Results from scenarios of altered commercial vessel traffic density, speed and transit route

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By

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Figure 67: Boxplot comparing the sound pressure levels (SPL) in the acoustically-derived subregions for the slowdown scenario with 100% participation to 10 knots throughout the full transit through the Salish Sea using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles. Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

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Figure 91: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 85% participation to ECHO speeds throughout the Salish Sea, and RIGHT: shown relative to RL from a scenario of 100% participation to ECHO speeds throughout the Salish Sea at 125 Hz at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

Figure 92: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 85% participation to ECHO speeds throughout the Salish Sea, and RIGHT: shown relative to RL from a scenario of 100% participation to ECHO speeds throughout the Salish Sea at the SRKW communication range (500 Hz-15 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

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Figure 96: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 100% participation to ECHO speeds in ECHO zones, and RIGHT: shown relative to RL from a scenario of 100% participation to ECHO speeds throughout the Salish Sea in SRKW echolocation range (15-100 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation in an ECHO slowdown throughout the Salish Sea exceed those of 100% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

Figure 97: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 85% participation to ECHO speeds in ECHO zones, and RIGHT: shown relative to RL from a scenario of 85% participation to ECHO speeds throughout the Salish Sea at 125 Hz at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 85% participation in an ECHO slowdown throughout the Salish Sea exceed those of 85% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

Figure 98: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 85% participation to ECHO speeds in ECHO zones, and RIGHT: shown relative to RL from a scenario of 85% participation to ECHO speeds throughout the Salish Sea in SRKW communication range (500 Hz to 15 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 85% participation in an ECHO slowdown throughout the Salish Sea exceed those of 85% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels

Figure 99: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 85% participation to ECHO speeds in ECHO zones, and RIGHT: shown relative to RL from a scenario of 85% participation to ECHO speeds throughout the Salish Sea in SRKW echolocation range (15-100 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 85% participation in an ECHO slowdown throughout the Salish Sea exceed those of 85% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

Figure 100: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 100% participation to 10 knots throughout the Salish Sea, and RIGHT: shown relative to RL from a scenario of 100% participation to ECHO speeds throughout the Salish Sea at 125 Hz at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) indicate greater vessel noise for the full slowdown at 10 knots compared to ECHO speeds and are where noise reductions for the 10 knot slowdown exceeds that of ECHO speeds, and blue indicates greater sound levels for the 10 knot scenario.

Figure 101: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 100% participation to 10 knots throughout the Salish Sea, and RIGHT: shown relative to RL from a scenario of 100% participation to ECHO speeds throughout the Salish Sea in the SRKW communication range (500 Hz to 15 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) indicate greater vessel noise for the full slowdown at 10 knots compared to ECHO speeds and are where noise reductions for the 10 knot slowdown exceeds that of ECHO speeds, and blue indicates greater sound levels for the 10 knot scenario.

Figure 102: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from a scenario of 100% participation to 10 knots throughout the Salish Sea, and RIGHT: shown relative to RL from a scenario of 100% participation to ECHO speeds throughout the Salish Sea in the SRKW echolocation range (15-100 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) indicate greater vessel noise for the full slowdown at 10 knots compared to ECHO speeds and are where noise reductions for the 10 knot slowdown exceeds that of ECHO speeds, and blue indicates greater sound levels for the 10 knot scenario.

ABSTRACT

Burnham, R., Vagle, S., Lauch M. 2025. Results from scenarios of altered commercial vessel traffic density, speed and transit route. Can. Tech. Rep. Fish. Aquat. Sci 3715. : xxix + 215 p. https://doi.org/10.60825/ktqc-3694

Noise increases resulting from a seven-fold increase in tanker and tug transits related to the Trans Mountain Expansion (TMX) project, and the efficacy of slowdown and rerouting measures as mitigation were estimated using a vessel noise model.

Potential acoustic impacts to southern resident killer whales (SRKW, *Orcinus orca*) were considered by examining communication and echolocation ranges (0.5-15 kHz and 15-100 kHz respectively) at typical swimming and foraging depths (7.5, 50 and 100 m) during May to October. Measure effectiveness was determined through the comparison of simulated scenarios to a pre-project baseline.

Increases were focused in shipping lanes and shallow water. Slowing vessels to 10 knots throughout their transit was the most effective mitigation measure, whereas a lateral displacement of tugs through the Strait of Juan de Fuca made no change overall.

The metric used to evaluate noise level change influenced conclusions on measure efficacy, where reductions were seen for slowdowns in upper (e.g., L_{75}, L_{95}) but not in lower percentiles (L_{50} or below). By targeting the faster moving vessels, slowdowns effectively shift the greatest noise sources to these lower levels.

Results presented are from best available inputs at the time; amendments may occur as refinements are made to the model.

RÉSUMÉ

Burnham, R., Vagle, S., Lauch M. 2025. Results from scenarios of altered commercial vessel traffic density, speed and transit route. Can. Tech. Rep. Fish. Aquat. Sci. 3715: xxix + 215 p. https://doi.org/10.60825/ktqc-3694

Un modèle de bruit de navire pour la mer des Salish a été utilisé pour comprendre les augmentations des niveaux de pression acoustique (SPL) résultant d'une augmentation par un facteur de sept des transits de pétroliers et de remorqueurs liés au projet d'agrandissement du réseau de Trans Mountain (TMX), et l'efficacité des mesures de ralentissement et de réacheminement pour les atténuer.

Les impacts acoustiques potentiels sur les orques résidentes du sud (SRKW, Orcinus orca) ont été prise en considération pendant l'examination des gammes de fréquences de communication et d'écholocation (0,5-15 kHz et 15-100 kHz respectivement) à des profondeurs typiques de nage et de recherche de nourriture (7,5, 50 et 100 m) de mai à octobre, lorsque les SRKW sont les plus présentes dans la mer des Salish. L'efficacité des mesures a été déterminée en comparant les scénarios simulés à une base de référence antérieure au projet de 2015.

Les augmentations de bruit des navires liées au TMX se sont concentrées dans les couloirs de navigation et les zones d'eau peu profonde. Le ralentissement des navires à 10 nœuds tout au long de leur traverses'est avéré être la mesure d'atténuation la plus efficace, tandis qu'un déplacement latéral des remorqueurs dans le détroit de Juan de Fuca n'a apporté aucun changement.

La métrique utilisée pour évaluer le changement de niveau sonore a influencé les conclusions sur l'efficacité de la mesure, où des réductions ont été observées pour les ralentissements dans les percentiles supérieurs (par exemple, L75 ou L95), mais pas dans les percentiles inférieurs (L50 ou moins). En ciblant les navires les plus rapides, les ralentissements déplacent effectivement les sources de bruit les plus importantes vers ceux de niveaux inférieurs.

Les résultats présentés sont les meilleures données disponibles en ce moment. Ils seront probablement modifiés au fur et à mesure des améliorations apportées au modèle.

List of Acronyms

AIS: Automatic Identification System

AMAR: Autonomous Multichannel Acoustic Recorder

CER: Canada Energy Regulator

CTD: Conductivity, Temperature, Depth profiles

dB: Decibel

DFO: Fisheries and Oceans Canada/ Government of Canada

ECHO: Vancouver Fraser Port Authority's Enhancing Cetacean Habitat and Observation Program

FFHPP: Fish and Fish Habitat Protection Program

Hz: Hertz

IQR: Interquartile range measured from the 25^{th} to the 75^{th} percentile.

kHz: kiloHertz

L_{eq}: Equivalent continuous sound level, also known as the time-average sound level.

m: meter

nm : Nautical mile (1852 m)

MMSI: Maritime Mobile Service Identity

NL : Noise level

PSD: Power Spectral Density

RAM: Range-dependent Acoustic Model

RL: Received level

rms: Root Mean Square

SARA: *Species at Risk Act*

SL: Source Level

SOG: Speed Over Ground

SPD: Spectral probability density

SPL: Sound Pressure Level

SRKW: Southern Resident Killer Whale

STW: Speed Through Water

TMC: Trans Mountain Corporation

TMX: Trans Mountain Expansion Project

TSS: Traffic Separation Scheme

1. EXECUTIVE SUMMARY

A vessel noise model was used to better understand implications to sound levels in the Salish Sea resulting from increased vessel traffic associated with the Trans Mountain Expansion (TMX) project. It is projected that TMX-related tanker transits with an associated tug escort will increase from approximately five to thirty four per month, with the first transits in May 2024. The noise additions were estimated from a pre-project baseline, using input data from 2015. This year also preceded any conservation measures put in place in the Salish Sea to help lessen the effects of noise disturbance on at-risk species.

The efficacy of several proposed management measures in mitigating these increases were estimated using the vessel noise model. These measures included vessel slowdowns for part or all of their transit through the Salish Sea to and from the Port of Vancouver, and a rerouting measure. The results from these modelled scenarios were sought by Fish and Fish Habitat Protection Program (FFHPP) as part of an adaptive management process.

The focus of the analysis was the potential acoustic disruption on endangered southern resident killer whales (SRKW, *Orcinus orca*). The Salish Sea is designated as critical habitat for SRKW, with foraging areas identified on Swiftsure Bank, and in Juan de Fuca and Haro Straits. The frequencies and depths considered in the analysis were selected to be relevant to SRKW acoustics use. The model output (125 Hz) was extrapolated to SRKW communication (500 Hz to 15 kHz) and echolocation (15-100 kHz) range, as well as a combined metric that encompasses the full calling repertoire (0.5-100 kHz). Also, sound level changes were estimated through the water column, establishing sound pressure levels (SPL) for each scenario at a typical SRKW swimming and transiting depth near the surface (7.5 m), a mid-column depth where SRKW typically first encounter prey (50 m) and a maximum repeatable foraging depth (100 m).

Changes in sound levels in decibels (dB) for each scenario were established through comparison to the baseline vessel data from 2015 plus the additional TMX traffic ((baseline +TMX) + measure). Data inputs for each scenario were simulated through the modification of 2015 baseline data. For each scenario the SPL were estimated at the model output frequency and three SRKW frequency ranges for the three depths for the Salish Sea (overall SPL and change), as well as dividing the study area into regions of interest. Eight acoustically-derived sub-regions were used, whereby calculations were made for Swiftsure Bank (west and east), Juan de Fuca Juan de Fuca (west and east), Haro Strait-Boundary Pass, the Gulf Island and Strait of Georgia (north and south). These sub-regions were defined through the use of passive acoustic recordings and previous work to characterize the soundscape in the Salish Sea. They also differed in their vessel presence, inclusion of shipping lanes, SRKW use and bathymetry. In addition, SPL and change relative to (baseline+TMX) was estimated for areas where SRKW are frequently present from May to October determined from sightings data (predicted likelihood of occurrence 70% or more), sub-divided into four regions (Swiftsure Bank, Juan de Fuca Strait, Haro Strait-Boundary Pass and the Strait of Georgia). Using behavioural observations and focal follow data, areas of foraging were also identified and examined as regions of greater interest. Theses were also divided into sub-regions on Swiftsure Bank, and Juan de Fuca and Haro Straits. Although in some cases the areas of interest were not contiguous within these sub-regions, the overall SPL and dB change were expressed as one aggregated to value for each scenario.

Sound levels and changes in sound levels were considered for percentiles representing background levels (L_5), the median (L_{50}), the upper extent of sound levels (L_{95}) and the arithmetic mean (L_{eq}), as well as quartiles (L_{25}, L_{75}). The median (L_{50}) represents a more typical sound level, signifying the sound level met or exceeded 50% of the time, or the equivalent of 2196 hours (92 days) out of 4392 hours (183 days). The median is used as the sound level that SRKW are more likely to experience on any given day or at any location within the Salish Sea. **This metric was selected to be used to create noise maps in the report to exemplify the changes in sound level calculated by the vessel noise model.** At the upper sound level, the 95th percentile or L_{95} represents the sound levels present 5% of the time or less (approximately 220 hours or 9 days of the total six months modeled). As such, this represents the worst case for SRKW and the sound level increases they may be subject to. Accordingly, quartiles represent the sound levels present at 75% or more of the time (L_{25}) or 25% or less of the time (L_{75}). The mean (L_{eq}) is presented as an alternative to percentiles as it is calculated independent to the time period being considered. However, it is sensitive to extreme inputs. As such, the mean can be skewed by local high amplitude and/or transient noise sources. **This metric was also used in some more limited examples to demonstrate the changes that might be seen, often representing a change in the highest sound levels, and as a comparison to the median.**

The extent and level of participation in the measure, and the metric considered to express SPL and dB change were influential in whether the measure would be deemed successful in mitigating the elevated levels from TMX-vessels. Typically measures were seen to be successful in reducing noise levels when considered in the upper percentiles representing the noisiest periods (e.g., L_{95}, or the sound levels that are exceeded 5% or less of the time), whereas little change or even additions were noted for lower percentiles representing more ambient noise (e.g., L_5). For slowdowns it was thought that the aggregation of vessels in one location or sub-region may result in these increases in background sound levels. For slowdown measures the greatest change was when addressing the fastest travelling vessels, which are often those that are emitting the most noise. This resulted in changes at the upper end of the sound levels noted for an area. A re-routing of tugs, displacing them south to travel further away from the Canadian coastline as they transit the Strait of Juan de Fuca was also tested as a mitigation scenario, but no differences were seen in the acoustic sub-regions or for the Salish Sea overall.

Presented are results from best available inputs at the time. They will likely see amendments as refinements are made to the model. All results depicted in the figures and tables of this report are designed to be examples of how the data could be presented, and demonstrative of the sound levels changes using test case data. They do not represent the only means to present model outputs. The subregions, frequency ranges, and depths used draw on species- and study-region specific data. The use of certain metrics in figures is solely to give a visual demonstration of the change in sounds levels at that level/percentile and should not be seen as an endorsement of the use of that metric in place of others. Changes in sound levels in all metrics/percentiles considered are presented in full in the tables in the report.

2. INTRODUCTION

Growth in world economies and expansion of oceanic transport routes for commercial shipping has increased both near-shore and deep ocean sound levels (Andrew et al. 2002, McDonald et al. 2006, Hatch et al. 2008, Hildebrand 2009, McKenna et al. 2009). More than 80% of global trade uses maritime shipping routes, with the number and size of vessels predicted to increase. Commercial vessel noise emissions are predominantly in the low frequencies (<1000 Hz) and can propagate over great distances (Jasny 2005, NRC 2005, Hildebrand 2009, Frisk 2012, Gillespie 2016, Mikis-Olds and Nichols 2016); however, these vessels can also emit noise into the mid- to high-frequencies, up to 100 kHz (Ross 1976, Gray and Greeley 1980, Richardson et al. 1995, Arveson and Vendittis 2000, Veirs et al. 2016). As the reliance on oceanic shipping routes increases, the demand on ports in the Pacific northwest has grown. This has seen increased traffic through British Columbia (BC) waters and into the Salish Sea, which encompasses waters around southern Vancouver Island and northern Washington State. This area hosts commercial traffic transiting to ports including Vancouver, Victoria, and Nanaimo in Canada, and Port Angeles, Tacoma, and Seattle in the United States.

The Salish Sea has been shown to have the highest ambient noise levels along the BC coast (Erbe et al. 2012). Underwater sound mapping and modeling techniques can be used to understand anthropogenic additions to soundscapes, highlight regions that are likely to have the most elevated sound levels, as well as help guide mitigation actions to lessen potential impacts (Van de Graaf et al. 2012, Gedamke et al. 2016). They can also add to efforts to monitor ecosystem health or guide marine spatial planning. As underwater ambient sound levels rise, there is concern that introduced noise from shipping could impact marine life, impairing their ability to send and receive acoustic information, which is their principle means of understanding their surroundings. The Salish Sea hosts foraging habitat for several marine species, including the endangered southern resident killer whale (*Orcinus orca*, SRKW), with this area designated as critical habitat for SRKW (2017a,b, Figure 1). Sighting data indicates SRKW are most prevalent in this area during May to October following prey movements (Olson et al. 2018, Hanson et al. 2010, 2021, DFO 2021, Thornton et al. 2022a, Shields 2023). However, there is an overlap between their foraging areas and international shipping lanes (Cominelli et al. 2018, Figure 1), with near-future predicted increases in vessel numbers anticipated to have an acoustic impact on SRKW (Vagle et al. 2021, Thornton et al. 2022b, Burnham et al. 2023). Acoustic disturbance, particularly from vessels, has been listed as one of the main threats to population success, survival, and recovery for SRKW (DFO 2018, 2021, SRKW ITA 2024), with anthropogenic additions interfering with several of their key life processes. This could impact the success of individuals or the survival of the ecotype (Weilgart 2007, Erbe et al. 2016).

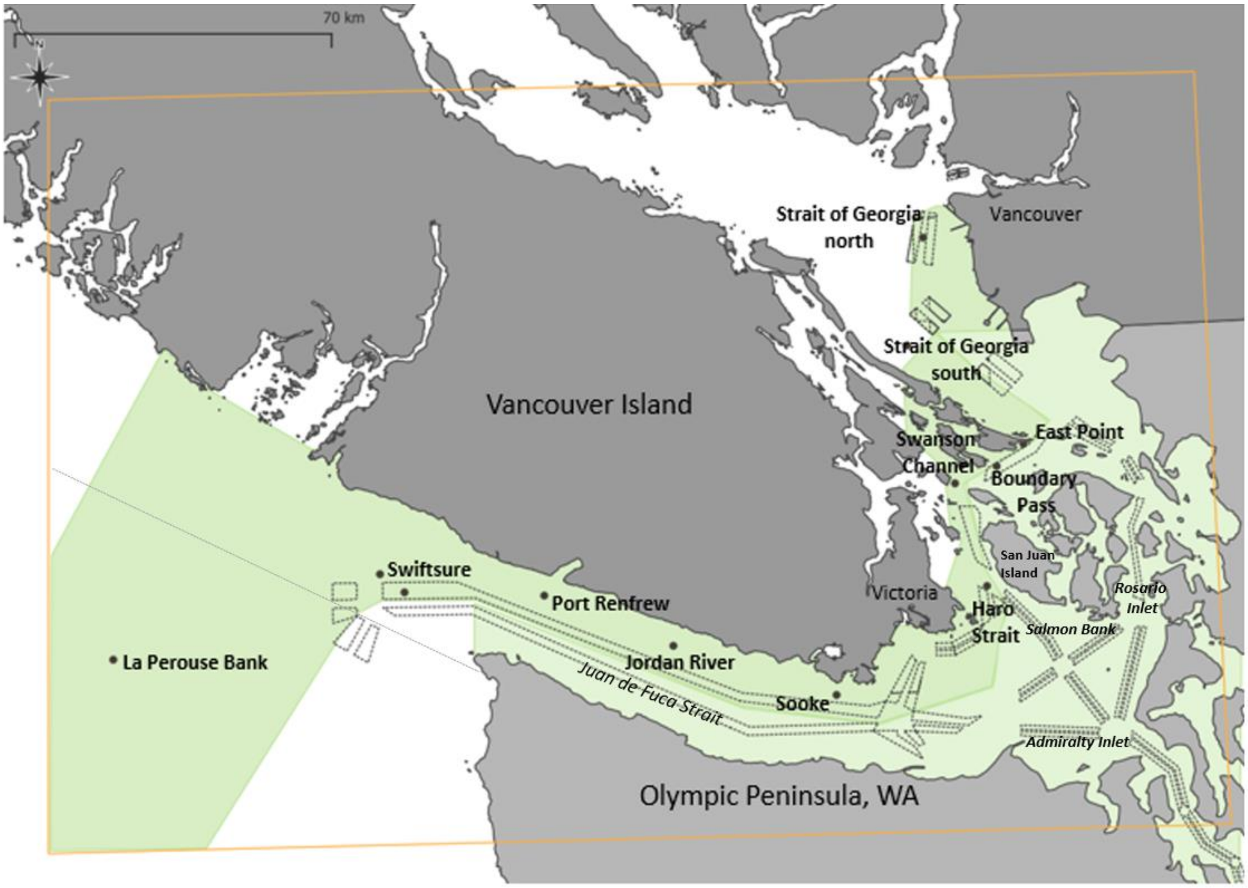

Figure 1: Swiftsure Bank and the Salish Sea. Indicated: full study area extent (yellow rectangle); acoustic mooring locations and names (black circles); international commercial shipping lanes (dashed lines); SRKW critical habitat (green shading). Dotted grey line between Swiftsure and La Perouse Bank indicates the 12 nautical mile territorial sea limit.

Marine development are predicted to bring near-future increases in project-related vessel traffic to the Salish Sea. For example, the expansion of the Trans Mountain pipeline (TMX) which twinned the pipeline and nearly tripled its capacity. This came into service in May 2024. At capacity, this project is expected to increase tanker transits approximately seven-fold, from five to thirty-four tankers each month transiting through the Salish Sea to call to Westridge Marine Terminal in Burnaby, BC. This will lead to an increase in total traffic through Burrard Inlet by approximately 13.4% and by 5.5% through Juan de Fuca Strait. The number of escort (tug) vessels will also increase in support of the extra tankers through pilotage areas. Tankers with a summer deadweight tonnage of 40,000 tons or more and carrying liquid in excess of 6,000 tones through Haro Strait and Boundary Pass (see Figure 1) require escort tugs. These tugs, therefore, must be included in the assessment of sound level change related to project vessels.

Measures to lessen vessel noise can be operational, or through changes to the sound source by the introduction of quietening technologies and/or improved maintenance practices. Operational measures, which can be implemented on shorter timelines and have an immediate effect to address vessel noise additions, have been trialed in the Salish Sea. So far, management measures in the Salish Sea have included changes in transit speed and rerouting or exclusion of passage through areas noted to be particularly important to SRKW to try and lessen the acoustic disturbance.

Voluntary seasonal slowdown measures were first trialed by the Vancouver Fraser Port Authority's Enhancing Cetacean Habitat and Observation (ECHO) program in 2017. Since then, the spatial and temporal extents have increased (Table 1 in Appendix); in 2019 an area in Boundary Pass was added, in 2020 slowdowns were initiated on Swiftsure Bank in the outbound lane, and then expanded to include both in- and out-bound traffic in 2022. Additional measures, including rerouting vessels away from foraging areas along the Canadian coast through Juan de Fuca Strait began in 2019. Initially for all commercial vessels, this lateral displacement measure now targets tugs (Table 1 in Appendix, Figure 2). The sites and speeds for the measures were selected through the engagement of working groups, committees and stakeholders, and their resulting advice. Passive acoustic recordings in the area have been used to quantify the acoustic benefits of these measures to SRKW. Reductions are quantified through comparison to control periods before and after the trial periods (see Vagle and Neves 2019, Vagle 2020, Burnham et al. 2021, Burnham and Vagle 2023; the location of the acoustic recorders and weather stations used in analysis are shown in Figure 2).

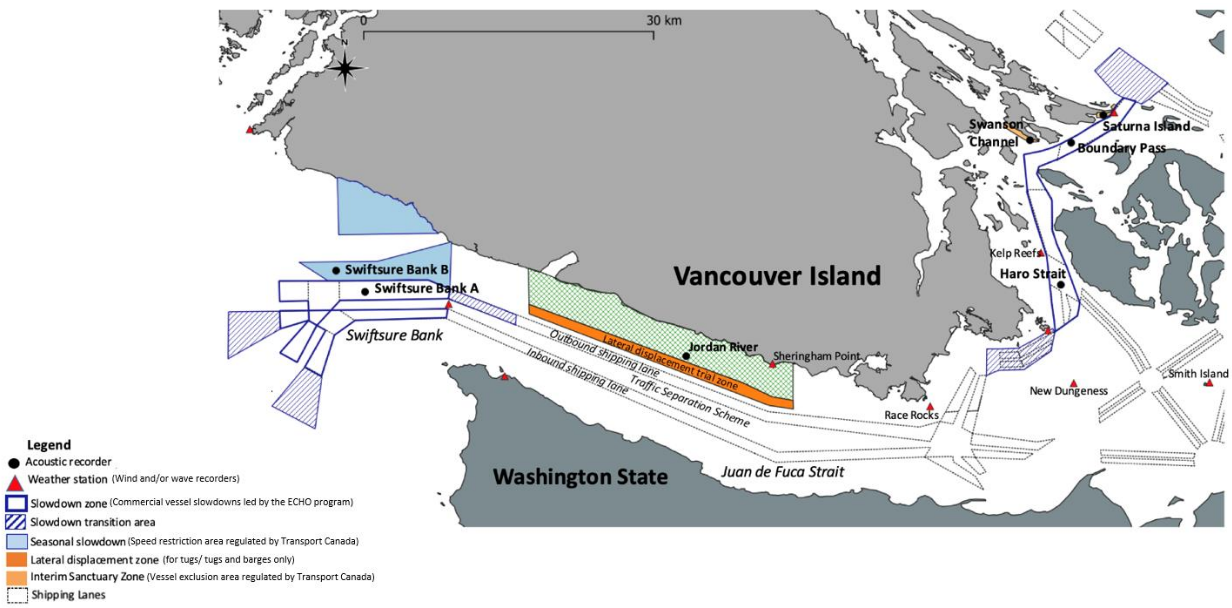

Figure 2: Locations of management actions undertaken from summer 2021 onwards. Commercial shipping lanes are shown for reference. The location of the acoustic recorders used for the analysis are also shown (black circles) and weather stations are indicated (red triangles). The seasonal speed restrictions on Swiftsure Bank (solid light blue shading) and Interim Sanctuary Zones (yellow) are mandatory measures, whereas reducing speed in the slowdown zones and lateral displacement are voluntary measures coordinated by the ECHO program.

Here we use a vessel noise model to understand how commercial vessel noise contributes to the ambient sound levels, and how changes in vessel presence, transit route, and speed may alter these noise contributions. This is in addition to work done to characterize the soundscape from *in-situ* recordings (see Burnham et al. 2021). At their simplest, models predict the received levels of sound at a given location, using inputs of sound source levels (SL) and knowledge of sound propagation in the area. Variables on transmission losses are also included to better represent the complexity of the properties defining the soundscape. The model shown here was developed to forecast sound levels as a response to predicted changes in shipping traffic, and aid in developing mitigation actions to lessen the acoustic disturbance of marine mammals in the Salish Sea, specifically SRKW. The model was evaluated via comparison to acoustic recordings made at locations throughout the study area, as a means of validation and refinement, although this is an ongoing process.

The scenarios tested include a near-future, project-related increase in vessel number, and evaluation of measures to lessen the potential additional acoustic disturbance that might result. Mitigation measures tested include various slowdown scenarios, and a lateral displacement which moved vessels away from SRKW foraging areas. For each scenario, the change in sound level that might result was quantified throughout the study area, in subregions, and at three water depths. The conclusions made from the analysis are the best possible with the current model version as well as model inputs and validation data availability. Amendments, modifications, and refinements are anticipated as knowledge increases, more data becomes available, and the model is enhanced by further validation efforts and sensitivity analyses.

3. METHODS

3.1 Study area and subregions

The study area is defined by the model extent, bounded by 49.0°N, 125.5°W in the northwest, 49.0°N, 123.0°W in the northeast, 48.0°N, 125.5°W in the southwest and 48.0°N, 123.0°W in the southeast (Figure 1). It was designed to encapsulate the waters that SRKW are known to frequent (see Olson et al. 2018, Thornton et al. 2022a), SRKW critical habitat, and the areas expected to be impacted by changes in project-related vessel presence. It is also broad enough that it would capture changes in SRKW movement patterns, described in recent years (see Hanson et al. 2021, Shields 2023).

3.1.1. Subregions

The soundscape levels and changes under different scenarios were examined as a total change in the study area, as well as in different zones through the use of subdivisions into regions of interest. The subregions were derived through the use of known acoustic properties of the Salish Sea, and on data on SRKW presence and habitat use, specifically foraging.

Acoustically-derived subregions

Acoustic recordings made at 13 locations in the Salish Sea contributed to the discernment of soundscape-based acoustic subregions (Figure 3). Sound levels and empirical probability curves in the frequencies that represent vessel metrics (63-Hz and 125-Hz 1/3 octave bands, 100 Hz to 1000 Hz), rain (1-kHz band centered around 20 kHz), and wind (a 1-kHz band centered around 8 kHz) were examined alongside broadband (10 Hz to 100 kHz) measures and frequencies relevant to SRKW (communication range 500 Hz-15 kHz; echolocation range 15-100 kHz). Spatiotemporal patterns of noise sources, sound transmission properties and the distribution of sound energy through power spectral density (PSD) curves were considered (see Burnham et al. 2021). Subregions were formed by grouping together locations that showed similarities in these properties, with distinctions between regions defining the area boundaries. This analysis initially suggested six subregions; Swiftsure Bank, western Juan de Fuca, eastern Juan de Fuca, Haro Strait-Boundary Pass, Gulf Islands, and the Strait of Georgia (see Burnham et al. 2021). This subdivision is also similar to the sections along the commercial shipping lanes identified by the Canada Energy Regulator (CER) in their recommendations to the Governor in Council to address the impact to at-risk marine mammals, including SRKW, from underwater noise increases associated with TMX-related shipping. In consultation with FFHPP, the subregions at Swiftsure Bank and the Strait of Georgia were further subdivided (Figure 3). This was to ensure that the changes in these subregions were not diluted because of their larger spatial extent.

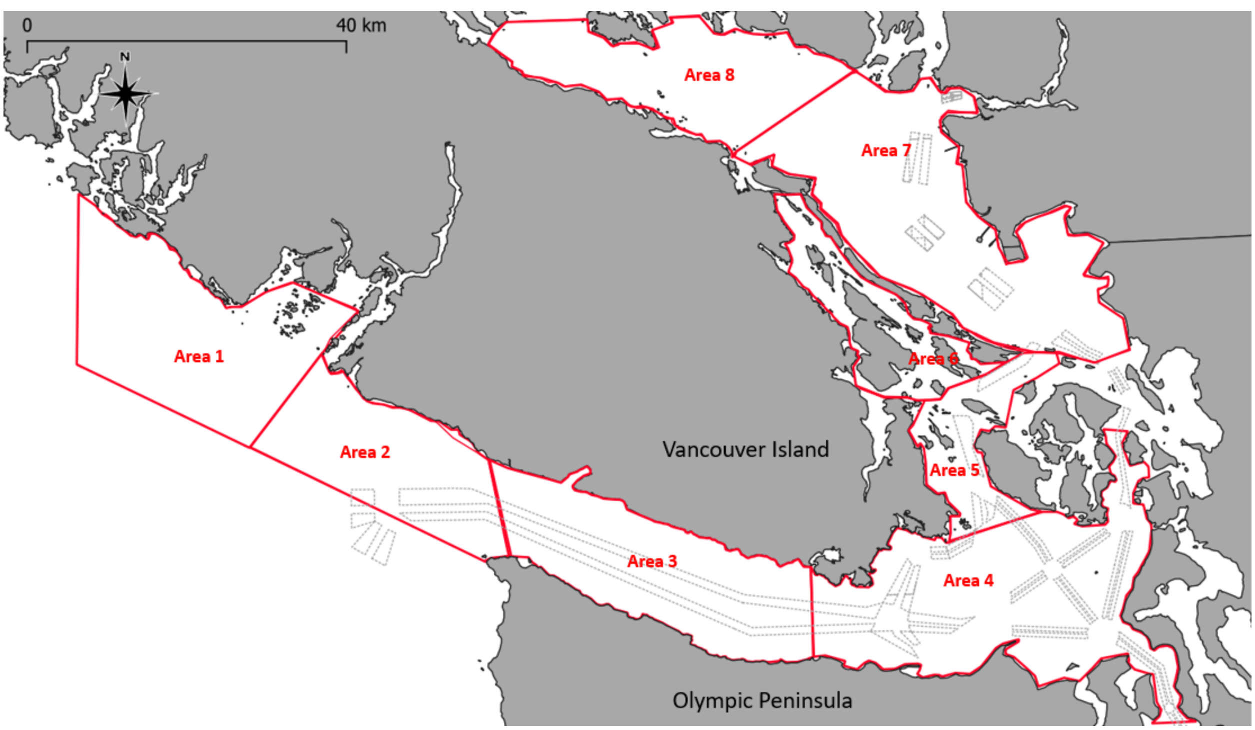

Figure 3: The eight acoustic subregions, indicated by red outlines. Area 1: Swiftsure Bank - west, Area 2: Swiftsure Bank east, Area 3: Juan de Fuca Strait west, Area 4: Juan de Fuca Strait east, Area 5: Haro Strait-Boundary Pass, Area 6: the Gulf Islands, Area 7: Strait of Georgia south, Area 8: Strait of Georgia north. Areas 1 and 2 have a maximum distance from shore limit of 12 nm. The shipping lanes are indicated by grey dashed lines.

Acoustic subregion descriptions by area (also see Burnham et al. 2021):

Area 1: Swiftsure Bank west

Remote shipping lane vessel traffic is a contributor to the soundscape here. It is also a site of mixing and water movement, influenced by both local and distant/offshore wind and wave effects.

Area 2: Swiftsure Bank east

Commercial vessel noise is a consistent contributor, with shipping lanes present, as well as offshore wind effects. This subdivision captures areas of SRKW foraging.

Area 3: Juan de Fuca west

Noise in the lower acoustic frequencies in this area is dominated by shipping lanes, with additions of higher-frequency vessel noise from small/non-commercial vessel traffic, especially in the summer. Offshore generated ocean swell is also a factor here.

Area 4: Juan de Fuca east

The acoustic recordings from the Sooke mooring were used to characterize this region, as recordings were unlike those of neighbouring locations. A localized wind effect is evident in the summer months.

Area 4: Boundary Pass-Haro Strait

This area is relatively quiet, except for the direct passage of vessels that create acute and intermittent noise additions.

Area 5: Gulf Islands

The presence of smaller, recreational vessels is elevated, particularly during the summer, and defines the soundscape in this area. Ferry traffic is also a regular contributor to the observed noise.

Area 7: Strait of Georgia south

Ferry transits define the soundscape in this area, with additional contributions from commercial vessels transiting international shipping lanes.

Area 8: Strait of Georgia north

Similar to the soundscape of the southern Strait of Georgia, but less influenced by direct noise contributions from ferries and commercial shipping.

SRKW Occurrence subregions

Areas where the presence of SRKW had been frequently noted by visual observations from May to October were used to define these subregions of occurrence. The presence and prevalence of SRKW in the Salish Sea was determined from 12 years of encounter data, combining information from dedicated surveys (see Noren et al. 2009. Holt et al. 2013, Olson et al. 2018, Thornton et al. 2022a) and from whale watchers. Time and location of SRKW sightings were collated, removing duplication and repeated sightings of the same whale group, identified as groups that were observed within an hour and/ or 2 nautical miles or 3.7 km of each other. Sightings were effort-corrected by overlaying a grid quantifying search or survey effort, expressed as a proportion of the total effort for the study area. A spatiotemporal model was used to interpolate results throughout the Salish Sea, resulting in a predictive layer of where SRKW presence would be expected at the 70% confidence level (Figure 4, Thornton et al. 2022a,b). To enable comparison with a focus on areas important to SRKW, the level of change for areas of higher SRKW presence was expressed for four subregions: Swiftsure Bank, Juan de Fuca Strait, Haro Strait and the Strait of Georgia (Figure 4). For each subregion the SPL level and change from baseline and baseline+TMX in dB were determined.

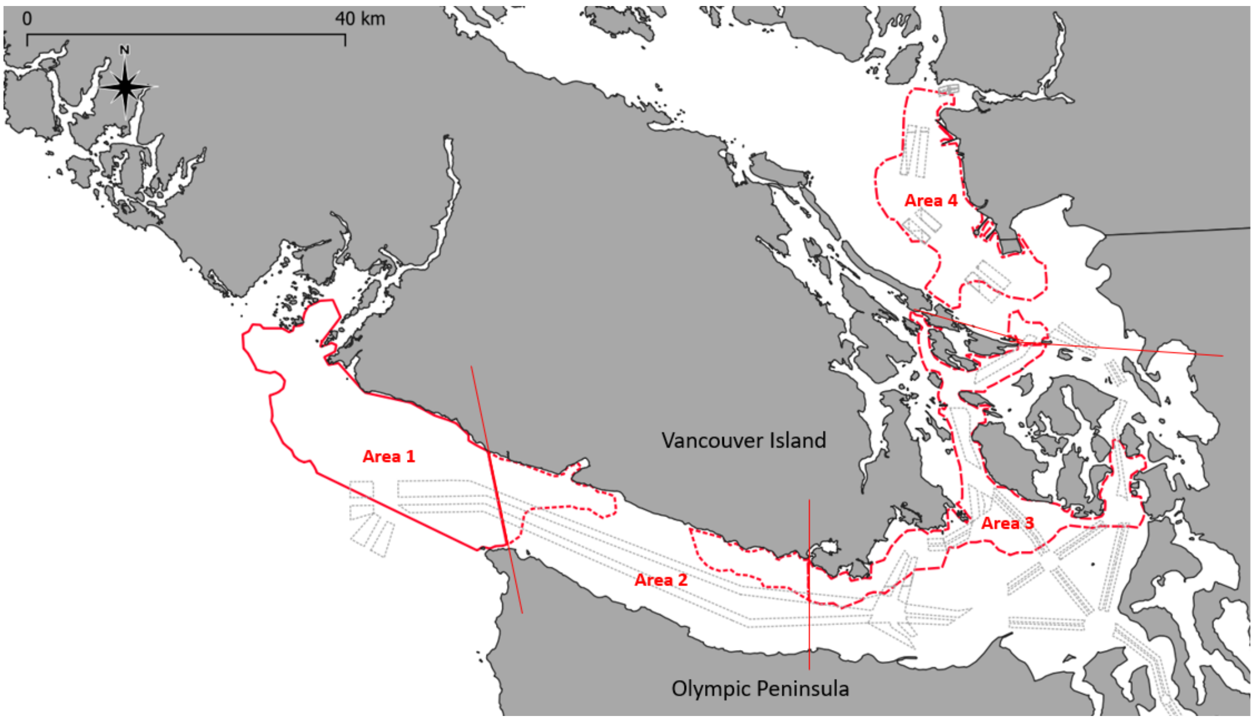

Figure 4: Areas of increased SRKW presence in the study area (red outline), where frequency of occurrence is equal to or exceeds 70%. Adapted from Thornton et al. 2022a. The division into four subregions is shown: Area 1: Swiftsure Bank, Area 2: Juan de Fuca Strait, Area 3: Haro Strait and Area 4: Strait of Georgia, with red lines used to highlight the subdivision.

SRKW occurrence subregion descriptions by area (also see Thornton et al. 2022a):

Area 1: Swiftsure Bank

Presence of SRKW clipped to 12 nm from shore to be consistent with the acoustic subregion definitions. This area represents sighting data west of the entry to Juan de Fuca Strait.

Area 2: Juan de Fuca Strait

Combined results from areas of higher occurrence at the eastern and western extents of the subdivision.

Area 3: Haro Strait – Boundary Pass

Combined results of areas in and around Haro Strait, extending into areas of eastern Juan de Fuca and Boundary Pass.

Area 4: Strait of Georgia

Area of increased SRKW presence in the southern extent of the Strait.

SRKW Foraging subdivisions

Behavioural data from the dedicated SRKW surveys on Swiftsure Bank, Juan de Fuca Strait, and Haro Strait were collated to determine the dominant habitat use of the whales observed. This used focal follow and group behaviour survey protocols, initially detailing whether whales were foraging, traveling, socializing, or resting, and ultimately categorized as foraging or non-foraging (see Noren et al. 2009, Holt et al. 2013, Thornton et al. 2022a,b). A Bayesian interference approach of integrated nested Laplace approximations was used to extrapolate the probability of foraging throughout these areas. This was used to distinguish areas of common or frequent foraging for SRKW (Figure 5). The foraging subdivisions used areas that were described by Stredulinsky et al. (2023) as common, defined as a region where the likelihood of SRKW foraging exceeded 25%. These areas were divided into three subregions for comparison (Swiftsure Bank, Juan de Fuca Strait, and Haro Strait). The foraging subregions encapsulated areas that were determined to be frequent foraging areas (equal to or exceeding 50% likelihood of foraging, Stredulinsky et al. 2023), but are more conservative.

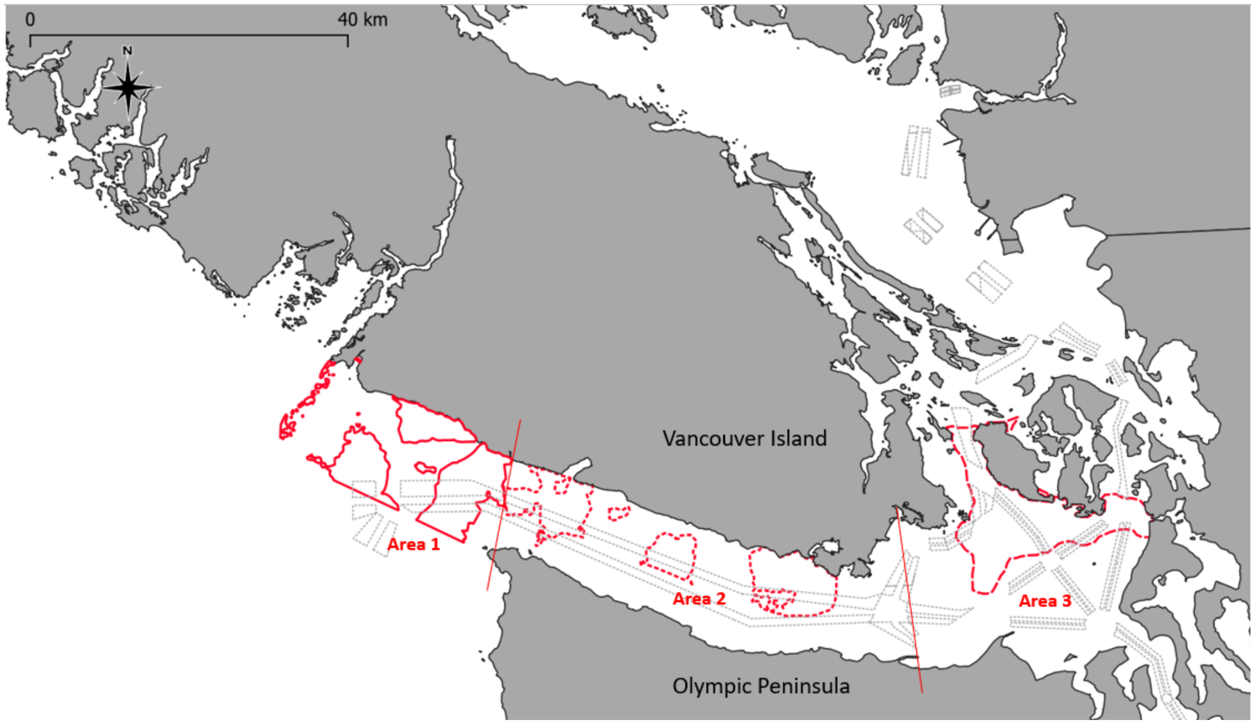

Figure 5: SRKW foraging areas (red outline) determined from visual observations and classifications of behaviour (areas considered common foraging areas in Stredulinsky et al. 2023). Results reported for three subregions: Area 1: Swiftsure Bank, Area 2: Juan de Fuca Strait, Area 3: Haro Strait, with red lines used to highlight the subdivision.

SRKW foraging subregion descriptions by area (also see Stredulinsky et al. 2023):

Area 1: Swiftsure Bank
Combined foraging areas west of Barkley Sound to the entrance to Juan de Fuca out to the 12 nm limit.

Area 2: Juan de Fuca Strait
Aggregation of four areas of common foraging for SRKW in the Strait.

Area 3: Haro Strait
Areas of foraging in Haro Strait and on Salmon Bank extending into eastern Juan de Fuca.

3.2 Vessel noise model

The Salish Sea vessel noise model was developed from a range-dependent model (RAM) first established by Collins (1993), refined by Aulanier et al. (2017) and then adapted to the study area. Under a probabilistic framework, called RAMDAM, vessel tracking data, ship source levels, and acoustic propagation parameters (Table 1) were used to estimate and map received levels from vessel sources in both horizontal and vertical space through time. The RAM model uses the Pade split-stepping method to solve the range-dependent parabolic equation for sound propagation in cylindrical coordinate system on a vertical plane. This resulted in outputs at 20 water depths between 0.5 and 500 m. The horizontal direction was divided into 120 vertical planes, equally distributed to achieve a full 360 degrees coverage around each vessel.

Model inputs include vessel tracking data, and variables to characterize the sound speed field and transmission losses as sounds are propagated. Table 1 shows the model inputs, their sources, and the relative sensitivity of the model outputs to each.

Table 1: A list of vessel noise model and extrapolation inputs, the sources of the data, assumptions under which the data was applied and the relative sensitivity of the model to each of the inputs expressed qualitatively.

Model Input	Data Input	Source	Assumption	Model sensitivity
Bathymetry	15 s arc, 300 m resolution	Canadian Hydrographic Service, 2020	Interpolated to model grid	Low
Sediment data	Sediment type, on a 300 m resolution	Haggarty et al. 2018	Sediment type approximated to different zones	High
Geoacoustic sediment properties	Low frequency (60-500 Hz) propagation of P and S waves	Hamilton 1980, Jensen et al. 2011	Properties tuned to for acoustic observations	High
Water properties	Temperature, salinity, wind data	Live Ocean model, SalishSeaCast model	Interpolated from hydrodynamic model grid to acoustic model grid	Medium
Water column properties	40 vertical layers	McDougall and Barker 2011	Variable layer thickness	Low
Acoustic transmission properties	Acoustic frequency dependent absorption for pH value of 8	Francois and Garrison 1982	Assumes constant pH	Low
Vessel source levels	Derived source levels, considering SOG	Veirs et al. 2016, Simard et al. 2016, MacGillivray and Li 2018	Assumes all vessels of the same type have the same SL	High
Vessel presence	Cleaned AIS vessel presence data. AIS Class A only	CCG	Assumes all vessels are accounted for	High

3.2.1 Vessel data

Automatic Identification Systems (AIS) vessel tracking data was collected by Canadian Coast Guard terrestrial receivers, using Class A AIS data. These transceivers are mandated for vessels over 300 tons, excluding fishing vessels, and for passenger vessels for more than 12 passengers and exceeding 150 tons. Towage and escort vessels must also carry a Class A receiver. The raw data received show vessel name, identification number, type, and location every 5-30 seconds. These data were cleaned and binned into 5-minute packages from which the pathway and speed of each vessel was interpolated. Speed over ground (SOG) was calculated for each 5-minute bin using the distance between GPS location and elapsed time. Any seemingly erroneous data were removed, and missing data points were interpolated from neighboring time periods and locations. Vessel types identified include bulk carriers, container ships, tankers, ferries, tugs, vehicle carriers, fishing vessels, government/research vessels, naval vessels, passenger vessels, whale watching vessels, and recreational vessels. Inputs to the model were either real data from 2015, or synthetic data created by modifying the 2015 data to represent any given scenario. This included modification of the number of vessels, their transit route and their speeds. Cleaning/filtering of the data included removing any vessels traveling at speeds greater than 30 knots, and GPS locations that were on land.

3.2.2 Environmental data

High resolution bathymetry, sediment composition, and water property data were input into the model. Bathymetric data was obtained from the Canadian Hydrographic Service (CHS 2020) and interpolated to give water depths for the study area with a 15-arc second spacing, or at approximately 300 m resolution (Haugerud 1999, Table 1). Propagation through unconsolidated ocean floor sediment was incorporated using values from Hamilton (1980) and Jensen et al. (2011), using broad bottom-type classifications (Table 1). Sound speed profiles through the water column were calculated from conductivity, salinity, temperature, and depth (CTD) measures formed from both *in-situ* data collected at 3-4 monthly intervals, and from hourly reported conditions from the SalishSeaCast NEMO model (Sootiens et al. 2016, Sootiens and Allen 2017). Frequency dependent absorption was accounted for by using the pH value of 8 from Francois and Garrison (1982).

3.3 Model outputs

Model outputs were received levels (RL) at 125 Hz every thirty minutes, at a spatial resolution of approximately 440 m by 500 m at 20 vertical levels through the water column between 0.5 and maximum 500 m. In the surface waters the resolution for the vertical layers was 1 m, whereas at the deepest depths it was 24 m. This gives an output of received levels as a function of time, t (30 minute intervals), depth d, and points on a horizontal grid (i, j). From this, RL were extrapolated to SRKW-relevant frequencies, using the frequency dependent source level curve for tankers reported by MacGillvray and Li (2018). This monopole curve (Figure 6) was formed from data from multiple vessel passages at different speeds directly over a hydrophone. This was used to form a correction factor for two ranges used to describe SRKW acoustics use; communication and social calls characterized to be the 500 Hz to 15 kHz range, and the echolocation signal frequency range was 15-100 kHz (Heise et al. 2017). This is consistent with methods used in Burnham et al. (2023).

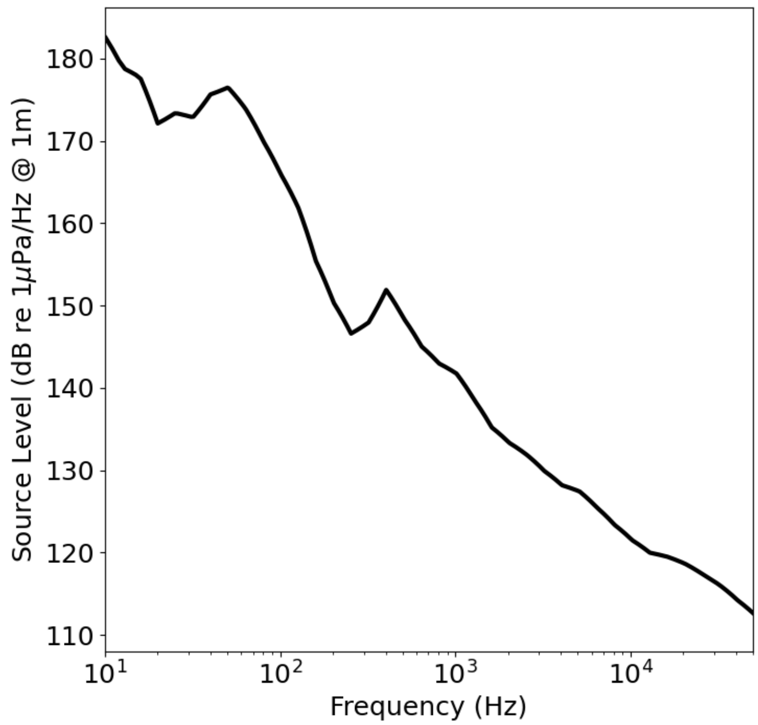

Figure 6: Average monopole sound source level (SL) from multiple tankers transiting directly over a hydrophone in the Salish Sea adapted from that presented by MacGillvray and Li (2018), used to extrapolate the model output of 125 Hz to SRKW communication (500 Hz to 15 kHz) and echolocation (15-100 kHz) ranges.

When extrapolating a frequency dependent absorption factor was added, which assumed that the source of noise emitted from vessels was in the shipping lanes. Water absorption coefficients were incorporated into the model outputs, calculated as a function of distance for each grid point from the shipping lanes (see Burnham et al. 2023). As the model inputs were Class A AIS carrying vessels it was assumed that the source of vessel noise would be focused in the shipping lanes.

3.4 Passive acoustic recordings

Recordings were made at twelve locations throughout the Salish Sea. The deployment locations were those thought to be important to SRKW, including foraging areas, as well as representing varied settings when considering topography, exposure, and proximity to shipping lanes (Figure 1). Recordings were made using Autonomous Multichannel Acoustic Recorders (AMAR G4, Jasco Applied Sciences), with calibrated hydrophones (M36-100, GeoSpectrum Technologies) mounted on quiet moorings (Oceanetic Measurement Ltd.) that positioned the hydrophones approximately 2 m off the sea floor. The recordings were made constantly, without duty cycling. The first recorders were deployed in early 2018 and have been maintained and serviced regularly to ensure consistent data collection since. Sample rate was 256 kHz with 24-bit resolution and the data were stored on internal SD cards as wav files to be downloaded when the moorings were retrieved. Once recovered, the files were processed with custom Python scripts, modified from those described in Merchant et al. (2015), into one-minute power spectra in 1-Hz frequency ranges using Hanning windows with a 50% overlap and Welch's averaging. The data have been used to form a soundscape description (see Burnham et al. 2021), to understand the dominant sound sources in time and space through the Salish Sea. They have also been used previously to consider the efficacy of management measures (see Figure 2), by comparing sound levels during the trial periods to those in the months directly preceding and following (see Vagle and Neves 2019, Vagle 2020, Burnham et al. 2021, Burnham and Vagle 2023). Here, the recordings at 125 Hz from data collected *in-situ* were compared to model outputs at 125 Hz at the deployment locations as a means to validate the model. The comparison for the same frequency, time period (2018 onwards), and depth showed the model to often underestimate the received levels (Figure 7), especially in enclosed waterways and around the Gulf Islands. The model does not capture all noise inputs, for example remote or anchored vessels, offshore weather events, or recreational vessels. This must be kept in mind when interpreting the results. Further ongoing refinements of the model will aim to address the disparities between model outputs and field recordings.

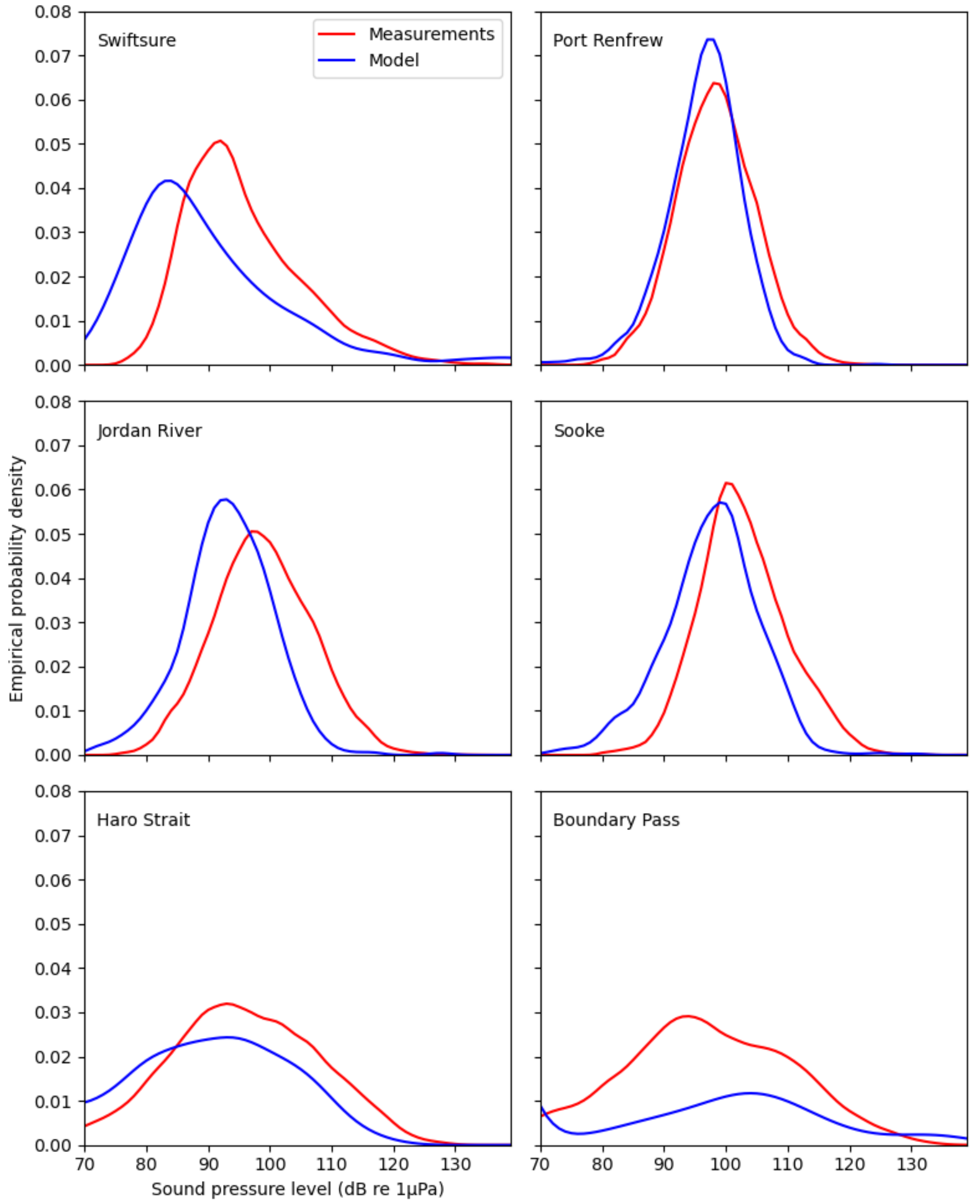

Figure 7: Model validation through comparison to recordings. The simulated model output (blue) and recorded SPL levels from moorings at Swiftsure Bank, Port Renfrew, Jordan River, Sooke, Haro Strait and Boundary Pass (red) for May 2018, expressed as an empirical probability density curves. Comparison was done using 125 Hz and model output depths matching the deployment depths of recorders.

3.5 Metrics

Sound levels can be presented in a number of ways; soundscape levels and changes in noise levels can be summarized using multiple different dimensions including time, frequency, location, and spatial extent. The selection of presentation method, or metric, has to be biologically relevant to the at-risk species of interest, and to the question or questions being considered.

Percentiles or exceedance values represent the distribution of sound levels over time and the proportion of time a specific sound level is exceeded. Percentiles are inversely related to exceedance levels, for example the sound level that is exceeded 95% of the time is equivalent to the 5th percentile, and is often used to describe background or ambient sound levels. In this report sound levels are discussed as percentiles throughout. Sound levels and changes in sound levels were considered for percentiles representing background level (L_5). Modelled for each scenario were the sound levels that are met or exceeded at least 95% of the time (L_5); the median (L_{50}), representing a more typical sound level which was met or exceeded 50% of the time; the upper extent of sound levels (L_{95}), representing the sound levels present 5% of the time or less; quartiles (L_{25}, L_{75}) representing the sound levels present at 75% or more of the time (L_{25}) or 25% or less of the time (L_{75}); and the arithmetic mean (L_{eq}). As well as percentiles, the arithmetic mean is often used to describe underwater sound levels as a measure of central tendency. The advantage of this metric is that it is calculated independent of the temporal period chosen for analysis, whereas percentiles are sensitive to this. It is, however, sensitive to extreme input values, and can be highly influenced by high amplitude noise sources or transient noise sources if present, then becoming more like the higher percentile values (Table 2). The value of the arithmetic mean is typically greater than the median, often more representative of the higher percentiles (95th percentile or greater). It can be an indicator of the skew of the data relative to the median (Robinson et al. 2014, van Geel et al. 2022). Other measures that may be considered are those that depict repetition in the data. The modal sound level may be useful in describing the most typical soundscape level but would be less useful if the data was bi- or multi-modal.

Table 2: Comparison of the median/50th percentile (L_{50}) and the arithmetic or linear mean (L_{eq}) as summary metrics of sound levels.

Median	Mean
Positive	
- Can be used to determine the statistical significance of a trend over time	- Most often used in terrestrial work, and commonly applied to aquatic evaluations
- Indicator of typical sound levels, less influenced by transient noise events	- Less sensitive to time period selected, independent of the length of time of segments unlike other averaging metrics
- More robust than other indicator metrics such as the mode	
- Can be used to quantify the percentage of time sound levels exceed a certain level	
Negative	
- Sensitive to the chosen time period of analysis	- Sensitive to outliers
	- Dominated by noisiest contributions to soundscape (can be >95th percentile in some cases)

Sound level reporting and metrics

Maps of sound level outputs from the vessel noise model presented here express the median values over the six months of May to October throughout the study area. The median level was selected to represent what SRKW would be experiencing for at least 50% of the time. However, this selection was made to demonstrate the changes through space (horizontal and vertical) as a visual input; the use of the median is not indicative of an endorsement for the use of this metric, just one option to consider the changes in sound levels. Maps of sound level outputs from the model calculated using the arithmetic mean have been included for some scenarios as a comparison. Tabulated values for the subregions also expressed sound levels and amount of change at different percentiles, including L_5 as a background level of ambient noise and, then at the other extreme, the loudest additions to the soundscape by considering L_{95} and the arithmetic mean (L_{eq}), which is sensitive to extreme sound sources. Quartiles were also given (L_{25} and L_{75}). To present all the tabulated values as figures was unfeasible and so sound level maps depicting the median (all scenarios) and mean (baseline, baseline + TMX, baseline+TMX+ 10 knot slowdown) were given as examples and to allow comparison between the two metrics. The estimated change in sound levels at each percentile was compared for each scenario to evaluate how the selection of metric in reporting results can influence the conclusions made. The change in sound levels for all of the scenarios modelled was calculated by referencing the baseline. This showed the additions that TMX-related vessels make, and how much each of the measures contributed to noise reduction, with the aim of returning to the baseline. To establish the efficacy of measures to mitigate noise additions, scenario outputs were also compared to the baseline condition plus the TMX-related vessels (baseline + TMX), with vessel inputs to the model including the additional TMX-related tankers and tugs. The change in sound level was therefore expressed as an addition or reduction of noise in decibels (dB) relative to this scenario of extra vessels (baseline +TMX). Each were given at 125 Hz (the model output frequency and representative of low-frequency commercial vessel noise and the lower frequencies of the broadband recordings), the SRKW communication (0.5-15 kHz) and echolocation (15-100 kHz) ranges, and a combined metric that aggregates these to represent the broader SRKW repertoire (0.5-100 kHz).

4. SCENARIOS

Increases in vessel presence predicted as a result of TMX coming online in Spring 2024 were modeled. Mitigation measures were then tested, which included assessing the effectiveness of present voluntary measures coordinated by ECHO, as well as considering an expansion of these measures into other areas and possible other speed reduction schemes. All outputs of each modelled scenario were expressed as the received level (RL) for May to October, when SRKW are most prevalent in the Salish Sea. Outputs were at three depths through the water column; 7.5 m to represent typical swimming depths in the upper water column, 50 m to represent when SRKW first encounter prey, considering the typical swimming depth of Chinook salmon

(*Oncorhynchus tshawytscha*) (Wright et al. 2017), and 100 m to represent the maximum foraging depth that has been noted on repeated dives through biologgers (Baird et al. 2005, Wright et al. 2017, Tennessen et al. 2019 a,b).

Measures were expressed as noise level maps, displaying the median sound pressure levels for the Salish Sea, boxplots showing the median and extent of sound levels of each subregion for the frequencies of interest, and figures that display the difference in dB when compared to the baseline+TMX scenario results. Some scenarios were displayed using the mean to demonstrate the use of that metric and as a comparison to the median. Also, tables of values including the 5th, 25th, 50th, 75th and 95th percentiles and mean were included to give the SPL and change in dB for the Salish Sea as a whole and for the subregions of interest.

4.1 Baseline

The baseline for the modelling exercises and predictive scenarios used AIS data from Coast Guard terrestrial receivers recorded from May to October 2015. No *in-situ* acoustic recordings are available for this period, and so the baseline relies on model outputs only. This baseline was chosen as it aligns with the initial environmental assessment approval for the project and preceded any TMX-related traffic increases and the implementation of any management actions in the Salish Sea. Outputs of the model at 125 Hz (Figures 8, 11-14), and in the SRKW communication (Figures 9, 11-14) and SRKW echolocation (Figures 10-14) frequency ranges for May-October 2015 formed a reference point to establish additions from project-related vessels or the effectiveness of mitigation measures. For each case the median sound levels at 7.5, 50 and 100 m were considered and were aggregated to values for the 6 months of summer (Figures 8-10, Tables 4a-d). Baseline sound levels were also depicted using the arithmetic mean (L_{eq}) for comparison (Figures 11-13, Tables 3a-d). Maximum sound levels were up to 20 decibels (dB) greater when using mean values compared to median values. The use of mean values further highlighted the presence of vessel traffic lanes as the locations of the noise sources, with the transit routes of commercial vessels more distinct in the noise level maps.

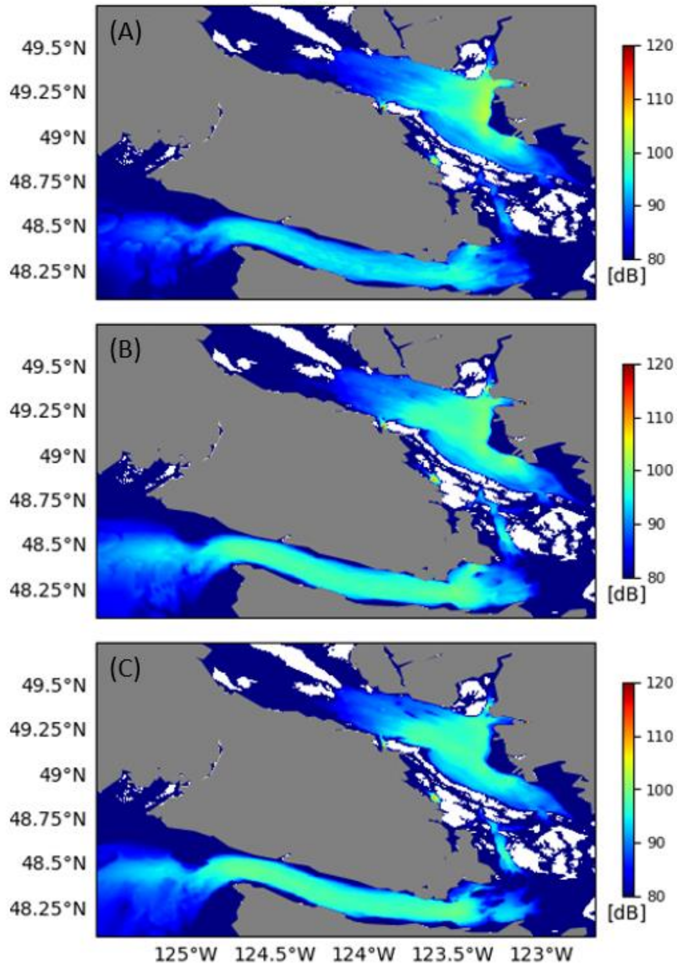

Figure 8: Modelled **median** baseline noise levels in decibels (dB) at **125 Hz** using Automatic Identification System (AIS) data from May to October 2015 at (A) 7.5 m, (B) 50 m, and (C) 100 m.

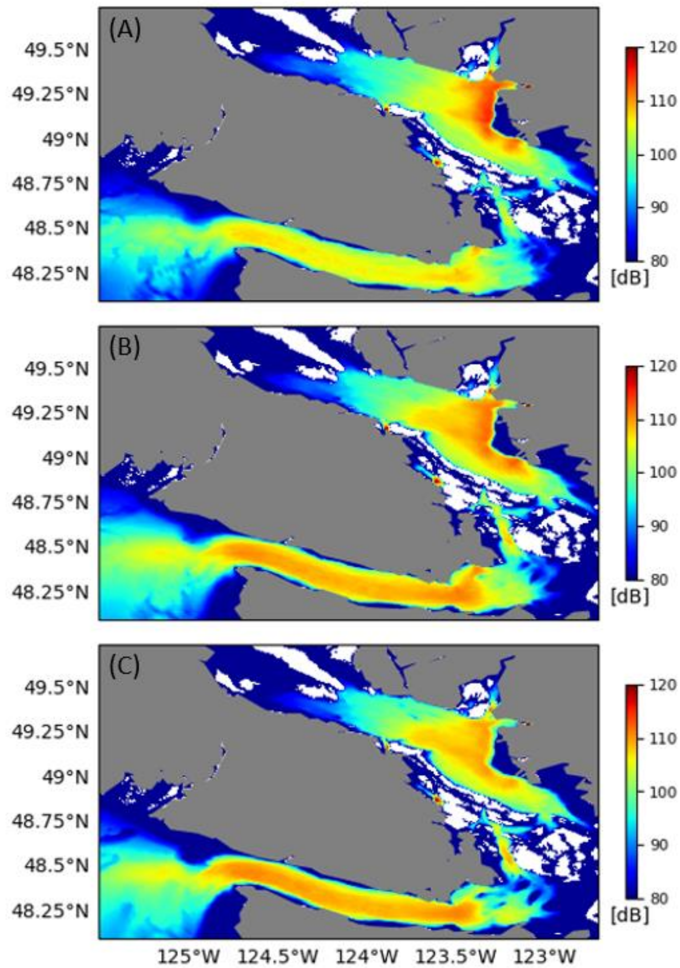

Figure 9: Modelled **median** noise levels in decibels (dB) the **SRKW communication call range** (500 Hz -15 kHz) using Automatic Identification Systems (AIS) data from May-October 2015 at (A) 7.5 m, (B) 50 m, and (C) 100 m.

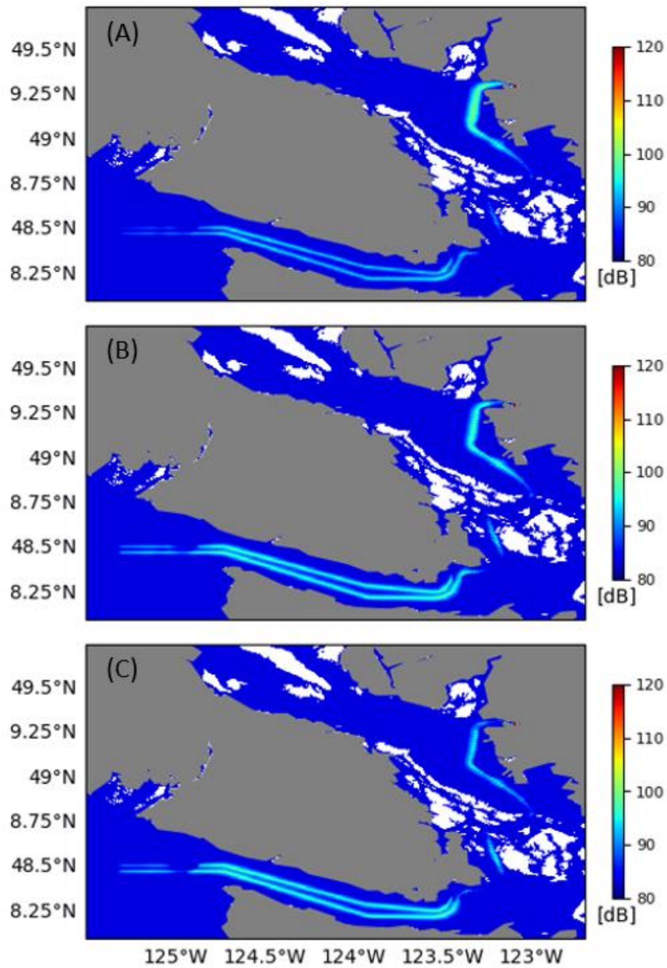

Figure 10: Modelled **median** noise levels in decibels (dB) in the **SRKW echolocation signal range** (15-100 kHz) using AIS data from May-October 2015 at (A) 7.5 m, (B) 50 m, and (C) 100 m.

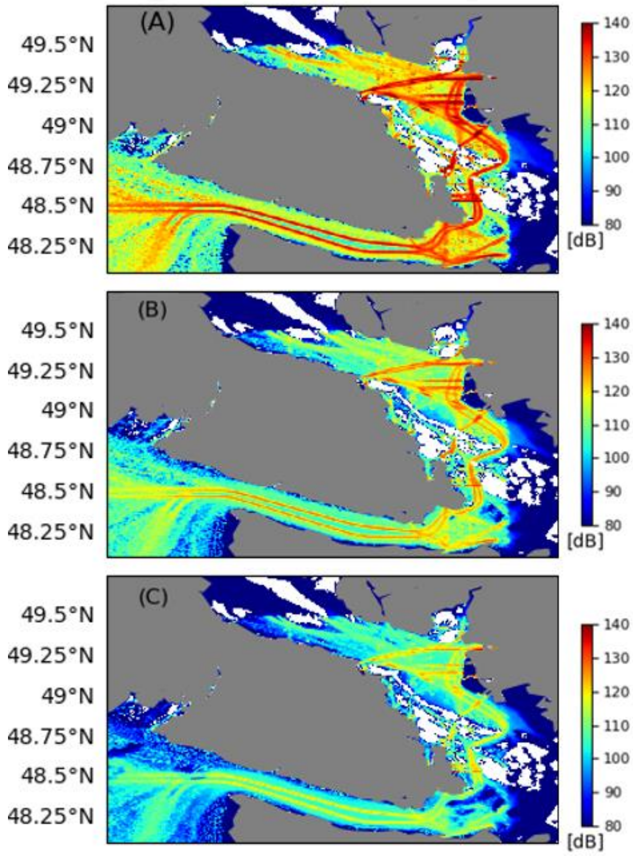

Figure 11: Modelled **mean** (L_{eq}) baseline noise levels in decibels (dB) at **125 Hz** using Automatic Identification System (AIS) data from May to October 2015 at (A) 7.5 m, (B) 50 m, and (C) 100 m. Note the adjusted colour scale compared to the noise level maps for the median results.

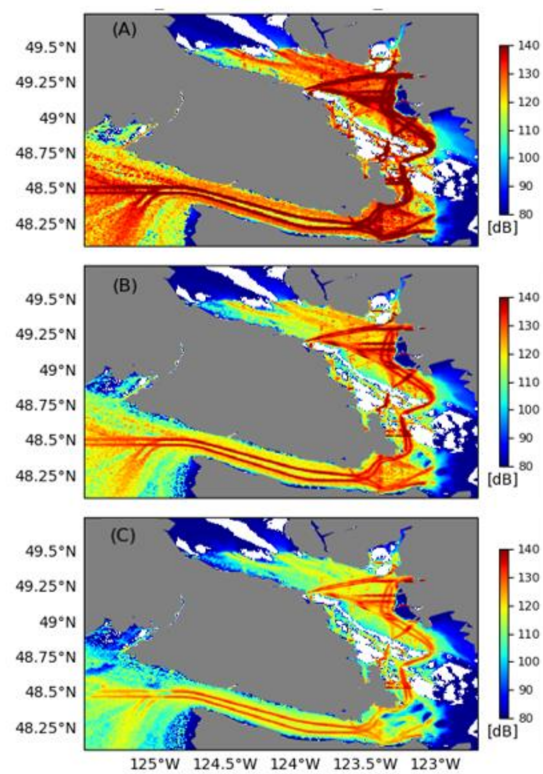

Figure 12: Modelled **mean** (L_{eq}) noise levels in decibels (dB) the **SRKW communication call range** (500 Hz -15 kHz) using Automatic Identification Systems (AIS) data from May-October 2015 at (A) 7.5 m, (B) 50 m, and (C) 100 m. Note the adjusted colour scale compared to the noise level maps for the median results.

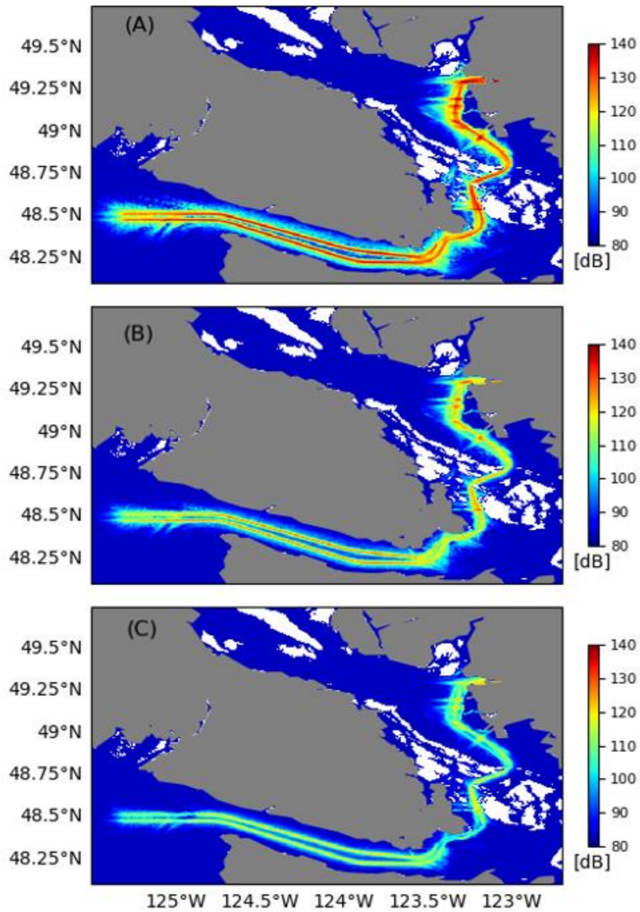

Figure 13: Modelled **mean** (L_{eq}) noise levels in decibels (dB) in the **SRKW echolocation signal range** (15-100 kHz) using AIS data from May-October 2015 at (A) 7.5 m, (B) 50 m, and (C) 100 m. Note the adjusted colour scale compared to the noise level maps for the median results.

Table 3a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for the May-October 2015 baseline. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) sound levels are given for all subregions, as are quartiles (L_{25}, L_{75}).

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	56.6	64.1	70.7	77.5	90.3	115.6
50 m	56.9	65.3	72.4	79.9	92.7	105.9
100 m	56.4	64.0	71.0	77.7	89.6	96.4
Swiftsure Bank east						
7.5 m	67.5	78.9	86.5	93.1	103.3	122.6
50 m	70.2	82.3	89.5	95.6	105.0	113.3
100 m	70.7	82.5	89.4	95.2	104.0	106.1
Juan de Fuca west						
7.5 m	75.1	85.8	92.3	98.1	107.7	125.5
50 m	79.0	89.0	95.0	100.4	109.6	116.5
100 m	79.5	89.0	94.9	100.3	109.3	110.6
Juan de Fuca east						
7.5 m	72.6	82.4	88.6	95.3	115.5	123.5
50 m	76.2	85.6	91.4	97.3	109.4	114.3
100 m	75.8	84.5	90.0	95.6	105.1	106.6
Haro-Boundary						
7.5 m	61.2	71.1	83.7	94.3	112.6	128.6
50 m	61.3	73.0	86.7	97.0	112.0	119.2
100 m	59.7	73.1	87.1	97.1	110.6	114.8
Gulf Islands						
7.5 m	54.1	62.3	84.4	114.2	129.9	124.5
50 m	54.1	65.1	86.5	105.8	119.3	114.7
100 m	54.1	65.2	85.8	99.5	109.4	108.2
Strait of Georgia South						
7.5 m	80.3	88.4	94.6	100.9	127.2	128.8
50 m	82.6	89.8	94.6	99.7	118.6	120.1
100 m	82.5	89.2	93.6	98.2	112.7	114.6
Strait of Georgia North						
7.5 m	75.8	82.2	86.9	92.1	109.2	119.2
50 m	77.7	83.5	87.4	91.8	101.4	110.7
100 m	77.5	83.2	87.1	91.3	98.9	104.4
Salish Sea Total						
7.5 m	83.1	91.8	98.3	114.6	132.0	134.2
50 m	85.7	94.0	99.9	108.7	122.9	125.1
100 m	85.7	93.7	99.4	106.0	117.3	119.5

Foraging Subregions						
Swiftsure Bank						
7.5 m	68.7	80.5	88.3	95.0	105.1	124.0
50 m	71.8	84.2	91.5	97.6	106.9	114.8
100 m	72.7	84.7	91.6	97.6	106.4	108.6
Juan de Fuca						
7.5 m	75.1	86.4	92.9	98.7	108.2	125.7
50 m	79.2	89.8	95.7	101.1	110.4	116.7
100 m	80.0	90.0	95.7	101.1	110.0	110.9
Haro Strait						
7.5 m	61.9	73.5	83.8	93.2	110.6	125.5
50 m	64.6	76.5	86.9	95.9	110.2	116.6
100 m	63.2	75.3	86.6	95.6	108.7	109.9
Occurrence Subregions						
Swiftsure Bank						
7.5 m	66.8	78.2	85.9	92.5	102.7	122.0
50 m	69.6	81.7	88.9	95.0	104.4	112.8
100 m	70.0	81.9	88.8	94.6	103.4	105.5
Juan de Fuca						
7.5 m	74.0	85.4	91.5	96.8	105.2	121.9
50 m	77.5	88.5	94.2	99.1	107.6	113.1
100 m	77.7	88.3	94.0	99.0	106.7	107.4
Haro-Boundary						
7.5 m	69.5	80.4	88.1	96.6	123.4	127.0
50 m	72.6	83.3	90.7	98.3	115.7	118.0
100 m	71.7	81.7	89.2	97.0	109.9	110.9
Strait of Georgia						
7.5 m	80.6	89.9	96.8	103.5	130.0	130.3
50 m	82.4	90.7	96.0	101.3	121.5	121.7
100 m	81.8	89.3	94.1	99.0	114.9	115.7

Table 3b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the May-October 2015 baseline. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) sound levels are given for all subregions, as are quartiles (L_{25}, L_{75}).

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	80.7	80.8	82.0	86.9	99.2	124.4
50 m	80.7	80.9	83.2	89.2	101.6	114.7
100 m	80.7	80.8	82.7	87.4	98.8	105.3
Swiftsure Bank east						
7.5 m	81.8	90.5	98.1	104.7	115.0	134.3
50 m	83.3	94.0	101.1	107.2	116.7	125.0
100 m	83.8	94.2	101.1	106.9	115.7	117.8
Juan de Fuca west						
7.5 m	86.9	97.4	103.9	109.8	119.4	137.3
50 m	90.7	100.7	106.6	112.1	121.4	128.3
100 m	91.2	100.7	106.6	112.0	121.1	122.4
Juan de Fuca east						
7.5 m	85.1	94.0	100.1	106.7	126.9	134.7
50 m	88.1	97.1	102.9	108.6	120.7	125.6
100 m	87.9	96.1	101.5	107.0	116.4	117.9
Haro-Boundary						
7.5 m	80.8	84.0	95.5	106.1	124.4	140.2
50 m	80.8	85.5	98.4	108.7	123.7	130.8
100 m	80.7	85.6	98.9	108.8	122.4	126.2
Gulf Islands						
7.5 m	78.9	79.6	94.4	123.9	140.6	135.2
50 m	78.9	80.5	96.5	115.6	129.8	125.3
100 m	78.9	80.6	95.8	109.3	119.8	118.8
Strait of Georgia South						
7.5 m	91.3	99.6	105.9	112.2	138.5	139.9
50 m	93.6	100.8	105.7	110.8	129.8	131.3
100 m	93.4	100.1	104.5	109.3	123.8	125.8
Strait of Georgia North						
7.5 m	85.4	91.3	95.9	101.2	117.8	127.9
50 m	87.0	92.5	96.5	100.8	110.0	119.3
100 m	86.9	92.3	96.1	100.3	107.7	113.1
Salish Sea Total						
7.5 m	94.7	103.0	109.6	124.6	142.9	145.5
50 m	97.1	105.3	111.2	119.3	133.9	136.4
100 m	97.1	104.9	110.7	117.1	128.6	130.8

Foraging Subregions						
Swiftsure Bank						
7.5 m	82.1	92.2	100.0	106.7	116.8	135.8
50 m	84.2	95.9	103.1	109.2	118.6	126.6
100 m	85.1	96.4	103.3	109.3	118.2	120.3
Juan de Fuca						
7.5 m	86.7	98.0	104.5	110.4	119.9	137.5
50 m	90.9	101.5	107.3	112.7	122.2	128.5
100 m	91.7	101.6	107.3	112.7	121.7	122.7
Haro Strait						
7.5 m	80.7	85.5	95.3	104.8	122.4	137.2
50 m	81.1	88.1	98.4	107.5	122.0	128.3
100 m	81.0	87.0	98.3	107.3	120.4	121.7
Occurrence Subregions						
Swiftsure Bank						
7.5 m	81.7	89.9	97.5	104.1	114.4	133.7
50 m	83.0	93.3	100.5	106.6	116.1	124.4
100 m	83.5	93.6	100.5	106.3	115.1	117.2
Juan de Fuca						
7.5 m	85.6	96.9	103.1	108.3	116.8	133.7
50 m	89.0	100.0	105.7	110.7	119.2	124.8
100 m	89.3	99.9	105.5	110.5	118.4	119.2
Haro-Boundary						
7.5 m	83.3	92.2	99.7	108.2	134.4	138.7
50 m	85.4	95.0	102.3	109.9	126.9	129.7
100 m	84.9	93.5	100.9	108.7	121.6	122.6
Strait of Georgia						
7.5 m	92.2	101.5	108.4	115.1	141.7	141.9
50 m	94.0	102.2	107.6	112.9	133.1	133.3
100 m	93.3	100.9	105.6	110.6	126.5	127.3

Table 3c: Modelled sound levels (RL) for each subregion in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the May-October 2015 baseline. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) sound levels are given for all subregions, as are quartiles (L_{25}, L_{75}).

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	83.2	83.2	83.2	83.2	83.2	83.2
50 m	83.2	83.2	83.2	83.2	83.2	83.2
100 m	83.2	83.2	83.2	83.2	83.2	83.2
Swiftsure Bank east						
7.5 m	83.3	83.3	84.5	88.4	98.9	119.0
50 m	83.3	83.5	85.8	90.4	100.5	109.7
100 m	83.3	83.7	86.0	90.3	99.5	102.7
Juan de Fuca west						
7.5 m	83.3	83.6	86.9	92.3	103.5	123.3
50 m	83.3	84.8	89.2	94.4	105.4	114.1
100 m	83.3	85.0	89.3	94.6	105.0	108.0
Juan de Fuca east						
7.5 m	83.3	83.4	84.7	88.2	103.9	116.3
50 m	83.3	84.0	86.1	90.0	100.8	107.3
100 m	83.3	84.0	85.8	89.2	98.3	100.1
Haro-Boundary						
7.5 m	83.1	83.1	83.5	89.2	108.5	121.9
50 m	83.1	83.1	84.5	91.7	107.3	113.0
100 m	83.1	83.1	84.8	92.0	105.9	106.8
Gulf Islands						
7.5 m	81.4	81.4	81.4	81.4	93.4	93.2
50 m	81.4	81.4	81.4	81.5	85.2	85.7
100 m	81.4	81.4	81.4	81.4	83.1	82.9
Strait of Georgia South						
7.5 m	83.3	83.9	86.9	92.1	120.0	119.3
50 m	83.3	83.9	86.0	90.0	110.8	110.2
100 m	83.3	83.5	84.7	87.7	103.7	103.9
Strait of Georgia North						
7.5 m	83.3	83.3	83.3	83.3	83.3	83.3
50 m	83.3	83.3	83.3	83.3	83.3	83.3
100 m	83.3	83.3	83.3	83.3	83.3	83.3
Salish Sea Total						
7.5 m	92.1	92.2	93.7	97.8	120.5	127.6
50 m	92.1	92.5	94.5	99.0	113.7	118.5
100 m	92.1	92.5	94.5	98.7	110.4	112.2

Foraging Subregions						
Swiftsure Bank						
7.5 m	83.3	83.3	85.1	90.0	100.8	120.9
50 m	83.3	83.7	87.0	92.2	102.4	111.7
100 m	83.3	83.9	87.3	92.4	102.1	105.5
Juan de Fuca						
7.5 m	83.3	83.6	86.9	92.4	103.6	123.5
50 m	83.3	84.8	89.2	94.6	105.8	114.3
100 m	83.3	85.0	89.5	94.7	105.3	108.2
Haro Strait						
7.5 m	83.3	83.3	83.7	88.3	106.0	119.9
50 m	83.3	83.3	84.4	90.4	105.3	111.1
100 m	83.3	83.3	84.7	90.6	103.8	104.6
Occurrence Subregions						
Swiftsure Bank						
7.5 m	83.3	83.3	84.3	88.0	98.3	118.4
50 m	83.3	83.5	85.6	89.9	99.9	109.2
100 m	83.3	83.6	85.7	89.8	98.9	102.1
Juan de Fuca						
7.5 m	83.3	83.4	85.4	89.5	99.8	119.2
50 m	83.3	84.1	87.1	91.5	102.2	110.1
100 m	83.3	84.2	87.3	91.8	101.1	104.2
Haro-Boundary						
7.5 m	83.3	83.4	84.7	90.1	109.7	121.7
50 m	83.3	83.7	86.2	92.3	106.9	112.8
100 m	83.3	83.6	85.7	91.6	104.7	106.0
Strait of Georgia						
7.5 m	83.3	84.9	89.8	96.0	124.0	123.2
50 m	83.3	84.8	88.6	93.7	115.4	114.4
100 m	83.3	84.0	86.6	90.9	108.0	107.2

Table 3d: Modelled sound levels (RL) for each subregion for the **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for the May-October 2015 baseline. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) sound levels given for all subregions, as are quartiles (L_{25}, L_{75}).

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	85.2	85.2	85.7	88.4	99.3	124.4
50 m	85.2	85.2	86.2	90.2	101.7	114.7
100 m	85.2	85.2	86.0	88.8	99.0	105.4
Swiftsure Bank east						
7.5 m	85.6	91.3	98.3	104.8	115.1	134.4
50 m	86.3	94.3	101.3	107.3	116.8	125.1
100 m	86.6	94.6	101.2	107.0	115.8	118.0
Juan de Fuca west						
7.5 m	88.4	97.6	104.0	109.9	119.5	137.5
50 m	91.4	100.8	106.7	112.1	121.5	128.5
100 m	91.9	100.8	106.6	112.1	121.2	122.5
Juan de Fuca east						
7.5 m	87.3	94.3	100.2	106.7	126.9	134.8
50 m	89.4	97.3	102.9	108.7	120.7	125.6
100 m	89.2	96.4	101.6	107.1	116.5	118.0
Haro-Boundary						
7.5 m	85.1	86.6	95.7	106.1	124.5	140.3
50 m	85.1	87.4	98.6	108.8	123.8	130.8
100 m	85.0	87.5	99.0	108.9	122.4	126.2
Gulf Islands						
7.5 m	83.3	83.6	94.7	123.9	140.6	135.2
50 m	83.3	84.0	96.6	115.6	129.8	125.3
100 m	83.3	84.0	96.0	109.3	119.8	118.8
Strait of Georgia South						
7.5 m	92.0	99.7	105.9	112.3	138.6	139.9
50 m	93.9	100.9	105.8	110.9	129.9	131.3
100 m	93.8	100.2	104.6	109.3	123.9	125.8
Strait of Georgia North						
7.5 m	87.5	91.9	96.2	101.2	117.8	127.9
50 m	88.6	93.0	96.7	100.9	110.0	119.4
100 m	88.5	92.8	96.4	100.3	107.7	113.1
Salish Sea Total						
7.5 m	96.6	103.4	109.7	124.6	142.9	145.6
50 m	98.3	105.5	111.3	119.4	134.0	136.4
100 m	98.3	105.2	110.8	117.2	128.7	130.8

Foraging Subregions						
Swiftsure Bank						
7.5 m	85.7	92.7	100.1	106.7	116.9	135.9
50 m	86.8	96.1	103.3	109.3	118.7	126.7
100 m	87.3	96.6	103.4	109.3	118.3	120.5
Juan de Fuca						
7.5 m	88.3	98.2	104.6	110.5	120.0	137.7
50 m	91.6	101.5	107.4	112.8	122.3	128.7
100 m	92.2	101.7	107.4	112.8	121.8	122.8
Haro Strait						
7.5 m	85.2	87.5	95.6	104.9	122.5	137.3
50 m	85.3	89.3	98.6	107.6	122.0	128.4
100 m	85.3	88.5	98.4	107.4	120.5	121.7
Occurrence Subregions						
Swiftsure Bank						
7.5 m	85.6	90.8	97.7	104.2	114.5	133.8
50 m	86.2	93.8	100.6	106.7	116.2	124.6
100 m	86.4	94.0	100.6	106.4	115.2	117.4
Juan de Fuca						
7.5 m	87.6	97.1	103.1	108.4	116.9	133.8
50 m	90.0	100.1	105.8	110.7	119.3	125.0
100 m	90.3	100.0	105.6	110.6	118.5	119.3
Haro-Boundary						
7.5 m	86.3	92.7	99.9	108.2	134.4	138.8
50 m	87.5	95.3	102.4	110.0	127.0	129.8
100 m	87.2	93.9	101.0	108.7	121.7	122.7
Strait of Georgia						
7.5 m	92.7	101.6	108.5	115.1	141.8	142.0
50 m	94.3	102.3	107.6	113.0	133.2	133.3
100 m	93.7	100.9	105.7	110.6	126.6	127.3

The distribution of sound levels for the baseline were considered through the use of boxplots (Figures 14-15). The lowest sound levels were seen at the western and northern extent of the study area (Swiftsure Bank west and Strait of Georgia north). The greatest variability in sound levels was seen for the Gulf Islands in the lower frequencies, and areas capturing Haro Strait, irrespective of how the subregion was defined (Figures 14-15). The values from Tables 4a-d were displayed as bar charts (Figures 16-17) for ease of comparison.

