Transport Canada Transports Canada

HORIZONTAL IMPLEMENTATION REVIEW OF THE WORLD CLASS PREVENTION, PREPAREDNESS AND RESPONSE FOR OIL SPILLS FROM SHIPS INITIATIVE

EVALUATION AND ADVISORY SERVICES
TRANSPORT CANADA

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ABBREVIATIONS AND ACRONYMS

ADM	Associate Deputy Minister
AIS	Automatic Identification System
AMOP	Arctic and Marine Oil Spill Program
ARP	Area Response Planning
ARPI	Area Response Planning Pilot Initiative
B.C.	British Columbia
CCG	Canadian Coast Guard
CEPA	Canadian Environmental Protection Act
CESD	Commissioner on the Environment and Sustainable Development
CHS	Canadian Hydrographic Service
CODAR	Coastal Ocean Dynamics Applications Radar
COOGER	Centre for Offshore Oil, Gas and Energy Research
COSMoS	Canadian Oil Spill Modelling System
CPFP	Community Participation Funding Program
CSA	Canada Shipping Act
DFO	Department of Fisheries and Oceans
DG	Director General
DM	Deputy Minister
EBSA	Ecologically & Biologically Significant Area
ECCC	Environment and Climate Change Canada
EEMAP	Environmental Emergencies Mapping System
FTE	Full-Time Equivalent
FY	Fiscal Year
GIS	Geographic Information System
GPS	Global Positioning System
HPC	High Performance Computer
HR	Human Resource
ICS	Incident Command System
IM	Information Management
IMO	International Maritime Organization
IMPC	Interdepartmental Marine Pollution Committee
ISTOP	Integrated Satellite Tracking of Pollution
IT	Information Technology
LNG	Liquefied Natural Gas
MPMO	Major Projects Management Office
MSS	Marine Safety and Security
MSSE	Marine Safety and Security Executive
NASP	National Aerial Surveillance Program
NEB	National Energy Board
NOAA	National Oceanic and Atmospheric Administration
NRCan	Natural Resources Canada
OHF	Oil Handling Facility
ONC	Ocean Networks Canada
OPI	Office of Primary Interest

OPP	Oceans Protection Plan
OSRS	Oil Spill Response Science Program
P.E.I	Prince Edward Island
PAA	Program Alignment Architecture
PM	Performance Measurement
PPCP	Public, Private and Community Partnerships
R&D	Research & Development
RAC	Regional Advisory Council
RMS	Response Management System
RO	Response Organization
RPP	Report on Plans and Priorities
SITCEN	Situation Centre
SO	Strategic Outcome
SOPF	Ship-Source Oil Pollution Fund
TC	Transport Canada
TCC	Transport Canada Centre
TERMPOL	Technical Review Process of Marine Terminal Systems and Transshipment Sites
TI	Technical Inspection
TOR	Terms of Reference
U.S.	United States
USCG	United States Coast Guard
WaMoS	Wave and Current Monitoring System
WCTSS	World Class Tanker Safety System

EXECUTIVE SUMMARY

INTRODUCTION

This report presents the findings and the recommendations of the Horizontal Implementation Review of the World Class Tanker Safety System (WCTSS) Initiative.

About the Review

The Review was a requirement of the Treasury Board. It was conducted between the fall of 2015 and the summer of 2016 by Transport Canada's (TC's) Evaluation and Advisory Services, in cooperation with the three partner departments involved in the WCTSS Initiative: Department of Fisheries and Oceans (DFO), Environment and Climate Change Canada (ECCC) and Natural Resources Canada (NRCan).

The Review covers Phases 1A, 1B and 2 of the WCTSS Initiative and focuses on whether the 32 initiatives that compose it have been implemented as planned. It covers the first three fiscal years of the Initiative (2013-14, 2014-15 and 2015-16), but new information was accepted up to and including the time of report writing (November, 2016). As per the Treasury Board requirements, the Review also addresses readiness for the 2018-19 evaluation, such as the availability of performance data; governance; relevance; and to the extent possible, other issues outlined in the 2009 Policy on Evaluation.

About the WCTSS Initiative

The overall objective of the Initiative is to strengthen Canada's regime for ship-source oil spill prevention; preparedness and response; and liability and compensation, the three pillars of the regime. The goal is to bring it to the level of a world class regime capable of minimizing the impact that the marine transportation of oil could have on the environment in the event of a ship-source oil spill.

The Initiative does the following: 1) reviews of the state of the three pillars of the regime; 2) enhancements to the appropriate legislative and regulatory frameworks; 3) scientific research and analysis to inform decision-making; 4) strategic investments in navigational infrastructure and information, supported by scientific research and reviews; 5) enhanced oversight, where appropriate; 6) enhanced planning and institutional response for ship-source oil spills; and 7) enhanced community/stakeholder engagement.

Between FY 2013-14 and FY 2014-15, {ATIP REMOVED} in new funds was allotted to the Initiative (Phases 1A, 1B and 2), along with {ATIP REMOVED} in existing funding and {ATIP REMOVED} in ongoing funding. Of the new funding, {ATIP REMOVED} went to TC, {ATIP REMOVED} to DFO, {ATIP REMOVED} to ECCC and {ATIP REMOVED} to NRCan.

FINDINGS

Relevance

Evaluators found there to be a continued need for WCTSS or WCTSS-like initiatives in order to enable natural resource development and export expansion through marine transportation in a manner that minimizes possible impacts on the environment and marine safety, and secures the confidence of Canadians.

Also, the WCTSS initiatives are aligned with the roles and responsibilities of the federal government and are within the legislative authorities and mandates of the four departments involved. They are also aligned with federal government and departmental priorities, as well as departmental strategic outcomes.

Status of Implementation

Evaluators found that a number of initiatives were not carried out as planned. Of the 32 initiatives, eight have been completed (seven of which are reviews), six are on track, seven are experiencing some delays, ten have been delayed past their original end date, and one was cancelled.

Most of the delays were due to factors which could not have been mitigated. For many of the initiatives that were delayed, the lateness of completion had no consequences, in part because there was a completion strategy in place and funding arrangements had been made. This was especially the case for science initiatives.

Evaluators ranked the delayed initiatives and those experiencing delays according to a number of risk factors to get a clearer picture of which, if any, of the delayed initiatives were a concern (see Annex C). When risk factors were taken into consideration, the number of initiatives which remained a concern was seven. Two were rated as carrying some potential risk and requiring close monitoring, and five were rated as carrying identifiable risks and requiring action if they are to be completed. Evaluators note that the Government of Canada's Oceans Protection Plan (OPP) helped reduce these numbers (e.g. initiatives requiring re-authorization by the Government of Canada) and could still reduce the numbers further.

Resource Utilization

Overall resource utilization of new funds spent across the three fiscal years was close to 76%, but it varied considerably by department and generally increased across fiscal years. The percentages by department are as follows: 95.4% for NRCan, followed by 85.8% for TC, 69.2% for DFO, and 62.4% for ECCC.

Evaluators found plenty of evidence of resources being properly managed through re-profiling and cash management and very little evidence of funds being lapsed. Reasons for variances also varied by department, but were usually related to delays in receiving funds, delays in project schedules or delays in administrative processes such as procurement, contracting and staffing.

Governance

The interdepartmental governance structure, which was put in place to oversee the implementation of the WCTSS Initiative, appears to have provided sound oversight. However, the interdepartmental dashboard that was used to monitor implementation could be improved.

Readiness for the Evaluation in 2018-19

The performance information needed to support an evaluation of the WCTSS in 2018-19 appears to be available, although the strategy calls for TC's evaluation unit to collect a great deal of the data through various lines of inquiry at the time of the evaluation. Also, the Review has served to improve the Initiative's performance measurement strategy.

Outputs/Achievements

Given the fact that very few initiatives had been completed at the time of the Review, the evaluators were unable to examine the extent to which the initiatives and their outputs have contributed to immediate outcomes, which was anticipated at the start of the Review.

Nevertheless, evaluators can state that all of the completed reviews were used for their intended purposes and that a great number of expected outputs and deliverables have been produced, especially for advice and scientific information, both of which serve as foundations for other initiatives or components.

Due to delays in a number of initiatives, many outputs and deliverables are yet to come, especially in the areas of legislation/regulations and oversight.

CONCLUSIONS

The WCTSS Initiative was found to be relevant in all respects. With respect to implementation, the WCTSS Initiative is progressing towards achieving its objectives. Of the 32 initiatives that were implemented under Phases 1A, 1B and 2, seven were identified as carrying a potential or an identifiable risk and would require closer monitoring and/or action if they are to be completed (see Annex C for further details).

Structures were put in place to govern the implementation of the Initiative and an interdepartmental dashboard monitored the progress of the initiatives on a monthly basis. Performance data is available for the 2018-19 evaluation. However, the interdepartmental dashboard being used to monitor the progress of implementation could be improved.

RECOMMENDATIONS

The evaluation made the following recommendation, addressed to TC.

Recommendation: When developing a tracking scheme to monitor the implementation of Oceans Protection Plan initiatives, it is recommended that TC:

1. ensure that it is able to track the WCTSS initiatives distinctly within that scheme; and
2. apply lessons learned from monitoring WCTSS implementation. Specifically, it is recommended that TC track and request from the partner departments the following information:
    - a list of all expected and completed milestones and timelines by fiscal year for each initiative based on what is described in foundational documents and performance measurement strategies; and
    - interdepartmental expenditure information, specifically, the total dollars allocated and the percentage of dollars spent by fiscal year for each initiative.

INTRODUCTION

Evaluation and Advisory Services (EAS) of Transport Canada (TC) led a horizontal implementation review of the World Class Prevention, Preparedness and Response for Oil Spills from Ships Initiative, hereafter referred to as the Review and the World Class Tanker Safety System Initiative (WCTSS), respectively. Three partner departments participated in the Review: Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), including the Canadian Coast Guard (CCG), and Natural Resources Canada (NRCan). The Review was a requirement set out in foundational documents, and it was conducted between the fall of 2015 and the fall of 2016. A summative evaluation is to be conducted in 2018-19.