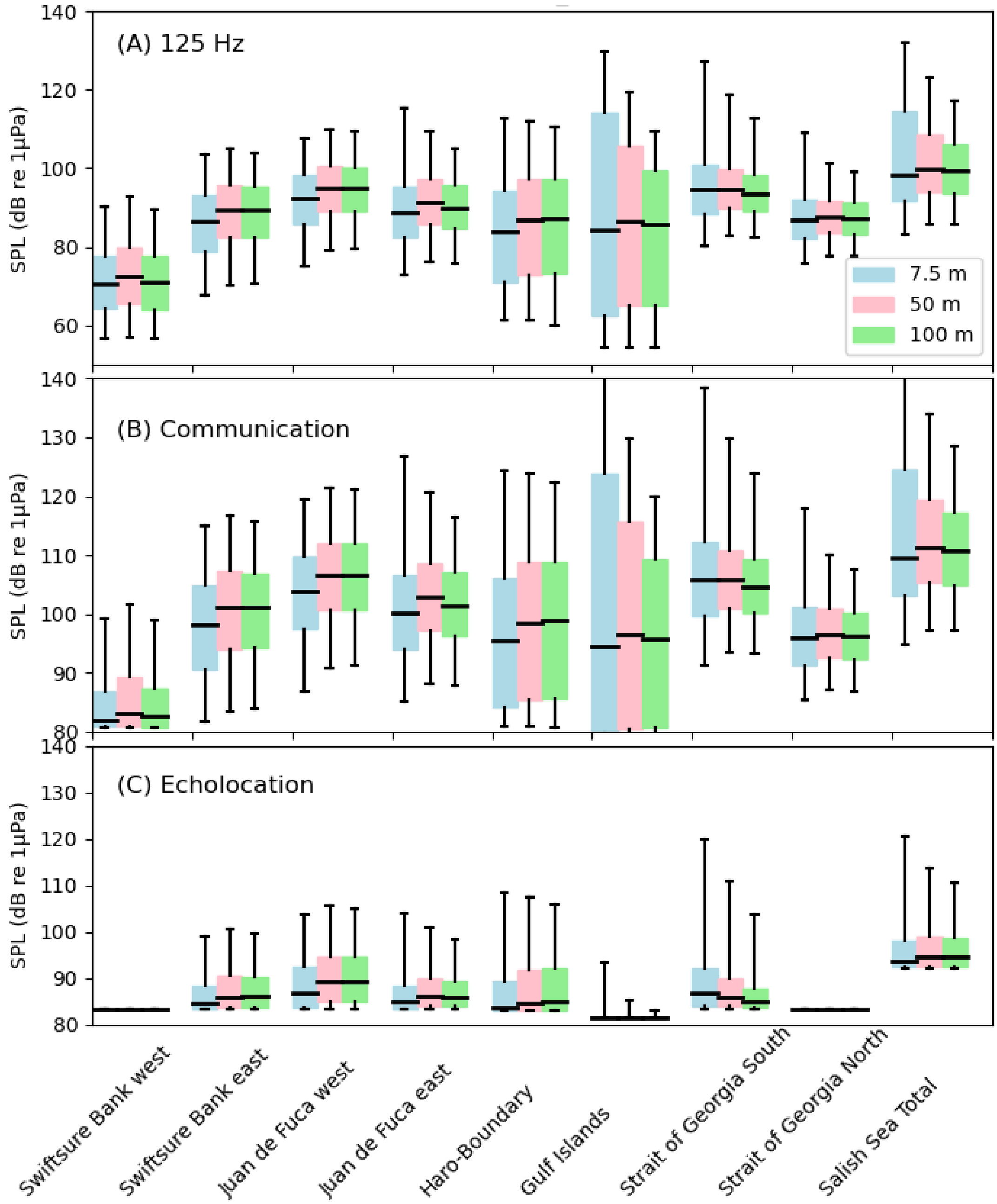

Figure 14: Boxplot comparing the sound pressure levels (SPL) for the baseline scenario in the **acoustically-derived subregions** using May-October 2015 AIS input data at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown for depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

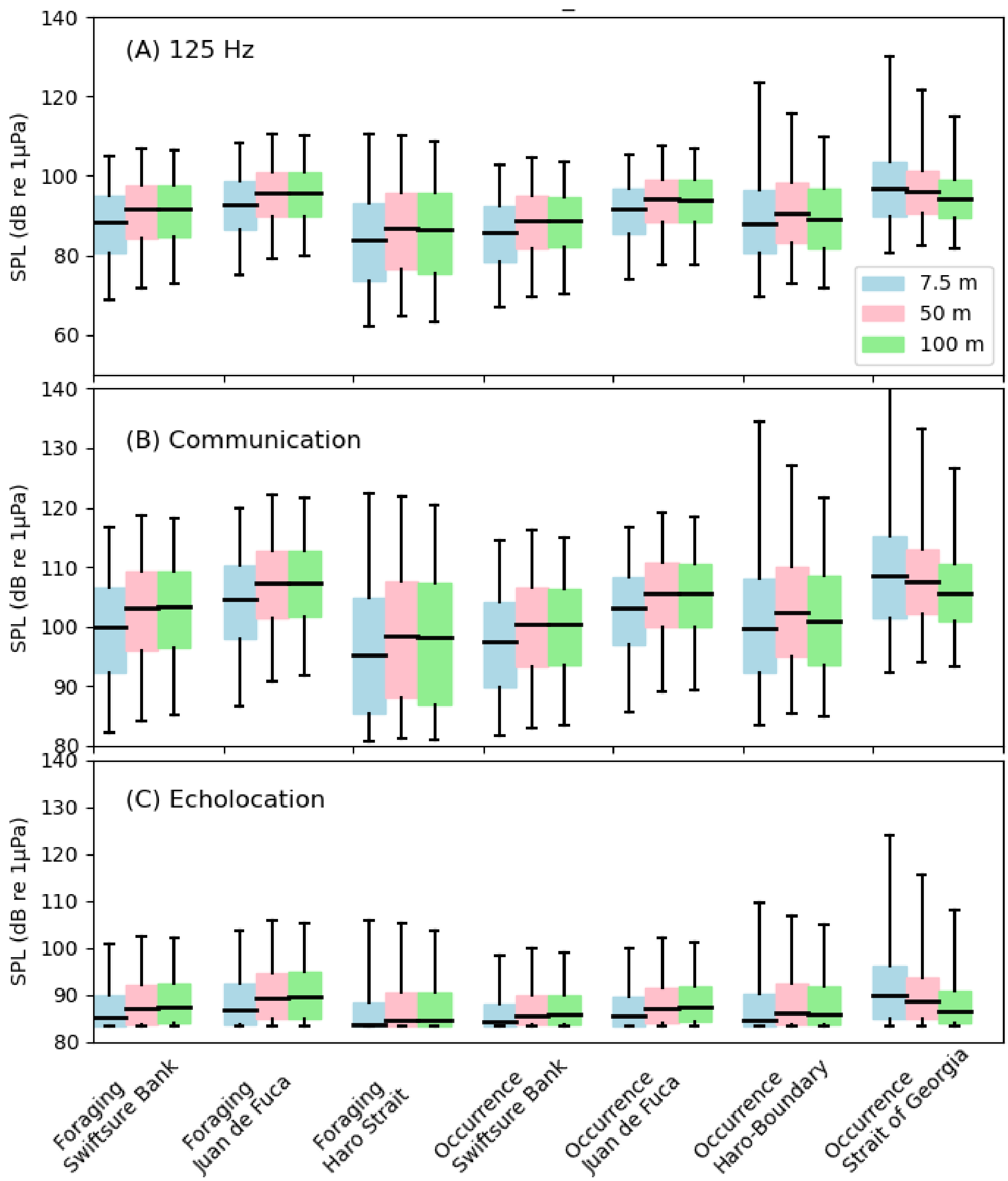

Figure 15: Boxplot comparing the sound pressure levels (SPL) for the baseline scenario using **subregions derived from SRKW occurrence and foraging data** using May-October 2015 AIS input data at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown for depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

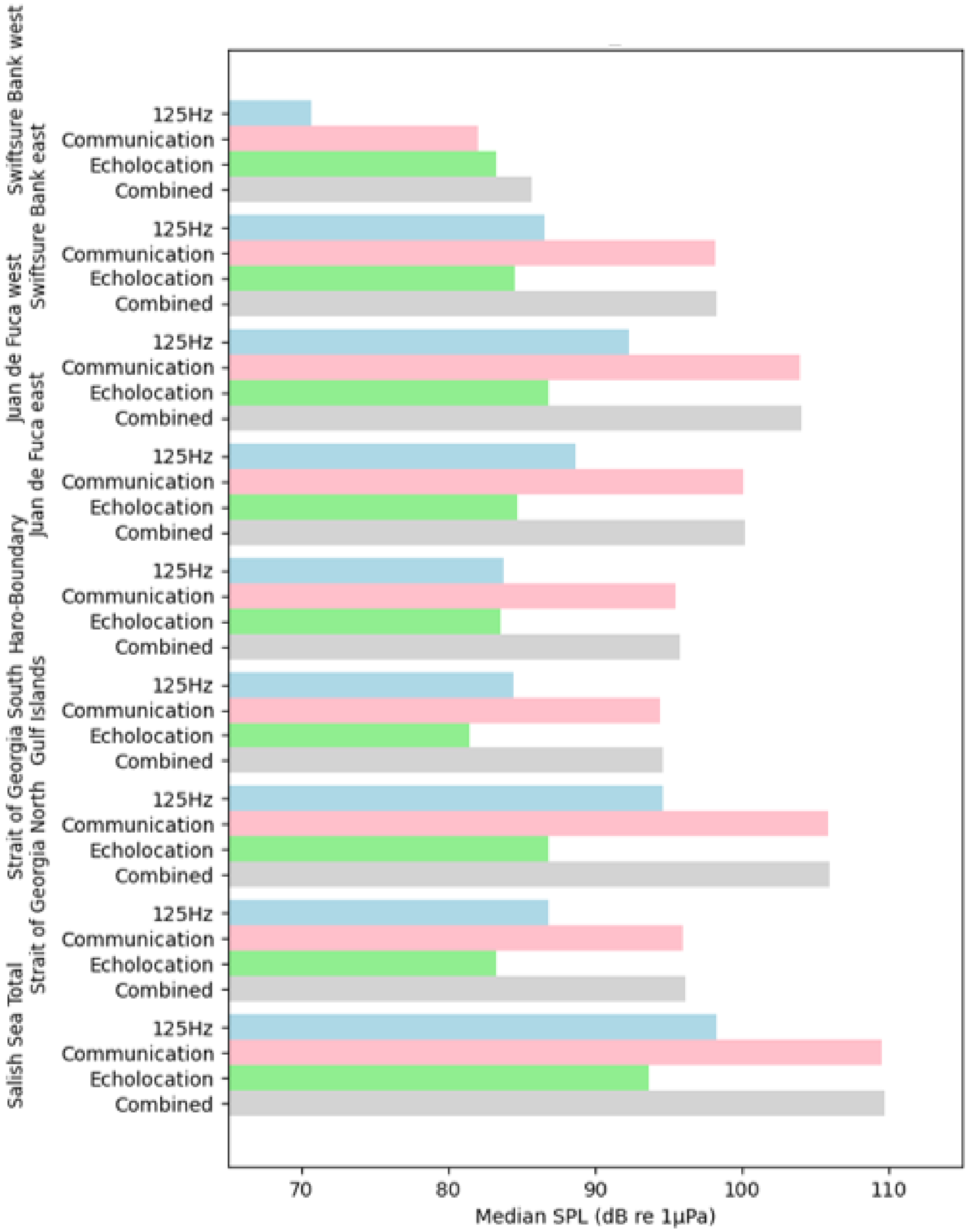

Figure 16: Bar chart showing the **median** received levels (RL) in decibels (dB) of the baseline scenario in 125 Hz (blue), SRKW communication (pink), SRKW echolocation (green), and combined (grey) frequency ranges. The RL are shown at 7.5 m depth for each **acoustically-derived subregion**.

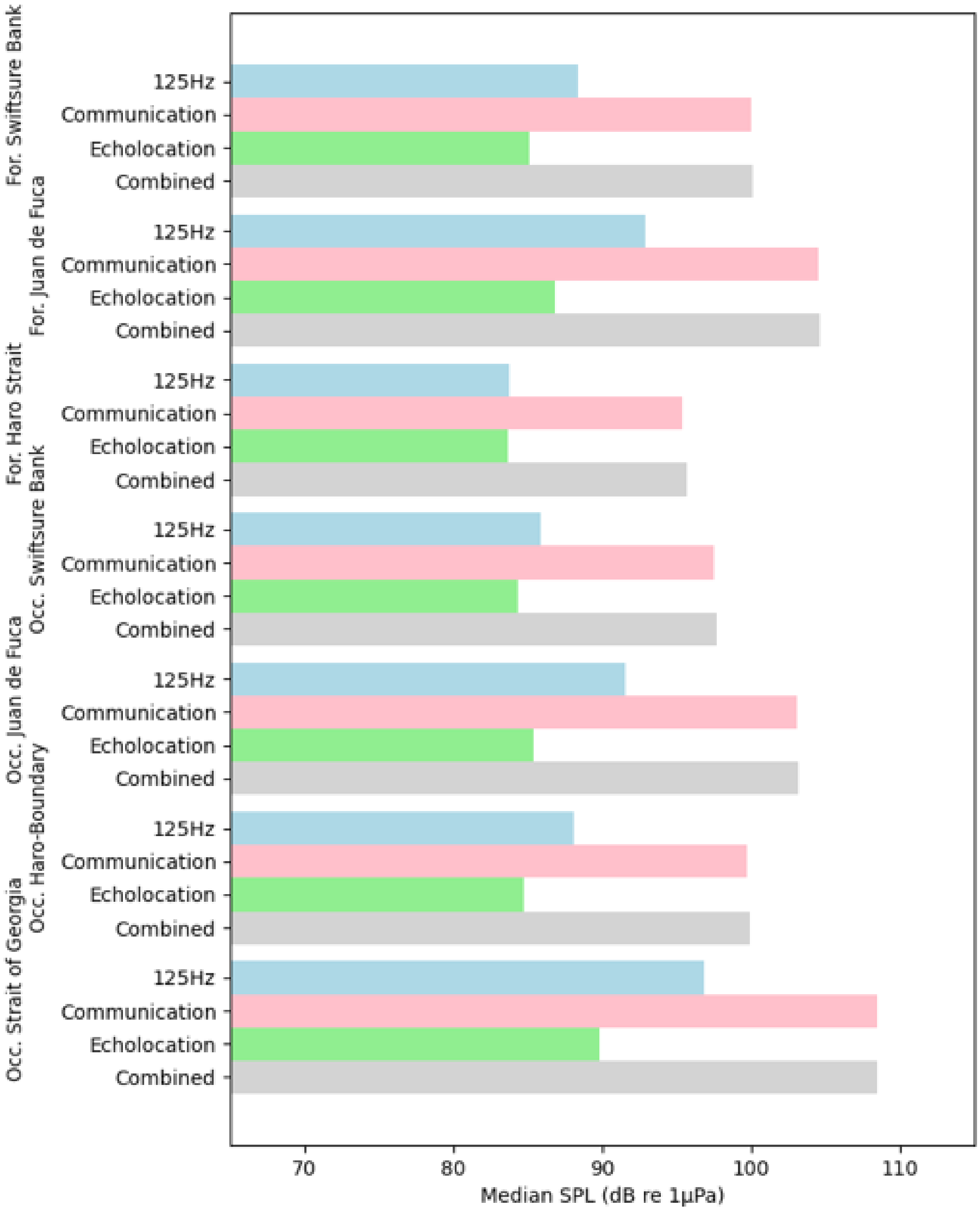

Figure 17: Bar chart showing the **median** received levels (RL) in decibels (dB) of the baseline scenario in the 125 Hz (blue), SRKW communication (pink), SRKW echolocation (green), and combined (grey) frequency ranges. The RL are shown at 7.5 m depth for each **subregion derived from data on SRKW occurrence and foraging**.

4.2 Trans Mountain Expansion (TMX) Project-related vessel increases

The vessel noise model was used to estimate received levels for a near-future expected increase in TMX-related tanker traffic. This project is forecast to increase tanker transits to and from Vancouver and La Perouse Bank from roughly one vessel a week to approximately 1 tanker per day when the new pipeline is fully operational (from five to thirty-four transits in each direction per month). This 7-fold increase scenario was simulated by modifying the Class A AIS records from May to October 2015 to reflect this increase in vessel number and was input into the vessel noise model. Tankers with summer deadweight tonnage (SDT) of 40,000 tonnes or more and carrying an excess of 6,000 tonnes of liquid through Boundary Pass and Haro Strait require a tug escort, and so these escorts were also included in the modeled scenarios for both inbound and outbound transits. Transit times of these additional vessels were randomised through the month, as no sailing schedule is known.

Few areas in the Salish Sea did not see noise emissions from this increase in tanker traffic, with the additions focused in or near the shipping lanes (Figures 18-20). The model output was extrapolated to understand potential acoustic additions in the SRKW communication (Figure 19) and echolocation ranges (Figure 20). The RL and change in RL in dB at different percentiles is also given in Tables 4a-d.

The spatial extent of the additions for the communication range was similar to those at 125 Hz (Figures 24-26). Additions in the echolocation range (Figure 20) were much more spatially restricted, and focused in the shipping lanes. The greatest additions to the soundscape were seen in Haro Strait and through Boundary Pass. These additions exceeded 7 dB in the lowest frequency at the L_{95} noise level when using acoustically-derived subregions, with this level of addition, however, not seen at other percentiles used to describe more typical sound levels such as the median. This suggests for this region the TMX-related vessels add to the noisiest times, with sound levels equalling those present for only 5% of the time. The Haro Strait-Boundary Pass region has the lowest sound levels in the lower percentiles (e.g., L_5, L_{25}, L_{50}) of the acoustic subregions that have a shipping lane within it. It also has the highest sound levels at the L_{95} level (Tables 3a-d, 4a-d), demonstrating further how much direct transits of commercial vessels add to the background sound levels (Tables 4a-d). Additions were greatest in the near-surface waters (7.5 m) compared to the other depths (Figures 18-20, Tables 4a-d).

The same scenario was depicted using the mean sound levels to consider TMX-related additions to the soundscape in broadband (125 Hz model output), and SRKW communication and echolocation ranges (Figures 21-23, Tables 4a-d). This metric showed the greatest additions to the baseline sound levels were in the areas at the western entrance of Juan de Fuca Strait and the southern section of Strait of Georgia, focused in and directly near to shipping lanes (Figures 21-23, Table 4a-d).

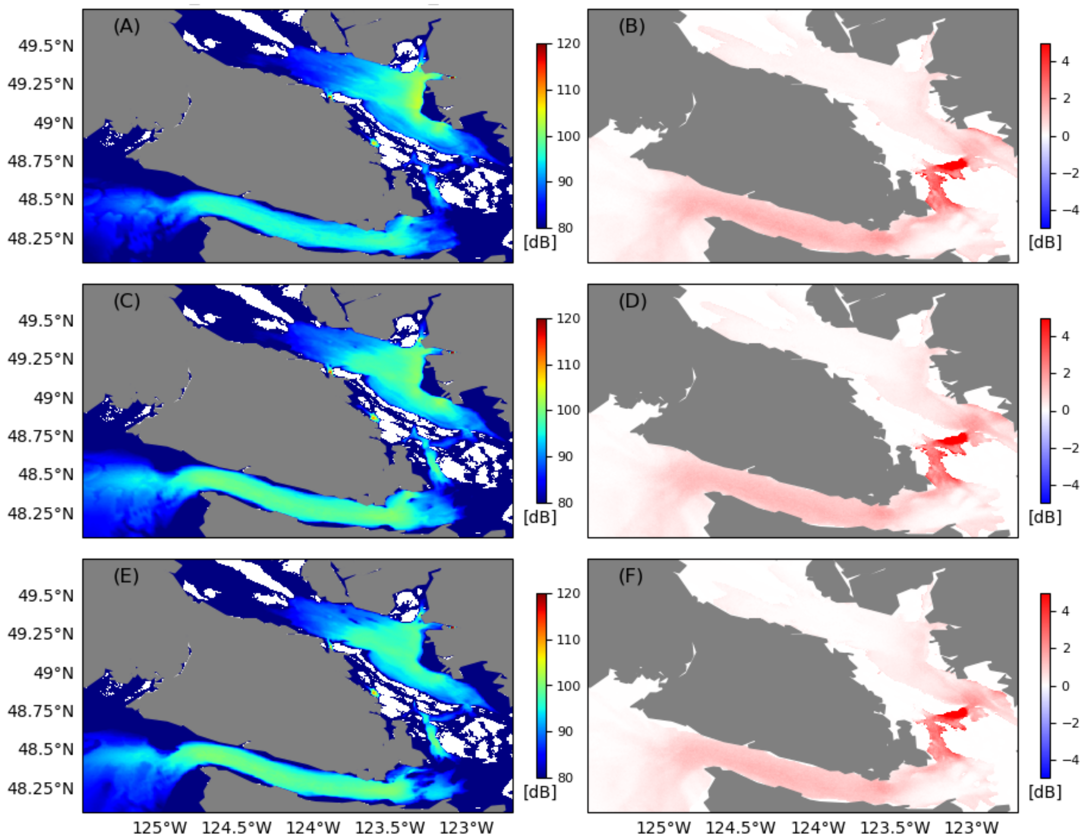

Figure 18: LEFT (A,C,E): Modelled **median** received levels at **125 Hz** of project-related vessel noise (2015 baseline + TMX) based on expected increases in TMX tankers and tugs over the period from May to October 2015 at 7.5, 50, and 100 m depth. RIGHT (B,D,F): The difference in decibels (dB) between the TMX scenario and the baseline.

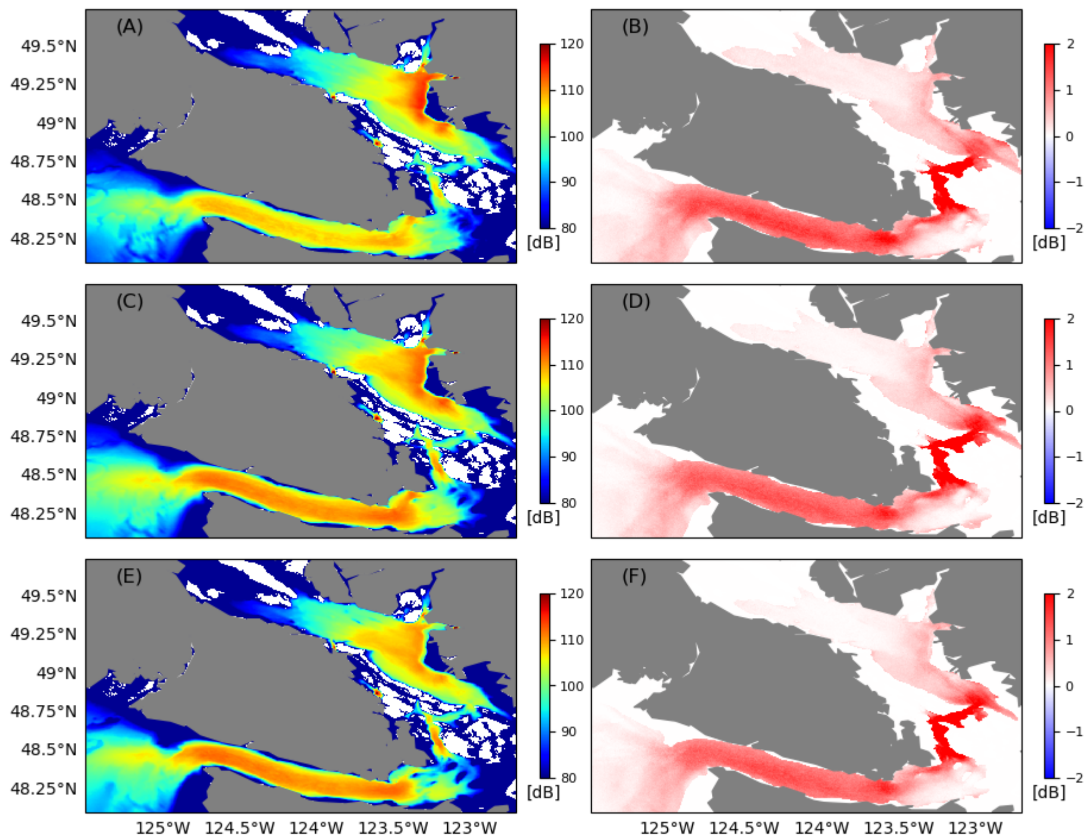

Figure 19: LEFT (A,C,E): Modelled **median** received levels in the SRKW **communication range (500 Hz – 15 kHz)** of project-related vessel noise (2015 baseline + TMX) based on expected increases in TMX tankers and tugs over the period from May to October 2015 at 7.5, 50, and 100 m depth. RIGHT (B,D,F): The difference in decibels (dB) between the TMX scenario and the baseline.

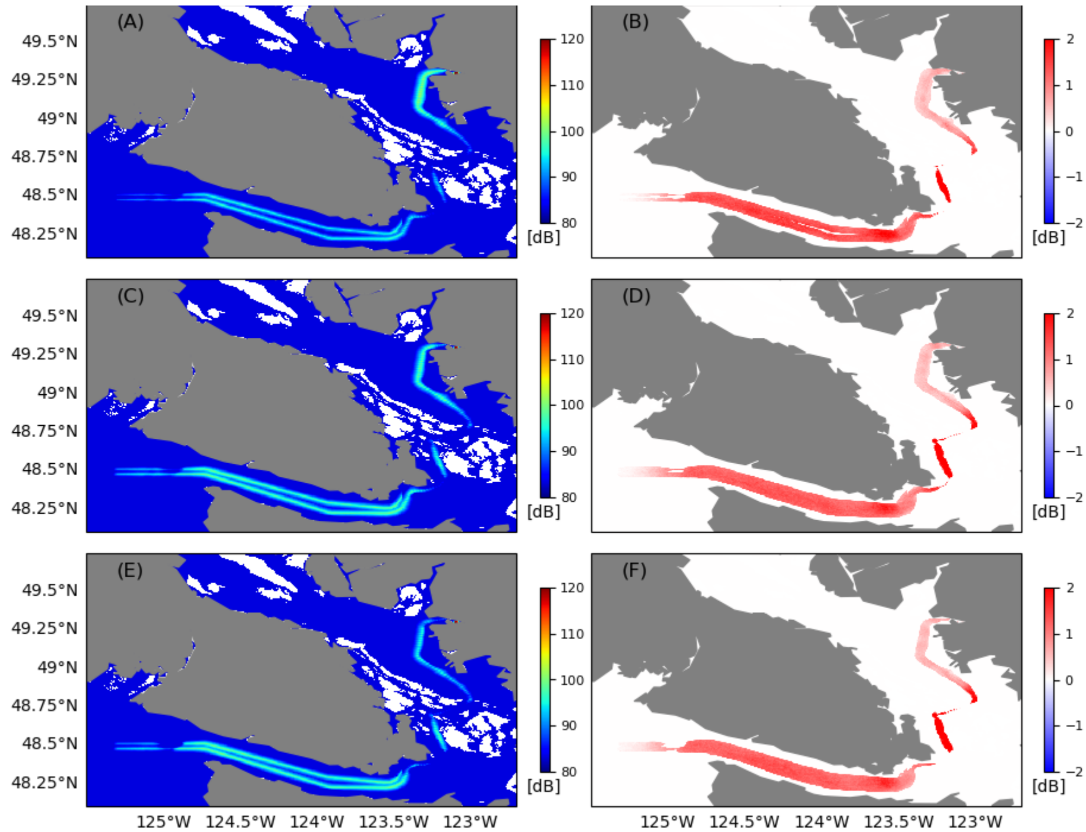

Figure 20: LEFT (A,C,E): Modelled **median** received levels in the SRKW **echolocation range (15-100 kHz)** of project-related vessel noise (2015 baseline + TMX) based on the expected increases in TMX tankers and tugs over the period from May to October 2015 at 7.5, 50, and 100 m depth. RIGHT (B,D,F): The difference in decibels (dB) between the TMX scenario and the baseline.

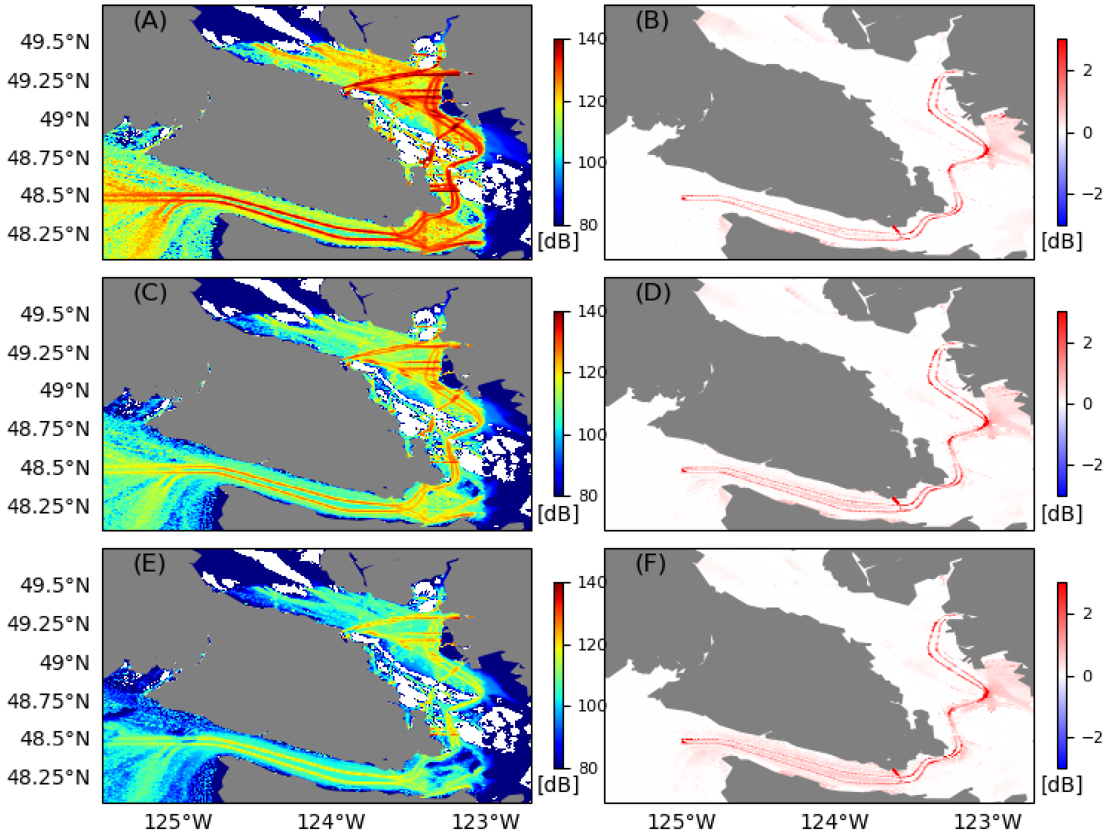

Figure 21: LEFT (A,C,E): Modelled **mean** (L_{eq}) received levels at **125 Hz** of project-related vessel noise (2015 baseline + TMX) based on expected increases in TMX tankers and tugs over the period from May to October 2015 at 7.5, 50, and 100 m depth. RIGHT (B,D,F): The difference in decibels (dB) between the TMX scenario and the baseline. Note the adjusted colour scale compared to the noise level maps for the median results.

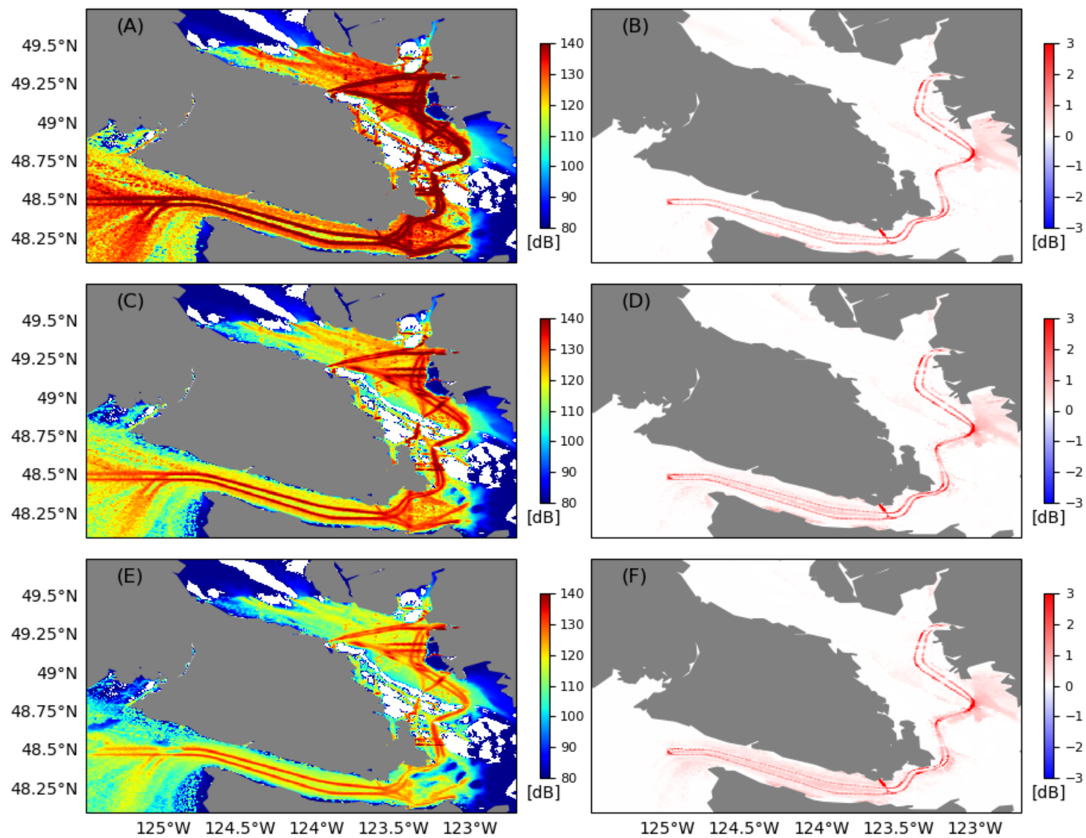

Figure 22: LEFT (A,C,E): Modelled **mean** (L_{eq}) received levels in the SRKW **communication range (500 Hz – 15 kHz)** of project-related vessel noise (2015 baseline + TMX) based on expected increases in TMX tankers and tugs over the period from May to October 2015 at 7.5, 50, and 100 m depth. RIGHT (B,D,F): The difference in decibels (dB) between the TMX scenario and the baseline. Note the adjusted colour scale compared to the noise level maps for the median results.

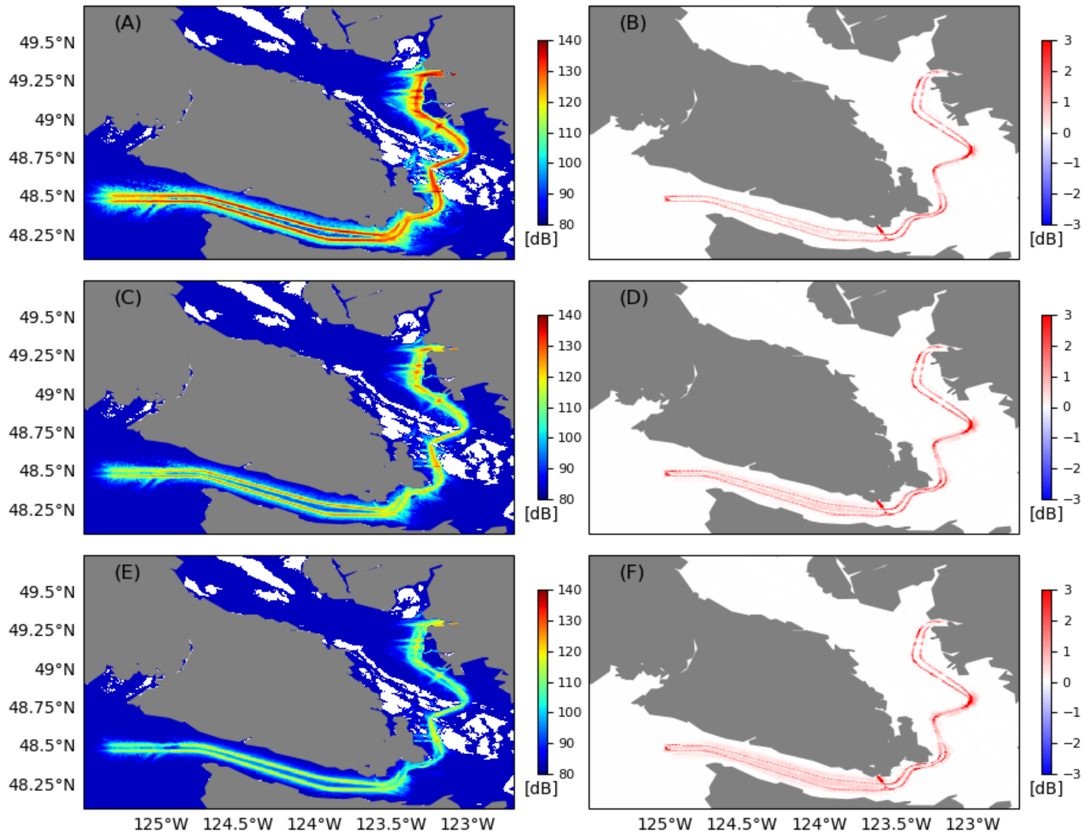

Figure 23: LEFT (A,C,E): Modelled **mean** (L_{eq}) received levels in the SRKW **echolocation range (15-100 kHz)** of project-related vessel noise (2015 baseline + TMX) based on the expected increases in TMX tankers and tugs over the period from May to October 2015 at 7.5, 50, and 100 m depth. RIGHT (B,D,F): The difference in decibels (dB) between the TMX scenario and the baseline. Note the adjusted colour scale compared to the noise level maps for the median results.

Table 4a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derive from the **TMX-vessel scenario**. Background ambient (L_5), quartiles (L_{25} and L_{75}), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the TMX scenario and the baseline ((baseline + TMX)) - baseline) is expressed in decibels (dB) in paratheses.

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	56.8 (+0.1)	64.3 (+0.2)	70.8 (+0.1)	77.6 (0.0)	90.3 (0.0)	115.6 (0.0)
50 m	57.0 (+0.1)	65.4 (+0.1)	72.5 (0.0)	79.9 (0.0)	92.7 (0.0)	105.9 (0.0)
100 m	56.5 (+0.1)	64.1 (+0.1)	71.0 (0.0)	77.7 (0.0)	89.6 (0.0)	96.4 (0.0)
Swiftsure Bank east						
7.5 m	69.0 (+1.6)	80.3 (+1.5)	87.6 (+1.1)	93.9 (+0.8)	104.4 (+1.1)	123.1 (+0.5)
50 m	72.0 (+1.8)	83.8 (+1.4)	90.5 (+1.0)	96.4 (+0.8)	106.0 (+1.0)	113.9 (+0.6)
100 m	72.6 (+1.9)	84.0 (+1.5)	90.5 (+1.1)	96.0 (+0.8)	104.8 (+0.9)	106.7 (+0.6)
Juan de Fuca west						
7.5 m	77.6 (+2.5)	87.5 (+1.7)	93.6 (+1.3)	99.1 (+1.0)	109.8 (+2.2)	126.1 (+0.6)
50 m	81.4 (+2.4)	90.6 (+1.6)	96.2 (+1.2)	101.3 (+0.9)	111.0 (+1.3)	117.2 (+0.7)
100 m	81.8 (+2.3)	90.6 (+1.5)	96.1 (+1.2)	101.3 (+0.9)	110.4 (+1.1)	111.3 (+0.7)
Juan de Fuca east						
7.5 m	74.0 (+1.4)	83.6 (+1.2)	89.6 (+1.0)	96.0 (+0.7)	116.3 (+0.9)	123.8 (+0.3)
50 m	77.5 (+1.3)	86.7 (+1.1)	92.3 (+0.9)	97.9 (+0.6)	110.3 (+0.9)	114.7 (+0.4)
100 m	77.1 (+1.3)	85.6 (+1.1)	90.9 (+0.9)	96.3 (+0.7)	105.8 (+0.7)	107.1 (+0.4)
Haro-Boundary						
7.5 m	62.8 (+1.6)	74.7 (+3.6)	86.5 (+2.7)	96.1 (+1.7)	120.0 (+7.4)	129.0 (+0.3)
50 m	63.3 (+2.0)	77.4 (+4.4)	89.3 (+2.6)	98.7 (+1.7)	115.0 (+3.0)	119.6 (+0.4)
100 m	61.8 (+2.0)	77.9 (+4.8)	89.6 (+2.5)	98.7 (+1.6)	112.3 (+1.7)	115.0 (+0.3)
Gulf Islands						
7.5 m	54.1 (0.0)	64.9 (+2.6)	84.5 (+0.1)	114.2 (0.0)	129.9 (0.0)	124.5 (0.0)
50 m	54.1 (0.0)	67.7 (+2.6)	86.6 (+0.1)	105.8 (0.0)	119.3 (0.0)	114.7 (0.0)
100 m	54.1 (0.0)	67.6 (+2.4)	85.9 (+0.1)	99.5 (0.0)	109.4 (0.0)	108.2 (0.0)
Strait of Georgia South						
7.5 m	81.0 (+0.7)	88.9 (+0.5)	95.0 (+0.4)	101.3 (+0.4)	127.6 (+0.4)	128.9 (+0.2)
50 m	83.4 (+0.8)	90.3 (+0.5)	95.0 (+0.4)	100.0 (+0.3)	118.9 (+0.3)	120.3 (+0.2)
100 m	83.2 (+0.8)	89.6 (+0.5)	93.9 (+0.3)	98.5 (+0.3)	113.0 (+0.3)	114.8 (+0.1)
Strait of Georgia North						
7.5 m	76.0 (+0.2)	82.3 (+0.2)	87.0 (+0.2)	92.2 (+0.1)	109.2 (0.0)	119.2 (0.0)
50 m	77.9 (+0.2)	83.6 (+0.1)	87.5 (+0.1)	91.8 (0.0)	101.4 (0.0)	110.7 (0.0)
100 m	77.7 (+0.2)	83.3 (+0.1)	87.2 (0.0)	91.3 (0.0)	98.9 (0.0)	104.4 (0.0)
Salish Sea Total						
7.5 m	84.1 (+1.1)	92.7 (+0.9)	99.1 (+0.8)	114.7 (+0.1)	132.4 (+0.4)	134.5 (+0.3)
50 m	86.9 (+1.2)	95.1 (+1.0)	100.8 (+0.9)	109.1 (+0.4)	123.5 (+0.6)	125.4 (+0.3)
100 m	86.9 (+1.2)	94.7 (+1.0)	100.3 (+0.9)	106.7 (+0.7)	118.1 (+0.8)	119.8 (+0.3)

Foraging Subregions						
Swiftsure Bank						
7.5 m	70.5 (+1.8)	82.1 (+1.6)	89.4 (+1.1)	95.8 (+0.8)	106.1 (+1.0)	124.4 (+0.4)
50 m	73.7 (+2.0)	85.7 (+1.5)	92.6 (+1.1)	98.3 (+0.8)	107.8 (+0.9)	115.3 (+0.5)
100 m	74.7 (+2.0)	86.2 (+1.5)	92.7 (+1.1)	98.4 (+0.8)	107.3 (+0.8)	109.1 (+0.5)
Juan de Fuca						
7.5 m	77.7 (+2.7)	88.1 (+1.7)	94.1 (+1.3)	99.7 (+0.9)	109.4 (+1.2)	126.2 (+0.6)
50 m	81.8 (+2.5)	91.4 (+1.5)	96.9 (+1.2)	102.0 (+0.9)	111.5 (+1.1)	117.3 (+0.6)
100 m	82.3 (+2.3)	91.5 (+1.5)	96.9 (+1.2)	102.0 (+0.9)	110.9 (+1.0)	111.5 (+0.6)
Haro Strait						
7.5 m	63.0 (+1.0)	75.3 (+1.9)	85.8 (+2.0)	94.5 (+1.4)	115.5 (+4.9)	125.9 (+0.4)
50 m	65.7 (+1.1)	78.6 (+2.0)	88.8 (+1.9)	97.1 (+1.3)	112.1 (+1.9)	117.0 (+0.4)
100 m	64.2 (+1.0)	78.0 (+2.8)	88.7 (+2.0)	96.8 (+1.2)	109.8 (+1.1)	110.3 (+0.4)
Occurrence Subregions						
Swiftsure Bank						
7.5 m	68.4 (+1.6)	79.7 (+1.5)	87.0 (+1.1)	93.3 (+0.8)	103.8 (+1.1)	122.5 (+0.5)
50 m	71.3 (+1.7)	83.1 (+1.4)	89.9 (+1.0)	95.8 (+0.8)	105.4 (+1.0)	113.3 (+0.6)
100 m	71.9 (+1.9)	83.4 (+1.5)	89.9 (+1.1)	95.4 (+0.8)	104.2 (+0.9)	106.1 (+0.6)
Juan de Fuca						
7.5 m	76.6 (+2.6)	87.0 (+1.6)	92.7 (+1.2)	97.6 (+0.9)	106.2 (+1.0)	122.4 (+0.5)
50 m	80.0 (+2.6)	90.0 (+1.5)	95.2 (+1.1)	99.9 (+0.8)	108.6 (+1.0)	113.6 (+0.6)
100 m	80.1 (+2.5)	89.8 (+1.5)	95.1 (+1.1)	99.8 (+0.8)	107.6 (+0.8)	108.0 (+0.6)
Haro-Boundary						
7.5 m	71.2 (+1.6)	81.9 (+1.5)	89.6 (+1.6)	97.7 (+1.2)	124.6 (+1.1)	127.6 (+0.5)
50 m	74.3 (+1.7)	84.8 (+1.5)	92.2 (+1.5)	99.5 (+1.3)	117.0 (+1.3)	118.6 (+0.6)
100 m	73.4 (+1.7)	83.5 (+1.8)	90.9 (+1.7)	98.4 (+1.4)	111.4 (+1.4)	111.5 (+0.6)
Strait of Georgia						
7.5 m	81.6 (+1.0)	90.5 (+0.6)	97.3 (+0.5)	103.9 (+0.4)	130.5 (+0.5)	130.6 (+0.3)
50 m	83.6 (+1.2)	91.3 (+0.7)	96.5 (+0.5)	101.8 (+0.4)	121.9 (+0.5)	122.0 (+0.3)
100 m	82.9 (+1.1)	90.0 (+0.6)	94.6 (+0.5)	99.5 (+0.4)	115.3 (+0.4)	116.0 (+0.2)

Table 4b: Modelled sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the **TMX-vessel scenario**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the TMX scenario and the baseline ((baseline + TMX)) - baseline) is expressed in decibels (dB) in paratheses.

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	80.7 (0.0)	80.8 (0.0)	82.0 (0.0)	86.9 (0.0)	99.2 (0.0)	124.4 (0.0)
50 m	80.7 (0.0)	80.9 (0.0)	83.3 (0.0)	89.2 (0.0)	101.6 (0.0)	114.7 (0.0)
100 m	80.7 (0.0)	80.8 (0.0)	82.7 (0.0)	87.4 (0.0)	98.8 (0.0)	105.3 (0.0)
Swiftsure Bank east						
7.5 m	82.6 (+0.8)	92.0 (+1.5)	99.2 (+1.1)	105.6 (+0.8)	116.2 (+1.2)	134.8 (+0.5)
50 m	84.6 (+1.3)	95.4 (+1.4)	102.2 (+1.0)	108.0 (+0.8)	117.8 (+1.0)	125.6 (+0.6)
100 m	85.2 (+1.4)	95.7 (+1.5)	102.2 (+1.1)	107.7 (+0.8)	116.6 (+0.9)	118.4 (+0.6)
Juan de Fuca west						
7.5 m	89.3 (+2.5)	99.1 (+1.7)	105.2 (+1.3)	110.8 (+1.0)	121.6 (+2.2)	137.9 (+0.6)
50 m	93.1 (+2.4)	102.2 (+1.6)	107.8 (+1.2)	113.0 (+0.9)	122.7 (+1.4)	129.0 (+0.7)
100 m	93.5 (+2.3)	102.2 (+1.5)	107.8 (+1.2)	113.0 (+0.9)	122.2 (+1.1)	123.1 (+0.7)
Juan de Fuca east						
7.5 m	86.2 (+1.1)	95.1 (+1.2)	101.1 (+1.0)	107.4 (+0.7)	127.8 (+0.9)	135.1 (+0.4)
50 m	89.4 (+1.2)	98.2 (+1.1)	103.8 (+0.9)	109.3 (+0.7)	121.6 (+1.0)	126.0 (+0.5)
100 m	89.1 (+1.1)	97.2 (+1.1)	102.4 (+1.0)	107.7 (+0.7)	117.2 (+0.8)	118.4 (+0.5)
Haro-Boundary						
7.5 m	81.1 (+0.3)	86.9 (+2.8)	98.2 (+2.7)	107.8 (+1.7)	131.8 (+7.4)	140.6 (+0.4)
50 m	81.2 (+0.3)	89.3 (+3.9)	101.0 (+2.6)	110.4 (+1.7)	126.8 (+3.0)	131.2 (+0.5)
100 m	80.9 (+0.2)	89.8 (+4.2)	101.3 (+2.5)	110.4 (+1.6)	124.0 (+1.7)	126.5 (+0.3)
Gulf Islands						
7.5 m	78.9 (0.0)	80.4 (+0.8)	94.6 (+0.1)	123.9 (0.0)	140.6 (0.0)	135.2 (0.0)
50 m	78.9 (0.0)	81.7 (+1.2)	96.6 (+0.1)	115.6 (0.0)	129.8 (0.0)	125.3 (0.0)
100 m	78.9 (0.0)	81.7 (+1.1)	95.9 (+0.1)	109.3 (0.0)	119.8 (0.0)	118.8 (0.0)
Strait of Georgia South						
7.5 m	92.0 (+0.7)	100.1 (+0.5)	106.3 (+0.4)	112.6 (+0.4)	138.9 (+0.4)	140.1 (+0.2)
50 m	94.4 (+0.8)	101.3 (+0.5)	106.1 (+0.4)	111.1 (+0.3)	130.2 (+0.4)	131.4 (+0.2)
100 m	94.2 (+0.8)	100.6 (+0.5)	104.9 (+0.4)	109.6 (+0.3)	124.1 (+0.3)	126.0 (+0.1)
Strait of Georgia North						
7.5 m	85.6 (+0.2)	91.5 (+0.2)	96.1 (+0.2)	101.3 (+0.1)	117.8 (0.0)	127.9 (0.0)
50 m	87.3 (+0.2)	92.7 (+0.1)	96.6 (+0.1)	100.9 (0.0)	110.0 (0.0)	119.4 (0.0)
100 m	87.1 (+0.2)	92.4 (+0.1)	96.2 (0.0)	100.3 (0.0)	107.7 (0.0)	113.1 (0.0)
Salish Sea Total						
7.5 m	95.7 (+1.0)	104.0 (+1.0)	110.4 (+0.9)	124.7 (+0.1)	143.3 (+0.5)	145.8 (+0.3)
50 m	98.3 (+1.2)	106.4 (+1.1)	112.1 (+0.9)	119.8 (+0.5)	134.6 (+0.7)	136.7 (+0.4)
100 m	98.3 (+1.2)	106.0 (+1.1)	111.7 (+1.0)	117.9 (+0.8)	129.4 (+0.8)	131.1 (+0.3)

Foraging Subregions						
Swiftsure Bank						
7.5 m	83.3 (+1.2)	93.8 (+1.6)	101.1 (+1.1)	107.5 (+0.8)	117.8 (+1.0)	136.2 (+0.4)
50 m	85.9 (+1.7)	97.4 (+1.5)	104.2 (+1.1)	110.0 (+0.8)	119.5 (+0.9)	127.1 (+0.5)
100 m	86.9 (+1.7)	97.9 (+1.5)	104.4 (+1.1)	110.1 (+0.8)	119.0 (+0.8)	120.9 (+0.6)
Juan de Fuca						
7.5 m	89.3 (+2.6)	99.7 (+1.7)	105.8 (+1.3)	111.3 (+0.9)	121.2 (+1.2)	138.1 (+0.6)
50 m	93.4 (+2.5)	103.0 (+1.5)	108.5 (+1.2)	113.6 (+0.9)	123.2 (+1.1)	129.2 (+0.7)
100 m	94.0 (+2.3)	103.1 (+1.5)	108.5 (+1.2)	113.6 (+0.9)	122.7 (+1.0)	123.3 (+0.6)
Haro Strait						
7.5 m	80.8 (+0.1)	87.2 (+1.7)	97.4 (+2.1)	106.2 (+1.4)	127.3 (+4.9)	137.6 (+0.4)
50 m	81.3 (+0.3)	90.1 (+2.0)	100.4 (+1.9)	108.8 (+1.3)	123.8 (+1.9)	128.7 (+0.4)
100 m	81.1 (+0.1)	89.7 (+2.7)	100.3 (+2.1)	108.5 (+1.3)	121.6 (+1.1)	122.1 (+0.4)
Occurrence Subregions						
Swiftsure Bank						
7.5 m	82.4 (+0.7)	91.4 (+1.4)	98.6 (+1.1)	105.0 (+0.9)	115.6 (+1.2)	134.2 (+0.5)
50 m	84.2 (+1.2)	94.8 (+1.4)	101.5 (+1.0)	107.4 (+0.8)	117.1 (+1.0)	125.0 (+0.6)
100 m	84.8 (+1.3)	95.1 (+1.5)	101.5 (+1.1)	107.1 (+0.8)	115.9 (+0.9)	117.8 (+0.6)
Juan de Fuca						
7.5 m	88.1 (+2.5)	98.5 (+1.6)	104.2 (+1.2)	109.2 (+0.9)	117.9 (+1.1)	134.2 (+0.5)
50 m	91.5 (+2.5)	101.5 (+1.5)	106.8 (+1.1)	111.5 (+0.8)	120.3 (+1.0)	125.4 (+0.6)
100 m	91.7 (+2.4)	101.4 (+1.5)	106.6 (+1.1)	111.4 (+0.8)	119.3 (+0.9)	119.8 (+0.6)
Haro-Boundary						
7.5 m	84.3 (+1.0)	93.7 (+1.5)	101.3 (+1.6)	109.3 (+1.2)	135.7 (+1.3)	139.2 (+0.5)
50 m	86.8 (+1.3)	96.5 (+1.5)	103.8 (+1.5)	111.2 (+1.3)	128.4 (+1.4)	130.3 (+0.6)
100 m	86.1 (+1.2)	95.2 (+1.8)	102.6 (+1.7)	110.1 (+1.4)	123.1 (+1.5)	123.2 (+0.6)
Strait of Georgia						
7.5 m	93.2 (+1.0)	102.1 (+0.6)	108.9 (+0.5)	115.5 (+0.4)	142.2 (+0.5)	142.2 (+0.3)
50 m	95.2 (+1.2)	102.9 (+0.7)	108.1 (+0.5)	113.3 (+0.4)	133.6 (+0.5)	133.6 (+0.3)
100 m	94.4 (+1.1)	101.5 (+0.6)	106.1 (+0.5)	111.0 (+0.4)	126.9 (+0.4)	127.5 (+0.2)

Table 4c: Modelled sound levels (RL) for each subregion in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the **TMX-vessel scenario**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the TMX scenario and the baseline ((baseline + TMX)) - baseline) is expressed in decibels (dB) in paratheses.

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)
50 m	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)
100 m	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)	83.2 (0.0)
Swiftsure Bank east						
7.5 m	83.3 (0.0)	83.4 (+0.1)	85.0 (+0.5)	89.2 (+0.7)	100.4 (+1.5)	119.7 (+0.7)
50 m	83.3 (0.0)	83.8 (+0.2)	86.5 (+0.7)	91.2 (+0.8)	101.8 (+1.4)	110.6 (+0.8)
100 m	83.3 (0.0)	83.9 (+0.3)	86.6 (+0.7)	91.0 (+0.8)	100.7 (+1.2)	103.5 (+0.8)
Juan de Fuca west						
7.5 m	83.3 (0.0)	84.1 (+0.4)	87.9 (+1.1)	93.3 (+1.0)	106.9 (+3.4)	124.0 (+0.7)
50 m	83.3 (0.0)	85.7 (+0.9)	90.3 (+1.1)	95.4 (+1.0)	107.3 (+1.9)	114.9 (+0.8)
100 m	83.3 (0.0)	85.9 (+0.9)	90.4 (+1.1)	95.5 (+0.9)	106.5 (+1.5)	108.8 (+0.8)
Juan de Fuca east						
7.5 m	83.3 (0.0)	83.6 (+0.2)	85.3 (+0.6)	89.1 (+0.9)	107.4 (+3.5)	117.1 (+0.8)
50 m	83.3 (0.0)	84.3 (+0.3)	86.8 (+0.7)	90.9 (+0.9)	103.1 (+2.3)	108.2 (+0.9)
100 m	83.3 (0.0)	84.3 (+0.3)	86.4 (+0.7)	90.0 (+0.8)	99.8 (+1.5)	101.0 (+0.9)
Haro-Boundary						
7.5 m	83.1 (0.0)	83.1 (0.0)	84.3 (+0.7)	90.8 (+1.6)	116.5 (+8.1)	122.5 (+0.6)
50 m	83.1 (0.0)	83.1 (0.0)	85.7 (+1.2)	93.3 (+1.6)	110.9 (+3.6)	113.7 (+0.7)
100 m	83.1 (0.0)	83.1 (0.0)	86.1 (+1.2)	93.5 (+1.5)	107.9 (+2.0)	107.4 (+0.6)
Gulf Islands						
7.5 m	81.4 (0.0)	81.4 (0.0)	81.4 (0.0)	81.5 (0.0)	93.4 (0.0)	93.2 (0.0)
50 m	81.4 (0.0)	81.4 (0.0)	81.4 (0.0)	81.5 (+0.1)	85.4 (+0.2)	85.7 (0.0)
100 m	81.4 (0.0)	81.4 (0.0)	81.4 (0.0)	81.5 (+0.1)	83.3 (+0.2)	82.9 (0.0)
Strait of Georgia South						
7.5 m	83.3 (0.0)	84.1 (+0.2)	87.2 (+0.4)	92.6 (+0.5)	120.6 (+0.7)	119.6 (+0.3)
50 m	83.3 (0.0)	84.0 (+0.2)	86.3 (+0.3)	90.4 (+0.5)	111.5 (+0.7)	110.5 (+0.4)
100 m	83.3 (0.0)	83.6 (+0.1)	85.0 (+0.2)	88.2 (+0.4)	104.4 (+0.6)	104.3 (+0.3)
Strait of Georgia North						
7.5 m	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)
50 m	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)
100 m	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)	83.3 (0.0)
Salish Sea Total						
7.5 m	92.1 (0.0)	92.4 (+0.1)	94.2 (+0.5)	98.7 (+0.8)	122.4 (+1.9)	128.2 (+0.6)
50 m	92.1 (0.0)	92.8 (+0.3)	95.2 (+0.7)	99.9 (+0.9)	115.5 (+1.8)	119.2 (+0.7)
100 m	92.1 (0.0)	92.8 (+0.3)	95.2 (+0.7)	99.7 (+0.9)	111.9 (+1.5)	112.9 (+0.7)

Foraging Subregions						
Swiftsure Bank						
7.5 m	83.3 (0.0)	83.4 (+0.1)	85.8 (+0.6)	90.7 (+0.8)	102.2 (+1.4)	121.5 (+0.6)
50 m	83.3 (0.0)	84.1 (+0.4)	87.8 (+0.8)	92.9 (+0.8)	103.6 (+1.2)	112.4 (+0.7)
100 m	83.3 (0.0)	84.3 (+0.5)	88.1 (+0.8)	93.2 (+0.8)	103.1 (+1.1)	106.2 (+0.7)
Juan de Fuca						
7.5 m	83.3 (0.0)	84.0 (+0.4)	87.9 (+1.1)	93.3 (+0.9)	105.5 (+1.8)	124.1 (+0.7)
50 m	83.3 (0.0)	85.7 (+0.9)	90.3 (+1.1)	95.5 (+0.9)	107.3 (+1.5)	115.1 (+0.8)
100 m	83.3 (0.0)	86.0 (+0.9)	90.6 (+1.1)	95.6 (+0.9)	106.6 (+1.3)	109.0 (+0.8)
Haro Strait						
7.5 m	83.3 (0.0)	83.3 (0.0)	84.3 (+0.6)	89.5 (+1.2)	111.7 (+5.7)	120.4 (+0.5)
50 m	83.3 (0.0)	83.3 (0.0)	85.4 (+1.0)	91.7 (+1.3)	107.6 (+2.3)	111.6 (+0.5)
100 m	83.3 (0.0)	83.3 (0.0)	85.7 (+1.0)	91.8 (+1.2)	105.1 (+1.4)	105.1 (+0.4)
Occurrence Subregions						
Swiftsure Bank						
7.5 m	83.3 (0.0)	83.4 (+0.1)	84.8 (+0.4)	88.7 (+0.7)	99.9 (+1.5)	119.1 (+0.7)
50 m	83.3 (0.0)	83.7 (+0.2)	86.2 (+0.6)	90.7 (+0.8)	101.2 (+1.3)	110.0 (+0.8)
100 m	83.3 (0.0)	83.9 (+0.3)	86.3 (+0.6)	90.5 (+0.7)	100.0 (+1.2)	102.9 (+0.8)
Juan de Fuca						
7.5 m	83.3 (0.0)	83.6 (+0.2)	86.1 (+0.7)	90.3 (+0.8)	101.5 (+1.7)	119.9 (+0.7)
50 m	83.3 (0.0)	84.6 (+0.5)	87.9 (+0.8)	92.4 (+0.8)	103.7 (+1.6)	110.9 (+0.8)
100 m	83.3 (0.0)	84.8 (+0.6)	88.2 (+0.9)	92.6 (+0.8)	102.5 (+1.3)	104.9 (+0.8)
Haro-Boundary						
7.5 m	83.3 (0.0)	83.4 (+0.1)	85.5 (+0.8)	91.5 (+1.4)	115.7 (+6.0)	122.4 (+0.7)
50 m	83.3 (0.0)	83.9 (+0.2)	87.2 (+1.0)	93.7 (+1.4)	110.1 (+3.2)	113.5 (+0.8)
100 m	83.3 (0.0)	83.8 (+0.2)	86.7 (+1.1)	93.0 (+1.4)	106.6 (+1.9)	106.7 (+0.7)
Strait of Georgia						
7.5 m	83.3 (0.0)	85.2 (+0.3)	90.3 (+0.5)	96.5 (+0.5)	124.6 (+0.7)	123.6 (+0.3)
50 m	83.3 (0.0)	85.2 (+0.4)	89.1 (+0.5)	94.2 (+0.5)	116.0 (+0.6)	114.7 (+0.4)
100 m	83.3 (0.0)	84.3 (+0.2)	87.0 (+0.4)	91.5 (+0.5)	108.6 (+0.6)	107.5 (+0.4)

Table 4d: Modelled sound levels (RL) for each subregion in the **combined range (0.5-100 kHz),)**, at depths of 7.5, 50 and 100 m derived for the **TMX-vessel scenario**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the TMX scenario and the baseline ((baseline + TMX)) - baseline) is expressed in decibels (dB) in paratheses.

Subregion	L_5	L_{25}	L_{50}	L_{75}	L_{95}	L_{eq}
Acoustic Subregions						
Swiftsure Bank west						
7.5 m	85.2 (0.0)	85.2 (0.0)	85.7 (0.0)	88.4 (0.0)	99.3 (0.0)	124.4 (0.0)
50 m	85.2 (0.0)	85.2 (0.0)	86.3 (0.0)	90.2 (0.0)	101.7 (0.0)	114.7 (0.0)
100 m	85.2 (0.0)	85.2 (0.0)	86.0 (0.0)	88.8 (0.0)	99.0 (0.0)	105.4 (0.0)
Swiftsure Bank east						
7.5 m	86.0 (+0.4)	92.5 (+1.3)	99.4 (+1.1)	105.7 (+0.8)	116.3 (+1.2)	134.9 (+0.5)
50 m	87.0 (+0.7)	95.7 (+1.4)	102.3 (+1.0)	108.1 (+0.8)	117.9 (+1.0)	125.7 (+0.6)
100 m	87.4 (+0.8)	96.0 (+1.4)	102.3 (+1.1)	107.8 (+0.8)	116.7 (+0.9)	118.6 (+0.6)
Juan de Fuca west						
7.5 m	90.3 (+1.8)	99.2 (+1.6)	105.3 (+1.3)	110.9 (+1.0)	121.8 (+2.2)	138.1 (+0.6)
50 m	93.5 (+2.1)	102.3 (+1.5)	107.9 (+1.2)	113.1 (+0.9)	122.9 (+1.4)	129.1 (+0.7)
100 m	93.9 (+2.0)	102.3 (+1.5)	107.8 (+1.2)	113.0 (+0.9)	122.3 (+1.1)	123.2 (+0.7)
Juan de Fuca east						
7.5 m	88.0 (+0.7)	95.4 (+1.1)	101.2 (+1.0)	107.4 (+0.7)	127.8 (+1.0)	135.2 (+0.4)
50 m	90.3 (+1.0)	98.4 (+1.0)	103.8 (+0.9)	109.4 (+0.7)	121.7 (+1.0)	126.1 (+0.5)
100 m	90.1 (+0.9)	97.4 (+1.0)	102.5 (+0.9)	107.8 (+0.7)	117.3 (+0.8)	118.5 (+0.5)
Haro-Boundary						
7.5 m	85.2 (+0.1)	88.4 (+1.8)	98.4 (+2.6)	107.9 (+1.7)	131.9 (+7.4)	140.6 (+0.4)
50 m	85.2 (+0.1)	90.2 (+2.8)	101.2 (+2.5)	110.5 (+1.7)	126.9 (+3.0)	131.3 (+0.5)
100 m	85.1 (+0.1)	90.7 (+3.1)	101.5 (+2.4)	110.5 (+1.6)	124.1 (+1.7)	126.5 (+0.3)
Gulf Islands						
7.5 m	83.3 (0.0)	84.0 (+0.3)	94.8 (+0.1)	123.9 (0.0)	140.6 (0.0)	135.2 (0.0)
50 m	83.3 (0.0)	84.6 (+0.6)	96.7 (+0.1)	115.6 (0.0)	129.8 (0.0)	125.3 (0.0)
100 m	83.3 (0.0)	84.6 (+0.5)	96.1 (+0.1)	109.3 (0.0)	119.8 (0.0)	118.8 (0.0)
Strait of Georgia South						
7.5 m	92.6 (+0.6)	100.2 (+0.5)	106.3 (+0.4)	112.7 (+0.4)	139.0 (+0.4)	140.1 (+0.2)
50 m	94.7 (+0.8)	101.4 (+0.5)	106.2 (+0.4)	111.2 (+0.3)	130.3 (+0.4)	131.5 (+0.2)
100 m	94.5 (+0.7)	100.7 (+0.5)	104.9 (+0.4)	109.6 (+0.3)	124.2 (+0.3)	126.0 (+0.1)
Strait of Georgia North						
7.5 m	87.6 (+0.1)	92.1 (+0.1)	96.3 (+0.1)	101.4 (+0.1)	117.8 (0.0)	127.9 (0.0)
50 m	88.7 (+0.2)	93.1 (+0.1)	96.8 (+0.1)	100.9 (+0.0)	110.1 (0.0)	119.4 (0.0)
100 m	88.6 (+0.2)	92.9 (+0.1)	96.4 (+0.0)	100.4 (+0.0)	107.7 (0.0)	113.1 (0.0)
Salish Sea Total						
7.5 m	97.3 (+0.7)	104.3 (+0.9)	110.5 (+0.9)	124.7 (+0.1)	143.4 (+0.5)	145.9 (+0.3)
50 m	99.3 (+1.0)	106.6 (+1.0)	112.2 (+0.9)	119.9 (+0.5)	134.7 (+0.7)	136.8 (+0.4)
100 m	99.2 (+0.9)	106.2 (+1.1)	111.8 (+1.0)	117.9 (+0.8)	129.5 (+0.9)	131.1 (+0.3)

Foraging Subregions						
Swiftsure Bank						
7.5 m	86.3 (+0.5)	94.2 (+1.4)	101.2 (+1.1)	107.5 (+0.8)	117.9 (+1.0)	136.4 (+0.4)
50 m	87.8 (+1.0)	97.6 (+1.5)	104.3 (+1.1)	110.1 (+0.8)	119.6 (+0.9)	127.2 (+0.5)
100 m	88.4 (+1.1)	98.1 (+1.5)	104.5 (+1.1)	110.2 (+0.8)	119.1 (+0.8)	121.0 (+0.6)
Juan de Fuca						
7.5 m	90.3 (+2.0)	99.8 (+1.6)	105.8 (+1.3)	111.4 (+0.9)	121.3 (+1.3)	138.2 (+0.6)
50 m	93.8 (+2.2)	103.1 (+1.5)	108.6 (+1.2)	113.7 (+0.9)	123.3 (+1.1)	129.3 (+0.7)
100 m	94.3 (+2.1)	103.2 (+1.5)	108.6 (+1.2)	113.7 (+0.9)	122.8 (+1.0)	123.5 (+0.7)
Haro Strait						
7.5 m	85.2 (0.0)	88.7 (+1.2)	97.6 (+2.0)	106.3 (+1.4)	127.4 (+4.9)	137.7 (+0.4)
50 m	85.4 (+0.1)	91.0 (+1.6)	100.5 (+1.9)	108.9 (+1.3)	123.9 (+1.9)	128.8 (+0.4)
100 m	85.3 (+0.1)	90.6 (+2.1)	100.5 (+2.0)	108.6 (+1.3)	121.6 (+1.1)	122.1 (+0.4)
Occurrence Subregions						
Swiftsure Bank						
7.5 m	85.9 (+0.3)	92.0 (+1.2)	98.8 (+1.1)	105.1 (+0.8)	115.7 (+1.2)	134.3 (+0.5)
50 m	86.8 (+0.6)	95.1 (+1.3)	101.7 (+1.0)	107.5 (+0.8)	117.2 (+1.0)	125.1 (+0.6)
100 m	87.1 (+0.7)	95.4 (+1.4)	101.7 (+1.1)	107.2 (+0.8)	116.1 (+0.9)	117.9 (+0.6)
Juan de Fuca						
7.5 m	89.3 (+1.7)	98.6 (+1.5)	104.3 (+1.1)	109.3 (+0.9)	118.0 (+1.1)	134.3 (+0.5)
50 m	92.1 (+2.1)	101.6 (+1.5)	106.8 (+1.1)	111.6 (+0.8)	120.4 (+1.1)	125.5 (+0.6)
100 m	92.3 (+2.0)	101.5 (+1.5)	106.7 (+1.1)	111.4 (+0.8)	119.3 (+0.9)	119.9 (+0.6)
Haro-Boundary						
7.5 m	86.8 (+0.6)	94.1 (+1.4)	101.4 (+1.5)	109.4 (+1.2)	135.8 (+1.4)	139.3 (+0.5)
50 m	88.4 (+0.9)	96.7 (+1.4)	103.9 (+1.5)	111.3 (+1.3)	128.4 (+1.4)	130.4 (+0.6)
100 m	87.9 (+0.8)	95.5 (+1.6)	102.7 (+1.7)	110.1 (+1.4)	123.2 (+1.5)	123.3 (+0.6)
Strait of Georgia						
7.5 m	93.6 (+0.9)	102.2 (+0.6)	109.0 (+0.5)	115.6 (+0.4)	142.3 (+0.5)	142.2 (+0.3)
50 m	95.4 (+1.1)	103.0 (+0.7)	108.1 (+0.5)	113.4 (+0.4)	133.7 (+0.5)	133.6 (+0.3)
100 m	94.8 (+1.0)	101.6 (+0.6)	106.2 (+0.5)	111.1 (+0.4)	127.0 (+0.4)	127.6 (+0.2)

Comparing the median and distribution of values for subregions, the greatest sound levels were recorded in the Strait of Juan de Fuca, when using the acoustic and foraging subdivisions (Figures 24-25). The greatest variability in sound levels was again seen in Haro Strait/Haro Strait-Boundary Pass and Gulf Islands subregions. It is the Haro Strait-Boundary Pass subregions that consistently experience the greatest noise additions from TMX-related tanker and tug traffic additions (Figures 26-27).

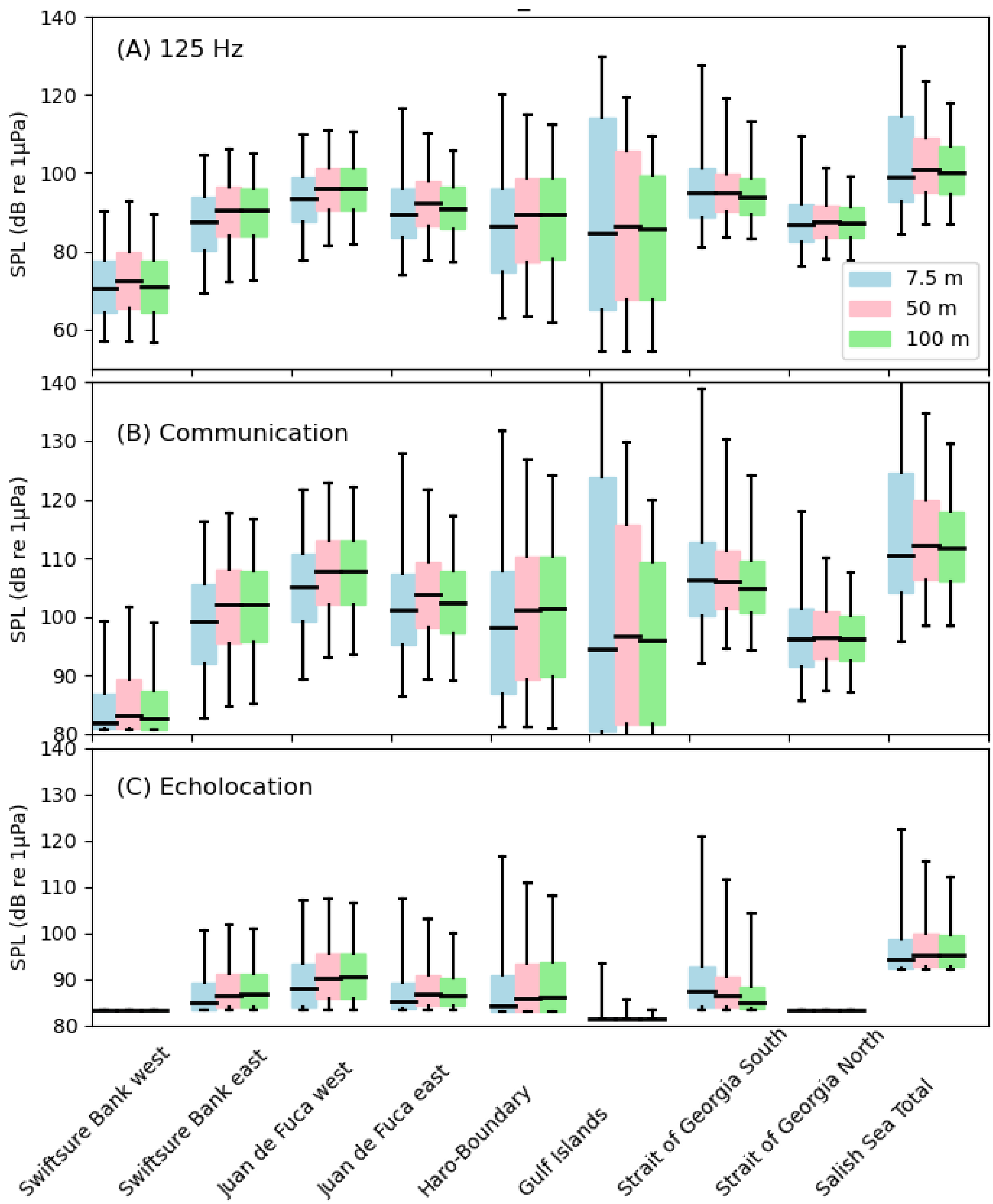

Figure 24: Boxplot comparing the sound pressure levels (SPL) for the **baseline + TMX** scenario in the **acoustically-derived subregions** using May-October 2015 AIS input data at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles**. Sound levels for each subregion of interest are shown at 7.5 m (blue) 50 m (pink) and 100 m (green).

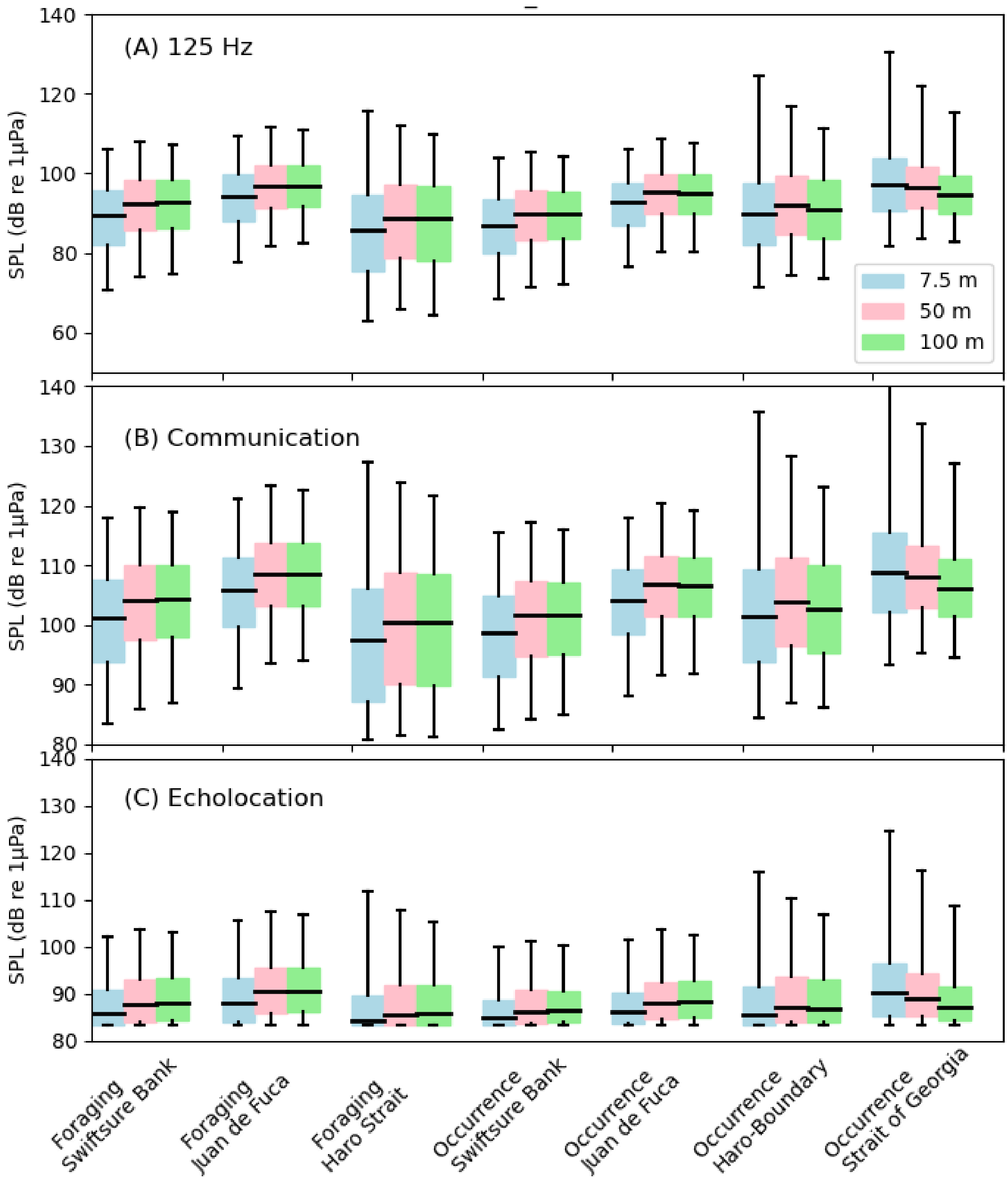

Figure 25: Boxplot comparing the sound pressure levels (SPL) for the **baseline + TMX** scenario in the **subregions derived using occurrence and foraging data** using May-October 2015 AIS input data at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25^th^ and 75^th^ percentile, and whiskers indicating the 5^th^ and 95^th^ percentiles.** Sound levels for each subregion of interest are shown at 7.5 m (blue) 50 m (pink) and 100 m (green).

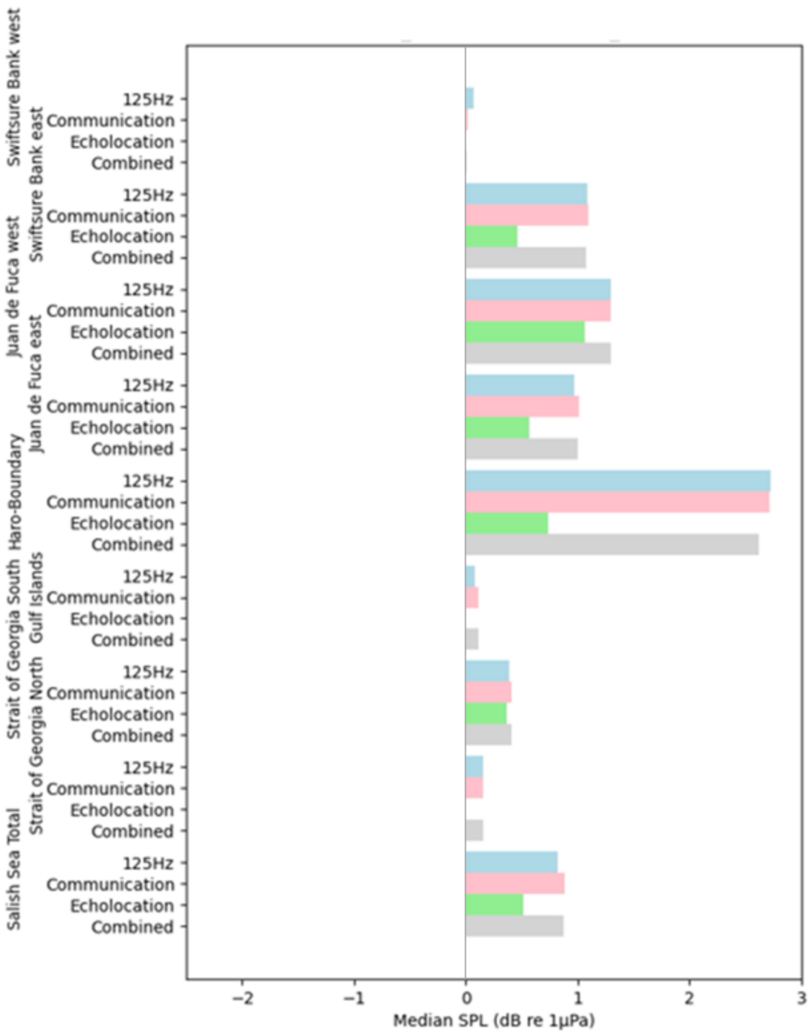

Figure 26: Bar chart showing the difference in decibels (dB) between the **baseline + TMX** scenario and the baseline at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation and combined frequency ranges. RL **median** differences are shown for each **acoustically-derived** subregion.

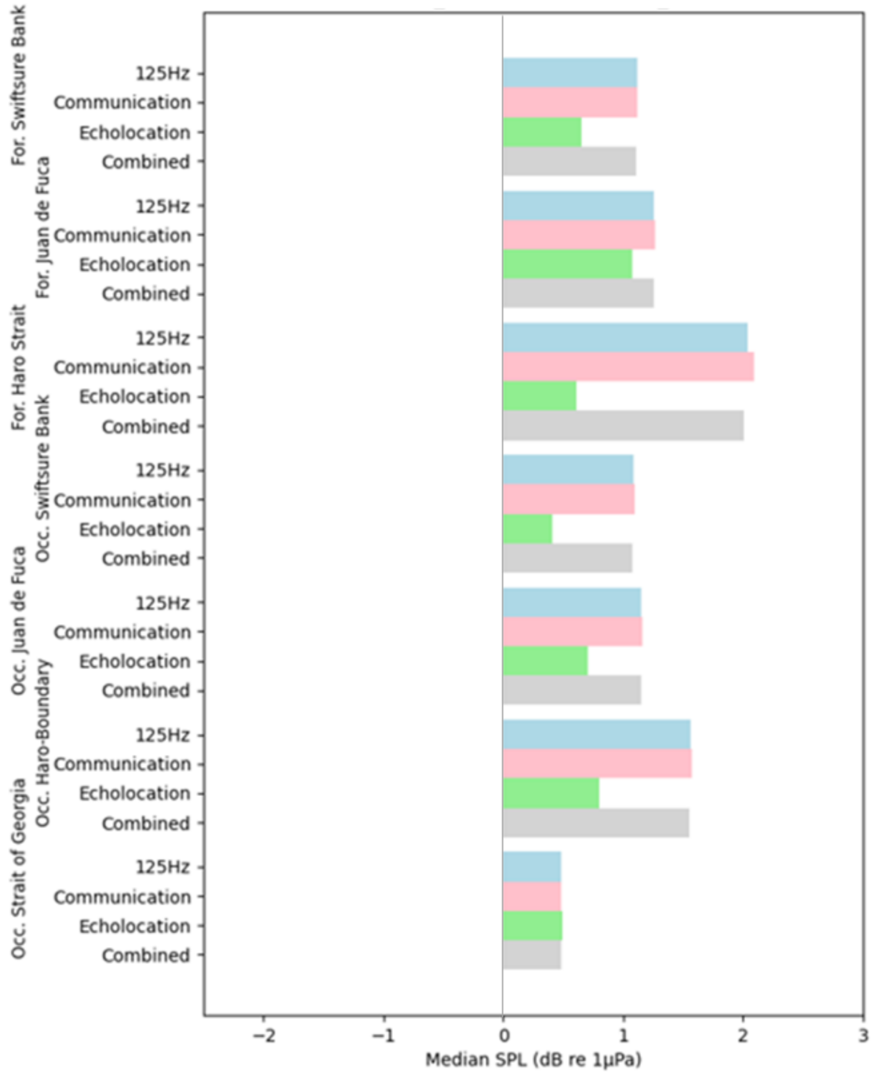

Figure 27: Bar chart showing the difference in decibels (dB) between the **baseline + TMX scenario** and the baseline at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. RL **median** differences are shown for each **subregion derived from data on SRKW occurrence and foraging**.

4.3. Vessel Slowdown Scenarios

The transit of a modern commercial vessel can elevate ambient noise levels by approximately 12-17 dB in SRKW echolocation frequencies, and 17-35 dB in SRKW communication frequencies (Veirs et al. 2016). These noise emissions are influenced by a number of variables, including vessel speed. Slowing the transit speed of vessels has been estimated to reduce noise emissions by approximately 1 dB per knot of reduced speed (1.8 dB per m/s). However, this can vary between and within ship classes (Veirs et al. 2016). Vessel speed reduction measures have been trialed as an operational means of reducing inputs to the soundscape from commercial traffic in several regions. Here we use the vessel noise model to consider the implementation of these measures in the Salish Sea and evaluate vessel slowdowns as a measure to mitigate the anticipated noise increases from TMX.

4.3.1 ECHO Slowdown measures

Voluntary slowdown measures were first trialed in Haro Strait in 2017 by the ECHO program. Since then, the slowdown requests have been expanded to encompass Boundary Pass (Figures 2, 34) and sections on Swiftsure Bank (Figures 8, 35-36, Table 1 in Appendix). The focus of the slowdown measures are commercial vessels, which are requested to reduce transit speed when it is safe and feasible through the slowdown zones. Each slowdown zone has transition zones associated with it, where vessels can slow down to the requested speed, or speed up having completed their passage (Figures 8, 28-30). Initial trials on Swiftsure Bank in 2020 were for outbound traffic only (Figure 29), but since 2021 the slowdown request has been in place for both in- and outbound vessels (Figures 2, 30, Table 1 in Appendix). The requested slowdown speed differed by vessel type and was designed to maximize participation rate and acoustic benefits through reductions in underwater noise.

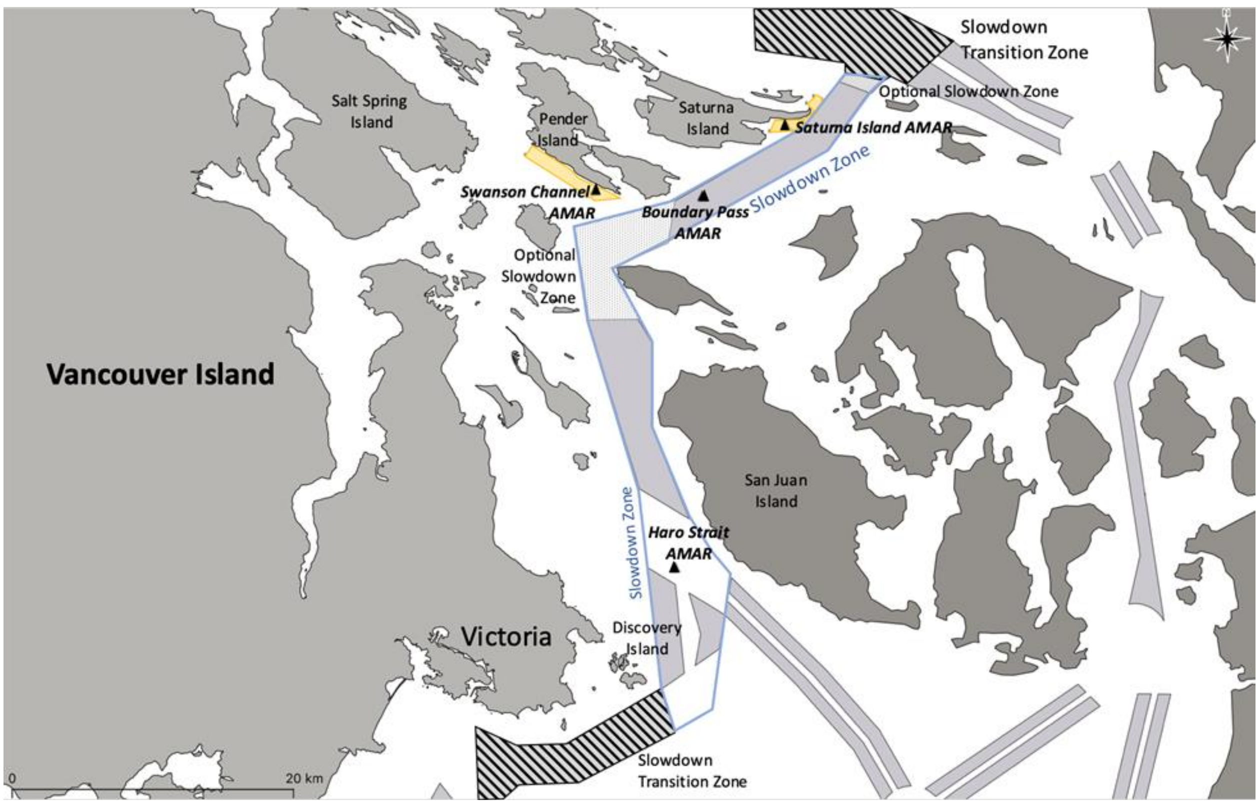

Figure 28: The voluntary slowdown area in Haro Strait and Boundary Pass (blue outline), and transition zones (black crosshatching). The requested slowdown speeds differ by vessel type.

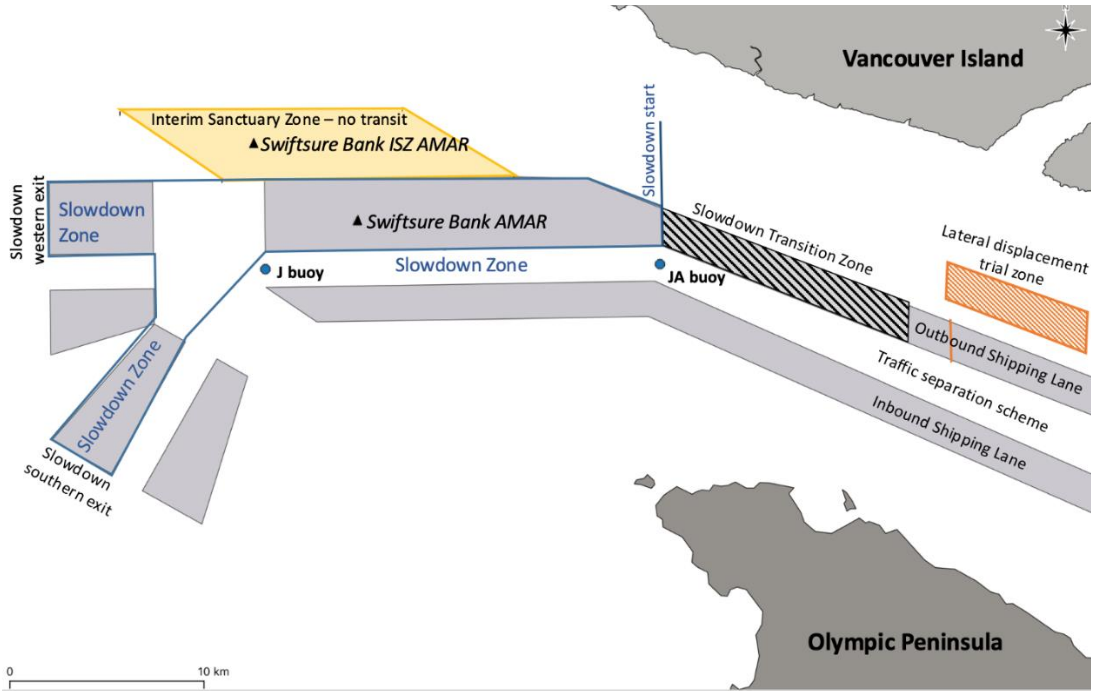

Figure 29: The voluntary slowdown area and transition zones on Swiftsure Bank for 2020 (blue outline), with slowdown requested for outbound traffic only west of the JA buoy. The requested slowdown speeds differ by vessel type.