ABOUT THE WCTSS INITIATIVE

In Budget 2012, as part of the government's plan for Responsible Resource Development, the Government of Canada announced funding over a two year period for a number of measures to strengthen Canada's regime for ship-source oil spill prevention, preparedness and response. In March 2013, the Government of Canada announced in Vancouver the first set of measures being taken towards the development of a World Class Tanker Safety System. There have been additional announcements since then. In Budget 2015, funding for five years and additional measures were announced to enhance the safety of marine transportation in the Arctic and further strengthen environmental protection and marine incident prevention, preparedness and response south of the 60th parallel.

OBJECTIVES

The overall objective of the WCTSS initiative is to strengthen Canada's regime for ship-source oil spill prevention; preparedness and response; and liability and compensation, the three pillars of the regime. The goal is to bring it to the level of a world class regime capable of minimizing the impact that the increased marine transportation of oil could have on the environment in the event of a ship-source oil spill.

To achieve this, the WCTSS initiative assesses the current state of the three pillars of the ship-source oil spill regime: 1) prevention, 2) preparedness and response, and 3) liability and compensation. The Initiative then makes enhancements to the regime's legislative and regulatory frameworks and oversight, as required; the institutional response and planning for ship-source oil spills; and community engagement. It also makes strategic investments in navigation services and products to support the safe navigation of projected vessel traffic, and advances scientific research and analysis to inform response decision-making.

PROGRAM PROFILE

The WCTSS Initiative consists of a collection of 32 initiatives. It has been developed and implemented in phases. Phase 1 A of the Initiative, for the most part, covers the 2013-14 to 2016-17 time period (see initiatives shaded in grey in Table 1). Phase 1B initiatives extend from 2013-14 to as far as 2017-2018, in some cases (see initiatives shaded in blue in Table 1). Phase 2 initiatives extend from 2014-15 to as far as 2018-19, in some cases (see initiatives shaded in green in Table 1).

The total cost of the WCTSS Initiative is {ATIP REMOVED} in new or existing funds {ATIP REMOVED} in existing funds[1]), along with {ATIP REMOVED} in ongoing funding. Breaking the new funding down by department, the numbers are {ATIP REMOVED} for TC {ATIP REMOVED}, {ATIP REMOVED} for DFO {ATIP REMOVED}, {ATIP REMOVED} for ECCC {ATIP REMOVED}, and {ATIP REMOVED} for NRCan {ATIP REMOVED}.

Table 1: New, Existing and Ongoing Funds Allotted for the World Class Tanker Safety System Initiative

Initiative	Fiscal Years	Total New Funds	Existing	Ongoing
	{ATIP REMOVED}			
New/Modified Aids to Navigation to Service the Kitimat Area (DFO-CCG)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Hydrographic/Navigational Products for Kitimat (DFO-CHS)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Tanker Screening Guidelines (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Transport Canada Centre in Kitimat (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Amendment to the *Canada Shipping Act*, *2001* and Modernization of the Environmental Response Program (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Team of International Experts on Tanker Safety (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Panel Review of Canada's Oil Spill Preparedness and Response Regime (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Scientific Research and Activities (ECCC, DFO)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Integrated Satellite Tracking of Pollution - Satellite Based Monitoring (ECCC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Increased Tanker Inspections (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Options for a Modern Charted Navigation System (CCG-CHS of DFO)	{ATIP	{ATIP	{ATIP	{ATIP

[1] Note that the amount for existing funds is an underestimate because for a number of initiatives, the amount of existing funds being used was not specified in foundational documents.

Initiative	Fiscal Years	Total New Funds	Existing	Ongoing
	{ATIP REMOVED}			
	REMOVED}	REMOVED}	REMOVED}	REMOVED}
Geoscience Studies for Marine Safety in the BC North Coast (NRCan)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Review of Navigational Plans for High Risk Waters – TERMPOL (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Review of Compulsory Pilotage and Tug Escorts (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Appropriate Governance for Ports (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Systematic Surveillance and Monitoring of Ships – NASP (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Laying the Groundwork for the Arctic (TC, CCG)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Public, Private and Community Partnerships (CCG, TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Incident Command System (CCG)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Incident Command Support (ECCC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Review of Spill Treating Agents and Countermeasures (ECCC, DFO, TC and NRCan)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Science and Technology for Clean-up (DFO, ECCC and NRCan)*	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Review of Liability and Compensation Regime (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}

Initiative	Fiscal Years	Total New Funds	Existing	Ongoing
	{ATIP REMOVED}			
Ocean Networks Canada Smart Oceans Contribution Program (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Area Response Planning Pilot Project (TC, CCG, DFO and ECCC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Community Participation Funding Program (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Alternative Response Measures – legislative amendments (TC and ECCC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Operational Science for Marine Oil Spill Response (ECCC and NRCan)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Contribution to Clear Seas Centre for Responsible Marine Shipping (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Enhancements to Ship-Source Oil Pollution Fund (TC)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Options for Long-Term Governance and Funding of WCTSS (TC and CCG-DFO)	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
Total		{ATIP REMOVED}	{ATIP REMOVED}	{ATIP REMOVED}
* Note that NRCan did not receive funding from the WCTSS Initiative for its project listed under this initiative. It was funded through NRCan's PERD and A-base funding.				

Activities and Expected Outputs

Table 2 presents the activities and expected outputs of the WCTSS Initiative and the specific initiatives that align with each of them. There are 8 main activities and associated expected outputs. Some initiatives have multiple types of outputs, and thus are listed more than once in Table 2.

Table 2: World Class Tanker Safety System Initiatives by Type of Activity and Expected Outputs

Activity	Expected Outputs	Initiative
		Phase of WCTSS: Phase 1A Phase 1B Phase 2
Reviews*	Advice	New/Modified Aids to Navigation to Service the Kitimat Area (DFO-CCG) {Phase 1A}
		Tanker Screening Guidelines (TC) {Phase 1A}
		Team of International Experts on Tanker Safety (TC) {Phase 1A}

Activity	Expected Outputs	Initiative
		Phase of WCTSS: Phase 1A Phase 1B Phase 2
		Panel Review of Canada's Oil Spill Preparedness and Response Regime (TC) {Phase 1A}
		Options for a Modern Charted Navigation System (CCG-CHS of DFO and ECCC) {Phase 1B}
		Review of Navigational Plans for High Risk Waters – TERMPOL (TC) {Phase 1B}
		Review of Compulsory Pilotage and Tug Escorts (TC) {Phase 1B}
		Laying the Groundwork for the Arctic (TC, CCG) {Phase 1B}
		Public, Private and Community Partnerships (CCG, TC) *{Phase 1B}*
		Review of Spill Treating Agents and Countermeasures (ECCC, DFO, TC and NRCan) {Phase 1B}
		Review of Liability and Compensation Regime (TC) {Phase 1B}
		Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC){Phase 2}
		Options for Long-term Governance and Funding of a World Class Tanker Safety System (TC, DFO-CCG) {Phase 2}
Navigational Infrastructure	Navigational Information	New/Modified Aids to Navigation to Service the Kitimat Area (DFO-CCG) {Phase 1A}
		Hydrographic/Navigational Products for Kitimat (DFO) {Phase 1A}
		Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC) {Phase 1B}
		Ocean Networks Canada Smart Oceans Contribution Program (TC) {Phase 1B}
Science	Scientific Information and Advice	Hydrographic/Navigational Products for Kitimat (DFO) {Phase 1A}
		Scientific Research and Activities (ECCC, DFO) {Phase 1A}
		Geoscience Studies for Marine Safety in the B.C. North Coast (NRCan) {Phase 1B}
		Science and Technology for Clean-up (DFO, ECCC and NRCan) {Phase 1B}
		Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC) {Phase 2}
		Ocean Networks Canada Smart Oceans Contribution Program (TC) {Phase 2}
		Area Response Planning Pilot Project (TC, CCG, DFO and ECCC) {Phase 2}
		Alternative Response Measures (TC, CCG and EC) {Phase 2}
		Operational Science for Marine Oil Spill Response (ECCC and NRCan) {Phase 2}
		Contribution to Clear Seas Centre for Responsible Marine Shipping (TC) {Phase 2}
Legislative/Regulatory	Legislation and Regulations	Tanker Screening Guidelines (TC) {Phase 1A}
		Amendments to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program (TC) {Phase 1A}
		Appropriate Governance for Ports (TC){Phase 1B}
		Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC) {Phase 2}
		Alternative Response Measures (TC, CCG and EC) {Phase 2}
		Enhancements to Ship-Source Oil Pollution Fund (TC) {Phase 2}
Oversight/Surveillance	Oversight	Tanker Screening Guidelines (TC) {Phase 1A}
		Transport Canada Centre in Kitimat (TC) {Phase 1A}
		Amendments to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program (TC) {Phase 1B}
		Integrated Satellite Tracking of Pollution - Satellite Based Monitoring (ECCC) {Phase 1B}
		Increased Tanker Inspections (TC) {Phase 1B}
		Appropriate Governance for Ports (TC) {Phase 1B}
		Systematic Surveillance and Monitoring of Ships – National Aerial Surveillance Program (TC) {Phase 1B}
		Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC) {Phase 2}

Activity	Expected Outputs	Initiative
		Phase of WCTSS: Phase 1A Phase 1B Phase 2
Response System/Support/Planning	Coordinated Incident Response	Incident Command System (CCG) {Phase 1B}
		Incident Command Support (ECCC) {Phase 1B}
		Area Response Planning Pilot Project (TC, CCG, DFO and ECCC)
Community/Stakeholder Awareness	Community/Stakeholder Engagement	Panel Review of Canada's Marine Oil Spill Preparedness and Response Regime (TC) {Phase 1A}
		Appropriate Governance for Ports (TC) {Phase 1B}
		Public, Private and Community Partnerships (CCG, TC) {Phase 1B}
		Area Response Planning Pilot Project (TC, CCG, DFO and ECCC) {Phase 2}
		Community Participation Funding Program (TC) {Phase 2}
		Ocean Networks Canada Smart Oceans Contribution Program (TC) {Phase 2}
		Contribution to Clear Seas Centre for Responsible Marine Shipping (TC) {Phase 2}
Liability and Compensation	Liability and Compensation Regime	Enhancements to Ship-Source Oil Pollution Fund (TC) {Phase 2}
* Initiatives under "Review" that are italicized are purely reviews while the non-italicized ones contain additional activities and outputs.		