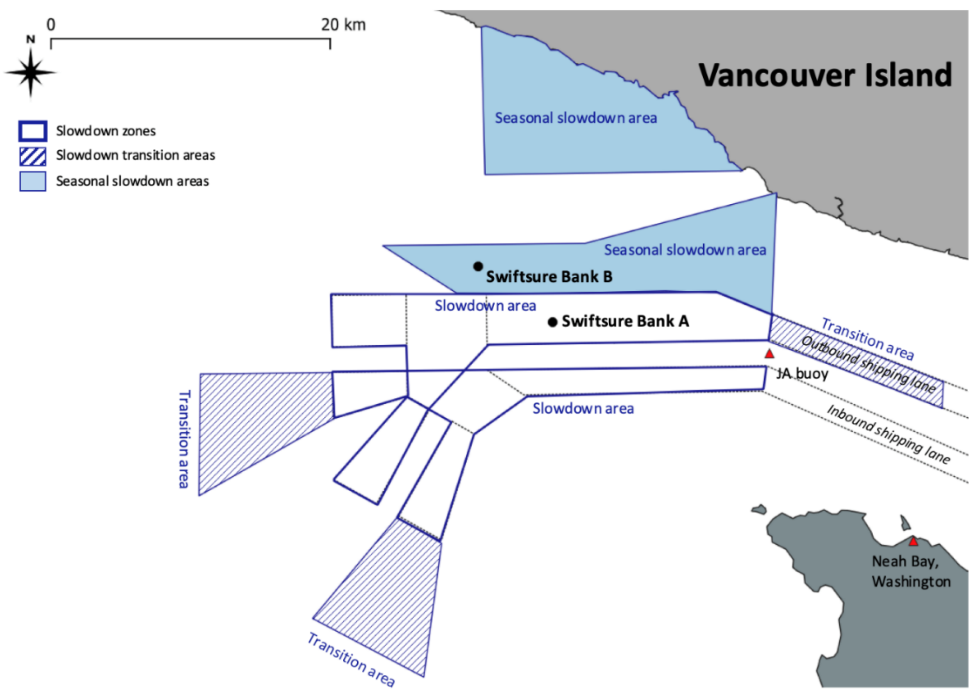

Figure 30: Slowdown measures on Swiftsure Bank for 2021 onwards, outlined in blue. The transition area is indicated with blue cross hatching, the acoustic moorings shown with black circles, and weather stations shown with red triangles. Additional seasonal speed restriction areas (solid light blue shading) are mandatory measures enforced by Transport Canada and separate from the voluntary slowdowns for large commercial vessels coordinated by the ECHO Program. They are not included in the slowdown scenarios using slowdown zones.

Two scenarios were modelled using ECHO-inspired slowdown zones and slowdown speeds. The first reflected 100% participation, where all commercial vessels transiting through the slowdown zones travelled at or below the requested speeds. A second, more realistic scenario, was also modelled, where the level of participation and transit speeds were taken from that reported by the ECHO program for 2023. Overall participation in Haro Strait and Boundary Pass was 87%, and 86% for tankers, and on Swiftsure Bank participation overall was 86%, with 84% of tankers participating, so 85% participation was used in the modelled scenario (see Table 1 in the Appendix, ECHO 2024, or see https://www.portvancouver.com/sites/default/files/2024-08/2023-ECHO-Program-annual-report-2.pdf). The requested slowdown speeds were 11 knots for bulkers, ferries, government/research vessels, tankers and tugs, and 14.5 knots for containerships, passenger/cruise ships and vehicle carriers. These speeds were used to modify the AIS data from May to October 2015 to simulate the slowdown. This time period is longer than the measures are typically in place, with measures on Swiftsure Bank initiated on June 1, and in Haro Strait-Boundary Pass initiated at the first confirmed sighting or acoustics encounter of SRKW during the summer after June 1. The AIS data were also adjusted to include the presence of TMX vessels in both of these scenarios, with 100% of TMX vessels presumed to participate in the slowdown for both. The TMX-related vessels are already committed to complying to the slowdown speeds through the trial zones on Swiftsure Bank and Haro Strait-Boundary Pass.

To ensure that all vessels that would be part of the slowdown trials were captured in the model accurately, the ECHO slowdown regions were extended slightly beyond the extent of the shipping lanes. This meant that vessels that were traveling on the shipping lane boundary, or just outside, were still incorporated into the modeling efforts, and transit speeds adjusted if necessary (Figures 31-32). Speed of vessels was calculated using the distance traveled and time elapsed in the AIS records. This was then assessed for each five-minute data point and compared to the requested slowdown speed. If the vessel speed was at or below the requested speed, no action was taken. If the vessel speed exceeded the slowdown speed, the time stamp of that 5-minute section and each of the subsequent time stamps were adjusted to reflect the extra time that it would take to travel the distance at the slowdown speed.

The vessel inputs for the vessel noise model were simulated by creating a synthetic AIS record from the May to October 2015 data. The vessels identified as needing to be slowed in the slowdown zones had their speed adjusted in the transition zones (Figures 31-32), so that they were compliant with the requested slowdown speeds for the full length of the slowdown zone. Vessels were slowed linearly from the speed they were travelling, which exceeded the slowdown speed on entering the transition zone, to the requested speed over the length of the transition zone. The areas of the transition zones were adjusted from the ECHO spatial definitions to match the extended slowdown regions to ensure all vessels were captured (Figures 31-32). Escort tugs were modelled to match the slowdown of the tanker they were associated with in speed and direction. An escort tug was defined as those traveling within 200 m of a tanker and had a directional heading that differed by no more than 10°, and speeds that differed less than 3 knots for at least two consecutive five-minute time steps.

Results from both scenarios were compared to the baseline + TMX scenario to understand the change in sound levels that these measures might have on the project-related noise additions (Figures 33-35). Comparison between different levels of participation rates was also possible (see Section 5).

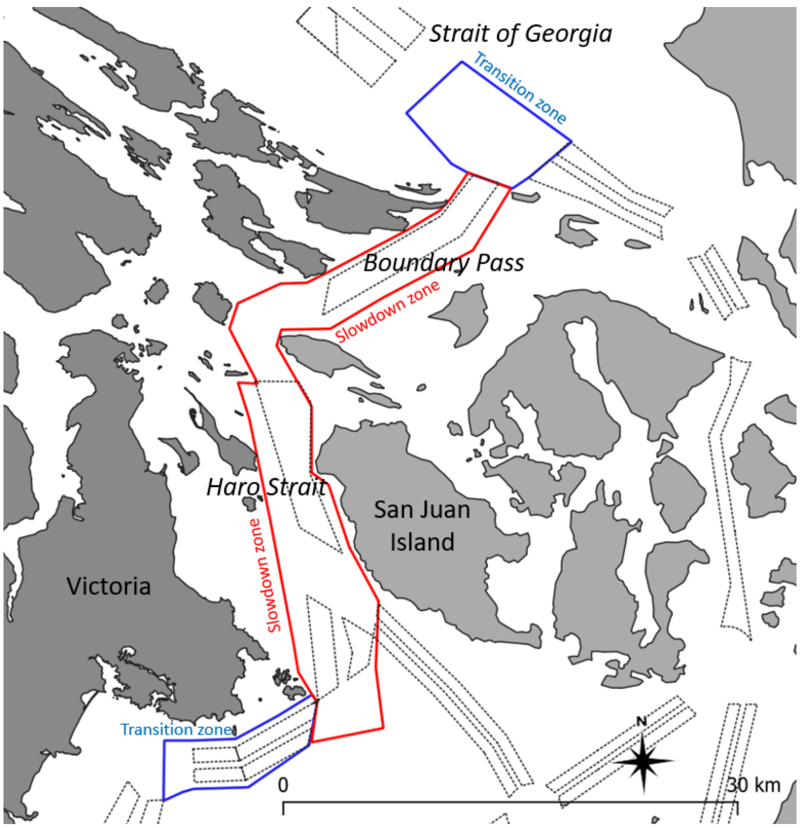

Figure 31: Boundaries of the Haro Strait-Boundary Pass slowdown zone (red outline) with transition zones (blue outline).

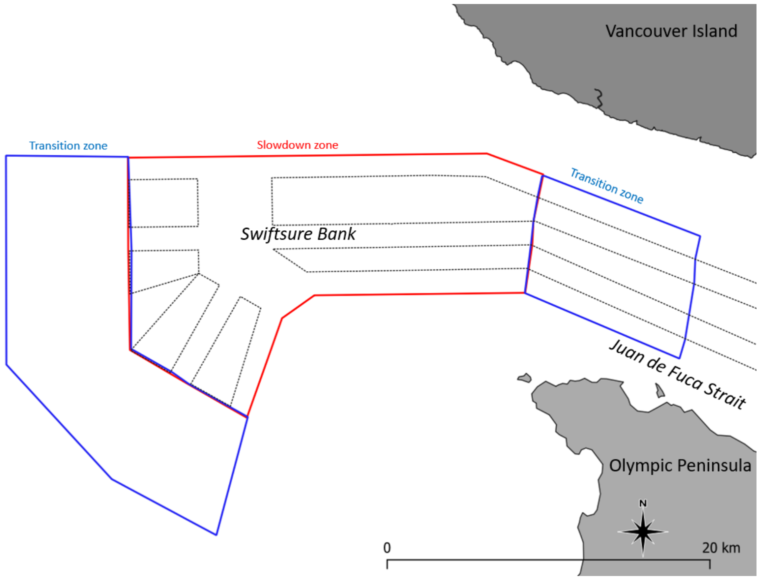

Figure 32: Boundaries of the Swiftsure Bank slowdown zone (red outline) and transition zone (blue outline).

ECHO-inspired slowdown, 100% participation

The use of slowdown measures as they are currently in the Salish Sea was the first scenario to be evaluated. Measures to reduce vessel speeds in the ECHO-outlined slowdown zones and speeds to conform to current seasonal requests showed this measure was most effective in reducing noise inputs from TMX-vessels in areas surrounding the slowdown zones, but that directly within the zones some additions were apparent (Figures 33-35). This, especially in Haro Strait, may be because the slowdown aggregates vessels in space. Noise levels were only consistently reduced for all frequency ranges and all depths considered when comparing sound levels calculated using metrics of L_{50} or greater (Tables 5a-d). Reductions of the noise additions from TMX-related vessels were only present in areas directly in or adjacent to slowdown zones, with some reductions seen in areas around the transitions at the eastern extent of Juan de Fuca and the around the transition to the Boundary Pass slowdown zone in the Strait of Georgia (Figures 33-35, Tables 5a-d). Reductions relative to the 2015 baseline scenario were few, mostly occurring at 100 m depth (Tables 5a-d).

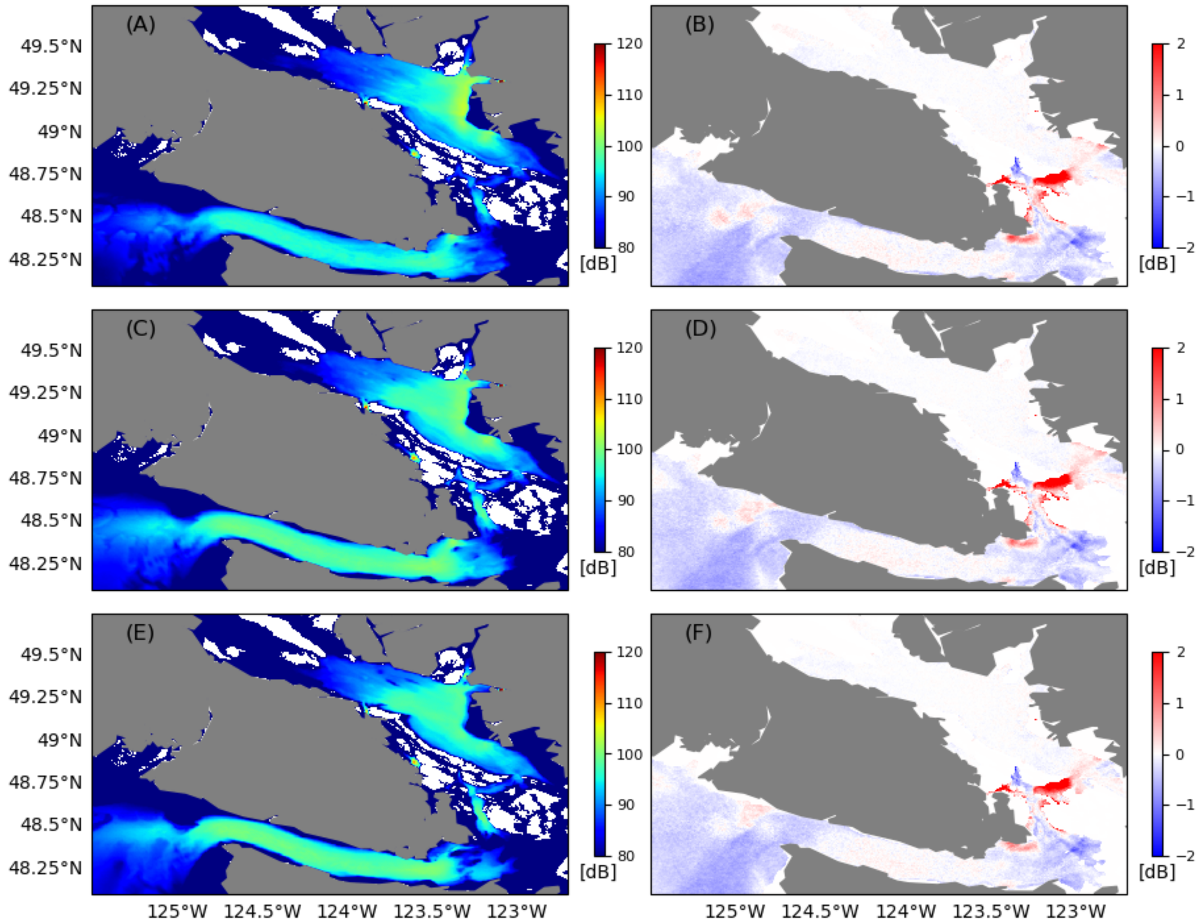

Figure 33: LEFT (A,C,E): Modelled **median** received levels at **125 Hz** for the **ECHO-inspired slowdown scenario with 100% participation rate** of vessels traveling at ECHO requested speeds through ECHO slowdown zones. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

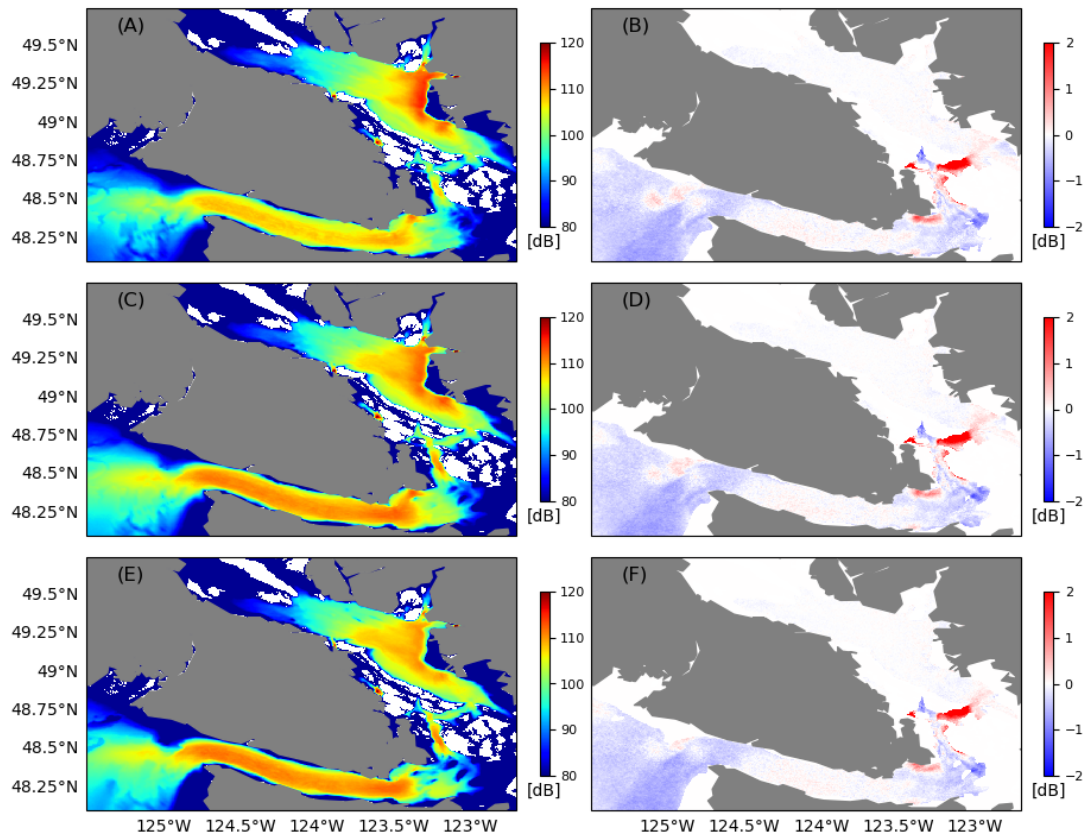

Figure 34: LEFT (A,C,E): Modelled **median** received levels in the SRKW **communication range (500 Hz to 15 kHz)** for the **ECHO-inspired slowdown scenario with 100% participation rate** of vessels traveling at ECHO requested speeds through ECHO slowdown zones. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

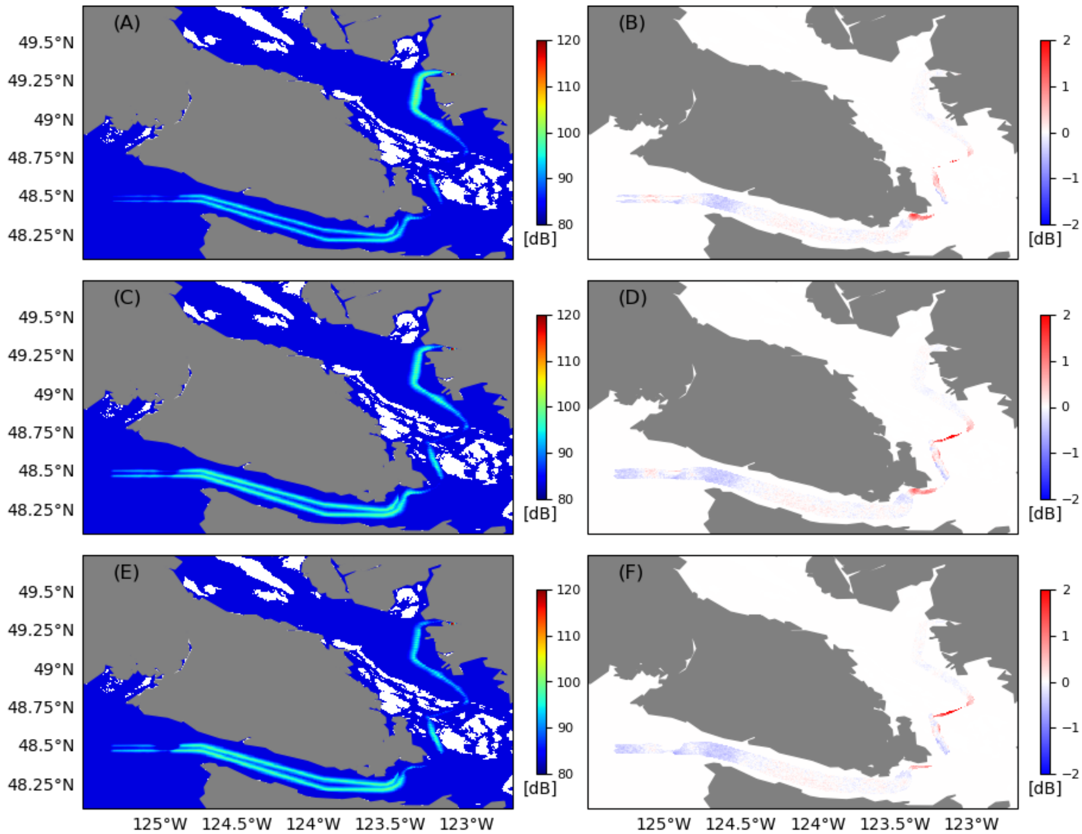

Figure 35: LEFT (A,C,E): Modelled **median** received levels in the SRKW **echolocation range (15-100 kHz)** for the **ECHO-inspired slowdown scenario with 100% participation rate** of vessels traveling at ECHO requested speeds through ECHO slowdown zones. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

Under this slowdown scenario, Juan de Fuca west and Strait of Georgia south subregions had the greatest sound levels (Figures 36-37), despite the greatest reductions relative to baseline being seen in Juan de Fuca Strait and Swiftsure Bank (Figures 38-39). Additions were found in Haro Strait and Boundary Pass subregions when considering median values (Figures 38-39), likely as a result of the congregating effect of vessels created by the slowdown, and a greater exposure time of vessel noise.

Table 5a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	56.8	(+0.1)	(0.0)	64.1	(0.0)	(-0.1)	70.6	(0.0)	(-0.1)	77.5	(0.0)	(-0.1)	90.3	(-0.1)	(-0.1)	115.5	(-0.1)	(-0.1)
50 m	57.0	(+0.1)	(0.0)	65.2	(0.0)	(-0.1)	72.4	(-0.1)	(-0.1)	79.9	(0.0)	(-0.1)	92.6	(-0.1)	(-0.1)	105.9	(0.0)	(0.0)
100 m	56.5	(+0.1)	(0.0)	64.0	(0.0)	(-0.1)	70.9	(0.0)	(-0.1)	77.7	(0.0)	(0.0)	89.5	(-0.1)	(-0.1)	96.4	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	69.6	(+2.1)	(+0.6)	80.8	(+1.9)	(+0.4)	87.5	(+0.9)	(-0.2)	93.2	(+0.1)	(-0.7)	104.8	(+1.5)	(+0.4)	121.8	(-0.8)	(-1.3)
50 m	72.7	(+2.4)	(+0.7)	84.2	(+1.8)	(+0.4)	90.3	(+0.8)	(-0.2)	95.6	(0.0)	(-0.8)	105.2	(+0.2)	(-0.8)	112.7	(-0.6)	(-1.2)
100 m	73.3	(+2.6)	(+0.7)	84.4	(+1.9)	(+0.3)	90.3	(+0.8)	(-0.3)	95.2	(0.0)	(-0.8)	103.7	(-0.2)	(-1.1)	105.4	(-0.7)	(-1.3)
Juan de Fuca west																		
7.5 m	77.6	(+2.5)	(0.0)	87.4	(+1.6)	(0.0)	93.5	(+1.2)	(-0.1)	99.1	(+0.9)	(-0.1)	109.6	(+1.9)	(-0.2)	126.0	(+0.5)	(-0.1)
50 m	81.4	(+2.4)	(0.0)	90.6	(+1.5)	(0.0)	96.1	(+1.1)	(-0.1)	101.2	(+0.9)	(-0.1)	110.9	(+1.3)	(-0.1)	117.1	(+0.6)	(-0.1)
100 m	81.8	(+2.3)	(0.0)	90.5	(+1.5)	(0.0)	96.0	(+1.1)	(-0.1)	101.2	(+0.8)	(-0.1)	110.4	(+1.0)	(-0.1)	111.2	(+0.6)	(-0.1)
Juan de Fuca east																		
7.5 m	74.4	(+1.7)	(+0.4)	83.7	(+1.3)	(+0.2)	89.6	(+1.0)	(0.0)	96.1	(+0.8)	(+0.2)	116.4	(+0.9)	(0.0)	123.8	(+0.3)	(-0.1)
50 m	77.9	(+1.7)	(+0.3)	86.8	(+1.2)	(+0.1)	92.2	(+0.9)	(0.0)	97.9	(+0.6)	(-0.1)	110.2	(+0.8)	(0.0)	114.6	(+0.3)	(-0.1)
100 m	77.3	(+1.5)	(+0.2)	85.6	(+1.1)	(0.0)	90.8	(+0.9)	(0.0)	96.2	(+0.6)	(-0.1)	105.8	(+0.6)	(-0.1)	107.1	(+0.4)	(0.0)
Haro-Boundary																		
7.5 m	63.2	(+2.0)	(+0.4)	76.2	(+5.1)	(+1.5)	86.8	(+3.1)	(+0.3)	95.3	(+1.0)	(-0.8)	122.5	(+9.9)	(+2.5)	126.9	(-1.7)	(-2.0)
50 m	63.9	(+2.5)	(+0.5)	79.1	(+6.1)	(+1.7)	89.5	(+2.8)	(+0.2)	97.8	(+0.8)	(-0.9)	115.6	(+3.6)	(+0.6)	117.8	(-1.4)	(-1.8)
100 m	62.4	(+2.7)	(+0.6)	79.6	(+6.5)	(+1.7)	89.7	(+2.6)	(+0.1)	97.7	(+0.6)	(-1.0)	111.4	(+0.8)	(-0.9)	113.6	(-1.2)	(-1.5)
Gulf Islands																		
7.5 m	54.1	(0.0)	(0.0)	65.2	(+2.9)	(+0.3)	84.5	(+0.1)	(0.0)	114.2	(0.0)	(0.0)	130.0	(+0.1)	(+0.1)	124.5	(0.0)	(0.0)
50 m	54.2	(0.0)	(0.0)	67.9	(+2.8)	(+0.2)	86.5	(+0.1)	(0.0)	105.8	(0.0)	(0.0)	119.4	(+0.1)	(+0.1)	114.6	(-0.1)	(-0.1)
100 m	54.2	(+0.1)	(+0.1)	67.8	(+2.7)	(+0.2)	85.9	(+0.1)	(0.0)	99.5	(0.0)	(0.0)	109.4	(0.0)	(0.0)	108.2	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	81.0	(+0.7)	(0.0)	88.9	(+0.5)	(0.0)	95.0	(+0.4)	(0.0)	101.3	(+0.4)	(0.0)	127.6	(+0.4)	(0.0)	128.9	(+0.1)	(0.0)

50 m	83.4	(+0.8)	(0.0)	90.3	(+0.5)	(0.0)	95.0	(+0.4)	(0.0)	100.0	(+0.3)	(0.0)	119	(+0.4)	(0.0)	120.3	(+0.1)	(0.0)
100 m	83.2	(+0.8)	(0.0)	89.6	(+0.5)	(0.0)	93.9	(+0.3)	(0.0)	98.5	(+0.3)	(0.0)	113	(+0.3)	(0.0)	114.7	(+0.1)	(0.0)
Strait of Georgia North																		
7.5 m	76.0	(+0.2)	(0.0)	82.3	(+0.2)	(0.0)	87.0	(+0.1)	(0.0)	92.2	(+0.1)	(0.0)	109.2	(0.0)	(-0.1)	119.2	(0.0)	(0.0)
50 m	77.9	(+0.3)	(0.0)	83.6	(+0.1)	(0.0)	87.5	(+0.1)	(0.0)	91.8	(0.0)	(0.0)	101.4	(0.0)	(-0.1)	110.6	(0.0)	(0.0)
100 m	77.8	(+0.2)	(0.0)	83.3	(+0.1)	(0.0)	87.2	(0.0)	(0.0)	91.3	(0.0)	(0.0)	98.9	(0.0)	(0.0)	104.4	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	84.2	(+1.1)	(+0.1)	92.8	(+1.0)	(+0.1)	99.1	(+0.8)	(0.0)	114.7	(+0.1)	(0.0)	132.6	(+0.6)	(+0.2)	133.9	(-0.3)	(-0.6)
50 m	87.0	(+1.3)	(+0.1)	95.1	(+1.1)	(+0.1)	100.8	(+0.8)	(0.0)	108.9	(+0.3)	(-0.1)	123.6	(+0.7)	(+0.1)	124.9	(-0.2)	(-0.5)
100 m	87.0	(+1.2)	(+0.1)	94.8	(+1.1)	(+0.1)	100.2	(+0.9)	(-0.1)	106.4	(+0.4)	(-0.2)	117.8	(+0.5)	(-0.3)	119.2	(-0.3)	(-0.5)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	71.1	(+2.5)	(+0.6)	82.6	(+2.1)	(+0.5)	89.3	(+1.0)	(-0.1)	95.1	(+0.1)	(-0.7)	105.7	(+0.7)	(-0.3)	122.9	(-1.1)	(-1.6)
50 m	74.5	(+2.7)	(+0.7)	86.2	(+2.0)	(+0.4)	92.3	(+0.9)	(-0.2)	97.5	(0.0)	(-0.8)	106.8	(-0.2)	(-1.1)	113.9	(-0.9)	(-1.4)
100 m	75.5	(+2.7)	(+0.7)	86.6	(+1.9)	(+0.4)	92.5	(+0.9)	(-0.2)	97.5	(0.0)	(-0.8)	106.0	(-0.4)	(-1.2)	107.7	(-0.9)	(-1.5)
Juan de Fuca																		
7.5 m	77.7	(+2.7)	(0.0)	88.0	(+1.6)	(-0.1)	94.0	(+1.2)	(-0.1)	99.6	(+0.8)	(-0.1)	109.2	(+1.0)	(-0.2)	126.1	(+0.4)	(-0.1)
50 m	81.8	(+2.6)	(0.0)	91.3	(+1.5)	(-0.1)	96.7	(+1.1)	(-0.1)	101.9	(+0.8)	(-0.1)	111.4	(+0.9)	(-0.1)	117.2	(+0.5)	(-0.1)
100 m	82.4	(+2.4)	(0.0)	91.4	(+1.4)	(-0.1)	96.7	(+1.0)	(-0.1)	101.8	(+0.8)	(-0.1)	110.8	(+0.8)	(-0.2)	111.4	(+0.5)	(-0.1)
Haro Strait																		
7.5 m	63.9	(+2.0)	(+1.0)	76.3	(+2.9)	(+1.0)	85.9	(+2.1)	(+0.1)	93.6	(+0.4)	(-0.9)	117.4	(+6.7)	(+1.9)	123.8	(-1.7)	(-2.1)
50 m	66.8	(+2.2)	(+1.1)	79.6	(+3.1)	(+1.1)	88.7	(+1.8)	(0.0)	96.1	(+0.2)	(-1.1)	111.3	(+1.1)	(-0.7)	115.0	(-1.5)	(-2.0)
100 m	65.1	(+1.9)	(+1.0)	79.3	(+4.1)	(+1.3)	88.5	(+1.9)	(-0.1)	95.6	(0.0)	(-1.3)	107.7	(-1.0)	(-2.2)	107.9	(-2.1)	(-2.5)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	69.0	(+2.1)	(+0.6)	80.1	(+1.9)	(+0.5)	86.8	(+0.9)	(-0.1)	92.6	(+0.1)	(-0.7)	104.2	(+1.6)	(+0.4)	121.2	(-0.8)	(-1.3)
50 m	72.0	(+2.4)	(+0.7)	83.5	(+1.9)	(+0.4)	89.7	(+0.8)	(-0.2)	95.0	(0.0)	(-0.8)	104.6	(+0.2)	(-0.8)	112.1	(-0.6)	(-1.2)
100 m	72.6	(+2.6)	(+0.7)	83.7	(+1.9)	(+0.3)	89.6	(+0.8)	(-0.3)	94.6	(0.0)	(-0.8)	103.1	(-0.2)	(-1.1)	104.8	(-0.7)	(-1.3)
Juan de Fuca																		
7.5 m	76.7	(+2.7)	(+0.1)	86.9	(+1.5)	(-0.1)	92.5	(+0.9)	(-0.2)	97.4	(+0.6)	(-0.3)	106.8	(+1.7)	(+0.7)	121.8	(-0.1)	(-0.6)

50 m	80.1	(+2.7)	(+0.1)	89.9	(+1.4)	(-0.1)	95.0	(+0.9)	(-0.2)	99.7	(+0.6)	(-0.3)	108.5	(+0.9)	(-0.1)	113.1	(+0.1)	(-0.5)
100 m	80.3	(+2.6)	(+0.2)	89.7	(+1.4)	(-0.1)	94.8	(+0.8)	(-0.3)	99.5	(+0.5)	(-0.3)	107.3	(+0.5)	(-0.3)	107.5	(+0.1)	(-0.5)
Haro-Boundary																		
7.5 m	72.2	(+2.7)	(+1.0)	82.7	(+2.3)	(+0.7)	89.9	(+1.8)	(+0.2)	97.7	(+1.1)	(0.0)	125.4	(+2.0)	(+0.9)	126.3	(-0.7)	(-1.2)
50 m	75.3	(+2.7)	(+1.0)	85.5	(+2.2)	(+0.7)	92.3	(+1.6)	(+0.1)	99.0	(+0.8)	(-0.5)	117.4	(+1.7)	(+0.4)	117.5	(-0.6)	(-1.1)
100 m	74.0	(+2.2)	(+0.5)	84	(+2.3)	(+0.5)	91.0	(+1.8)	(+0.1)	97.7	(+0.7)	(-0.6)	110.7	(+0.7)	(-0.7)	110.0	(-0.9)	(-1.4)
Strait of Georgia																		
7.5 m	81.6	(+1.0)	(0.0)	90.5	(+0.6)	(0.0)	97.3	(+0.5)	(0.0)	103.9	(+0.4)	(0.0)	130.5	(+0.5)	(+0.1)	130.5	(+0.2)	(0.0)
50 m	83.7	(+1.2)	(0.0)	91.3	(+0.7)	(0.0)	96.5	(+0.5)	(0.0)	101.8	(+0.4)	(0.0)	122.0	(+0.5)	(0.0)	121.9	(+0.2)	(0.0)
100 m	82.9	(+1.1)	(0.0)	90.0	(+0.6)	(0.0)	94.6	(+0.5)	(0.0)	99.5	(+0.4)	(0.0)	115.4	(+0.5)	(0.0)	115.9	(+0.2)	(0.0)

Table 5b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.0	(0.0)	(-0.1)	86.8	(0.0)	(-0.1)	99.2	(-0.1)	(-0.1)	124.3	(-0.1)	(-0.1)
50 m	80.7	(0.0)	(0.0)	80.9	(0.0)	(0.0)	83.2	(0.0)	(-0.1)	89.2	(0.0)	(0.0)	101.5	(-0.1)	(-0.1)	114.7	(0.0)	(0.0)
100 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.7	(0.0)	(0.0)	87.4	(0.0)	(0.0)	98.8	(-0.1)	(-0.1)	105.3	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	82.9	(+1.1)	(+0.3)	92.4	(+1.9)	(+0.4)	99.1	(+0.9)	(-0.1)	104.9	(+0.1)	(-0.7)	116.6	(+1.6)	(+0.4)	133.4	(-0.9)	(-1.3)
50 m	85.1	(+1.8)	(+0.5)	95.8	(+1.8)	(+0.4)	101.9	(+0.8)	(-0.2)	107.2	(0.0)	(-0.8)	116.9	(+0.2)	(-0.8)	124.4	(-0.6)	(-1.2)
100 m	85.8	(+1.9)	(+0.5)	96.1	(+1.8)	(+0.3)	101.9	(+0.8)	(-0.3)	106.9	(0.0)	(-0.8)	115.5	(-0.2)	(-1.1)	117.1	(-0.7)	(-1.3)
Juan de Fuca west																		
7.5 m	89.3	(+2.5)	(0.0)	99.1	(+1.6)	(0.0)	105.2	(+1.2)	(-0.1)	110.7	(+0.9)	(-0.1)	121.4	(+2.0)	(-0.2)	137.8	(+0.5)	(-0.1)
50 m	93.1	(+2.4)	(0.0)	102.2	(+1.5)	(0.0)	107.8	(+1.1)	(-0.1)	112.9	(+0.9)	(-0.1)	122.7	(+1.3)	(-0.1)	128.9	(+0.6)	(-0.1)
100 m	93.5	(+2.2)	(0.0)	102.2	(+1.5)	(0.0)	107.7	(+1.1)	(-0.1)	112.9	(+0.8)	(-0.1)	122.1	(+1.0)	(-0.1)	123.0	(+0.6)	(-0.1)
Juan de Fuca east																		
7.5 m	86.5	(+1.4)	(+0.3)	95.3	(+1.3)	(+0.2)	101.2	(+1.0)	(0.0)	107.5	(+0.9)	(+0.2)	127.9	(+1.0)	(+0.1)	135.0	(+0.3)	(-0.1)
50 m	89.7	(+1.6)	(+0.3)	98.3	(+1.2)	(+0.1)	103.8	(+0.9)	(0.0)	109.2	(+0.6)	(-0.1)	121.6	(+1.0)	(0.0)	126.0	(+0.4)	(-0.1)
100 m	89.2	(+1.3)	(+0.2)	97.3	(+1.1)	(0.0)	102.4	(+0.9)	(0.0)	107.7	(+0.7)	(-0.1)	117.2	(+0.7)	(0.0)	118.4	(+0.5)	(0.0)
Haro-Boundary																		
7.5 m	81.1	(+0.3)	(0.0)	88.2	(+4.2)	(+1.3)	98.5	(+3.1)	(+0.3)	107.0	(+1.0)	(-0.8)	134.3	(+9.9)	(+2.5)	138.5	(-1.7)	(-2.1)
50 m	81.2	(+0.4)	(+0.1)	91.0	(+5.5)	(+1.6)	101.2	(+2.8)	(+0.2)	109.5	(+0.8)	(-0.9)	127.4	(+3.6)	(+0.6)	129.4	(-1.4)	(-1.8)
100 m	80.9	(+0.3)	(0.0)	91.5	(+5.9)	(+1.6)	101.5	(+2.6)	(+0.1)	109.4	(+0.6)	(-1.0)	123.2	(+0.8)	(-0.9)	124.9	(-1.2)	(-1.5)
Gulf Islands																		
7.5 m	78.9	(0.0)	(0.0)	80.5	(+0.9)	(+0.1)	94.5	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(+0.1)	(+0.1)	135.1	(0.0)	(0.0)
50 m	78.9	(0.0)	(0.0)	81.8	(+1.3)	(+0.1)	96.6	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.9	(+0.1)	(+0.1)	125.2	(-0.1)	(-0.1)
100 m	78.9	(0.0)	(0.0)	81.8	(+1.2)	(+0.1)	95.9	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.7	(0.0)	(0.0)	118.8	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	92.1	(+0.7)	(0.0)	100.1	(+0.5)	(0.0)	106.3	(+0.4)	(0.0)	112.6	(+0.4)	(0.0)	138.9	(+0.5)	(0.0)	140.1	(+0.2)	(0.0)

50 m	94.4	(+0.9)	(0.0)	101.3	(+0.5)	(0.0)	106.1	(+0.4)	(0.0)	111.1	(+0.3)	(0.0)	130.2	(+0.4)	(0.0)	131.4	(+0.2)	(0.0)
100 m	94.2	(+0.8)	(0.0)	100.6	(+0.5)	(0.0)	104.9	(+0.4)	(0.0)	109.6	(+0.3)	(0.0)	124.2	(+0.3)	(0.0)	125.9	(+0.1)	(0.0)
Strait of Georgia North																		
7.5 m	85.6	(+0.2)	(0.0)	91.5	(+0.2)	(0.0)	96.1	(+0.1)	(0.0)	101.3	(+0.1)	(0.0)	117.8	(0.0)	(-0.1)	127.9	(0.0)	(0.0)
50 m	87.3	(+0.2)	(0.0)	92.7	(+0.1)	(0.0)	96.5	(+0.1)	(0.0)	100.9	(0.0)	(0.0)	110.0	(0.0)	(-0.1)	119.3	(0.0)	(0.0)
100 m	87.1	(+0.2)	(0.0)	92.4	(+0.1)	(0.0)	96.2	(0.0)	(0.0)	100.3	(0.0)	(0.0)	107.7	(0.0)	(0.0)	113.0	(-0.1)	(-0.1)
Salish Sea Total																		
7.5 m	95.8	(+1.1)	(+0.1)	104.1	(+1.1)	(+0.1)	110.4	(+0.9)	(0.0)	124.6	(+0.1)	(0.0)	143.6	(+0.7)	(+0.3)	145.2	(-0.3)	(-0.7)
50 m	98.4	(+1.3)	(+0.1)	106.5	(+1.2)	(+0.1)	112.1	(+0.9)	(0.0)	119.7	(+0.3)	(-0.2)	134.7	(+0.8)	(+0.1)	136.2	(-0.2)	(-0.6)
100 m	98.4	(+1.3)	(+0.1)	106.1	(+1.2)	(+0.1)	111.6	(+0.9)	(-0.1)	117.6	(+0.5)	(-0.3)	129.1	(+0.5)	(-0.3)	130.5	(-0.3)	(-0.6)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.7	(+1.6)	(+0.4)	94.3	(+2.1)	(+0.5)	101.0	(+1.0)	(-0.1)	106.7	(+0.1)	(-0.7)	117.5	(+0.7)	(-0.3)	134.6	(-1.1)	(-1.6)
50 m	86.5	(+2.3)	(+0.6)	97.8	(+2.0)	(+0.4)	104.0	(+0.9)	(-0.2)	109.2	(0.0)	(-0.8)	118.5	(-0.1)	(-1.0)	125.7	(-0.9)	(-1.4)
100 m	87.5	(+2.4)	(+0.6)	98.3	(+1.9)	(+0.4)	104.2	(+0.9)	(-0.2)	109.2	(0.0)	(-0.8)	117.8	(-0.4)	(-1.2)	119.4	(-0.9)	(-1.5)
Juan de Fuca																		
7.5 m	89.3	(+2.6)	(0.0)	99.6	(+1.6)	(-0.1)	105.7	(+1.2)	(-0.1)	111.2	(+0.8)	(-0.1)	120.9	(+1.0)	(-0.2)	137.9	(+0.4)	(-0.1)
50 m	93.4	(+2.5)	(0.0)	102.9	(+1.5)	(-0.1)	108.4	(+1.1)	(-0.1)	113.5	(+0.8)	(-0.1)	123.1	(+0.9)	(-0.2)	129.0	(+0.5)	(-0.1)
100 m	94.0	(+2.4)	(0.0)	103.0	(+1.4)	(-0.1)	108.4	(+1.0)	(-0.1)	113.5	(+0.8)	(-0.1)	122.5	(+0.8)	(-0.2)	123.2	(+0.5)	(-0.1)
Haro Strait																		
7.5 m	80.9	(+0.2)	(+0.1)	88.2	(+2.7)	(+1.0)	97.5	(+2.2)	(+0.1)	105.2	(+0.4)	(-0.9)	129.2	(+6.8)	(+1.9)	135.5	(-1.7)	(-2.1)
50 m	81.7	(+0.6)	(+0.3)	91.2	(+3.1)	(+1.1)	100.3	(+1.9)	(0.0)	107.7	(+0.2)	(-1.1)	123.1	(+1.1)	(-0.7)	126.7	(-1.6)	(-2.0)
100 m	81.3	(+0.3)	(+0.2)	91.0	(+4.1)	(+1.3)	100.2	(+1.9)	(-0.1)	107.2	(0.0)	(-1.3)	119.4	(-1.0)	(-2.2)	119.6	(-2.1)	(-2.5)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	82.7	(+1.0)	(+0.3)	91.8	(+1.9)	(+0.5)	98.4	(+1.0)	(-0.1)	104.2	(+0.1)	(-0.7)	116.0	(+1.6)	(+0.5)	132.8	(-0.9)	(-1.3)
50 m	84.7	(+1.7)	(+0.5)	95.2	(+1.9)	(+0.4)	101.3	(+0.8)	(-0.2)	106.6	(0.0)	(-0.8)	116.3	(+0.2)	(-0.8)	123.8	(-0.6)	(-1.2)
100 m	85.3	(+1.8)	(+0.5)	95.4	(+1.8)	(+0.3)	101.3	(+0.8)	(-0.3)	106.2	(0.0)	(-0.8)	114.8	(-0.2)	(-1.1)	116.5	(-0.7)	(-1.3)
Juan de Fuca																		
7.5 m	88.2	(+2.6)	(+0.1)	98.4	(+1.5)	(-0.1)	104.0	(+0.9)	(-0.2)	108.9	(+0.6)	(-0.3)	118.6	(+1.8)	(+0.7)	133.6	(-0.1)	(-0.6)

50 m	91.6	(+2.6)	(+0.1)	101.4	(+1.4)	(-0.1)	106.5	(+0.9)	(-0.2)	111.2	(+0.6)	(-0.3)	120.2	(+1.0)	(-0.1)	124.9	(+0.1)	(-0.5)
100 m	91.9	(+2.6)	(+0.2)	101.3	(+1.4)	(-0.1)	106.4	(+0.8)	(-0.3)	111.1	(+0.5)	(-0.3)	119.0	(+0.6)	(-0.3)	119.3	(+0.1)	(-0.5)
Haro-Boundary																		
7.5 m	85.0	(+1.8)	(+0.7)	94.4	(+2.2)	(+0.7)	101.5	(+1.8)	(+0.2)	109.3	(+1.1)	(-0.1)	136.7	(+2.3)	(+1.0)	138.0	(-0.7)	(-1.2)
50 m	87.6	(+2.2)	(+0.8)	97.2	(+2.2)	(+0.7)	104.0	(+1.6)	(+0.1)	110.7	(+0.8)	(-0.5)	128.8	(+1.8)	(+0.4)	129.1	(-0.6)	(-1.2)
100 m	86.5	(+1.6)	(+0.4)	95.7	(+2.3)	(+0.5)	102.7	(+1.8)	(+0.1)	109.4	(+0.7)	(-0.7)	122.4	(+0.8)	(-0.7)	121.7	(-0.9)	(-1.5)
Strait of Georgia																		
7.5 m	93.2	(+1.0)	(0.0)	102.1	(+0.6)	(0.0)	108.9	(+0.5)	(0.0)	115.5	(+0.5)	(0.0)	142.2	(+0.5)	(+0.1)	142.1	(+0.2)	(0.0)
50 m	95.2	(+1.2)	(0.0)	102.9	(+0.7)	(0.0)	108.1	(+0.5)	(0.0)	113.4	(+0.4)	(0.0)	133.7	(+0.5)	(0.0)	133.5	(+0.3)	(0.0)
100 m	94.5	(+1.1)	(0.0)	101.5	(+0.6)	(0.0)	106.1	(+0.5)	(0.0)	111.0	(+0.4)	(0.0)	127.0	(+0.5)	(0.0)	127.5	(+0.2)	(0.0)

Table 5c: Modelled received sound levels (RL) for each subregion at in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
50 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
100 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.9	(+0.4)	(0.0)	88.6	(+0.2)	(-0.6)	101.7	(+2.8)	(+1.3)	118.4	(-0.6)	(-1.3)
50 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(+0.1)	86.4	(+0.5)	(-0.1)	90.5	(+0.1)	(-0.7)	101.4	(+0.9)	(-0.5)	109.4	(-0.3)	(-1.2)
100 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(+0.1)	86.5	(+0.5)	(-0.1)	90.3	(0.0)	(-0.7)	99.8	(+0.3)	(-0.8)	102.3	(-0.4)	(-1.2)
Juan de Fuca west																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(0.0)	87.9	(+1.0)	(-0.1)	93.2	(+0.9)	(-0.1)	106.6	(+3.1)	(-0.3)	123.9	(+0.6)	(-0.1)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	90.2	(+1.0)	(-0.1)	95.3	(+0.9)	(-0.1)	107.2	(+1.9)	(-0.1)	114.9	(+0.7)	(-0.1)
100 m	83.3	(0.0)	(0.0)	85.8	(+0.9)	(0.0)	90.3	(+1.0)	(-0.1)	95.4	(+0.9)	(-0.1)	106.5	(+1.5)	(-0.1)	108.7	(+0.7)	(-0.1)
Juan de Fuca east																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	85.3	(+0.6)	(0.0)	89.1	(+0.9)	(0.0)	107.2	(+3.3)	(-0.3)	117.1	(+0.8)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.3	(+0.4)	(0.0)	86.8	(+0.8)	(0.0)	90.9	(+0.9)	(0.0)	103.0	(+2.2)	(-0.1)	108.2	(+0.9)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.3)	(0.0)	86.4	(+0.7)	(0.0)	90.0	(+0.8)	(0.0)	99.7	(+1.5)	(0.0)	101.1	(+0.9)	(0.0)
Haro-Boundary																		
7.5 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	84.4	(+0.8)	(+0.1)	90.2	(+0.9)	(-0.7)	119.1	(+10.7)	(+2.6)	120.6	(-1.2)	(-1.8)
50 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	85.7	(+1.2)	(+0.1)	92.4	(+0.8)	(-0.8)	111.9	(+4.6)	(+0.9)	111.9	(-1.1)	(-1.8)
100 m	83.1	(0.0)	(0.0)	83.1	(+0.1)	(+0.1)	86.1	(+1.2)	(0.0)	92.6	(+0.6)	(-0.9)	107.4	(+1.5)	(-0.5)	105.6	(-1.2)	(-1.9)
Gulf Islands																		
7.5 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	93.5	(0.0)	(0.0)	92.2	(-1.0)	(-1.0)
50 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	85.1	(-0.1)	(-0.3)	84.9	(-0.8)	(-0.8)
100 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	82.9	(-0.1)	(-0.4)	82.8	(-0.1)	(-0.2)
Strait of Georgia South																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.2)	(0.0)	87.2	(+0.4)	(0.0)	92.6	(+0.5)	(0.0)	120.7	(+0.8)	(+0.1)	119.6	(+0.3)	(0.0)

50 m	83.3	(0.0)	(0.0)	84.0	(+0.2)	(0.0)	86.3	(+0.3)	(0.0)	90.4	(+0.5)	(0.0)	111.5	(+0.7)	(+0.1)	110.5	(+0.4)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.6	(+0.1)	(0.0)	85.0	(+0.2)	(0.0)	88.2	(+0.4)	(0.0)	104.4	(+0.7)	(+0.1)	104.2	(+0.3)	(0.0)
Strait of Georgia North																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	92.1	(0.0)	(0.0)	92.4	(+0.1)	(0.0)	94.2	(+0.5)	(0.0)	98.5	(+0.6)	(-0.2)	123.2	(+2.8)	(+0.9)	127.6	(0.0)	(-0.6)
50 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.2	(+0.7)	(0.0)	99.6	(+0.6)	(-0.3)	115.8	(+2.2)	(+0.3)	118.6	(+0.1)	(-0.6)
100 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.1	(+0.7)	(0.0)	99.3	(+0.6)	(-0.3)	111.6	(+1.2)	(-0.3)	112.3	(+0.1)	(-0.6)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.2)	(+0.1)	85.7	(+0.6)	(0.0)	90.1	(+0.1)	(-0.6)	102.9	(+2.1)	(+0.7)	120.0	(-0.9)	(-1.5)
50 m	83.3	(0.0)	(0.0)	84.2	(+0.5)	(+0.2)	87.7	(+0.7)	(-0.1)	92.2	(0.0)	(-0.7)	102.9	(+0.5)	(-0.7)	111.0	(-0.6)	(-1.4)
100 m	83.3	(0.0)	(0.0)	84.5	(+0.6)	(+0.1)	88.0	(+0.7)	(-0.1)	92.5	(0.0)	(-0.8)	102.2	(+0.1)	(-1.0)	104.9	(-0.6)	(-1.3)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(0.0)	87.8	(+1.0)	(-0.1)	93.2	(+0.8)	(-0.1)	105.1	(+1.5)	(-0.4)	124	(+0.5)	(-0.1)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(-0.1)	90.2	(+1.0)	(-0.1)	95.4	(+0.8)	(-0.1)	107.1	(+1.3)	(-0.2)	115	(+0.6)	(-0.1)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(-0.1)	90.4	(+1.0)	(-0.1)	95.5	(+0.8)	(-0.1)	106.4	(+1.1)	(-0.2)	108.9	(+0.6)	(-0.1)
Haro Strait																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	84.3	(+0.7)	(0.0)	88.7	(+0.4)	(-0.8)	113.7	(+7.8)	(+2.0)	118.3	(-1.6)	(-2.1)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	85.4	(+1.0)	(0.0)	90.6	(+0.2)	(-1.0)	107.2	(+1.9)	(-0.4)	109.5	(-1.6)	(-2.1)
100 m	83.3	(0.0)	(0.0)	83.3	(+0.1)	(+0.1)	85.7	(+1.0)	(-0.1)	90.6	(0.0)	(-1.2)	103.2	(-0.6)	(-2.0)	102.6	(-2.1)	(-2.5)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.7	(+0.4)	(0.0)	88.2	(+0.2)	(-0.5)	101.2	(+2.8)	(+1.3)	117.8	(-0.6)	(-1.3)
50 m	83.3	(0.0)	(0.0)	83.8	(+0.3)	(+0.1)	86.1	(+0.5)	(-0.1)	90	(+0.1)	(-0.7)	100.8	(+0.9)	(-0.5)	108.8	(-0.3)	(-1.2)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(+0.1)	86.2	(+0.5)	(-0.1)	89.8	(0.0)	(-0.7)	99.2	(+0.3)	(-0.8)	101.7	(-0.4)	(-1.2)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	85.9	(+0.5)	(-0.2)	90.0	(+0.5)	(-0.3)	103.2	(+3.4)	(+1.7)	119.3	(0.0)	(-0.7)

50 m	83.3	(0.0)	(0.0)	84.6	(+0.5)	(0.0)	87.7	(+0.6)	(-0.3)	92.0	(+0.5)	(-0.4)	103.9	(+1.7)	(+0.1)	110.3	(+0.2)	(-0.6)
100 m	83.3	(0.0)	(0.0)	84.8	(+0.5)	(0.0)	87.9	(+0.6)	(-0.3)	92.2	(+0.4)	(-0.4)	102.2	(+1.0)	(-0.3)	104.3	(+0.2)	(-0.6)
Haro-Boundary																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.1)	(0.0)	85.6	(+0.9)	(+0.1)	91.2	(+1.0)	(-0.3)	117.8	(+8.1)	(+2.1)	121.2	(-0.4)	(-1.1)
50 m	83.3	(0.0)	(0.0)	84.0	(+0.3)	(+0.1)	87.3	(+1.1)	(+0.1)	93.2	(+0.9)	(-0.5)	110.8	(+3.9)	(+0.7)	112.4	(-0.3)	(-1.1)
100 m	83.3	(0.0)	(0.0)	83.8	(+0.2)	(+0.1)	86.7	(+1.1)	(0.0)	92.4	(+0.7)	(-0.6)	106.2	(+1.4)	(-0.5)	105.4	(-0.6)	(-1.3)
Strait of Georgia																		
7.5 m	83.3	(0.0)	(0.0)	85.2	(+0.4)	(0.0)	90.3	(+0.5)	(0.0)	96.5	(+0.5)	(0.0)	124.7	(+0.7)	(+0.1)	123.6	(+0.3)	(0.0)
50 m	83.3	(0.0)	(0.0)	85.2	(+0.4)	(0.0)	89.1	(+0.5)	(0.0)	94.2	(+0.5)	(0.0)	116.1	(+0.7)	(+0.1)	114.7	(+0.4)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.2)	(0.0)	87.0	(+0.4)	(0.0)	91.5	(+0.5)	(0.0)	108.7	(+0.6)	(+0.1)	107.5	(+0.4)	(0.0)

Table 5d: Modelled received sound levels (RL) for each subregion in a **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.7	(0.0)	(0.0)	88.4	(0.0)	(0.0)	99.3	(-0.1)	(-0.1)	124.3	(-0.1)	(-0.1)
50 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.2	(0.0)	(0.0)	90.2	(0.0)	(0.0)	101.6	(-0.1)	(-0.1)	114.7	(0.0)	(0.0)
100 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.0	(0.0)	(0.0)	88.8	(0.0)	(0.0)	98.9	(-0.1)	(-0.1)	105.3	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	86.1	(+0.5)	(+0.1)	92.9	(+1.7)	(+0.4)	99.2	(+0.9)	(-0.1)	105.0	(+0.1)	(-0.7)	116.7	(+1.6)	(+0.5)	133.6	(-0.9)	(-1.3)
50 m	87.3	(+1.0)	(+0.3)	96.1	(+1.7)	(+0.4)	102.1	(+0.8)	(-0.2)	107.3	(0.0)	(-0.8)	117.1	(+0.2)	(-0.8)	124.5	(-0.6)	(-1.2)
100 m	87.7	(+1.1)	(+0.3)	96.3	(+1.7)	(+0.3)	102.0	(+0.8)	(-0.3)	107.0	(0.0)	(-0.8)	115.6	(-0.2)	(-1.1)	117.3	(-0.7)	(-1.3)
Juan de Fuca west																		
7.5 m	90.3	(+1.8)	(0.0)	99.2	(+1.6)	(0.0)	105.2	(+1.2)	(-0.1)	110.8	(+0.9)	(-0.1)	121.5	(+2.0)	(-0.2)	138	(+0.5)	(-0.1)
50 m	93.5	(+2.1)	(0.0)	102.3	(+1.5)	(0.0)	107.8	(+1.1)	(-0.1)	113.0	(+0.9)	(-0.1)	122.8	(+1.3)	(-0.1)	129.1	(+0.6)	(-0.1)
100 m	93.9	(+2.0)	(0.0)	102.3	(+1.5)	(0.0)	107.8	(+1.1)	(-0.1)	113.0	(+0.8)	(-0.1)	122.2	(+1.1)	(-0.1)	123.2	(+0.6)	(-0.1)
Juan de Fuca east																		
7.5 m	88.2	(+0.9)	(+0.2)	95.6	(+1.3)	(+0.2)	101.3	(+1.0)	(0.0)	107.6	(+0.9)	(+0.2)	127.9	(+1.0)	(+0.1)	135.1	(+0.3)	(-0.1)
50 m	90.6	(+1.2)	(+0.2)	98.5	(+1.2)	(+0.1)	103.8	(+0.9)	(0.0)	109.3	(+0.6)	(-0.1)	121.7	(+1.0)	(0.0)	126.0	(+0.4)	(-0.1)
100 m	90.2	(+1.0)	(+0.1)	97.5	(+1.1)	(0.0)	102.5	(+0.9)	(0.0)	107.7	(+0.7)	(-0.1)	117.2	(+0.7)	(0.0)	118.5	(+0.5)	(0.0)
Haro-Boundary																		
7.5 m	85.2	(+0.1)	(0.0)	89.4	(+2.8)	(+1.0)	98.7	(+2.9)	(+0.3)	107.1	(+1.0)	(-0.8)	134.5	(+9.9)	(+2.5)	138.6	(-1.7)	(-2.0)
50 m	85.2	(+0.2)	(0.0)	91.6	(+4.2)	(+1.4)	101.4	(+2.8)	(+0.2)	109.6	(+0.8)	(-0.9)	127.5	(+3.6)	(+0.6)	129.4	(-1.4)	(-1.8)
100 m	85.1	(+0.1)	(0.0)	92.1	(+4.5)	(+1.4)	101.6	(+2.5)	(+0.1)	109.5	(+0.6)	(-1.0)	123.3	(+0.8)	(-0.9)	125.0	(-1.2)	(-1.5)
Gulf Islands																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(+0.1)	94.7	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(+0.1)	(+0.1)	135.1	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.6	(+0.6)	(+0.1)	96.7	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.9	(+0.1)	(+0.1)	125.2	(-0.1)	(-0.1)
100 m	83.3	(0.0)	(0.0)	84.6	(+0.6)	(+0.1)	96.0	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.7	(0.0)	(-0.1)	118.8	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	92.6	(+0.6)	(0.0)	100.2	(+0.5)	(0.0)	106.3	(+0.4)	(0.0)	112.7	(+0.4)	(0.0)	139.0	(+0.5)	(0.0)	140.1	(+0.2)	(0.0)

50 m	94.7	(+0.8)	(0.0)	101.4	(+0.5)	(0.0)	106.2	(+0.4)	(0.0)	111.2	(+0.3)	(0.0)	130.3	(+0.4)	(0.0)	131.5	(+0.2)	(0.0)
100 m	94.5	(+0.7)	(0.0)	100.7	(+0.5)	(0.0)	104.9	(+0.4)	(0.0)	109.6	(+0.3)	(0.0)	124.2	(+0.3)	(0.0)	126.0	(+0.1)	(0.0)
Strait of Georgia North																		
7.5 m	87.6	(+0.1)	(0.0)	92.1	(+0.1)	(0.0)	96.3	(+0.1)	(0.0)	101.3	(+0.1)	(0.0)	117.8	(0.0)	(-0.1)	127.9	(0.0)	(0.0)
50 m	88.7	(+0.2)	(0.0)	93.1	(+0.1)	(0.0)	96.7	(+0.1)	(0.0)	100.9	(0.0)	(0.0)	110.0	(0.0)	(0.0)	119.3	(0.0)	(0.0)
100 m	88.6	(+0.2)	(0.0)	92.9	(+0.1)	(0.0)	96.4	(0.0)	(0.0)	100.4	(0.0)	(0.0)	107.7	(0.0)	(0.0)	113.0	(-0.1)	(-0.1)
Salish Sea Total																		
7.5 m	97.3	(+0.7)	(0.0)	104.4	(+1.0)	(+0.1)	110.5	(+0.9)	(0.0)	124.7	(+0.1)	(0.0)	143.7	(+0.8)	(+0.3)	145.2	(-0.3)	(-0.7)
50 m	99.3	(+1.0)	(+0.1)	106.6	(+1.1)	(+0.1)	112.2	(+0.9)	(0.0)	119.7	(+0.3)	(-0.2)	134.8	(+0.8)	(+0.1)	136.3	(-0.2)	(-0.6)
100 m	99.3	(+1.0)	(0.0)	106.3	(+1.1)	(+0.1)	111.7	(+0.9)	(-0.1)	117.7	(+0.5)	(-0.3)	129.2	(+0.5)	(-0.3)	130.6	(-0.3)	(-0.6)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	86.5	(+0.8)	(+0.2)	94.6	(+1.9)	(+0.5)	101.1	(+1.0)	(-0.1)	106.8	(+0.1)	(-0.7)	117.7	(+0.8)	(-0.3)	134.8	(-1.1)	(-1.6)
50 m	88.2	(+1.4)	(+0.4)	98.0	(+1.9)	(+0.4)	104.1	(+0.9)	(-0.2)	109.3	(0.0)	(-0.8)	118.6	(-0.1)	(-1.0)	125.8	(-0.9)	(-1.4)
100 m	88.9	(+1.6)	(+0.5)	98.5	(+1.8)	(+0.4)	104.3	(+0.9)	(-0.2)	109.3	(0.0)	(-0.8)	117.9	(-0.4)	(-1.2)	119.6	(-0.9)	(-1.5)
Juan de Fuca																		
7.5 m	90.3	(+2.0)	(0.0)	99.8	(+1.6)	(-0.1)	105.7	(+1.2)	(-0.1)	111.3	(+0.8)	(-0.1)	121.0	(+1.0)	(-0.3)	138.1	(+0.4)	(-0.1)
50 m	93.8	(+2.2)	(0.0)	103.0	(+1.5)	(-0.1)	108.4	(+1.1)	(-0.1)	113.6	(+0.8)	(-0.1)	123.2	(+0.9)	(-0.2)	129.2	(+0.5)	(-0.1)
100 m	94.4	(+2.1)	(0.0)	103.1	(+1.4)	(-0.1)	108.5	(+1.0)	(-0.1)	113.6	(+0.8)	(-0.1)	122.6	(+0.8)	(-0.2)	123.3	(+0.5)	(-0.1)
Haro Strait																		
7.5 m	85.3	(+0.1)	(0.0)	89.4	(+1.9)	(+0.7)	97.7	(+2.1)	(+0.1)	105.3	(+0.4)	(-0.9)	129.3	(+6.8)	(+1.9)	135.6	(-1.7)	(-2.1)
50 m	85.6	(+0.2)	(+0.1)	91.9	(+2.5)	(+0.9)	100.5	(+1.9)	(0.0)	107.8	(+0.2)	(-1.1)	123.2	(+1.2)	(-0.7)	126.8	(-1.6)	(-2.0)
100 m	85.4	(+0.1)	(+0.1)	91.7	(+3.2)	(+1.1)	100.3	(+1.9)	(-0.1)	107.3	(0.0)	(-1.3)	119.5	(-1.0)	(-2.2)	119.7	(-2.1)	(-2.5)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	86.0	(+0.4)	(+0.1)	92.4	(+1.6)	(+0.4)	98.6	(+0.9)	(-0.1)	104.3	(+0.1)	(-0.7)	116.1	(+1.6)	(+0.5)	133.0	(-0.9)	(-1.3)
50 m	87.1	(+0.9)	(+0.3)	95.5	(+1.7)	(+0.4)	101.4	(+0.8)	(-0.2)	106.7	(0.0)	(-0.8)	116.4	(+0.2)	(-0.8)	123.9	(-0.6)	(-1.2)
100 m	87.4	(+1.0)	(+0.3)	95.7	(+1.7)	(+0.3)	101.4	(+0.8)	(-0.3)	106.3	(0.0)	(-0.8)	115.0	(-0.2)	(-1.1)	116.7	(-0.7)	(-1.3)
Juan de Fuca																		
7.5 m	89.4	(+1.8)	(+0.1)	98.6	(+1.5)	(-0.1)	104.1	(+0.9)	(-0.2)	109.0	(+0.6)	(-0.3)	118.7	(+1.8)	(+0.7)	133.8	(-0.1)	(-0.6)

50 m	92.2	(+2.2)	(+0.1)	101.5	(+1.4)	(-0.1)	106.6	(+0.8)	(-0.2)	111.3	(+0.6)	(-0.3)	120.3	(+1.0)	(-0.1)	125.0	(+0.1)	(-0.5)
100 m	92.4	(+2.2)	(+0.1)	101.4	(+1.4)	(-0.1)	106.4	(+0.8)	(-0.3)	111.1	(+0.5)	(-0.3)	119.0	(+0.6)	(-0.3)	119.4	(+0.1)	(-0.5)
Haro-Boundary																		
7.5 m	87.3	(+1.0)	(+0.4)	94.7	(+2.0)	(+0.7)	101.6	(+1.8)	(+0.2)	109.4	(+1.1)	(-0.1)	136.7	(+2.3)	(+1.0)	138.1	(-0.7)	(-1.2)
50 m	89.0	(+1.5)	(+0.6)	97.4	(+2.1)	(+0.7)	104.0	(+1.6)	(+0.1)	110.8	(+0.8)	(-0.5)	128.8	(+1.8)	(+0.4)	129.2	(-0.6)	(-1.2)
100 m	88.2	(+1.0)	(+0.3)	96.0	(+2.1)	(+0.5)	102.8	(+1.8)	(+0.1)	109.5	(+0.7)	(-0.7)	122.5	(+0.8)	(-0.7)	121.8	(-0.8)	(-1.5)
Strait of Georgia																		
7.5 m	93.6	(+0.9)	(0.0)	102.2	(+0.6)	(0.0)	109.0	(+0.5)	(0.0)	115.6	(+0.5)	(0.0)	142.3	(+0.5)	(+0.1)	142.2	(+0.2)	(0.0)
50 m	95.5	(+1.1)	(0.0)	103.0	(+0.7)	(0.0)	108.1	(+0.5)	(0.0)	113.4	(+0.4)	(0.0)	133.7	(+0.5)	(0.0)	133.6	(+0.3)	(0.0)
100 m	94.8	(+1.1)	(0.0)	101.6	(+0.6)	(0.0)	106.2	(+0.5)	(0.0)	111.1	(+0.4)	(0.0)	127.0	(+0.5)	(0.0)	127.5	(+0.2)	(0.0)

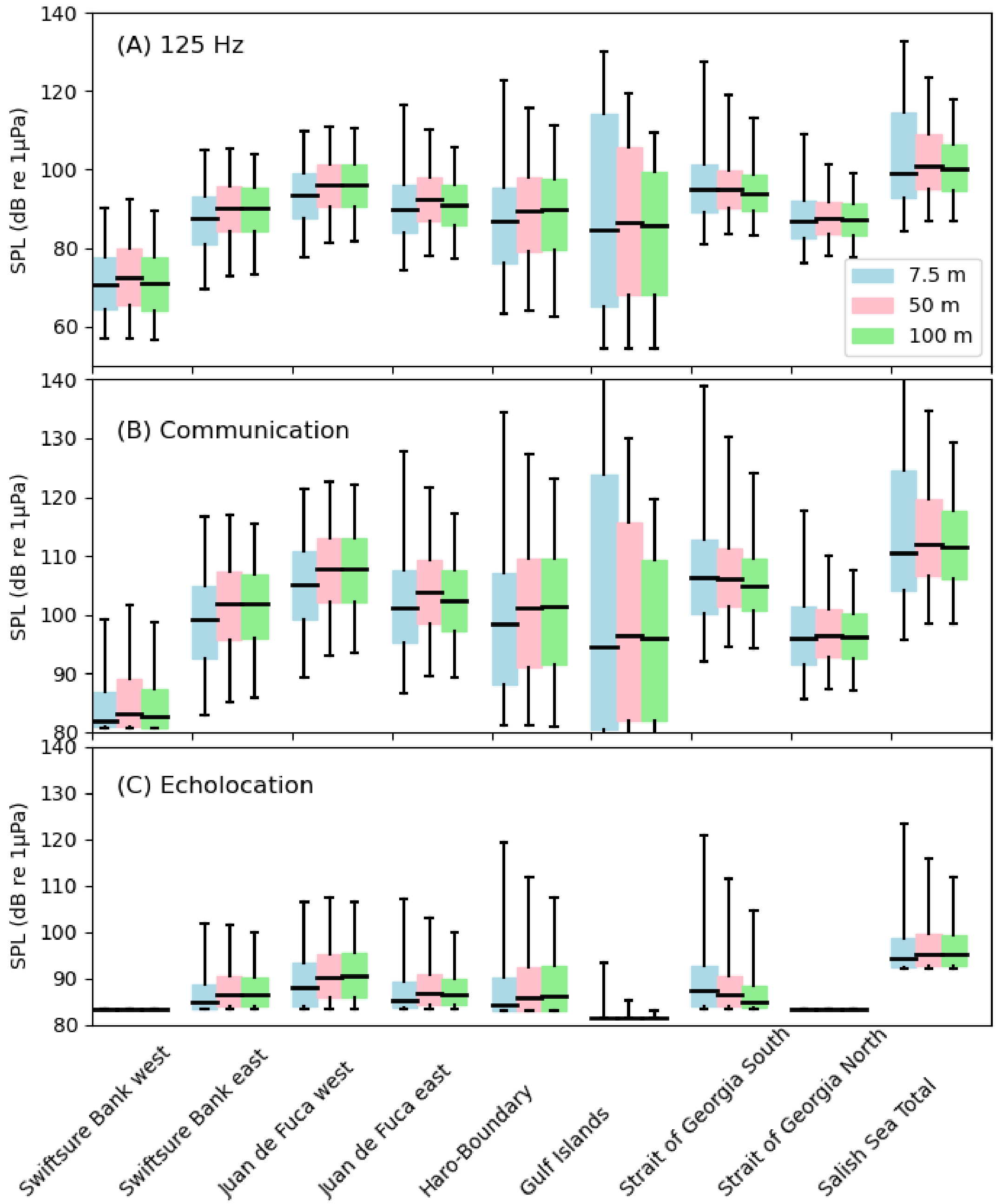

Figure 36: Boxplot comparing the sound pressure levels (SPL) in the **acoustically-derived subregions** for the slowdown scenario with **100% participation in current ECHO measures** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles**. Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

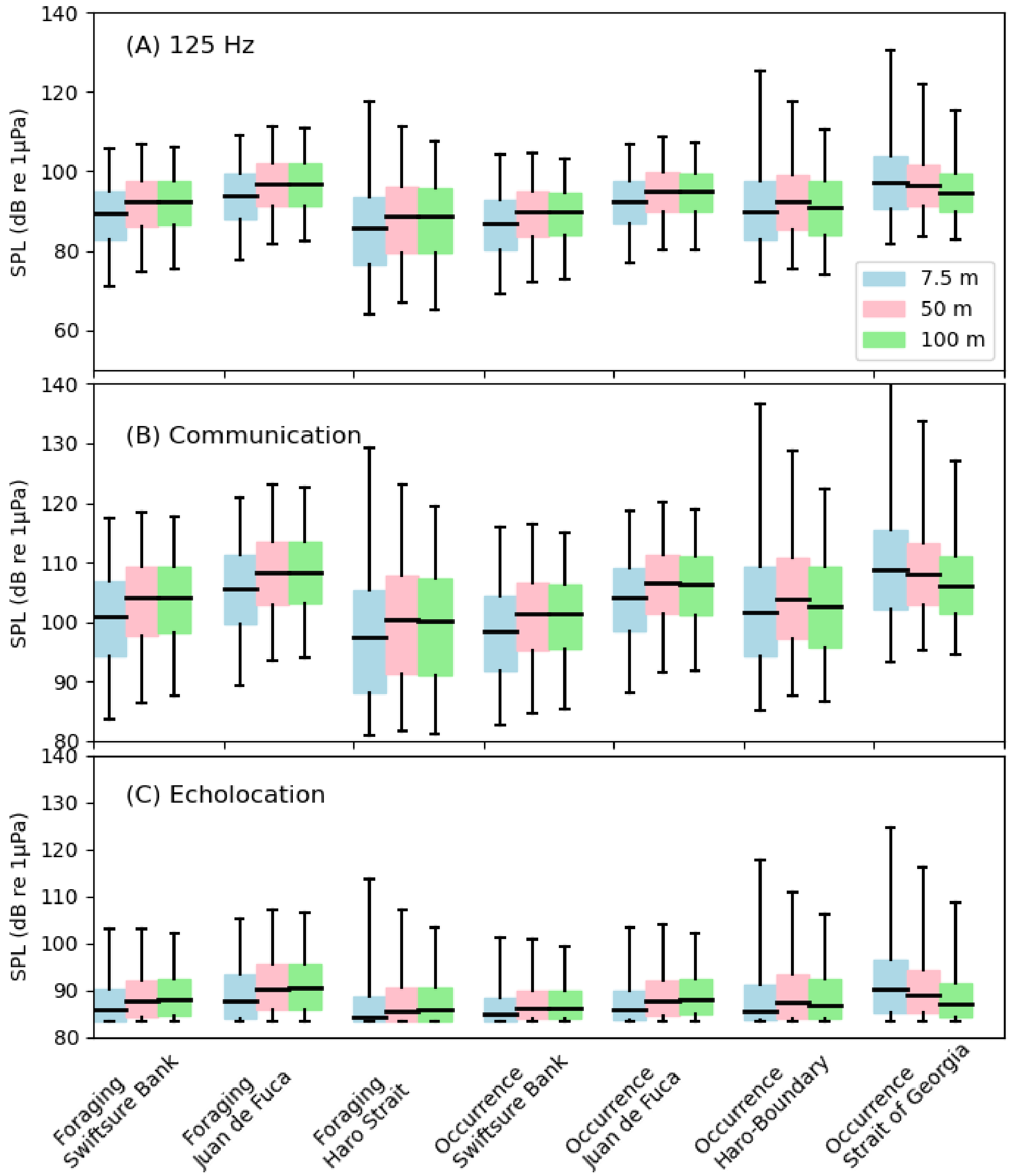

Figure 37: Boxplot comparing the sound pressure levels (SPL) in the **subregions derived from SRKW occurrence and foraging** for the slowdown scenario with **100% participation in current ECHO measures** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

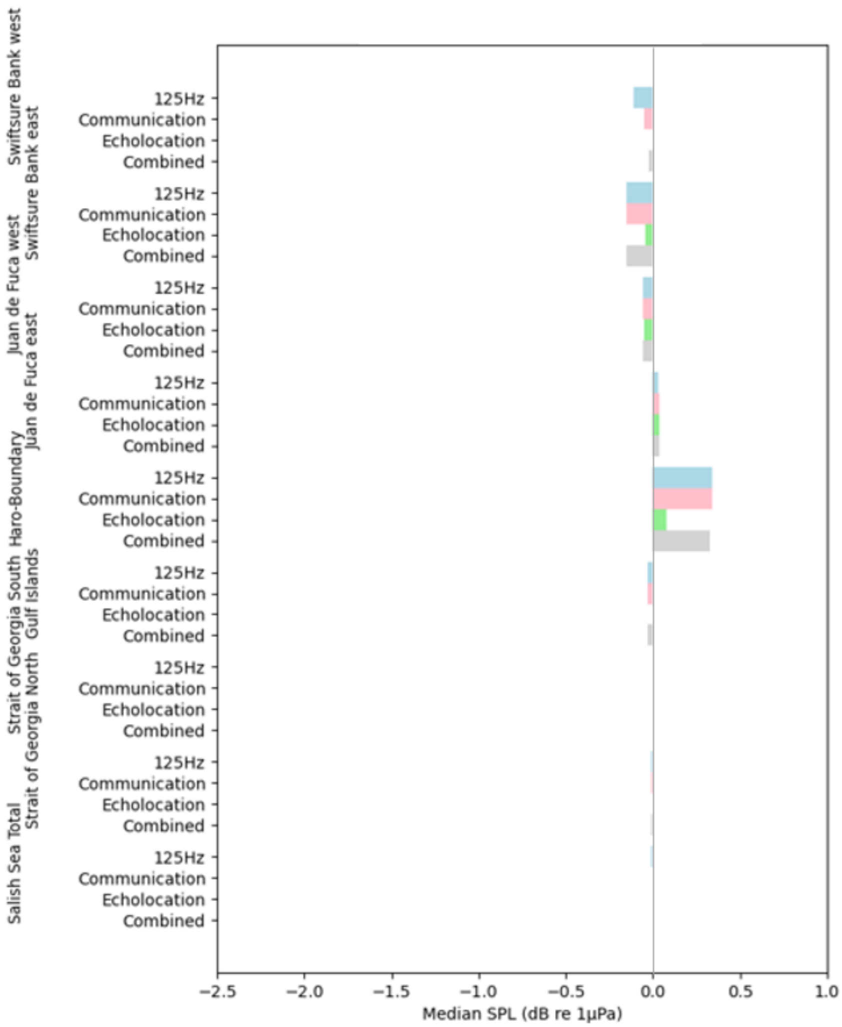

Figure 38: Bar chart showing the difference in decibels (dB) of the **100% participation of vessel speed reductions to current ECHO measures** relative to the baseline + TMX scenario a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. **Median** RL differences have been calculated using the **acoustically-derived subregions**.

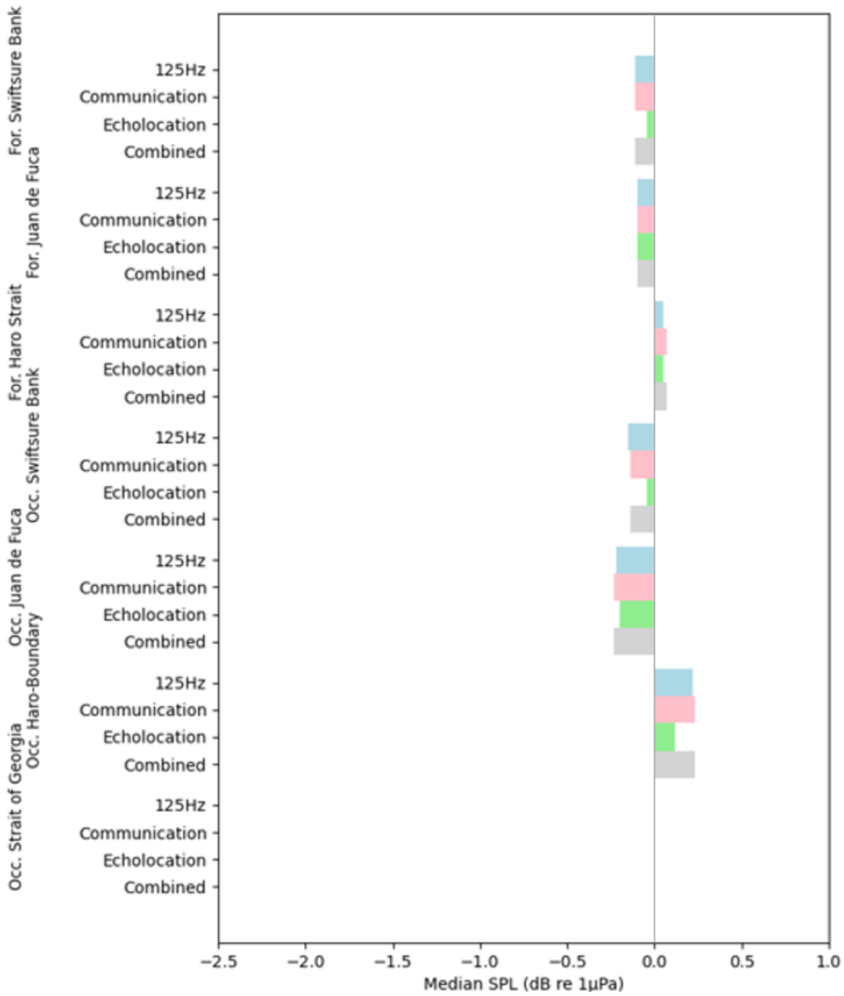

Figure 39: Bar chart showing the difference in decibels (dB) of the **100% participation** of vessel speed reductions to **current ECHO measures** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. **Median** RL differences are shown for the **SRKW occurrence** (Occ. subregions) **and foraging** (For.) subregions.

ECHO-inspired slowdown, 85% participation

Similar results to the scenario of 100% participation (Figures 40-42, Tables 6a-d) were seen for the more realistic scenario of 85% participation to current ECHO slowdown measures (Figures 33-35, Tables 6a-d). Again, noise reductions were seen in waters around the slowdown zones, but additions were evident especially in Haro Strait and Boundary Pass. Additions in the lower percentiles suggest that slowdowns increase background levels while decreasing the number of greater magnitude noise sources. A comparison of scenarios that differ in participation rate showed that reducing the speed of the fastest vessels likely has a greater influence on sound levels than increasing participation from current levels to full (all vessel/100%) participation (also see Section 5).

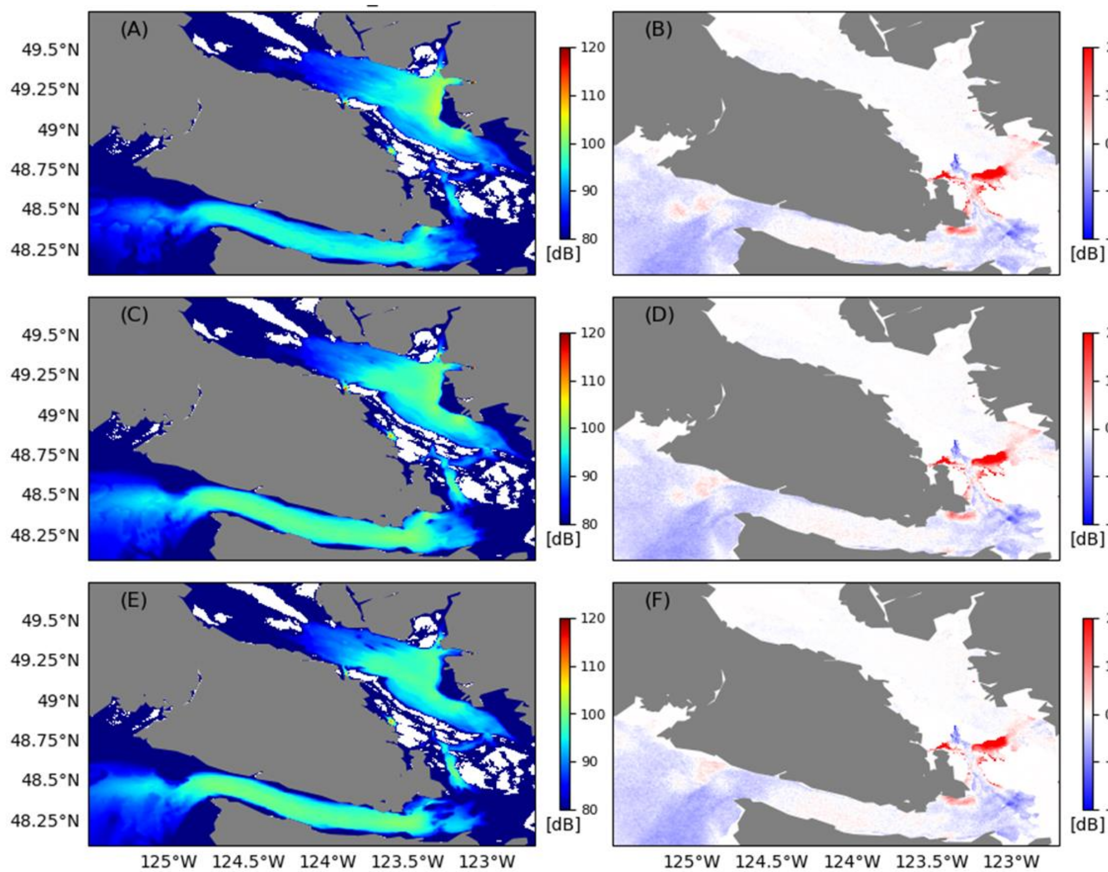

Figure 40: LEFT (A,C,E): Modelled **median** received sound levels at **125 Hz** for the **ECHO-inspired slowdown scenario with 85% participation rate** of vessels traveling at ECHO requested speeds through ECHO slowdown zones. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

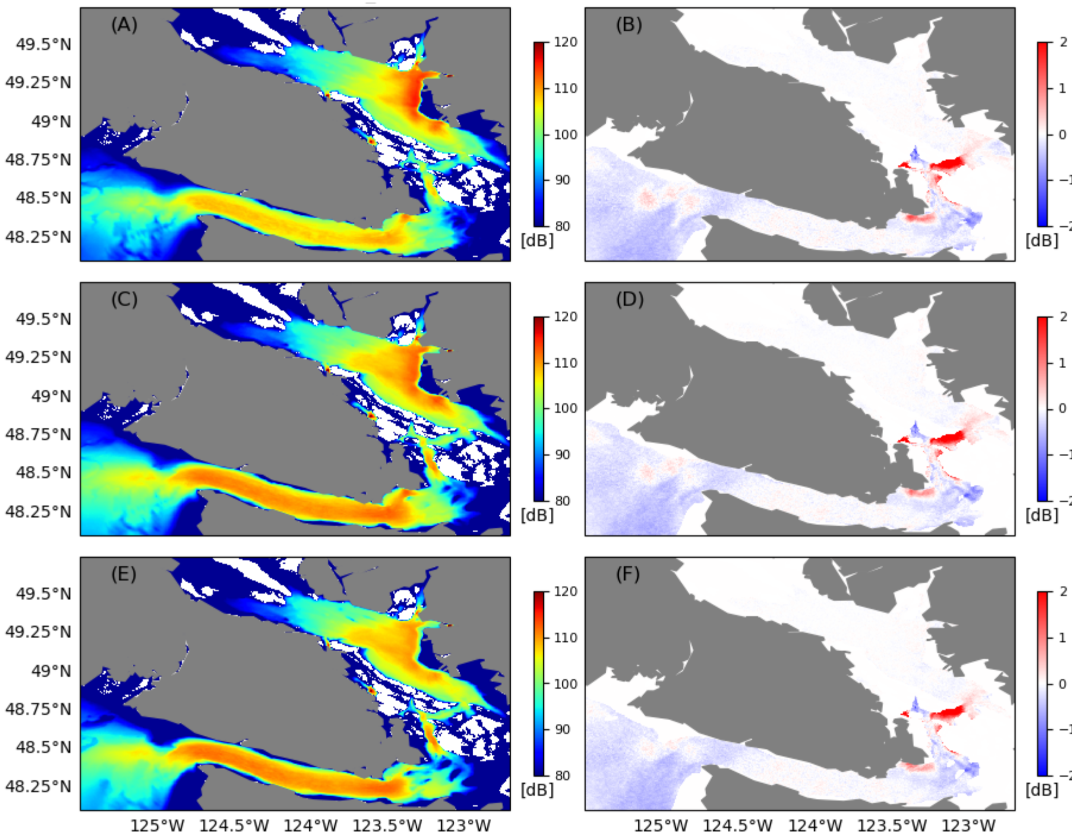

Figure 41: LEFT (A,C,E): Modelled **median** received sound levels in the **SRKW communication range (500 Hz to 15 kHz) for the ECHO-inspired slowdown** scenario with **85% participation** rate of vessels traveling at ECHO requested speeds through ECHO slowdown zones. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

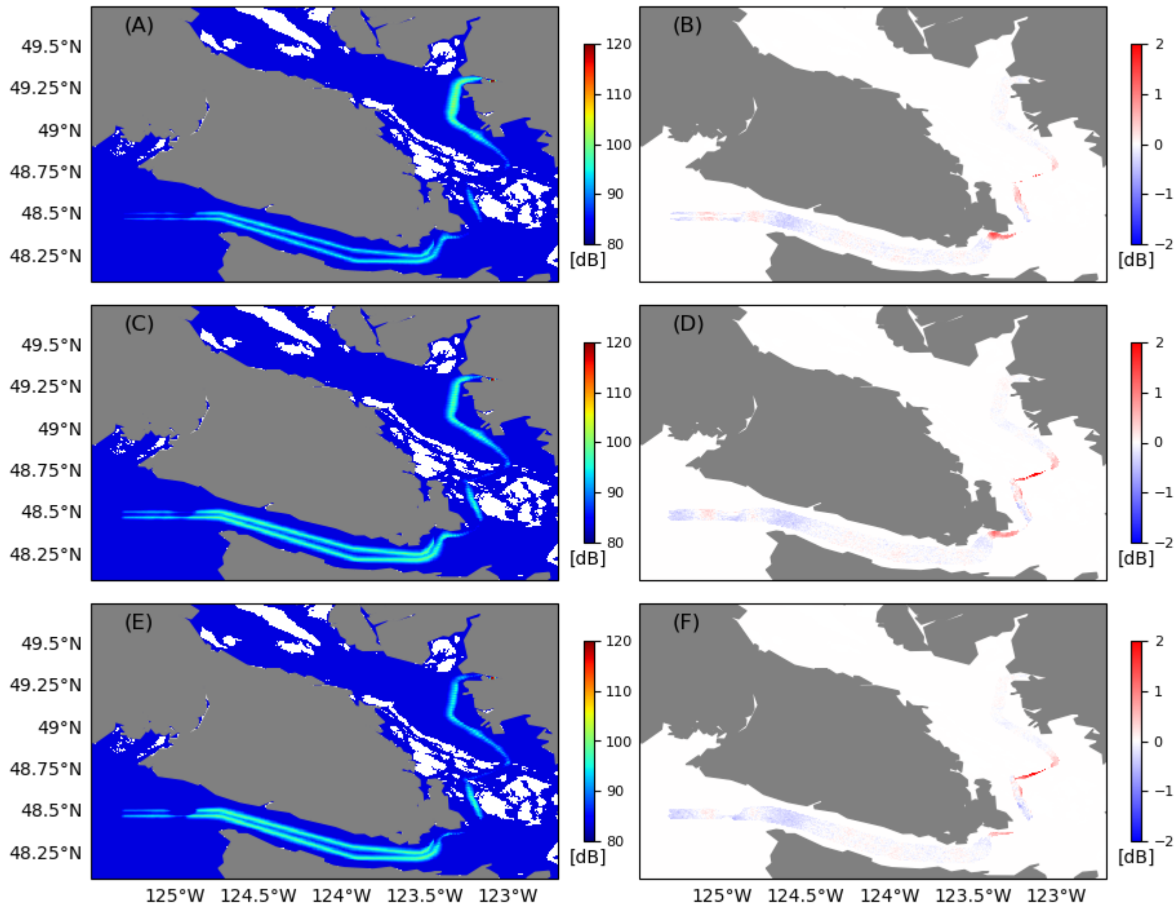

Figure 42: LEFT (A,C,E): Modelled **median** received sound levels in the **SRKW echolocation range (15-100 kHz) for the ECHO-inspired slowdown** scenario with **85% participation** rate of vessels traveling at ECHO requested speeds through ECHO slowdown zones. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

Despite the vessel slowdowns the sound levels remained the highest in Juan de Fuca Strait for this scenario (Figures 43-44, Tables 6a-d). Reductions in noise levels were restricted to the slowdown zones and waters adjacent, with limited influence of the slowdown seen in Juan de Fuca Strait, and the decreases in noise noted likely resulting from slowdown zones being present at both extents of the Strait, as there are no slowdown measures in the strait itself (Figures 45-46). Additions were again seen in subregions containing Haro Strait and Boundary Pass at median sound levels (Figures 45-46, Tables 6a-d).