Reviews – Advice

Under the activity of reviews, there are seven initiatives which are purely reviews (they are the italicized ones in Table 2), undertaken to provide advice, and six which have a significant review component, but involve additional activities (and contribute to other expected outputs). For example, the Panel Review of Canada's Oil Spill Preparedness and Response Regime also involved two risk analyses while the New/Modified Aids to Navigation to Service the Kitimat Area involved the installation of aids to navigation as well as the review to inform those installations.

Navigational Infrastructure – Navigational Information

There are four navigational infrastructure-related initiatives that will contribute to improving available navigational information: 1) New/Modified Aids to Navigation to Service the Kitimat Area, 2) Hydrographic/Navigational Products for Kitimat, 3) Modern Navigation System – Phase 1, and 4) Ocean Networks Canada Smart Oceans Contribution Program. The activities carried-out under these initiatives, such as the installation or deployment of tide gauges, current meters and satellites to collect data on ocean currents and the physical state of the marine environment produce navigational information (i.e. navigation charts, sailing directions, tides and currents tables, etc.) used by mariners for safe navigation.

Science – Scientific Information and Advice

There are five purely science-based initiatives (amounting to an investment of {ATIP REMOVED} in new funding), one initiative that is primarily science-based, two which have a large science component, and two which are science-related.

The five purely science-based initiatives are as follows: 1) Geoscience Studies for Marine Safety in the B.C. North Coast, 2) Scientific Research and Activities, 3) Science and Technology for Clean-up, 4) Operational Science for Marine Oil Spill Response and 5) Hydrographic/Navigational Products for Kitimat. This science is being used to produce scientific information that will inform decision making in

the area of response or preparedness for oil spills from ships, among other things. For example, these initiatives will identify regional geo-hazards and their resultant environmental impacts; identify marine habitats and environmental sensitivities and priorities along Canadian shores and waters; model how various oil products may behave in the marine environment and under a variety of circumstances to inform clean-up decisions; test and/or develop standard methods for evaluating spill-treating agents for cleaning-up oil spills; and conduct hydrological surveys of marine environments to produce scientific information needed to build navigational infrastructure.

The Ocean Networks Canada Smart Oceans Contribution Program supports the testing of new radar-based systems that can detect oil spills up to 4 kilometers away; the development of tools that will help response organizations/governmental organizations know where potential oil spills will spread and move using advanced computer models; and the development of baseline information about the marine environment in B.C.'s lower mainland that could be used in the event of an oil spill to assess impacts on the marine environment. The initiative will also contribute to the development of tools that can provide valuable mariner information on tsunamis, storm surges and sea-state, in which case, it will contribute to navigational information.[2]

The two initiatives which have a large science component are the Area Response Planning Pilot initiative and the Modern Navigation System – Phase 1 initiative. The science in the former initiative is being used to increase the scientific knowledge of the four local area response environments in order to identify sensitivities and potential consequences of an oil spill; and to increase scientific knowledge of spilled substances and countermeasures to inform a response in those areas.

The science in the latter initiative is being used to support the development of modern navigational infrastructure and navigation information, in some cases, in real time. In fact, it is actually a suite of fourteen initiatives that will move Canada towards an information/technology-based system. This includes an e-Navigation information hub, e-Navigation capabilities for the CCG, enhanced weather monitoring through the deployment of smart environmental buoys, upgrades to hydrographic data to modern/international standards, enhanced Electronic Navigational Chart coverage, up-to-date information on restrictions to safe navigation, and reviews to prepare for the transition to dynamic hydrographic products and services and implement a resilient position and timing solution for Canada.

As for the two science-related initiatives, scientific information and advice was used to inform the Alternative Response Measures initiative and the Contribution to Clear Seas Centre for Responsible Marine Shipping initiative was designed to promote science and best practices in marine transportation.

Legislative/Regulatory – Legislation and Regulations

There are six initiatives that involve amendments to legislation and/or regulations**,** four of which are designed to improve oversight:

- Tanker Screening Guidelines and Increased/Mandatory Inspections (improved oversight)

[2] Evaluators estimate that the WCTSS Initiative invests {ATIP REMOVED} in new monies for scientific research and related activities, or {ATIP REMOVED} of the total new monies allotted to the WCTSS Initiative (Phase 1A, 1B and 2). Including the Ocean Networks Canada Smart Oceans Contribution Program, the estimate is {ATIP REMOVED} or {ATIP REMOVED}

The original intention of this initiative was to amend the *Canada Shipping Act, 2001* (CSA 2001) to strengthen the inspection of tankers. However, after the completion of a review of the Ship Inspection Reporting Program, TC decided that it would be better to amend the *Vessel Pollution and Dangerous Chemicals Regulations* such that tankers would be required to undergo annual mandatory inspections. This then became part of the Increased Inspections initiative, which was renamed as the Increased/Mandatory Inspections Initiative. One of the objectives of this latter initiative is to improve oversight by increasing the percentage of foreign flagged tankers that are inspected to 100%.

- Amendments to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program (improved oversight)

  TC is to amend the CSA 2001 and then develop the regulatory framework pursuant to it, in order to strengthen the oversight of oil handling facilities in the area of preparedness and emergency response.

- Appropriate Governance for Ports (improved oversight)

  Under this initiative, TC will designate the navigable waters at Kitimat as a public port under the *Canada Marine Act*. This will provide for an enhanced level of marine traffic control procedures and enforcement provisions at the port of Kitimat to ensure the safe and efficient movement of ships in its harbor.

- Modern Navigation System – Phase 1 (improved navigational information and oversight)

  TC will amend the *Navigation Safety Regulations* to extend Automatic Identification System (AIS) carriage requirements to include a larger number of ships. This will improve navigational information (AIS is a requirement for the implementation of e-Navigation) and strengthen traffic management and navigational safety oversight by the CCG. It will also help ships avoid collisions, as information on ships navigating nearby will be displayed directly on navigation screens.

- Alternative Response Measures (improved response)

  Canada has committed to modernize its offshore oil and gas regime by implementing an enhanced regulatory system and strengthening environmental protections. ECCC published Regulations Establishing a List of Spill-treating Agents (*Canada Oil and Gas Operations Act*) in Canada Gazette Part II in 2016. These Regulations support this initiative by establishing a list of spill-treating agents (STAs) acceptable for use in the event of an oil spill from an offshore facility.

- Enhancements to Ship-Source Oil Pollution Fund initiative (improved compensation and liability regime).

  TC will make changes to the *Marine Liability Act* to enhance ship-source oil spill compensation and liability. This will include a modernized levy mechanism and unlimited liability coverage.

Oversight/Surveillance – Oversight

In addition to the oversight-related initiatives discussed under amendments to legislation and/or regulations, there are three other non-legislative/non-regulatory initiatives developed to improve oversight:

- The Transport Canada Centre in Kitimat initiative, to increase oversight capacity (e.g. inspections, enforcement) at Kitimat in advance of projected increases in vessel traffic in Kitimat and the Douglas Channel;
- The Integrated Satellite Tracking of Pollution - Satellite Based Monitoring initiative, to enhance satellite surveillance of Canadian waters for the identification and monitoring of oil spills from ships by moving from an 18-7 program to a 24-7 profile; and
- The Systematic Surveillance and Monitoring of Ships – National Aerial Surveillance Program (NASP) initiative, to increase the number of NASP surveillance hours over Canadian waters to help prevent and detect oil spills from ships and to interface with ECCC's satellite monitoring.

Response System/Support/Planning – Coordinated Incident Response

There are two initiatives related to improving coordinated incident response (the Incident Command System initiative and the Incident Command Support initiative) and one related to enhancing response planning (the Area Response Planning Pilot initiative), which will also enhance a coordinated incident response in the event of an oil spill from ships.

Community/Stakeholder Awareness – Community/Stakeholder Engagement

The Public, Private and Community Partnerships (PPCP) initiative and the Community Participation Funding Program (CPFP) will facilitate community/stakeholder awareness and engagement in the area of preparedness and response. The Contribution to Clear Seas Centre for Responsible Marine Shipping will also contribute to community/stakeholder awareness and engagement through outreach on best practices on a number of topics related to safe marine shipping.

The PPCP has two components, one involving the CCG and the other TC. The CCG's project, a five-year pilot, is to work with interested communities and stakeholders in Northern B.C. to ensure that their local knowledge and interests are understood and considered during the planning and preparedness phases of ship-sourced pollution response, and that these communities are prepared to participate in the decision-making process in responding to a ship-sourced pollution incident, should one occur. TC's project, also a pilot, is to leverage and increase the visibility of its current Pacific Regional Advisory Council on oil spill response such that it can serve as a forum for the participation of Aboriginal Peoples and communities in Northern B.C., in discussions on ship-source oil spill preparedness and response.

The CPFP is a grant program to support the participation of eligible stakeholders from local communities and Indigenous Groups in the Area Response Planning Pilot initiative (ARPI), to ensure that their knowledge of local conditions and environmental sensitivities are appropriately captured in that planning, by reimbursing the costs to prepare for and attend meetings.

Two other initiatives which have a community or stakeholder engagement or outreach component include the Ocean Networks Canada Smart Oceans Contribution Program and the Contribution to Clear Seas Centre for Responsible Marine Shipping initiative.

Liability and Compensation – Liability and Compensation Regime

Two initiatives will led to an enhanced liability and compensation regime, which have already been mentioned under “Reviews” and “Legislative/Regulatory” activities are the Review of the Liability and Compensation Regime and the Enhancements to Ship-Source Pollution Fund.