Table 6a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for slowdown in accordance **to current ECHO measures at 85% participation** rate. Input is May to October 2015 plus the additional TMX tankers and tugs. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the RL of this slowdown scenario to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	56.8	(+0.1)	(0.0)	64.2	(+0.1)	(-0.1)	70.7	(0.0)	(-0.1)	77.5	(0.0)	(-0.1)	90.3	(-0.1)	(-0.1)	115.6	(-0.1)	(-0.1)
50 m	57.0	(+0.1)	(0.0)	65.3	(0.0)	(-0.1)	72.4	(-0.1)	(-0.1)	79.9	(0.0)	(0.0)	92.6	(-0.1)	(-0.1)	105.9	(0.0)	(0.0)
100 m	56.5	(+0.1)	(0.0)	64.1	(0.0)	(-0.1)	70.9	(0.0)	(-0.1)	77.7	(0.0)	(0.0)	89.5	(-0.1)	(-0.1)	96.4	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	69.5	(+2.0)	(+0.5)	80.7	(+1.9)	(+0.4)	87.6	(+1.0)	(0.0)	93.4	(+0.3)	(-0.5)	105.0	(+1.7)	(+0.6)	122.0	(-0.6)	(-1.1)
50 m	72.5	(+2.3)	(+0.5)	84.1	(+1.8)	(+0.4)	90.4	(+0.9)	(-0.1)	95.8	(+0.2)	(-0.6)	105.4	(+0.3)	(-0.7)	112.9	(-0.4)	(-1.0)
100 m	73.1	(+2.4)	(+0.5)	84.4	(+1.8)	(+0.3)	90.4	(+0.9)	(-0.1)	95.4	(+0.2)	(-0.6)	104.0	(0.0)	(-0.9)	105.7	(-0.5)	(-1.0)
Juan de Fuca west																		
7.5 m	77.6	(+2.5)	(-0.1)	87.4	(+1.6)	(0.0)	93.5	(+1.2)	(-0.1)	99.1	(+0.9)	(-0.1)	109.7	(+2.0)	(-0.2)	126.0	(+0.5)	(-0.1)
50 m	81.4	(+2.3)	(-0.1)	90.6	(+1.5)	(0.0)	96.1	(+1.1)	(-0.1)	101.3	(+0.9)	(-0.1)	110.9	(+1.3)	(-0.1)	117.1	(+0.6)	(-0.1)
100 m	81.7	(+2.2)	(-0.1)	90.5	(+1.5)	(0.0)	96.0	(+1.1)	(-0.1)	101.2	(+0.9)	(-0.1)	110.4	(+1.0)	(-0.1)	111.2	(+0.6)	(-0.1)
Juan de Fuca east																		
7.5 m	74.4	(+1.8)	(+0.4)	83.8	(+1.3)	(+0.2)	89.6	(+1.0)	(0.0)	96.1	(+0.8)	(+0.2)	116.5	(+1.0)	(+0.2)	123.8	(+0.3)	(-0.1)
50 m	77.9	(+1.7)	(+0.3)	86.8	(+1.2)	(+0.2)	92.3	(+0.9)	(0.0)	97.9	(+0.6)	(-0.1)	110.3	(+0.9)	(+0.1)	114.7	(+0.4)	(0.0)
100 m	77.3	(+1.5)	(+0.2)	85.7	(+1.1)	(0.0)	90.9	(+0.9)	(0.0)	96.2	(+0.6)	(0.0)	105.8	(+0.7)	(0.0)	107.1	(+0.4)	(0.0)
Haro-Boundary																		
7.5 m	63.2	(+2.0)	(+0.4)	76.1	(+5.0)	(+1.4)	86.8	(+3.0)	(+0.3)	95.4	(+1.0)	(-0.7)	122.4	(+9.8)	(+2.4)	127.1	(-1.5)	(-1.9)
50 m	63.8	(+2.5)	(+0.5)	79.0	(+6.0)	(+1.7)	89.5	(+2.8)	(+0.2)	97.9	(+0.8)	(-0.8)	115.6	(+3.6)	(+0.6)	117.9	(-1.3)	(-1.7)
100 m	62.4	(+2.7)	(+0.6)	79.5	(+6.4)	(+1.6)	89.7	(+2.6)	(+0.1)	97.8	(+0.7)	(-0.9)	111.5	(+0.9)	(-0.7)	113.8	(-0.9)	(-1.2)
Gulf Islands																		
7.5 m	54.1	(0.0)	(0.0)	65.2	(+2.9)	(+0.3)	84.5	(+0.1)	(0.0)	114.2	(0.0)	(0.0)	130.0	(+0.1)	(+0.1)	124.5	(0.0)	(0.0)
50 m	54.2	(0.0)	(0.0)	67.9	(+2.8)	(+0.2)	86.5	(+0.1)	(0.0)	105.8	(0.0)	(0.0)	119.4	(+0.1)	(+0.1)	114.7	(0.0)	(0.0)
100 m	54.2	(+0.1)	(+0.1)	67.8	(+2.7)	(+0.2)	85.9	(+0.1)	(0.0)	99.5	(0.0)	(0.0)	109.4	(0.0)	(0.0)	108.5	(+0.2)	(+0.2)
Strait of Georgia South																		
7.5 m	81.0	(+0.7)	(0.0)	88.9	(+0.5)	(0.0)	95.0	(+0.4)	(0.0)	101.3	(+0.4)	(0.0)	127.6	(+0.4)	(0.0)	128.9	(+0.1)	(0.0)

50 m	83.4	(+0.8)	(0.0)	90.3	(+0.5)	(0.0)	95.0	(+0.4)	(0.0)	100.0	(+0.3)	(0.0)	119.0	(+0.4)	(0.0)	120.3	(+0.2)	(0.0)
100 m	83.2	(+0.8)	(0.0)	89.6	(+0.5)	(0.0)	93.9	(+0.3)	(0.0)	98.5	(+0.3)	(0.0)	113.0	(+0.3)	(0.0)	114.8	(+0.1)	(0.0)
Strait of Georgia North																		
7.5 m	76.0	(+0.2)	(0.0)	82.3	(+0.2)	(0.0)	87.0	(+0.1)	(0.0)	92.2	(+0.1)	(0.0)	109.2	(0.0)	(0.0)	119.2	(0.0)	(0.0)
50 m	77.9	(+0.2)	(0.0)	83.6	(+0.1)	(0.0)	87.5	(+0.1)	(0.0)	91.8	(0.0)	(0.0)	101.4	(0.0)	(0.0)	110.6	(0.0)	(0.0)
100 m	77.7	(+0.2)	(0.0)	83.3	(+0.1)	(0.0)	87.2	(0.0)	(0.0)	91.3	(0.0)	(0.0)	98.9	(0.0)	(0.0)	104.4	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	84.2	(+1.1)	(0.0)	92.8	(+1.0)	(+0.1)	99.1	(+0.8)	(0.0)	114.7	(+0.1)	(0.0)	132.6	(+0.6)	(+0.2)	134.0	(-0.3)	(-0.5)
50 m	87.0	(+1.3)	(0.0)	95.1	(+1.1)	(+0.1)	100.8	(+0.9)	(0.0)	109.0	(+0.3)	(-0.1)	123.6	(+0.7)	(+0.1)	125.0	(-0.1)	(-0.5)
100 m	86.9	(+1.2)	(0.0)	94.8	(+1.1)	(+0.1)	100.3	(+0.9)	(0.0)	106.5	(+0.5)	(-0.2)	117.8	(+0.5)	(-0.2)	119.4	(-0.1)	(-0.4)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	71.0	(+2.3)	(+0.5)	82.6	(+2.0)	(+0.4)	89.4	(+1.1)	(0.0)	95.2	(+0.2)	(-0.5)	105.9	(+0.8)	(-0.2)	123.2	(-0.8)	(-1.3)
50 m	74.3	(+2.6)	(+0.6)	86.1	(+1.9)	(+0.4)	92.5	(+1.0)	(-0.1)	97.7	(+0.2)	(-0.6)	107.0	(+0.1)	(-0.8)	114.2	(-0.7)	(-1.2)
100 m	75.3	(+2.6)	(+0.5)	86.6	(+1.9)	(+0.4)	92.6	(+1.0)	(-0.1)	97.7	(+0.2)	(-0.6)	106.3	(-0.2)	(-1.0)	107.9	(-0.6)	(-1.2)
Juan de Fuca																		
7.5 m	77.7	(+2.6)	(-0.1)	88.1	(+1.6)	(-0.1)	94.0	(+1.2)	(-0.1)	99.6	(+0.9)	(-0.1)	109.2	(+1.0)	(-0.2)	126.1	(+0.4)	(-0.1)
50 m	81.7	(+2.5)	(-0.1)	91.3	(+1.5)	(-0.1)	96.8	(+1.1)	(-0.1)	101.9	(+0.8)	(-0.1)	111.4	(+0.9)	(-0.1)	117.2	(+0.5)	(-0.1)
100 m	82.3	(+2.3)	(-0.1)	91.4	(+1.4)	(-0.1)	96.8	(+1.1)	(-0.1)	101.9	(+0.8)	(-0.1)	110.8	(+0.8)	(-0.1)	111.4	(+0.5)	(-0.1)
Haro Strait																		
7.5 m	63.8	(+1.9)	(+0.9)	76.3	(+2.8)	(+0.9)	85.8	(+2.1)	(0.0)	93.7	(+0.5)	(-0.8)	117.3	(+6.7)	(+1.8)	123.8	(-1.7)	(-2.1)
50 m	66.6	(+2.0)	(+0.9)	79.5	(+3.0)	(+1.0)	88.7	(+1.8)	(-0.1)	96.2	(+0.3)	(-1.0)	111.6	(+1.4)	(-0.5)	115.0	(-1.6)	(-2.0)
100 m	65.0	(+1.8)	(+0.8)	79.2	(+4.0)	(+1.2)	88.5	(+1.9)	(-0.1)	95.7	(+0.1)	(-1.2)	108.1	(-0.6)	(-1.7)	108.1	(-1.8)	(-2.2)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	68.9	(+2.0)	(+0.5)	80.1	(+1.9)	(+0.4)	86.9	(+1.0)	(0.0)	92.8	(+0.3)	(-0.6)	104.4	(+1.7)	(+0.6)	121.4	(-0.6)	(-1.1)
50 m	71.9	(+2.3)	(+0.5)	83.5	(+1.8)	(+0.4)	89.8	(+0.9)	(-0.1)	95.2	(+0.2)	(-0.6)	104.8	(+0.3)	(-0.7)	112.3	(-0.4)	(-1.0)
100 m	72.5	(+2.4)	(+0.5)	83.7	(+1.9)	(+0.3)	89.8	(+0.9)	(-0.1)	94.8	(+0.2)	(-0.6)	103.3	(0.0)	(-0.9)	105.0	(-0.5)	(-1.0)
Juan de Fuca																		
7.5 m	76.6	(+2.6)	(0.0)	87.0	(+1.6)	(0.0)	92.5	(+1.0)	(-0.2)	97.5	(+0.7)	(-0.2)	106.2	(+1.1)	(0.0)	121.9	(0.0)	(-0.5)

50 m	80.0	(+2.6)	(0.0)	89.9	(+1.5)	(0.0)	95.1	(+0.9)	(-0.2)	99.7	(+0.6)	(-0.2)	108.4	(+0.8)	(-0.2)	113.2	(+0.2)	(-0.4)
100 m	80.2	(+2.5)	(+0.1)	89.8	(+1.5)	(0.0)	94.9	(+0.9)	(-0.2)	99.6	(+0.6)	(-0.2)	107.3	(+0.5)	(-0.3)	107.6	(+0.2)	(-0.4)
Haro-Boundary																		
7.5 m	72.1	(+2.6)	(+1.0)	82.7	(+2.3)	(+0.7)	89.9	(+1.8)	(+0.2)	97.7	(+1.2)	(0.0)	125.4	(+2.0)	(+0.8)	126.4	(-0.6)	(-1.2)
50 m	75.3	(+2.6)	(+0.9)	85.5	(+2.3)	(+0.7)	92.3	(+1.6)	(+0.1)	99.1	(+0.8)	(-0.4)	117.4	(+1.7)	(+0.4)	117.5	(-0.5)	(-1.1)
100 m	73.9	(+2.2)	(+0.5)	84.0	(+2.3)	(+0.5)	91.0	(+1.8)	(+0.1)	97.8	(+0.8)	(-0.6)	110.8	(+0.9)	(-0.5)	110.2	(-0.7)	(-1.3)
Strait of Georgia																		
7.5 m	81.6	(+1.0)	(0.0)	90.5	(+0.6)	(0.0)	97.3	(+0.5)	(0.0)	103.9	(+0.4)	(0.0)	130.5	(+0.5)	(0.0)	130.5	(+0.3)	(0.0)
50 m	83.6	(+1.2)	(0.0)	91.3	(+0.7)	(0.0)	96.5	(+0.5)	(0.0)	101.8	(+0.4)	(0.0)	122.0	(+0.5)	(0.0)	122.0	(+0.3)	(0.0)
100 m	82.9	(+1.1)	(0.0)	90.0	(+0.6)	(0.0)	94.6	(+0.5)	(0.0)	99.5	(+0.4)	(0.0)	115.4	(+0.4)	(0.0)	115.9	(+0.2)	(0.0)

Table 6b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for slowdown in accordance **to current ECHO measures** at **85% participation** rate. Input is May to October 2015 plus the additional TMX tankers and tugs. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the RL of this slowdown scenario to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.0	(0.0)	(0.0)	86.8	(0.0)	-0.1)	99.2	(-0.1)	(-0.1)	124.3	(-0.1)	(-0.1)
50 m	80.7	(0.0)	(0.0)	80.9	(0.0)	(0.0)	83.2	(0.0)	(-0.1)	89.2	(0.0)	(0.0)	101.6	(-0.1)	(-0.1)	114.7	(0.0)	(0.0)
100 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.7	(0.0)	(0.0)	87.4	(0.0)	(0.0)	98.8	(-0.1)	(-0.1)	105.3	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	82.8	(+1.1)	(+0.3)	92.4	(+1.9)	(+0.4)	99.2	(+1.1)	(0.0)	105.0	(+0.3)	(-0.6)	116.8	(+1.8)	(+0.6)	133.7	(-0.6)	(-1.1)
50 m	85.0	(+1.7)	(+0.4)	95.8	(+1.8)	(+0.4)	102.1	(+0.9)	(-0.1)	107.4	(+0.2)	(-0.6)	117.1	(+0.4)	(-0.6)	124.6	(-0.4)	(-1.0)
100 m	85.6	(+1.8)	(+0.4)	96.0	(+1.8)	(+0.3)	102.0	(+0.9)	(-0.1)	107.1	(+0.2)	(-0.6)	115.7	(0.0)	(-0.9)	117.4	(-0.5)	(-1.1)
Juan de Fuca west																		
7.5 m	89.2	(+2.4)	(-0.1)	99.0	(+1.6)	(0.0)	105.2	(+1.2)	(-0.1)	110.7	(+0.9)	(-0.1)	121.4	(+2.0)	(-0.2)	137.9	(+0.5)	(-0.1)
50 m	93.0	(+2.3)	(-0.1)	102.2	(+1.5)	(0.0)	107.8	(+1.1)	(-0.1)	112.9	(+0.9)	(-0.1)	122.7	(+1.3)	(-0.1)	128.9	(+0.6)	(-0.1)
100 m	93.4	(+2.2)	(-0.1)	102.2	(+1.5)	(0.0)	107.7	(+1.1)	(-0.1)	112.9	(+0.9)	(-0.1)	122.1	(+1.1)	(-0.1)	123.0	(+0.6)	(-0.1)
Juan de Fuca east																		
7.5 m	86.5	(+1.4)	(+0.3)	95.3	(+1.4)	(+0.2)	101.2	(+1.1)	(0.0)	107.5	(+0.9)	(+0.2)	128.0	(+1.1)	(+0.2)	135.0	(+0.3)	(-0.1)
50 m	89.7	(+1.6)	(+0.3)	98.4	(+1.2)	(+0.2)	103.8	(+0.9)	(0.0)	109.3	(+0.6)	(-0.1)	121.7	(+1.1)	(+0.1)	126.0	(+0.4)	(-0.1)
100 m	89.2	(+1.3)	(+0.2)	97.3	(+1.1)	(0.0)	102.4	(+0.9)	(0.0)	107.7	(+0.7)	(0.0)	117.2	(+0.8)	(0.0)	118.4	(+0.5)	(0.0)
Haro-Boundary																		
7.5 m	81.1	(+0.3)	(0.0)	88.1	(+4.1)	(+1.3)	98.5	(+3.0)	(+0.3)	107.1	(+1.0)	(-0.7)	134.2	(+9.8)	(+2.4)	138.7	(-1.5)	(-1.9)
50 m	81.2	(+0.4)	(+0.1)	90.9	(+5.4)	(+1.6)	101.2	(+2.8)	(+0.2)	109.6	(+0.8)	(-0.8)	127.4	(+3.7)	(+0.6)	129.5	(-1.3)	(-1.7)
100 m	81.0	(+0.3)	(0.0)	91.4	(+5.8)	(+1.5)	101.4	(+2.6)	(+0.1)	109.5	(+0.7)	(-0.9)	123.3	(+1.0)	(-0.7)	125.2	(-1.0)	(-1.3)
Gulf Islands																		
7.5 m	78.9	(0.0)	(0.0)	80.5	(+0.9)	(+0.1)	94.5	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(+0.1)	(+0.1)	135.2	(0.0)	(0.0)
50 m	78.9	(0.0)	(0.0)	81.8	(+1.3)	(+0.1)	96.6	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.9	(+0.1)	(+0.1)	125.3	(0.0)	(0.0)
100 m	78.9	(0.0)	(0.0)	81.8	(+1.2)	(+0.1)	95.9	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.7	(0.0)	(-0.1)	119.1	(+0.2)	(+0.2)
Strait of Georgia South																		
7.5 m	92.1	(+0.7)	(0.0)	100.1	(+0.5)	(0.0)	106.3	(+0.4)	(0.0)	112.6	(+0.4)	(0.0)	138.9	(+0.4)	(0.0)	140.1	(+0.2)	(0.0)

50 m	94.4	(+0.9)	(0.0)	101.3	(+0.5)	(0.0)	106.1	(+0.4)	(0.0)	111.1	(+0.3)	(0.0)	130.2	(+0.4)	(0.0)	131.4	(+0.2)	(0.0)
100 m	94.2	(+0.8)	(0.0)	100.6	(+0.5)	(0.0)	104.9	(+0.4)	(0.0)	109.6	(+0.3)	(0.0)	124.1	(+0.3)	(0.0)	125.9	(+0.1)	(0.0)
Strait of Georgia North																		
7.5 m	85.6	(+0.2)	(0.0)	91.5	(+0.1)	(0.0)	96.1	(+0.1)	(0.0)	101.3	(+0.1)	(0.0)	117.8	(0.0)	(0.0)	127.9	(0.0)	(0.0)
50 m	87.3	(+0.2)	(0.0)	92.7	(+0.1)	(0.0)	96.5	(+0.1)	(0.0)	100.9	(0.0)	(0.0)	110.0	(0.0)	(0.0)	119.3	(0.0)	(0.0)
100 m	87.1	(+0.2)	(0.0)	92.4	(+0.1)	(0.0)	96.2	(0.0)	(0.0)	100.3	(0.0)	(0.0)	107.7	(0.0)	(0.0)	113.0	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	95.8	(+1.0)	(0.0)	104.1	(+1.1)	(+0.1)	110.4	(+0.9)	(0.0)	124.7	(+0.1)	(0.0)	143.6	(+0.7)	(+0.3)	145.2	(-0.3)	(-0.6)
50 m	98.4	(+1.3)	(0.0)	106.5	(+1.2)	(+0.1)	112.1	(+0.9)	(0.0)	119.7	(+0.4)	(-0.1)	134.8	(+0.8)	(+0.1)	136.2	(-0.1)	(-0.5)
100 m	98.3	(+1.2)	(0.0)	106.1	(+1.2)	(+0.1)	111.6	(+1.0)	(0.0)	117.6	(+0.5)	(-0.2)	129.2	(+0.6)	(-0.3)	130.6	(-0.2)	(-0.5)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.6	(+1.5)	(+0.3)	94.2	(+2.0)	(+0.4)	101.1	(+1.1)	(0.0)	106.9	(+0.3)	(-0.5)	117.7	(+0.9)	(-0.1)	134.9	(-0.8)	(-1.3)
50 m	86.4	(+2.2)	(+0.5)	97.8	(+1.9)	(+0.4)	104.1	(+1.0)	(-0.1)	109.4	(+0.2)	(-0.6)	118.7	(+0.1)	(-0.8)	125.9	(-0.7)	(-1.2)
100 m	87.3	(+2.2)	(+0.5)	98.3	(+1.9)	(+0.4)	104.3	(+1.0)	(-0.1)	109.4	(+0.2)	(-0.6)	118.0	(-0.2)	(-1.0)	119.7	(-0.6)	(-1.2)
Juan de Fuca																		
7.5 m	89.3	(+2.6)	(-0.1)	99.7	(+1.6)	(-0.1)	105.7	(+1.2)	(-0.1)	111.3	(+0.9)	(-0.1)	120.9	(+1.0)	(-0.2)	137.9	(+0.4)	(-0.1)
50 m	93.3	(+2.5)	(-0.1)	102.9	(+1.5)	(-0.1)	108.4	(+1.1)	(-0.1)	113.5	(+0.8)	(-0.1)	123.1	(+1.0)	(-0.1)	129.1	(+0.6)	(-0.1)
100 m	93.9	(+2.3)	(-0.1)	103.0	(+1.5)	(-0.1)	108.4	(+1.1)	(-0.1)	113.5	(+0.8)	(-0.1)	122.6	(+0.9)	(-0.1)	123.2	(+0.5)	(-0.1)
Haro Strait																		
7.5 m	80.9	(+0.2)	(+0.1)	88.1	(+2.6)	(+0.9)	97.5	(+2.1)	(+0.1)	105.3	(+0.5)	(-0.9)	129.1	(+6.7)	(+1.8)	135.5	(-1.7)	(-2.1)
50 m	81.6	(+0.5)	(+0.3)	91.2	(+3.1)	(+1.0)	100.3	(+1.9)	(0.0)	107.8	(+0.3)	(-1.0)	123.3	(+1.4)	(-0.5)	126.7	(-1.6)	(-2.0)
100 m	81.2	(+0.3)	(+0.1)	90.9	(+4.0)	(+1.2)	100.2	(+1.9)	(-0.1)	107.3	(+0.1)	(-1.2)	119.9	(-0.6)	(-1.7)	119.8	(-1.8)	(-2.2)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	82.6	(+1.0)	(+0.2)	91.8	(+1.9)	(+0.4)	98.6	(+1.1)	(0.0)	104.4	(+0.3)	(-0.6)	116.2	(+1.8)	(+0.6)	133.1	(-0.6)	(-1.1)
50 m	84.6	(+1.6)	(+0.4)	95.1	(+1.8)	(+0.4)	101.4	(+0.9)	(-0.1)	106.8	(+0.2)	(-0.6)	116.5	(+0.4)	(-0.6)	124	(-0.4)	(-1.0)
100 m	85.2	(+1.7)	(+0.4)	95.4	(+1.8)	(+0.3)	101.4	(+0.9)	(-0.1)	106.5	(+0.2)	(-0.6)	115.1	(0.0)	(-0.9)	116.7	(-0.5)	(-1.1)
Juan de Fuca																		
7.5 m	88.1	(+2.5)	(0.0)	98.5	(+1.6)	(0.0)	104.0	(+1.0)	(-0.2)	109.0	(+0.7)	(-0.2)	117.9	(+1.1)	(0.0)	133.7	(0.0)	(-0.5)

50 m	91.6	(+2.6)	(0.0)	101.4	(+1.5)	(0.0)	106.6	(+0.9)	(-0.2)	111.3	(+0.6)	(-0.2)	120.1	(+0.9)	(-0.2)	125.0	(+0.2)	(-0.4)
100 m	91.8	(+2.5)	(+0.1)	101.3	(+1.5)	(0.0)	106.4	(+0.9)	(-0.2)	111.1	(+0.6)	(-0.2)	118.9	(+0.5)	(-0.3)	119.3	(+0.2)	(-0.4)
Haro-Boundary																		
7.5 m	85.0	(+1.7)	(+0.7)	94.4	(+2.2)	(+0.7)	101.5	(+1.8)	(+0.2)	109.3	(+1.2)	(0.0)	136.6	(+2.2)	(+0.9)	138.0	(-0.6)	(-1.2)
50 m	87.5	(+2.1)	(+0.8)	97.2	(+2.2)	(+0.7)	104.0	(+1.6)	(+0.1)	110.8	(+0.8)	(-0.4)	128.8	(+1.8)	(+0.4)	129.2	(-0.5)	(-1.1)
100 m	86.5	(+1.6)	(+0.3)	95.7	(+2.3)	(+0.5)	102.7	(+1.8)	(+0.1)	109.5	(+0.8)	(-0.6)	122.5	(+0.9)	(-0.5)	121.9	(-0.7)	(-1.3)
Strait of Georgia																		
7.5 m	93.2	(+1.0)	(0.0)	102.1	(+0.6)	(0.0)	108.9	(+0.5)	(0.0)	115.5	(+0.5)	(0.0)	142.2	(+0.5)	(0.0)	142.2	(+0.3)	(0.0)
50 m	95.2	(+1.2)	(0.0)	102.9	(+0.7)	(0.0)	108.1	(+0.5)	(0.0)	113.4	(+0.4)	(0.0)	133.7	(+0.5)	(0.0)	133.6	(+0.3)	(0.0)
100 m	94.5	(+1.1)	(0.0)	101.5	(+0.6)	(0.0)	106.1	(+0.5)	(0.0)	111.0	(+0.4)	(0.0)	127.0	(+0.5)	(0.0)	127.5	(+0.2)	(0.0)

Table 6c: Modelled received sound levels (RL) for each subregion at in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for slowdown in accordance to **current ECHO measures** at **85% participation** rate. Input is May to October 2015 plus the additional TMX tankers and tugs. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the RL of this slowdown scenario to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
50 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
100 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	85.0	(+0.5)	(0.0)	88.8	(+0.3)	(-0.4)	101.7	(+2.8)	(+1.2)	118.6	(-0.4)	(-1.1)
50 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(+0.1)	86.4	(+0.6)	(-0.1)	90.7	(+0.3)	(-0.5)	101.5	(+1.0)	(-0.4)	109.6	(-0.1)	(-1.0)
100 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(+0.1)	86.6	(+0.6)	(-0.1)	90.5	(+0.2)	(-0.5)	100.0	(+0.5)	(-0.7)	102.5	(-0.2)	(-1.0)
Juan de Fuca west																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(0.0)	87.9	(+1.0)	(-0.1)	93.2	(+0.9)	(-0.1)	106.6	(+3.1)	(-0.3)	123.9	(+0.6)	(-0.1)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	90.2	(+1.0)	(-0.1)	95.3	(+0.9)	(-0.1)	107.2	(+1.8)	(-0.1)	114.9	(+0.8)	(-0.1)
100 m	83.3	(0.0)	(0.0)	85.8	(+0.9)	(0.0)	90.3	(+1.0)	(-0.1)	95.5	(+0.9)	(-0.1)	106.4	(+1.4)	(-0.1)	108.8	(+0.7)	(-0.1)
Juan de Fuca east																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	85.3	(+0.6)	(0.0)	89.1	(+0.9)	(0.0)	107.7	(+3.8)	(+0.3)	117.1	(+0.8)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.3	(+0.4)	(0.0)	86.8	(+0.7)	(0.0)	90.9	(+0.9)	(0.0)	103.2	(+2.4)	(+0.1)	108.2	(+0.9)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.3)	(0.0)	86.4	(+0.7)	(0.0)	90.0	(+0.8)	(0.0)	99.8	(+1.5)	(0.0)	101.0	(+0.9)	(0.0)
Haro-Boundary																		
7.5 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	84.4	(+0.8)	(+0.1)	90.2	(+1.0)	(-0.6)	119.0	(+10.5)	(+2.5)	120.8	(-1.0)	(-1.6)
50 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	85.7	(+1.2)	(0.0)	92.5	(+0.9)	(-0.8)	111.9	(+4.6)	(+0.9)	112.1	(-0.9)	(-1.6)
100 m	83.1	(0.0)	(0.0)	83.1	(+0.1)	(+0.1)	86.1	(+1.2)	(0.0)	92.7	(+0.7)	(-0.8)	107.5	(+1.6)	(-0.4)	105.8	(-1.0)	(-1.6)
Gulf Islands																		
7.5 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	93.5	(0.0)	(0.0)	92.4	(-0.8)	(-0.8)
50 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	85.1	(-0.1)	(-0.3)	85.0	(-0.7)	(-0.7)
100 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	82.9	(-0.2)	(-0.4)	82.9	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.2)	(0.0)	87.2	(+0.4)	(0.0)	92.6	(+0.5)	(0.0)	120.7	(+0.7)	(0.0)	119.6	(+0.4)	(0.0)

50 m	83.3	(0.0)	(0.0)	84.0	(+0.2)	(0.0)	86.3	(+0.3)	(0.0)	90.4	(+0.5)	(0.0)	111.5	(+0.7)	(0.0)	110.5	(+0.4)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.6	(+0.1)	(0.0)	85.0	(+0.3)	(0.0)	88.2	(+0.4)	(0.0)	104.4	(+0.7)	(0.0)	104.2	(+0.3)	(0.0)
Strait of Georgia North																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	92.1	(0.0)	(0.0)	92.4	(+0.1)	(0.0)	94.2	(+0.5)	(0.0)	98.5	(+0.7)	(-0.2)	123.2	(+2.7)	(+0.8)	127.7	(+0.1)	(-0.6)
50 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.2	(+0.7)	(0.0)	99.7	(+0.7)	(-0.3)	115.8	(+2.2)	(+0.3)	118.7	(+0.2)	(-0.5)
100 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.1	(+0.7)	(0.0)	99.4	(+0.6)	(-0.3)	111.7	(+1.3)	(-0.2)	112.3	(+0.1)	(-0.5)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.2)	(0.0)	85.8	(+0.7)	(0.0)	90.2	(+0.3)	(-0.5)	103.0	(+2.2)	(+0.8)	120.3	(-0.6)	(-1.2)
50 m	83.3	(0.0)	(0.0)	84.2	(+0.5)	(+0.1)	87.7	(+0.8)	(0.0)	92.4	(+0.2)	(-0.6)	103.1	(+0.8)	(-0.5)	111.3	(-0.4)	(-1.1)
100 m	83.3	(0.0)	(0.0)	84.5	(+0.6)	(+0.1)	88.1	(+0.8)	(-0.1)	92.6	(+0.2)	(-0.6)	102.3	(+0.3)	(-0.8)	105.1	(-0.4)	(-1.1)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(0.0)	87.8	(+1.0)	(-0.1)	93.2	(+0.9)	(-0.1)	105.1	(+1.4)	(-0.4)	124.0	(+0.5)	(-0.1)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	90.2	(+1.0)	(-0.1)	95.4	(+0.8)	(-0.1)	107.2	(+1.3)	(-0.2)	115.0	(+0.7)	(-0.1)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(0.0)	90.4	(+1.0)	(-0.1)	95.6	(+0.8)	(-0.1)	106.5	(+1.1)	(-0.1)	108.9	(+0.7)	(-0.1)
Haro Strait																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	84.3	(+0.6)	(0.0)	88.8	(+0.5)	(-0.7)	113.6	(+7.7)	(+1.9)	118.5	(-1.4)	(-1.9)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	85.4	(+1.0)	(0.0)	90.7	(+0.3)	(-0.9)	107.4	(+2.1)	(-0.2)	109.7	(-1.4)	(-1.9)
100 m	83.3	(0.0)	(0.0)	83.3	(+0.1)	(+0.1)	85.7	(+0.9)	(-0.1)	90.7	(+0.1)	(-1.1)	103.6	(-0.1)	(-1.5)	102.9	(-1.7)	(-2.1)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.8	(+0.4)	(0.0)	88.3	(+0.3)	(-0.4)	101.1	(+2.8)	(+1.3)	118.0	(-0.4)	(-1.1)
50 m	83.3	(0.0)	(0.0)	83.8	(+0.3)	(+0.1)	86.1	(+0.6)	(0.0)	90.2	(+0.2)	(-0.5)	100.9	(+1.0)	(-0.4)	109.0	(-0.2)	(-1.0)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(+0.1)	86.2	(+0.6)	(-0.1)	90.0	(+0.2)	(-0.5)	99.4	(+0.5)	(-0.7)	101.9	(-0.2)	(-1.0)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	83.7	(+0.2)	(0.0)	85.9	(+0.5)	(-0.1)	90.0	(+0.6)	(-0.3)	101.9	(+2.0)	(+0.3)	119.3	(+0.1)	(-0.6)

50 m	83.3	(0.0)	(0.0)	84.6	(+0.5)	(0.0)	87.7	(+0.6)	(-0.2)	92.1	(+0.6)	(-0.3)	103.6	(+1.5)	(-0.1)	110.4	(+0.3)	(-0.5)
100 m	83.3	(0.0)	(0.0)	84.8	(+0.6)	(0.0)	88.0	(+0.7)	(-0.2)	92.3	(+0.5)	(-0.3)	102.1	(+1.0)	(-0.4)	104.4	(+0.3)	(-0.5)
Haro-Boundary																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.1)	(0.0)	85.6	(+0.9)	(+0.1)	91.2	(+1.1)	(-0.3)	117.7	(+8.0)	(+2.0)	121.4	(-0.3)	(-1.0)
50 m	83.3	(0.0)	(0.0)	84.0	(+0.3)	(+0.1)	87.3	(+1.1)	(+0.1)	93.2	(+0.9)	(-0.4)	110.8	(+4.0)	(+0.7)	112.5	(-0.2)	(-1.0)
100 m	83.3	(0.0)	(0.0)	83.8	(+0.2)	(+0.1)	86.7	(+1.1)	(0.0)	92.4	(+0.8)	(-0.6)	106.3	(+1.5)	(-0.4)	105.6	(-0.4)	(-1.1)
Strait of Georgia																		
7.5 m	83.3	(0.0)	(0.0)	85.2	(+0.3)	(0.0)	90.3	(+0.5)	(0.0)	96.5	(+0.5)	(0.0)	124.7	(+0.7)	(0.0)	123.6	(+0.4)	(0.0)
50 m	83.3	(0.0)	(0.0)	85.2	(+0.4)	(0.0)	89.1	(+0.5)	(0.0)	94.2	(+0.5)	(0.0)	116.1	(+0.7)	(0.0)	114.8	(+0.4)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.2)	(0.0)	87.0	(+0.4)	(0.0)	91.5	(+0.5)	(0.0)	108.6	(+0.6)	(0.0)	107.5	(+0.4)	(0.0)

Table 6d: Modelled received sound levels (RL) for each subregion in a **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for slowdown in accordance to **current ECHO measures** at **85% participation** rate. Input is May to October 2015 plus additional TMX tankers and tugs. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference between the RL of this slowdown scenario to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline+TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.7	(0.0)	(0.0)	88.4	(0.0)	(0.0)	99.3	(-0.1)	(-0.1)	124.3	(-0.1)	(-0.1)
50 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.2	(0.0)	(0.0)	90.2	(0.0)	(0.0)	101.6	(-0.1)	(-0.1)	114.7	(0.0)	(0.0)
100 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.0	(0.0)	(0.0)	88.8	(0.0)	(0.0)	98.9	(-0.1)	(-0.1)	105.4	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	86.1	(+0.5)	(+0.1)	92.9	(+1.6)	(+0.4)	99.3	(+1.0)	(0.0)	105.1	(+0.3)	(-0.5)	116.9	(+1.8)	(+0.6)	133.8	(-0.6)	(-1.1)
50 m	87.2	(+0.9)	(+0.2)	96.0	(+1.7)	(+0.3)	102.2	(+0.9)	(-0.1)	107.5	(+0.2)	(-0.6)	117.2	(+0.4)	(-0.6)	124.7	(-0.4)	(-1.0)
100 m	87.6	(+1.0)	(+0.3)	96.3	(+1.7)	(+0.3)	102.2	(+0.9)	(-0.1)	107.2	(+0.2)	(-0.6)	115.8	(0.0)	(-0.9)	117.5	(-0.5)	(-1.1)
Juan de Fuca west																		
7.5 m	90.2	(+1.8)	(-0.1)	99.2	(+1.6)	(0.0)	105.2	(+1.2)	(-0.1)	110.8	(+0.9)	(-0.1)	121.6	(+2.0)	(-0.2)	138.0	(+0.5)	(-0.1)
50 m	93.5	(+2.0)	(-0.1)	102.3	(+1.5)	(0.0)	107.8	(+1.1)	(-0.1)	113.0	(+0.9)	(-0.1)	122.8	(+1.3)	(-0.1)	129.1	(+0.6)	(-0.1)
100 m	93.8	(+1.9)	(-0.1)	102.3	(+1.5)	(0.0)	107.8	(+1.1)	(-0.1)	113.0	(+0.9)	(-0.1)	122.2	(+1.1)	(-0.1)	123.2	(+0.6)	(-0.1)
Juan de Fuca east																		
7.5 m	88.2	(+0.9)	(+0.2)	95.6	(+1.3)	(+0.2)	101.3	(+1.0)	(0.0)	107.6	(+0.9)	(+0.2)	128.0	(+1.2)	(+0.2)	135.1	(+0.3)	(-0.1)
50 m	90.6	(+1.2)	(+0.3)	98.5	(+1.2)	(+0.2)	103.8	(+0.9)	(0.0)	109.3	(+0.6)	(-0.1)	121.8	(+1.1)	(+0.1)	126.0	(+0.4)	(-0.1)
100 m	90.2	(+1.0)	(+0.1)	97.5	(+1.1)	(0.0)	102.5	(+0.9)	(0.0)	107.7	(+0.7)	(0.0)	117.3	(+0.8)	(0.0)	118.5	(+0.5)	(0.0)
Haro-Boundary																		
7.5 m	85.2	(+0.1)	(0.0)	89.3	(+2.7)	(+0.9)	98.7	(+2.9)	(+0.3)	107.2	(+1.0)	(-0.7)	134.3	(+9.8)	(+2.4)	138.8	(-1.5)	(-1.9)
50 m	85.2	(+0.2)	(0.0)	91.5	(+4.1)	(+1.3)	101.4	(+2.7)	(+0.2)	109.7	(+0.8)	(-0.8)	127.5	(+3.7)	(+0.6)	129.6	(-1.3)	(-1.7)
100 m	85.1	(+0.1)	(0.0)	92.0	(+4.5)	(+1.3)	101.6	(+2.5)	(+0.1)	109.6	(+0.7)	(-0.9)	123.4	(+1.0)	(-0.7)	125.2	(-1.0)	(-1.3)
Gulf Islands																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(0.0)	94.7	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(+0.1)	(+0.1)	135.2	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.6	(+0.6)	(+0.1)	96.7	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.9	(+0.1)	(+0.1)	125.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.6	(+0.6)	(+0.1)	96.1	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.7	(0.0)	(-0.1)	119.1	(+0.2)	(+0.2)
Strait of Georgia South																		
7.5 m	92.6	(+0.6)	(0.0)	100.2	(+0.5)	(0.0)	106.3	(+0.4)	(0.0)	112.7	(+0.4)	(0.0)	139.0	(+0.5)	(0.0)	140.1	(+0.2)	(0.0)

50 m	94.7	(+0.8)	(0.0)	101.4	(+0.5)	(0.0)	106.2	(+0.4)	(0.0)	111.2	(+0.3)	(0.0)	130.3	(+0.4)	(0.0)	131.5	(+0.2)	(0.0)
100 m	94.5	(+0.7)	(0.0)	100.7	(+0.5)	(0.0)	104.9	(+0.4)	(0.0)	109.6	(+0.3)	(0.0)	124.2	(+0.3)	(0.0)	126.0	(+0.1)	(0.0)
Strait of Georgia North																		
7.5 m	87.6	(+0.1)	(0.0)	92.1	(+0.1)	(0.0)	96.3	(+0.1)	(0.0)	101.3	(+0.1)	(0.0)	117.8	(0.0)	(0.0)	127.9	(0.0)	(0.0)
50 m	88.7	(+0.2)	(0.0)	93.1	(+0.1)	(0.0)	96.7	(+0.1)	(0.0)	100.9	(0.0)	(0.0)	110.0	(0.0)	(0.0)	119.3	(0.0)	(0.0)
100 m	88.6	(+0.1)	(0.0)	92.9	(+0.1)	(0.0)	96.4	(0.0)	(0.0)	100.4	(0.0)	(0.0)	107.7	(0.0)	(0.0)	113.0	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	97.3	(+0.7)	(0.0)	104.4	(+1.0)	(+0.1)	110.5	(+0.9)	(0.0)	124.7	(+0.1)	(0.0)	143.6	(+0.7)	(+0.3)	145.3	(-0.3)	(-0.6)
50 m	99.3	(+1.0)	(0.0)	106.6	(+1.1)	(+0.1)	112.2	(+0.9)	(0.0)	119.7	(+0.4)	(-0.1)	134.8	(+0.8)	(+0.1)	136.3	(-0.1)	(-0.5)
100 m	99.3	(+1.0)	(0.0)	106.3	(+1.1)	(+0.1)	111.7	(+1.0)	(0.0)	117.7	(+0.5)	(-0.2)	129.3	(+0.6)	(-0.3)	130.7	(-0.1)	(-0.5)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	86.4	(+0.7)	(+0.2)	94.6	(+1.8)	(+0.4)	101.2	(+1.1)	(0.0)	107.0	(+0.3)	(-0.5)	117.8	(+0.9)	(-0.1)	135.1	(-0.8)	(-1.3)
50 m	88.1	(+1.3)	(+0.3)	98.0	(+1.9)	(+0.4)	104.2	(+1.0)	(-0.1)	109.5	(+0.2)	(-0.6)	118.8	(+0.1)	(-0.8)	126.1	(-0.6)	(-1.2)
100 m	88.8	(+1.5)	(+0.3)	98.4	(+1.8)	(+0.4)	104.4	(+1.0)	(-0.1)	109.5	(+0.2)	(-0.6)	118.1	(-0.2)	(-1.0)	119.9	(-0.6)	(-1.2)
Juan de Fuca																		
7.5 m	90.2	(+1.9)	(0.0)	99.8	(+1.6)	(-0.1)	105.7	(+1.2)	(-0.1)	111.3	(+0.9)	(-0.1)	121.1	(+1.0)	(-0.2)	138.1	(+0.5)	(-0.1)
50 m	93.7	(+2.2)	(-0.1)	103.0	(+1.5)	(-0.1)	108.5	(+1.1)	(-0.1)	113.6	(+0.8)	(-0.1)	123.2	(+1.0)	(-0.1)	129.2	(+0.6)	(-0.1)
100 m	94.3	(+2.0)	(-0.1)	103.1	(+1.4)	(-0.1)	108.5	(+1.1)	(-0.1)	113.6	(+0.8)	(-0.1)	122.7	(+0.9)	(-0.1)	123.4	(+0.6)	(-0.1)
Haro Strait																		
7.5 m	85.2	(+0.1)	(0.0)	89.3	(+1.8)	(+0.7)	97.7	(+2.1)	(+0.1)	105.4	(+0.5)	(-0.9)	129.2	(+6.7)	(+1.8)	135.6	(-1.7)	(-2.1)
50 m	85.5	(+0.2)	(+0.1)	91.8	(+2.5)	(+0.9)	100.5	(+1.9)	(0.0)	107.9	(+0.3)	(-1.0)	123.5	(+1.4)	(-0.5)	126.8	(-1.6)	(-2.0)
100 m	85.4	(+0.1)	(+0.1)	91.6	(+3.1)	(+1.0)	100.3	(+1.9)	(-0.1)	107.4	(+0.1)	(-1.2)	120.0	(-0.5)	(-1.7)	119.9	(-1.8)	(-2.2)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	86.0	(+0.4)	(+0.1)	92.3	(+1.6)	(+0.4)	98.7	(+1.0)	(0.0)	104.5	(+0.3)	(-0.6)	116.3	(+1.8)	(+0.6)	133.2	(-0.6)	(-1.1)
50 m	87.0	(+0.8)	(+0.2)	95.4	(+1.7)	(+0.3)	101.6	(+0.9)	(-0.1)	106.9	(+0.2)	(-0.6)	116.6	(+0.4)	(-0.6)	124.1	(-0.4)	(-1.0)
100 m	87.4	(+1.0)	(+0.2)	95.7	(+1.7)	(+0.3)	101.5	(+0.9)	(-0.1)	106.5	(+0.2)	(-0.6)	115.2	(0.0)	(-0.9)	116.9	(-0.5)	(-1.1)
Juan de Fuca																		
7.5 m	89.4	(+1.7)	(0.0)	98.6	(+1.5)	(0.0)	104.1	(+1.0)	(-0.2)	109.1	(+0.7)	(-0.2)	118.0	(+1.1)	(0.0)	133.8	(0.0)	(-0.5)

50 m	92.2	(+2.1)	(0.0)	101.5	(+1.5)	(0.0)	106.7	(+0.9)	(-0.2)	111.3	(+0.6)	(-0.2)	120.2	(+0.9)	(-0.2)	125.1	(+0.2)	(-0.4)
100 m	92.4	(+2.1)	(+0.1)	101.4	(+1.4)	(0.0)	106.5	(+0.9)	(-0.2)	111.2	(+0.6)	(-0.2)	119.0	(+0.5)	(-0.3)	119.5	(+0.2)	(-0.4)
Haro-Boundary																		
7.5 m	87.2	(+0.9)	(+0.4)	94.7	(+2.0)	(+0.7)	101.6	(+1.8)	(+0.2)	109.4	(+1.2)	(0.0)	136.7	(+2.3)	(+0.9)	138.1	(-0.6)	(-1.2)
50 m	88.9	(+1.4)	(+0.6)	97.4	(+2.1)	(+0.7)	104.0	(+1.6)	(+0.1)	110.8	(+0.8)	(-0.4)	128.8	(+1.9)	(+0.4)	129.3	(-0.5)	(-1.1)
100 m	88.2	(+1.0)	(+0.2)	96.0	(+2.1)	(+0.5)	102.8	(+1.8)	(+0.1)	109.5	(+0.8)	(-0.6)	122.6	(+0.9)	(-0.5)	122.0	(-0.7)	(-1.3)
Strait of Georgia																		
7.5 m	93.6	(+0.9)	(0.0)	102.2	(+0.6)	(0.0)	109.0	(+0.5)	(0.0)	115.6	(+0.5)	(0.0)	142.3	(+0.5)	(0.0)	142.2	(+0.3)	(0.0)
50 m	95.5	(+1.1)	(0.0)	103.0	(+0.7)	(0.0)	108.1	(+0.5)	(0.0)	113.4	(+0.4)	(0.0)	133.7	(+0.5)	(0.0)	133.6	(+0.3)	(0.0)
100 m	94.8	(+1.0)	(0.0)	101.6	(+0.6)	(0.0)	106.2	(+0.5)	(0.0)	111.1	(+0.4)	(0.0)	127.0	(+0.5)	(0.0)	127.5	(+0.2)	(0.0)

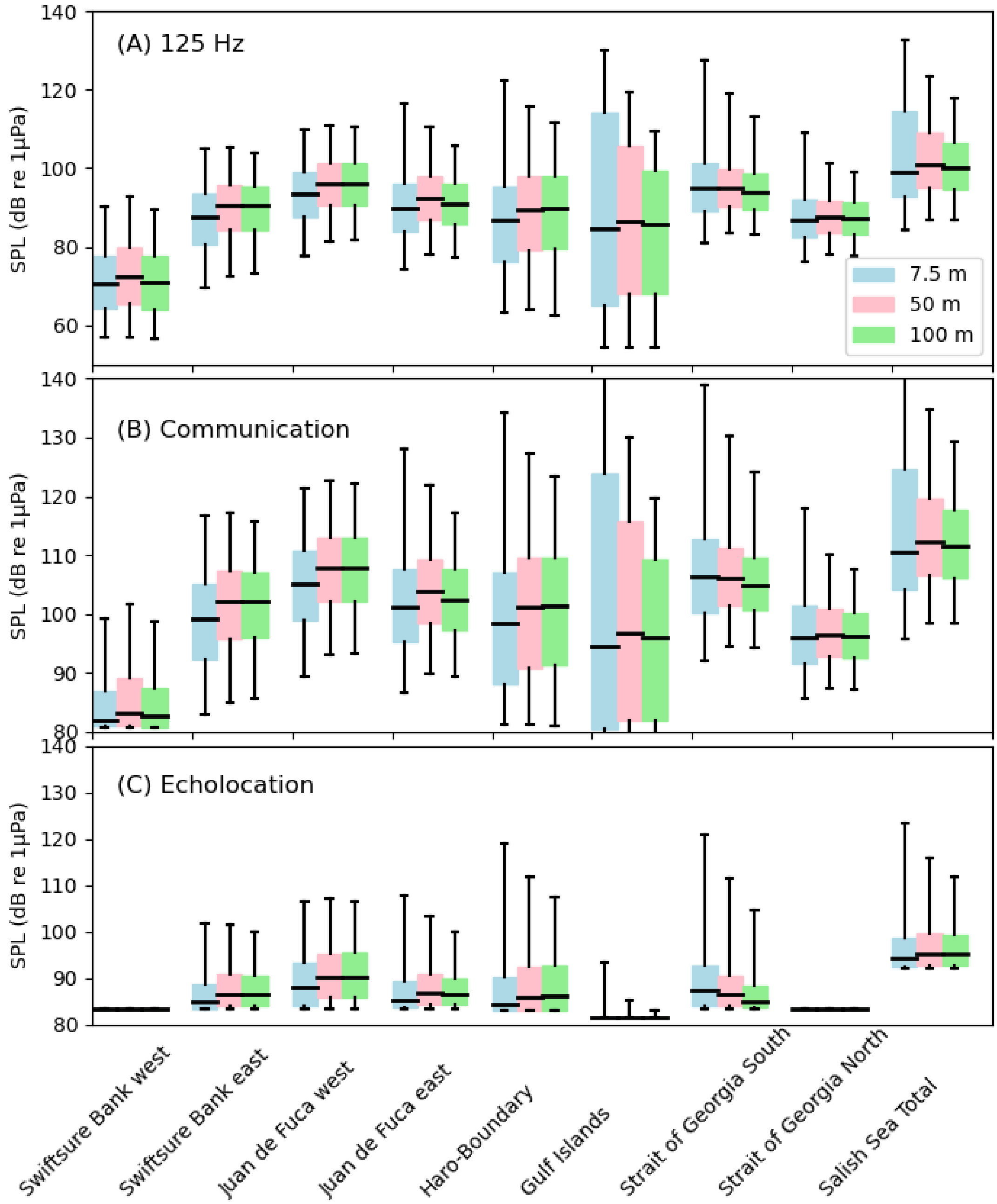

Figure 43: Boxplot comparing the sound pressure levels (SPL) in the **acoustically-derived subregions** for the slowdown scenario with **85% participation to current ECHO measures** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) SRKW echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

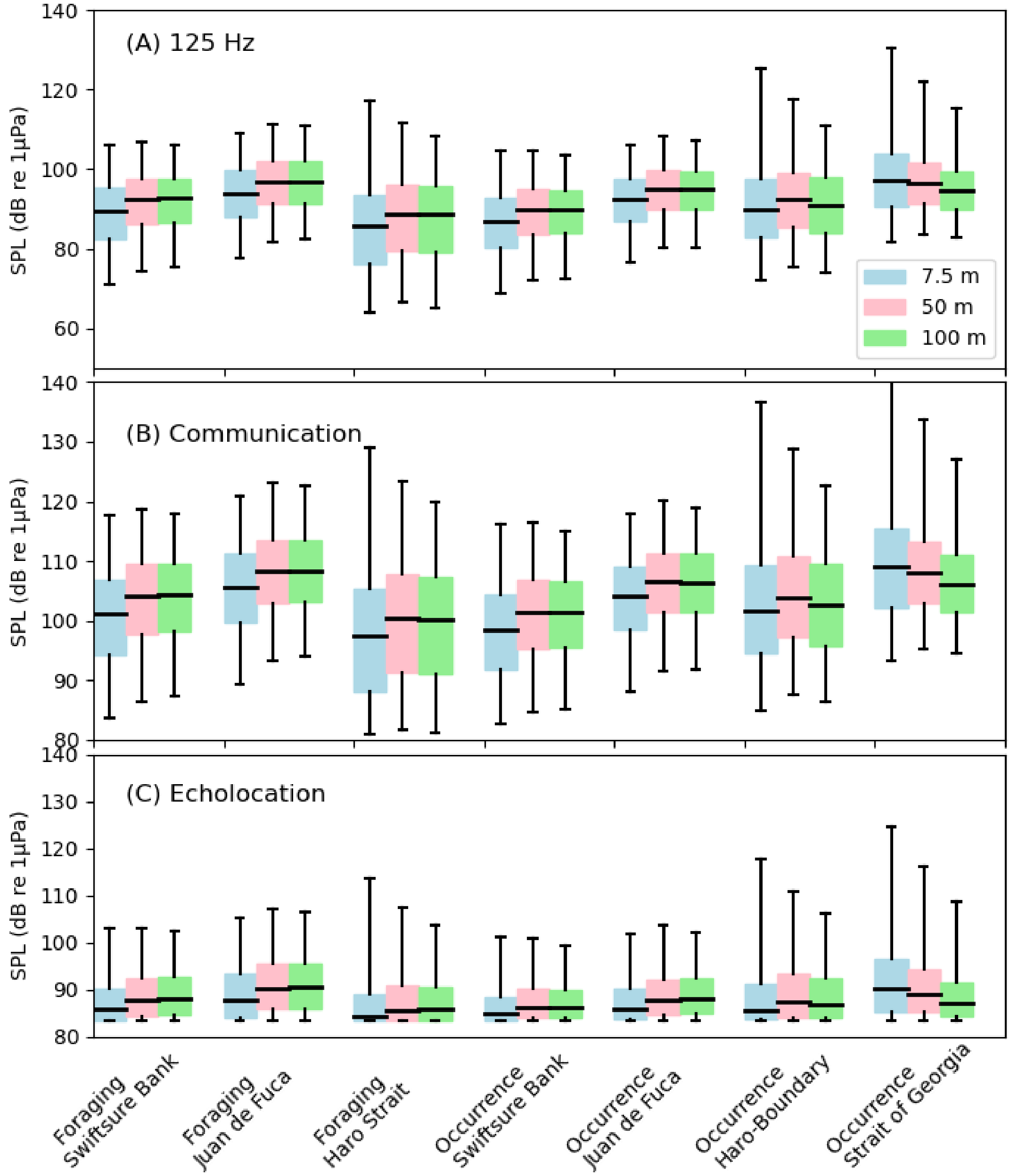

Figure 44: Boxplot comparing the sound pressure levels (SPL) in the **subregions** derived from **SRKW occurrence and foraging data** for the slowdown scenario with **85% participation to current ECHO measures** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

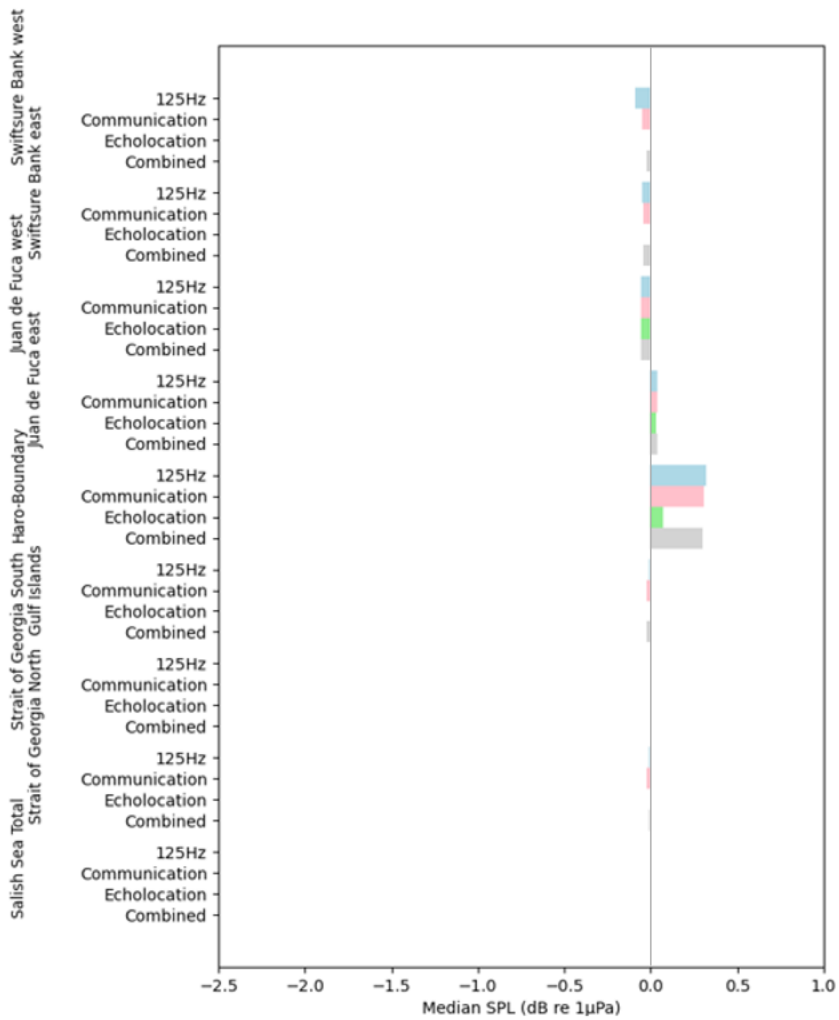

Figure 45: Bar chart showing the difference in decibels (dB) of the **85% participation of vessel speed reductions to current ECHO measures** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. The **median** RL differences were obtained using **acoustically-derived subregions**.

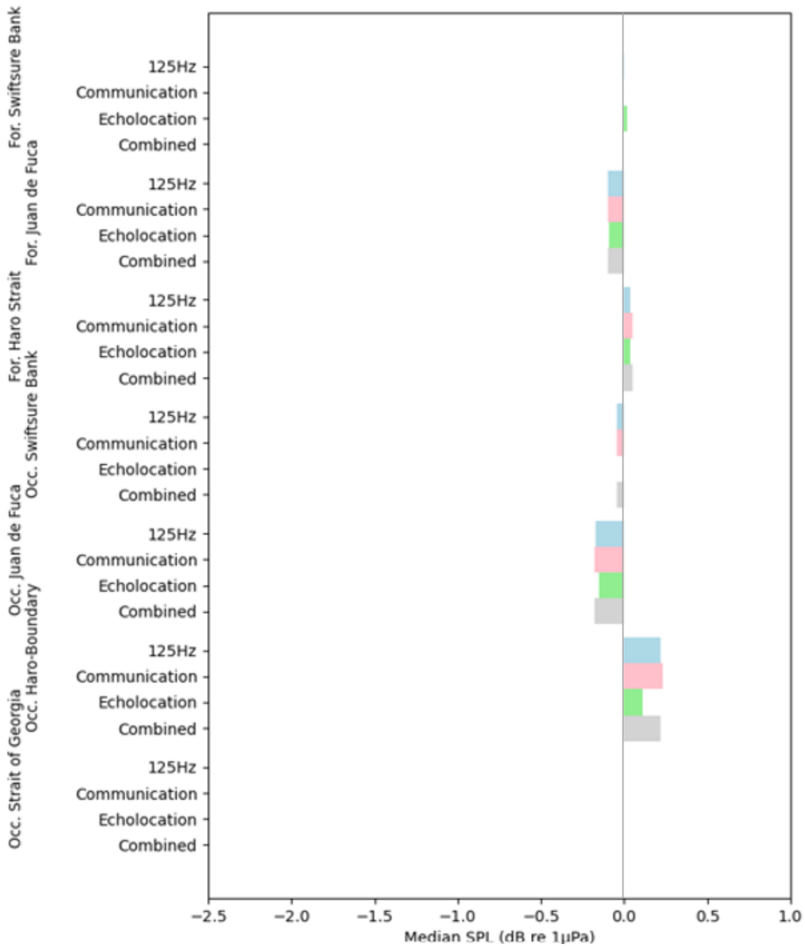

Figure 46: Bar chart showing the difference in decibels (dB) of the **85% participation of vessel speed reductions to current ECHO measures** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. The **median** RL were obtained using the **SRKW occurrence and foraging** subregions.

3.3.2 Full study area slowdown at ECHO speeds

Scenarios where all vessels are slowed down for the full extent of their transit through the Salish Sea were modeled. This extension of the ECHO slowdown measures introduced a reduction of speed for all vessels within the model domain (Figure 1) traveling from J Buoy (see Figure 29, 30) to Westridge Marine Terminal or vice versa. This used synthetic vessel input data derived from AIS records from 2015 and presumed that all vessels consistently traveled at speeds of 11 knots or less for bulkers, government/research vessels, tankers and tugs, and no more than 14.5 knots for containerships, passenger/cruise ships and vehicle carriers. These speeds are consistent with current ECHO measures. All commercial vessels that are targeted by the ECHO slowdown measures within the model domain were slowed to the requested speeds, except for passenger ferries.

Two scenarios were modeled, the first with 100% participation, where all commercial vessels in the study area except for passenger ferries were slowed to ECHO speeds. A more realistic scenario of 85% participation was also modelled, referencing the level of participation reported by ECHO for 2023 trials (ECHO 2024). There was no transition zone for the slowdowns, vessels entering the model domain from the west to transit into the Strait of Juan de Fuca were already slowed to the appropriate speed. When leaving port, vessels were allowed to increase speed up to and not exceeding the relevant slowdown speed for the vessel type.

ECHO-inspired slowdown throughout the Salish Sea, 100% participation

Median sound levels resulting from all commercial vessels being slowed to ECHO-inspired speeds were considered for 125 Hz, and in the SRKW communication and echolocation range (Figures 47-49). The efficacy of this measure to mitigate TMX or even reduce sound levels to baseline were considered (Tables 7a-d).

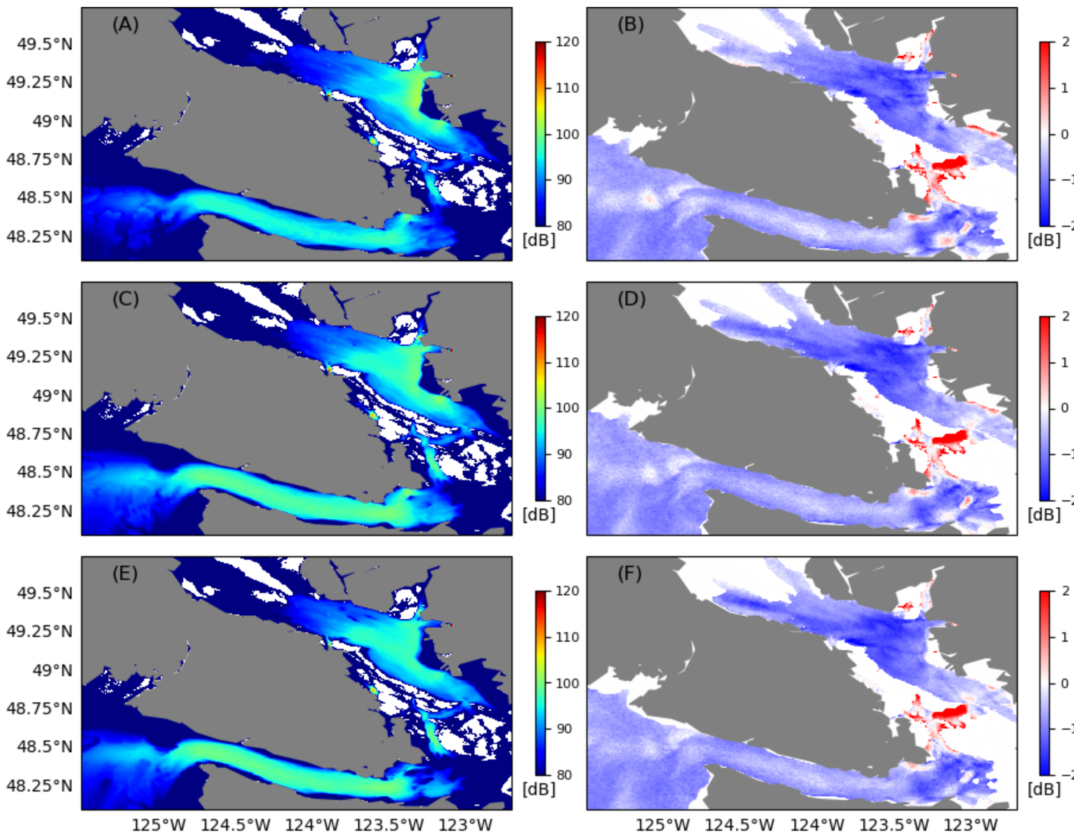

Figure 47: LEFT (A,C,E): Modelled **median** received sound levels at **125 Hz** for the ECHO-inspired slowdown scenario with **100% participation** rate of vessels traveling at ECHO requested speeds **throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m, and (E-F) 100 m depth.

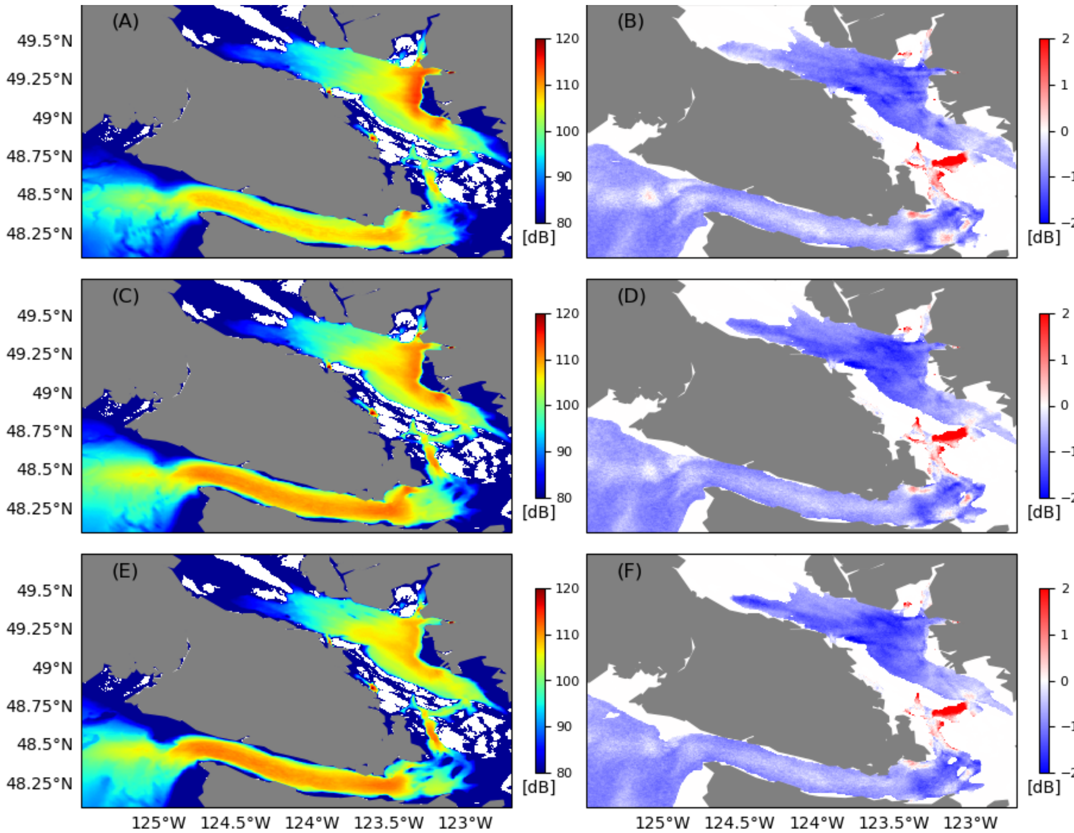

Figure 48: LEFT (A,C,E): Modelled **median** received sound levels in the SRKW **communication range (500 Hz to 15 kHz)** for the ECHO-inspired slowdown scenario with **100% participation** rate of vessels traveling at ECHO requested speeds **throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m, and (E-F) 100 m depth.

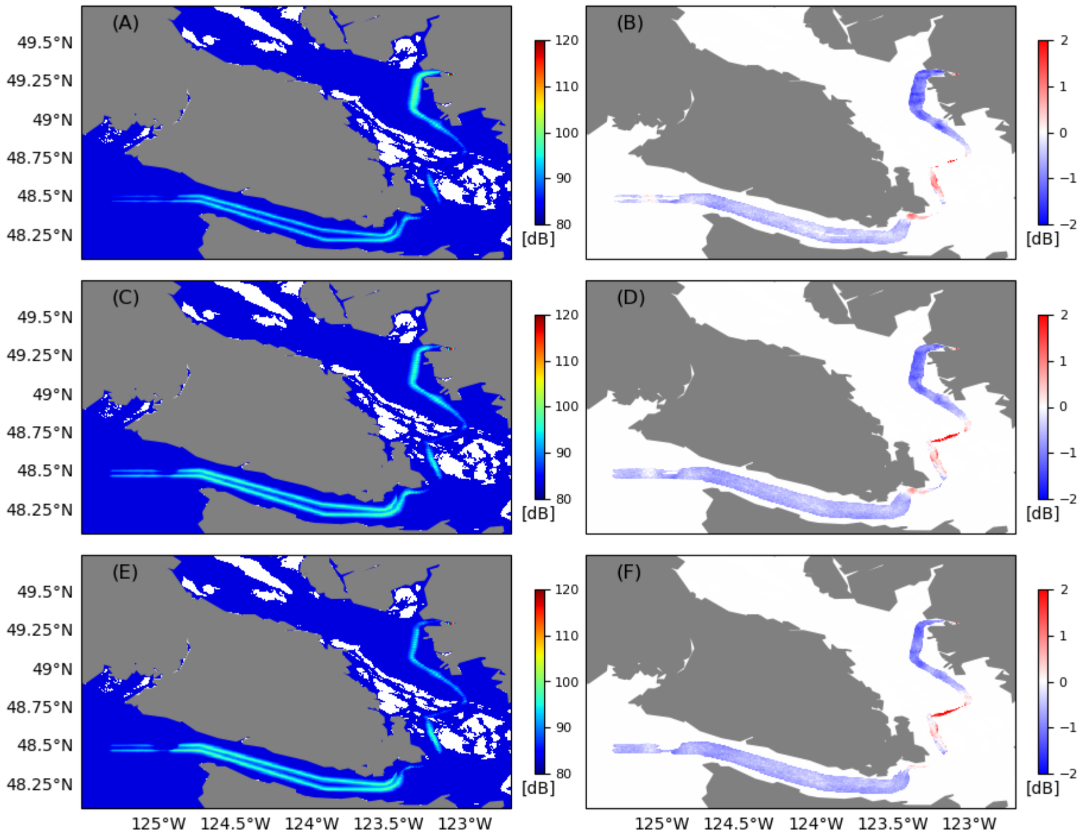

Figure 49: LEFT (A,C,E): Modelled **median** received sound levels in the SRKW **echolocation range (15-100 kHz)** for the ECHO-inspired slowdown scenario with **100% participation** rate of vessels traveling at ECHO requested speeds **throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m, and (E-F) 100 m depth.

The values from Tables 7a-d were displayed as boxplots in Figures 50-51. Using median sound levels the differences between this scenario and the baseline + TMX scenario showed notable reductions in all subregions except those encompassing Haro Strait and Boundary Pass areas (Figures 52-53).

Table 7a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L5			L25			L50			L75			L95			Leq		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	57.0	(+0.4)	(+0.3)	64.0	(-0.1)	(-0.3)	70.2	(-0.5)	(-0.5)	76.9	(-0.7)	(-0.7)	88.9	(-1.5)	(-1.5)	113.1	(-2.6)	(-2.6)
50 m	57.4	(+0.5)	(+0.4)	65.2	(0.0)	(-0.2)	72.0	(-0.4)	(-0.4)	79.3	(-0.6)	(-0.6)	91.1	(-1.6)	(-1.6)	103.4	(-2.4)	(-2.4)
100 m	56.8	(+0.4)	(+0.3)	64.0	(0.0)	(-0.1)	70.5	(-0.4)	(-0.5)	77.1	(-0.6)	(-0.6)	87.9	(-1.7)	(-1.7)	94.2	(-2.2)	(-2.2)
Swiftsure Bank east																		
7.5 m	69.9	(+2.4)	(+0.8)	80.3	(+1.5)	(0.0)	87.1	(+0.6)	(-0.5)	93.0	(-0.2)	(-1.0)	107.5	(+4.2)	(+3.1)	121.2	(-1.4)	(-1.9)
50 m	73.0	(+2.8)	(+1.1)	83.7	(+1.4)	(-0.1)	89.9	(+0.4)	(-0.6)	95.3	(-0.3)	(-1.1)	105.6	(+0.6)	(-0.4)	112.2	(-1.1)	(-1.7)
100 m	73.6	(+3.0)	(+1.1)	83.9	(+1.4)	(-0.2)	89.9	(+0.4)	(-0.7)	94.9	(-0.3)	(-1.1)	103.8	(-0.1)	(-1.0)	105.1	(-1.0)	(-1.6)
Juan de Fuca west																		
7.5 m	78.5	(+3.4)	(+0.9)	87.4	(+1.7)	(0.0)	93.0	(+0.7)	(-0.6)	98.1	(-0.1)	(-1.1)	114.2	(+6.6)	(+4.4)	124.3	(-1.2)	(-1.8)
50 m	82.2	(+3.2)	(+0.8)	90.5	(+1.4)	(-0.1)	95.5	(+0.6)	(-0.6)	100.2	(-0.2)	(-1.1)	110.9	(+1.3)	(-0.1)	115.6	(-0.9)	(-1.6)
100 m	82.4	(+2.9)	(+0.6)	90.4	(+1.4)	(-0.1)	95.5	(+0.6)	(-0.6)	100.2	(-0.2)	(-1.1)	109.5	(+0.2)	(-0.9)	109.6	(-1.0)	(-1.6)
Juan de Fuca east																		
7.5 m	75.0	(+2.4)	(+1.0)	83.6	(+1.2)	(0.0)	89.1	(+0.5)	(-0.5)	95.1	(-0.2)	(-0.8)	116.8	(+1.3)	(+0.5)	122.1	(-1.4)	(-1.8)
50 m	78.5	(+2.3)	(+1.0)	86.6	(+1.0)	(0.0)	91.7	(+0.3)	(-0.6)	96.8	(-0.5)	(-1.1)	109.8	(+0.4)	(-0.5)	113.0	(-1.3)	(-1.7)
100 m	77.8	(+2.0)	(+0.7)	85.4	(+0.9)	(-0.2)	90.2	(+0.3)	(-0.6)	95.1	(-0.5)	(-1.2)	104.5	(-0.6)	(-1.3)	105.4	(-1.2)	(-1.6)
Haro-Boundary																		
7.5 m	63.1	(+1.9)	(+0.3)	76.6	(+5.5)	(+2.0)	87.0	(+3.3)	(+0.6)	95.2	(+0.9)	(-0.8)	123.4	(+10.8)	(+3.4)	126.2	(-2.5)	(-2.8)
50 m	63.8	(+2.5)	(+0.5)	79.7	(+6.7)	(+2.3)	89.7	(+3.0)	(+0.4)	97.7	(+0.7)	(-1.0)	116.2	(+4.2)	(+1.2)	117.0	(-2.1)	(-2.6)
100 m	62.6	(+2.8)	(+0.8)	80.1	(+7.1)	(+2.3)	89.9	(+2.8)	(+0.3)	97.6	(+0.5)	(-1.1)	111.7	(+1.1)	(-0.6)	112.1	(-2.6)	(-2.9)
Gulf Islands																		
7.5 m	54.2	(+0.1)	(+0.1)	65.8	(+3.5)	(+1.0)	84.4	(-0.1)	(-0.1)	114.0	(-0.2)	(-0.2)	129.7	(-0.3)	(-0.3)	123.8	(-0.7)	(-0.7)
50 m	54.3	(+0.2)	(+0.2)	68.6	(+3.5)	(+0.9)	86.5	(0.0)	(-0.1)	105.7	(-0.1)	(-0.1)	119.2	(-0.1)	(-0.1)	114.0	(-0.7)	(-0.7)
100 m	54.3	(+0.2)	(+0.2)	68.3	(+3.1)	(+0.7)	85.7	(-0.1)	(-0.2)	99.3	(-0.1)	(-0.2)	109.5	(+0.1)	(+0.1)	107.2	(-1.1)	(-1.1)
Strait of Georgia South																		
7.5 m	80.4	(+0.2)	(-0.5)	88.0	(-0.5)	(-0.9)	93.9	(-0.7)	(-1.1)	99.8	(-1.1)	(-1.5)	127.1	(-0.1)	(-0.5)	126.6	(-2.2)	(-2.4)

50 m	82.9	(+0.3)	(-0.5)	89.4	(-0.4)	(-0.8)	93.9	(-0.8)	(-1.1)	98.5	(-1.2)	(-1.5)	118.2	(-0.4)	(-0.8)	117.9	(-2.2)	(-2.4)
100 m	82.8	(+0.3)	(-0.4)	88.8	(-0.4)	(-0.8)	92.8	(-0.8)	(-1.1)	97.0	(-1.3)	(-1.5)	111.9	(-0.8)	(-1.0)	111.8	(-2.8)	(-3.0)
Strait of Georgia North																		
7.5 m	75.3	(-0.5)	(-0.7)	81.5	(-0.7)	(-0.8)	86.0	(-0.8)	(-1.0)	90.6	(-1.4)	(-1.5)	109.0	(-0.2)	(-0.2)	118.0	(-1.2)	(-1.2)
50 m	77.3	(-0.4)	(-0.6)	82.7	(-0.8)	(-0.9)	86.4	(-1.0)	(-1.1)	90.6	(-1.2)	(-1.2)	100.6	(-0.8)	(-0.8)	109.6	(-1.1)	(-1.1)
100 m	77.1	(-0.4)	(-0.6)	82.5	(-0.8)	(-0.9)	86.1	(-1.0)	(-1.0)	90.2	(-1.1)	(-1.1)	98.1	(-0.8)	(-0.8)	103.4	(-1.1)	(-1.1)
Salish Sea Total																		
7.5 m	84.1	(+1.1)	(0.0)	92.3	(+0.6)	(-0.4)	98.4	(+0.1)	(-0.7)	114.4	(-0.2)	(-0.3)	132.4	(+0.4)	(+0.1)	132.4	(-1.8)	(-2.1)
50 m	87.1	(+1.3)	(+0.1)	94.7	(+0.7)	(-0.3)	100.1	(+0.2)	(-0.7)	108.4	(-0.2)	(-0.7)	123.4	(+0.4)	(-0.1)	123.4	(-1.7)	(-2.0)
100 m	87.0	(+1.3)	(+0.1)	94.4	(+0.7)	(-0.3)	99.6	(+0.3)	(-0.7)	105.7	(-0.3)	(-1.0)	117.3	(0.0)	(-0.7)	117.4	(-2.1)	(-2.4)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	71.4	(+2.8)	(+0.9)	82.1	(+1.6)	(0.0)	89.0	(+0.6)	(-0.5)	94.8	(-0.2)	(-1.0)	107.3	(+2.2)	(+1.2)	122.5	(-1.5)	(-1.9)
50 m	74.9	(+3.1)	(+1.1)	85.7	(+1.5)	(-0.1)	92.0	(+0.5)	(-0.6)	97.3	(-0.3)	(-1.0)	107.0	(0.0)	(-0.8)	113.6	(-1.2)	(-1.8)
100 m	75.8	(+3.1)	(+1.1)	86.1	(+1.4)	(-0.2)	92.1	(+0.5)	(-0.6)	97.3	(-0.3)	(-1.1)	106.0	(-0.4)	(-1.2)	107.4	(-1.2)	(-1.7)
Juan de Fuca																		
7.5 m	78.8	(+3.8)	(+1.1)	88.1	(+1.7)	(0.0)	93.6	(+0.7)	(-0.5)	98.6	(-0.1)	(-1.0)	110.9	(+2.7)	(+1.4)	124.2	(-1.5)	(-2.0)
50 m	82.7	(+3.5)	(+1.0)	91.2	(+1.4)	(-0.1)	96.2	(+0.5)	(-0.6)	100.9	(-0.2)	(-1.1)	110.7	(+0.2)	(-0.8)	115.5	(-1.2)	(-1.8)
100 m	83.1	(+3.1)	(+0.8)	91.3	(+1.3)	(-0.2)	96.2	(+0.5)	(-0.6)	100.9	(-0.2)	(-1.1)	109.6	(-0.4)	(-1.3)	109.7	(-1.2)	(-1.8)
Haro Strait																		
7.5 m	64.8	(+2.9)	(+1.9)	76.7	(+3.2)	(+1.4)	85.9	(+2.1)	(+0.1)	93.2	(+0.1)	(-1.3)	118.6	(+8.0)	(+3.1)	123.0	(-2.5)	(-2.9)
50 m	67.8	(+3.2)	(+2.1)	80.0	(+3.5)	(+1.5)	88.7	(+1.8)	(-0.1)	95.7	(-0.2)	(-1.4)	112.2	(+1.9)	(+0.1)	114.2	(-2.4)	(-2.8)
100 m	66.2	(+3.0)	(+2.0)	79.7	(+4.5)	(+1.7)	88.6	(+1.9)	(-0.1)	95.3	(-0.3)	(-1.5)	108.0	(-0.7)	(-1.8)	107.3	(-2.6)	(-3.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	69.2	(+2.4)	(+0.8)	79.7	(+1.5)	(0.0)	86.4	(+0.6)	(-0.5)	92.3	(-0.1)	(-1.0)	107.0	(+4.3)	(+3.1)	120.7	(-1.4)	(-1.8)
50 m	72.4	(+2.8)	(+1.0)	83.0	(+1.4)	(-0.1)	89.3	(+0.4)	(-0.6)	94.7	(-0.3)	(-1.1)	105.0	(+0.6)	(-0.4)	111.7	(-1.1)	(-1.6)
100 m	73.0	(+2.9)	(+1.0)	83.2	(+1.4)	(-0.2)	89.2	(+0.4)	(-0.7)	94.3	(-0.3)	(-1.1)	103.2	(-0.1)	(-1.0)	104.5	(-1.0)	(-1.6)
Juan de Fuca																		
7.5 m	77.6	(+3.6)	(+1.0)	86.9	(+1.5)	(-0.1)	92.0	(+0.4)	(-0.7)	96.5	(-0.3)	(-1.1)	109.5	(+4.4)	(+3.3)	120.6	(-1.3)	(-1.8)

50 m	81.0	(+3.5)	(+1.0)	89.7	(+1.3)	(-0.2)	94.5	(+0.3)	(-0.8)	98.8	(-0.3)	(-1.2)	107.9	(+0.4)	(-0.7)	112.1	(-1.0)	(-1.6)
100 m	81.0	(+3.4)	(+0.9)	89.6	(+1.2)	(-0.3)	94.3	(+0.3)	(-0.8)	98.6	(-0.3)	(-1.2)	106.2	(-0.5)	(-1.4)	106.4	(-1.1)	(-1.6)
Haro-Boundary																		
7.5 m	72.9	(+3.4)	(+1.7)	82.7	(+2.3)	(+0.7)	89.7	(+1.6)	(0.0)	97.2	(+0.7)	(-0.5)	126.0	(+2.5)	(+1.4)	125.7	(-1.3)	(-1.8)
50 m	76.0	(+3.4)	(+1.7)	85.5	(+2.2)	(+0.7)	92.1	(+1.4)	(-0.1)	98.7	(+0.5)	(-0.8)	117.8	(+2.0)	(+0.8)	116.9	(-1.1)	(-1.7)
100 m	74.6	(+2.9)	(+1.2)	84.1	(+2.3)	(+0.5)	90.8	(+1.6)	(-0.1)	97.4	(+0.4)	(-1.0)	110.8	(+0.9)	(-0.5)	109.5	(-1.4)	(-2.0)
Strait of Georgia																		
7.5 m	81.2	(+0.6)	(-0.4)	89.7	(-0.2)	(-0.8)	96.3	(-0.5)	(-1.0)	102.5	(-0.9)	(-1.4)	130.1	(+0.1)	(-0.3)	127.8	(-2.4)	(-2.7)
50 m	83.3	(+0.8)	(-0.3)	90.7	(0.0)	(-0.7)	95.5	(-0.5)	(-0.9)	100.4	(-0.9)	(-1.3)	121.4	(-0.1)	(-0.6)	119.2	(-2.5)	(-2.8)
100 m	82.6	(+0.8)	(-0.3)	89.4	(0.0)	(-0.6)	93.7	(-0.4)	(-0.9)	98.1	(-1.0)	(-1.4)	114.5	(-0.4)	(-0.8)	113.0	(-2.8)	(-3.0)

Table 7b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	81.8	(-0.2)	(-0.3)	86.3	(-0.6)	(-0.6)	97.7	(-1.5)	(-1.5)	121.8	(-2.6)	(-2.6)
50 m	80.7	(0.0)	(0.0)	80.9	(0.0)	(0.0)	83.0	(-0.3)	(-0.3)	88.6	(-0.6)	(-0.6)	100.0	(-1.6)	(-1.6)	112.2	(-2.5)	(-2.5)
100 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.4	(-0.2)	(-0.3)	86.9	(-0.6)	(-0.6)	97.1	(-1.7)	(-1.7)	103.0	(-2.3)	(-2.3)
Swiftsure Bank east																		
7.5 m	83.0	(+1.2)	(+0.4)	92.0	(+1.5)	(0.0)	98.7	(+0.6)	(-0.5)	104.6	(-0.1)	(-1.0)	119.3	(+4.3)	(+3.2)	132.9	(-1.4)	(-1.8)
50 m	85.4	(+2.1)	(+0.8)	95.3	(+1.4)	(-0.1)	101.6	(+0.4)	(-0.6)	106.9	(-0.3)	(-1.1)	117.4	(+0.7)	(-0.4)	124.0	(-1.1)	(-1.6)
100 m	86.0	(+2.2)	(+0.8)	95.6	(+1.3)	(-0.2)	101.5	(+0.4)	(-0.7)	106.6	(-0.3)	(-1.1)	115.6	(-0.1)	(-1.0)	116.8	(-1.0)	(-1.6)
Juan de Fuca west																		
7.5 m	90.2	(+3.3)	(+0.9)	99.1	(+1.7)	(0.0)	104.7	(+0.8)	(-0.6)	109.7	(-0.1)	(-1.1)	126.1	(+6.7)	(+4.5)	136.1	(-1.2)	(-1.8)
50 m	93.9	(+3.1)	(+0.8)	102.1	(+1.4)	(-0.1)	107.2	(+0.6)	(-0.6)	111.9	(-0.2)	(-1.1)	122.7	(+1.3)	(0.0)	127.4	(-0.9)	(-1.6)
100 m	94.1	(+2.9)	(+0.6)	102.1	(+1.4)	(-0.1)	107.1	(+0.6)	(-0.6)	111.9	(-0.2)	(-1.1)	121.3	(+0.2)	(-0.9)	121.4	(-1.0)	(-1.6)
Juan de Fuca east																		
7.5 m	87.1	(+2.0)	(+0.8)	95.2	(+1.2)	(+0.1)	100.7	(+0.5)	(-0.5)	106.6	(-0.1)	(-0.8)	128.3	(+1.4)	(+0.5)	133.4	(-1.3)	(-1.7)
50 m	90.3	(+2.1)	(+0.9)	98.2	(+1.0)	(0.0)	103.2	(+0.3)	(-0.6)	108.2	(-0.4)	(-1.1)	121.3	(+0.6)	(-0.4)	124.4	(-1.2)	(-1.7)
100 m	89.7	(+1.8)	(+0.6)	97.0	(+0.9)	(-0.2)	101.8	(+0.3)	(-0.6)	106.6	(-0.4)	(-1.1)	116.0	(-0.4)	(-1.2)	116.9	(-1.1)	(-1.5)
Haro-Boundary																		
7.5 m	81.1	(+0.2)	(0.0)	88.6	(+4.6)	(+1.8)	98.7	(+3.3)	(+0.6)	107.0	(+0.9)	(-0.8)	135.2	(+10.8)	(+3.4)	137.8	(-2.4)	(-2.8)
50 m	81.2	(+0.3)	(0.0)	91.5	(+6.1)	(+2.2)	101.4	(+3.0)	(+0.4)	109.4	(+0.7)	(-1.0)	128.0	(+4.2)	(+1.2)	128.7	(-2.1)	(-2.5)
100 m	80.9	(+0.2)	(0.0)	92.0	(+6.4)	(+2.2)	101.6	(+2.8)	(+0.3)	109.3	(+0.5)	(-1.1)	123.4	(+1.1)	(-0.6)	123.6	(-2.5)	(-2.8)
Gulf Islands																		
7.5 m	78.9	(0.0)	(0.0)	80.8	(+1.1)	(+0.4)	94.4	(0.0)	(-0.1)	123.7	(-0.2)	(-0.2)	140.3	(-0.3)	(-0.3)	134.5	(-0.7)	(-0.7)
50 m	78.9	(0.0)	(0.0)	82.2	(+1.7)	(+0.5)	96.5	(+0.1)	(-0.1)	115.4	(-0.1)	(-0.1)	129.7	(-0.1)	(-0.1)	124.6	(-0.7)	(-0.7)
100 m	78.9	(0.0)	(0.0)	82.1	(+1.5)	(+0.4)	95.8	(0.0)	(-0.1)	109.1	(-0.1)	(-0.2)	119.9	(+0.1)	(+0.1)	117.8	(-1.1)	(-1.1)
Strait of Georgia South																		
7.5 m	91.5	(+0.2)	(-0.5)	99.2	(-0.4)	(-0.9)	105.2	(-0.7)	(-1.1)	111.2	(-1.1)	(-1.5)	138.5	(0.0)	(-0.5)	137.6	(-2.3)	(-2.5)

50 m	94.0	(+0.4)	(-0.4)	100.5	(-0.3)	(-0.8)	105.0	(-0.7)	(-1.1)	109.7	(-1.1)	(-1.5)	129.5	(-0.4)	(-0.7)	128.9	(-2.4)	(-2.6)
100 m	93.8	(+0.4)	(-0.4)	99.8	(-0.3)	(-0.8)	103.8	(-0.7)	(-1.1)	108.0	(-1.2)	(-1.5)	123.1	(-0.7)	(-1.0)	122.8	(-3.0)	(-3.2)
Strait of Georgia North																		
7.5 m	85.0	(-0.4)	(-0.6)	90.6	(-0.7)	(-0.8)	95.1	(-0.9)	(-1.0)	99.7	(-1.4)	(-1.6)	117.6	(-0.2)	(-0.2)	126.7	(-1.2)	(-1.2)
50 m	86.7	(-0.3)	(-0.6)	91.8	(-0.8)	(-0.9)	95.5	(-1.0)	(-1.1)	99.6	(-1.2)	(-1.2)	109.1	(-0.9)	(-0.9)	118.2	(-1.1)	(-1.1)
100 m	86.6	(-0.3)	(-0.5)	91.6	(-0.8)	(-0.9)	95.2	(-1.0)	(-1.0)	99.2	(-1.1)	(-1.1)	106.8	(-0.8)	(-0.9)	112.0	(-1.1)	(-1.1)
Salish Sea Total																		
7.5 m	95.8	(+1.1)	(+0.1)	103.7	(+0.7)	(-0.3)	109.8	(+0.2)	(-0.7)	124.4	(-0.2)	(-0.3)	143.5	(+0.6)	(+0.1)	143.7	(-1.8)	(-2.1)
50 m	98.5	(+1.4)	(+0.2)	106.1	(+0.8)	(-0.3)	111.5	(+0.3)	(-0.6)	119.1	(-0.2)	(-0.7)	134.5	(+0.6)	(-0.1)	134.7	(-1.7)	(-2.0)
100 m	98.5	(+1.4)	(+0.2)	105.8	(+0.8)	(-0.3)	111.0	(+0.4)	(-0.6)	116.9	(-0.3)	(-1.0)	128.7	(+0.1)	(-0.8)	128.7	(-2.1)	(-2.4)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.9	(+1.8)	(+0.6)	93.8	(+1.6)	(0.0)	100.6	(+0.6)	(-0.5)	106.5	(-0.2)	(-1.0)	119.1	(+2.3)	(+1.3)	134.3	(-1.5)	(-1.9)
50 m	86.8	(+2.7)	(+1.0)	97.3	(+1.5)	(-0.1)	103.6	(+0.5)	(-0.6)	109.0	(-0.3)	(-1.0)	118.7	(+0.1)	(-0.8)	125.3	(-1.2)	(-1.7)
100 m	87.8	(+2.7)	(+0.9)	97.8	(+1.4)	(-0.2)	103.8	(+0.5)	(-0.6)	109.0	(-0.3)	(-1.1)	117.8	(-0.4)	(-1.2)	119.2	(-1.1)	(-1.7)
Juan de Fuca																		
7.5 m	90.4	(+3.7)	(+1.1)	99.7	(+1.7)	(0.0)	105.2	(+0.7)	(-0.5)	110.3	(-0.1)	(-1.0)	122.7	(+2.8)	(+1.5)	136.0	(-1.5)	(-2.0)
50 m	94.4	(+3.5)	(+1.0)	102.9	(+1.4)	(-0.1)	107.9	(+0.5)	(-0.6)	112.5	(-0.2)	(-1.1)	122.4	(+0.3)	(-0.8)	127.3	(-1.2)	(-1.8)
100 m	94.8	(+3.1)	(+0.8)	102.9	(+1.3)	(-0.2)	107.9	(+0.5)	(-0.6)	112.5	(-0.2)	(-1.1)	121.3	(-0.4)	(-1.3)	121.5	(-1.2)	(-1.8)
Haro Strait																		
7.5 m	81.1	(+0.4)	(+0.3)	88.5	(+3.0)	(+1.3)	97.5	(+2.2)	(+0.1)	104.9	(+0.1)	(-1.3)	130.4	(+8.0)	(+3.1)	134.7	(-2.4)	(-2.8)
50 m	82.1	(+1.0)	(+0.7)	91.6	(+3.5)	(+1.5)	100.3	(+1.9)	(-0.1)	107.4	(-0.1)	(-1.4)	123.9	(+2.0)	(+0.1)	125.9	(-2.3)	(-2.8)
100 m	81.5	(+0.6)	(+0.4)	91.4	(+4.5)	(+1.7)	100.3	(+2.0)	(-0.1)	107.0	(-0.3)	(-1.5)	119.8	(-0.6)	(-1.8)	119.0	(-2.6)	(-3.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	82.8	(+1.1)	(+0.4)	91.4	(+1.5)	(0.0)	98.1	(+0.6)	(-0.5)	104.0	(-0.1)	(-1.0)	118.8	(+4.4)	(+3.2)	132.4	(-1.3)	(-1.8)
50 m	85.0	(+1.9)	(+0.7)	94.7	(+1.4)	(-0.1)	100.9	(+0.4)	(-0.6)	106.3	(-0.3)	(-1.1)	116.8	(+0.7)	(-0.4)	123.4	(-1.0)	(-1.6)
100 m	85.6	(+2.1)	(+0.8)	94.9	(+1.3)	(-0.2)	100.9	(+0.4)	(-0.6)	106.0	(-0.3)	(-1.1)	115.0	(-0.1)	(-1.0)	116.2	(-1.0)	(-1.6)
Juan de Fuca																		
7.5 m	89.1	(+3.5)	(+1.0)	98.4	(+1.5)	(-0.1)	103.5	(+0.5)	(-0.7)	108.1	(-0.3)	(-1.1)	121.3	(+4.5)	(+3.5)	132.4	(-1.3)	(-1.8)