PROGRAM DELIVERY AND GOVERNANCE

The WCTSS Initiative is delivered through three Assistant Deputy Ministers (ADMs) at TC (Policy, Safety and Security, and Programs), four at ECCC (Environmental Protection Branch, Science and Technology Branch, Canadian Wildlife Service, and Meteorological Service of Canada), three at DFO (Ecosystems and Oceans Science Sector, Ecosystems and Fisheries Management Sector, and the Commissioner of the Canadian Coast Guard) and two at NRCan (Earth Sciences Sector and Innovation and Energy Technology Sector).

The departments involved in each initiative, along with the various entities within them, to the Director level are presented in Table 3. The initiative as a whole involves at least 35 entities at the Director level.

Table 3: The WCTSS Initiatives by Area Responsible for Delivery

Initiative	Branch/Division
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
New/Modified Aids to Navigation to Service the Kitimat Area	National Strategies, World Class Strategies (CCG) {Phase 1A}
	Integrated Technical Services, Electronics and Informatics, Marine and Civil Infrastructure and Environmental Response (CCG) {Phase 1A}
Hydrographic/Navigational Products for Kitimat	National Strategies, World Class Strategies (CCG) {Phase 1A}
	Pacific Region, Canadian Hydrographic Services (CHS of DFO) {Phase 1A}
	Ecosystems and Oceans Science Sector, Canadian Hydrographic Service (CHS of DFO) {Phase 1A}
	Integrated Technical Services, Electronics and Informatics, Marine and Civil Infrastructure and Environmental Response (CCG) {Phase 1A}
Tanker Screening Guidelines	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1A}
Transport Canada Centre in Kitimat	Pacific Region, Marine Safety and Security (TC) {Phase 1A}
Amendment to the Canada Shipping Act, 2001 and Modernization of the Environmental Response Program	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1A}
Panel Review of Canada’s Oil Spill Preparedness and Response Regime	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1A}
Scientific Research and Activities	Science and Technology Branch, Water Science and Technology (ECCC) {Phase 1A}
	Science and Technology Branch, Atmospheric Science and Technology (ECCC) {Phase 1A}
	Meteorological Service of Canada, Canadian Centre for Meteorological and Environmental Prediction (ECCC) {Phase 1A}
	Canadian Wildlife Service, Pacific Wildlife Service (ECCC) {Phase 1A}
	Science and Technology Branch, Wildlife and Landscape Science

Initiative	Branch/Division
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	(ECCC) {Phase 1A}
	Environmental Protection Branch, Environmental Protection Operations, Environmental Emergencies (ECCC) {Phase 1A}
	Ecosystems and Oceans Science Sector, Ecosystem Science, Environment and Biodiversity (DFO) {Phase 1A}
Integrated Satellite Tracking of Pollution – Satellite Based Monitoring	Prediction Services Directorate - Marine and Ice Services (ECCC) {Phase 1A}
Increased Tanker Inspections	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1B}
Options for a Modern Charted Navigation System	Integrated Technical Services, Electronics and Informatics, Marine and Civil Infrastructure and Environmental Response (CCG) {Phase 1B}
	National Strategies, World Class Strategies (CCG) {Phase 1B}
Geoscience Studies for Marine Safety in the B.C. North Coast	Geological Survey of Canada - Atlantic and Western Canada Branch, GSC Pacific, Sidney Division (NRCan) {Phase 1B}
Review of Navigational Plans for High Risk Waters – TERMPOL	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1B}
Review of Compulsory Pilotage and Tug Escorts	Safety and Security Group, Marine Safety and Security, Marine Personnel Standards, Pilotage and Medicine (TC) {Phase 1B}
Appropriate Governance for Ports	Programs Group, Air and Marine Programs, Programs and Operations (TC) {Phase 1B}
Systematic Surveillance and Monitoring of Ships – NASP	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1B}
Laying the Groundwork for the Arctic	Policy Group, Marine Policy, Seaway and Domestic Shipping Policy (TC) {Phase 1B}
	National Strategies, Horizontal CCG Priorities (CCG) {Phase 1B}
Public, Private and Community Partnerships	National Strategies, World Class Strategies (CCG) {Phase 1B}
	Pacific Region, Integrated Business Management Services (CCG) CG) {Phase 1B}
	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1B}
	Pacific Region, Marine Safety and Security (TC) {Phase 1B}
Incident Command System	Operations, Maritime Security (CCG) {Phase 1B}
	Integrated Technical Services, Electronics and Informatics (CCG) {Phase 1B}
Incident Command Support	Environmental Protection Branch, Environmental Protection Operations, Environmental Emergencies (ECCC) {Phase 1B}
Review of Spill Treating Agents and Countermeasures	Operations, Maritime Security (CCG) {Phase 1B}
	Environmental Protection Branch, Legislative and Regulatory Affairs (ECCC) {Phase 1B}
	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 1B}
Science and Technology for Clean-up	Ecosystems and Oceans Science Sector, Ecosystem Science, Environment and Biodiversity (DFO) {Phase 1B}
	Science and Technology Branch, Water Science and Technology (ECCC) {Phase 1B}