50 m	92.5	(+3.5)	(+1.0)	101.3	(+1.3)	(-0.2)	106.0	(+0.3)	(-0.8)	110.4	(-0.3)	(-1.2)	119.7	(+0.4)	(-0.6)	123.8	(-1.0)	(-1.6)
100 m	92.6	(+3.3)	(+0.9)	101.1	(+1.2)	(-0.3)	105.9	(+0.3)	(-0.8)	110.2	(-0.3)	(-1.2)	117.9	(-0.5)	(-1.4)	118.1	(-1.1)	(-1.6)
Haro-Boundary																		
7.5 m	85.6	(+2.3)	(+1.2)	94.4	(+2.2)	(+0.7)	101.4	(+1.6)	(0.0)	108.9	(+0.7)	(-0.5)	137.2	(+2.8)	(+1.5)	137.4	(-1.3)	(-1.8)
50 m	88.2	(+2.8)	(+1.4)	97.2	(+2.2)	(+0.7)	103.8	(+1.4)	(-0.1)	110.4	(+0.5)	(-0.8)	129.1	(+2.2)	(+0.8)	128.5	(-1.2)	(-1.8)
100 m	87.0	(+2.1)	(+0.9)	95.8	(+2.3)	(+0.5)	102.5	(+1.6)	(-0.1)	109.1	(+0.4)	(-1.0)	122.5	(+0.9)	(-0.6)	121.2	(-1.4)	(-2.0)
Strait of Georgia																		
7.5 m	92.8	(+0.6)	(-0.4)	101.3	(-0.2)	(-0.8)	107.9	(-0.5)	(-1.0)	114.1	(-0.9)	(-1.4)	141.8	(+0.1)	(-0.3)	139.5	(-2.4)	(-2.7)
50 m	94.8	(+0.8)	(-0.3)	102.2	(0.0)	(-0.7)	107.1	(-0.5)	(-0.9)	112.0	(-0.9)	(-1.3)	133.0	(-0.1)	(-0.6)	130.8	(-2.5)	(-2.8)
100 m	94.1	(+0.8)	(-0.3)	100.9	(0.0)	(-0.6)	105.2	(-0.4)	(-0.9)	109.6	(-1.0)	(-1.4)	126.1	(-0.4)	(-0.9)	124.5	(-2.8)	(-3.0)

Table 7c: Modelled received sound levels (RL) for each subregion at in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L5			L25			L50			L75			L95			Leq		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
50 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
100 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.8	(+0.3)	(-0.2)	88.5	(0.0)	(-0.7)	105.3	(+6.4)	(+4.8)	118.2	(-0.8)	(-1.5)
50 m	83.3	(0.0)	(0.0)	83.8	(+0.2)	(0.0)	86.2	(+0.3)	(-0.3)	90.3	(-0.1)	(-0.9)	102.2	(+1.8)	(+0.4)	109.2	(-0.5)	(-1.3)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(0.0)	86.3	(+0.3)	(-0.4)	90.1	(-0.2)	(-0.9)	100.2	(+0.7)	(-0.5)	102.2	(-0.5)	(-1.3)
Juan de Fuca west																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(0.0)	87.5	(+0.7)	(-0.4)	92.3	(0.0)	(-1.0)	112.9	(+9.4)	(+6.0)	122.2	(-1.1)	(-1.7)
50 m	83.3	(0.0)	(0.0)	85.6	(+0.8)	(-0.1)	89.7	(+0.6)	(-0.5)	94.4	(-0.1)	(-1.0)	108.2	(+2.8)	(+0.9)	113.4	(-0.8)	(-1.6)
100 m	83.3	(0.0)	(0.0)	85.8	(+0.8)	(-0.1)	89.9	(+0.6)	(-0.5)	94.5	(-0.1)	(-1.0)	106.2	(+1.2)	(-0.4)	107.2	(-0.8)	(-1.6)
Juan de Fuca east																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	85.1	(+0.4)	(-0.1)	88.6	(+0.3)	(-0.5)	108.9	(+5.0)	(+1.5)	116.0	(-0.3)	(-1.1)
50 m	83.3	(0.0)	(0.0)	84.3	(+0.3)	(0.0)	86.5	(+0.4)	(-0.3)	90.2	(+0.2)	(-0.7)	103.4	(+2.5)	(+0.3)	107.2	(-0.1)	(-1.0)
100 m	83.3	(0.0)	(0.0)	84.2	(+0.3)	(0.0)	86.1	(+0.3)	(-0.3)	89.3	(+0.1)	(-0.7)	99.3	(+1.0)	(-0.5)	99.9	(-0.2)	(-1.1)
Haro-Boundary																		
7.5 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	84.5	(+0.9)	(+0.2)	90.2	(+0.9)	(-0.7)	119.9	(+11.5)	(+3.4)	120.3	(-1.5)	(-2.1)
50 m	83.1	(0.0)	(0.0)	83.1	(+0.1)	(+0.1)	85.8	(+1.4)	(+0.2)	92.4	(+0.7)	(-0.9)	112.4	(+5.1)	(+1.5)	111.6	(-1.4)	(-2.1)
100 m	83.1	(0.0)	(0.0)	83.2	(+0.1)	(+0.1)	86.2	(+1.4)	(+0.1)	92.5	(+0.6)	(-1.0)	107.7	(+1.8)	(-0.2)	105.3	(-1.5)	(-2.1)
Gulf Islands																		
7.5 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	92.8	(-0.7)	(-0.7)	91.3	(-1.9)	(-1.9)
50 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	84.8	(-0.4)	(-0.6)	84.4	(-1.3)	(-1.3)
100 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	82.8	(-0.3)	(-0.5)	82.4	(-0.5)	(-0.6)
Strait of Georgia South																		
7.5 m	83.3	(0.0)	(0.0)	83.9	(0.0)	(-0.2)	86.6	(-0.3)	(-0.7)	91.3	(-0.8)	(-1.3)	120.3	(+0.3)	(-0.4)	116.8	(-2.5)	(-2.8)

50 m	83.3	(0.0)	(0.0)	83.9	(0.0)	(-0.1)	85.8	(-0.2)	(-0.5)	89.3	(-0.7)	(-1.2)	110.9	(0.0)	(-0.6)	107.8	(-2.4)	(-2.7)
100 m	83.3	(0.0)	(0.0)	83.6	(0.0)	(-0.1)	84.7	(-0.1)	(-0.3)	87.2	(-0.5)	(-1.0)	103.4	(-0.3)	(-1.0)	101.2	(-2.8)	(-3.1)
Strait of Georgia North																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	92.1	(0.0)	(0.0)	92.3	(+0.1)	(0.0)	94.0	(+0.3)	(-0.2)	97.8	(0.0)	(-0.8)	123.7	(+3.3)	(+1.4)	126.3	(-1.3)	(-1.9)
50 m	92.1	(0.0)	(0.0)	92.8	(+0.2)	(0.0)	95.0	(+0.4)	(-0.3)	99.0	(+0.1)	(-0.9)	116.0	(+2.4)	(+0.6)	117.5	(-1.0)	(-1.8)
100 m	92.1	(0.0)	(0.0)	92.8	(+0.2)	(0.0)	94.9	(+0.4)	(-0.3)	98.8	(0.0)	(-0.9)	111.5	(+1.1)	(-0.4)	111.0	(-1.2)	(-1.8)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	85.5	(+0.4)	(-0.2)	89.9	(0.0)	(-0.8)	105.1	(+4.3)	(+2.9)	119.8	(-1.1)	(-1.7)
50 m	83.3	(0.0)	(0.0)	84.1	(+0.4)	(0.0)	87.4	(+0.4)	(-0.4)	92.0	(-0.2)	(-0.9)	103.4	(+1.1)	(-0.2)	110.9	(-0.8)	(-1.5)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.4)	(0.0)	87.7	(+0.4)	(-0.4)	92.2	(-0.2)	(-1.0)	102.3	(+0.3)	(-0.8)	104.7	(-0.8)	(-1.5)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(0.0)	87.6	(+0.7)	(-0.4)	92.4	(0.0)	(-0.9)	108.9	(+5.2)	(+3.4)	122.1	(-1.4)	(-2.0)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(-0.1)	89.8	(+0.6)	(-0.5)	94.5	(-0.1)	(-1.0)	107.2	(+1.4)	(-0.1)	113.3	(-1.1)	(-1.8)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(-0.1)	90.0	(+0.6)	(-0.5)	94.7	(-0.1)	(-1.0)	105.8	(+0.4)	(-0.8)	107.2	(-1.1)	(-1.8)
Haro Strait																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	84.4	(+0.7)	(+0.1)	88.6	(+0.3)	(-0.9)	114.8	(+8.9)	(+3.1)	117.9	(-2.0)	(-2.5)
50 m	83.3	(0.0)	(0.0)	83.3	(+0.1)	(+0.1)	85.5	(+1.1)	(+0.1)	90.5	(+0.1)	(-1.1)	108.0	(+2.7)	(+0.4)	109.2	(-1.9)	(-2.4)
100 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(+0.1)	85.8	(+1.1)	(0.0)	90.5	(-0.1)	(-1.3)	103.6	(-0.1)	(-1.5)	102.3	(-2.3)	(-2.8)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.6	(+0.3)	(-0.2)	88.0	(0.0)	(-0.7)	104.7	(+6.4)	(+4.9)	117.6	(-0.8)	(-1.5)
50 m	83.3	(0.0)	(0.0)	83.7	(+0.2)	(0.0)	85.9	(+0.3)	(-0.3)	89.8	(-0.1)	(-0.9)	101.6	(+1.8)	(+0.4)	108.7	(-0.5)	(-1.3)
100 m	83.3	(0.0)	(0.0)	83.8	(+0.2)	(0.0)	86.0	(+0.3)	(-0.3)	89.6	(-0.2)	(-0.9)	99.6	(+0.7)	(-0.5)	101.6	(-0.5)	(-1.3)

Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	83.7	(+0.2)	(0.0)	85.7	(+0.3)	(-0.3)	89.4	(0.0)	(-0.9)	107.8	(+7.9)	(+6.2)	118.0	(-1.2)	(-1.9)
50 m	83.3	(0.0)	(0.0)	84.5	(+0.5)	(-0.1)	87.4	(+0.3)	(-0.5)	91.4	(-0.1)	(-1.0)	104.3	(+2.2)	(+0.6)	109.2	(-0.9)	(-1.7)
100 m	83.3	(0.0)	(0.0)	84.7	(+0.5)	(-0.1)	87.7	(+0.3)	(-0.5)	91.6	(-0.2)	(-1.0)	101.8	(+0.6)	(-0.7)	103.2	(-0.9)	(-1.7)
Haro-Boundary																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.1)	(0.0)	85.5	(+0.8)	(0.0)	90.9	(+0.8)	(-0.6)	118.5	(+8.9)	(+2.8)	120.6	(-1.1)	(-1.8)
50 m	83.3	(0.0)	(0.0)	84.0	(+0.3)	(+0.1)	87.2	(+1.0)	(-0.1)	92.9	(+0.6)	(-0.8)	111.2	(+4.4)	(+1.2)	111.8	(-0.9)	(-1.7)
100 m	83.3	(0.0)	(0.0)	83.8	(+0.3)	(+0.1)	86.6	(+1.0)	(-0.1)	92.1	(+0.5)	(-0.9)	106.3	(+1.6)	(-0.3)	104.8	(-1.1)	(-1.9)
Strait of Georgia																		
7.5 m	83.3	(0.0)	(0.0)	84.8	(-0.1)	(-0.4)	89.4	(-0.4)	(-0.9)	95.1	(-0.9)	(-1.4)	124.2	(+0.2)	(-0.4)	120.8	(-2.4)	(-2.7)
50 m	83.3	(0.0)	(0.0)	84.9	(0.0)	(-0.3)	88.3	(-0.3)	(-0.8)	92.9	(-0.8)	(-1.3)	115.4	(0.0)	(-0.6)	112.0	(-2.3)	(-2.7)
100 m	83.3	(0.0)	(0.0)	84.1	(0.0)	(-0.2)	86.4	(-0.2)	(-0.6)	90.2	(-0.7)	(-1.3)	107.6	(-0.4)	(-1.0)	104.9	(-2.3)	(-2.7)

Table 7d: Modelled received sound levels (RL) for each subregion in a **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to the baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.6	(-0.1)	(-0.1)	88.0	(-0.4)	(-0.4)	97.9	(-1.5)	(-1.5)	121.8	(-2.6)	(-2.6)
50 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.1	(-0.1)	(-0.2)	89.7	(-0.5)	(-0.5)	100.1	(-1.6)	(-1.6)	112.2	(-2.5)	(-2.5)
100 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.9	(-0.1)	(-0.1)	88.4	(-0.4)	(-0.4)	97.3	(-1.6)	(-1.6)	103.1	(-2.3)	(-2.3)
Swiftsure Bank east																		
7.5 m	86.2	(+0.6)	(+0.2)	92.6	(+1.3)	(0.0)	98.9	(+0.6)	(-0.5)	104.7	(-0.1)	(-1.0)	119.5	(+4.4)	(+3.2)	133.1	(-1.3)	(-1.8)
50 m	87.5	(+1.2)	(+0.5)	95.6	(+1.3)	(-0.1)	101.7	(+0.4)	(-0.6)	107.0	(-0.3)	(-1.1)	117.5	(+0.7)	(-0.3)	124.1	(-1.0)	(-1.6)
100 m	87.9	(+1.3)	(+0.5)	95.8	(+1.3)	(-0.1)	101.6	(+0.4)	(-0.6)	106.7	(-0.3)	(-1.1)	115.7	(-0.1)	(-1.0)	117.0	(-1.0)	(-1.6)
Juan de Fuca west																		
7.5 m	91.0	(+2.6)	(+0.7)	99.2	(+1.6)	(0.0)	104.7	(+0.7)	(-0.5)	109.8	(-0.1)	(-1.1)	126.3	(+6.8)	(+4.5)	136.3	(-1.2)	(-1.8)
50 m	94.2	(+2.8)	(+0.7)	102.2	(+1.4)	(-0.1)	107.3	(+0.6)	(-0.6)	112.0	(-0.2)	(-1.1)	122.9	(+1.4)	(0.0)	127.5	(-0.9)	(-1.6)
100 m	94.5	(+2.6)	(+0.6)	102.2	(+1.4)	(-0.1)	107.2	(+0.6)	(-0.6)	111.9	(-0.2)	(-1.1)	121.4	(+0.2)	(-0.9)	121.6	(-1.0)	(-1.6)
Juan de Fuca east																		
7.5 m	88.6	(+1.3)	(+0.6)	95.5	(+1.1)	(0.0)	100.8	(+0.5)	(-0.5)	106.7	(-0.1)	(-0.8)	128.3	(+1.5)	(+0.5)	133.5	(-1.3)	(-1.7)
50 m	91.1	(+1.7)	(+0.7)	98.3	(+1.0)	(0.0)	103.3	(+0.3)	(-0.6)	108.3	(-0.4)	(-1.1)	121.3	(+0.6)	(-0.4)	124.4	(-1.2)	(-1.6)
100 m	90.6	(+1.4)	(+0.5)	97.3	(+0.9)	(-0.2)	101.9	(+0.3)	(-0.6)	106.6	(-0.4)	(-1.1)	116.1	(-0.4)	(-1.2)	117.0	(-1.0)	(-1.5)
Haro-Boundary																		
7.5 m	85.2	(+0.1)	(0.0)	89.7	(+3.1)	(+1.3)	98.9	(+3.2)	(+0.5)	107.0	(+0.9)	(-0.8)	135.4	(+10.8)	(+3.4)	137.9	(-2.4)	(-2.8)
50 m	85.2	(+0.1)	(0.0)	92.1	(+4.7)	(+1.9)	101.5	(+2.9)	(+0.4)	109.5	(+0.7)	(-1.0)	128.1	(+4.3)	(+1.2)	128.8	(-2.1)	(-2.5)
100 m	85.1	(+0.1)	(0.0)	92.5	(+5.0)	(+1.9)	101.8	(+2.7)	(+0.3)	109.4	(+0.5)	(-1.1)	123.6	(+1.1)	(-0.6)	123.7	(-2.5)	(-2.8)
Gulf Islands																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(+0.2)	94.6	(0.0)	(-0.1)	123.7	(-0.2)	(-0.2)	140.3	(-0.3)	(-0.3)	134.5	(-0.7)	(-0.7)
50 m	83.3	(0.0)	(0.0)	84.8	(+0.8)	(+0.3)	96.7	(0.0)	(-0.1)	115.4	(-0.1)	(-0.1)	129.7	(-0.1)	(-0.1)	124.6	(-0.7)	(-0.7)
100 m	83.3	(0.0)	(0.0)	84.8	(+0.7)	(+0.2)	95.9	(0.0)	(-0.1)	109.1	(-0.1)	(-0.2)	119.9	(+0.1)	(+0.1)	117.8	(-1.1)	(-1.1)
Strait of Georgia South																		
7.5 m	92.1	(+0.2)	(-0.4)	99.3	(-0.4)	(-0.9)	105.2	(-0.7)	(-1.1)	111.2	(-1.1)	(-1.5)	138.5	(0.0)	(-0.5)	137.6	(-2.3)	(-2.5)

50 m	94.3	(+0.4)	(-0.4)	100.6	(-0.3)	(-0.8)	105.1	(-0.7)	(-1.1)	109.7	(-1.1)	(-1.5)	129.5	(-0.4)	(-0.7)	128.9	(-2.4)	(-2.6)
100 m	94.1	(+0.4)	(-0.4)	99.9	(-0.3)	(-0.8)	103.9	(-0.7)	(-1.1)	108.1	(-1.2)	(-1.5)	123.1	(-0.7)	(-1.0)	122.8	(-3.0)	(-3.2)
Strait of Georgia North																		
7.5 m	87.2	(-0.2)	(-0.4)	91.4	(-0.6)	(-0.7)	95.4	(-0.8)	(-1.0)	99.8	(-1.4)	(-1.5)	117.6	(-0.2)	(-0.2)	126.7	(-1.2)	(-1.2)
50 m	88.3	(-0.2)	(-0.4)	92.3	(-0.7)	(-0.8)	95.7	(-1.0)	(-1.0)	99.7	(-1.2)	(-1.2)	109.1	(-0.9)	(-0.9)	118.2	(-1.1)	(-1.1)
100 m	88.2	(-0.2)	(-0.4)	92.2	(-0.7)	(-0.8)	95.4	(-0.9)	(-1.0)	99.3	(-1.1)	(-1.1)	106.8	(-0.8)	(-0.8)	112.0	(-1.1)	(-1.1)
Salish Sea Total																		
7.5 m	97.3	(+0.7)	(+0.1)	104.0	(+0.6)	(-0.3)	109.9	(+0.2)	(-0.7)	124.4	(-0.2)	(-0.3)	143.5	(+0.6)	(+0.2)	143.8	(-1.8)	(-2.1)
50 m	99.4	(+1.1)	(+0.2)	106.3	(+0.8)	(-0.3)	111.6	(+0.3)	(-0.6)	119.1	(-0.2)	(-0.7)	134.6	(+0.6)	(-0.1)	134.8	(-1.7)	(-2.0)
100 m	99.4	(+1.1)	(+0.1)	106.0	(+0.8)	(-0.3)	111.1	(+0.4)	(-0.6)	116.9	(-0.3)	(-1.0)	128.8	(+0.1)	(-0.7)	128.7	(-2.1)	(-2.4)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	86.6	(+0.9)	(+0.3)	94.2	(+1.5)	(0.0)	100.8	(+0.6)	(-0.5)	106.6	(-0.2)	(-1.0)	119.2	(+2.3)	(+1.3)	134.4	(-1.5)	(-1.9)
50 m	88.4	(+1.7)	(+0.7)	97.5	(+1.4)	(-0.1)	103.7	(+0.5)	(-0.6)	109.1	(-0.3)	(-1.0)	118.8	(+0.1)	(-0.8)	125.5	(-1.2)	(-1.7)
100 m	89.1	(+1.8)	(+0.7)	97.9	(+1.3)	(-0.1)	103.9	(+0.5)	(-0.6)	109.1	(-0.3)	(-1.1)	117.9	(-0.4)	(-1.2)	119.4	(-1.1)	(-1.7)
Juan de Fuca																		
7.5 m	91.2	(+2.9)	(+0.9)	99.8	(+1.6)	(0.0)	105.3	(+0.7)	(-0.5)	110.4	(-0.1)	(-1.0)	122.9	(+2.8)	(+1.6)	136.2	(-1.5)	(-2.0)
50 m	94.7	(+3.1)	(+0.9)	102.9	(+1.4)	(-0.1)	107.9	(+0.5)	(-0.6)	112.6	(-0.2)	(-1.1)	122.5	(+0.3)	(-0.8)	127.5	(-1.2)	(-1.8)
100 m	95.1	(+2.8)	(+0.7)	103.0	(+1.3)	(-0.2)	108.0	(+0.5)	(-0.6)	112.6	(-0.2)	(-1.1)	121.5	(-0.3)	(-1.3)	121.6	(-1.2)	(-1.8)
Haro Strait																		
7.5 m	85.3	(+0.1)	(+0.1)	89.6	(+2.1)	(+1.0)	97.7	(+2.1)	(+0.1)	105.0	(+0.1)	(-1.3)	130.6	(+8.1)	(+3.1)	134.8	(-2.4)	(-2.8)
50 m	85.7	(+0.4)	(+0.3)	92.2	(+2.9)	(+1.3)	100.4	(+1.9)	(-0.1)	107.5	(-0.1)	(-1.4)	124.0	(+2.0)	(+0.1)	126.0	(-2.3)	(-2.8)
100 m	85.5	(+0.2)	(+0.2)	92.1	(+3.6)	(+1.5)	100.4	(+2.0)	(0.0)	107.1	(-0.3)	(-1.5)	119.9	(-0.6)	(-1.8)	119.1	(-2.6)	(-3.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	86.0	(+0.5)	(+0.2)	92.0	(+1.2)	(0.0)	98.3	(+0.6)	(-0.5)	104.1	(-0.1)	(-1.0)	118.9	(+4.4)	(+3.3)	132.5	(-1.3)	(-1.8)
50 m	87.2	(+1.0)	(+0.4)	95.0	(+1.3)	(-0.1)	101.1	(+0.4)	(-0.6)	106.4	(-0.3)	(-1.1)	116.9	(+0.7)	(-0.3)	123.5	(-1.0)	(-1.6)
100 m	87.6	(+1.2)	(+0.5)	95.3	(+1.3)	(-0.1)	101.0	(+0.4)	(-0.6)	106.1	(-0.3)	(-1.1)	115.1	(-0.1)	(-1.0)	116.4	(-1.0)	(-1.6)
Juan de Fuca																		
7.5 m	90.1	(+2.5)	(+0.8)	98.5	(+1.4)	(-0.1)	103.6	(+0.5)	(-0.7)	108.1	(-0.3)	(-1.1)	121.5	(+4.6)	(+3.6)	132.5	(-1.3)	(-1.8)

50 m	93.0	(+3.0)	(+0.9)	101.3	(+1.3)	(-0.2)	106.1	(+0.3)	(-0.8)	110.4	(-0.3)	(-1.1)	119.8	(+0.5)	(-0.6)	123.9	(-1.0)	(-1.6)
100 m	93.1	(+2.8)	(+0.8)	101.2	(+1.2)	(-0.3)	105.9	(+0.3)	(-0.8)	110.3	(-0.3)	(-1.2)	118.0	(-0.5)	(-1.3)	118.3	(-1.1)	(-1.6)
Haro-Boundary																		
7.5 m	87.6	(+1.3)	(+0.7)	94.7	(+2.0)	(+0.7)	101.5	(+1.6)	(0.0)	108.9	(+0.7)	(-0.5)	137.3	(+2.9)	(+1.5)	137.5	(-1.3)	(-1.8)
50 m	89.4	(+1.9)	(+1.0)	97.4	(+2.1)	(+0.7)	103.8	(+1.4)	(-0.1)	110.5	(+0.5)	(-0.8)	129.2	(+2.2)	(+0.8)	128.6	(-1.1)	(-1.8)
100 m	88.5	(+1.4)	(+0.6)	96.0	(+2.1)	(+0.5)	102.6	(+1.6)	(-0.1)	109.2	(+0.4)	(-1.0)	122.6	(+0.9)	(-0.5)	121.3	(-1.4)	(-2.0)
Strait of Georgia																		
7.5 m	93.3	(+0.5)	(-0.3)	101.4	(-0.2)	(-0.8)	108.0	(-0.5)	(-1.0)	114.2	(-0.9)	(-1.4)	141.9	(+0.1)	(-0.4)	139.5	(-2.4)	(-2.7)
50 m	95.1	(+0.8)	(-0.3)	102.3	(0.0)	(-0.7)	107.2	(-0.5)	(-0.9)	112.1	(-0.9)	(-1.3)	133.1	(-0.1)	(-0.6)	130.9	(-2.5)	(-2.8)
100 m	94.5	(+0.7)	(-0.3)	101.0	(0.0)	(-0.6)	105.3	(-0.4)	(-0.9)	109.7	(-1.0)	(-1.4)	126.1	(-0.4)	(-0.9)	124.6	(-2.8)	(-3.0)

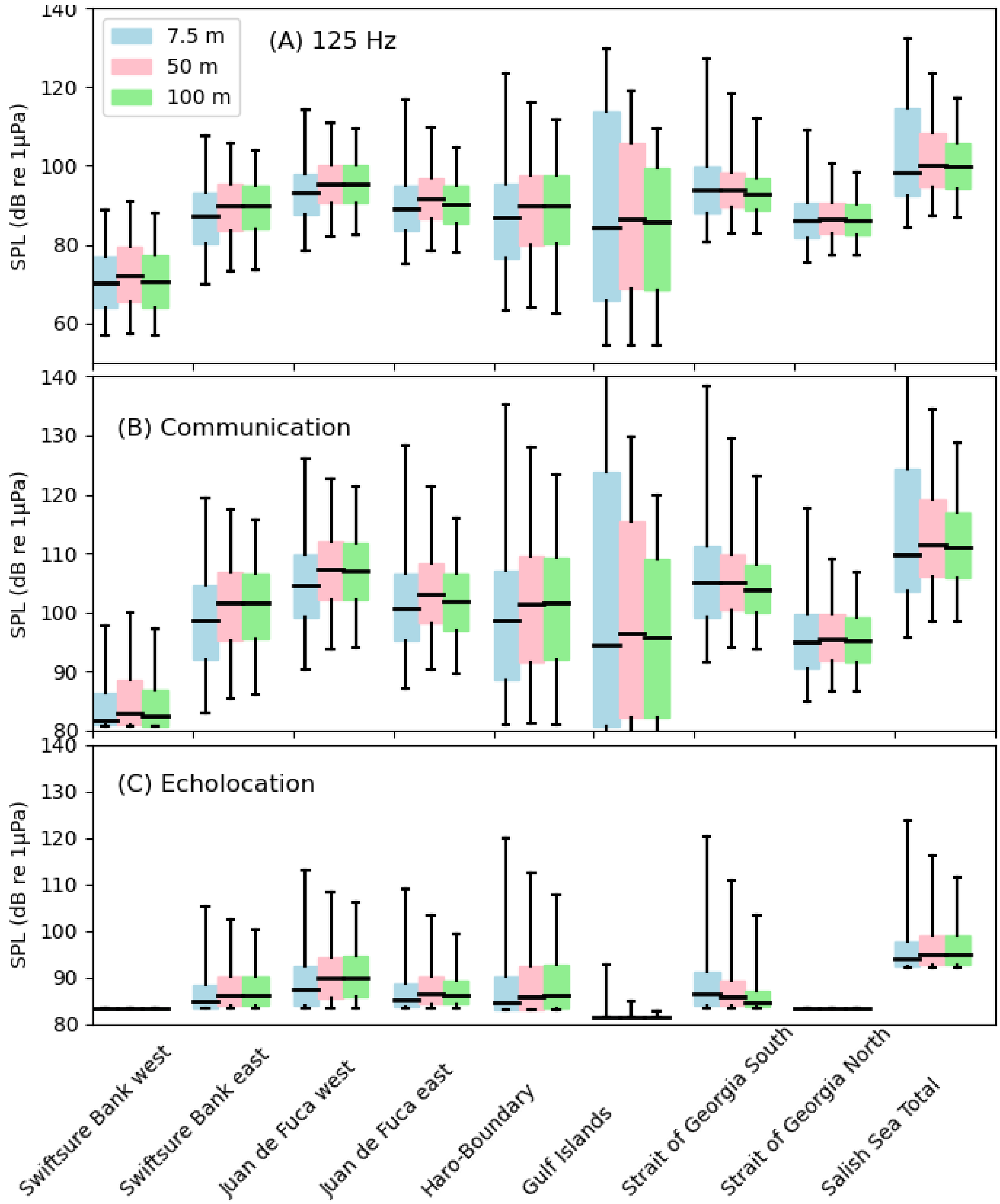

Figure 50: Boxplot comparing the sound pressure levels (SPL) in the **acoustically-derived subregions** for the slowdown scenario with **100% participation to current ECHO speeds throughout the full transit through the Salish Sea** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

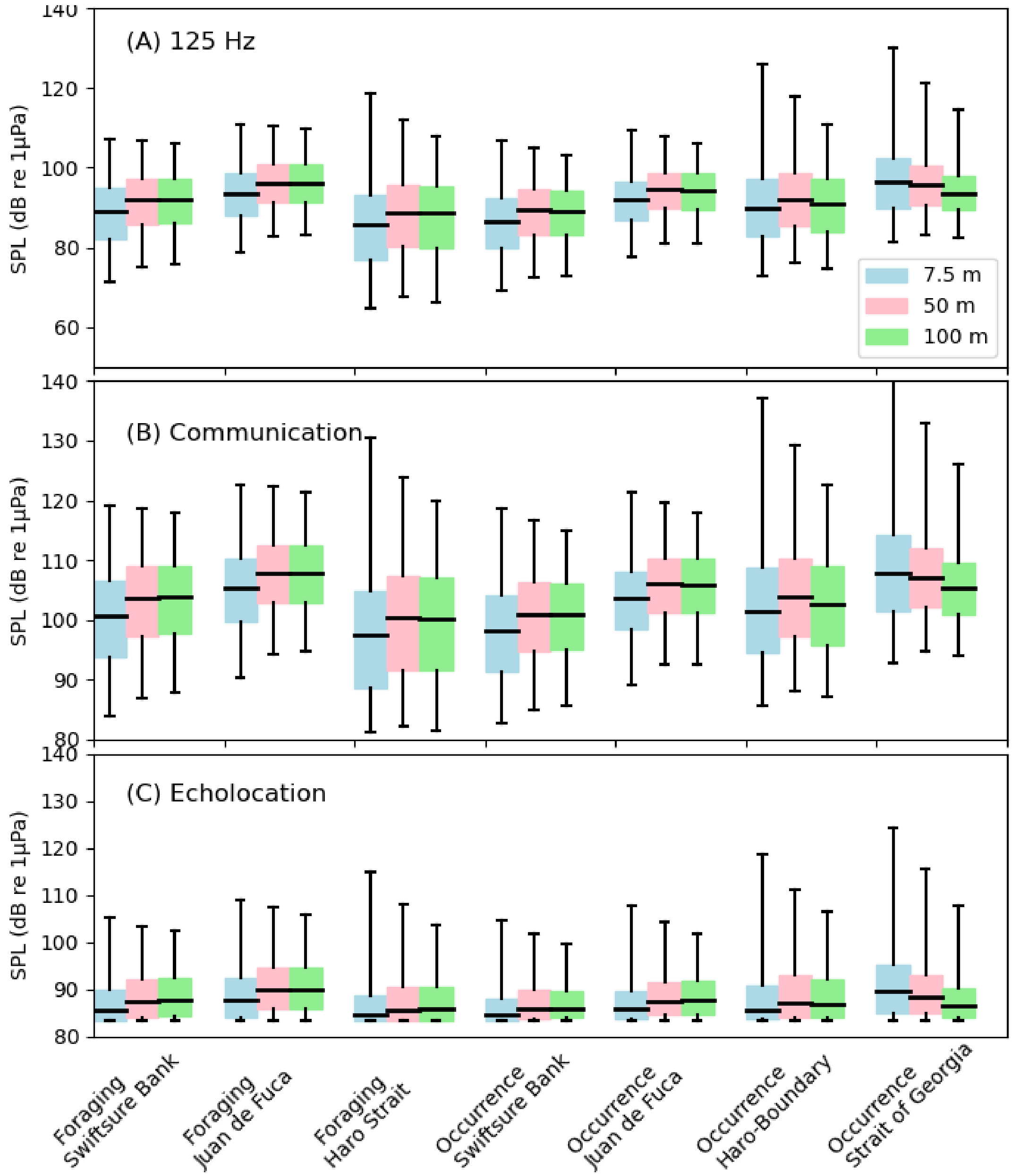

Figure 51: Boxplot comparing the sound pressure levels (SPL) in the **subregions derived from data on SRKW occurrence and foraging** for the slowdown scenario with **100% participation to current ECHO speeds throughout the full transit through the Salish Sea** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

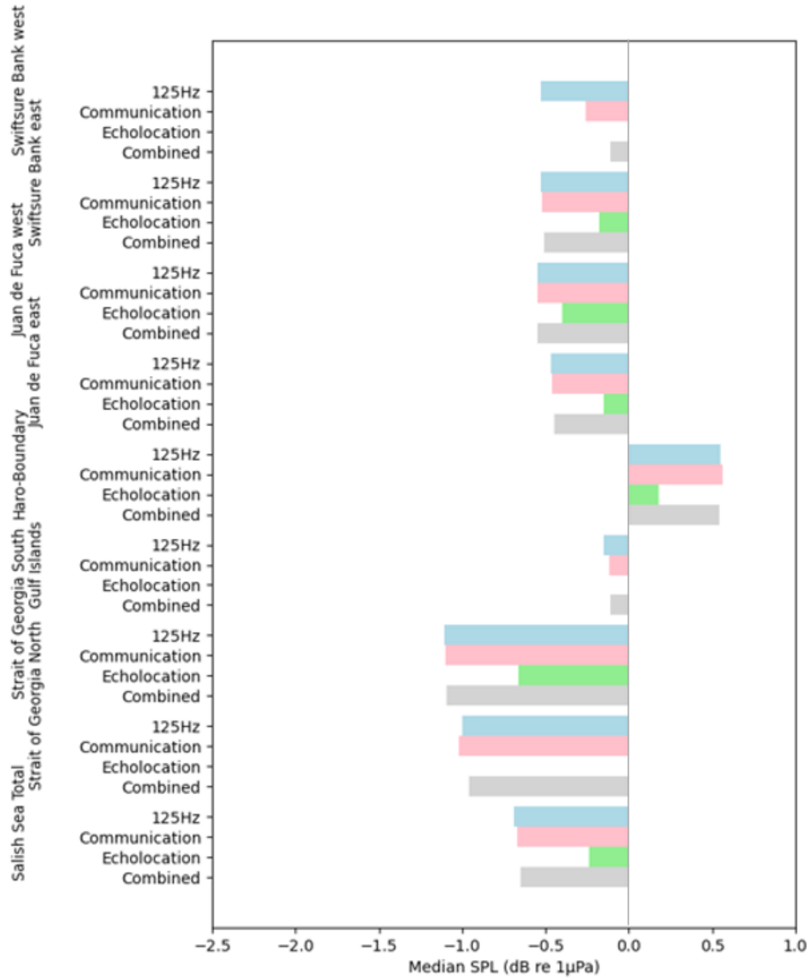

Figure 52: Bar chart showing the difference in decibels (dB) of the **100% participation of vessel speed reductions to current ECHO speeds throughout the full transit through the Salish Sea** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. RL **median** differences are shown for the **acoustically-derived subregions**.

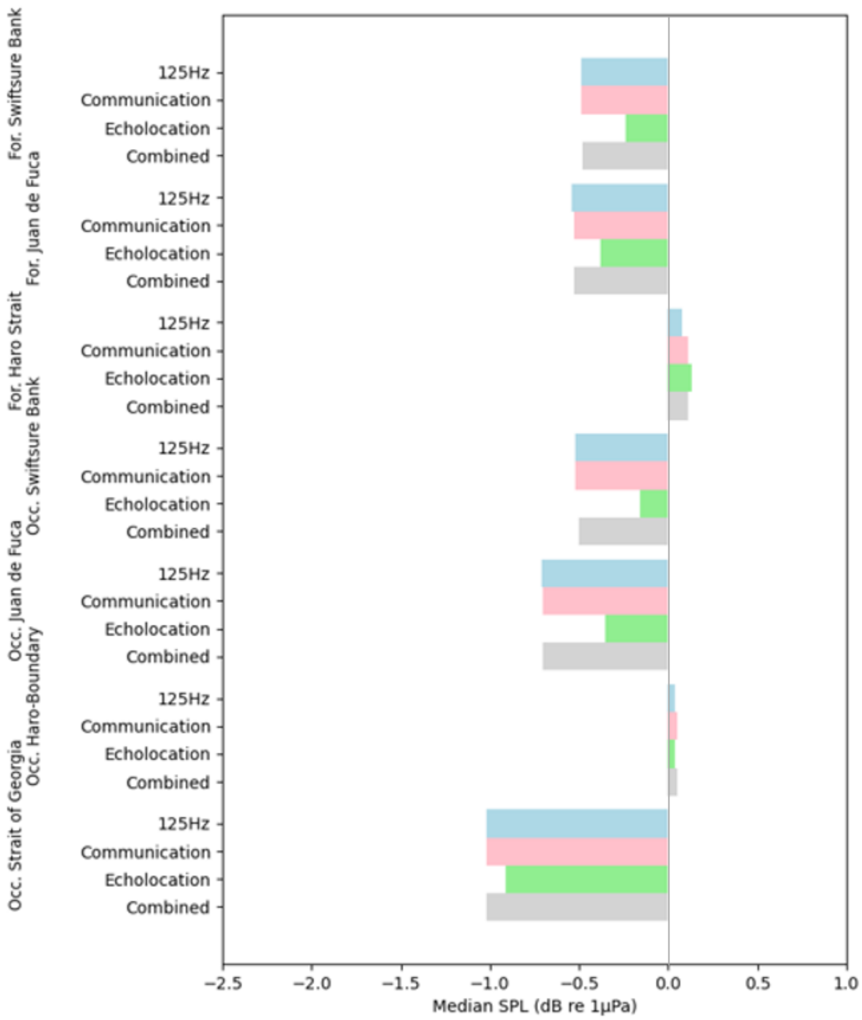

Figure 53: Bar chart showing the difference in decibels (dB) of the **100% participation of vessel speed reductions to current ECHO speeds throughout the full transit through the Salish Sea** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. RL **median** differences are shown for the **SRKW occurrence and foraging** subregions.

ECHO-inspired slowdown throughout the Salish Sea, 85% participation

As before, the slowdown scenario, now through the full study area, was considered at the more realistic participation level of 85%, drawing on the average participation rate in slowdowns in 2023 as reported by ECHO (Figures 54-56).

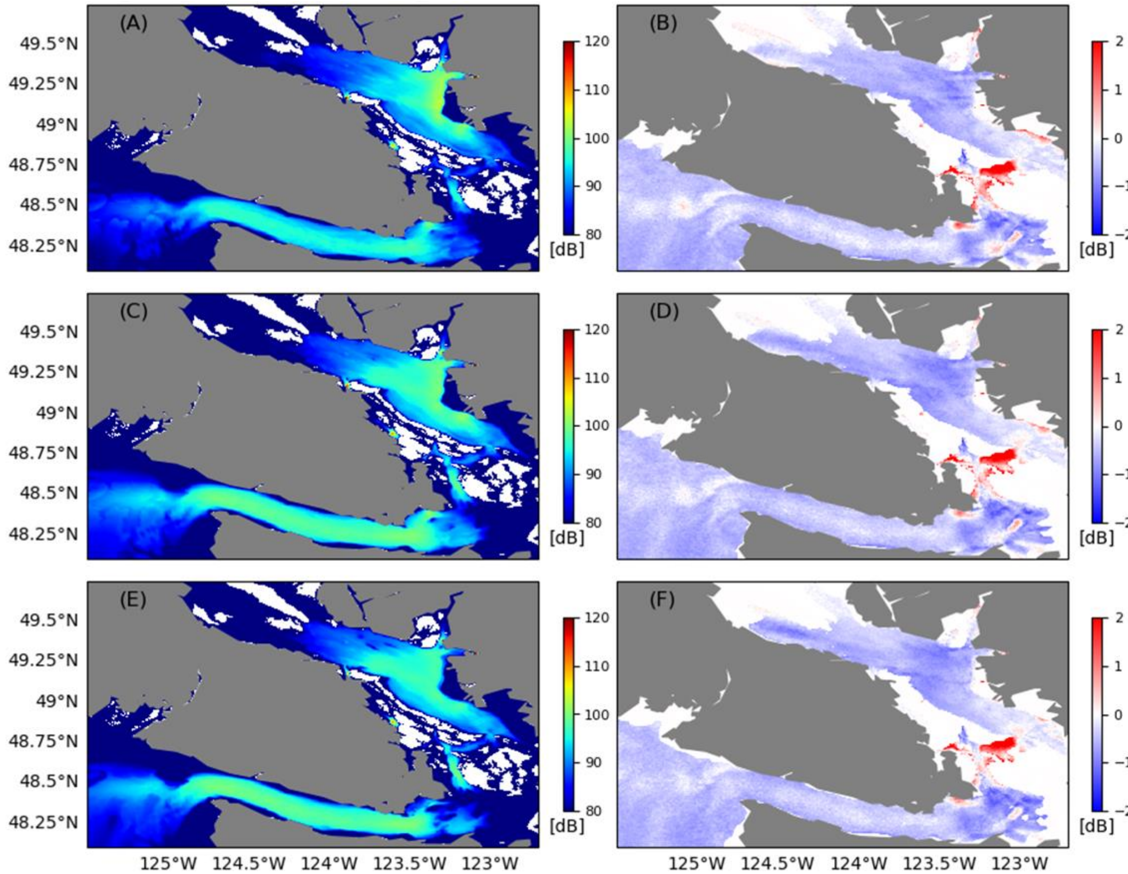

Figure 54: LEFT (A,C,E): Modelled **median** received sound levels at **125 Hz** for the ECHO-inspired slowdown scenario with **85% participation rate of vessels traveling at ECHO requested speeds throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

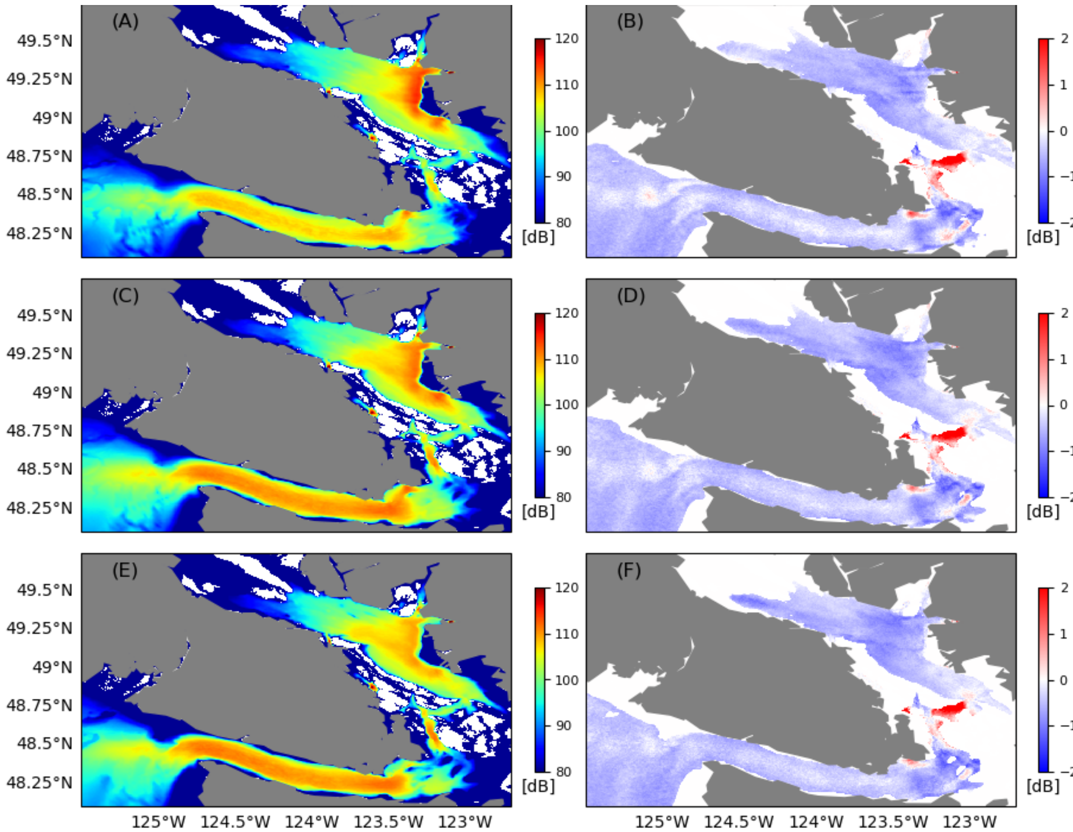

Figure 55: LEFT (A,C,E): Modelled **median** received sound levels in the SRKW **communication range (500 Hz to 15 kHz)** for the ECHO-inspired slowdown scenario with **85% participation rate of vessels traveling at ECHO requested speeds throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

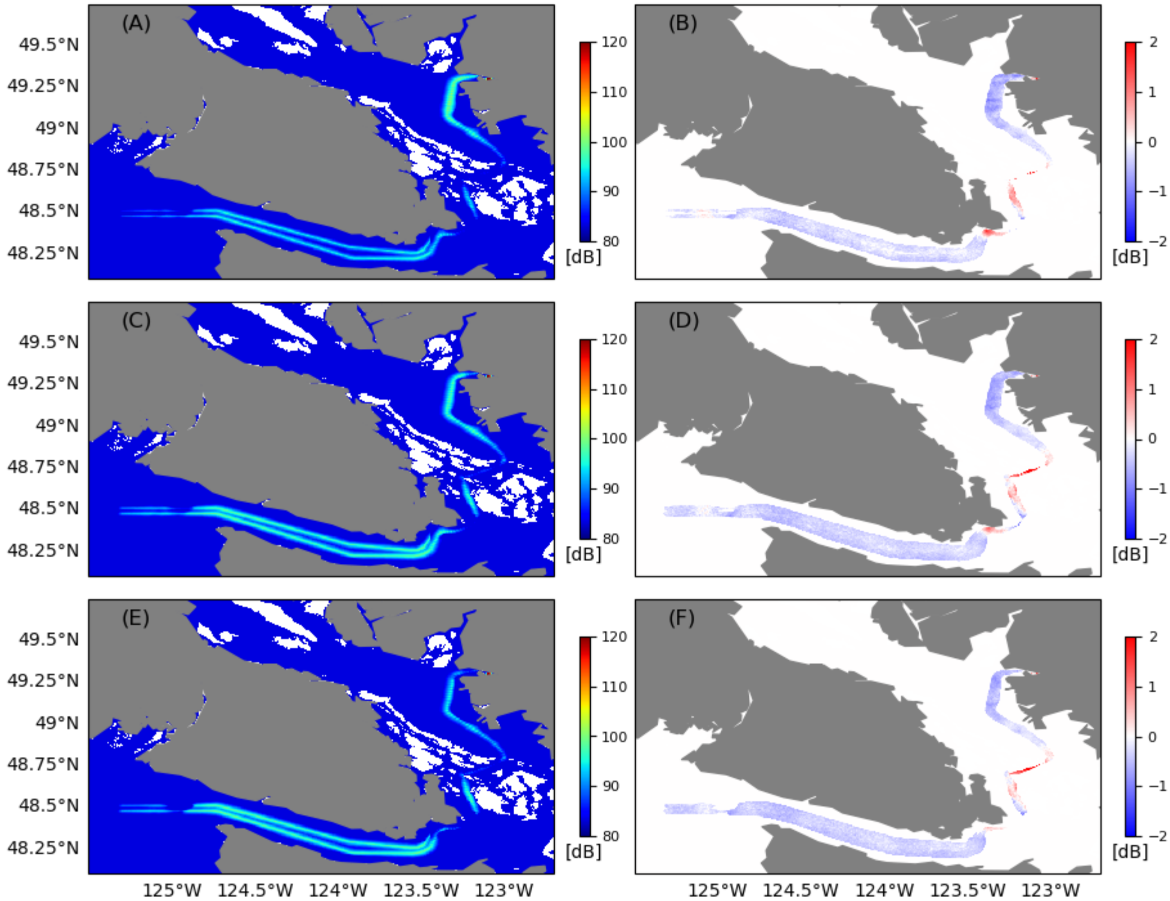

Figure 56: LEFT (A,C,E): Modelled median received sound levels in the SRKW **echolocation range (15-100 kHz)** for the ECHO-inspired slowdown scenario with **85% participation rate of vessels traveling at ECHO requested speeds throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

The values from Tables 8a-d were displayed as boxplots (Figures 57-58). Using median sound levels, the differences between this scenario and the baseline + TMX scenario show significant noise reductions in all subregions, except for Haro Strait-Boundary Pass area (Figures 59-60).

Table 8a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **85% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions:																		
Swiftsure Bank west																		
7.5 m	56.9	(+0.3)	(+0.2)	64.1	(0.0)	(-0.2)	70.4	(-0.3)	(-0.4)	77.1	(-0.5)	(-0.5)	89.3	(-1.0)	(-1.0)	114.0	(-1.7)	(-1.7)
50 m	57.3	(+0.4)	(+0.3)	65.3	(0.0)	(-0.1)	72.1	(-0.3)	(-0.3)	79.5	(-0.5)	(-0.5)	91.6	(-1.1)	(-1.1)	104.3	(-1.6)	(-1.6)
100 m	56.7	(+0.3)	(+0.2)	64.1	(0.0)	(-0.1)	70.7	(-0.3)	(-0.3)	77.3	(-0.5)	(-0.5)	88.4	(-1.2)	(-1.2)	94.9	(-1.5)	(-1.5)
Swiftsure Bank east																		
7.5 m	69.5	(+2.0)	(+0.5)	80.4	(+1.5)	(+0.1)	87.3	(+0.8)	(-0.3)	93.3	(+0.2)	(-0.7)	105.2	(+1.9)	(+0.8)	121.8	(-0.8)	(-1.2)
50 m	72.5	(+2.3)	(+0.6)	83.8	(+1.5)	(0.0)	90.2	(+0.7)	(-0.4)	95.6	(+0.1)	(-0.7)	105.5	(+0.4)	(-0.6)	112.8	(-0.6)	(-1.1)
100 m	73.1	(+2.4)	(+0.5)	84.0	(+1.5)	(0.0)	90.1	(+0.7)	(-0.4)	95.3	(0.0)	(-0.8)	104.0	(+0.1)	(-0.8)	105.6	(-0.5)	(-1.1)
Juan de Fuca west																		
7.5 m	78.2	(+3.1)	(+0.6)	87.5	(+1.7)	(+0.1)	93.2	(+1.0)	(-0.3)	98.4	(+0.2)	(-0.7)	111.5	(+3.8)	(+1.6)	124.9	(-0.6)	(-1.2)
50 m	81.9	(+2.9)	(+0.5)	90.6	(+1.5)	(0.0)	95.8	(+0.8)	(-0.4)	100.6	(+0.2)	(-0.8)	110.5	(+0.9)	(-0.4)	116.1	(-0.4)	(-1.1)
100 m	82.2	(+2.7)	(+0.4)	90.5	(+1.5)	(0.0)	95.7	(+0.8)	(-0.4)	100.5	(+0.2)	(-0.8)	109.7	(+0.3)	(-0.8)	110.2	(-0.4)	(-1.1)
Juan de Fuca east																		
7.5 m	74.8	(+2.2)	(+0.8)	83.7	(+1.3)	(+0.1)	89.4	(+0.7)	(-0.3)	95.7	(+0.4)	(-0.3)	116.8	(+1.3)	(+0.4)	122.6	(-0.9)	(-1.2)
50 m	78.3	(+2.1)	(+0.7)	86.7	(+1.1)	(+0.1)	91.9	(+0.5)	(-0.3)	97.2	(-0.1)	(-0.7)	110.0	(+0.6)	(-0.3)	113.5	(-0.8)	(-1.2)
100 m	77.6	(+1.8)	(+0.5)	85.6	(+1.0)	(0.0)	90.5	(+0.5)	(-0.4)	95.5	(-0.1)	(-0.8)	104.9	(-0.2)	(-0.9)	106.0	(-0.6)	(-1.0)
Haro-Boundary																		
7.5 m	63.3	(+2.1)	(+0.5)	76.1	(+5.0)	(+1.4)	86.9	(+3.2)	(+0.4)	95.3	(+1.0)	(-0.8)	122.8	(+10.1)	(+2.8)	126.0	(-2.7)	(-3.0)
50 m	64.0	(+2.7)	(+0.7)	79.0	(+6.1)	(+1.7)	89.6	(+2.9)	(+0.3)	97.8	(+0.8)	(-0.9)	115.7	(+3.7)	(+0.7)	117.0	(-2.1)	(-2.6)
100 m	62.6	(+2.9)	(+0.8)	79.5	(+6.4)	(+1.6)	89.8	(+2.7)	(+0.2)	97.7	(+0.6)	(-1.0)	111.4	(+0.8)	(-0.8)	112.1	(-2.6)	(-2.9)
Gulf Islands																		
7.5 m	54.1	(0.0)	(0.0)	65.4	(+3.1)	(+0.5)	84.5	(+0.1)	(0.0)	114.2	(0.0)	(0.0)	130.0	(+0.1)	(+0.1)	124.1	(-0.4)	(-0.4)
50 m	54.2	(0.0)	(0.0)	68.2	(+3.1)	(+0.5)	86.5	(0.0)	(0.0)	105.8	(0.0)	(0.0)	119.4	(+0.1)	(+0.1)	114.3	(-0.4)	(-0.4)
100 m	54.2	(0.0)	(0.0)	68.0	(+2.9)	(+0.4)	85.9	(+0.1)	(0.0)	99.5	(0.0)	(0.0)	109.4	(0.0)	(0.0)	107.5	(-0.7)	(-0.7)
Strait of Georgia South																		
7.5 m	80.9	(+0.6)	(-0.1)	88.5	(0.0)	(-0.4)	94.4	(-0.2)	(-0.6)	100.4	(-0.5)	(-0.8)	127.7	(+0.5)	(+0.1)	127.6	(-1.2)	(-1.3)

50 m	83.4	(+0.8)	(0.0)	89.9	(+0.1)	(-0.4)	94.4	(-0.2)	(-0.6)	99.1	(-0.6)	(-0.9)	118.9	(+0.3)	(0.0)	118.9	(-1.2)	(-1.4)
100 m	83.2	(+0.7)	(0.0)	89.2	(+0.1)	(-0.4)	93.3	(-0.3)	(-0.6)	97.6	(-0.6)	(-0.9)	112.7	(0.0)	(-0.2)	113.1	(-1.5)	(-1.7)
Strait of Georgia North																		
7.5 m	75.8	(0.0)	(-0.2)	82.0	(-0.2)	(-0.4)	86.5	(-0.4)	(-0.5)	91.3	(-0.8)	(-0.9)	109.0	(-0.2)	(-0.2)	118.5	(-0.7)	(-0.7)
50 m	77.7	(0.0)	(-0.2)	83.2	(-0.3)	(-0.4)	87.0	(-0.5)	(-0.5)	91.2	(-0.6)	(-0.7)	100.9	(-0.6)	(-0.6)	110.0	(-0.7)	(-0.7)
100 m	77.5	(0.0)	(-0.2)	82.9	(-0.3)	(-0.4)	86.7	(-0.5)	(-0.5)	90.7	(-0.5)	(-0.6)	98.4	(-0.5)	(-0.5)	103.8	(-0.6)	(-0.6)
Salish Sea Total																		
7.5 m	84.3	(+1.2)	(+0.2)	92.6	(+0.8)	(-0.1)	98.7	(+0.4)	(-0.4)	114.6	(0.0)	(-0.1)	132.7	(+0.7)	(+0.3)	132.9	(-1.3)	(-1.6)
50 m	87.2	(+1.4)	(+0.2)	94.9	(+0.9)	(-0.1)	100.4	(+0.5)	(-0.4)	108.7	(0.0)	(-0.4)	123.6	(+0.7)	(+0.1)	124.0	(-1.1)	(-1.5)
100 m	87.1	(+1.4)	(+0.2)	94.6	(+0.9)	(-0.1)	99.9	(+0.6)	(-0.4)	106.0	(0.0)	(-0.7)	117.6	(+0.2)	(-0.5)	118.0	(-1.5)	(-1.8)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	71.0	(+2.3)	(+0.5)	82.2	(+1.6)	(+0.1)	89.2	(+0.8)	(-0.3)	95.1	(+0.2)	(-0.6)	105.5	(+0.4)	(-0.6)	123.1	(-0.9)	(-1.3)
50 m	74.3	(+2.6)	(+0.6)	85.7	(+1.5)	(0.0)	92.2	(+0.7)	(-0.3)	97.6	(0.0)	(-0.7)	107.0	(+0.1)	(-0.8)	114.1	(-0.7)	(-1.2)
100 m	75.2	(+2.5)	(+0.5)	86.2	(+1.5)	(0.0)	92.3	(+0.7)	(-0.4)	97.6	(+0.1)	(-0.8)	106.3	(-0.1)	(-0.9)	108.0	(-0.6)	(-1.1)
Juan de Fuca																		
7.5 m	78.4	(+3.3)	(+0.7)	88.2	(+1.7)	(+0.1)	93.8	(+0.9)	(-0.3)	99.0	(+0.2)	(-0.7)	108.8	(+0.5)	(-0.7)	124.9	(-0.8)	(-1.4)
50 m	82.4	(+3.1)	(+0.6)	91.4	(+1.5)	(0.0)	96.5	(+0.8)	(-0.4)	101.2	(+0.2)	(-0.7)	110.6	(+0.2)	(-0.9)	116.1	(-0.6)	(-1.3)
100 m	82.8	(+2.8)	(+0.5)	91.4	(+1.5)	(0.0)	96.5	(+0.8)	(-0.4)	101.2	(+0.2)	(-0.7)	109.9	(-0.1)	(-1.1)	110.2	(-0.6)	(-1.3)
Haro Strait																		
7.5 m	64.6	(+2.6)	(+1.6)	76.3	(+2.8)	(+1.0)	85.9	(+2.1)	(+0.1)	93.4	(+0.2)	(-1.2)	118.0	(+7.4)	(+2.5)	123.0	(-2.5)	(-2.9)
50 m	67.5	(+2.9)	(+1.8)	79.6	(+3.1)	(+1.1)	88.7	(+1.8)	(-0.1)	95.8	(0.0)	(-1.3)	111.6	(+1.4)	(-0.5)	114.1	(-2.5)	(-2.9)
100 m	65.9	(+2.7)	(+1.7)	79.3	(+4.0)	(+1.3)	88.6	(+1.9)	(-0.1)	95.5	(-0.2)	(-1.4)	107.6	(-1.1)	(-2.2)	107.2	(-2.8)	(-3.2)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	68.9	(+2.0)	(+0.5)	79.7	(+1.5)	(+0.1)	86.7	(+0.8)	(-0.3)	92.7	(+0.2)	(-0.7)	104.6	(+2.0)	(+0.8)	121.3	(-0.8)	(-1.2)
50 m	71.9	(+2.3)	(+0.5)	83.1	(+1.5)	(0.0)	89.6	(+0.7)	(-0.4)	95.0	(+0.1)	(-0.7)	104.8	(+0.4)	(-0.6)	112.2	(-0.6)	(-1.1)
100 m	72.4	(+2.4)	(+0.5)	83.3	(+1.5)	(0.0)	89.5	(+0.7)	(-0.4)	94.6	(0.0)	(-0.8)	103.4	(+0.1)	(-0.8)	105.0	(-0.5)	(-1.1)
Juan de Fuca																		
7.5 m	77.2	(+3.2)	(+0.6)	87.0	(+1.6)	(0.0)	92.2	(+0.7)	(-0.4)	96.9	(+0.1)	(-0.8)	106.8	(+1.7)	(+0.7)	121.3	(-0.6)	(-1.1)

50 m	80.5	(+3.1)	(+0.5)	89.9	(+1.4)	(-0.1)	94.8	(+0.6)	(-0.5)	99.1	(0.0)	(-0.8)	107.8	(+0.3)	(-0.8)	112.6	(-0.4)	(-1.0)
100 m	80.6	(+2.9)	(+0.5)	89.7	(+1.4)	(-0.1)	94.6	(+0.6)	(-0.5)	99.0	(0.0)	(-0.8)	106.5	(-0.2)	(-1.1)	107.0	(-0.4)	(-1.0)
Haro-Boundary																		
7.5 m	72.7	(+3.2)	(+1.5)	82.7	(+2.3)	(+0.8)	89.8	(+1.7)	(+0.1)	97.7	(+1.1)	(-0.1)	125.5	(+2.1)	(+0.9)	125.9	(-1.1)	(-1.6)
50 m	75.8	(+3.2)	(+1.5)	85.5	(+2.3)	(+0.7)	92.1	(+1.5)	(0.0)	98.9	(+0.6)	(-0.7)	117.4	(+1.7)	(+0.4)	117.1	(-1.0)	(-1.6)
100 m	74.4	(+2.6)	(+1.0)	84.0	(+2.3)	(+0.5)	90.9	(+1.7)	(-0.1)	97.5	(+0.5)	(-0.8)	110.6	(+0.7)	(-0.7)	109.7	(-1.2)	(-1.8)
Strait of Georgia																		
7.5 m	81.6	(+1.0)	(0.0)	90.2	(+0.3)	(-0.3)	96.8	(0.0)	(-0.5)	103.1	(-0.3)	(-0.8)	130.7	(+0.7)	(+0.2)	128.9	(-1.4)	(-1.7)
50 m	83.7	(+1.3)	(+0.1)	91.1	(+0.4)	(-0.2)	96.0	(0.0)	(-0.5)	100.9	(-0.4)	(-0.8)	121.9	(+0.5)	(0.0)	120.2	(-1.4)	(-1.7)
100 m	83.0	(+1.2)	(+0.1)	89.8	(+0.4)	(-0.2)	94.1	(0.0)	(-0.5)	98.6	(-0.4)	(-0.9)	115.1	(+0.2)	(-0.2)	114.1	(-1.7)	(-1.9)

Table 8b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **85% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions:																		
Swiftsure Bank west																		
7.5 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	81.8	(-0.2)	(-0.2)	86.4	(-0.5)	(-0.5)	98.2	(-1.0)	(-1.0)	122.7	(-1.7)	(-1.7)
50 m	80.7	(0.0)	(0.0)	80.9	(0.0)	(0.0)	83.0	(-0.2)	(-0.2)	88.8	(-0.4)	(-0.4)	100.5	(-1.1)	(-1.1)	113.1	(-1.6)	(-1.6)
100 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.5	(-0.2)	(-0.2)	87.0	(-0.4)	(-0.4)	97.7	(-1.2)	(-1.2)	103.8	(-1.6)	(-1.6)
Swiftsure Bank east																		
7.5 m	82.8	(+1.0)	(+0.2)	92	(+1.5)	(+0.1)	98.9	(+0.8)	(-0.3)	104.9	(+0.2)	(-0.7)	117	(+2.0)	(+0.8)	133.5	(-0.7)	(-1.2)
50 m	84.9	(+1.7)	(+0.4)	95.4	(+1.5)	(0.0)	101.8	(+0.7)	(-0.4)	107.3	(+0.1)	(-0.7)	117.2	(+0.4)	(-0.6)	124.5	(-0.5)	(-1.1)
100 m	85.6	(+1.8)	(+0.4)	95.7	(+1.5)	(0.0)	101.8	(+0.7)	(-0.4)	106.9	(0.0)	(-0.8)	115.8	(+0.1)	(-0.8)	117.4	(-0.5)	(-1.1)
Juan de Fuca west																		
7.5 m	89.9	(+3.0)	(+0.6)	99.1	(+1.7)	(+0.1)	104.9	(+1.0)	(-0.3)	110.1	(+0.2)	(-0.7)	123.3	(+3.9)	(+1.7)	136.7	(-0.6)	(-1.2)
50 m	93.6	(+2.9)	(+0.5)	102.2	(+1.5)	(0.0)	107.4	(+0.8)	(-0.4)	112.2	(+0.2)	(-0.8)	122.3	(+0.9)	(-0.4)	127.9	(-0.4)	(-1.1)
100 m	93.9	(+2.6)	(+0.4)	102.2	(+1.5)	(0.0)	107.4	(+0.8)	(-0.4)	112.2	(+0.2)	(-0.8)	121.4	(+0.4)	(-0.8)	122.0	(-0.4)	(-1.1)
Juan de Fuca east																		
7.5 m	86.9	(+1.8)	(+0.6)	95.3	(+1.3)	(+0.2)	100.9	(+0.8)	(-0.2)	107.1	(+0.5)	(-0.2)	128.2	(+1.4)	(+0.4)	134.0	(-0.8)	(-1.1)
50 m	90.1	(+1.9)	(+0.7)	98.3	(+1.2)	(+0.1)	103.4	(+0.6)	(-0.3)	108.6	(0.0)	(-0.7)	121.4	(+0.8)	(-0.2)	124.9	(-0.7)	(-1.1)
100 m	89.5	(+1.6)	(+0.5)	97.2	(+1.0)	(0.0)	102.1	(+0.6)	(-0.4)	107.0	(0.0)	(-0.8)	116.4	(-0.1)	(-0.8)	117.4	(-0.5)	(-1.0)
Haro-Boundary																		
7.5 m	81.1	(+0.3)	(+0.1)	88.1	(+4.1)	(+1.2)	98.6	(+3.1)	(+0.4)	107.0	(+1.0)	(-0.8)	134.6	(+10.1)	(+2.8)	137.6	(-2.6)	(-2.9)
50 m	81.3	(+0.4)	(+0.1)	90.9	(+5.4)	(+1.6)	101.3	(+2.9)	(+0.3)	109.5	(+0.8)	(-0.9)	127.5	(+3.8)	(+0.7)	128.7	(-2.1)	(-2.5)
100 m	81.0	(+0.3)	(+0.1)	91.4	(+5.8)	(+1.6)	101.5	(+2.7)	(+0.2)	109.4	(+0.6)	(-1.0)	123.2	(+0.9)	(-0.8)	123.6	(-2.6)	(-2.9)
Gulf Islands																		
7.5 m	78.9	(0.0)	(0.0)	80.6	(+1.0)	(+0.2)	94.5	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(+0.1)	(+0.1)	134.8	(-0.4)	(-0.4)
50 m	78.9	(0.0)	(0.0)	82.0	(+1.5)	(+0.3)	96.6	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.9	(+0.1)	(+0.1)	124.9	(-0.4)	(-0.4)
100 m	78.9	(0.0)	(0.0)	82.0	(+1.3)	(+0.2)	95.9	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.8	(0.0)	(0.0)	118.1	(-0.7)	(-0.7)
Strait of Georgia South																		
7.5 m	92.0	(+0.6)	(-0.1)	99.7	(+0.1)	(-0.4)	105.7	(-0.2)	(-0.6)	111.8	(-0.5)	(-0.8)	139.1	(+0.6)	(+0.2)	138.6	(-1.3)	(-1.4)

50 m	94.4	(+0.8)	(0.0)	101.0	(+0.2)	(-0.3)	105.5	(-0.2)	(-0.6)	110.3	(-0.6)	(-0.9)	130.2	(+0.4)	(0.0)	130.0	(-1.3)	(-1.5)
100 m	94.2	(+0.8)	(0.0)	100.3	(+0.1)	(-0.3)	104.3	(-0.2)	(-0.6)	108.7	(-0.6)	(-0.9)	123.9	(+0.1)	(-0.3)	124.2	(-1.6)	(-1.8)
Strait of Georgia North																		
7.5 m	85.4	(0.0)	(-0.2)	91.1	(-0.2)	(-0.4)	95.5	(-0.4)	(-0.6)	100.4	(-0.8)	(-0.9)	117.6	(-0.2)	(-0.2)	127.1	(-0.7)	(-0.7)
50 m	87.0	(0.0)	(-0.2)	92.3	(-0.3)	(-0.4)	96.0	(-0.5)	(-0.5)	100.2	(-0.6)	(-0.7)	109.4	(-0.6)	(-0.6)	118.6	(-0.7)	(-0.7)
100 m	86.9	(0.0)	(-0.2)	92.0	(-0.3)	(-0.4)	95.7	(-0.5)	(-0.5)	99.7	(-0.5)	(-0.6)	107.1	(-0.6)	(-0.6)	112.4	(-0.7)	(-0.7)
Salish Sea Total																		
7.5 m	95.9	(+1.2)	(+0.2)	103.9	(+0.9)	(-0.1)	110.1	(+0.5)	(-0.4)	124.6	(0.0)	(-0.1)	143.7	(+0.8)	(+0.4)	144.2	(-1.3)	(-1.6)
50 m	98.6	(+1.5)	(+0.2)	106.3	(+1.0)	(-0.1)	111.8	(+0.6)	(-0.4)	119.4	(0.0)	(-0.5)	134.7	(+0.8)	(+0.1)	135.2	(-1.1)	(-1.5)
100 m	98.5	(+1.4)	(+0.2)	106.0	(+1.0)	(-0.1)	111.3	(+0.6)	(-0.4)	117.2	(+0.1)	(-0.7)	128.9	(+0.3)	(-0.5)	129.3	(-1.5)	(-1.8)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.6	(+1.4)	(+0.3)	93.9	(+1.6)	(+0.1)	100.8	(+0.8)	(-0.3)	106.8	(+0.2)	(-0.6)	117.2	(+0.4)	(-0.6)	134.9	(-0.9)	(-1.3)
50 m	86.3	(+2.2)	(+0.5)	97.4	(+1.6)	(0.0)	103.9	(+0.7)	(-0.3)	109.3	(0.0)	(-0.7)	118.7	(+0.1)	(-0.8)	125.9	(-0.7)	(-1.2)
100 m	87.3	(+2.2)	(+0.4)	97.9	(+1.5)	(0.0)	104.0	(+0.7)	(-0.4)	109.3	(+0.1)	(-0.7)	118.1	(-0.1)	(-0.9)	119.8	(-0.6)	(-1.1)
Juan de Fuca																		
7.5 m	90.0	(+3.3)	(+0.7)	99.8	(+1.7)	(+0.1)	105.4	(+0.9)	(-0.3)	110.6	(+0.2)	(-0.7)	120.5	(+0.6)	(-0.7)	136.7	(-0.8)	(-1.4)
50 m	94.0	(+3.1)	(+0.6)	103.0	(+1.5)	(0.0)	108.1	(+0.8)	(-0.4)	112.9	(+0.2)	(-0.7)	122.3	(+0.2)	(-0.9)	127.9	(-0.6)	(-1.3)
100 m	94.5	(+2.8)	(+0.5)	103.1	(+1.5)	(0.0)	108.1	(+0.8)	(-0.4)	112.9	(+0.2)	(-0.7)	121.6	(-0.1)	(-1.1)	122.0	(-0.6)	(-1.3)
Haro Strait																		
7.5 m	81.1	(+0.3)	(+0.2)	88.1	(+2.6)	(+0.9)	97.5	(+2.2)	(+0.1)	105.0	(+0.2)	(-1.2)	129.8	(+7.4)	(+2.5)	134.7	(-2.5)	(-2.9)
50 m	82.0	(+0.9)	(+0.6)	91.2	(+3.1)	(+1.1)	100.3	(+1.9)	(0.0)	107.5	(0.0)	(-1.3)	123.4	(+1.4)	(-0.5)	125.8	(-2.5)	(-2.9)
100 m	81.5	(+0.5)	(+0.4)	91.0	(+4.0)	(+1.3)	100.2	(+2.0)	(-0.1)	107.1	(-0.1)	(-1.4)	119.4	(-1.0)	(-2.2)	118.9	(-2.8)	(-3.2)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	82.6	(+0.9)	(+0.2)	91.4	(+1.5)	(+0.1)	98.3	(+0.8)	(-0.3)	104.3	(+0.2)	(-0.7)	116.4	(+2.0)	(+0.9)	133.0	(-0.7)	(-1.2)
50 m	84.6	(+1.5)	(+0.4)	94.8	(+1.5)	(0.0)	101.2	(+0.7)	(-0.4)	106.7	(+0.1)	(-0.7)	116.6	(+0.5)	(-0.6)	123.9	(-0.5)	(-1.1)
100 m	85.2	(+1.7)	(+0.4)	95.1	(+1.5)	(0.0)	101.2	(+0.7)	(-0.4)	106.3	(0.0)	(-0.8)	115.1	(+0.1)	(-0.8)	116.8	(-0.5)	(-1.1)
Juan de Fuca																		
7.5 m	88.7	(+3.0)	(+0.6)	98.5	(+1.6)	(0.0)	103.8	(+0.7)	(-0.4)	108.4	(+0.1)	(-0.8)	118.6	(+1.8)	(+0.7)	133.0	(-0.6)	(-1.1)

50 m	92.0	(+3.0)	(+0.5)	101.4	(+1.4)	(-0.1)	106.3	(+0.6)	(-0.5)	110.7	(0.0)	(-0.8)	119.5	(+0.3)	(-0.7)	124.4	(-0.4)	(-1.0)
100 m	92.2	(+2.9)	(+0.5)	101.3	(+1.4)	(-0.1)	106.1	(+0.6)	(-0.5)	110.6	(0.0)	(-0.8)	118.2	(-0.2)	(-1.1)	118.7	(-0.5)	(-1.0)
Haro-Boundary																		
7.5 m	85.4	(+2.1)	(+1.1)	94.4	(+2.3)	(+0.8)	101.4	(+1.7)	(+0.1)	109.3	(+1.1)	(-0.1)	136.8	(+2.4)	(+1.0)	137.6	(-1.1)	(-1.6)
50 m	88.0	(+2.6)	(+1.3)	97.2	(+2.3)	(+0.7)	103.8	(+1.5)	(0.0)	110.5	(+0.6)	(-0.7)	128.8	(+1.8)	(+0.4)	128.7	(-1.0)	(-1.6)
100 m	86.8	(+2.0)	(+0.7)	95.7	(+2.3)	(+0.5)	102.6	(+1.7)	(0.0)	109.2	(+0.5)	(-0.8)	122.3	(+0.7)	(-0.7)	121.4	(-1.2)	(-1.8)
Strait of Georgia																		
7.5 m	93.2	(+1.0)	(0.0)	101.8	(+0.3)	(-0.3)	108.4	(0.0)	(-0.5)	114.7	(-0.3)	(-0.8)	142.4	(+0.7)	(+0.2)	140.5	(-1.4)	(-1.7)
50 m	95.3	(+1.3)	(+0.1)	102.7	(+0.4)	(-0.2)	107.6	(0.0)	(-0.5)	112.5	(-0.4)	(-0.8)	133.6	(+0.5)	(0.0)	131.8	(-1.4)	(-1.7)
100 m	94.6	(+1.2)	(+0.1)	101.3	(+0.4)	(-0.2)	105.7	(0.0)	(-0.5)	110.2	(-0.4)	(-0.8)	126.7	(+0.2)	(-0.2)	125.6	(-1.7)	(-1.9)

Table 8c: Modelled received sound levels (RL) for each subregion at in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **85% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions:																		
Swiftsure Bank west																		
7.5 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
50 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
100 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.9	(+0.4)	(-0.1)	88.7	(+0.2)	(-0.5)	101.9	(+3.0)	(+1.4)	118.7	(-0.3)	(-1.0)
50 m	83.3	(0.0)	(0.0)	83.8	(+0.3)	(0.0)	86.3	(+0.5)	(-0.2)	90.6	(+0.2)	(-0.6)	101.6	(+1.1)	(-0.2)	109.6	(-0.1)	(-0.9)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(0.0)	86.4	(+0.4)	(-0.2)	90.4	(+0.1)	(-0.7)	100.1	(+0.6)	(-0.5)	102.6	(-0.1)	(-0.9)
Juan de Fuca west																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(0.0)	87.7	(+0.8)	(-0.2)	92.6	(+0.3)	(-0.7)	109.6	(+6.1)	(+2.7)	122.8	(-0.5)	(-1.2)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	89.9	(+0.8)	(-0.3)	94.7	(+0.2)	(-0.7)	107.4	(+2.0)	(+0.1)	113.9	(-0.3)	(-1.1)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(0.0)	90.1	(+0.8)	(-0.3)	94.8	(+0.2)	(-0.7)	106.1	(+1.1)	(-0.4)	107.7	(-0.3)	(-1.1)
Juan de Fuca east																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	85.2	(+0.5)	(-0.1)	88.8	(+0.5)	(-0.3)	108.1	(+4.2)	(+0.6)	116.4	(+0.1)	(-0.8)
50 m	83.3	(0.0)	(0.0)	84.3	(+0.4)	(0.0)	86.7	(+0.6)	(-0.1)	90.4	(+0.4)	(-0.5)	103.0	(+2.2)	(-0.1)	107.5	(+0.2)	(-0.7)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.3)	(0.0)	86.2	(+0.5)	(-0.2)	89.6	(+0.4)	(-0.5)	99.3	(+1.0)	(-0.5)	100.3	(+0.1)	(-0.8)
Haro-Boundary																		
7.5 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	84.4	(+0.9)	(+0.2)	90.2	(+0.9)	(-0.6)	119.3	(+10.9)	(+2.8)	120.4	(-1.4)	(-2.0)
50 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	85.8	(+1.3)	(+0.1)	92.5	(+0.8)	(-0.8)	112.0	(+4.7)	(+1.1)	111.7	(-1.3)	(-2.0)
100 m	83.1	(0.0)	(0.0)	83.1	(+0.1)	(+0.1)	86.1	(+1.3)	(+0.1)	92.6	(+0.6)	(-0.9)	107.4	(+1.6)	(-0.5)	105.4	(-1.4)	(-2.1)
Gulf Islands																		
7.5 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	93.5	(0.0)	(0.0)	92.0	(-1.2)	(-1.2)
50 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	85.1	(-0.1)	(-0.3)	84.8	(-0.9)	(-0.9)
100 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	82.9	(-0.2)	(-0.4)	82.5	(-0.4)	(-0.4)
Strait of Georgia South																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.1)	(-0.1)	86.9	(0.0)	(-0.3)	91.8	(-0.3)	(-0.8)	120.8	(+0.8)	(+0.1)	117.9	(-1.4)	(-1.7)

50 m	83.3	(0.0)	(0.0)	84.0	(+0.1)	(-0.1)	86.0	(+0.1)	(-0.3)	89.7	(-0.2)	(-0.7)	111.5	(+0.7)	(0.0)	108.8	(-1.3)	(-1.7)
100 m	83.3	(0.0)	(0.0)	83.6	(+0.1)	(0.0)	84.8	(+0.1)	(-0.2)	87.6	(-0.1)	(-0.6)	104.2	(+0.4)	(-0.2)	102.4	(-1.5)	(-1.9)
Strait of Georgia North																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	92.1	(0.0)	(0.0)	92.3	(+0.1)	(0.0)	94.1	(+0.4)	(-0.1)	98.1	(+0.2)	(-0.6)	123.5	(+3.0)	(+1.1)	126.8	(-0.8)	(-1.4)
50 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.1	(+0.5)	(-0.2)	99.3	(+0.3)	(-0.6)	115.9	(+2.2)	(+0.4)	117.9	(-0.6)	(-1.3)
100 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.0	(+0.5)	(-0.2)	99.0	(+0.3)	(-0.7)	111.5	(+1.1)	(-0.4)	111.5	(-0.7)	(-1.4)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	85.6	(+0.5)	(-0.1)	90.2	(+0.2)	(-0.5)	102.0	(+1.2)	(-0.2)	120.4	(-0.5)	(-1.1)
50 m	83.3	(0.0)	(0.0)	84.1	(+0.4)	(0.0)	87.6	(+0.6)	(-0.2)	92.3	(+0.1)	(-0.7)	103.1	(+0.8)	(-0.5)	111.3	(-0.3)	(-1.1)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.5)	(0.0)	87.9	(+0.6)	(-0.3)	92.5	(+0.1)	(-0.7)	102.4	(+0.4)	(-0.7)	105.2	(-0.3)	(-1.0)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(0.0)	87.7	(+0.8)	(-0.2)	92.7	(+0.3)	(-0.6)	105.3	(+1.7)	(-0.1)	122.7	(-0.7)	(-1.4)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	90.0	(+0.8)	(-0.3)	94.8	(+0.2)	(-0.7)	106.7	(+0.9)	(-0.6)	113.8	(-0.5)	(-1.3)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(0.0)	90.2	(+0.8)	(-0.3)	95.0	(+0.2)	(-0.7)	105.8	(+0.4)	(-0.8)	107.7	(-0.5)	(-1.3)
Haro Strait																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	84.4	(+0.7)	(+0.1)	88.7	(+0.4)	(-0.9)	114.3	(+8.4)	(+2.6)	117.8	(-2.1)	(-2.6)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	85.5	(+1.0)	(+0.1)	90.6	(+0.2)	(-1.1)	107.5	(+2.2)	(-0.1)	109.0	(-2.0)	(-2.6)
100 m	83.3	(0.0)	(0.0)	83.3	(+0.1)	(+0.1)	85.8	(+1.0)	(0.0)	90.6	(0.0)	(-1.2)	103.2	(-0.5)	(-1.9)	102.1	(-2.5)	(-3.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.7	(+0.3)	(-0.1)	88.3	(+0.2)	(-0.5)	101.3	(+3.0)	(+1.5)	118.1	(-0.3)	(-1.0)
50 m	83.3	(0.0)	(0.0)	83.7	(+0.2)	(0.0)	86.0	(+0.4)	(-0.2)	90.1	(+0.2)	(-0.6)	101.0	(+1.1)	(-0.2)	109.1	(-0.1)	(-0.9)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(0.0)	86.1	(+0.4)	(-0.2)	89.9	(+0.1)	(-0.6)	99.5	(+0.6)	(-0.5)	102.0	(-0.1)	(-0.9)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	83.7	(+0.2)	(0.0)	85.9	(+0.5)	(-0.2)	89.7	(+0.2)	(-0.6)	103.9	(+4.1)	(+2.4)	118.7	(-0.6)	(-1.2)

50 m	83.3	(0.0)	(0.0)	84.6	(+0.5)	(0.0)	87.6	(+0.5)	(-0.3)	91.7	(+0.2)	(-0.7)	103.6	(+1.5)	(-0.1)	109.7	(-0.4)	(-1.1)
100 m	83.3	(0.0)	(0.0)	84.8	(+0.5)	(-0.1)	87.8	(+0.5)	(-0.4)	91.9	(+0.2)	(-0.7)	101.8	(+0.6)	(-0.7)	103.8	(-0.4)	(-1.1)
Haro-Boundary																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.1)	(0.0)	85.6	(+0.9)	(+0.1)	91.0	(+0.9)	(-0.5)	118.0	(+8.3)	(+2.3)	120.9	(-0.8)	(-1.5)
50 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(+0.1)	87.2	(+1.1)	(0.0)	93.0	(+0.7)	(-0.7)	110.9	(+4.0)	(+0.8)	112.0	(-0.7)	(-1.5)
100 m	83.3	(0.0)	(0.0)	83.8	(+0.3)	(+0.1)	86.7	(+1.0)	(0.0)	92.2	(+0.6)	(-0.8)	106.1	(+1.4)	(-0.5)	105.0	(-1.0)	(-1.7)
Strait of Georgia																		
7.5 m	83.3	(0.0)	(0.0)	85.0	(+0.2)	(-0.2)	89.9	(0.0)	(-0.5)	95.7	(-0.3)	(-0.8)	124.8	(+0.8)	(+0.2)	121.9	(-1.3)	(-1.6)
50 m	83.3	(0.0)	(0.0)	85.1	(+0.3)	(-0.1)	88.7	(+0.1)	(-0.4)	93.4	(-0.3)	(-0.8)	116.1	(+0.7)	(0.0)	113.1	(-1.3)	(-1.7)
100 m	83.3	(0.0)	(0.0)	84.2	(+0.2)	(-0.1)	86.7	(+0.1)	(-0.3)	90.7	(-0.2)	(-0.7)	108.4	(+0.4)	(-0.2)	105.9	(-1.3)	(-1.7)

Table 8d: Modelled received sound levels (RL) for each subregion in a **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **85% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions:																		
Swiftsure Bank west																		
7.5 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.6	(-0.1)	(-0.1)	88.1	(-0.3)	(-0.3)	98.4	(-1.0)	(-1.0)	122.7	(-1.7)	(-1.7)
50 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.1	(-0.1)	(-0.1)	89.8	(-0.3)	(-0.4)	100.6	(-1.1)	(-1.1)	113.1	(-1.6)	(-1.6)
100 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.9	(-0.1)	(-0.1)	88.5	(-0.3)	(-0.3)	97.8	(-1.1)	(-1.1)	103.8	(-1.6)	(-1.6)
Swiftsure Bank east																		
7.5 m	86.0	(+0.4)	(+0.1)	92.6	(+1.3)	(+0.1)	99.1	(+0.8)	(-0.3)	105.0	(+0.2)	(-0.7)	117.1	(+2.0)	(+0.8)	133.7	(-0.7)	(-1.2)
50 m	87.2	(+0.9)	(+0.2)	95.7	(+1.4)	(0.0)	101.9	(+0.7)	(-0.4)	107.4	(+0.1)	(-0.7)	117.3	(+0.5)	(-0.6)	124.6	(-0.5)	(-1.1)
100 m	87.6	(+1.0)	(+0.2)	96.0	(+1.4)	(0.0)	101.9	(+0.7)	(-0.4)	107.0	(0.0)	(-0.8)	115.9	(+0.1)	(-0.8)	117.5	(-0.5)	(-1.1)
Juan de Fuca west																		
7.5 m	90.7	(+2.3)	(+0.4)	99.3	(+1.7)	(+0.1)	105.0	(+1.0)	(-0.3)	110.1	(+0.2)	(-0.7)	123.5	(+4.0)	(+1.7)	136.9	(-0.6)	(-1.2)
50 m	94.0	(+2.5)	(+0.4)	102.3	(+1.5)	(0.0)	107.5	(+0.8)	(-0.4)	112.3	(+0.2)	(-0.8)	122.5	(+1.0)	(-0.4)	128.1	(-0.4)	(-1.1)
100 m	94.2	(+2.4)	(+0.4)	102.3	(+1.5)	(0.0)	107.5	(+0.8)	(-0.4)	112.3	(+0.2)	(-0.8)	121.6	(+0.4)	(-0.8)	122.1	(-0.4)	(-1.1)
Juan de Fuca east																		
7.5 m	88.5	(+1.2)	(+0.4)	95.6	(+1.2)	(+0.1)	101.0	(+0.8)	(-0.2)	107.2	(+0.5)	(-0.2)	128.3	(+1.4)	(+0.4)	134.0	(-0.7)	(-1.1)
50 m	90.9	(+1.5)	(+0.6)	98.5	(+1.1)	(+0.1)	103.5	(+0.6)	(-0.3)	108.7	(0.0)	(-0.7)	121.5	(+0.8)	(-0.2)	125.0	(-0.7)	(-1.1)
100 m	90.5	(+1.3)	(+0.4)	97.4	(+1.0)	(0.0)	102.2	(+0.6)	(-0.4)	107.0	(0.0)	(-0.8)	116.5	(0.0)	(-0.8)	117.5	(-0.5)	(-1.0)
Haro-Boundary																		
7.5 m	85.2	(+0.1)	(0.0)	89.3	(+2.7)	(+0.9)	98.8	(+3.0)	(+0.4)	107.1	(+1.0)	(-0.8)	134.7	(+10.2)	(+2.8)	137.7	(-2.6)	(-2.9)
50 m	85.3	(+0.2)	(0.0)	91.6	(+4.1)	(+1.3)	101.4	(+2.8)	(+0.3)	109.6	(+0.8)	(-0.9)	127.6	(+3.8)	(+0.7)	128.8	(-2.1)	(-2.5)
100 m	85.1	(+0.1)	(0.0)	92.0	(+4.5)	(+1.3)	101.7	(+2.6)	(+0.2)	109.5	(+0.6)	(-1.0)	123.3	(+0.9)	(-0.8)	123.7	(-2.5)	(-2.8)
Gulf Islands																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(+0.1)	94.7	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(+0.1)	(+0.1)	134.8	(-0.4)	(-0.4)
50 m	83.3	(0.0)	(0.0)	84.7	(+0.7)	(+0.1)	96.7	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	130.0	(+0.1)	(+0.1)	124.9	(-0.4)	(-0.4)
100 m	83.3	(0.0)	(0.0)	84.7	(+0.7)	(+0.1)	96.0	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.8	(0.0)	(0.0)	118.1	(-0.7)	(-0.7)
Strait of Georgia South																		
7.5 m	92.5	(+0.6)	(-0.1)	99.8	(+0.1)	(-0.4)	105.8	(-0.2)	(-0.6)	111.8	(-0.5)	(-0.8)	139.1	(+0.6)	(+0.2)	138.7	(-1.3)	(-1.4)
50 m	94.7	(+0.8)	(0.0)	101.1	(+0.2)	(-0.3)	105.6	(-0.2)	(-0.6)	110.3	(-0.6)	(-0.9)	130.2	(+0.4)	(0.0)	130.0	(-1.3)	(-1.5)

100 m	94.5	(+0.7)	(0.0)	100.3	(+0.1)	(-0.3)	104.4	(-0.2)	(-0.6)	108.7	(-0.6)	(-0.9)	123.9	(+0.1)	(-0.3)	124.2	(-1.6)	(-1.8)
Strait of Georgia North																		
7.5 m	87.5	(0.0)	(-0.1)	91.8	(-0.2)	(-0.3)	95.8	(-0.4)	(-0.5)	100.4	(-0.8)	(-0.9)	117.6	(-0.2)	(-0.2)	127.1	(-0.7)	(-0.7)
50 m	88.6	(0.0)	(-0.2)	92.8	(-0.3)	(-0.4)	96.2	(-0.4)	(-0.5)	100.3	(-0.6)	(-0.7)	109.4	(-0.6)	(-0.6)	118.6	(-0.7)	(-0.7)
100 m	88.5	(0.0)	(-0.2)	92.6	(-0.3)	(-0.3)	95.9	(-0.4)	(-0.5)	99.8	(-0.5)	(-0.6)	107.1	(-0.6)	(-0.6)	112.4	(-0.7)	(-0.7)
Salish Sea Total																		
7.5 m	97.4	(+0.8)	(+0.1)	104.2	(+0.8)	(-0.1)	110.2	(+0.5)	(-0.4)	124.6	(0.0)	(-0.1)	143.7	(+0.8)	(+0.4)	144.3	(-1.3)	(-1.6)
50 m	99.4	(+1.2)	(+0.2)	106.5	(+1.0)	(-0.1)	111.9	(+0.6)	(-0.4)	119.4	(0.0)	(-0.5)	134.8	(+0.8)	(+0.1)	135.3	(-1.1)	(-1.5)
100 m	99.4	(+1.1)	(+0.2)	106.2	(+1.0)	(-0.1)	111.4	(+0.6)	(-0.4)	117.2	(+0.1)	(-0.7)	129.0	(+0.3)	(-0.5)	129.3	(-1.5)	(-1.8)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	86.4	(+0.7)	(+0.1)	94.2	(+1.5)	(+0.1)	101.0	(+0.8)	(-0.3)	106.9	(+0.2)	(-0.6)	117.3	(+0.4)	(-0.6)	135.1	(-0.8)	(-1.3)
50 m	88.1	(+1.3)	(+0.3)	97.6	(+1.5)	(0.0)	104.0	(+0.7)	(-0.3)	109.4	(0.0)	(-0.7)	118.9	(+0.1)	(-0.8)	126.1	(-0.7)	(-1.2)
100 m	88.7	(+1.4)	(+0.3)	98.1	(+1.4)	(0.0)	104.1	(+0.7)	(-0.4)	109.4	(+0.1)	(-0.7)	118.2	(-0.1)	(-0.9)	119.9	(-0.6)	(-1.1)
Juan de Fuca																		
7.5 m	90.8	(+2.5)	(+0.6)	99.9	(+1.7)	(+0.1)	105.5	(+0.9)	(-0.3)	110.7	(+0.2)	(-0.7)	120.6	(+0.6)	(-0.6)	136.9	(-0.8)	(-1.4)
50 m	94.3	(+2.8)	(+0.5)	103.1	(+1.5)	(0.0)	108.2	(+0.8)	(-0.4)	113.0	(+0.2)	(-0.7)	122.5	(+0.2)	(-0.9)	128.1	(-0.6)	(-1.3)
100 m	94.8	(+2.5)	(+0.4)	103.2	(+1.5)	(0.0)	108.2	(+0.8)	(-0.4)	113.0	(+0.2)	(-0.7)	121.7	(-0.1)	(-1.1)	122.2	(-0.6)	(-1.3)
Haro Strait																		
7.5 m	85.3	(+0.1)	(+0.1)	89.3	(+1.8)	(+0.7)	97.7	(+2.1)	(+0.1)	105.1	(+0.2)	(-1.2)	129.9	(+7.4)	(+2.5)	134.8	(-2.5)	(-2.9)
50 m	85.7	(+0.4)	(+0.3)	91.9	(+2.5)	(+0.9)	100.5	(+1.9)	(0.0)	107.6	(0.0)	(-1.3)	123.5	(+1.4)	(-0.5)	125.9	(-2.5)	(-2.9)
100 m	85.5	(+0.2)	(+0.1)	91.7	(+3.2)	(+1.1)	100.4	(+2.0)	(-0.1)	107.2	(-0.1)	(-1.4)	119.5	(-1.0)	(-2.2)	119.0	(-2.8)	(-3.2)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	85.9	(+0.4)	(+0.1)	92.1	(+1.3)	(+0.1)	98.5	(+0.8)	(-0.3)	104.4	(+0.2)	(-0.7)	116.5	(+2.0)	(+0.9)	133.1	(-0.7)	(-1.2)
50 m	87.0	(+0.8)	(+0.2)	95.1	(+1.4)	(0.0)	101.3	(+0.7)	(-0.3)	106.8	(+0.1)	(-0.7)	116.7	(+0.5)	(-0.6)	124.0	(-0.5)	(-1.1)
100 m	87.3	(+0.9)	(+0.2)	95.4	(+1.4)	(0.0)	101.3	(+0.7)	(-0.4)	106.4	(0.0)	(-0.8)	115.3	(+0.1)	(-0.8)	116.9	(-0.5)	(-1.1)
Juan de Fuca																		
7.5 m	89.8	(+2.1)	(+0.4)	98.6	(+1.5)	(0.0)	103.8	(+0.7)	(-0.4)	108.5	(+0.1)	(-0.8)	118.7	(+1.9)	(+0.8)	133.2	(-0.6)	(-1.1)
50 m	92.6	(+2.6)	(+0.5)	101.5	(+1.4)	(-0.1)	106.4	(+0.6)	(-0.5)	110.8	(0.0)	(-0.8)	119.6	(+0.3)	(-0.7)	124.5	(-0.4)	(-1.0)

100 m	92.7	(+2.4)	(+0.4)	101.4	(+1.4)	(-0.1)	106.2	(+0.6)	(-0.5)	110.6	(0.0)	(-0.8)	118.3	(-0.2)	(-1.1)	118.9	(-0.4)	(-1.0)
Haro-Boundary																		
7.5 m	87.5	(+1.2)	(+0.6)	94.8	(+2.1)	(+0.7)	101.5	(+1.7)	(+0.1)	109.3	(+1.1)	(-0.1)	136.8	(+2.4)	(+1.1)	137.7	(-1.1)	(-1.6)
50 m	89.3	(+1.8)	(+0.9)	97.4	(+2.1)	(+0.7)	103.9	(+1.5)	(0.0)	110.6	(+0.6)	(-0.7)	128.9	(+1.9)	(+0.4)	128.8	(-1.0)	(-1.6)
100 m	88.4	(+1.3)	(+0.5)	96.0	(+2.1)	(+0.5)	102.7	(+1.7)	(0.0)	109.3	(+0.5)	(-0.8)	122.4	(+0.8)	(-0.7)	121.5	(-1.2)	(-1.8)
Strait of Georgia																		
7.5 m	93.6	(+0.9)	(0.0)	101.9	(+0.3)	(-0.3)	108.5	(0.0)	(-0.5)	114.8	(-0.3)	(-0.8)	142.4	(+0.7)	(+0.2)	140.6	(-1.4)	(-1.7)
50 m	95.5	(+1.2)	(+0.1)	102.7	(+0.4)	(-0.2)	107.6	(0.0)	(-0.5)	112.6	(-0.4)	(-0.8)	133.7	(+0.5)	(0.0)	131.9	(-1.4)	(-1.7)
100 m	94.9	(+1.1)	(+0.1)	101.4	(+0.4)	(-0.2)	105.7	(0.0)	(-0.5)	110.2	(-0.4)	(-0.8)	126.8	(+0.2)	(-0.2)	125.7	(-1.7)	(-1.9)

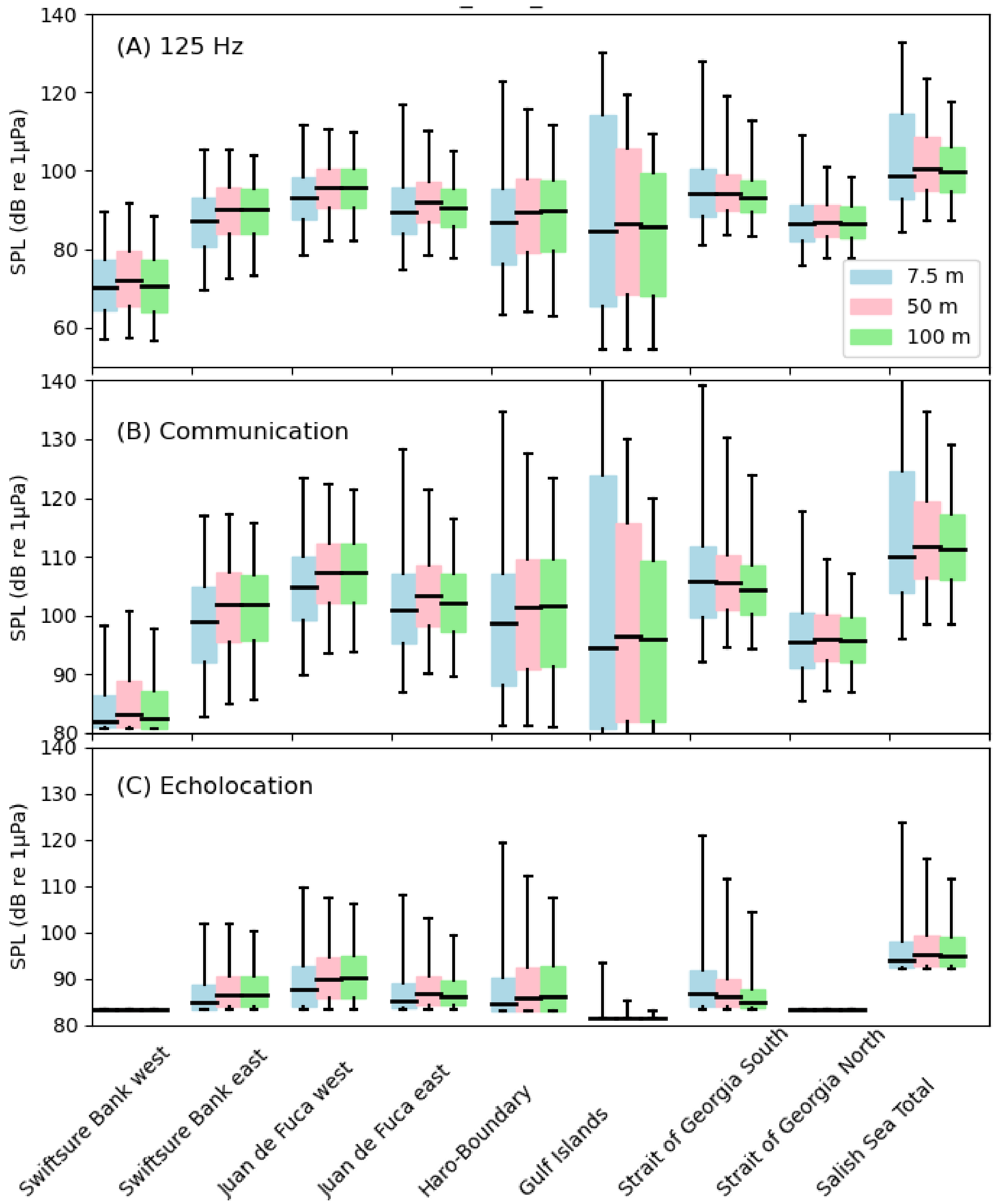

Figure 57: Boxplot comparing the sound pressure levels (SPL) in the **acoustically-derived subregions** for the slowdown scenario with **85% participation to current ECHO speeds throughout the full transit through the Salish Sea** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

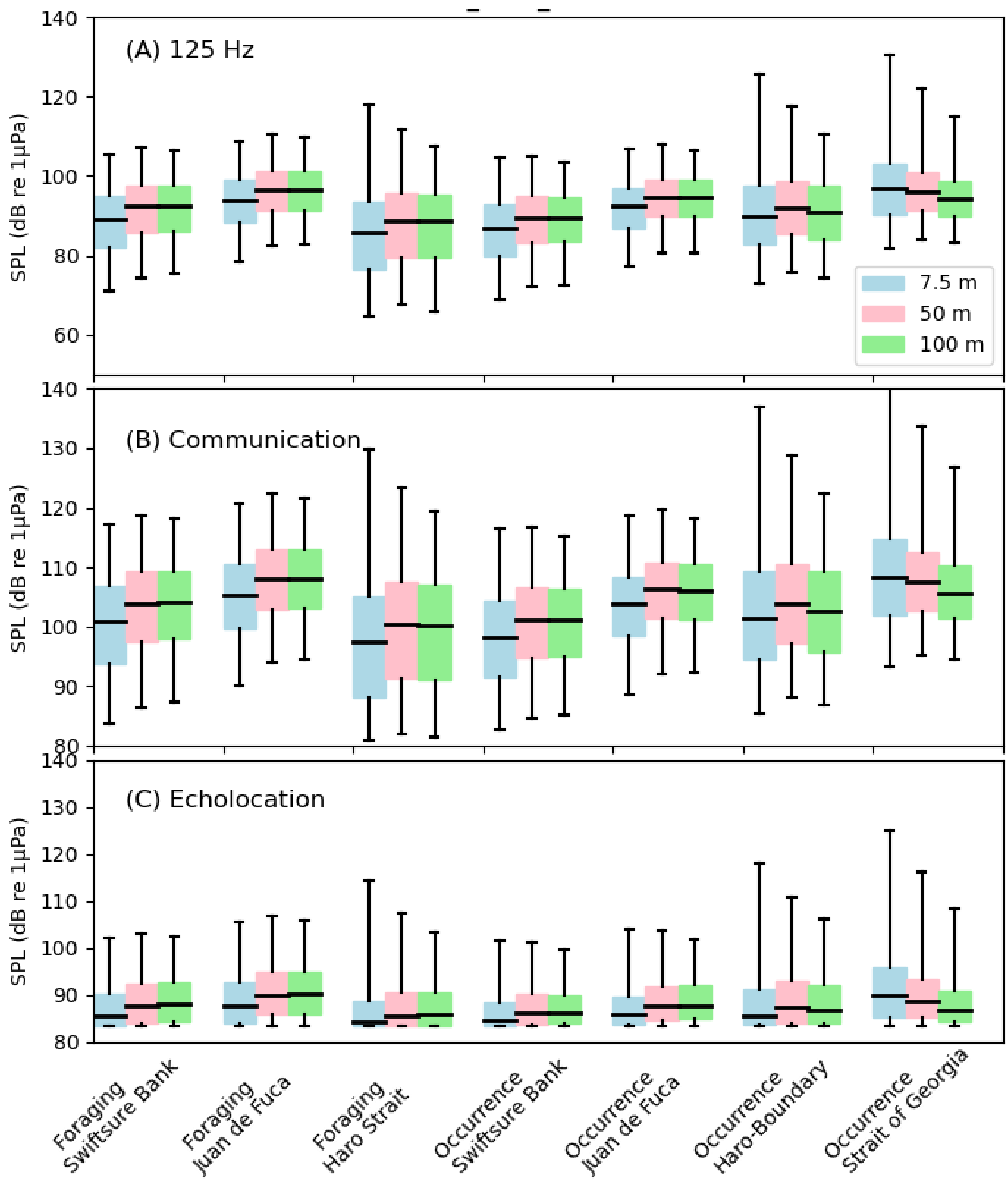

Figure 58: Boxplot comparing the sound pressure levels (SPL) in the subregions derived from data on SRKW **occurrence and foraging** for the slowdown scenario with **85% participation to current ECHO speeds throughout the full transit through the Salish Sea** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles.** Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

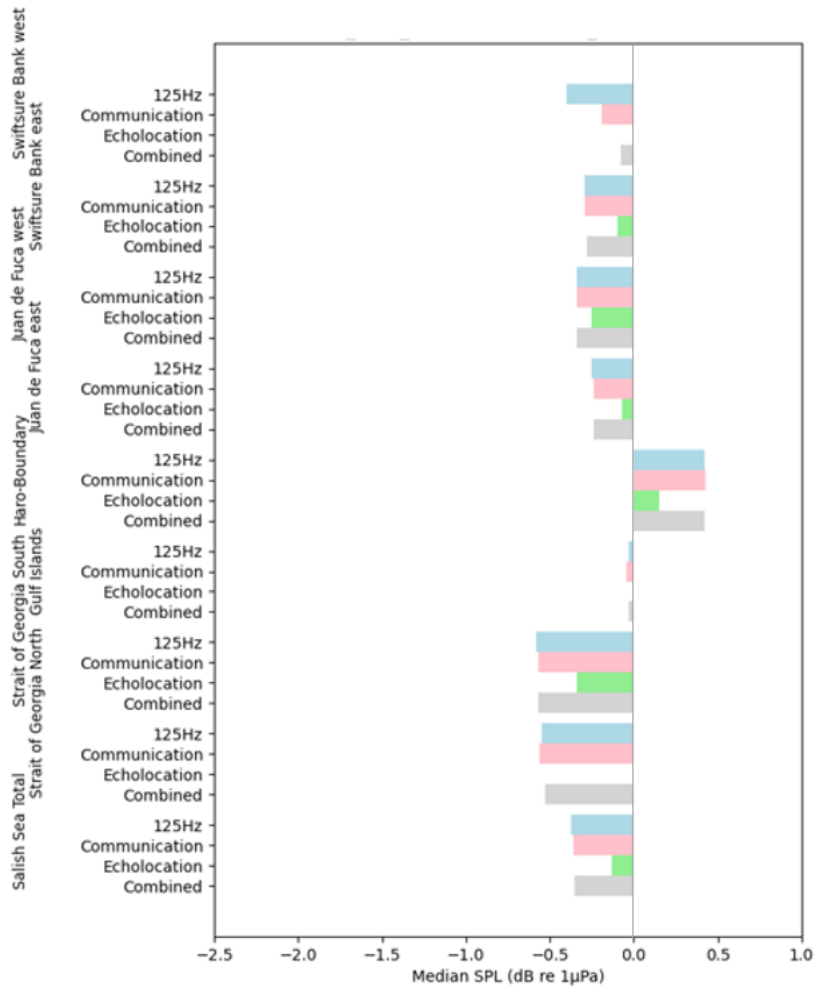

Figure 59: Bar chart showing the difference in decibels (dB) of the **85% participation of vessel speed reductions to current ECHO speeds throughout the full transit through the Salish Sea** relative to the baseline + TMX scenario at the depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. RL **median** differences have been calculated using the **acoustically-derived subregions**.

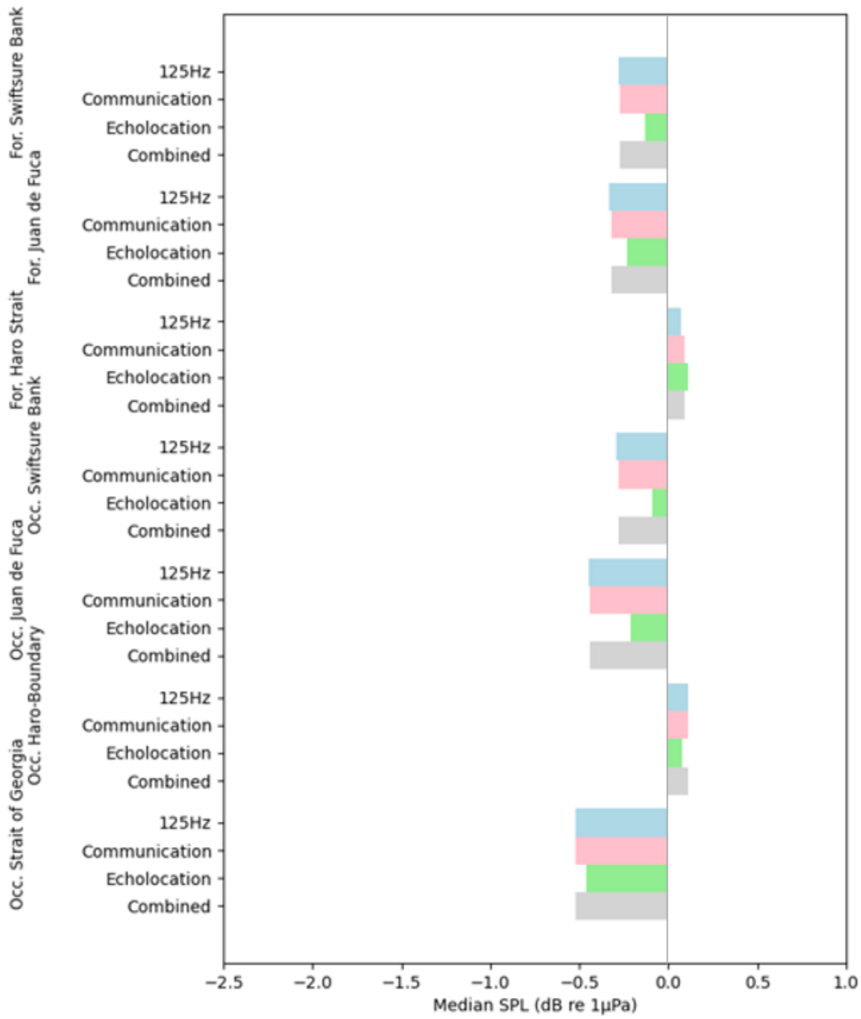

Figure 60: Bar chart showing the difference in decibels (dB) of the **85% participation of vessel speed reductions to current ECHO speeds throughout the full transit through the Salish Sea** relative to the baseline + TMX scenario at the depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. RL **median** differences were calculated using subregions derived from data on **SRKW occurrence and foraging.**

4.3.2 Full study area slowdown at 10 knots

A full vessel slowdown of all vessels transiting the Salish Sea with all vessel types transiting at the same speed was tested. The speed of 10 knots selected for the scenario exceeded the requested speed reductions by ECHO, however, it is not unprecedented for other jurisdictions that have used vessel speed reductions as a mitigation or conservation measure. Vessel speed reduction trials have used 10 knots as their slowdown speed in areas of Southern California, San Francisco and the Monterey Bay area on the west coast of the United States (U.S.), and Stellwagen Bank National Marine Sanctuary, Boston Harbour and Cape Cod on the U.S. east coast (see https://farallones.noaa.gov/eco/whales/vessel-speed-reduction.html, https://sanctuaries.noaa.gov/news/jun19/right-whale-corporate-responsibility-project-stellwagen-bank-national-marine-sanctuary.html). In Canada, a seasonal 10 knot vessel slowdown has been requested in Cabot Strait in the Gulf of St Lawrence to protect the north Atlantic right whale (*Eubalaena glacialis*). The selection of the speed limit was to lessen the risk of vessel strikes to whales and, in the event of a strike occurring, that the lethality to the whales would be reduced (Vanderlaan and Taggart 2007), but has also resulted in vessel noise reductions.

In this scenario the transits of all Class A AIS carrying vessels in the model domain were adjusted so that their travel speed was 10 knots or less consistently. This included all vessels targeted by the ECHO measures, but also slowed ferries to no more than 10 knots, which differed from previous scenarios. This scenario was used to demonstrate the potential benefits of slowing all vessels regardless of type, but does not consider the technical or economic feasibility of such a measure. Vessels leaving port were allowed to increase their transit speed up to, but not exceeding, 10 knots. The input data was again synthesized from 2015 data, changing the time it would take between reported locations to reflect the slower transit speed. The results from this scenario are shown in Figures 60-70 and Tables 9a-d. A comparison of median values and RL change (Figure 61-63) to mean values and RL change (Figures 64-66, Tables 9a-d) is given. For both the mean and the median the changes in the southern sections of the Strait of Georgia are highlighted as having the greatest change from slowing vessels. The mean also shows reductions in Haro Strait and Boundary Pass regions, which are less notable when considering the median sound levels (Figures 60-66).

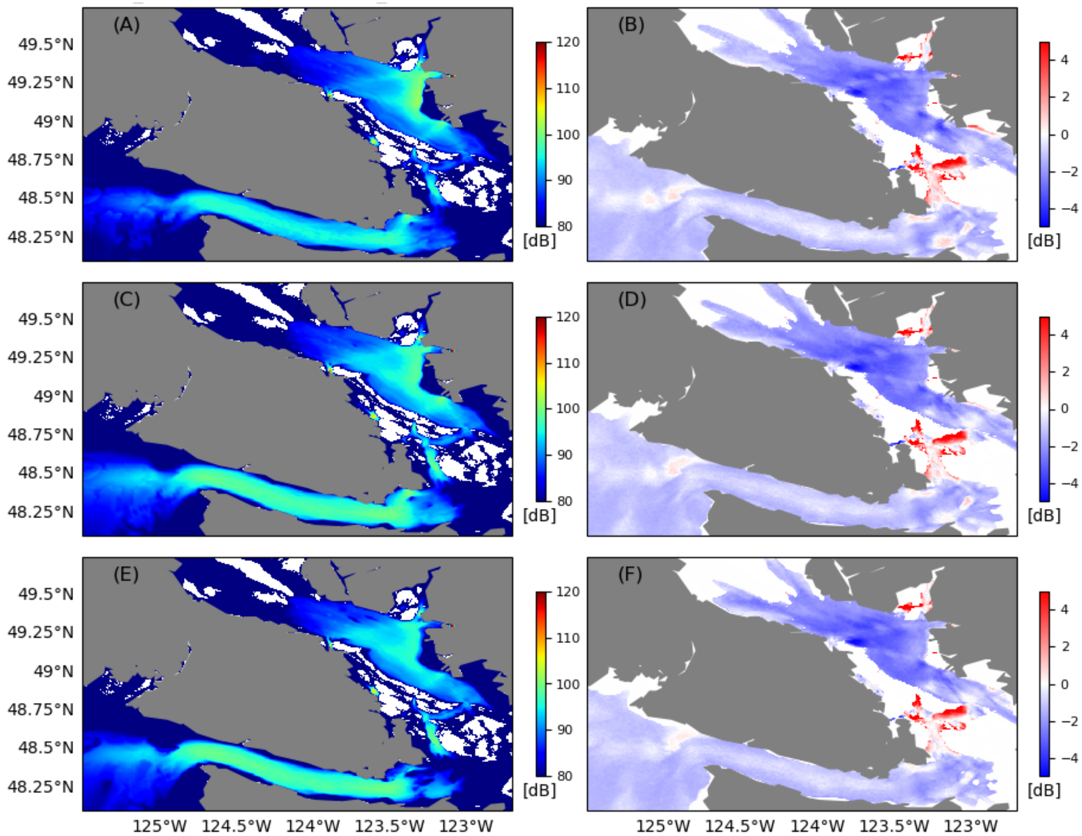

Figure 61: LEFT (A,C,E): Modelled median received sound levels at **125 Hz** for **100% participation rate of vessels traveling at 10 knots throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

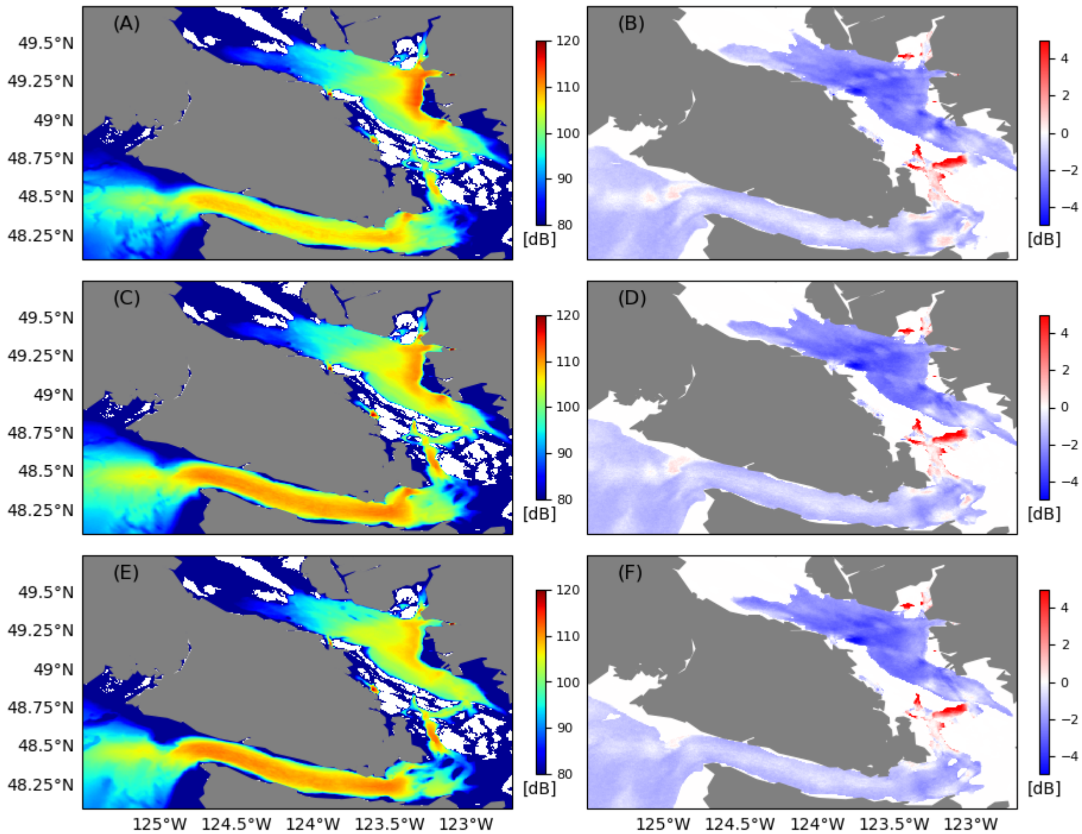

Figure 62: LEFT (A,C,E): Modelled median received sound levels in the SRKW **communication range (500 Hz to 15 kHz)** for **100% participation rate of vessels traveling at 10 knots throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

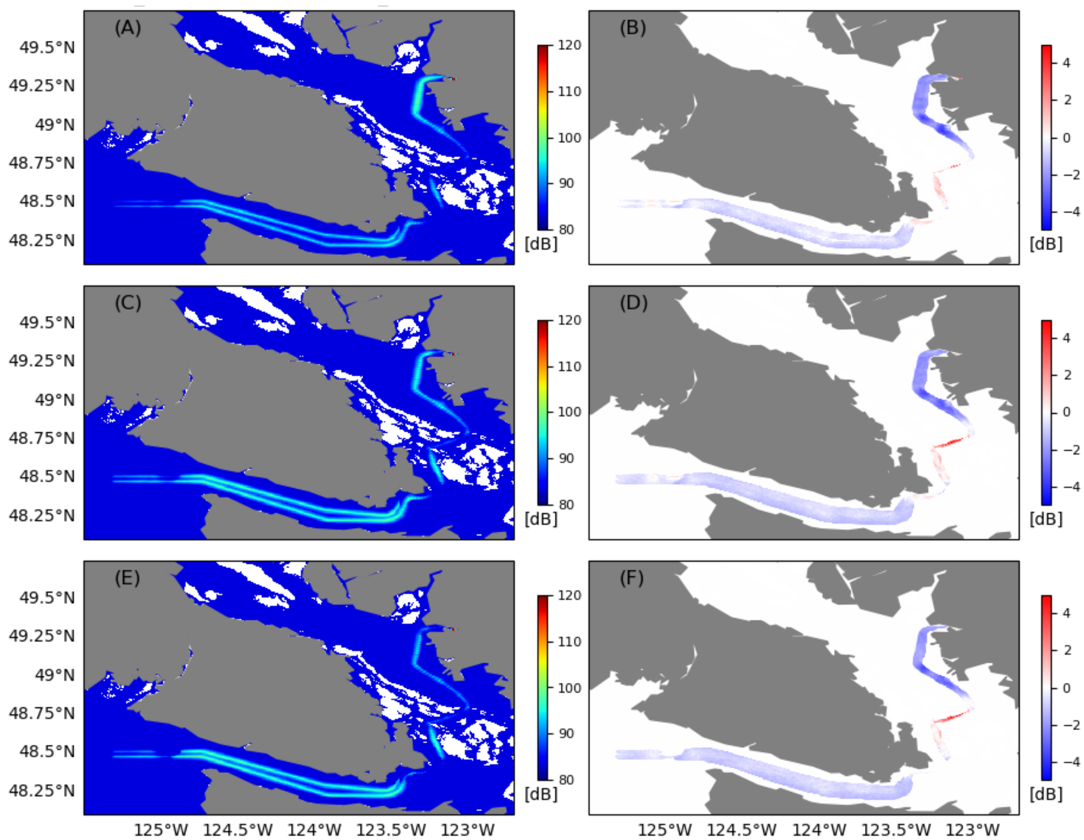

Figure 63: LEFT (A,C,E): Modelled median received sound levels in the SRKW **echolocation range (15-100 kHz)** for **100% participation rate of vessels traveling at 10 knots throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth.

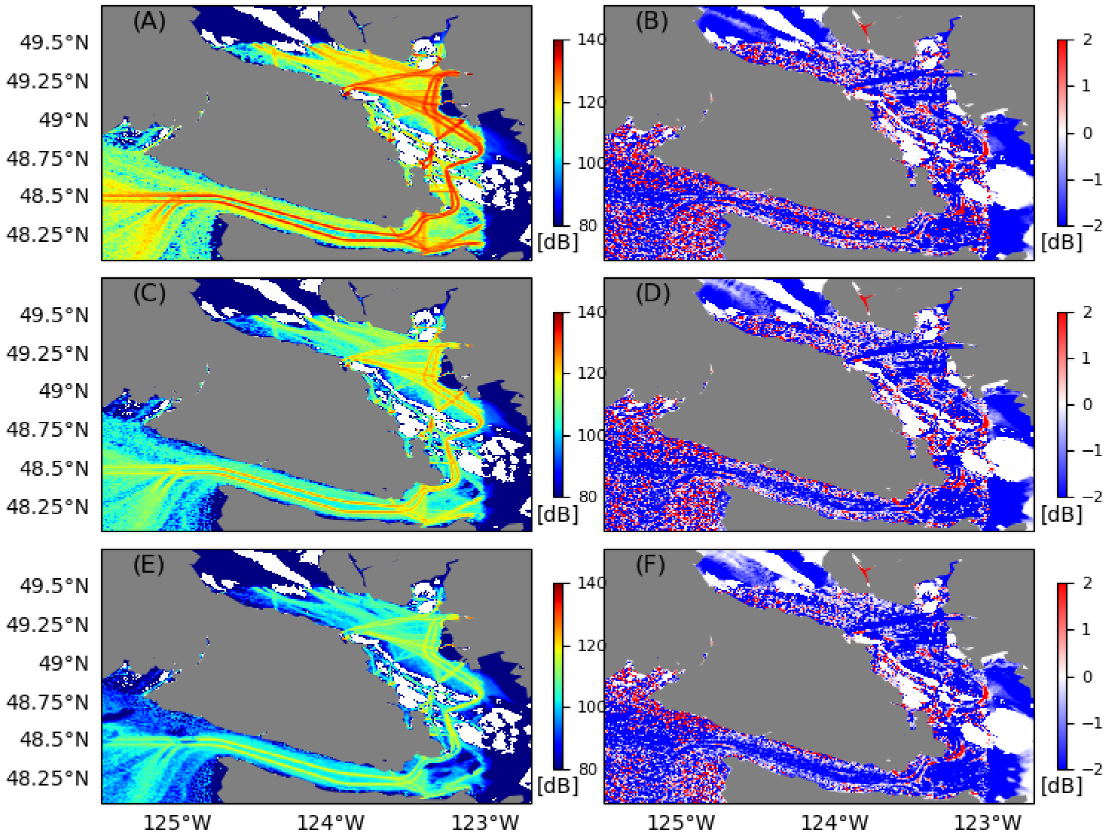

Figure 64: LEFT (A,C,E): Modelled **mean** (L_{eq}) received sound levels at **125 Hz** for **100% participation rate of vessels traveling at 10 knots throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth. Note the adjusted colour scale compared to the noise level maps for the median results.

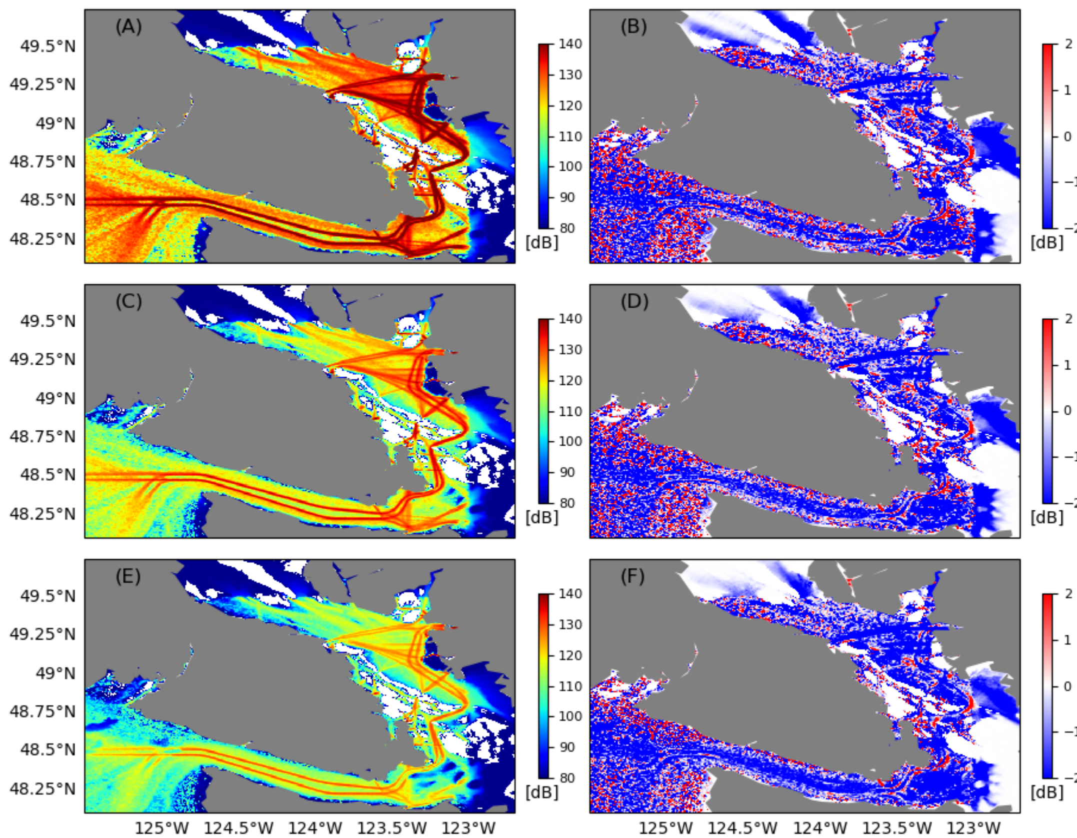

Figure 65: LEFT (A,C,E): Modelled **mean** (L_{eq}) received sound levels in the SRKW **communication range (500 Hz to 15 kHz)** for **100% participation rate of vessels traveling at 10 knots throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth. Note the adjusted colour scale compared to the noise level maps for the median results.

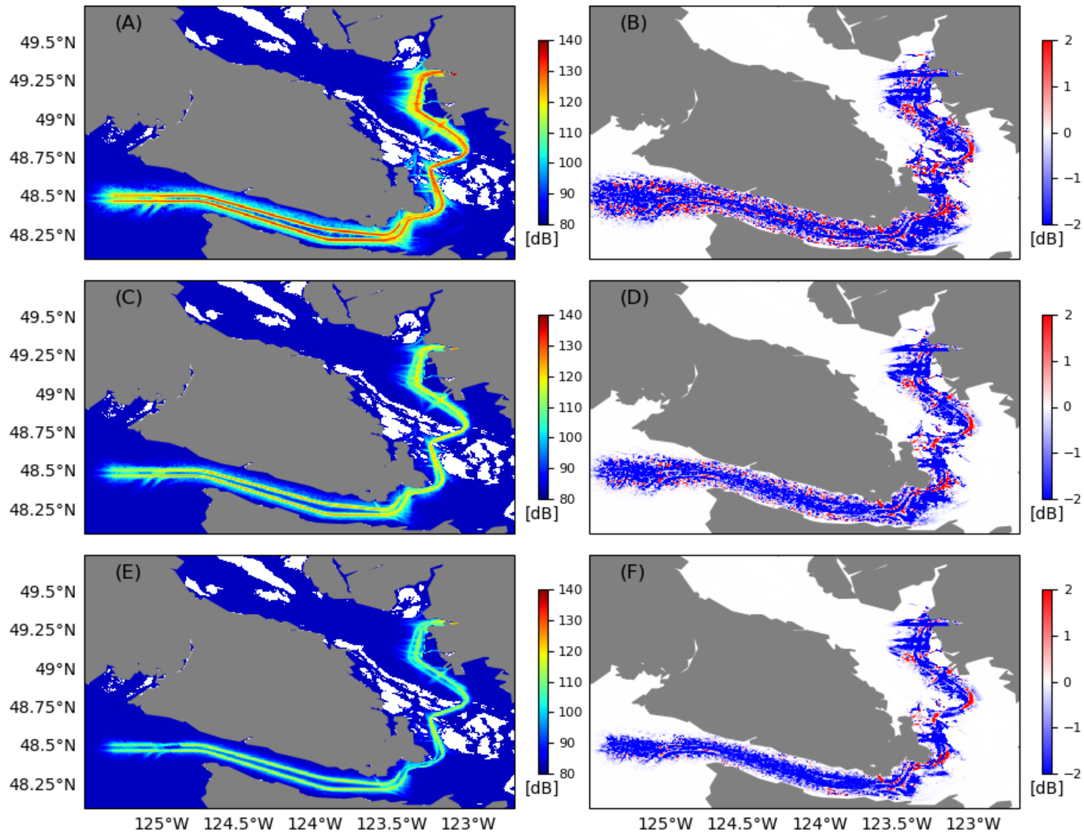

Figure 66: LEFT (A,C,E): Modelled **mean** (L_{eq}) received sound levels in the SRKW **echolocation range (15-100 kHz)** for **100% participation rate of vessels traveling at 10 knots throughout the full transit through the Salish Sea**. RIGHT (B,D,F): the change in decibels (dB) from the baseline + TMX scenario, where noise additions are shown in red, and noise reductions are shown in blue. These are expressed at (A-B) 7.5 m, (C-D) 50 m and (E-F) 100 m depth. Note the adjusted colour scale compared to the noise level maps for the median results.

Table 9a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to 10 knots throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	57.3	(+0.7)	(+0.5)	64.1	(0.0)	(-0.2)	70.3	(-0.4)	(-0.5)	76.8	(-0.7)	(-0.7)	88.2	(-2.2)	(-2.2)	112.0	(-3.6)	(-3.6)
50 m	57.8	(+0.9)	(+0.8)	65.4	(+0.1)	(0.0)	72.2	(-0.3)	(-0.3)	79.3	(-0.6)	(-0.6)	90.3	(-2.4)	(-2.4)	102.5	(-3.4)	(-3.4)
100 m	57.2	(+0.7)	(+0.6)	64.2	(+0.1)	(0.0)	70.6	(-0.4)	(-0.4)	77.1	(-0.6)	(-0.7)	87.1	(-2.5)	(-2.5)	93.5	(-2.9)	(-2.9)
Swiftsure Bank east																		
7.5 m	70.5	(+3.0)	(+1.4)	80.8	(+1.9)	(+0.4)	87.0	(+0.4)	(-0.7)	92.5	(-0.6)	(-1.5)	112.9	(+9.6)	(+8.5)	120.3	(-2.3)	(-2.8)
50 m	73.7	(+3.5)	(+1.7)	84.0	(+1.7)	(+0.2)	89.7	(+0.2)	(-0.8)	94.8	(-0.8)	(-1.6)	107.2	(+2.1)	(+1.1)	111.4	(-2.0)	(-2.5)
100 m	74.2	(+3.5)	(+1.6)	84.1	(+1.6)	(+0.1)	89.6	(+0.2)	(-0.9)	94.3	(-0.9)	(-1.7)	104.1	(+0.1)	(-0.7)	104.2	(-1.9)	(-2.5)
Juan de Fuca west																		
7.5 m	79.1	(+4.0)	(+1.5)	87.6	(+1.8)	(+0.1)	92.8	(+0.5)	(-0.8)	97.5	(-0.6)	(-1.6)	120.8	(+13.1)	(+10.9)	123.5	(-2.0)	(-2.6)
50 m	82.7	(+3.6)	(+1.2)	90.5	(+1.5)	(-0.1)	95.2	(+0.3)	(-0.9)	99.7	(-0.7)	(-1.7)	113.8	(+4.2)	(+2.8)	114.7	(-1.7)	(-2.4)
100 m	82.8	(+3.3)	(+1.0)	90.4	(+1.4)	(-0.1)	95.2	(+0.3)	(-0.9)	99.6	(-0.7)	(-1.7)	110.3	(+0.9)	(-0.2)	108.8	(-1.8)	(-2.4)
Juan de Fuca east																		
7.5 m	75.6	(+2.9)	(+1.5)	83.4	(+1.0)	(-0.1)	88.8	(+0.2)	(-0.8)	95.0	(-0.3)	(-0.9)	117.8	(+2.3)	(+1.5)	121.2	(-2.3)	(-2.6)
50 m	79.0	(+2.8)	(+1.4)	86.4	(+0.8)	(-0.3)	91.3	(-0.1)	(-1.0)	96.2	(-1.1)	(-1.7)	110.2	(+0.8)	(0.0)	112.2	(-2.1)	(-2.5)
100 m	78.2	(+2.3)	(+1.1)	85.1	(+0.6)	(-0.5)	89.8	(-0.1)	(-1.1)	94.5	(-1.1)	(-1.8)	104.5	(-0.7)	(-1.4)	104.7	(-2.0)	(-2.4)
Haro-Boundary																		
7.5 m	63.0	(+1.8)	(+0.2)	77.8	(+6.7)	(+3.2)	87.2	(+3.5)	(+0.8)	95.0	(+0.7)	(-1.0)	124.8	(+12.2)	(+4.8)	124.3	(-4.4)	(-4.7)
50 m	64.2	(+2.9)	(+0.9)	80.9	(+7.9)	(+3.5)	89.9	(+3.2)	(+0.6)	97.4	(+0.4)	(-1.3)	117.0	(+5.0)	(+2.0)	115.4	(-3.8)	(-4.2)
100 m	63.5	(+3.7)	(+1.7)	81.3	(+8.2)	(+3.4)	90.0	(+2.9)	(+0.4)	97.3	(+0.2)	(-1.4)	112.0	(+1.4)	(-0.3)	109.5	(-5.2)	(-5.5)
Gulf Islands																		
7.5 m	54.9	(+0.8)	(+0.8)	67.4	(+5.1)	(+2.6)	83.9	(-0.6)	(-0.6)	113.3	(-0.9)	(-0.9)	129.0	(-0.9)	(-0.9)	122.0	(-2.5)	(-2.5)
50 m	55.7	(+1.6)	(+1.6)	70.4	(+5.3)	(+2.7)	86.3	(-0.2)	(-0.3)	105.0	(-0.8)	(-0.8)	118.8	(-0.5)	(-0.5)	112.2	(-2.5)	(-2.5)
100 m	56.1	(+1.9)	(+1.9)	69.3	(+4.1)	(+1.6)	85.1	(-0.7)	(-0.8)	98.7	(-0.7)	(-0.8)	109.4	(0.0)	(0.0)	105.9	(-2.4)	(-2.4)
Strait of Georgia South																		
7.5 m	79.7	(-0.6)	(-1.3)	86.9	(-1.5)	(-2.0)	92.7	(-1.9)	(-2.3)	98.9	(-2.0)	(-2.4)	125.9	(-1.3)	(-1.7)	124.1	(-4.6)	(-4.8)
50 m	82.4	(-0.2)	(-1.0)	88.4	(-1.4)	(-1.9)	92.6	(-2.0)	(-2.4)	96.9	(-2.7)	(-3.0)	116.7	(-1.9)	(-2.3)	115.5	(-4.7)	(-4.8)

100 m	82.4	(-0.1)	(-0.8)	87.8	(-1.3)	(-1.8)	91.5	(-2.1)	(-2.4)	95.3	(-2.9)	(-3.2)	110.3	(-2.4)	(-2.6)	109.5	(-5.1)	(-5.2)
Strait of Georgia North																		
7.5 m	74.4	(-1.4)	(-1.6)	80.3	(-1.9)	(-2.0)	84.8	(-2.0)	(-2.2)	89.4	(-2.7)	(-2.8)	108.3	(-0.9)	(-0.9)	117.5	(-1.8)	(-1.8)
50 m	76.6	(-1.0)	(-1.3)	81.6	(-1.9)	(-2.0)	85.0	(-2.4)	(-2.5)	88.9	(-2.9)	(-2.9)	99.5	(-1.9)	(-1.9)	109.1	(-1.6)	(-1.6)
100 m	76.6	(-1.0)	(-1.2)	81.4	(-1.9)	(-2.0)	84.6	(-2.5)	(-2.5)	88.3	(-2.9)	(-3.0)	97.2	(-1.8)	(-1.8)	102.8	(-1.7)	(-1.7)
Salish Sea Total																		
7.5 m	84.0	(+0.9)	(-0.1)	92.0	(+0.2)	(-0.7)	97.8	(-0.5)	(-1.3)	113.7	(-0.9)	(-1.0)	132.3	(+0.3)	(-0.1)	130.9	(-3.4)	(-3.6)
50 m	87.1	(+1.4)	(+0.1)	94.4	(+0.4)	(-0.6)	99.6	(-0.3)	(-1.2)	107.7	(-0.9)	(-1.3)	123.3	(+0.4)	(-0.2)	121.9	(-3.2)	(-3.5)
100 m	87.0	(+1.3)	(+0.1)	94.1	(+0.4)	(-0.6)	99.1	(-0.2)	(-1.2)	105.0	(-1.0)	(-1.7)	117.1	(-0.2)	(-0.9)	115.7	(-3.8)	(-4.1)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	72.1	(+3.4)	(+1.6)	82.6	(+2.0)	(+0.4)	88.8	(+0.5)	(-0.6)	94.3	(-0.6)	(-1.4)	115.3	(+10.2)	(+9.2)	121.6	(-2.4)	(-2.9)
50 m	75.5	(+3.8)	(+1.8)	86.0	(+1.8)	(+0.3)	91.8	(+0.3)	(-0.8)	96.8	(-0.8)	(-1.6)	109.2	(+2.3)	(+1.4)	112.7	(-2.1)	(-2.6)
100 m	76.3	(+3.6)	(+1.6)	86.3	(+1.6)	(+0.1)	91.9	(+0.2)	(-0.9)	96.7	(-0.8)	(-1.7)	106.5	(+0.1)	(-0.7)	106.6	(-2.0)	(-2.6)
Juan de Fuca																		
7.5 m	79.5	(+4.4)	(+1.8)	88.2	(+1.8)	(+0.1)	93.4	(+0.6)	(-0.7)	98.2	(-0.5)	(-1.5)	120.2	(+12.0)	(+10.8)	123.4	(-2.3)	(-2.9)
50 m	83.2	(+4.0)	(+1.5)	91.3	(+1.4)	(-0.1)	96.0	(+0.3)	(-0.9)	100.4	(-0.6)	(-1.5)	113.7	(+3.3)	(+2.2)	114.7	(-2.0)	(-2.7)
100 m	83.5	(+3.5)	(+1.2)	91.3	(+1.4)	(-0.2)	96.0	(+0.3)	(-0.9)	100.4	(-0.6)	(-1.5)	110.3	(+0.3)	(-0.6)	108.8	(-2.0)	(-2.7)
Haro Strait																		
7.5 m	65.5	(+3.5)	(+2.5)	77.6	(+4.1)	(+2.3)	86.0	(+2.2)	(+0.2)	92.8	(-0.3)	(-1.7)	120.3	(+9.6)	(+4.8)	121.7	(-3.8)	(-4.2)
50 m	68.4	(+3.8)	(+2.7)	80.9	(+4.4)	(+2.3)	88.7	(+1.8)	(-0.1)	95.2	(-0.6)	(-1.9)	112.7	(+2.5)	(+0.7)	112.9	(-3.7)	(-4.1)
100 m	66.8	(+3.6)	(+2.6)	80.7	(+5.4)	(+2.7)	88.6	(+1.9)	(-0.1)	94.8	(-0.9)	(-2.1)	107.8	(-0.9)	(-2.0)	105.9	(-4.1)	(-4.5)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	69.8	(+3.0)	(+1.4)	80.1	(+1.9)	(+0.4)	86.3	(+0.4)	(-0.6)	91.9	(-0.6)	(-1.5)	112.3	(+9.6)	(+8.5)	119.8	(-2.3)	(-2.7)
50 m	73.0	(+3.4)	(+1.7)	83.4	(+1.7)	(+0.2)	89.1	(+0.2)	(-0.8)	94.2	(-0.8)	(-1.6)	106.5	(+2.1)	(+1.1)	110.8	(-1.9)	(-2.5)
100 m	73.5	(+3.5)	(+1.6)	83.5	(+1.6)	(+0.1)	89.0	(+0.2)	(-0.9)	93.7	(-0.9)	(-1.7)	103.5	(+0.1)	(-0.7)	103.7	(-1.9)	(-2.4)
Juan de Fuca																		
7.5 m	78.3	(+4.3)	(+1.7)	87.0	(+1.6)	(0.0)	91.7	(+0.2)	(-0.9)	95.9	(-0.9)	(-1.7)	116.9	(+11.8)	(+10.7)	120.0	(-1.9)	(-2.5)
50 m	81.6	(+4.1)	(+1.6)	89.8	(+1.3)	(-0.2)	94.2	(0.0)	(-1.0)	98.2	(-0.9)	(-1.7)	110.5	(+2.9)	(+1.9)	111.4	(-1.7)	(-2.2)

100 m	81.5	(+3.9)	(+1.4)	89.6	(+1.3)	(-0.2)	94.0	(+0.1)	(-1.0)	98.0	(-0.9)	(-1.7)	106.8	(0.0)	(-0.8)	105.7	(-1.7)	(-2.3)
Haro-Boundary																		
7.5 m	73.4	(+3.9)	(+2.3)	82.9	(+2.5)	(+1.0)	89.7	(+1.6)	(0.0)	97.4	(+0.8)	(-0.3)	127.1	(+3.7)	(+2.6)	124.8	(-2.2)	(-2.7)
50 m	76.5	(+3.9)	(+2.2)	85.7	(+2.5)	(+0.9)	92.1	(+1.4)	(-0.1)	98.6	(+0.3)	(-1.0)	118.7	(+3.0)	(+1.7)	116.0	(-2.0)	(-2.6)
100 m	75.0	(+3.2)	(+1.6)	84.3	(+2.6)	(+0.8)	90.8	(+1.6)	(-0.2)	97.1	(+0.1)	(-1.3)	111.3	(+1.4)	(0.0)	108.6	(-2.3)	(-2.9)
Strait of Georgia																		
7.5 m	80.4	(-0.3)	(-1.2)	88.7	(-1.2)	(-1.9)	95.1	(-1.7)	(-2.1)	101.9	(-1.5)	(-2.0)	128.9	(-1.1)	(-1.6)	126.3	(-4.0)	(-4.2)
50 m	82.5	(+0.1)	(-1.1)	89.6	(-1.1)	(-1.8)	94.3	(-1.7)	(-2.1)	99.1	(-2.3)	(-2.7)	120.1	(-1.3)	(-1.8)	117.7	(-4.0)	(-4.2)
100 m	81.9	(+0.1)	(-1.0)	88.3	(-1.0)	(-1.6)	92.5	(-1.5)	(-2.0)	96.8	(-2.3)	(-2.7)	113.6	(-1.3)	(-1.7)	111.7	(-4.0)	(-4.2)

Table 9b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to 10 knots throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	81.8	(-0.2)	(-0.3)	86.2	(-0.7)	(-0.7)	97.1	(-2.2)	(-2.2)	120.7	(-3.7)	(-3.7)
50 m	80.7	(0.0)	(0.0)	80.9	(0.0)	(0.0)	83.0	(-0.2)	(-0.3)	88.6	(-0.6)	(-0.6)	99.3	(-2.3)	(-2.3)	111.3	(-3.5)	(-3.5)
100 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.5	(-0.2)	(-0.2)	86.9	(-0.6)	(-0.6)	96.4	(-2.5)	(-2.5)	102.3	(-3.1)	(-3.1)
Swiftsure Bank east																		
7.5 m	83.4	(+1.6)	(+0.8)	92.4	(+1.9)	(+0.4)	98.6	(+0.5)	(-0.6)	104.1	(-0.6)	(-1.5)	124.8	(+9.8)	(+8.6)	132.0	(-2.3)	(-2.7)
50 m	85.9	(+2.6)	(+1.3)	95.6	(+1.7)	(+0.2)	101.4	(+0.2)	(-0.8)	106.4	(-0.8)	(-1.6)	119.0	(+2.2)	(+1.2)	123.1	(-1.9)	(-2.5)
100 m	86.5	(+2.6)	(+1.2)	95.8	(+1.6)	(+0.1)	101.3	(+0.2)	(-0.9)	106.0	(-0.9)	(-1.7)	115.9	(+0.2)	(-0.7)	116.0	(-1.9)	(-2.4)
Juan de Fuca west																		
7.5 m	90.8	(+3.9)	(+1.4)	99.2	(+1.8)	(+0.1)	104.4	(+0.5)	(-0.8)	109.2	(-0.6)	(-1.6)	132.6	(+13.2)	(+11.0)	135.3	(-2.0)	(-2.6)
50 m	94.3	(+3.6)	(+1.2)	102.1	(+1.5)	(-0.1)	106.9	(+0.3)	(-0.9)	111.3	(-0.7)	(-1.7)	125.6	(+4.3)	(+2.9)	126.6	(-1.7)	(-2.4)
100 m	94.5	(+3.3)	(+1.0)	102.1	(+1.4)	(-0.1)	106.8	(+0.3)	(-0.9)	111.3	(-0.7)	(-1.7)	122.1	(+1.0)	(-0.1)	120.6	(-1.8)	(-2.5)
Juan de Fuca east																		
7.5 m	87.5	(+2.4)	(+1.3)	95.0	(+1.1)	(-0.1)	100.3	(+0.2)	(-0.8)	106.5	(-0.2)	(-0.9)	129.3	(+2.5)	(+1.5)	132.6	(-2.1)	(-2.5)
50 m	90.7	(+2.6)	(+1.3)	97.9	(+0.8)	(-0.3)	102.8	(-0.1)	(-1.0)	107.7	(-1.0)	(-1.7)	121.8	(+1.1)	(+0.1)	123.6	(-2.0)	(-2.4)
100 m	90.0	(+2.1)	(+1.0)	96.7	(+0.6)	(-0.5)	101.4	(-0.1)	(-1.1)	106.0	(-1.0)	(-1.7)	116.0	(-0.5)	(-1.2)	116.1	(-1.8)	(-2.3)
Haro-Boundary																		
7.5 m	81.0	(+0.1)	(-0.1)	89.7	(+5.7)	(+2.9)	99.0	(+3.5)	(+0.8)	106.7	(+0.7)	(-1.0)	136.6	(+12.2)	(+4.8)	136.0	(-4.2)	(-4.6)
50 m	81.2	(+0.3)	(0.0)	92.7	(+7.2)	(+3.4)	101.6	(+3.2)	(+0.6)	109.1	(+0.4)	(-1.3)	128.8	(+5.1)	(+2.0)	127.1	(-3.6)	(-4.1)
100 m	81.0	(+0.3)	(+0.1)	93.1	(+7.5)	(+3.3)	101.8	(+2.9)	(+0.4)	109.0	(+0.2)	(-1.4)	123.7	(+1.4)	(-0.3)	121.2	(-5.0)	(-5.3)
Gulf Islands																		
7.5 m	78.9	(0.0)	(0.0)	81.4	(+1.7)	(+1.0)	94.1	(-0.4)	(-0.5)	123.0	(-0.9)	(-0.9)	139.6	(-1.0)	(-1.0)	132.6	(-2.6)	(-2.6)
50 m	78.9	(0.0)	(0.0)	83.2	(+2.6)	(+1.5)	96.5	(0.0)	(-0.1)	114.8	(-0.8)	(-0.8)	129.3	(-0.5)	(-0.5)	122.7	(-2.6)	(-2.6)
100 m	78.9	(+0.1)	(+0.1)	82.5	(+1.9)	(+0.8)	95.2	(-0.6)	(-0.7)	108.6	(-0.7)	(-0.7)	119.8	(0.0)	(0.0)	116.4	(-2.4)	(-2.4)
Strait of Georgia South																		
7.5 m	90.8	(-0.5)	(-1.2)	98.1	(-1.5)	(-1.9)	104.0	(-1.9)	(-2.3)	110.3	(-2.0)	(-2.3)	137.3	(-1.2)	(-1.7)	135.3	(-4.6)	(-4.8)
50 m	93.4	(-0.1)	(-1.0)	99.5	(-1.3)	(-1.8)	103.8	(-2.0)	(-2.3)	108.2	(-2.7)	(-3.0)	128.0	(-1.8)	(-2.2)	126.6	(-4.6)	(-4.8)

100 m	93.3	(-0.1)	(-0.8)	98.8	(-1.3)	(-1.8)	102.6	(-2.0)	(-2.3)	106.4	(-2.8)	(-3.1)	121.6	(-2.2)	(-2.5)	120.7	(-5.1)	(-5.2)
Strait of Georgia North																		
7.5 m	84.2	(-1.1)	(-1.3)	89.4	(-1.9)	(-2.0)	93.9	(-2.1)	(-2.2)	98.5	(-2.7)	(-2.8)	117.0	(-0.8)	(-0.8)	126.1	(-1.7)	(-1.7)
50 m	86.1	(-0.9)	(-1.2)	90.7	(-1.9)	(-2.0)	94.1	(-2.4)	(-2.5)	97.9	(-2.9)	(-3.0)	108.1	(-1.9)	(-1.9)	117.8	(-1.6)	(-1.6)
100 m	86.1	(-0.9)	(-1.1)	90.5	(-1.9)	(-2.0)	93.6	(-2.5)	(-2.5)	97.3	(-3.0)	(-3.0)	105.8	(-1.8)	(-1.8)	111.4	(-1.6)	(-1.6)
Salish Sea Total																		
7.5 m	95.8	(+1.0)	(0.0)	103.4	(+0.4)	(-0.6)	109.2	(-0.3)	(-1.2)	123.7	(-0.9)	(-1.0)	143.4	(+0.6)	(+0.1)	142.2	(-3.3)	(-3.6)
50 m	98.6	(+1.5)	(+0.3)	105.9	(+0.6)	(-0.5)	111.0	(-0.2)	(-1.1)	118.4	(-0.9)	(-1.4)	134.5	(+0.6)	(-0.1)	133.3	(-3.1)	(-3.5)
100 m	98.5	(+1.4)	(+0.2)	105.5	(+0.6)	(-0.5)	110.6	(-0.1)	(-1.1)	116.2	(-0.9)	(-1.7)	128.6	(0.0)	(-0.9)	127.0	(-3.7)	(-4.0)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	84.4	(+2.3)	(+1.1)	94.2	(+2.0)	(+0.4)	100.5	(+0.5)	(-0.6)	106.0	(-0.6)	(-1.4)	127.2	(+10.4)	(+9.4)	133.4	(-2.4)	(-2.8)
50 m	87.4	(+3.3)	(+1.6)	97.6	(+1.8)	(+0.3)	103.4	(+0.3)	(-0.8)	108.4	(-0.8)	(-1.6)	121.0	(+2.4)	(+1.5)	124.5	(-2.1)	(-2.6)
100 m	88.3	(+3.2)	(+1.4)	98.0	(+1.6)	(+0.1)	103.5	(+0.2)	(-0.9)	108.4	(-0.8)	(-1.7)	118.3	(+0.2)	(-0.7)	118.3	(-2.0)	(-2.6)
Juan de Fuca																		
7.5 m	91.1	(+4.4)	(+1.8)	99.8	(+1.8)	(+0.1)	105.1	(+0.6)	(-0.7)	109.9	(-0.5)	(-1.5)	132.1	(+12.1)	(+10.9)	135.2	(-2.3)	(-2.9)
50 m	94.8	(+4.0)	(+1.5)	102.9	(+1.5)	(-0.1)	107.6	(+0.3)	(-0.9)	112.1	(-0.6)	(-1.5)	125.5	(+3.4)	(+2.3)	126.5	(-2.0)	(-2.7)
100 m	95.2	(+3.5)	(+1.2)	103.0	(+1.4)	(-0.2)	107.7	(+0.3)	(-0.9)	112.1	(-0.6)	(-1.5)	122.1	(+0.4)	(-0.6)	120.6	(-2.0)	(-2.7)
Haro Strait																		
7.5 m	81.2	(+0.5)	(+0.4)	89.4	(+3.9)	(+2.2)	97.6	(+2.3)	(+0.2)	104.5	(-0.3)	(-1.7)	132.0	(+9.6)	(+4.7)	133.4	(-3.7)	(-4.1)
50 m	82.3	(+1.2)	(+1.0)	92.5	(+4.4)	(+2.4)	100.3	(+1.9)	(0.0)	106.9	(-0.6)	(-1.9)	124.5	(+2.6)	(+0.7)	124.6	(-3.7)	(-4.1)
100 m	81.7	(+0.7)	(+0.6)	92.4	(+5.4)	(+2.7)	100.3	(+2.0)	(-0.1)	106.5	(-0.8)	(-2.1)	119.6	(-0.9)	(-2.0)	117.6	(-4.1)	(-4.5)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.1	(+1.4)	(+0.7)	91.8	(+1.9)	(+0.4)	98.0	(+0.5)	(-0.6)	103.5	(-0.6)	(-1.5)	124.1	(+9.7)	(+8.6)	131.5	(-2.2)	(-2.7)
50 m	85.4	(+2.4)	(+1.2)	95.0	(+1.7)	(+0.2)	100.7	(+0.2)	(-0.8)	105.8	(-0.8)	(-1.6)	118.3	(+2.2)	(+1.2)	122.5	(-1.9)	(-2.5)
100 m	86.0	(+2.5)	(+1.2)	95.2	(+1.6)	(+0.1)	100.6	(+0.2)	(-0.9)	105.4	(-0.9)	(-1.7)	115.2	(+0.2)	(-0.7)	115.4	(-1.9)	(-2.4)
Juan de Fuca																		
7.5 m	89.8	(+4.1)	(+1.7)	98.5	(+1.6)	(0.0)	103.3	(+0.2)	(-0.9)	107.5	(-0.9)	(-1.7)	128.8	(+12.0)	(+10.9)	131.7	(-2.0)	(-2.5)
50 m	93.1	(+4.1)	(+1.6)	101.3	(+1.4)	(-0.2)	105.7	(+0.1)	(-1.0)	109.8	(-0.9)	(-1.7)	122.3	(+3.1)	(+2.0)	123.1	(-1.7)	(-2.3)

100 m	93.1	(+3.8)	(+1.4)	101.2	(+1.3)	(-0.2)	105.6	(+0.1)	(-1.0)	109.6	(-0.9)	(-1.7)	118.5	(+0.1)	(-0.7)	117.4	(-1.7)	(-2.3)
Haro-Boundary																		
7.5 m	86.0	(+2.7)	(+1.6)	94.6	(+2.5)	(+1.0)	101.3	(+1.6)	(0.0)	109.0	(+0.8)	(-0.4)	138.4	(+4.0)	(+2.7)	136.4	(-2.2)	(-2.8)
50 m	88.6	(+3.2)	(+1.8)	97.4	(+2.4)	(+0.9)	103.7	(+1.4)	(-0.1)	110.2	(+0.3)	(-1.0)	130.0	(+3.1)	(+1.7)	127.6	(-2.1)	(-2.7)
100 m	87.3	(+2.4)	(+1.2)	96.0	(+2.5)	(+0.8)	102.5	(+1.6)	(-0.2)	108.7	(+0.1)	(-1.3)	123.0	(+1.4)	(-0.1)	120.3	(-2.3)	(-2.9)
Strait of Georgia																		
7.5 m	92.0	(-0.2)	(-1.2)	100.3	(-1.2)	(-1.8)	106.8	(-1.7)	(-2.2)	113.5	(-1.6)	(-2.0)	140.6	(-1.1)	(-1.6)	137.9	(-4.0)	(-4.3)
50 m	94.1	(+0.1)	(-1.1)	101.1	(-1.1)	(-1.8)	105.9	(-1.7)	(-2.1)	110.7	(-2.3)	(-2.7)	131.8	(-1.4)	(-1.9)	129.3	(-4.0)	(-4.3)
100 m	93.4	(+0.1)	(-1.0)	99.9	(-1.0)	(-1.6)	104.1	(-1.5)	(-2.0)	108.3	(-2.3)	(-2.7)	125.1	(-1.4)	(-1.8)	123.2	(-4.0)	(-4.3)

Table 9c: Modelled received sound levels (RL) for each subregion at in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to 10 knots throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
50 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
100 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.8	(+0.3)	(-0.2)	88.1	(-0.3)	(-1.1)	111.8	(+12.8)	(+11.3)	117.4	(-1.6)	(-2.3)
50 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(+0.1)	86.1	(+0.2)	(-0.4)	89.9	(-0.5)	(-1.3)	105.0	(+4.5)	(+3.1)	108.4	(-1.3)	(-2.2)
100 m	83.3	(0.0)	(0.0)	84.0	(+0.3)	(0.0)	86.1	(+0.2)	(-0.5)	89.6	(-0.6)	(-1.4)	101.2	(+1.7)	(+0.5)	101.3	(-1.4)	(-2.2)
Juan de Fuca west																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(+0.1)	87.3	(+0.5)	(-0.6)	91.8	(-0.4)	(-1.4)	119.7	(+16.2)	(+12.8)	121.4	(-1.9)	(-2.6)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	89.5	(+0.3)	(-0.8)	93.9	(-0.6)	(-1.5)	112.1	(+6.7)	(+4.8)	112.5	(-1.6)	(-2.4)
100 m	83.3	(+0.1)	(0.0)	85.8	(+0.8)	(-0.1)	89.6	(+0.3)	(-0.8)	94.0	(-0.6)	(-1.5)	107.7	(+2.7)	(+1.2)	106.4	(-1.7)	(-2.4)
Juan de Fuca east																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.1)	(0.0)	85.0	(+0.3)	(-0.3)	88.3	(0.0)	(-0.8)	111.9	(+8.0)	(+4.5)	115.4	(-0.9)	(-1.8)
50 m	83.3	(0.0)	(0.0)	84.2	(+0.3)	(-0.1)	86.3	(+0.2)	(-0.5)	89.8	(-0.2)	(-1.1)	105.0	(+4.1)	(+1.9)	106.5	(-0.7)	(-1.7)
100 m	83.3	(0.0)	(0.0)	84.1	(+0.2)	(-0.1)	85.9	(+0.1)	(-0.5)	88.9	(-0.3)	(-1.1)	99.9	(+1.6)	(+0.1)	99.3	(-0.8)	(-1.7)
Haro-Boundary																		
7.5 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	84.5	(+1.0)	(+0.3)	90.0	(+0.8)	(-0.8)	121.2	(+12.8)	(+4.7)	119.4	(-2.4)	(-3.0)
50 m	83.1	(0.0)	(0.0)	83.2	(+0.2)	(+0.2)	85.9	(+1.5)	(+0.3)	92.2	(+0.5)	(-1.1)	113.3	(+6.0)	(+2.3)	110.8	(-2.2)	(-2.9)
100 m	83.1	(0.0)	(0.0)	83.3	(+0.3)	(+0.2)	86.3	(+1.4)	(+0.2)	92.2	(+0.3)	(-1.3)	108.0	(+2.2)	(+0.1)	104.5	(-2.3)	(-3.0)
Gulf Islands																		
7.5 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	92.0	(-1.4)	(-1.5)	90.2	(-2.9)	(-2.9)
50 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	84.4	(-0.8)	(-1.0)	83.9	(-1.8)	(-1.8)
100 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	82.7	(-0.4)	(-0.6)	82.3	(-0.6)	(-0.7)
Strait of Georgia South																		
7.5 m	83.3	(0.0)	(0.0)	83.7	(-0.2)	(-0.4)	85.9	(-1.0)	(-1.3)	90.2	(-1.9)	(-2.4)	118.8	(-1.2)	(-1.9)	115.3	(-4.0)	(-4.3)

50 m	83.3	(0.0)	(0.0)	83.7	(-0.2)	(-0.4)	85.2	(-0.8)	(-1.1)	88.2	(-1.8)	(-2.2)	109.0	(-1.9)	(-2.5)	106.2	(-3.9)	(-4.3)
100 m	83.3	(0.0)	(0.0)	83.4	(-0.1)	(-0.2)	84.3	(-0.5)	(-0.7)	86.3	(-1.4)	(-1.8)	101.3	(-2.4)	(-3.0)	99.7	(-4.2)	(-4.5)
Strait of Georgia North																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	92.1	(0.0)	(0.0)	92.3	(+0.1)	(0.0)	93.8	(+0.1)	(-0.4)	97.4	(-0.5)	(-1.3)	125.2	(+4.7)	(+2.8)	125.4	(-2.2)	(-2.8)
50 m	92.1	(0.0)	(0.0)	92.7	(+0.2)	(0.0)	94.8	(+0.2)	(-0.5)	98.6	(-0.4)	(-1.3)	117.1	(+3.5)	(+1.6)	116.6	(-1.9)	(-2.7)
100 m	92.1	(0.0)	(0.0)	92.8	(+0.2)	(0.0)	94.7	(+0.3)	(-0.4)	98.4	(-0.4)	(-1.3)	112.0	(+1.6)	(+0.1)	110.1	(-2.1)	(-2.7)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.2)	(+0.1)	85.5	(+0.4)	(-0.3)	89.6	(-0.4)	(-1.2)	114.4	(+13.7)	(+12.3)	119.0	(-1.9)	(-2.6)
50 m	83.3	(0.0)	(0.0)	84.2	(+0.5)	(+0.1)	87.3	(+0.3)	(-0.5)	91.5	(-0.6)	(-1.4)	107.3	(+4.9)	(+3.7)	110.0	(-1.7)	(-2.4)
100 m	83.3	(0.0)	(0.0)	84.4	(+0.5)	(+0.1)	87.5	(+0.3)	(-0.6)	91.8	(-0.7)	(-1.5)	103.8	(+1.7)	(+0.6)	103.9	(-1.6)	(-2.4)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.5)	(+0.1)	87.5	(+0.6)	(-0.5)	92.1	(-0.3)	(-1.2)	119.1	(+15.5)	(+13.6)	121.2	(-2.3)	(-2.9)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	89.6	(+0.4)	(-0.7)	94.1	(-0.4)	(-1.3)	111.8	(+6.0)	(+4.5)	112.4	(-1.9)	(-2.7)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(-0.1)	89.8	(+0.4)	(-0.7)	94.3	(-0.5)	(-1.4)	107.5	(+2.2)	(+0.9)	106.3	(-2.0)	(-2.7)
Haro Strait																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	84.5	(+0.8)	(+0.2)	88.4	(+0.1)	(-1.1)	116.2	(+10.3)	(+4.5)	116.8	(-3.1)	(-3.6)
50 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(+0.1)	85.5	(+1.1)	(+0.1)	90.2	(-0.2)	(-1.5)	108.6	(+3.3)	(+1.0)	108.1	(-3.0)	(-3.6)
100 m	83.3	(0.0)	(0.0)	83.5	(+0.2)	(+0.2)	85.8	(+1.1)	(+0.1)	90.0	(-0.6)	(-1.7)	103.5	(-0.3)	(-1.7)	101.0	(-3.7)	(-4.1)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.6	(+0.2)	(-0.2)	87.7	(-0.3)	(-1.0)	111.1	(+12.8)	(+11.2)	116.8	(-1.6)	(-2.3)
50 m	83.3	(0.0)	(0.0)	83.8	(+0.3)	(+0.1)	85.8	(+0.2)	(-0.4)	89.4	(-0.5)	(-1.3)	104.3	(+4.4)	(+3.1)	107.8	(-1.3)	(-2.2)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(0.0)	85.8	(+0.2)	(-0.4)	89.1	(-0.6)	(-1.4)	100.5	(+1.6)	(+0.5)	100.7	(-1.4)	(-2.2)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	83.7	(+0.3)	(+0.1)	85.7	(+0.3)	(-0.4)	89.0	(-0.4)	(-1.3)	115.8	(+15.9)	(+14.2)	117.2	(-2.0)	(-2.7)

50 m	83.3	(0.0)	(0.0)	84.6	(+0.5)	(0.0)	87.2	(+0.2)	(-0.7)	90.9	(-0.6)	(-1.4)	108.5	(+6.3)	(+4.7)	108.4	(-1.7)	(-2.5)
100 m	83.3	(0.0)	(0.0)	84.8	(+0.5)	(0.0)	87.5	(+0.2)	(-0.7)	91.1	(-0.7)	(-1.5)	103.7	(+2.6)	(+1.2)	102.4	(-1.7)	(-2.5)
Haro-Boundary																		
7.5 m	83.3	(0.0)	(0.0)	83.5	(+0.1)	(0.0)	85.5	(+0.8)	(0.0)	90.7	(+0.6)	(-0.8)	120.0	(+10.4)	(+4.3)	119.8	(-1.8)	(-2.5)
50 m	83.3	(0.0)	(0.0)	84.1	(+0.4)	(+0.2)	87.1	(+0.9)	(-0.1)	92.6	(+0.3)	(-1.1)	112.2	(+5.4)	(+2.2)	111.1	(-1.7)	(-2.5)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(+0.1)	86.6	(+0.9)	(-0.1)	91.8	(+0.2)	(-1.2)	106.8	(+2.0)	(+0.1)	104.0	(-2.0)	(-2.7)
Strait of Georgia																		
7.5 m	83.3	(0.0)	(0.0)	84.4	(-0.5)	(-0.8)	88.4	(-1.4)	(-1.9)	93.9	(-2.1)	(-2.6)	122.3	(-1.7)	(-2.3)	119.2	(-4.1)	(-4.4)
50 m	83.3	(0.0)	(0.0)	84.4	(-0.4)	(-0.8)	87.3	(-1.3)	(-1.8)	91.5	(-2.2)	(-2.7)	113.4	(-2.0)	(-2.6)	110.3	(-4.1)	(-4.4)
100 m	83.3	(0.0)	(0.0)	83.8	(-0.3)	(-0.5)	85.6	(-1.0)	(-1.4)	88.9	(-2.0)	(-2.5)	105.1	(-2.9)	(-3.5)	103.1	(-4.0)	(-4.4)

Table 9d: Modelled received sound levels (RL) for each subregion in a **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for the slowdown scenario of **100% participation of vessels to current ECHO slowdown speeds throughout their complete transit through the Salish Sea**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference the slowdown makes compared to baseline conditions in decibel.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.6	(-0.1)	(-0.1)	88.0	(-0.5)	(-0.5)	97.2	(-2.1)	(-2.1)	120.7	(-3.7)	(-3.7)
50 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.1	(-0.1)	(-0.1)	89.7	(-0.5)	(-0.5)	99.4	(-2.3)	(-2.3)	111.3	(-3.5)	(-3.5)
100 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.9	(-0.1)	(-0.1)	88.4	(-0.4)	(-0.4)	96.6	(-2.4)	(-2.4)	102.3	(-3.1)	(-3.1)
Swiftsure Bank east																		
7.5 m	86.3	(+0.7)	(+0.4)	92.9	(+1.7)	(+0.4)	98.8	(+0.5)	(-0.6)	104.2	(-0.6)	(-1.5)	125.0	(+9.9)	(+8.7)	132.2	(-2.2)	(-2.7)
50 m	87.8	(+1.5)	(+0.8)	95.9	(+1.6)	(+0.2)	101.5	(+0.2)	(-0.8)	106.5	(-0.8)	(-1.6)	119.2	(+2.3)	(+1.3)	123.2	(-1.9)	(-2.5)
100 m	88.2	(+1.6)	(+0.8)	96.1	(+1.5)	(+0.1)	101.4	(+0.2)	(-0.9)	106.1	(-0.9)	(-1.7)	116.0	(+0.2)	(-0.7)	116.1	(-1.9)	(-2.4)
Juan de Fuca west																		
7.5 m	91.5	(+3.0)	(+1.2)	99.3	(+1.7)	(+0.1)	104.5	(+0.5)	(-0.8)	109.3	(-0.6)	(-1.6)	132.8	(+13.3)	(+11.1)	135.5	(-2.0)	(-2.6)
50 m	94.7	(+3.2)	(+1.1)	102.2	(+1.4)	(-0.1)	107.0	(+0.3)	(-0.9)	111.4	(-0.7)	(-1.6)	125.8	(+4.3)	(+3.0)	126.7	(-1.7)	(-2.4)
100 m	94.8	(+3.0)	(+1.0)	102.2	(+1.4)	(-0.1)	106.9	(+0.3)	(-0.9)	111.4	(-0.7)	(-1.7)	122.2	(+1.0)	(-0.1)	120.8	(-1.8)	(-2.5)
Juan de Fuca east																		
7.5 m	88.9	(+1.6)	(+0.9)	95.3	(+1.0)	(-0.1)	100.4	(+0.2)	(-0.8)	106.6	(-0.2)	(-0.9)	129.4	(+2.5)	(+1.6)	132.7	(-2.1)	(-2.5)
50 m	91.4	(+2.1)	(+1.1)	98.1	(+0.8)	(-0.3)	102.9	(-0.1)	(-1.0)	107.7	(-1.0)	(-1.7)	121.9	(+1.1)	(+0.2)	123.7	(-2.0)	(-2.4)
100 m	90.9	(+1.7)	(+0.8)	97.0	(+0.6)	(-0.5)	101.5	(-0.1)	(-1.0)	106.1	(-1.0)	(-1.7)	116.1	(-0.4)	(-1.2)	116.2	(-1.8)	(-2.3)
Haro-Boundary																		
7.5 m	85.1	(0.0)	(0.0)	90.6	(+4.0)	(+2.2)	99.1	(+3.4)	(+0.8)	106.8	(+0.7)	(-1.0)	136.8	(+12.2)	(+4.8)	136.1	(-4.2)	(-4.5)
50 m	85.2	(+0.1)	(0.0)	93.2	(+5.7)	(+2.9)	101.7	(+3.1)	(+0.6)	109.2	(+0.4)	(-1.3)	128.9	(+5.1)	(+2.0)	127.2	(-3.6)	(-4.1)
100 m	85.2	(+0.1)	(0.0)	93.6	(+6.0)	(+2.9)	101.9	(+2.9)	(+0.4)	109.1	(+0.2)	(-1.4)	123.9	(+1.4)	(-0.3)	121.3	(-4.9)	(-5.2)
Gulf Islands																		
7.5 m	83.3	(0.0)	(0.0)	84.4	(+0.8)	(+0.5)	94.3	(-0.3)	(-0.5)	123.0	(-0.9)	(-0.9)	139.6	(-1.0)	(-1.0)	132.6	(-2.6)	(-2.6)
50 m	83.3	(0.0)	(0.0)	85.4	(+1.4)	(+0.8)	96.6	(0.0)	(-0.1)	114.8	(-0.8)	(-0.8)	129.3	(-0.5)	(-0.5)	122.7	(-2.6)	(-2.6)
100 m	83.4	(0.0)	(0.0)	85.0	(+1.0)	(+0.4)	95.4	(-0.6)	(-0.7)	108.6	(-0.7)	(-0.7)	119.8	(0.0)	(0.0)	116.4	(-2.4)	(-2.4)
Strait of Georgia South																		
7.5 m	91.5	(-0.4)	(-1.1)	98.3	(-1.4)	(-1.9)	104.1	(-1.9)	(-2.3)	110.3	(-2.0)	(-2.3)	137.3	(-1.2)	(-1.7)	135.3	(-4.6)	(-4.8)

50 m	93.8	(-0.1)	(-0.9)	99.6	(-1.3)	(-1.8)	103.8	(-1.9)	(-2.3)	108.2	(-2.6)	(-3.0)	128.1	(-1.8)	(-2.2)	126.7	(-4.6)	(-4.8)
100 m	93.7	(-0.1)	(-0.8)	98.9	(-1.3)	(-1.7)	102.6	(-1.9)	(-2.3)	106.5	(-2.8)	(-3.1)	121.7	(-2.2)	(-2.5)	120.8	(-5.1)	(-5.2)
Strait of Georgia North																		
7.5 m	86.8	(-0.7)	(-0.8)	90.4	(-1.6)	(-1.7)	94.2	(-1.9)	(-2.1)	98.6	(-2.6)	(-2.7)	117.0	(-0.8)	(-0.8)	126.2	(-1.7)	(-1.7)
50 m	87.9	(-0.6)	(-0.8)	91.4	(-1.6)	(-1.7)	94.4	(-2.3)	(-2.3)	98.0	(-2.9)	(-2.9)	108.1	(-1.9)	(-1.9)	117.8	(-1.6)	(-1.6)
100 m	87.9	(-0.6)	(-0.7)	91.2	(-1.6)	(-1.7)	94.0	(-2.3)	(-2.4)	97.4	(-2.9)	(-2.9)	105.9	(-1.8)	(-1.8)	111.4	(-1.6)	(-1.6)
Salish Sea Total																		
7.5 m	97.3	(+0.7)	(0.0)	103.7	(+0.4)	(-0.6)	109.4	(-0.3)	(-1.2)	123.7	(-0.9)	(-1.0)	143.5	(+0.6)	(+0.1)	142.3	(-3.3)	(-3.6)
50 m	99.5	(+1.2)	(+0.2)	106.1	(+0.5)	(-0.5)	111.1	(-0.1)	(-1.1)	118.5	(-0.9)	(-1.4)	134.6	(+0.7)	(0.0)	133.4	(-3.1)	(-3.5)
100 m	99.4	(+1.1)	(+0.2)	105.8	(+0.6)	(-0.5)	110.7	(-0.1)	(-1.1)	116.3	(-0.9)	(-1.7)	128.7	(0.0)	(-0.8)	127.1	(-3.7)	(-4.0)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	86.9	(+1.1)	(+0.6)	94.6	(+1.8)	(+0.4)	100.6	(+0.5)	(-0.6)	106.1	(-0.6)	(-1.4)	127.4	(+10.5)	(+9.5)	133.5	(-2.4)	(-2.8)
50 m	88.8	(+2.1)	(+1.1)	97.8	(+1.7)	(+0.3)	103.5	(+0.3)	(-0.8)	108.5	(-0.8)	(-1.6)	121.2	(+2.5)	(+1.6)	124.6	(-2.1)	(-2.6)
100 m	89.5	(+2.2)	(+1.0)	98.2	(+1.6)	(+0.1)	103.7	(+0.2)	(-0.9)	108.5	(-0.8)	(-1.6)	118.5	(+0.2)	(-0.6)	118.5	(-2.0)	(-2.6)
Juan de Fuca																		
7.5 m	91.7	(+3.4)	(+1.5)	100	(+1.8)	(+0.1)	105.1	(+0.6)	(-0.7)	109.9	(-0.5)	(-1.5)	132.3	(+12.2)	(+11.0)	135.3	(-2.3)	(-2.9)
50 m	95.1	(+3.6)	(+1.3)	103	(+1.4)	(-0.1)	107.7	(+0.3)	(-0.8)	112.2	(-0.6)	(-1.5)	125.7	(+3.4)	(+2.3)	126.6	(-2.0)	(-2.7)
100 m	95.5	(+3.2)	(+1.1)	103	(+1.4)	(-0.1)	107.7	(+0.3)	(-0.8)	112.2	(-0.6)	(-1.5)	122.2	(+0.4)	(-0.5)	120.8	(-2.0)	(-2.7)
Haro Strait																		
7.5 m	85.4	(+0.2)	(+0.2)	90.3	(+2.8)	(+1.7)	97.8	(+2.2)	(+0.2)	104.6	(-0.3)	(-1.6)	132.2	(+9.7)	(+4.7)	133.5	(-3.7)	(-4.1)
50 m	85.8	(+0.5)	(+0.4)	93.0	(+3.7)	(+2.1)	100.5	(+1.9)	(0.0)	107.0	(-0.6)	(-1.9)	124.6	(+2.6)	(+0.7)	124.7	(-3.6)	(-4.1)
100 m	85.5	(+0.3)	(+0.2)	92.9	(+4.4)	(+2.3)	100.4	(+2.0)	(-0.1)	106.5	(-0.8)	(-2.1)	119.7	(-0.8)	(-2.0)	117.7	(-4.0)	(-4.4)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	86.2	(+0.6)	(+0.3)	92.4	(+1.6)	(+0.4)	98.2	(+0.5)	(-0.6)	103.6	(-0.6)	(-1.5)	124.3	(+9.8)	(+8.7)	131.6	(-2.2)	(-2.7)
50 m	87.5	(+1.3)	(+0.7)	95.3	(+1.6)	(+0.2)	100.9	(+0.2)	(-0.8)	105.9	(-0.8)	(-1.6)	118.5	(+2.3)	(+1.3)	122.7	(-1.9)	(-2.5)
100 m	87.9	(+1.4)	(+0.7)	95.5	(+1.5)	(+0.1)	100.8	(+0.2)	(-0.9)	105.5	(-0.9)	(-1.7)	115.4	(+0.2)	(-0.7)	115.5	(-1.8)	(-2.4)
Juan de Fuca																		
7.5 m	90.7	(+3.0)	(+1.3)	98.7	(+1.6)	(0.0)	103.3	(+0.2)	(-0.9)	107.5	(-0.8)	(-1.7)	129.0	(+12.1)	(+11.0)	131.9	(-2.0)	(-2.5)

50 m	93.5	(+3.5)	(+1.4)	101.4	(+1.3)	(-0.2)	105.8	(+0.1)	(-1.0)	109.9	(-0.9)	(-1.7)	122.5	(+3.2)	(+2.1)	123.3	(-1.7)	(-2.3)
100 m	93.5	(+3.3)	(+1.2)	101.3	(+1.3)	(-0.2)	105.7	(+0.1)	(-1.0)	109.7	(-0.9)	(-1.7)	118.7	(+0.2)	(-0.7)	117.6	(-1.7)	(-2.3)
Haro-Boundary																		
7.5 m	87.8	(+1.5)	(+1.0)	94.9	(+2.2)	(+0.9)	101.5	(+1.6)	(0.0)	109.0	(+0.8)	(-0.4)	138.5	(+4.0)	(+2.7)	136.5	(-2.2)	(-2.7)
50 m	89.7	(+2.2)	(+1.3)	97.6	(+2.3)	(+0.9)	103.8	(+1.4)	(-0.1)	110.2	(+0.3)	(-1.0)	130.1	(+3.1)	(+1.7)	127.7	(-2.0)	(-2.6)
100 m	88.7	(+1.6)	(+0.8)	96.3	(+2.4)	(+0.7)	102.6	(+1.6)	(-0.2)	108.8	(+0.1)	(-1.3)	123.1	(+1.4)	(-0.1)	120.4	(-2.3)	(-2.9)
Strait of Georgia																		
7.5 m	92.5	(-0.2)	(-1.1)	100.4	(-1.2)	(-1.8)	106.8	(-1.7)	(-2.2)	113.6	(-1.6)	(-2.0)	140.6	(-1.1)	(-1.6)	138.0	(-4.0)	(-4.3)
50 m	94.4	(+0.1)	(-1.0)	101.2	(-1.1)	(-1.8)	106.0	(-1.7)	(-2.1)	110.7	(-2.3)	(-2.7)	131.8	(-1.4)	(-1.9)	129.3	(-4.0)	(-4.3)
100 m	93.8	(+0.1)	(-0.9)	100.0	(-1.0)	(-1.6)	104.1	(-1.5)	(-2.0)	108.4	(-2.3)	(-2.7)	125.2	(-1.4)	(-1.8)	123.3	(-4.0)	(-4.3)

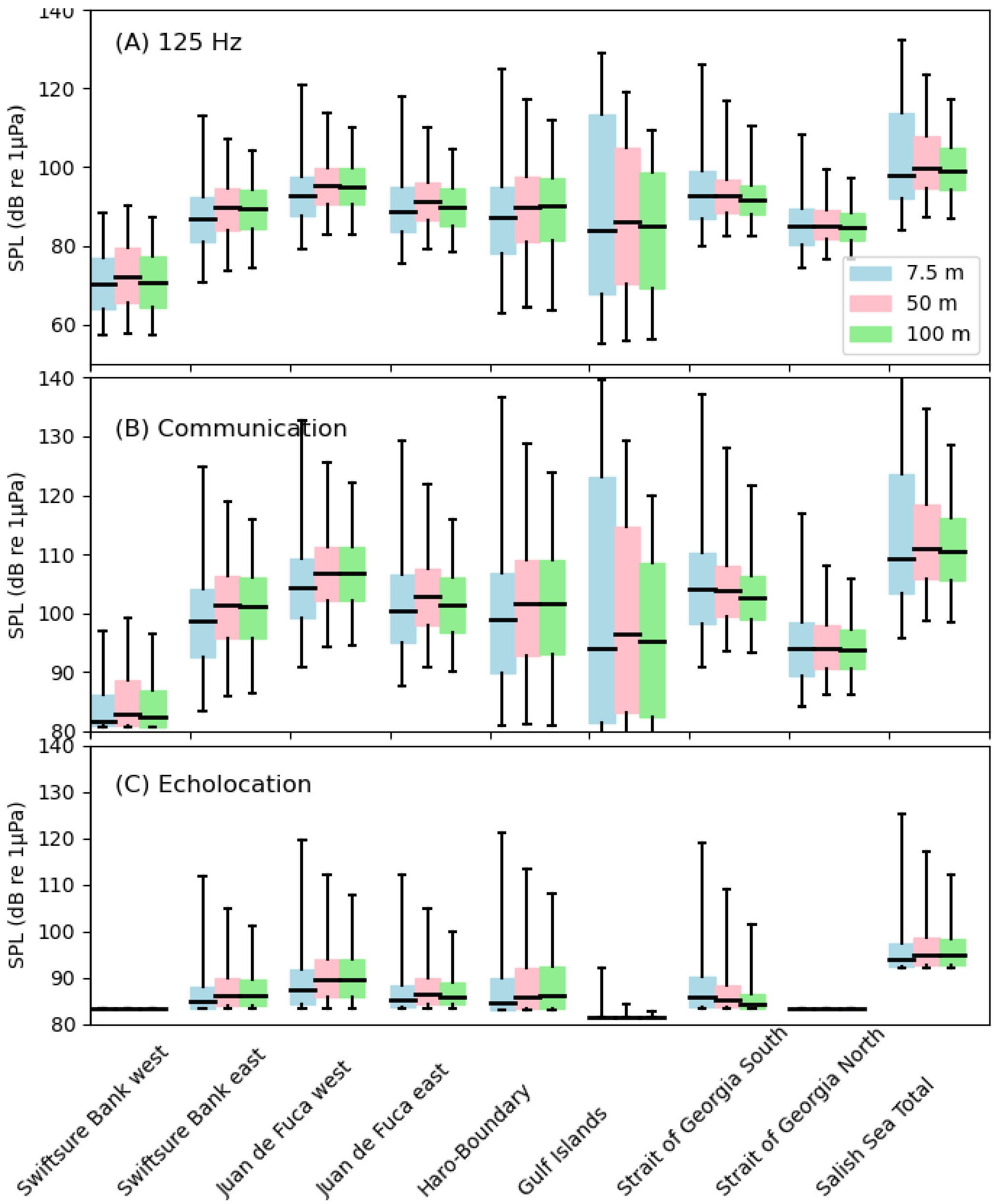

Figure 67: Boxplot comparing the sound pressure levels (SPL) in the **acoustically-derived subregions** for the slowdown scenario with **100% participation to 10 knots throughout the full transit through the Salish Sea** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is **the median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles**. Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

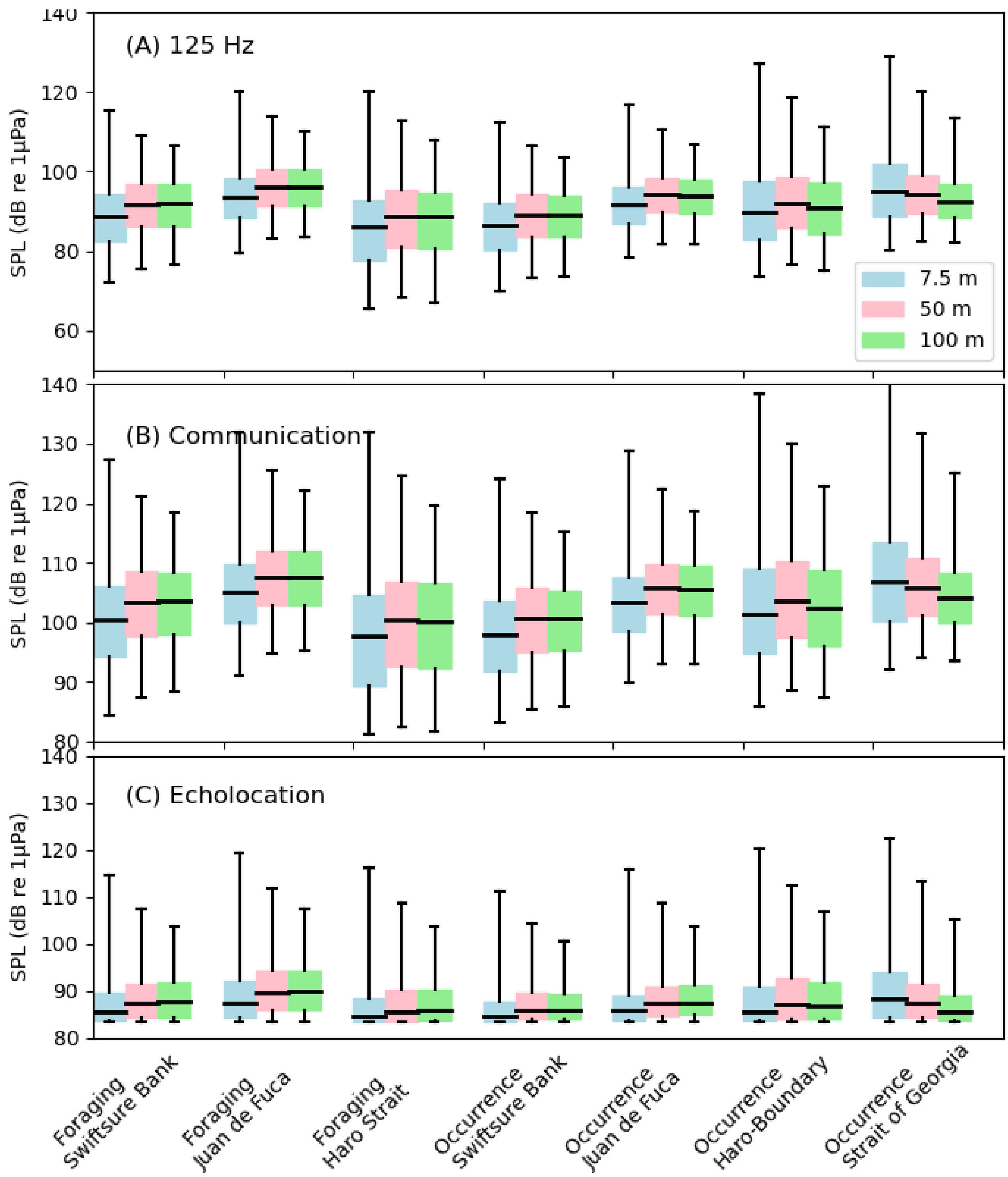

Figure 68: Boxplot comparing the sound pressure levels (SPL) in the **subregions derived from data on SRKW occurrence and foraging** for the slowdown scenario with **100% participation to 10 knots throughout the full transit through the Salish Sea** using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the **median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles**. Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

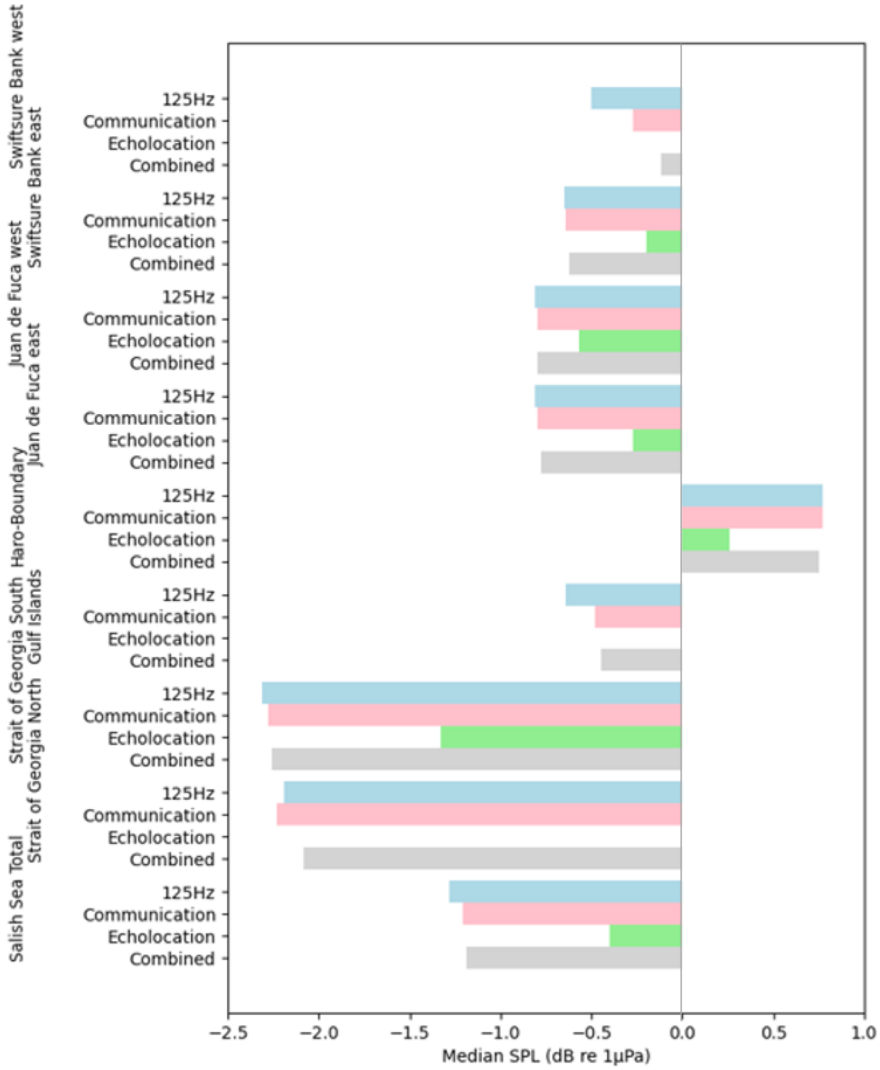

Figure 69: Bar chart showing the difference in decibels (dB) of the **100% participation of vessel speed reductions to 10 knots throughout the full transit through the Salish Sea** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. The **median** RL differences were calculated for the **acoustically-derived subregions**.

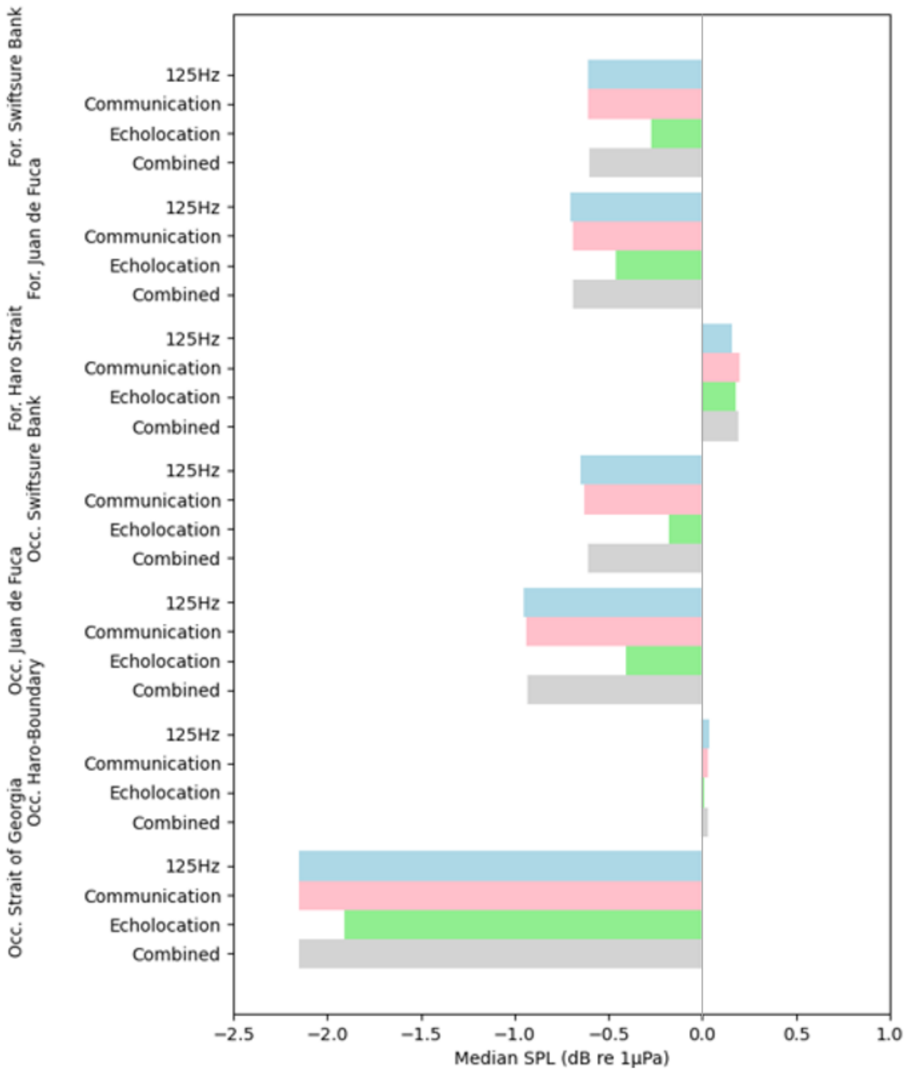

Figure 70: Bar chart showing the difference in decibels (dB) of the **100% participation of vessel speed reductions to 10 knots throughout the full transit through the Salish Sea** relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. The **median** RL differences were calculated for the **SRKW occurrence and foraging** subregions.

4.4 Lateral Displacement

Another means of reducing noise levels in areas important to at-risk species is to re-route vessels away from areas that are important for critical life functions, or exclude them all together. This measures has been trialed in the Salish Sea; ECHO has coordinated a voluntary measures to request vessels move their transits southward, away from the Canadian coastline which hosts SRKW foraging areas into a designated lateral displacement zone. The initial trial of this lateral displacement in 2017 targeted all commercial vessels in the outbound shipping lane as well as tugs travelling the length of Juan de Fuca Strait between the coast and the outbound shipping lane. However, participation rates were low, with the safe displacement distances for deep sea vessels limited to a few hundred meters by the traffic separation scheme (Table 1 in Appendix). Following this, the measure was focused toward tugs and tugs and barges transiting the length of Juan de Fuca Strait. These vessels account for approximately 10% of vessel transits in this region. Vessels transiting port-to-port in this area were exempt from participation. These vessels were identified by examining the tracks of vessels manually and then removing those not transiting the length of Juan de Fuca Strait. The remaining transits formed the vessel input data for the modelled scenario.

The lateral displacement measure requested tugs and tugs with barges to voluntarily alter their transit route southward and navigate either through the outbound shipping lane or within a dedicated 1500 m wide inshore lateral displacement zone while maintaining a 1000 m buffer from the traffic separation scheme (Figure 71). The transit of tugs that were already travelling in the inshore lateral displacement zone, within the outbound lane or further south remained unchanged in the model scenarios. If a tug was travelling in the area between the displacement zone and the coast on a bearing of 0-180º (inbound) they were displaced to follow a path 100 m inshore of the southern lateral displacement zone boundary (green route, Figure 72). If a tug was travelling the area on a bearing of 180-360º (outbound) the transit route was adjusted to follow a path 100 m offshore of the northern lateral displacement zone boundary (yellow route, Figure 72). This adjusted the longitudinal coordinates of the vessel track in the AIS records input into the model. No adjustments to speed were made.

The modeled scenario represented all tugs traveling either in the lateral displacement zone or outbound traffic lane (100% participation). For this scenario the vessels that were already traveling in the displacement trial zone or in the outbound shipping lane remained unchanged.

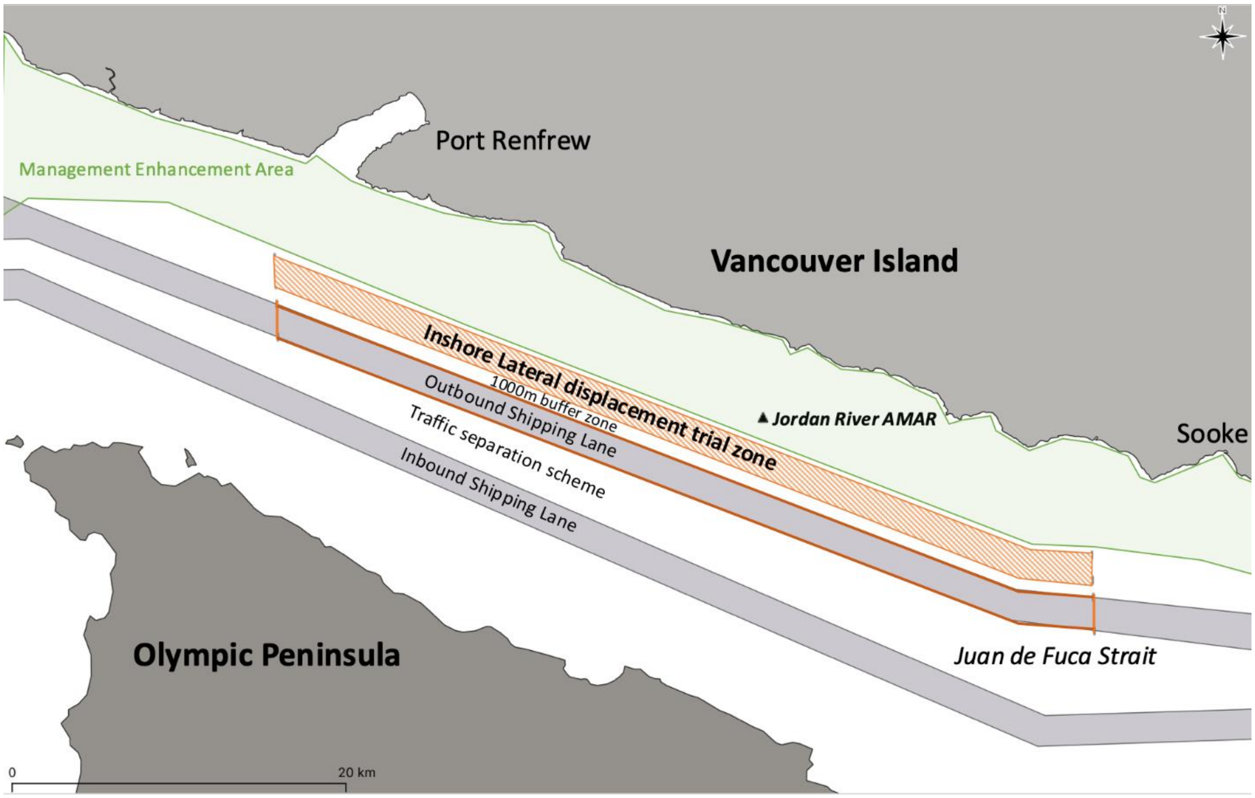

Figure 71: The section of Juan de Fuca where tugs/tugs and barges were requested to transit either in the 1500 m inshore lateral displacement zone or the outbound shipping lane to take a more southern route.

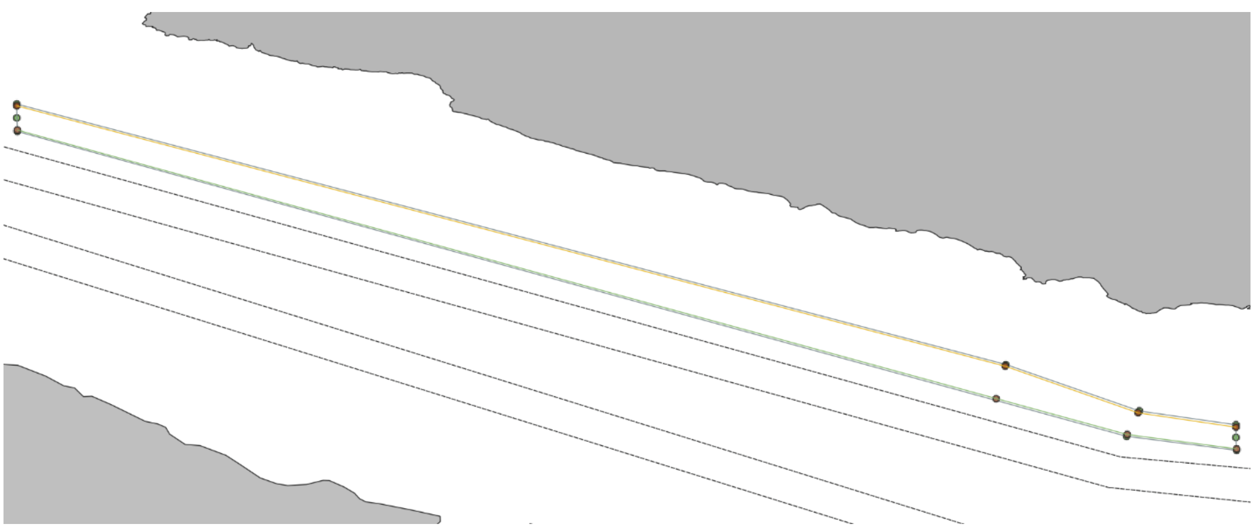

Figure 72: Inbound (green) and outbound (yellow) transit route for tugs re-routed as part of the lateral displacement scenario. Dashed grey lines denote inbound and outbound shipping lanes.

The model results showed no difference overall in RL within subregions at 125 Hz, and in the SRKW communication and SRKW echolocation frequency ranges when compared to baseline + TMX or baseline scenarios (Figures 73-75). This was due to the small number of vessels this measure is applicable to, and that subregions encompassed both the area the vessels were being moved from and to. A small reduction was noted in the Strait of Georgia (Tables 10a-d), although this is likely a result of the change in timing of vessels being in the strait, altering the number of cooccurring vessels due to extended transit length and time when vessels are displaced.

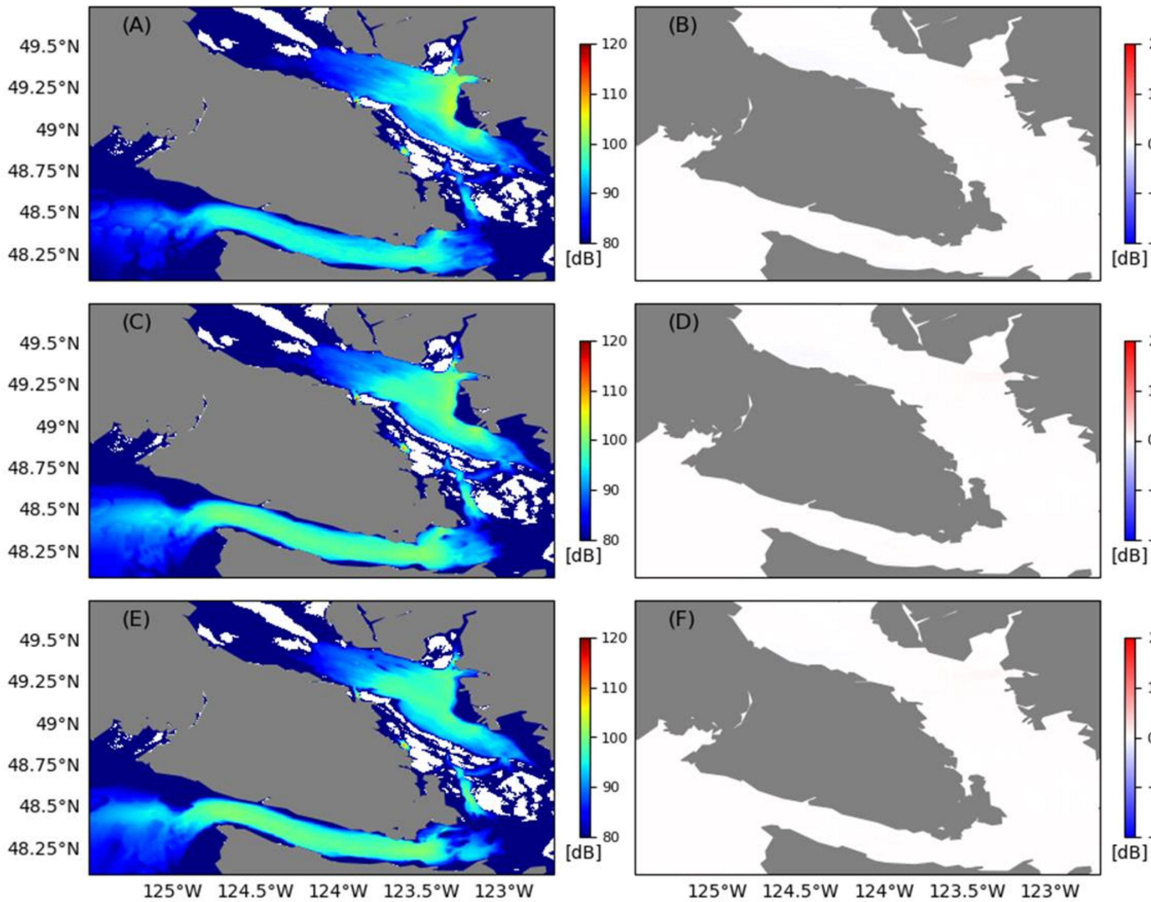

Figure 73: LEFT (A,C,E): Modelled **median** received sound levels (RL) at **125 Hz** at 7.5, 50 and 100 m depth with **100% participation** in the **lateral displacement** adjusting AIS data from May to October 2015 to include additional TMX tankers and tugs. RIGHT (B,D,F): change in RL in decibels (dB) from the baseline + TMX scenario at 125 Hz.

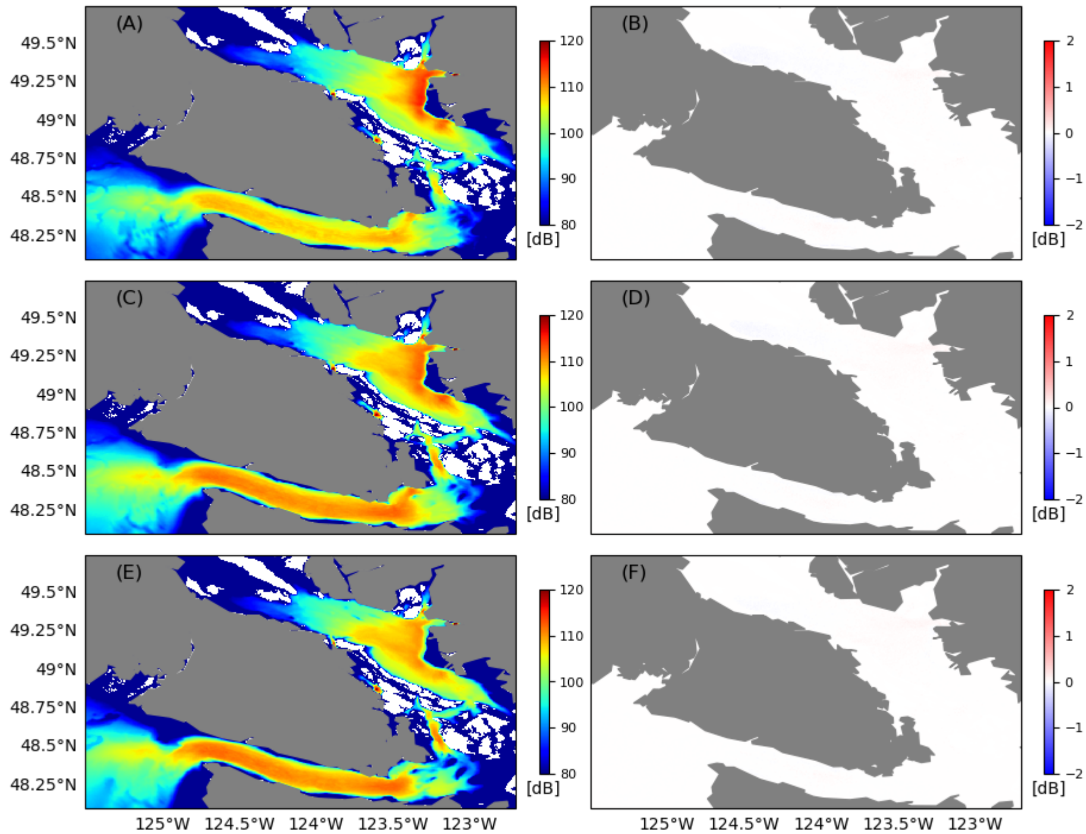

Figure 74: LEFT (A,C,E): Modelled **median** received sound levels (RL) in the SRKW **communication range (500 Hz to 15 kHz)** at 7.5, 50 and 100 m depth with **100% participation** in the **lateral displacement** adjusting AIS data from May to October 2015 to include additional TMX tankers and tugs. RIGHT (B,D,F): change in RL in decibels (dB) from the baseline + TMX scenario in that frequency range.

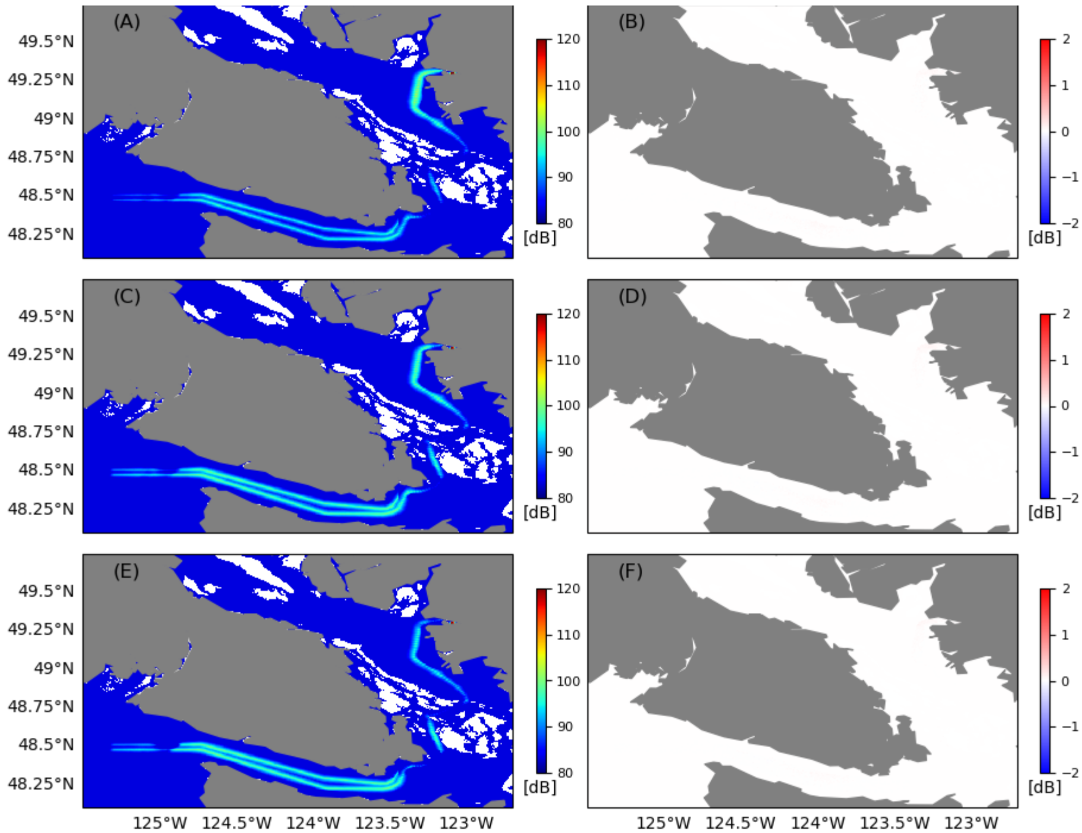

Figure 75: LEFT (A,C,E): Modelled **median** received sound levels (RL) in the SRKW **echolocation range (15-100 kHz)** at 7.5, 50 and 100 m depth with **100% participation** in the **lateral displacement** adjusting AIS data from May to October 2015 to include additional TMX tankers and tugs. RIGHT (B,D,F): change in RL in decibels (dB) from the baseline + TMX scenario in that frequency range.

Figures 76-77 allow comparison of sound levels in different subregions at different depths under this scenario. Figures 78-79 show how the displacement of tugs makes no difference to sound levels in the subregions.

Table 10a: Modelled received sound levels (RL) for each subregion at **125 Hz** at depths of 7.5, 50 and 100 m derived for the scenario of 100% participation to current **lateral displacement measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference lateral displacement makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	56.8	(+0.1)	(0.0)	64.3	(+0.2)	(0.0)	70.8	(+0.1)	(0.0)	77.6	(0.0)	(0.0)	90.3	(0.0)	(0.0)	115.6	(0.0)	(0.0)
50 m	57.0	(+0.1)	(0.0)	65.4	(+0.1)	(0.0)	72.5	(0.0)	(0.0)	79.9	(0.0)	(0.0)	92.7	(0.0)	(0.0)	105.9	(0.0)	(0.0)
100 m	56.5	(+0.1)	(0.0)	64.1	(+0.1)	(0.0)	71.0	(0.0)	(0.0)	77.7	(0.0)	(0.0)	89.6	(0.0)	(0.0)	96.4	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	69.0	(+1.6)	(0.0)	80.3	(+1.5)	(0.0)	87.6	(+1.1)	(0.0)	93.9	(+0.8)	(0.0)	104.4	(+1.1)	(0.0)	123.1	(+0.5)	(0.0)
50 m	72.0	(+1.8)	(0.0)	83.8	(+1.4)	(0.0)	90.5	(+1.0)	(0.0)	96.4	(+0.8)	(0.0)	106.0	(+1.0)	(0.0)	113.9	(+0.6)	(0.0)
100 m	72.6	(+1.9)	(0.0)	84.0	(+1.5)	(0.0)	90.5	(+1.1)	(0.0)	96.0	(+0.8)	(0.0)	104.8	(+0.9)	(0.0)	106.7	(+0.6)	(0.0)
Juan de Fuca west																		
7.5 m	77.6	(+2.5)	(0.0)	87.5	(+1.7)	(0.0)	93.6	(+1.3)	(0.0)	99.1	(+1.0)	(0.0)	109.8	(+2.2)	(0.0)	126.1	(+0.6)	(0.0)
50 m	81.4	(+2.4)	(0.0)	90.6	(+1.6)	(0.0)	96.2	(+1.2)	(0.0)	101.3	(+0.9)	(0.0)	111.0	(+1.3)	(0.0)	117.2	(+0.7)	(0.0)
100 m	81.8	(+2.3)	(0.0)	90.6	(+1.5)	(0.0)	96.1	(+1.2)	(0.0)	101.3	(+0.9)	(0.0)	110.4	(+1.1)	(0.0)	111.3	(+0.7)	(0.0)
Juan de Fuca east																		
7.5 m	74.0	(+1.4)	(0.0)	83.6	(+1.2)	(0.0)	89.6	(+1.0)	(0.0)	96.0	(+0.7)	(0.0)	116.3	(+0.9)	(0.0)	123.8	(+0.3)	(0.0)
50 m	77.5	(+1.3)	(0.0)	86.7	(+1.1)	(0.0)	92.3	(+0.9)	(0.0)	97.9	(+0.6)	(0.0)	110.3	(+0.9)	(0.0)	114.7	(+0.4)	(0.0)
100 m	77.1	(+1.3)	(0.0)	85.6	(+1.1)	(0.0)	90.9	(+0.9)	(0.0)	96.3	(+0.7)	(0.0)	105.8	(+0.7)	(0.0)	107.1	(+0.4)	(0.0)
Haro-Boundary																		
7.5 m	62.8	(+1.6)	(0.0)	74.7	(+3.6)	(0.0)	86.5	(+2.7)	(0.0)	96.1	(+1.7)	(0.0)	120.0	(+7.4)	(0.0)	129.0	(+0.3)	(0.0)
50 m	63.3	(+2.0)	(0.0)	77.4	(+4.4)	(0.0)	89.3	(+2.6)	(0.0)	98.7	(+1.7)	(0.0)	115.0	(+3.0)	(0.0)	119.6	(+0.4)	(0.0)
100 m	61.8	(+2.0)	(0.0)	77.9	(+4.8)	(0.0)	89.6	(+2.5)	(0.0)	98.7	(+1.6)	(0.0)	112.3	(+1.7)	(0.0)	115.0	(+0.3)	(0.0)
Gulf Islands																		
7.5 m	54.1	(0.0)	(0.0)	64.9	(+2.6)	(0.0)	84.5	(+0.1)	(0.0)	114.2	(0.0)	(0.0)	129.9	(0.0)	(0.0)	124.5	(0.0)	(0.0)
50 m	54.1	(0.0)	(0.0)	67.7	(+2.6)	(0.0)	86.6	(+0.1)	(0.0)	105.8	(0.0)	(0.0)	119.3	(0.0)	(0.0)	114.7	(0.0)	(0.0)
100 m	54.1	(0.0)	(0.0)	67.6	(+2.5)	(0.0)	85.9	(+0.1)	(0.0)	99.5	(0.0)	(0.0)	109.4	(0.0)	(0.0)	108.2	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	81.0	(+0.7)	(0.0)	88.9	(+0.5)	(0.0)	95.0	(+0.4)	(0.0)	101.3	(+0.4)	(0.0)	127.6	(+0.4)	(0.0)	129.1	(+0.3)	(+0.1)

50 m	83.4	(+0.8)	(0.0)	90.3	(+0.5)	(0.0)	95.0	(+0.4)	(0.0)	100	(+0.3)	(0.0)	119.0	(+0.4)	(0.0)	120.4	(+0.3)	(+0.1)
100 m	83.2	(+0.8)	(0.0)	89.6	(+0.5)	(0.0)	93.9	(+0.4)	(0.0)	98.5	(+0.3)	(0.0)	113.0	(+0.3)	(0.0)	115.0	(+0.3)	(+0.2)
Strait of Georgia North																		
7.5 m	76.0	(+0.2)	(0.0)	82.3	(+0.2)	(0.0)	87.0	(+0.2)	(0.0)	92.2	(+0.1)	(0.0)	109.2	(0.0)	(0.0)	119.2	(0.0)	(0.0)
50 m	77.9	(+0.2)	(0.0)	83.6	(+0.1)	(0.0)	87.5	(+0.1)	(0.0)	91.8	(0.0)	(0.0)	101.4	(0.0)	(0.0)	110.7	(0.0)	(0.0)
100 m	77.8	(+0.2)	(0.0)	83.3	(+0.1)	(0.0)	87.2	(0.0)	(0.0)	91.3	(0.0)	(0.0)	99.0	(0.0)	(0.0)	104.4	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	84.1	(+1.1)	(0.0)	92.7	(+0.9)	(0.0)	99.1	(+0.8)	(0.0)	114.7	(+0.1)	(0.0)	132.4	(+0.4)	(0.0)	134.5	(+0.3)	(0.0)
50 m	87.0	(+1.2)	(0.0)	95.1	(+1.0)	(0.0)	100.8	(+0.9)	(0.0)	109.1	(+0.4)	(0.0)	123.5	(+0.6)	(0.0)	125.5	(+0.4)	(0.0)
100 m	86.9	(+1.2)	(0.0)	94.7	(+1.1)	(0.0)	100.3	(+0.9)	(0.0)	106.7	(+0.7)	(0.0)	118.1	(+0.8)	(0.0)	119.8	(+0.3)	(+0.1)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	70.5	(+1.8)	(0.0)	82.1	(+1.6)	(0.0)	89.4	(+1.1)	(0.0)	95.8	(+0.8)	(0.0)	106.1	(+1.0)	(0.0)	124.4	(+0.4)	(0.0)
50 m	73.8	(+2.0)	(0.0)	85.7	(+1.5)	(0.0)	92.6	(+1.1)	(0.0)	98.3	(+0.8)	(0.0)	107.8	(+0.9)	(0.0)	115.3	(+0.5)	(0.0)
100 m	74.7	(+2.0)	(0.0)	86.2	(+1.5)	(0.0)	92.7	(+1.1)	(0.0)	98.4	(+0.8)	(0.0)	107.3	(+0.8)	(0.0)	109.1	(+0.5)	(0.0)
Juan de Fuca																		
7.5 m	77.7	(+2.7)	(0.0)	88.1	(+1.7)	(0.0)	94.1	(+1.3)	(0.0)	99.7	(+0.9)	(0.0)	109.4	(+1.2)	(0.0)	126.2	(+0.6)	(0.0)
50 m	81.8	(+2.5)	(0.0)	91.4	(+1.5)	(0.0)	96.9	(+1.2)	(0.0)	102.0	(+0.9)	(0.0)	111.5	(+1.1)	(0.0)	117.3	(+0.6)	(0.0)
100 m	82.3	(+2.4)	(0.0)	91.5	(+1.5)	(0.0)	96.9	(+1.2)	(0.0)	102.0	(+0.9)	(0.0)	110.9	(+1.0)	(0.0)	111.5	(+0.6)	(0.0)
Haro Strait																		
7.5 m	63.0	(+1.0)	(0.0)	75.3	(+1.9)	(0.0)	85.8	(+2.0)	(0.0)	94.5	(+1.4)	(0.0)	115.5	(+4.9)	(0.0)	125.9	(+0.4)	(0.0)
50 m	65.7	(+1.1)	(0.0)	78.6	(+2.0)	(0.0)	88.8	(+1.9)	(0.0)	97.1	(+1.3)	(0.0)	112.1	(+1.9)	(0.0)	117.0	(+0.4)	(0.0)
100 m	64.2	(+1.0)	(0.0)	78.0	(+2.8)	(0.0)	88.7	(+2.0)	(0.0)	96.9	(+1.2)	(0.0)	109.8	(+1.1)	(0.0)	110.3	(+0.4)	(0.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	68.4	(+1.6)	(0.0)	79.7	(+1.5)	(0.0)	87.0	(+1.1)	(0.0)	93.3	(+0.8)	(0.0)	103.8	(+1.1)	(0.0)	122.5	(+0.5)	(0.0)
50 m	71.3	(+1.7)	(0.0)	83.1	(+1.5)	(0.0)	89.9	(+1.0)	(0.0)	95.8	(+0.8)	(0.0)	105.4	(+1.0)	(0.0)	113.3	(+0.6)	(0.0)
100 m	71.9	(+1.9)	(0.0)	83.4	(+1.5)	(0.0)	89.9	(+1.1)	(0.0)	95.4	(+0.8)	(0.0)	104.2	(+0.9)	(0.0)	106.1	(+0.6)	(0.0)
Juan de Fuca																		
7.5 m	76.6	(+2.6)	(0.0)	87.0	(+1.6)	(0.0)	92.7	(+1.2)	(0.0)	97.6	(+0.9)	(0.0)	106.2	(+1.0)	(0.0)	122.4	(+0.5)	(0.0)

50 m	80.0	(+2.6)	(0.0)	90.0	(+1.5)	(0.0)	95.2	(+1.1)	(0.0)	99.9	(+0.8)	(0.0)	108.6	(+1.0)	(0.0)	113.6	(+0.6)	(0.0)
100 m	80.1	(+2.5)	(0.0)	89.8	(+1.5)	(0.0)	95.1	(+1.1)	(0.0)	99.8	(+0.8)	(0.0)	107.6	(+0.8)	(0.0)	108.0	(+0.6)	(0.0)
Haro-Boundary																		
7.5 m	71.2	(+1.6)	(0.0)	81.9	(+1.5)	(0.0)	89.6	(+1.6)	(0.0)	97.7	(+1.2)	(0.0)	124.6	(+1.1)	(0.0)	127.6	(+0.5)	(0.0)
50 m	74.3	(+1.7)	(0.0)	84.8	(+1.5)	(0.0)	92.2	(+1.5)	(0.0)	99.5	(+1.3)	(0.0)	117.0	(+1.3)	(0.0)	118.6	(+0.6)	(0.0)
100 m	73.4	(+1.7)	(0.0)	83.5	(+1.8)	(0.0)	90.9	(+1.7)	(0.0)	98.4	(+1.4)	(0.0)	111.4	(+1.4)	(0.0)	111.5	(+0.6)	(0.0)
Strait of Georgia																		
7.5 m	81.6	(+1.0)	(0.0)	90.5	(+0.6)	(0.0)	97.3	(+0.5)	(0.0)	103.9	(+0.5)	(0.0)	130.5	(+0.5)	(0.0)	130.7	(+0.4)	(+0.1)
50 m	83.6	(+1.2)	(0.0)	91.3	(+0.7)	(0.0)	96.5	(+0.5)	(0.0)	101.8	(+0.4)	(0.0)	122.0	(+0.5)	(0.0)	122.1	(+0.4)	(+0.1)
100 m	82.9	(+1.1)	(0.0)	90.0	(+0.6)	(0.0)	94.6	(+0.5)	(0.0)	99.5	(+0.4)	(0.0)	115.4	(+0.4)	(0.0)	116.1	(+0.3)	(+0.1)

Table 10b: Modelled received sound levels (RL) for each subregion in the SRKW **communication (500 Hz to 15 kHz)** range at depths of 7.5, 50 and 100 m derived for the scenario of 100% participation to current **lateral displacement** measures. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference lateral displacement makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.0	(0.0)	(0.0)	86.9	(0.0)	(0.0)	99.2	(0.0)	(0.0)	124.4	(0.0)	(0.0)
50 m	80.7	(0.0)	(0.0)	80.9	(0.0)	(0.0)	83.3	(0.0)	(0.0)	89.2	(0.0)	(0.0)	101.6	(0.0)	(0.0)	114.7	(0.0)	(0.0)
100 m	80.7	(0.0)	(0.0)	80.8	(0.0)	(0.0)	82.7	(0.0)	(0.0)	87.4	(0.0)	(0.0)	98.8	(0.0)	(0.0)	105.4	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	82.6	(+0.8)	(0.0)	92.0	(+1.5)	(0.0)	99.2	(+1.1)	(0.0)	105.6	(+0.9)	(0.0)	116.2	(+1.2)	(0.0)	134.8	(+0.5)	(0.0)
50 m	84.6	(+1.3)	(0.0)	95.4	(+1.5)	(0.0)	102.2	(+1.0)	(0.0)	108.0	(+0.8)	(0.0)	117.8	(+1.0)	(0.0)	125.6	(+0.6)	(0.0)
100 m	85.2	(+1.4)	(0.0)	95.7	(+1.5)	(0.0)	102.2	(+1.1)	(0.0)	107.7	(+0.8)	(0.0)	116.6	(+0.9)	(0.0)	118.4	(+0.6)	(0.0)
Juan de Fuca west																		
7.5 m	89.3	(+2.5)	(0.0)	99.1	(+1.7)	(0.0)	105.2	(+1.3)	(0.0)	110.8	(+1.0)	(0.0)	121.6	(+2.2)	(0.0)	137.9	(+0.6)	(0.0)
50 m	93.1	(+2.4)	(0.0)	102.2	(+1.6)	(0.0)	107.8	(+1.2)	(0.0)	113.0	(+0.9)	(0.0)	122.7	(+1.4)	(0.0)	129.0	(+0.7)	(0.0)
100 m	93.5	(+2.3)	(0.0)	102.2	(+1.5)	(0.0)	107.8	(+1.2)	(0.0)	113.0	(+0.9)	(0.0)	122.2	(+1.1)	(0.0)	123.1	(+0.7)	(0.0)
Juan de Fuca east																		
7.5 m	86.2	(+1.1)	(0.0)	95.1	(+1.2)	(0.0)	101.1	(+1.0)	(0.0)	107.4	(+0.7)	(0.0)	127.8	(+0.9)	(0.0)	135.1	(+0.4)	(0.0)
50 m	89.4	(+1.2)	(0.0)	98.2	(+1.1)	(0.0)	103.8	(+0.9)	(0.0)	109.3	(+0.7)	(0.0)	121.6	(+1.0)	(0.0)	126.0	(+0.5)	(0.0)
100 m	89.1	(+1.1)	(0.0)	97.2	(+1.1)	(0.0)	102.4	(+1.0)	(0.0)	107.7	(+0.7)	(0.0)	117.2	(+0.8)	(0.0)	118.4	(+0.5)	(0.0)
Haro-Boundary																		
7.5 m	81.1	(+0.3)	(0.0)	86.9	(+2.8)	(0.0)	98.2	(+2.7)	(0.0)	107.8	(+1.7)	(0.0)	131.8	(+7.4)	(0.0)	140.6	(+0.4)	(0.0)
50 m	81.2	(+0.3)	(0.0)	89.3	(+3.9)	(0.0)	101.0	(+2.6)	(0.0)	110.4	(+1.7)	(0.0)	126.8	(+3.0)	(0.0)	131.2	(+0.5)	(0.0)
100 m	80.9	(+0.2)	(0.0)	89.8	(+4.2)	(0.0)	101.3	(+2.5)	(0.0)	110.4	(+1.6)	(0.0)	124.0	(+1.7)	(0.0)	126.5	(+0.3)	(0.0)
Gulf Islands																		
7.5 m	78.9	(0.0)	(0.0)	80.4	(+0.8)	(0.0)	94.6	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(0.0)	(0.0)	135.2	(0.0)	(0.0)
50 m	78.9	(0.0)	(0.0)	81.7	(+1.2)	(0.0)	96.6	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.8	(0.0)	(0.0)	125.3	(0.0)	(0.0)
100 m	78.9	(0.0)	(0.0)	81.7	(+1.1)	(0.0)	95.9	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.8	(0.0)	(0.0)	118.8	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	92.0	(+0.7)	(0.0)	100.1	(+0.5)	(0.0)	106.3	(+0.4)	(0.0)	112.6	(+0.4)	(0.0)	138.9	(+0.4)	(0.0)	140.2	(+0.3)	(+0.2)

50 m	94.4	(+0.8)	(0.0)	101.4	(+0.5)	(0.0)	106.1	(+0.4)	(0.0)	111.2	(+0.3)	(0.0)	130.2	(+0.4)	(0.0)	131.6	(+0.3)	(+0.1)
100 m	94.2	(+0.8)	(0.0)	100.6	(+0.5)	(0.0)	104.9	(+0.4)	(0.0)	109.6	(+0.3)	(0.0)	124.2	(+0.4)	(0.0)	126.2	(+0.3)	(+0.2)
Strait of Georgia North																		
7.5 m	85.6	(+0.2)	(0.0)	91.5	(+0.2)	(0.0)	96.1	(+0.2)	(0.0)	101.3	(+0.1)	(0.0)	117.8	(0.0)	(0.0)	127.9	(0.0)	(0.0)
50 m	87.3	(+0.2)	(0.0)	92.7	(+0.1)	(0.0)	96.6	(+0.1)	(0.0)	100.9	(0.0)	(0.0)	110.1	(0.0)	(0.0)	119.4	(0.0)	(0.0)
100 m	87.1	(+0.2)	(0.0)	92.4	(+0.1)	(0.0)	96.2	(0.0)	(0.0)	100.3	(0.0)	(0.0)	107.7	(0.0)	(0.0)	113.1	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	95.7	(+1.0)	(0.0)	104.0	(+1.0)	(0.0)	110.4	(+0.9)	(0.0)	124.7	(+0.1)	(0.0)	143.3	(+0.5)	(0.0)	145.9	(+0.4)	(0.0)
50 m	98.3	(+1.2)	(0.0)	106.4	(+1.1)	(0.0)	112.1	(+1.0)	(0.0)	119.8	(+0.5)	(0.0)	134.6	(+0.7)	(0.0)	136.8	(+0.4)	(0.0)
100 m	98.3	(+1.2)	(0.0)	106.0	(+1.1)	(0.0)	111.7	(+1.0)	(0.0)	117.9	(+0.8)	(0.0)	129.4	(+0.9)	(0.0)	131.1	(+0.4)	(+0.1)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(+1.2)	(0.0)	93.8	(+1.6)	(0.0)	101.1	(+1.1)	(0.0)	107.5	(+0.8)	(0.0)	117.8	(+1.0)	(0.0)	136.2	(+0.4)	(0.0)
50 m	85.9	(+1.7)	(0.0)	97.4	(+1.5)	(0.0)	104.2	(+1.1)	(0.0)	110.0	(+0.8)	(0.0)	119.5	(+0.9)	(0.0)	127.1	(+0.5)	(0.0)
100 m	86.9	(+1.7)	(0.0)	97.9	(+1.5)	(0.0)	104.4	(+1.1)	(0.0)	110.1	(+0.8)	(0.0)	119.0	(+0.8)	(0.0)	120.9	(+0.6)	(0.0)
Juan de Fuca																		
7.5 m	89.3	(+2.6)	(0.0)	99.7	(+1.7)	(0.0)	105.8	(+1.3)	(0.0)	111.3	(+0.9)	(0.0)	121.2	(+1.2)	(0.0)	138.1	(+0.6)	(0.0)
50 m	93.4	(+2.5)	(0.0)	103.0	(+1.6)	(0.0)	108.5	(+1.2)	(0.0)	113.6	(+0.9)	(0.0)	123.2	(+1.1)	(0.0)	129.2	(+0.7)	(0.0)
100 m	94.0	(+2.3)	(0.0)	103.1	(+1.5)	(0.0)	108.5	(+1.2)	(0.0)	113.6	(+0.9)	(0.0)	122.7	(+1.0)	(0.0)	123.3	(+0.7)	(0.0)
Haro Strait																		
7.5 m	80.8	(+0.1)	(0.0)	87.2	(+1.7)	(0.0)	97.4	(+2.1)	(0.0)	106.2	(+1.4)	(0.0)	127.3	(+4.9)	(0.0)	137.6	(+0.4)	(0.0)
50 m	81.3	(+0.3)	(0.0)	90.1	(+2.0)	(0.0)	100.4	(+1.9)	(0.0)	108.8	(+1.3)	(0.0)	123.8	(+1.9)	(0.0)	128.7	(+0.4)	(0.0)
100 m	81.1	(+0.1)	(0.0)	89.7	(+2.7)	(0.0)	100.3	(+2.1)	(0.0)	108.5	(+1.3)	(0.0)	121.6	(+1.1)	(0.0)	122.1	(+0.4)	(0.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	82.4	(+0.7)	(0.0)	91.4	(+1.4)	(0.0)	98.6	(+1.1)	(0.0)	105.0	(+0.9)	(0.0)	115.6	(+1.2)	(0.0)	134.2	(+0.5)	(0.0)
50 m	84.2	(+1.2)	(0.0)	94.8	(+1.4)	(0.0)	101.5	(+1.0)	(0.0)	107.4	(+0.8)	(0.0)	117.1	(+1.0)	(0.0)	125.0	(+0.6)	(0.0)
100 m	84.8	(+1.3)	(0.0)	95.1	(+1.5)	(0.0)	101.5	(+1.1)	(0.0)	107.1	(+0.8)	(0.0)	115.9	(+0.9)	(0.0)	117.8	(+0.6)	(0.0)
Juan de Fuca																		
7.5 m	88.1	(+2.5)	(0.0)	98.5	(+1.6)	(0.0)	104.2	(+1.2)	(0.0)	109.2	(+0.9)	(0.0)	117.9	(+1.1)	(0.0)	134.2	(+0.5)	(0.0)

50 m	91.5	(+2.5)	(0.0)	101.5	(+1.5)	(0.0)	106.8	(+1.1)	(0.0)	111.5	(+0.8)	(0.0)	120.3	(+1.0)	(0.0)	125.4	(+0.6)	(0.0)
100 m	91.7	(+2.4)	(0.0)	101.4	(+1.5)	(0.0)	106.6	(+1.1)	(0.0)	111.4	(+0.8)	(0.0)	119.3	(+0.9)	(0.0)	119.8	(+0.6)	(0.0)
Haro-Boundary																		
7.5 m	84.3	(+1.0)	(0.0)	93.7	(+1.5)	(0.0)	101.3	(+1.6)	(0.0)	109.3	(+1.2)	(0.0)	135.7	(+1.3)	(0.0)	139.2	(+0.5)	(0.0)
50 m	86.8	(+1.3)	(0.0)	96.5	(+1.5)	(0.0)	103.8	(+1.5)	(0.0)	111.2	(+1.3)	(0.0)	128.4	(+1.4)	(0.0)	130.3	(+0.6)	(0.0)
100 m	86.1	(+1.2)	(0.0)	95.2	(+1.8)	(0.0)	102.6	(+1.7)	(0.0)	110.1	(+1.4)	(0.0)	123.1	(+1.5)	(0.0)	123.2	(+0.6)	(0.0)
Strait of Georgia																		
7.5 m	93.2	(+1.0)	(0.0)	102.1	(+0.6)	(0.0)	108.9	(+0.5)	(0.0)	115.5	(+0.5)	(0.0)	142.2	(+0.5)	(0.0)	142.3	(+0.4)	(+0.1)
50 m	95.2	(+1.2)	(0.0)	102.9	(+0.7)	(0.0)	108.1	(+0.5)	(0.0)	113.4	(+0.4)	(0.0)	133.6	(+0.5)	(0.0)	133.7	(+0.4)	(+0.1)
100 m	94.4	(+1.1)	(0.0)	101.5	(+0.7)	(0.0)	106.1	(+0.5)	(0.0)	111.0	(+0.4)	(0.0)	127.0	(+0.5)	(0.0)	127.6	(+0.3)	(+0.1)

Table 10c: Modelled received sound levels (RL) for each subregion at in the SRKW **echolocation (15-100 kHz)** range at depths of 7.5, 50 and 100 m derived for the scenario of 100% participation to current **lateral displacement measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference lateral displacement makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
50 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
100 m	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)	83.2	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	85.0	(+0.5)	(0.0)	89.2	(+0.7)	(0.0)	100.4	(+1.5)	(0.0)	119.7	(+0.7)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.8	(+0.2)	(0.0)	86.5	(+0.7)	(0.0)	91.2	(+0.8)	(0.0)	101.8	(+1.4)	(0.0)	110.6	(+0.8)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(0.0)	86.6	(+0.7)	(0.0)	91.0	(+0.8)	(0.0)	100.7	(+1.2)	(0.0)	103.5	(+0.8)	(0.0)
Juan de Fuca west																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.4)	(0.0)	87.9	(+1.1)	(0.0)	93.3	(+1.0)	(0.0)	106.9	(+3.4)	(0.0)	124.0	(+0.7)	(0.0)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	90.3	(+1.1)	(0.0)	95.4	(+1.0)	(0.0)	107.3	(+1.9)	(0.0)	114.9	(+0.8)	(0.0)
100 m	83.3	(0.0)	(0.0)	85.9	(+0.9)	(0.0)	90.4	(+1.1)	(0.0)	95.5	(+1.0)	(0.0)	106.5	(+1.5)	(0.0)	108.8	(+0.8)	(0.0)
Juan de Fuca east																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	85.3	(+0.6)	(0.0)	89.1	(+0.9)	(0.0)	107.4	(+3.5)	(0.0)	117.1	(+0.8)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.3	(+0.3)	(0.0)	86.8	(+0.7)	(0.0)	90.9	(+0.9)	(0.0)	103.1	(+2.3)	(0.0)	108.2	(+0.9)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.3)	(0.0)	86.4	(+0.7)	(0.0)	90.0	(+0.8)	(0.0)	99.8	(+1.5)	(0.0)	101.0	(+0.9)	(0.0)
Haro-Boundary																		
7.5 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	84.3	(+0.7)	(0.0)	90.8	(+1.6)	(0.0)	116.5	(+8.1)	(0.0)	122.5	(+0.6)	(0.0)
50 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	85.7	(+1.2)	(0.0)	93.3	(+1.6)	(0.0)	110.9	(+3.6)	(0.0)	113.7	(+0.7)	(0.0)
100 m	83.1	(0.0)	(0.0)	83.1	(0.0)	(0.0)	86.1	(+1.3)	(0.0)	93.5	(+1.5)	(0.0)	107.9	(+2.0)	(0.0)	107.4	(+0.6)	(0.0)
Gulf Islands																		
7.5 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(0.0)	(0.0)	93.4	(0.0)	(0.0)	93.2	(0.0)	(0.0)
50 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	85.4	(+0.2)	(0.0)	85.7	(0.0)	(0.0)
100 m	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.4	(0.0)	(0.0)	81.5	(+0.1)	(0.0)	83.3	(+0.2)	(0.0)	82.9	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	83.3	(0.0)	(0.0)	84.1	(+0.2)	(0.0)	87.2	(+0.4)	(0.0)	92.6	(+0.5)	(0.0)	120.7	(+0.7)	(0.0)	119.8	(+0.5)	(+0.2)

50 m	83.3	(0.0)	(0.0)	84.0	(+0.2)	(0.0)	86.3	(+0.3)	(0.0)	90.4	(+0.5)	(0.0)	111.5	(+0.7)	(0.0)	110.6	(+0.5)	(+0.1)
100 m	83.3	(0.0)	(0.0)	83.6	(+0.1)	(0.0)	85.0	(+0.3)	(0.0)	88.2	(+0.4)	(0.0)	104.4	(+0.7)	(0.0)	104.4	(+0.5)	(+0.2)
Strait of Georgia North																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	92.1	(0.0)	(0.0)	92.4	(+0.1)	(0.0)	94.2	(+0.5)	(0.0)	98.7	(+0.8)	(0.0)	122.4	(+1.9)	(0.0)	128.2	(+0.6)	(0.0)
50 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.2	(+0.7)	(0.0)	99.9	(+0.9)	(0.0)	115.5	(+1.8)	(0.0)	119.3	(+0.7)	(0.0)
100 m	92.1	(0.0)	(0.0)	92.8	(+0.3)	(0.0)	95.2	(+0.7)	(0.0)	99.7	(+0.9)	(0.0)	111.9	(+1.5)	(0.0)	112.9	(+0.7)	(0.0)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	85.8	(+0.6)	(0.0)	90.7	(+0.8)	(0.0)	102.2	(+1.4)	(0.0)	121.5	(+0.6)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.1	(+0.4)	(0.0)	87.8	(+0.8)	(0.0)	92.9	(+0.8)	(0.0)	103.6	(+1.2)	(0.0)	112.4	(+0.7)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.5)	(0.0)	88.1	(+0.8)	(0.0)	93.2	(+0.8)	(0.0)	103.1	(+1.1)	(0.0)	106.2	(+0.7)	(0.0)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.4)	(0.0)	87.9	(+1.1)	(0.0)	93.3	(+1.0)	(0.0)	105.5	(+1.8)	(0.0)	124.1	(+0.7)	(0.0)
50 m	83.3	(0.0)	(0.0)	85.7	(+0.9)	(0.0)	90.4	(+1.1)	(0.0)	95.5	(+0.9)	(0.0)	107.3	(+1.5)	(0.0)	115.1	(+0.8)	(0.0)
100 m	83.3	(0.0)	(0.0)	86.0	(+0.9)	(0.0)	90.6	(+1.1)	(0.0)	95.7	(+0.9)	(0.0)	106.6	(+1.3)	(0.0)	109.0	(+0.8)	(0.0)
Haro Strait																		
7.5 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	84.3	(+0.6)	(0.0)	89.5	(+1.2)	(0.0)	111.7	(+5.8)	(0.0)	120.4	(+0.5)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	85.4	(+1.0)	(0.0)	91.7	(+1.3)	(0.0)	107.6	(+2.3)	(0.0)	111.6	(+0.5)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.3	(0.0)	(0.0)	85.7	(+1.0)	(0.0)	91.8	(+1.2)	(0.0)	105.1	(+1.4)	(0.0)	105.1	(+0.4)	(0.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	84.8	(+0.4)	(0.0)	88.7	(+0.7)	(0.0)	99.9	(+1.5)	(0.0)	119.1	(+0.7)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.7	(+0.2)	(0.0)	86.2	(+0.6)	(0.0)	90.7	(+0.8)	(0.0)	101.2	(+1.3)	(0.0)	110.0	(+0.8)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.9	(+0.3)	(0.0)	86.3	(+0.6)	(0.0)	90.5	(+0.7)	(0.0)	100.0	(+1.2)	(0.0)	102.9	(+0.8)	(0.0)
Juan de Fuca																		
7.5 m	83.3	(0.0)	(0.0)	83.6	(+0.2)	(0.0)	86.1	(+0.7)	(0.0)	90.3	(+0.8)	(0.0)	101.5	(+1.7)	(0.0)	119.9	(+0.7)	(0.0)

50 m	83.3	(0.0)	(0.0)	84.6	(+0.5)	(0.0)	87.9	(+0.8)	(0.0)	92.4	(+0.8)	(0.0)	103.8	(+1.6)	(0.0)	110.9	(+0.8)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.8	(+0.6)	(0.0)	88.2	(+0.9)	(0.0)	92.6	(+0.8)	(0.0)	102.5	(+1.3)	(0.0)	104.9	(+0.8)	(0.0)
Haro-Boundary																		
7.5 m	83.3	(0.0)	(0.0)	83.4	(+0.1)	(0.0)	85.5	(+0.8)	(0.0)	91.5	(+1.4)	(0.0)	115.7	(+6.0)	(0.0)	122.4	(+0.7)	(0.0)
50 m	83.3	(0.0)	(0.0)	83.9	(+0.2)	(0.0)	87.2	(+1.0)	(0.0)	93.7	(+1.4)	(0.0)	110.1	(+3.2)	(0.0)	113.5	(+0.8)	(0.0)
100 m	83.3	(0.0)	(0.0)	83.8	(+0.2)	(0.0)	86.7	(+1.1)	(0.0)	93.0	(+1.4)	(0.0)	106.6	(+1.9)	(0.0)	106.7	(+0.7)	(0.0)
Strait of Georgia																		
7.5 m	83.3	(0.0)	(0.0)	85.2	(+0.3)	(0.0)	90.3	(+0.5)	(0.0)	96.5	(+0.5)	(0.0)	124.6	(+0.7)	(0.0)	123.7	(+0.5)	(+0.1)
50 m	83.3	(0.0)	(0.0)	85.2	(+0.4)	(0.0)	89.1	(+0.5)	(0.0)	94.2	(+0.5)	(0.0)	116.0	(+0.6)	(0.0)	114.8	(+0.4)	(+0.1)
100 m	83.3	(0.0)	(0.0)	84.3	(+0.2)	(0.0)	87.0	(+0.4)	(0.0)	91.5	(+0.5)	(0.0)	108.6	(+0.6)	(0.0)	107.6	(+0.4)	(+0.1)

Table 10d: Modelled received sound levels (RL) for each subregion in a **combined metric, with range 0.5-100 kHz**, at depths of 7.5, 50 and 100 m derived for the scenario of 100% participation to current **lateral displacement measures**. Background ambient (L_5), median (L_{50}), L_{95} and arithmetic mean (L_{eq}) are given, as are quartiles (L_{25}, L_{75}). The difference lateral displacement makes compared to baseline conditions in decibels (dB) is given in the first set of parentheses and to the baseline + TMX scenario in the second set of parentheses.

Subregion	L_5			L_{25}			L_{50}			L_{75}			L_{95}			L_{eq}		
Acoustic Subregions																		
Swiftsure Bank west																		
7.5 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	85.7	(0.0)	(0.0)	88.4	(0.0)	(0.0)	99.3	(0.0)	(0.0)	124.4	(0.0)	(0.0)
50 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.3	(0.0)	(0.0)	90.2	(0.0)	(0.0)	101.7	(0.0)	(0.0)	114.7	(0.0)	(0.0)
100 m	85.2	(0.0)	(0.0)	85.2	(0.0)	(0.0)	86.0	(0.0)	(0.0)	88.8	(0.0)	(0.0)	99.0	(0.0)	(0.0)	105.4	(0.0)	(0.0)
Swiftsure Bank east																		
7.5 m	86.0	(+0.4)	(0.0)	92.5	(+1.3)	(0.0)	99.4	(+1.1)	(0.0)	105.7	(+0.8)	(0.0)	116.3	(+1.2)	(0.0)	134.9	(+0.5)	(0.0)
50 m	87.0	(+0.7)	(0.0)	95.7	(+1.4)	(0.0)	102.3	(+1.0)	(0.0)	108.1	(+0.8)	(0.0)	117.9	(+1.0)	(0.0)	125.7	(+0.6)	(0.0)
100 m	87.4	(+0.8)	(0.0)	96.0	(+1.4)	(0.0)	102.3	(+1.1)	(0.0)	107.8	(+0.8)	(0.0)	116.7	(+0.9)	(0.0)	118.6	(+0.6)	(0.0)
Juan de Fuca west																		
7.5 m	90.3	(+1.8)	(0.0)	99.2	(+1.6)	(0.0)	105.3	(+1.3)	(0.0)	110.9	(+1.0)	(0.0)	121.8	(+2.2)	(0.0)	138.1	(+0.6)	(0.0)
50 m	93.5	(+2.1)	(0.0)	102.3	(+1.5)	(0.0)	107.9	(+1.2)	(0.0)	113.1	(+0.9)	(0.0)	122.9	(+1.4)	(0.0)	129.1	(+0.7)	(0.0)
100 m	93.9	(+2.0)	(0.0)	102.3	(+1.5)	(0.0)	107.8	(+1.2)	(0.0)	113.0	(+0.9)	(0.0)	122.3	(+1.1)	(0.0)	123.2	(+0.7)	(0.0)
Juan de Fuca east																		
7.5 m	88.0	(+0.7)	(0.0)	95.4	(+1.1)	(0.0)	101.2	(+1.0)	(0.0)	107.4	(+0.7)	(0.0)	127.8	(+1.0)	(0.0)	135.2	(+0.4)	(0.0)
50 m	90.3	(+1.0)	(0.0)	98.4	(+1.0)	(0.0)	103.8	(+0.9)	(0.0)	109.4	(+0.7)	(0.0)	121.7	(+1.0)	(0.0)	126.1	(+0.5)	(0.0)
100 m	90.1	(+0.9)	(0.0)	97.4	(+1.0)	(0.0)	102.5	(+0.9)	(0.0)	107.8	(+0.7)	(0.0)	117.3	(+0.8)	(0.0)	118.5	(+0.5)	(0.0)
Haro-Boundary																		
7.5 m	85.2	(+0.1)	(0.0)	88.4	(+1.8)	(0.0)	98.4	(+2.6)	(0.0)	107.9	(+1.7)	(0.0)	131.9	(+7.4)	(0.0)	140.6	(+0.4)	(0.0)
50 m	85.2	(+0.1)	(0.0)	90.2	(+2.8)	(0.0)	101.2	(+2.6)	(0.0)	110.5	(+1.7)	(0.0)	126.9	(+3.0)	(0.0)	131.3	(+0.5)	(0.0)
100 m	85.1	(+0.1)	(0.0)	90.7	(+3.1)	(0.0)	101.5	(+2.4)	(0.0)	110.5	(+1.6)	(0.0)	124.1	(+1.7)	(0.0)	126.5	(+0.3)	(0.0)
Gulf Islands																		
7.5 m	83.3	(0.0)	(0.0)	84.0	(+0.3)	(0.0)	94.8	(+0.1)	(0.0)	123.9	(0.0)	(0.0)	140.6	(0.0)	(0.0)	135.2	(0.0)	(0.0)
50 m	83.3	(0.0)	(0.0)	84.6	(+0.6)	(0.0)	96.7	(+0.1)	(0.0)	115.6	(0.0)	(0.0)	129.8	(0.0)	(0.0)	125.3	(0.0)	(0.0)
100 m	83.3	(0.0)	(0.0)	84.6	(+0.5)	(0.0)	96.1	(+0.1)	(0.0)	109.3	(0.0)	(0.0)	119.8	(0.0)	(0.0)	118.8	(0.0)	(0.0)
Strait of Georgia South																		
7.5 m	92.6	(+0.6)	(0.0)	100.2	(+0.5)	(0.0)	106.3	(+0.4)	(0.0)	112.7	(+0.4)	(0.0)	139.0	(+0.4)	(0.0)	140.3	(+0.3)	(+0.2)

50 m	94.7	(+0.8)	(0.0)	101.4	(+0.5)	(0.0)	106.2	(+0.4)	(0.0)	111.2	(+0.3)	(0.0)	130.3	(+0.4)	(0.0)	131.6	(+0.3)	(+0.1)
100 m	94.5	(+0.7)	(0.0)	100.7	(+0.5)	(0.0)	105.0	(+0.4)	(0.0)	109.6	(+0.3)	(0.0)	124.2	(+0.4)	(0.0)	126.2	(+0.3)	(+0.2)
Strait of Georgia North																		
7.5 m	87.6	(+0.1)	(0.0)	92.1	(+0.1)	(0.0)	96.3	(+0.1)	(0.0)	101.4	(+0.1)	(0.0)	117.8	(0.0)	(0.0)	127.9	(0.0)	(0.0)
50 m	88.7	(+0.2)	(0.0)	93.1	(+0.1)	(0.0)	96.8	(+0.1)	(0.0)	100.9	(0.0)	(0.0)	110.1	(0.0)	(0.0)	119.4	(0.0)	(0.0)
100 m	88.6	(+0.2)	(0.0)	92.9	(+0.1)	(0.0)	96.4	(0.0)	(0.0)	100.4	(0.0)	(0.0)	107.7	(0.0)	(0.0)	113.1	(0.0)	(0.0)
Salish Sea Total																		
7.5 m	97.3	(+0.7)	(0.0)	104.3	(+0.9)	(0.0)	110.5	(+0.9)	(0.0)	124.7	(+0.1)	(0.0)	143.4	(+0.5)	(0.0)	145.9	(+0.4)	(0.0)
50 m	99.3	(+1.0)	(0.0)	106.6	(+1.1)	(0.0)	112.2	(+0.9)	(0.0)	119.9	(+0.5)	(0.0)	134.7	(+0.7)	(0.0)	136.9	(+0.4)	(0.0)
100 m	99.3	(+0.9)	(0.0)	106.2	(+1.1)	(0.0)	111.8	(+1.0)	(0.0)	117.9	(+0.8)	(0.0)	129.5	(+0.9)	(0.0)	131.2	(+0.4)	(+0.1)
Foraging Subregions																		
Swiftsure Bank																		
7.5 m	86.3	(+0.5)	(0.0)	94.2	(+1.4)	(0.0)	101.2	(+1.1)	(0.0)	107.5	(+0.8)	(0.0)	117.9	(+1.0)	(0.0)	136.4	(+0.4)	(0.0)
50 m	87.8	(+1.0)	(0.0)	97.6	(+1.5)	(0.0)	104.3	(+1.1)	(0.0)	110.1	(+0.8)	(0.0)	119.6	(+0.9)	(0.0)	127.2	(+0.5)	(0.0)
100 m	88.4	(+1.1)	(0.0)	98.1	(+1.5)	(0.0)	104.5	(+1.1)	(0.0)	110.2	(+0.8)	(0.0)	119.1	(+0.8)	(0.0)	121.0	(+0.6)	(0.0)
Juan de Fuca																		
7.5 m	90.3	(+2.0)	(0.0)	99.8	(+1.6)	(0.0)	105.8	(+1.3)	(0.0)	111.4	(+0.9)	(0.0)	121.3	(+1.3)	(0.0)	138.2	(+0.6)	(0.0)
50 m	93.8	(+2.2)	(0.0)	103.1	(+1.5)	(0.0)	108.6	(+1.2)	(0.0)	113.7	(+0.9)	(0.0)	123.3	(+1.1)	(0.0)	129.3	(+0.7)	(0.0)
100 m	94.3	(+2.1)	(0.0)	103.2	(+1.5)	(0.0)	108.6	(+1.2)	(0.0)	113.7	(+0.9)	(0.0)	122.8	(+1.0)	(0.0)	123.5	(+0.7)	(0.0)
Haro Strait																		
7.5 m	85.2	(0.0)	(0.0)	88.7	(+1.2)	(0.0)	97.6	(+2.0)	(0.0)	106.3	(+1.4)	(0.0)	127.4	(+4.9)	(0.0)	137.7	(+0.4)	(0.0)
50 m	85.4	(+0.1)	(0.0)	91.0	(+1.6)	(0.0)	100.5	(+1.9)	(0.0)	108.9	(+1.3)	(0.0)	123.9	(+1.9)	(0.0)	128.8	(+0.4)	(0.0)
100 m	85.3	(+0.1)	(0.0)	90.6	(+2.1)	(0.0)	100.5	(+2.0)	(0.0)	108.6	(+1.3)	(0.0)	121.7	(+1.1)	(0.0)	122.1	(+0.4)	(0.0)
Occurrence Subregions																		
Swiftsure Bank																		
7.5 m	85.9	(+0.3)	(0.0)	92.0	(+1.2)	(0.0)	98.8	(+1.1)	(0.0)	105.1	(+0.8)	(0.0)	115.7	(+1.2)	(0.0)	134.3	(+0.5)	(0.0)
50 m	86.8	(+0.6)	(0.0)	95.1	(+1.3)	(0.0)	101.7	(+1.0)	(0.0)	107.5	(+0.8)	(0.0)	117.2	(+1.0)	(0.0)	125.1	(+0.6)	(0.0)
100 m	87.1	(+0.7)	(0.0)	95.4	(+1.4)	(0.0)	101.7	(+1.1)	(0.0)	107.2	(+0.8)	(0.0)	116.1	(+0.9)	(0.0)	117.9	(+0.6)	(0.0)
Juan de Fuca																		
7.5 m	89.3	(+1.7)	(0.0)	98.6	(+1.6)	(0.0)	104.3	(+1.2)	(0.0)	109.3	(+0.9)	(0.0)	118.0	(+1.1)	(0.0)	134.3	(+0.5)	(0.0)

50 m	92.1	(+2.1)	(0.0)	101.6	(+1.5)	(0.0)	106.8	(+1.1)	(0.0)	111.6	(+0.8)	(0.0)	120.4	(+1.1)	(0.0)	125.5	(+0.6)	(0.0)
100 m	92.3	(+2.0)	(0.0)	101.5	(+1.5)	(0.0)	106.7	(+1.1)	(0.0)	111.4	(+0.8)	(0.0)	119.3	(+0.9)	(0.0)	119.9	(+0.6)	(0.0)
Haro-Boundary																		
7.5 m	86.8	(+0.6)	(0.0)	94.1	(+1.4)	(0.0)	101.4	(+1.5)	(0.0)	109.4	(+1.2)	(0.0)	135.8	(+1.4)	(0.0)	139.3	(+0.5)	(0.0)
50 m	88.4	(+0.9)	(0.0)	96.7	(+1.4)	(0.0)	103.9	(+1.5)	(0.0)	111.3	(+1.3)	(0.0)	128.4	(+1.4)	(0.0)	130.4	(+0.6)	(0.0)
100 m	87.9	(+0.8)	(0.0)	95.5	(+1.6)	(0.0)	102.7	(+1.7)	(0.0)	110.1	(+1.4)	(0.0)	123.2	(+1.5)	(0.0)	123.3	(+0.6)	(0.0)
Strait of Georgia																		
7.5 m	93.6	(+0.9)	(0.0)	102.2	(+0.6)	(0.0)	109.0	(+0.5)	(0.0)	115.6	(+0.5)	(0.0)	142.3	(+0.5)	(0.0)	142.4	(+0.4)	(+0.1)
50 m	95.4	(+1.1)	(0.0)	103.0	(+0.7)	(0.0)	108.1	(+0.5)	(0.0)	113.4	(+0.4)	(0.0)	133.7	(+0.5)	(0.0)	133.7	(+0.4)	(+0.1)
100 m	94.8	(+1.0)	(0.0)	101.6	(+0.6)	(0.0)	106.2	(+0.5)	(0.0)	111.1	(+0.5)	(0.0)	127.0	(+0.5)	(0.0)	127.6	(+0.3)	(+0.1)

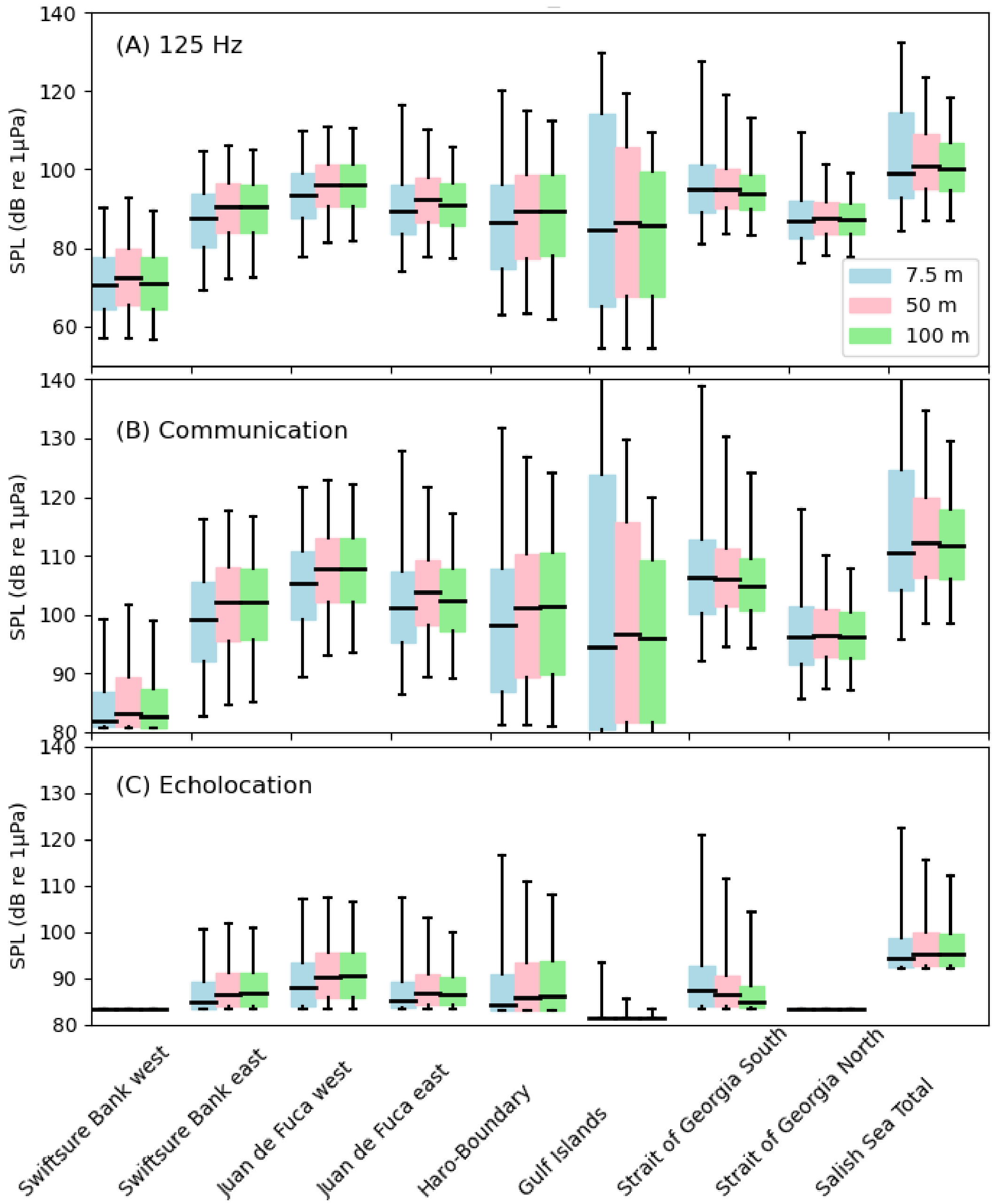

Figure 76: Boxplot comparing the sound pressure levels (SPL) in the **acoustically-derived subregions** for the scenario of 100% participation to current **lateral displacement** measures using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles. Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

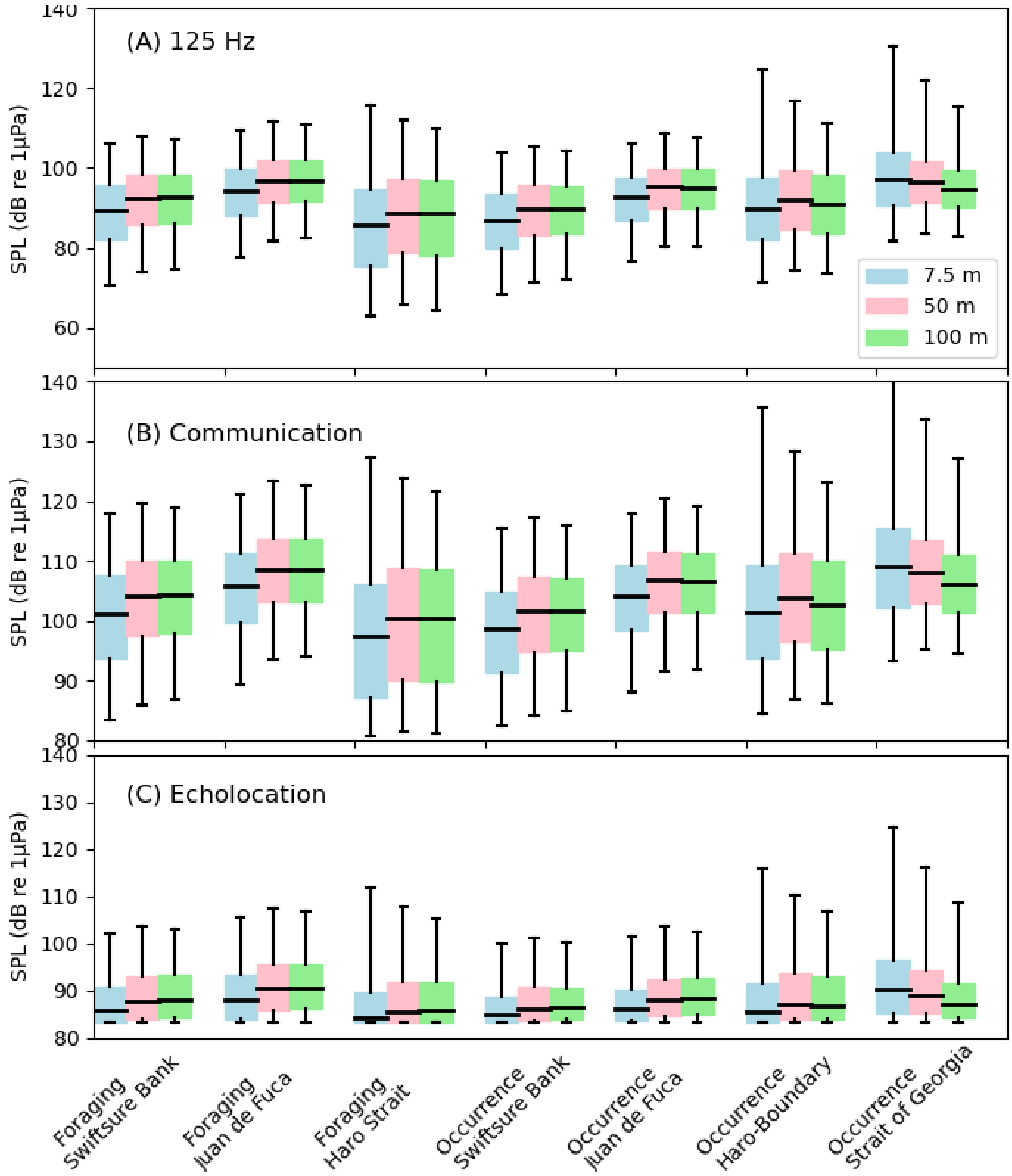

Figure 77: Boxplot comparing the sound pressure levels (SPL) in the **subregions derived from data on SRKW occurrence and foraging** for the scenario of 100% participation to current **lateral displacement** measures using May-October 2015 AIS input data with the additional TMX tankers and tugs at (A) 125 Hz, and in (B) SRKW communication and (C) echolocation ranges. Indicated is the median, with the boxes extending to the 25th and 75th percentile, and whiskers indicating the 5th and 95th percentiles. Sound levels for each subregion of interest are shown at depths of 7.5 m (blue) 50 m (pink) and 100 m (green).

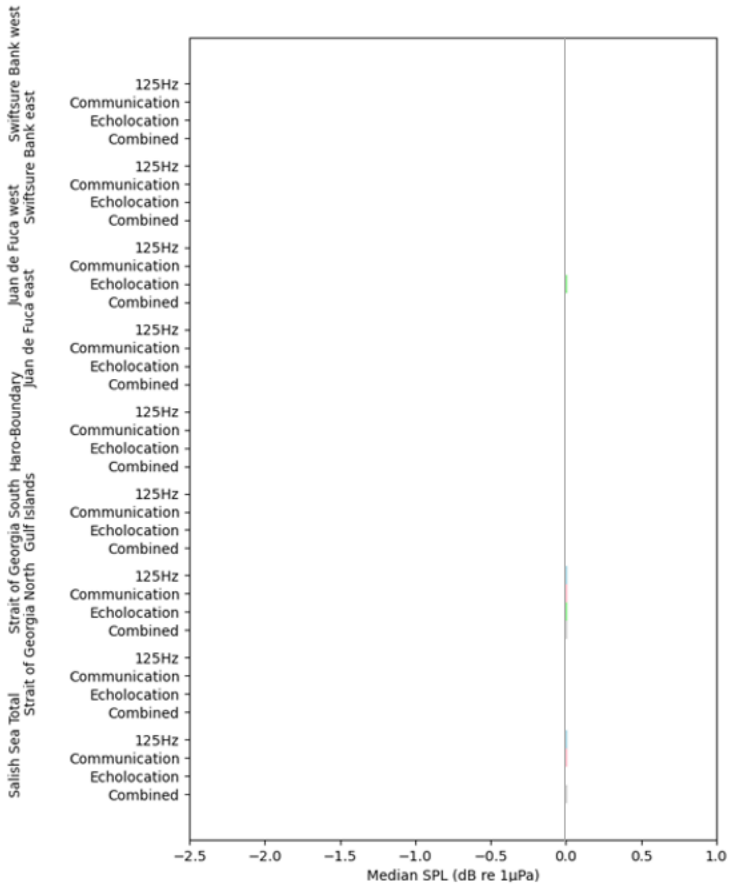

Figure 78: Bar chart showing the difference in decibels (dB) of **100% participation** to current **lateral displacement** measures relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. Median RL differences were calculated using the **acoustically-derived subregions**.

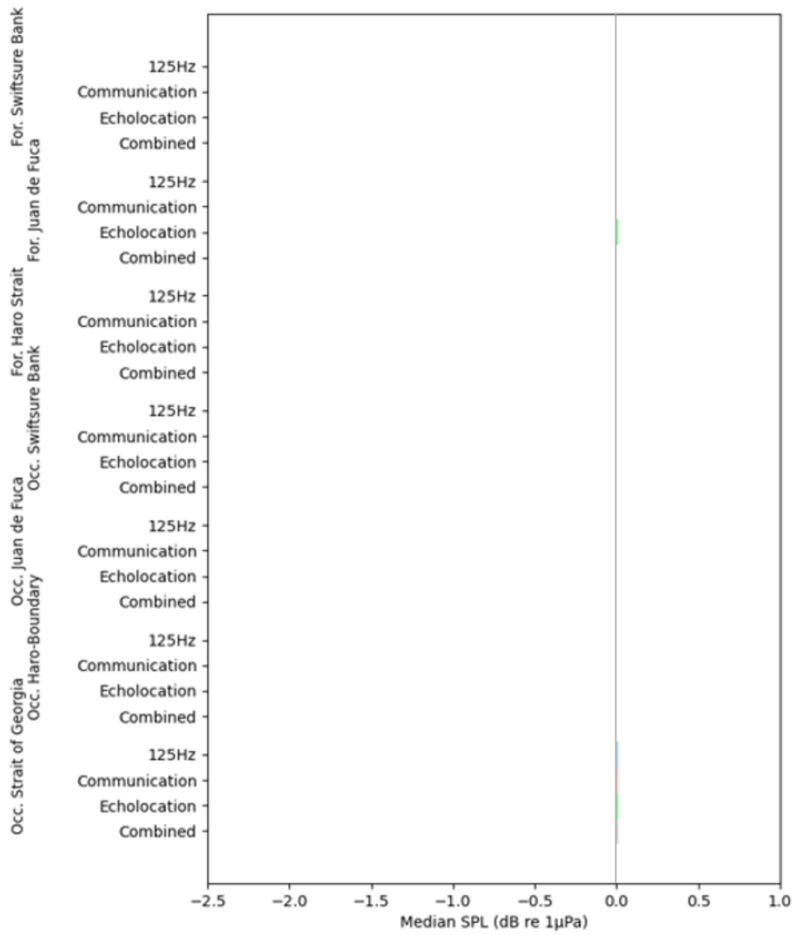

Figure 79: Bar chart showing the difference in decibels (dB) of **100% participation** to current **lateral displacement** measures relative to the baseline + TMX scenario at a depth of 7.5 m in the 125 Hz, SRKW communication, SRKW echolocation, and combined frequency ranges. Median RL differences were calculated using **subregions derived from data on SRKW occurrence and foraging**.

4.5 Metrics

Noise maps from the scenarios were depicted using median values for demonstrative purposes, with some also depicting the arithmetic mean to compare. The median was used to represent the sound levels that SRKW would be subject to 50% of the time. If the sound levels measured were normally distributed (focused around a central value) the results from the mean would be very similar to the median. However, the mean is sensitive to extreme inputs or outliers in the data that can skew its value, and so noise maps (Figures 11-13, 21-22, 64-66) and calculated values (Tables 3-10) received values representing the mean were more in line with L_{95} than L_{50}. A comparison between baseline values using the median and mean differed in places by up to 30 dB (Figure 80), with the comparison of the baseline + TMX scenario showing similar results (Figure 81). The values differed the most in the upper water column (7.5 m depth).

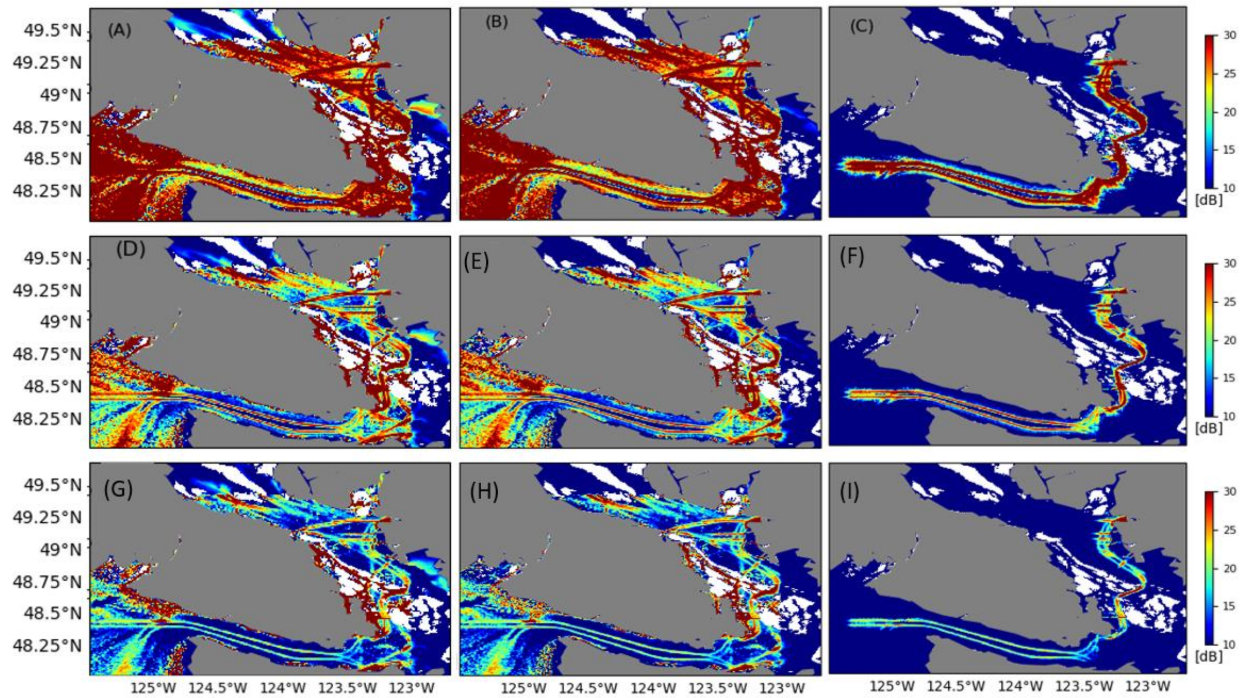

Figure 80: Difference in RL for the baseline scenario using 2015 AIS Class A data for May to October between arithmetic mean (L_{eq}) and median (L_{50}) values for 125 Hz (A, D,G), SRKW communication (B, E, H) and echolocation range (C, F, I) at 7.5 m (A-C), 50 m (D-F) and 100 m (G-I).

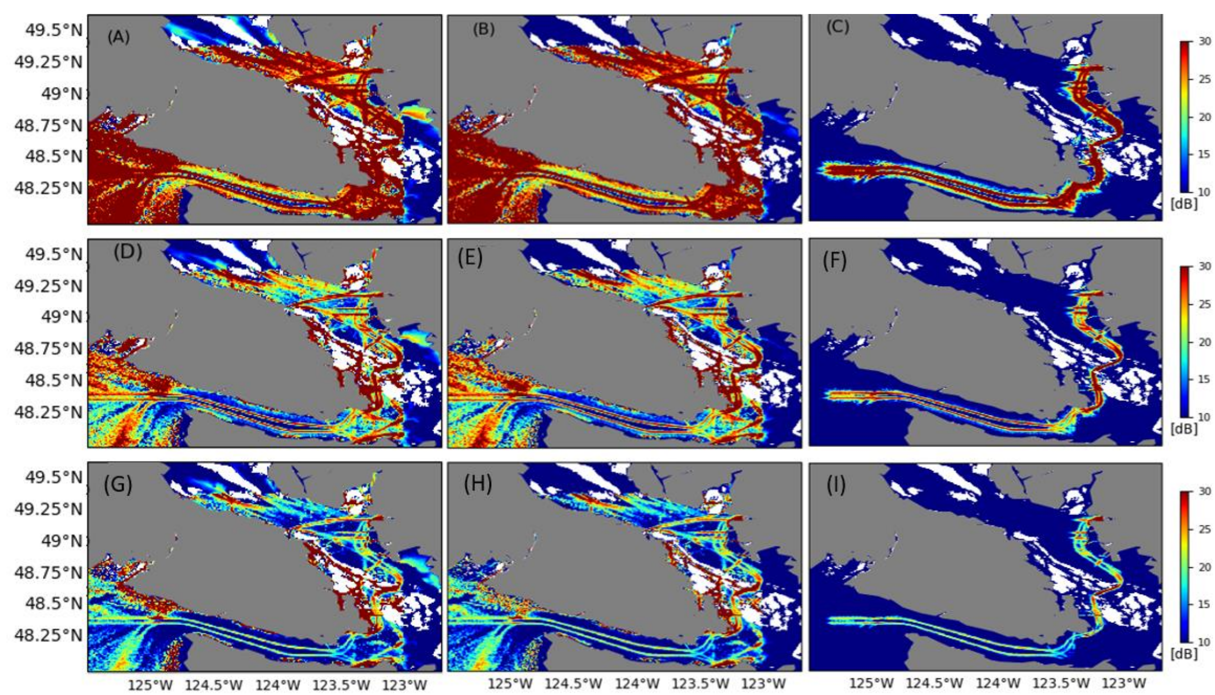

Figure 81: Difference in RL for the baseline+TMX scenario using 2015 AIS Class A data for May to October between arithmetic mean (L_{eq}) and median (L_{50}) values for 125 Hz (A, D,G), SRKW communication (B, E, H) and echolocation range (C, F, I) at 7.5 m (A-C), 50 m (D-F) and 100 m (G-I).

In examining model outputs at different percentiles (L_5, L_{25}, L_{50}, L_{75}, L_{95}), and the arithmetic mean (L_{eq}) (Tables 3-10), it became apparent that conclusions on the efficacy and effectiveness of the measures considered changed depending on the metric used in the assessment. In many scenarios, background, or ambient noise levels (5^{th} -25^{th} percentiles), increased with the slowing down of vessels, whereas clear noise reductions were observed in the higher percentiles (95^{th}) and in the mean (L_{eq}). Slowdowns target the faster, and therefore the loudest, vessels. Also, slowed down vessels are not removed from, and still contribute, to the soundscape. By slowing vessels down their contributions to the soundscape are now made in lower sound levels, that are represented by the lower percentiles. Therefore, noise reductions were less evident in the lower percentiles as more vessels were contributing to somewhat lower noise levels by reducing their speed. Also, reducing speeds creates situations where more vessels are in the same area at the same time as it takes longer to transit through subregions; for enclosed waterways especially this may also modify time defined noise metrics. Slower transit also increases transit time, increasing the time vessels are in a certain area, or its exposure time. A comparison between the median (L_{50}) and mean (L_{eq}) values seen for the full vessel slowdown to 10 knots showed a substantial difference in the resulting noise levels. Again, it showed that conclusions of efficacy of the measures, and the sound levels resulting, might differ by up to 30 dB in some areas, with the most striking differences between median and mean results seen at 7.5 m depth (Figure 82). Areas of greater difference include those identified as foraging areas for SRKW.

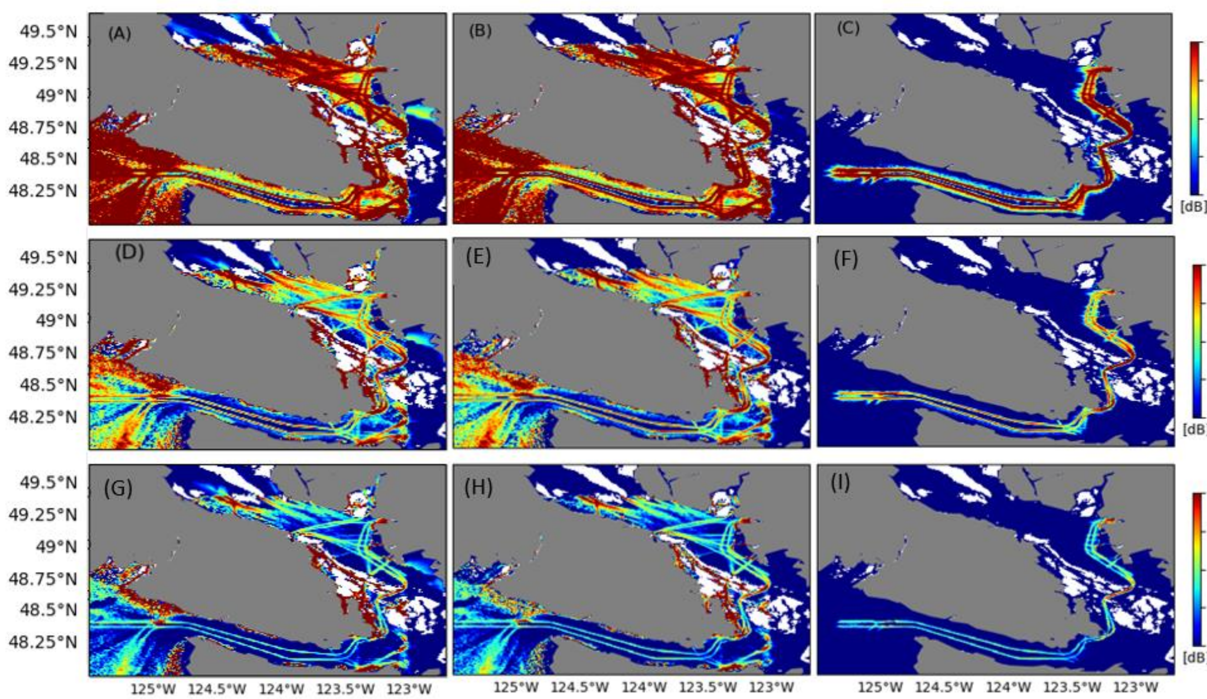

Figure 82: Difference in RL for the scenario representing a full slowdown of vessels transiting the Salish Sea to 10 knots using 2015 AIS Class A data for May to October between (L_{eq}) and median (L_{50}) values for 125 Hz (A, D,G), SRKW communication (B, E, H) and echolocation range (C, F, I) at 7.5 m (A-C), 50 m (D-F) and 100 m (G-I).

Considering the current slowdown measures, slowing vessels to ECHO speeds in slowdown zones to the reported 85% participation rate showed reduction of the greatest noise sources at the 95th percentile and the mean (Figure 83i, j), which are more sensitive to these louder noise inputs. However, in the lower percentiles less change was seen to the baseline + TMX sound levels, with increases seen in slowdown zones with more vessels contributing to the lower sound levels (Figure 83). Conclusions on the efficacy of these measures will therefore differ based on the metric considered. Table 11 highlights data already presented in Tables 6a-c comparing the sound levels and decibel change due to this slowdown relative to the baseline + TMX. The results differ, in that the median shows additions to the soundscape whereas the mean shows reductions to noise emissions from TMX-related vessel traffic (Table 11).

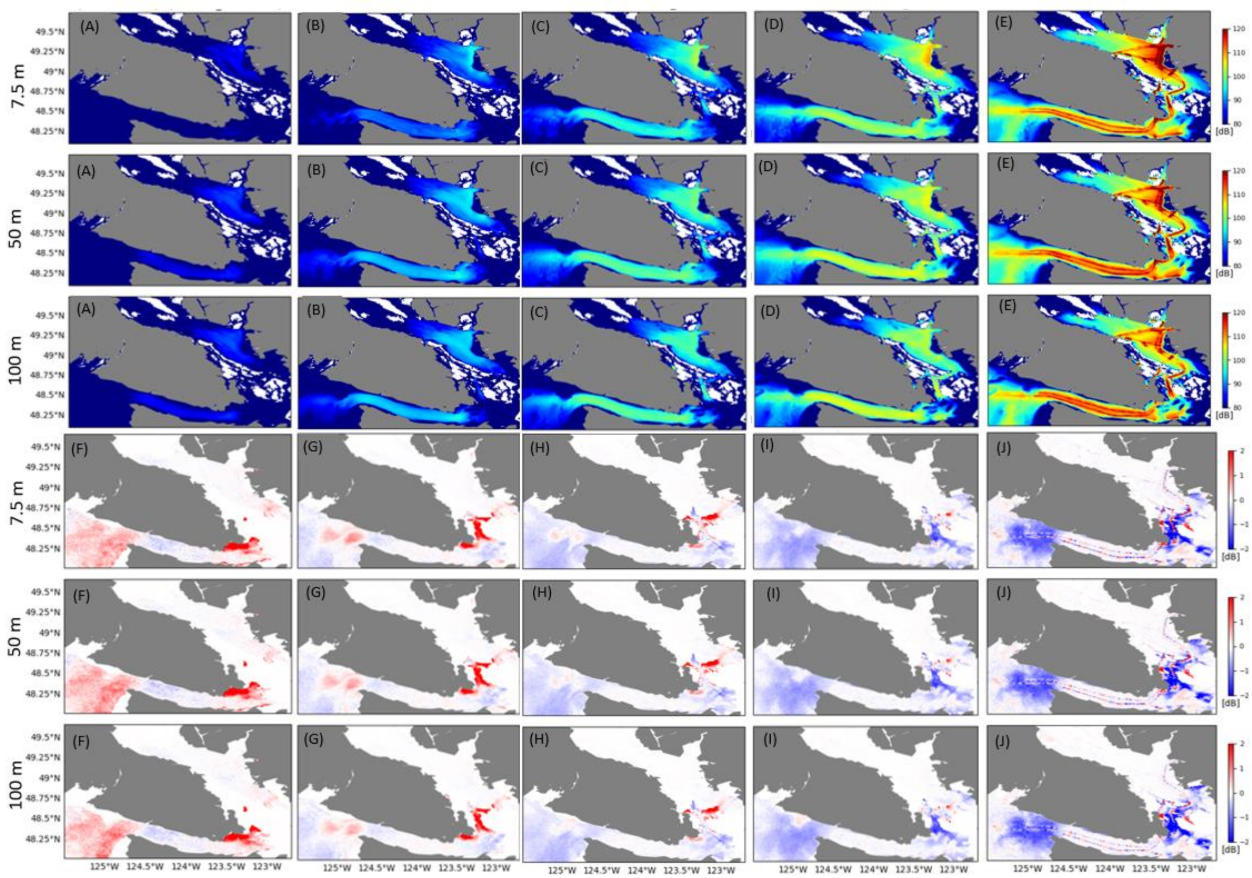

Figure 83: RL (rows 1-3, A-E) for vessel slowdown representing current **ECHO measures at 85% participation** and RL differences (rows 4-6, F-J) relative to the baseline+TMX scenario at the (A,F) 5th, (B,G) 25th, (C,H) 50th, (D, I) 75th and (E,J) 95th percentiles at 7.5, 50, and 100 m depths.

Figure 84 shows the comparison of percentiles when evaluating sound levels and changes relative to the baseline + TMX scenario outputs for the slowdown of all vessels in the study area to 10 knots (also see Figures 61-66, Tables 9a-d). The difference in noise levels by percentile is more notable in this scenario. For the 5th percentile, representing the background ambient noise levels, the slowdown is seen to elevate the received levels in the soundscape. This means that for the six months considered for the scenario SRKW could be subject to elevated noise levels most of the time, with them only meeting the levels determined for the baseline+TMX scenario for the equivalent of 9 days or less out of 183 days. However, for the 25th, 50th, 75th and 95th percentiles there was widespread reductions in noise, and mitigation of the additions from TMX-related vessels (Figure 84). Curves to compare received sound levels (SPL, in dB) of the baseline + TMX scenario (Baseline_2015+TMX, blue line) and the scenario where all vessels in the model extent were slowed to 10 knots (Full_10kts+TMX, red line) showed where the slowing of vessels created the divergence in received levels from the baseline+TMX outputs (Figure 85). The Strait of Georgia curves show that the slowdown would result in reductions in noise levels even at the lower percentiles. This is likely from the slowing down of the ferries as well as other commercial traffic, which exceeds the extent of the other slowdown scenarios. In the Gulf Islands the changes are only apparent in higher percentiles, and quickly plateau, likely from the lack of commercial vessel traffic and no shipping lanes traversing this subregion (Figure 85). These all contrast to Haro Strait and Boundary Pass areas, where the slowdown is seen to add noise in the lower percentiles, with reductions only becoming apparent overall in the higher percentiles (Figure 85).

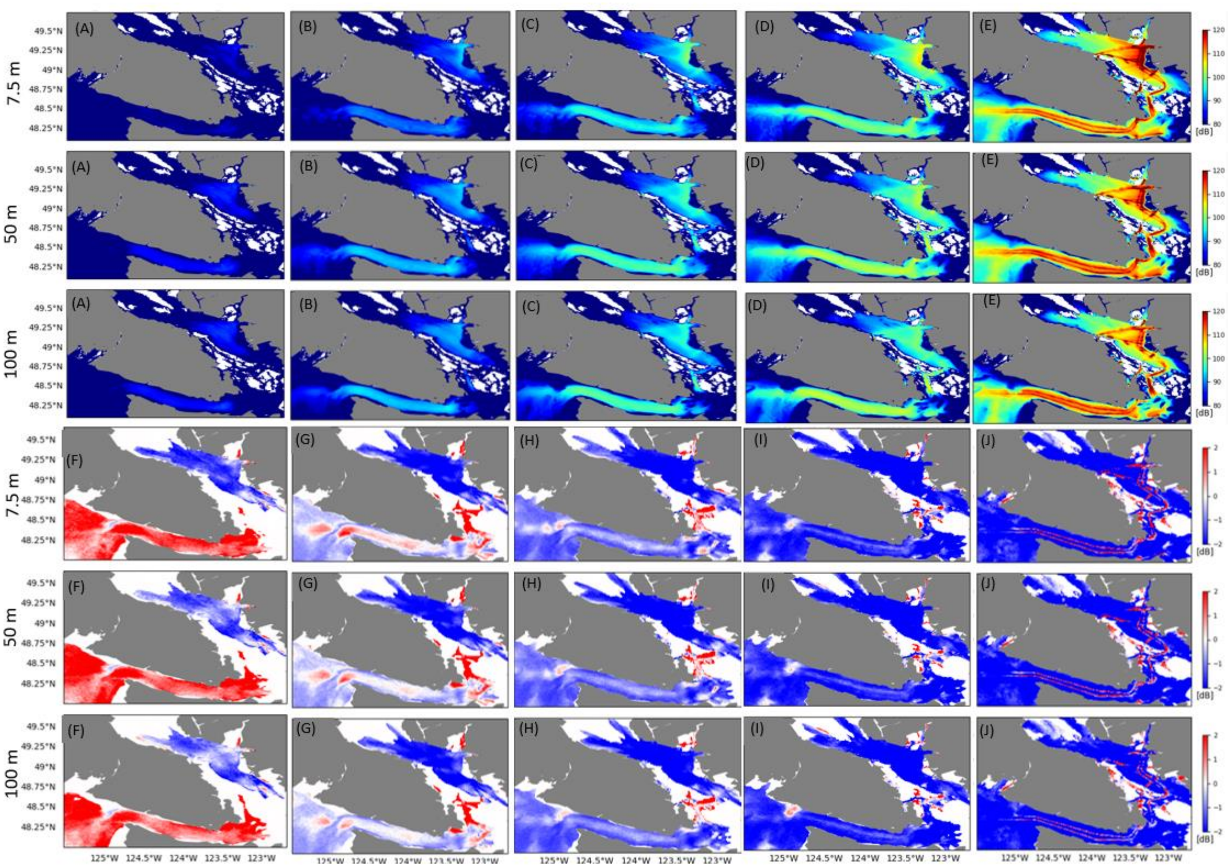

Figure 84: Modelled median received sound levels (RL; rows 1-3, A-E) for a scenario representing **vessel slowdown throughout the Salish Sea to 10 knots** and RL differences (rows 4-6, F-J) relative to the baseline + TMX scenario at the (A,F) 5th, (B,G) 25th, (C,H) 50th, (D, I) 75th and (E,J) 95th percentiles at 7.5, 50, and 100 m depths.

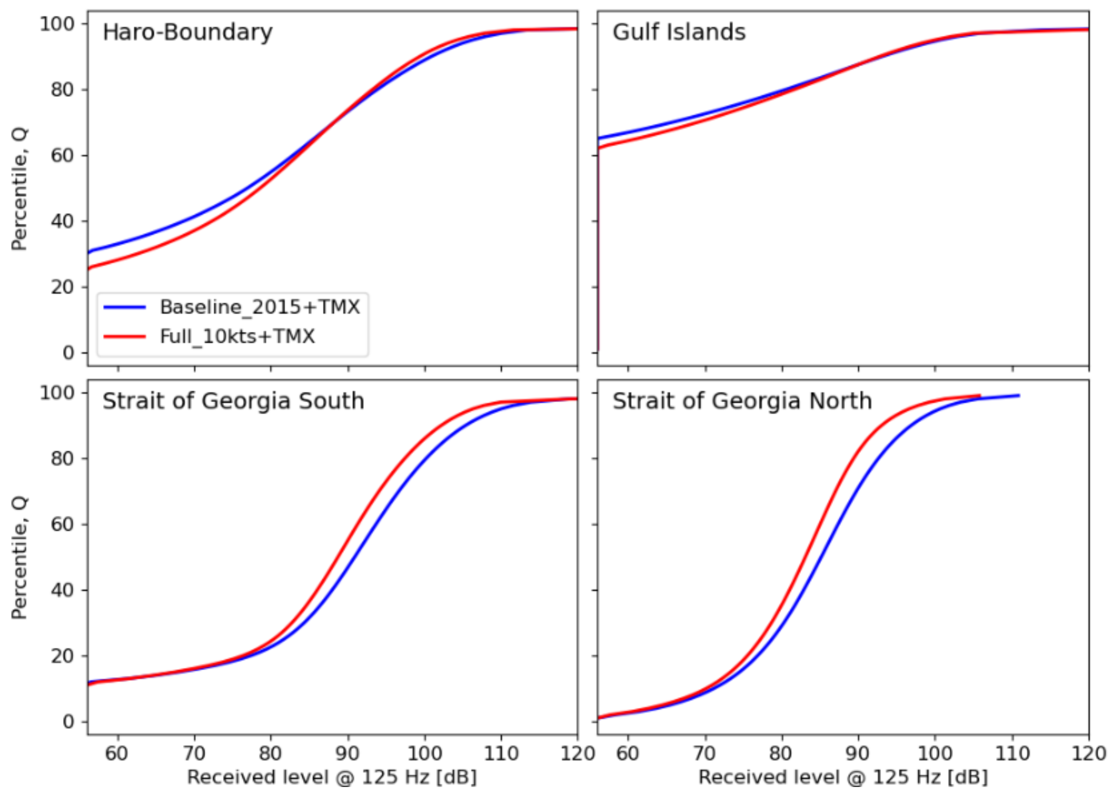

Figure 85: Curves to compare received sound levels, RL, of the baseline + TMX scenario (Baseline_2015+TMX, blue line) and the scenario where all vessels in the model extent were slowed to 10 knots (Full_10kts+TMX, red line) versus percentile.

Table 11: Example of how the use of the median (L_{50}) or arithmetic mean (L_{eq}) values might influence conclusions or management decisions. Shown are subregions that show differences in the sound level change dependent on the metric used. Data taken from the scenario depicting **current ECHO measures at 85% participation rate** (Full data in Tables 6a-d).

Subregion	L_{50} Sound levels (SPL)			L_{eq} Sound level (SPL)			L_{50} dB change			L_{eq} dB change		
	125 Hz	Comm.	Echo.	125 Hz	Comm.	Echo.	125 Hz	Comm.	Echo.	125 Hz	Comm.	Echo.
Acoustic Subregions												
Juan de Fuca east												
7.5 m	89.6	101.2	85.3	123.8	135.0	117.1	0.0	0.0	0.0	-0.1	-0.1	0.0
50 m	92.3	103.8	86.8	114.7	126.0	108.2	-0.1	0.0	0.0	0.0	-0.1	0.0
100 m	90.9	102.4	86.4	107.1	118.4	101.0	-0.1	0.0	0.0	0.0	0.0	0.0
Haro-Boundary												
7.5 m	86.8	98.5	84.4	127.1	138.8	120.8	+0.3	+0.3	+0.1	-1.9	-1.9	-1.6
50 m	89.5	101.2	85.7	117.9	129.6	112.1	+0.2	+0.2	0.0	-1.7	-1.7	-1.6
100 m	89.7	101.4	86.1	113.8	125.2	105.8	0.0	+0.1	0.0	-1.2	-1.3	-1.6
Gulf Islands												
7.5 m	84.5	94.5	81.4	124.5	135.2	92.4	0.0	0.0	0.0	0.0	0.0	-0.8
50 m	86.5	96.6	81.4	114.7	125.3	85.0	0.0	0.0	0.0	0.0	0.0	-0.7
100 m	85.9	95.9	81.4	108.5	119.1	82.9	0.0	0.0	0.0	+0.2	+0.2	0.0
Foraging Subregions												
Haro Strait												
7.5 m	85.8	97.5	84.3	123.8	135.5	118.5	0.0	+0.1	0.0	-2.1	-2.1	-1.9
50 m	88.7	100.3	85.4	115.0	126.7	109.7	-0.1	-0.1	0.0	-2.0	-2.0	-1.9
100 m	88.5	100.2	85.7	108.1	119.8	102.9	-0.1	-0.1	-0.1	-2.2	-2.2	-2.1
Occurrence Subregions												
Haro-Boundary												
7.5 m	89.9	101.5	85.6	126.4	138.0	121.4	+0.2	+0.2	+0.1	-1.2	-1.2	-1.0
50 m	92.3	104.0	87.3	117.5	129.2	112.5	+0.1	+0.1	+0.1	-1.1	-1.1	-1.0
100 m	91.0	102.7	86.7	110.2	121.9	105.6	+0.1	+0.1	0.0	-1.3	-1.3	-1.1
Strait of Georgia												
7.5 m	97.3	108.9	90.3	130.5	142.2	123.59	0.0	0.0	0.0	0.0	0.0	0.0
50 m	96.5	108.1	89.1	122.0	133.6	114.75	0.0	0.0	0.0	0.0	0.0	0.0
100 m	94.6	106.1	87.0	115.9	127.5	107.53	0.0	0.0	0.0	0.0	0.0	0.0

5. SCENARIO COMPARISONS

Scenario comparisons were first made using the received levels and change in sound levels for the Salish Sea as a whole as calculated by the model (in Tables 2-10 under the acoustically derived subdivisions) at 7.5 m depth at 125 Hz and for the SRKW communication and echolocation ranges. This showed that, despite the management measures, sound levels were similar for each scenario (Figure 86) and the change in noise as a result of a management measure rarely exceeded 1 dB and was never 3 dB or greater than baseline + TMX levels (Figure 87). The greatest changes from altering commercial vessels' speed were seen in the low frequencies. For the SRKW relevant frequency ranges, the changes were more evident in the communication range. The scenarios of slowing all vessels in the study area showed more notable reductions in sound levels, and increased participation allowed greater reductions in noise.

More detailed comparisons follow in the sections below to examine the influence of participation rate and extent of measure in mitigating noise emissions predicted from TMX-related vessels.

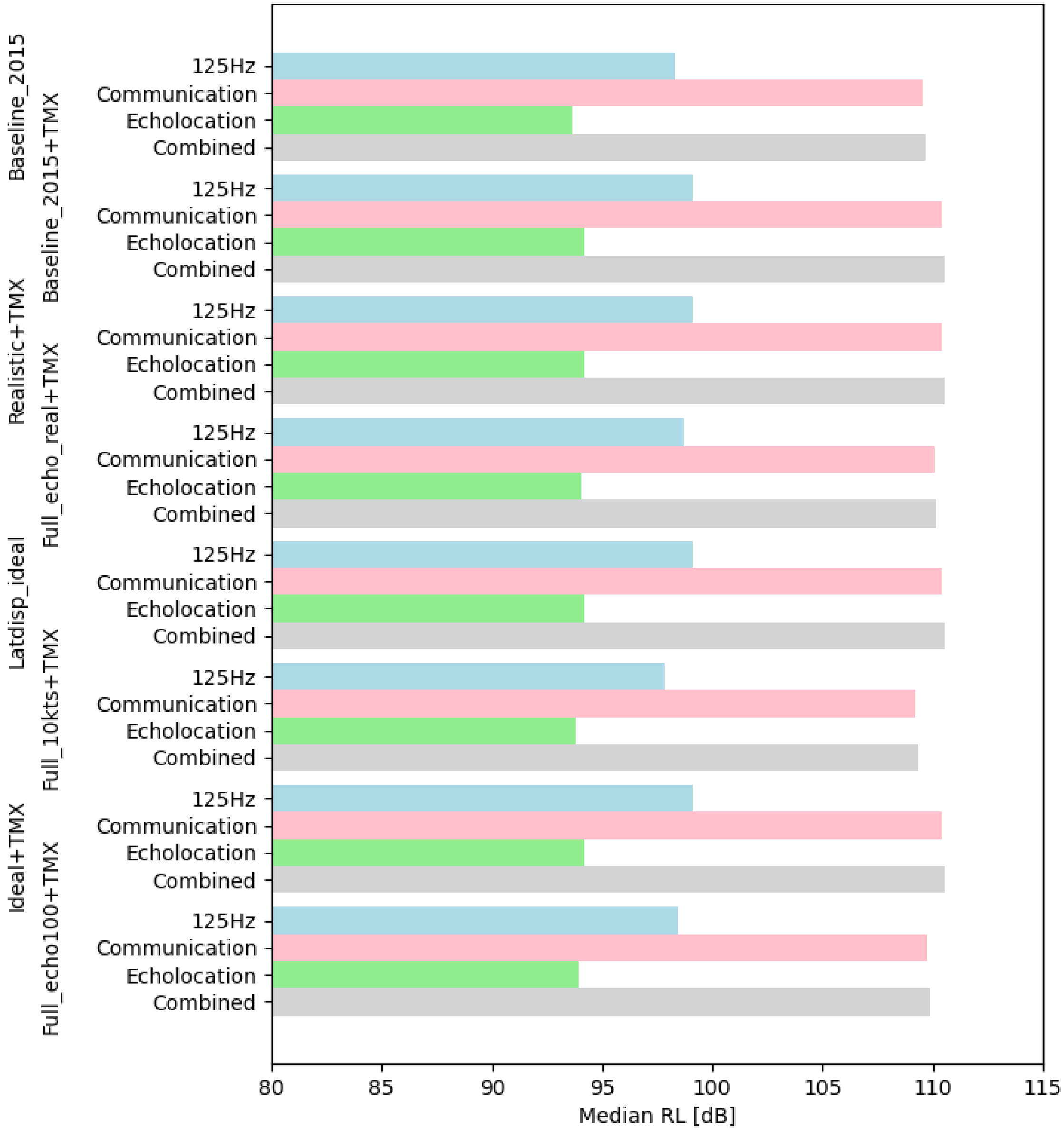

Figure 86: Modelled **median** received sound levels (RL; in decibels (dB)) for the Salish Sea as a whole from May to October 2015 at 7.5 m depth for each of the 8 scenarios. Baseline = Baseline_2015, Baseline plus TMX-vessels = Baseline_2015+TMX, Current ECHO measures, 100% participation = Ideal+TMX, Current ECHO measures 85% participation = Realistic+TMX, Full area slowdown at ECHO speed, 100% participation = Full_echo100+TMX, Full area slowdown at ECHO speed, 85% participation = Full_echo_real+TMX, Full area slowdown to 10 knots, 100% participation = Full_10kts+TMX, Lateral displacement, 100% participation = Latdisp_ideal.

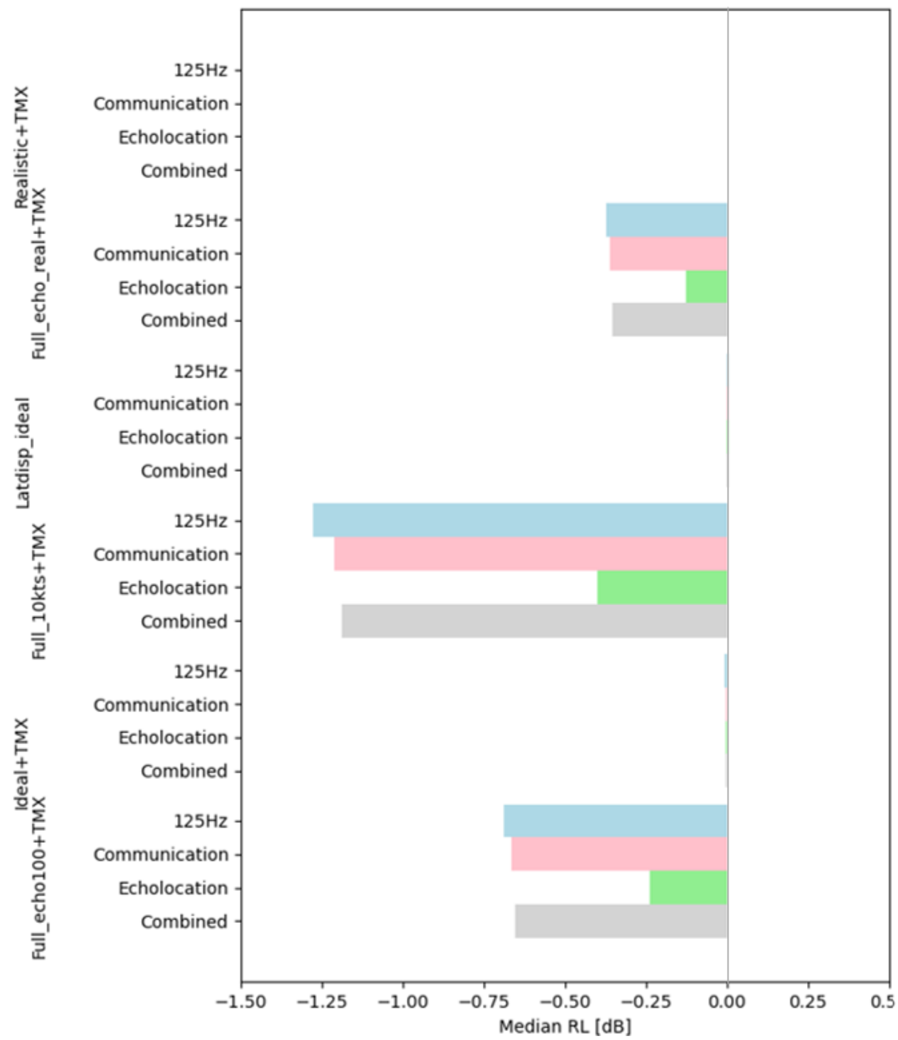

Figure 87: Change in median received levels (RL, in decibels (dB); May-October 2015) for the Salish Sea as a whole at 7.5 m depth between six management scenarios and the Baseline 2015+TMX scenario. The six scenarios are: Current ECHO measures 85% participation = Realistic+TMX, Full area slowdown at ECHO speed, 100% participation = Full_echo100+TMX, Full area slowdown at ECHO speed, 85% participation = Full_echo_real+TMX, Full area slowdown to 10 knots, 100% participation = Full_10kts+TMX, Lateral displacement, 100% participation = Latdisp_ideal.

Current ECHO measures (speeds and areas), comparing 100 and 85% participation levels

The scenarios inspired by the current slowdown measures in the Salish Sea were compared to evaluate the influence of participation level. This comparison considered a scenario of full, 100% participation of commercial vessels to the slowdown compared to 85% participation, chosen as this represented the average overall participation in ECHO measures reported to in 2023 (ECHO 2024). The comparison showed very little difference in median values between the scenarios at 125 Hz (Figure 88), and in the SRKW communication (Figure 89) and SRKW echolocation ranges (Figure 90). On Swiftsure Bank and in eastern Juan de Fuca especially, increased participation is not shown to further reduce sound levels, with noise levels under the 100% participation scenario exceeding those for 85% participation. Noise levels were reduced at lower percentiles (e.g., L_5) with the additional vessels slowing, however the patterns seen at median levels are strengthened in the higher percentiles (e.g., L_{95}, L_{eq}). This suggests that slowing the fastest vessels to the requested speed is most influential and that increased participation would not alter the sound levels notably once these greater sources of noise are reduced. Indeed slowing all vessels could elevate noise levels in the slowdown zones.

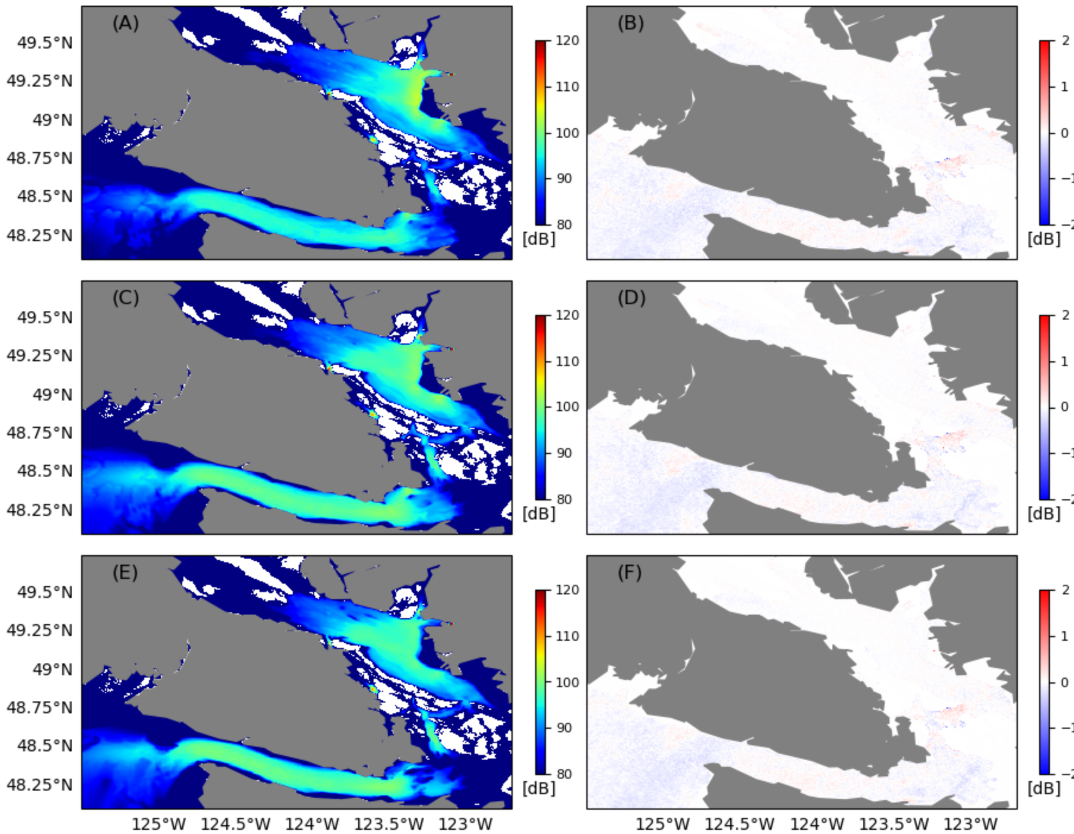

Figure 88: LEFT: Modelled median received sound levels (RL, in decibels (dB)) from **85% participation to current ECHO slowdown scenario**, and RIGHT: shown relative to RL from **100% participation to current ECHO slowdown** scenario at **125 Hz** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

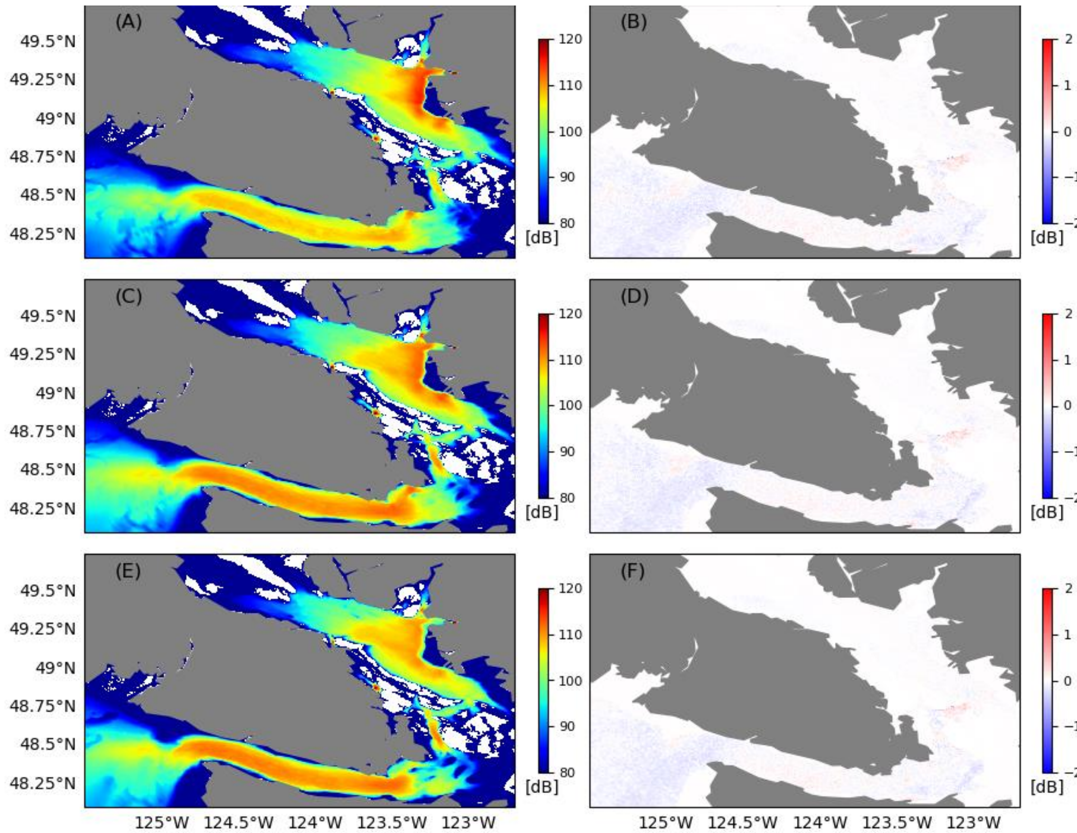

Figure 89: LEFT: Modelled **media**n received sound levels (RL, in decibels (dB)) from **85% participation to current ECHO slowdown scenario**, and RIGHT: shown relative to RL from **100% participation to current ECHO slowdown** scenario at SRKW communication range (500 Hz to 15 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

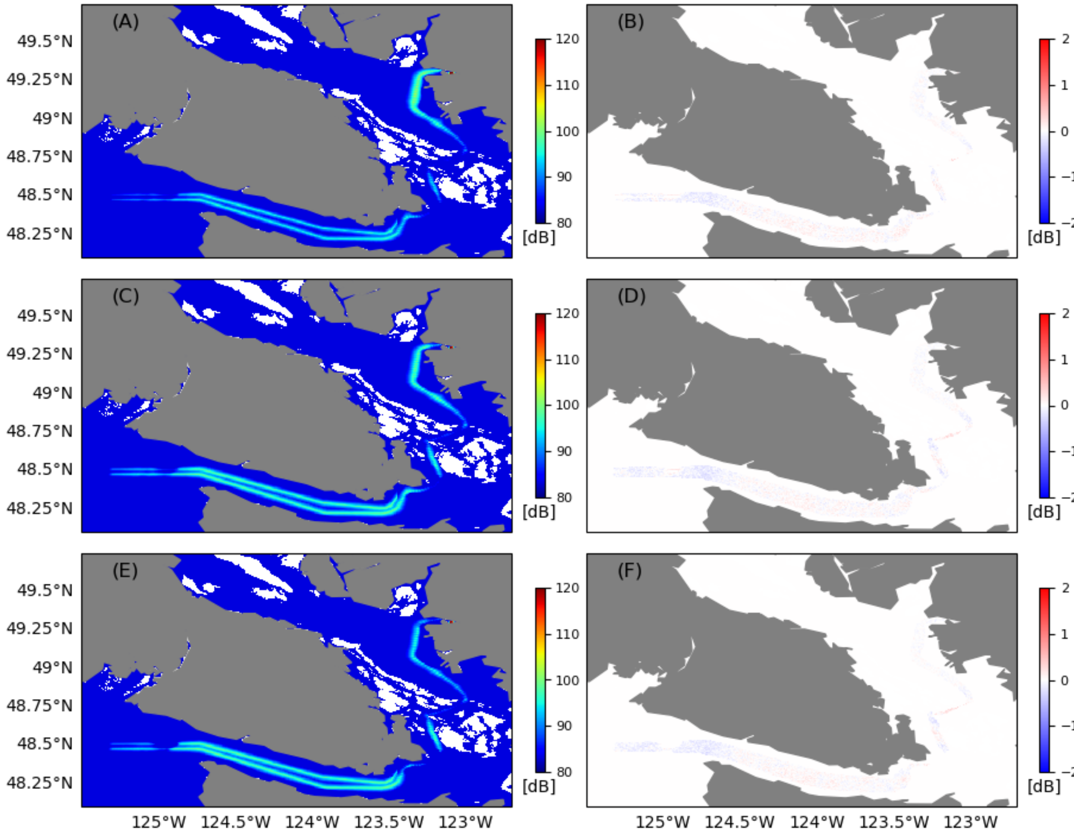

Figure 90: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from **85% participation to current ECHO slowdown scenario**, and RIGHT: shown relative to RL from **100% participation to current ECHO slowdown** scenario at SRKW echolocation range (15-100 kHz) at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

Full Salish Sea slowdowns at ECHO speeds comparing 100 and 85% participation levels

The results of comparing the outputs of the model for the full Salish Sea slowdown at ECHO speeds at 100% and 85% participation rates are shown in Figures 88-90. At median levels, greater participation did mitigate the additions of TMX-related vessel noise emissions more effectively in the Straits of Juan de Fuca and Georgia. Areas around Haro Strait and Boundary Pass, however, did not seem to benefit from the increased level of participation as sound levels were elevated for 100% participation compared to 85% participation at 125 Hz (Figure 91) and in the SRKW communication (Figure 92) and SRKW echolocation frequency ranges (Figure 93). Greater reductions in noise levels were apparent for 100% participation on Swiftsure Bank and through Juan de Fuca Strait at background L_5 levels, but examination of higher percentiles and the mean (L_{25}, L_{75}, L_{95}, L_{eq}) showed similar results for the comparison of participation as the median.

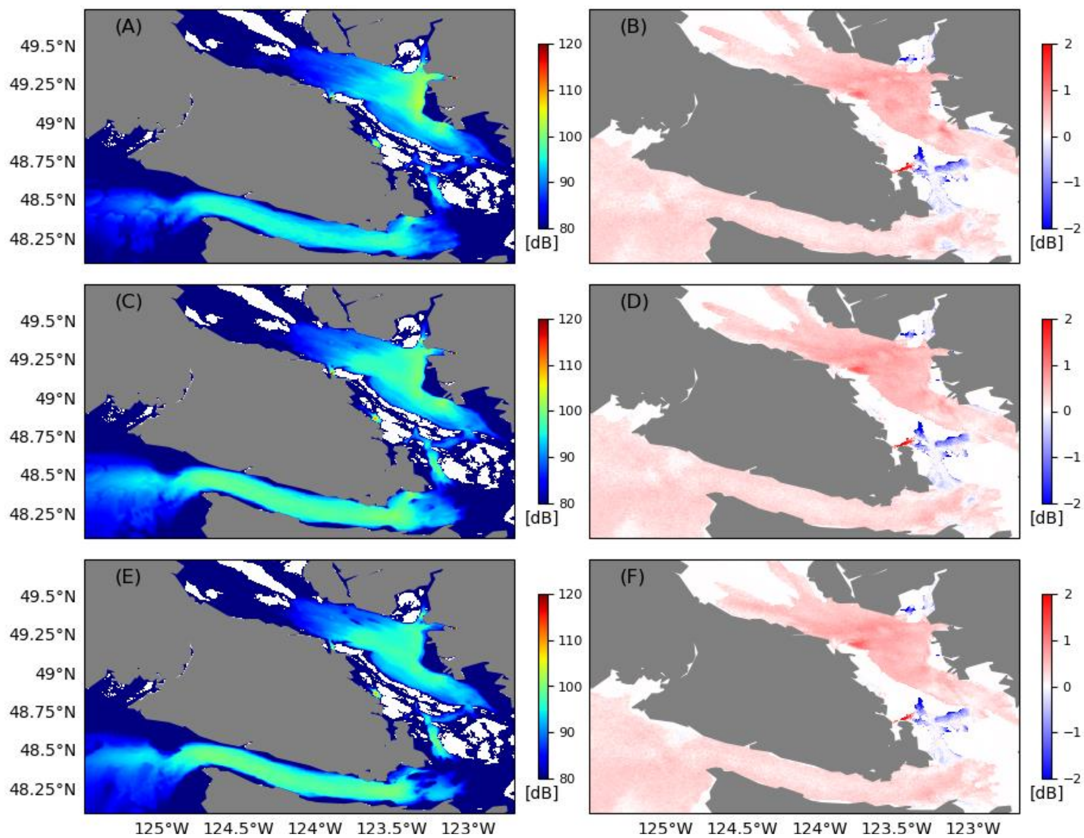

Figure 91: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **85% participation to ECHO speeds throughout the Salish Sea**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** at **125 Hz** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

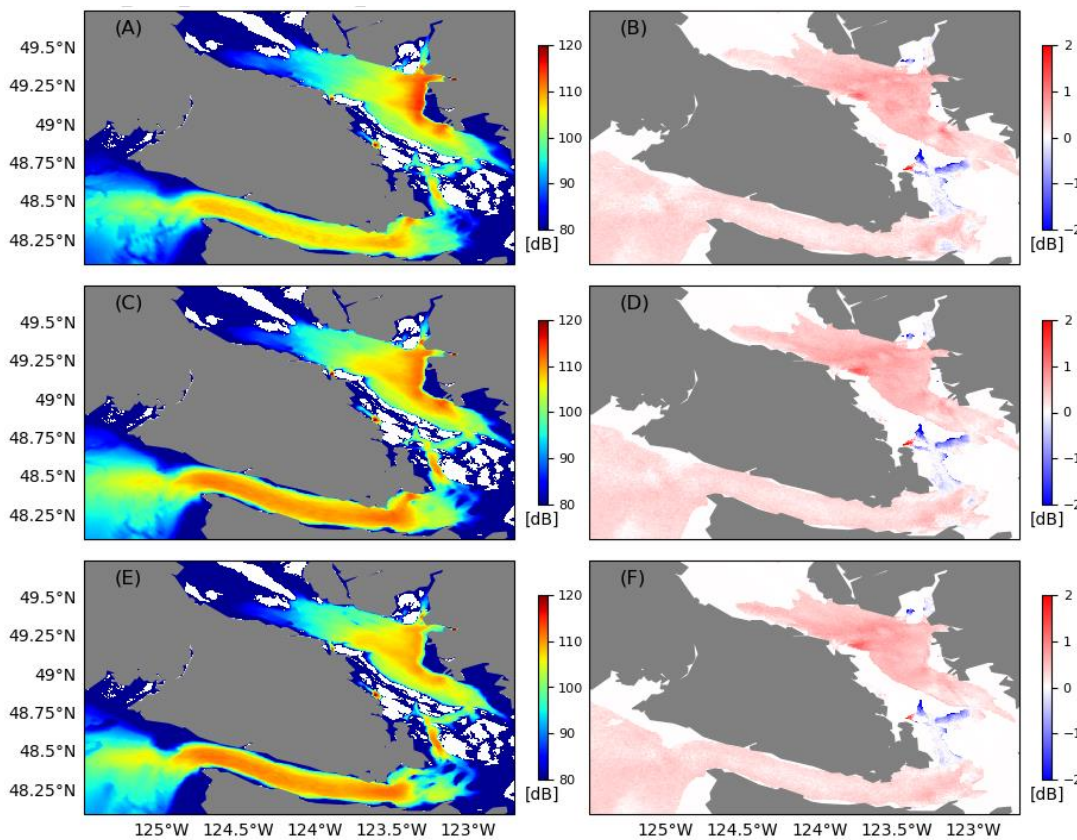

Figure 92: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **85% participation to ECHO speeds throughout the Salish Sea**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** at the SRKW **communication range (500 Hz-15 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of 85%, and blue indicates greater sound levels.

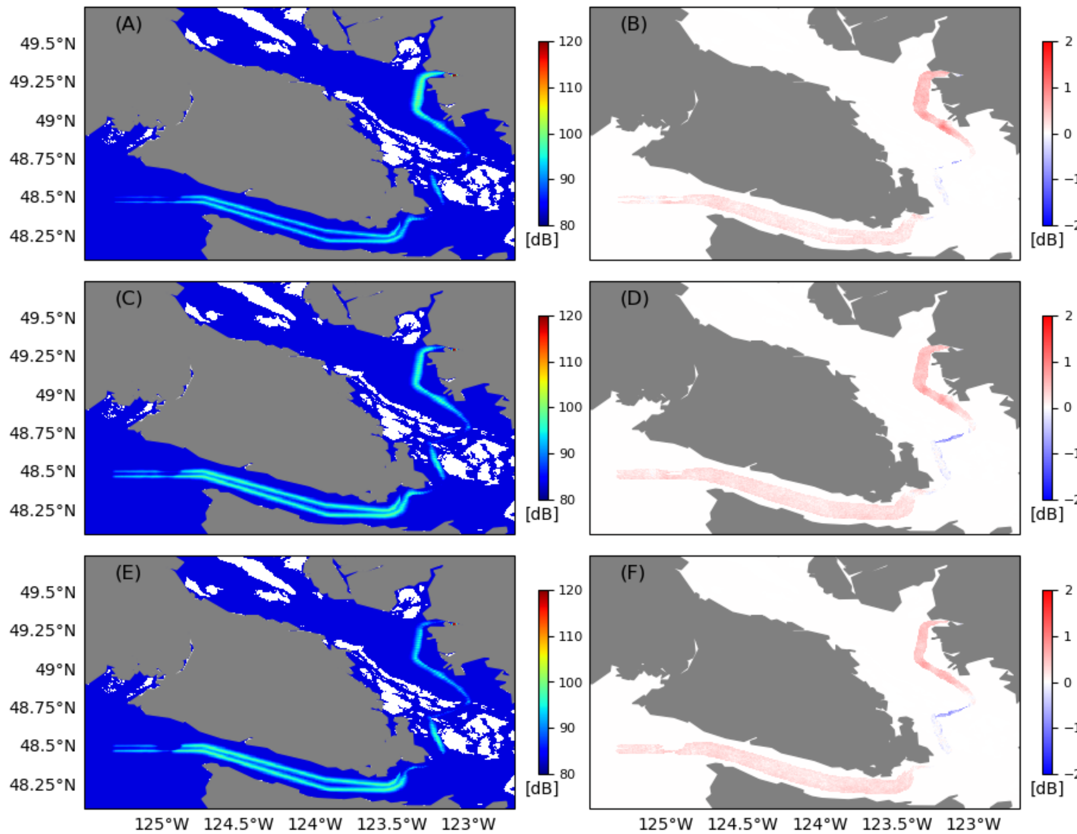

Figure 93: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **85% participation to ECHO speeds throughout the Salish Sea**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** at the SRKW **echolocation range (15-100 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation exceed those of the 85%, and blue indicates greater sound levels.

ECHO slowdown speeds in all of Salish Sea compared with slowdowns in ECHO areas only

The potential benefit of increasing the spatial extent of the management measures from the current ECHO slowdown zones to the full study area extent was then considered, first at 100% participation (Figures 94-96) and then at 85% participation (Figures 94-96) rates. In both cases, areas where measures are currently not in place were highlighted as the regions that differed between the scenarios. The change in RL, measured in dB, was greater when comparing measures with the higher (100%) participation rate, although the patterns of RL differences were similar (Figures 94-99).

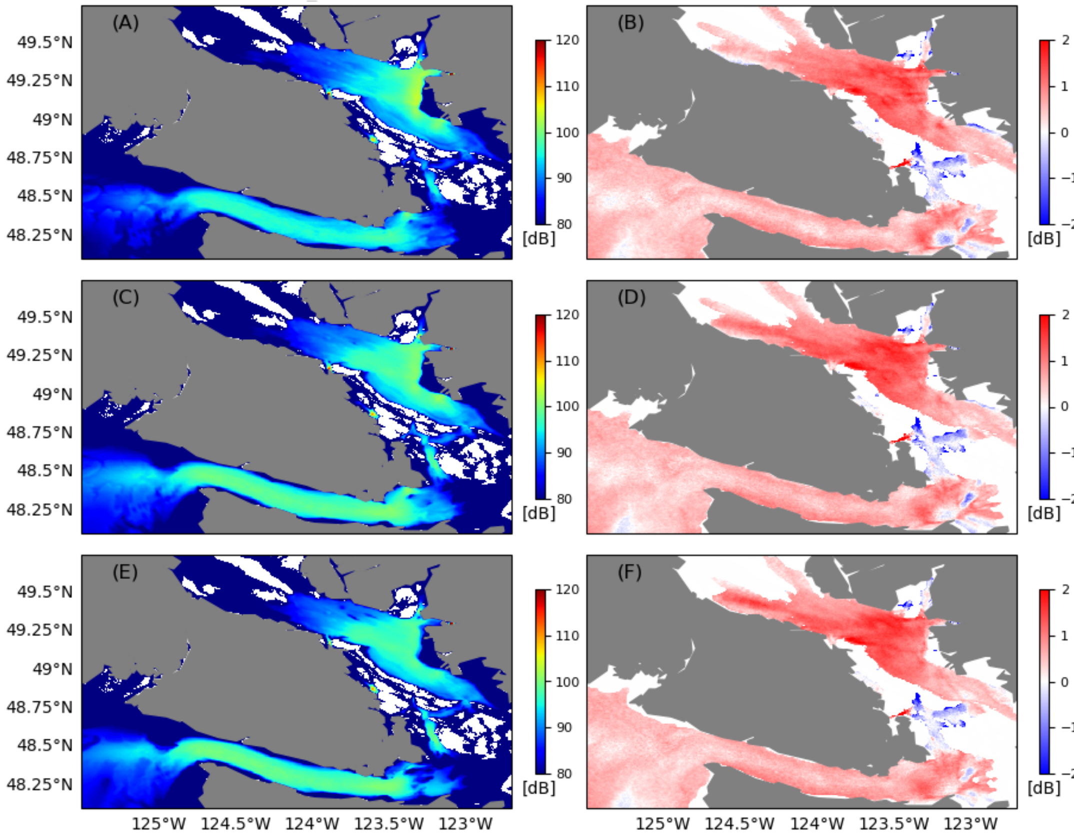

Figure 94: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **100% participation to ECHO speeds in ECHO zones**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** at **125 Hz** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation in an ECHO slowdown throughout the Salish Sea exceed those of 100% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

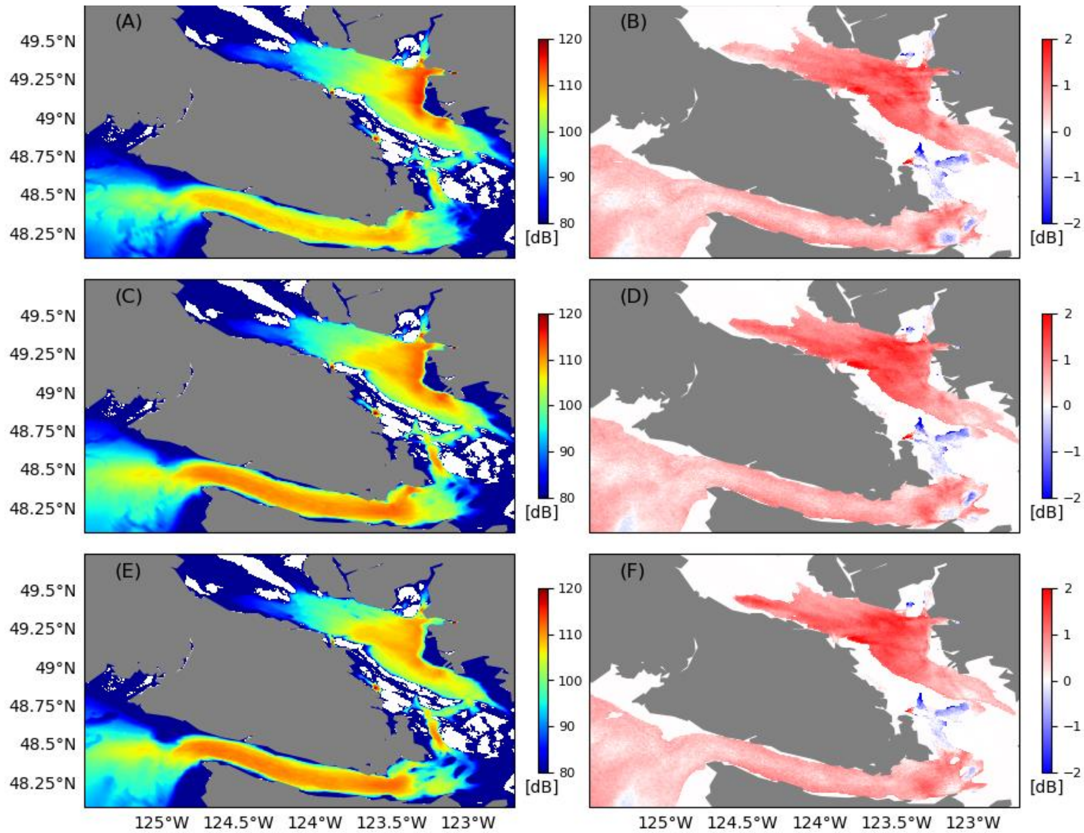

Figure 95: LEFT: Modelled **median** received levels (RL, in decibels (dB)) from a scenario of **100% participation to ECHO speeds in ECHO zones**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** in SRKW **communication range (500 Hz to 15 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation in an ECHO slowdown throughout the Salish Sea exceed those of 100% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

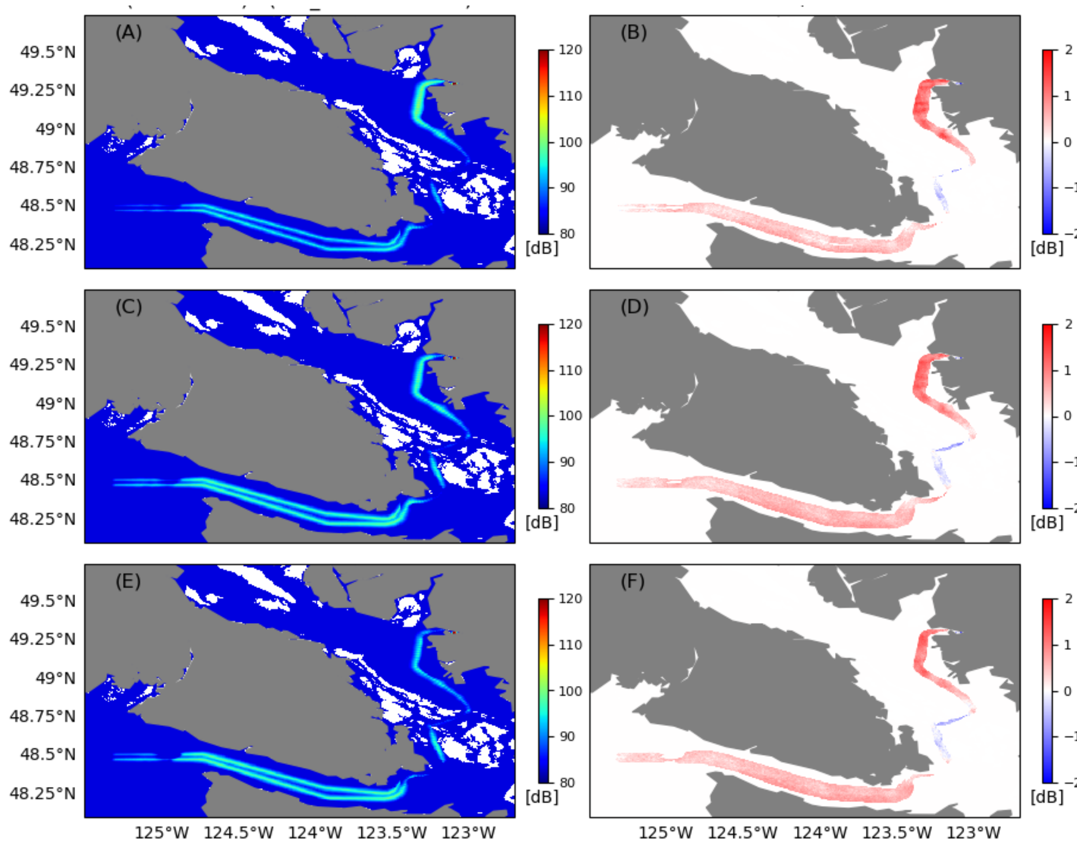

Figure 96: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **100% participation to ECHO speeds in ECHO zones**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** in SRKW **echolocation range (15-100 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 100% participation in an ECHO slowdown throughout the Salish Sea exceed those of 100% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

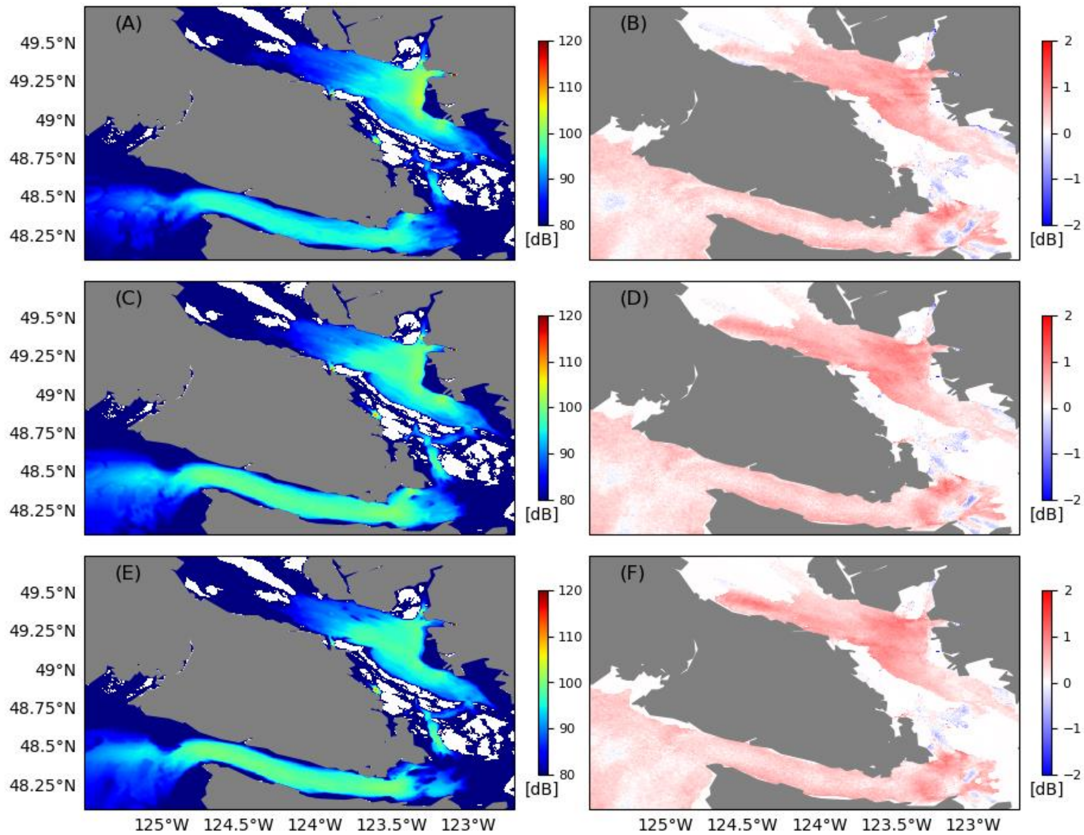

Figure 97: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **85% participation to ECHO speeds in ECHO zones**, and RIGHT: shown relative to RL from a scenario of **85% participation to ECHO speeds throughout the Salish Sea** at **125 Hz** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 85% participation in an ECHO slowdown throughout the Salish Sea exceed those of 85% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

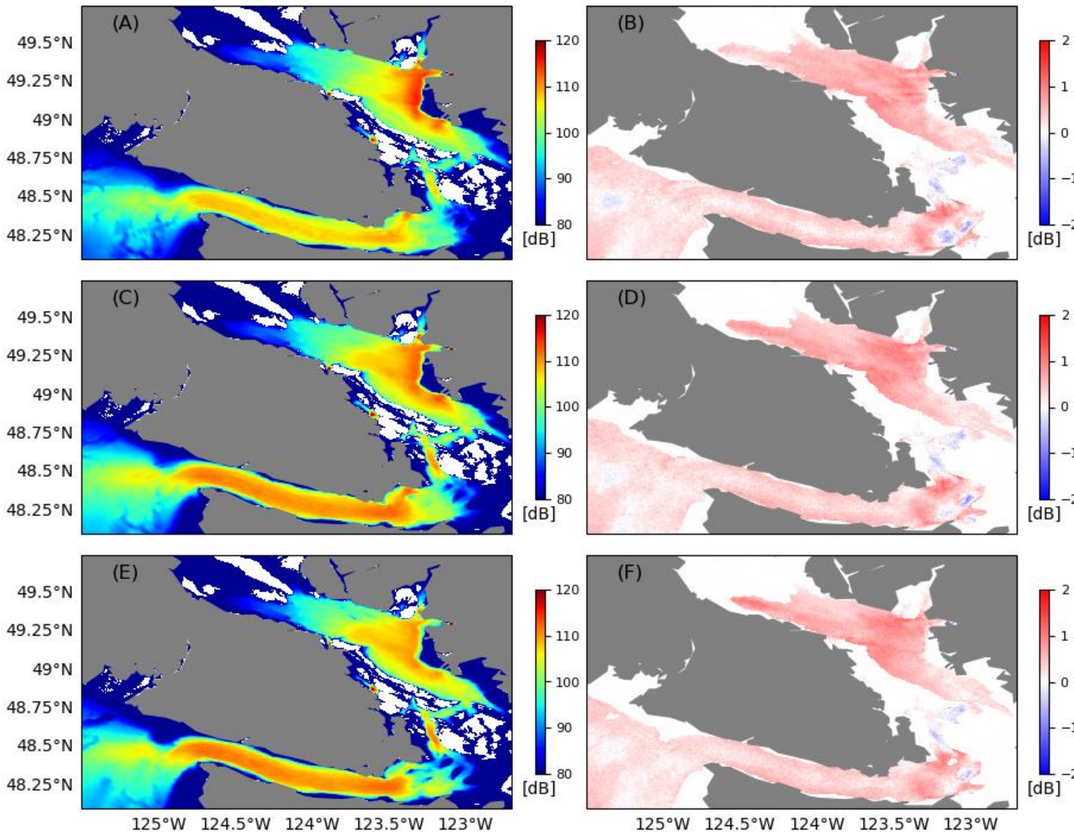

Figure 98: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **85% participation to ECHO speeds in ECHO zones**, and RIGHT: shown relative to RL from a scenario of **85% participation to ECHO speeds throughout the Salish Sea** in SRKW **communication range (500 Hz to 15 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 85% participation in an ECHO slowdown throughout the Salish Sea exceed those of 85% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

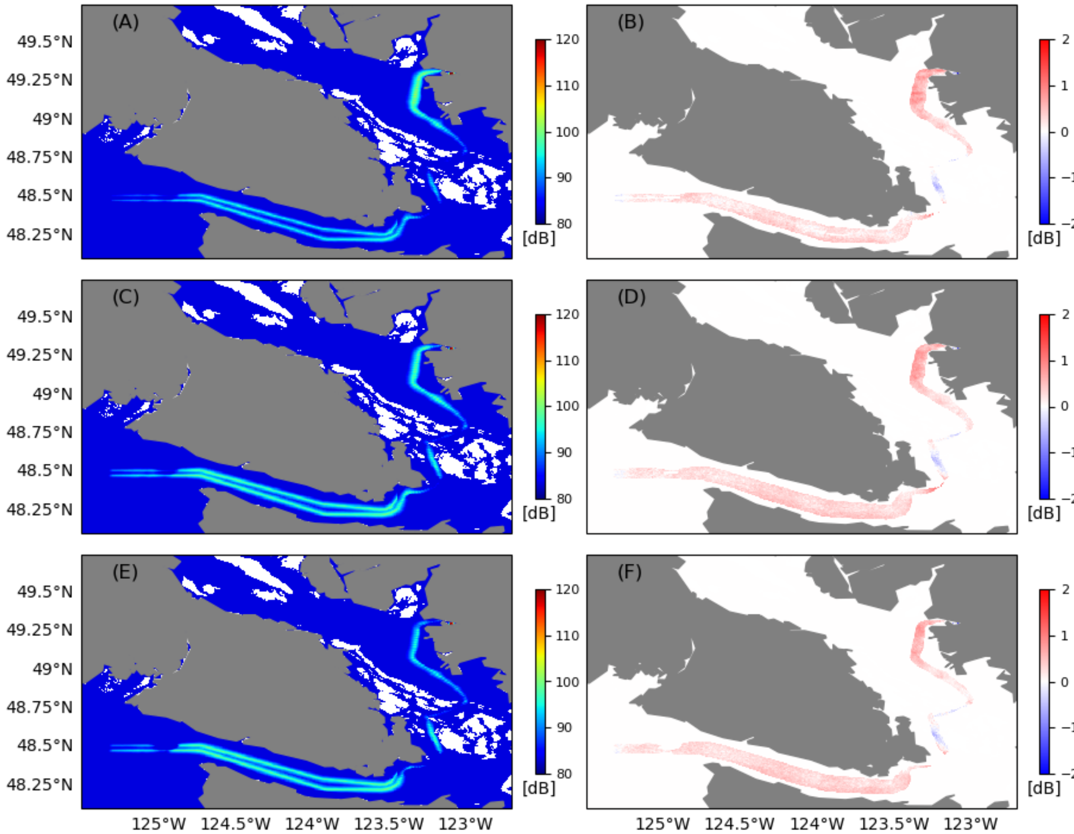

Figure 99: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **85% participation to ECHO speeds in ECHO zones**, and RIGHT: shown relative to RL from a scenario of **85% participation to ECHO speeds throughout the Salish Sea** in SRKW **echolocation range (15-100 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) are where noise reductions for 85% participation in an ECHO slowdown throughout the Salish Sea exceed those of 85% participation in an ECHO slowdown in ECHO zones, and blue indicates greater sound levels.

Full area slowdown, comparing ECHO slowdown speeds with all vessels slowed to 10 knots

The influence of slowdown speed was considered by comparing the results of the scenario where all vessels were slowed to ECHO speeds (100% participation) to that where they were slowed to 10 knots throughout their transit of the Salish Sea. The biggest RL change was seen in the Strait of Georgia; this likely resulted from slowing of ferries to 10 knots, whereas ferry speed remained unchanged in the scenario of ECHO-inspired measures when ECHO speeds were applied to the full study area (Figures 100-102). Background sound levels (L_5) showed reductions in the Strait of Georgia, which contrasted to the greater sound levels on Swiftsure Bank, through Juan de Fuca Strait and Haro Strait, where sound levels were most elevated for the 10 knot scenario compared to vessels traveling at ECHO speeds. Sound reductions were apparent for the 10 knot scenario in the western and eastern extent at Juan de Fuca at L_{25} levels. Median sound levels were elevated in the 10 knot slowdown scenario compared to the ECHO speed scenario through parts of Swiftsure Bank, Haro Strait and Boundary Pass. This shows that the additional reduction in speed increases the congregational effect of vessels in these areas. These areas of elevated sound levels persisted when considering sound levels in higher percentiles (e.g., L_{75}, L_{95}, L_{eq})

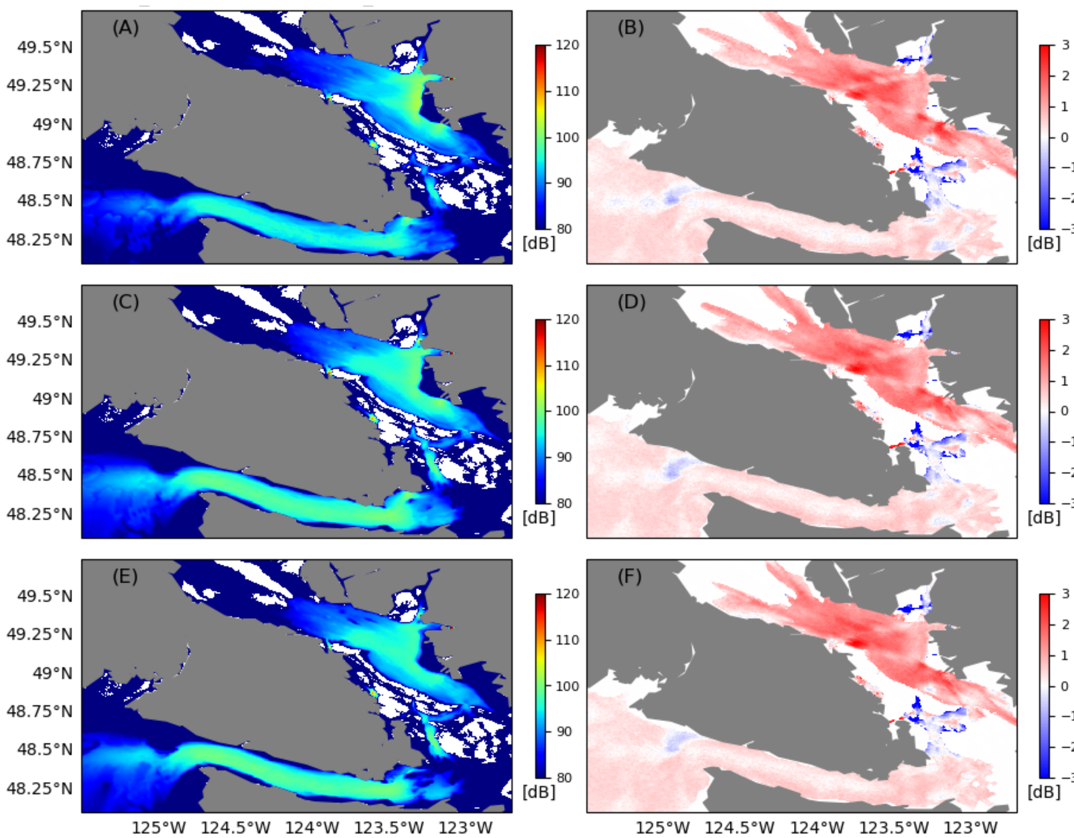

Figure 100: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **100% participation to 10 knots throughout the Salish Sea**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** at **125 Hz** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) indicate greater vessel noise for the full slowdown at 10 knots compared to ECHO speeds and are where noise reductions for the 10 knot slowdown exceeds that of ECHO speeds, and blue indicates greater sound levels for the 10 knot scenario.

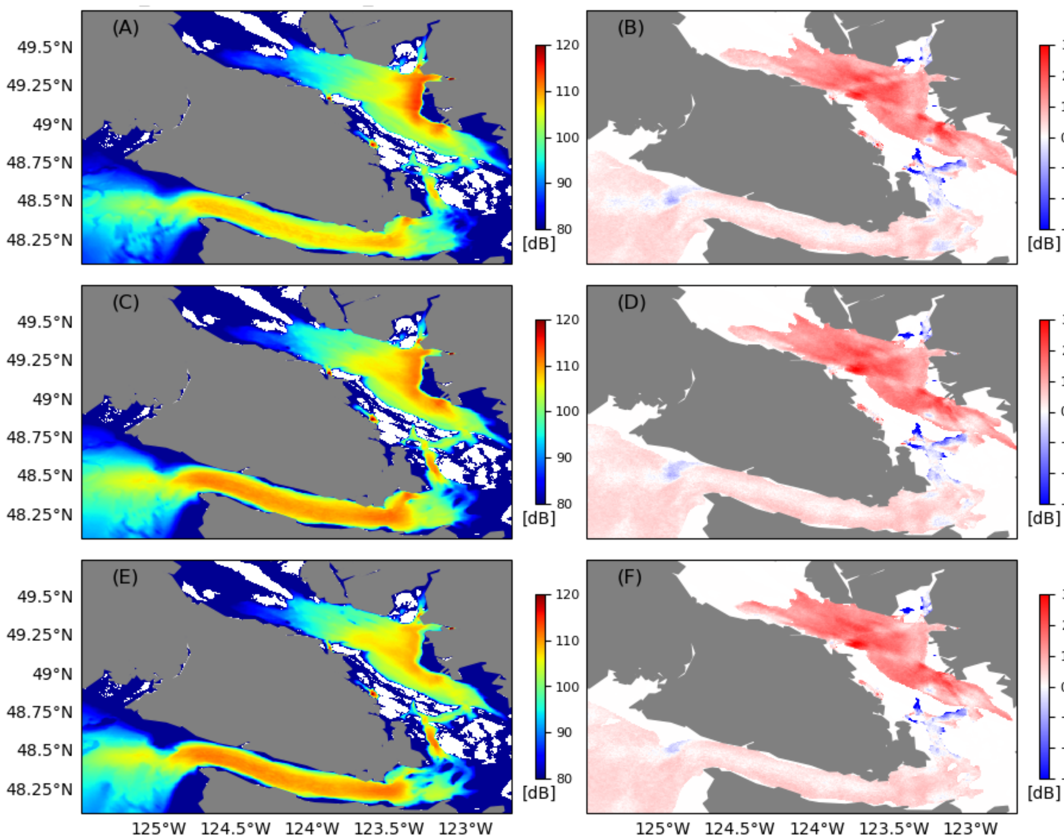

Figure 101: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **100% participation to 10 knots throughout the Salish Sea**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** in the SRKW **communication range (500 Hz to 15 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) indicate greater vessel noise for the full slowdown at 10 knots compared to ECHO speeds and are where noise reductions for the 10 knot slowdown exceeds that of ECHO speeds, and blue indicates greater sound levels for the 10 knot scenario.

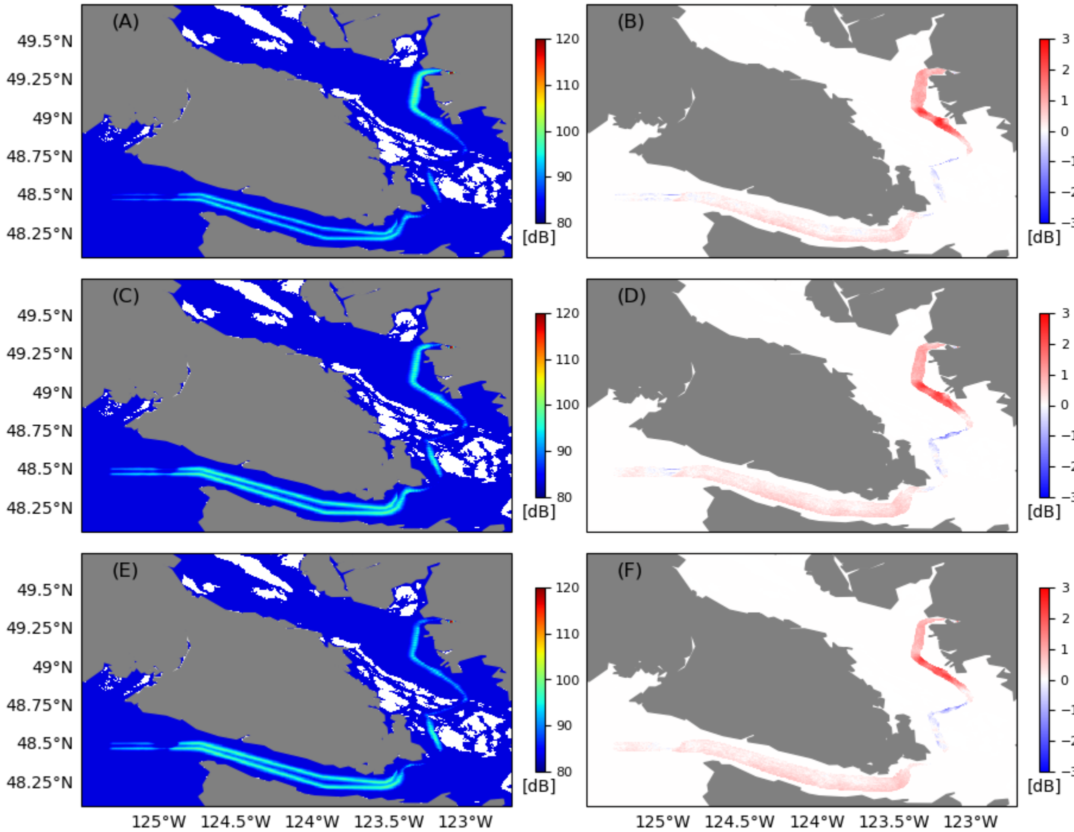

Figure 102: LEFT: Modelled **median** received sound levels (RL, in decibels (dB)) from a scenario of **100% participation to 10 knots throughout the Salish Sea**, and RIGHT: shown relative to RL from a scenario of **100% participation to ECHO speeds throughout the Salish Sea** in the SRKW **echolocation range (15-100 kHz)** at (A,B) 7.5 m, (C,D) 50 m and (E,F) 100 m depths. Positive values (shown in red) indicate greater vessel noise for the full slowdown at 10 knots compared to ECHO speeds and are where noise reductions for the 10 knot slowdown exceeds that of ECHO speeds, and blue indicates greater sound levels for the 10 knot scenario.

6. DISCUSSION AND CONCLUSIONS

The modelled scenarios showed that, particularly when considering median values, or lower percentiles, over a six month period as a comparison metric, the measures currently in place would not fully mitigate the predicted noise additions from TMX-related vessel (tanker and tug) traffic anticipated to increase seven-fold as TMX becomes fully operational. However, the evaluation of efficacy of measures was found to be highly dependent on the metric and frequency range used. For example, the modeling and analysis presented in this report suggest that using the arithmetic mean (L_{eq}) will yield different results when comparing vessel noise scenarios.

In all cases the lower frequencies, captured through the use of 125 Hz to represent commercial vessel traffic, and the SRKW communication range showed soundscape changes over a larger spatial extent than the SRKW echolocation frequency range representing high frequency noise. In the lower percentiles and also often in the median RL, vessel slowdowns were found to increase sound levels in some areas, in particular subregions capturing changes in Haro Strait and Boundary Pass. However, in the higher percentiles such as the 95th, and arithmetic mean values, RL were found to be reduced as a result of the loudest vessels becoming less noisy as their noise emissions declined as their transit speed reduced. Since no vessels were removed in this study, all vessels continue to contribute to the overall sound field, however, under various slowdown scenarios, the fastest and noisiest vessels contributed with lower source levels, but over longer time periods.

Scenarios involving varying levels of vessel participation in requests to slow down in certain areas were examined, revealing minimal differences across the scenarios of 100% (ideal) and 85% (realistic) vessel participation rates.

Slowing vessels throughout their full transit in the Salish Sea was found to reduce noise levels in areas where measures are not currently in place. This resulted in the largest overall decrease of vessel noise in this study, with greater reductions in vessel speed (10 knots in this study, compared to 11 or 14.5 knots) leading to greater reductions in noise emissions generally. While a slowdown of all vessels, including ferries, to 10 knots may be less feasible in its application, the scenario was included here to explore the extent of potential benefits that might be achieved in mitigating acoustic disturbance to SRKW in the Salish Sea through the use of other possible slowdown measures.

Although rerouting vessels can reduce the received levels in areas vessels are excluded from, the subregion definitions used here were too broad to show any potential benefit of a lateral displacement measure in a section of Juan de Fuca Strait. This included the subregions defined using data on SRKW presence and foraging behaviour, which were more spatially limited and distinct that the acoustically-derived subregions. The metrics used in this study showed no change from tugs taking a more southernly route through Juan de Fuca Strait.

The additions to the soundscape of TMX-related tankers and tugs were evident in all subregions compared to baseline conditions. The model results show where vessel noise emissions would be the greatest, highlighting regions in Juan de Fuca Strait, Haro Strait and Boundary Pass. These areas host SRKW foraging locations.

Comparing the scenario results of management actions to the baseline+TMX scenario showed where additional measures would be needed to fully mitigate the additional noise from TMX - related vessels. Comparison to the 2015 baseline scenario showed where measures might result in returning the soundscape to this pre-project levels. The results from the full area slowdowns suggest that for some regions, particularly in the higher frequencies and at depth, this may be possible when considering median or higher percentile sound levels. However, this result was not consistently observed.

Even for the measures that elicit the greatest change in vessel transits, slowing all vessels to 10 knots, consistent mitigation of TMX-related vessel noise for all depths and subregions was only seen when assessing impacts using the arithmetic mean (L_{eq}). The increases seen in sound levels in certain regions as a result of the slowdowns, especially in subregions that captured changes in Haro Strait and Boundary Pass, suggests that the topographical setting, current vessel transit load and the baseline ambient noise levels resulting from this, may need to be considered when implementing measures and evaluating their efficacy.

Evaluating changes using several metrics showed the effects of making changes to the soundscape. Slowing down the fastest and noisiest vessels, and therefore removing the loudest sound sources, will reduce the higher RL percentiles, but may increase one or more of the lower end percentiles. This suggests the metric used may be dependent on the desired outcome and the amount of data and certainty in it when it is used to characterize subregions, species presence, habitat use and area importance.

7. REFERENCES

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8. APPENDIX

Table 1: Voluntary measures enacted by ECHO in the Salish Sea aiming to reduce SRKW acoustic disturbance 2017-2023. Measures are listed by year and type. Participation rates and the resulting changes in sound levels reported by ECHO and/or DFO Science are given.

Year	Measure	Trial length (days)	Area covered	Participation rate	Ambient noise change	Killer whale presence
2017	**Slowdown**, Haro Strait (all vessels <11 kts) **Lateral displacement**	Aug 7-Oct 6 (61)	16.6 nm All vessels	61% (577/951 transits)	-1.1 dB at Lime Kiln, mostly in the low frequencies	SRKW observed on 9 days
2018	**Slowdown** (12.5 knots for bulkers, tankers, ferries and government vessels; 15 knots for vehicle carriers, cruise and container vessels)	Jul 12-Oct 31 (111)	16.6 nm	87 % reported participation (1467/1678 transits); 77% of vessels within a knot of requested speed	Slow-down: At Jordan River; 1.5 dB Lime Kiln	SRKW observed on 48 days
	Lateral displacement: Deep-sea vessels in outbound and tugs in inbound move southward	Aug 20-Oct 31 (72)	34 nm	57% of Deep-seas and 80% (76/122 transits) of tugs spent more the half of transit time in trial zone.	Deep-seas < -1.0 dB; tugs -4.3-5.8 dB in Juan de Fuca	SRKW observed on 11 days
2019	**Slowdown** (11.5 knots for bulkers, tankers, ferries and government vessels; 14.5 knots for vehicle carriers, cruise and container vessels)	Jul 5-Oct 15 (103)	29.6 nm	82% (1279/1551 transits); 67% within a knot of requested speed		SRKW sighted on 24 days
	Lateral displacement: Tugs and barge transit shifted southward	Jun 17-Oct 31 (125)	28 nm	76% of Tugs spent more the half of transit time in trial zone. Average move of 0.9 nm (93/122 transits)	Jordan River: median broadband: -3.6 dB ~7 dB in broadband ambient noise; 11.5 dB in higher frequencies per tug transit	
	Interim sanctuary zones: Vessel exclusion from areas of Swiftsure Bank,	Jun 1-Oct 31 (153)		Low compliance	Low compliance	

	Swanson Channel, East Point					
2020	**Slowdown**: 11.5 knots for bulkers, tankers, ferries and government vessels; 14.5 knots for vehicle carriers, cruise and container vessels for Haro Strait-Boundary Pass and Swiftsure Bank	Haro-Strait, Boundary Pass: Jul 1-Oct 31 (123)	Haro-Strait, Boundary Pass: 29.6 nm	Haro-Strait, Boundary Pass: 91% (1803/1980 transits); 68% within a knot of the requested speed	Haro-Strait, Boundary Pass: Haro Strait, Median change in 10-100000 Hz: -1.6 dB; 500-15000 Hz: 0.2 dB; 15-100 kHz: 1.3 dB Boundary Pass Median change in 10-100000 Hz: -2.3 dB; 500-15000 Hz: 0.8 dB; 15-100 kHz: 0.7 dB	
		Swiftsure Bank: Aug 1-Oct 31 (93)	Swiftsure Bank: 17-20 nm	Swiftsure Bank 82% (861/1044 transits)	Swiftsure Bank Median change in 10-100000 Hz: -2.0 dB; 500-15000 Hz: -2.0 dB; 15-100 kHz: -4.3 dB	
	Lateral displacement: Tugs and barge transit shifted southward	Jun 1-Oct 31 (153)	28 nm	82%. (138/168 transits)	Median change in 10-100000 Hz: -1.4 dB; 500-15000 Hz: -1.9 dB; 15-100 kHz: -3.3 dB per transit	
	Interim sanctuary zones: Vessel exclusion from areas of Swiftsure Bank and Swanson Channel, East Point	Jun 1-Oct 31 (153)		Low compliance	Swiftsure Bank: 1.8 dB; Saturna Island: 2.2 dB, Swanson Channel: -1.0 dB	
2021	**Slowdown:** 11 knots for bulkers, tankers, ferries and government vessels; 14.5 knots for vehicle carriers, cruise and container vessels **Swiftsure Bank outbound transits only**	Haro-Strait, Boundary Pass: Jul 1-Nov 30 (153)	Haro-Strait, Boundary Pass: 29.6 nm	Haro-Strait, Boundary Pass: 90% (2074/2295 transits)	Haro-Strait, Boundary Pass: Haro Strait, Median change in 10-100000 Hz: 1.1 dB; 500-15000 Hz: -0.8 dB; 15-100 kHz: 0.5 dB Boundary Pass Median change in 10-100000 Hz: 2.8 dB; 500-	

					15000 Hz: -1.3 dB; 15-100 kHz: 0.7 dB ECHO reported: >3 dB, 50% reduction	
		Swiftsure Bank: Jul 1-Oct 31 (183)	Swiftsure Bank 17-20 nm	Swiftsure Bank ECHO reported 81% (total 1624/2010 transits) Measured: 75%	Swiftsure Bank Median change in 10-100000 Hz: 7.3 dB; 500-15000 Hz: -0.8 dB; 15-100 kHz: 0.6 dB	
	Lateral displacement: Tugs and barge transit shifted southward	Jun 1 – Oct 31 (153)	28 nm	88% (138/168 transits)	Measured per tug, with 2 focal vessels. Up to 10-20 dB reduction dependent on vessel, frequency, and displacement	
	Interim sanctuary zones: Vessel exclusion from areas of Swiftsure Bank and Swanson Channel	Jun 1 – Oct 31 (153)		Low compliance	Saturna Island: 3.6 dB, Swanson Channel: 1.2 dB	
2022	**Slowdown:** 11 knots for bulkers, tankers, ferries and government vessels; 14.5 knots for vehicle carriers, cruise and container vessels	Haro-Strait, Boundary Pass: Jun 1-Oct 31 (153)	Haro-Strait, Boundary Pass: 29.6 nm	Haro-Strait, Boundary Pass: 93% (2262/2098 transits)	ECHO reported 2.7-2.8 dB reduction, 47% decrease	
	Out- and inbound transits	Swiftsure Bank: Jun 1-Oct 31 (153)	Swiftsure Bank 17-20 nm	Swiftsure Bank 81% (total 1973 transits)	ECHO reported: 2.2 dB in inbound, 3.1 dB in outbound, 40-50% reduction	
	Lateral displacement: Tugs and barge transit shifted southward	Jun 1- Oct 31 (153)	28 nm	88%. (100/103 transits) Slowdown + displacement: 86% (5700 vessels)	ECHO reported: 4-7 dB reduction per vessel transit, 60-80% decrease	
	Interim sanctuary zones: Vessel exclusion from areas of Swiftsure Bank and	June 1-Nov 30 (183)				

	Swanson Channel, East Point					
2023	**Slowdown**: 11 knots for bulkers, tankers, ferries and government vessels; 14.5 knots for vehicle carriers, cruise and container vessels **Lateral displacement:** Tugs and barge transit shifted southward **Interim sanctuary zones:** Vessel exclusion from areas of Swiftsure Bank and Swanson Channel **Seasonal speed restriction zones** Swiftsure Bank	Haro-Strait, Boundary Pass: Jun 1- Nov 30 (183) Swiftsure Bank: 153 Jun 1 – Oct 31 (153) Jun 1- Nov 30 183 Jun 1-Nov 30 (183)	Haro-Strait, Boundary Pass: 29.6 nm Swiftsure Bank 17-20 nm 28 nm	Haro-Strait, Boundary Pass: 87% (2442/2800 transits) Swiftsure Bank 86% (3636/4214) 95% (101/106 transits) Slowdown + lateral displacement: 87%, 6100 vessels	Haro-Strait, Boundary Pass: ECHO reports a 3 dB reduction, 50% decrease ECHO reported 4-7 dB reduction per tug transit (60-80% reduction) Overall ~30% reduction in vessel strike risk	SRKW sighted/ Acoustically detected on 36 days