Initiative	Branch/Division
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	Science and Technology Branch, Atmospheric Science and Technology (ECCC) {Phase 1B}
	Canadian Centre for Meteorological and Environmental Prediction (ECCC) {Phase 1B}
	Prediction Services Directorate (ECCC) {Phase 1B}
	Innovation and Energy Technology Sector, Office of Energy Research and Development, Energy Innovation Programs (NRCan) {Phase 1B}
Review of Liability and Compensation Regime	Policy Group, Marine Policy, International Marine Policy (TC) {Phase 1B}
Modern Navigation System – Phase 1	Integrated Technical Services, Electronics and Informatics, Marine and Civil Infrastructure and Environmental Response (CCG) {Phase 2}
	National Strategies, World Class Strategies (CCG) {Phase 2}
	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 2}
	Ecosystems and Oceans Science Sector, Canadian Hydrographic Service (CHS of DFO) {Phase 2}
Ocean Networks Canada - Smart Oceans Contribution Program	Programs Group, Stewardship and Sustainable Transportation Programs, Environmental Initiatives (TC) {Phase 2}
Area Response Planning Pilot Initiative	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 2}
	National Strategies, World Class Strategies (CCG-DFO) {Phase 2}
	Regional Maritime Services (B.C., Alberta, QC.), Environmental Response (CCG) {Phase 2}
	Ecosystems and Oceans Science Sector, Ecosystem Science, Environment and Biodiversity (DFO) {Phase 2}
	Ecosystems and Fisheries Management Sector, Oceans and Fisheries Policy Directorate, Integrated Oceans Management Branch (DFO) {Phase 2}
	Environmental Protection Branch, Environmental Protection Operations, Environmental Emergencies (ECCC) {Phase 2}
	Science and Technology Branch, Atmospheric Science and Technology (ECCC) {Phase 2}
	Science and Technology Branch, Wildlife and Landscape Science (ECCC) {Phase 2}
	Canadian Wildlife Service Branch, Stewardship and Regional Operations Directorate (ECCC) {Phase 2}
	Meteorological Service of Canada (ECCC) {Phase 2}
Alternative Response Measures – legislative amendments	Safety and Security Group, Marine Safety and Security, Navigation Safety and Environmental Programs (TC) {Phase 2}
	Environmental Protection Branch, Legislative and Regulatory Affairs, Legislative Governance (ECCC) {Phase 2}
	Science and Technology Branch, Water Science and Technology (ECCC) {Phase 2}
	Environmental Protection Branch, Environmental Protection Operations, Environmental Emergencies (ECCC) {Phase 2}

Initiative	Branch/Division
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	National Strategies, World Class Strategies (CCG) {Phase 2}
	Operations, Maritime Security (CCG) {Phase 2}
Community Participation Funding Program	Programs Group, Stewardship and Sustainable Transportation Programs, Environmental Initiatives (TC) {Phase 2}
Operational Science for Marine Oil Spill Response	Science and Technology Branch, Water Science and Technology, Emergencies, Operational Analytical Laboratories and Research Support (ECCC) {Phase 2}
	Science and Technology Branch, Atmospheric Science and Technology (ECCC) {Phase 2}
	Meteorological Service of Canada (ECCC) {Phase 2}
	Canadian Centre for Meteorological and Environmental Prediction (ECCC) {Phase 2}
	Science and Technology Branch, Science and Technology Strategies, Science and Technology Policy Division (ECCC) {Phase 2}
	Innovation and Energy Technology Sector, Office of Energy Research and Development, Energy Innovation Programs (NRCan) {Phase 2}
	Innovation and Energy Technology Sector, CanmetENERGY, Devon Research Centre (NRCan) {Phase 2}
Contribution to Clear Seas Centre for Responsible Marine Shipping	Programs Group, Stewardship and Sustainable Transportation Programs, Environmental Initiatives (TC) {Phase 2}
Enhancement to Ship-Source Oil Pollution Fund	Policy Group, Marine Policy, International Marine Policy (TC) {Phase 2}
Options for Long-Term Governance and Funding of WCTSS	Policy Group, Marine Policy, International Marine Policy (TC) {Phase 2}
	Safe Shipping and Economic and Industry Intelligence (CCG) {Phase 2}
	Vessel Procurement, Business Support (CCG) {Phase 2}
	National Strategies, World Class Strategies (CCG) {Phase 2}

Oversight of the implementation of the WCTSS Initiative was initially handled through the Director General (DG)-level Interdepartmental Marine Pollution Committee (IMPC). Under the auspices of this committee, the WCTSS Sub-Committee (DG-level) was formed was formed in April 2013. Four of the tasks which it was assigned are as follows:

- The development of an integrated approach to the delivery of the Government of Canada obligations and objectives related to each of the initiatives;
- The development of an integrated approach to Indigenous consultations or engagement for the WCTSS Initiative;
- The horizontal tracking of each initiative between government departments for the overall implementation of the WCTSS Initiative;
- The communication of updates to the DG-IMPC and the Deputy Minister (DM) Major Projects Management Office (MPMO).

The WCTSS Sub-Committee took guidance and direction from the DG-IMPC and met once a month, while the DG-level IMPC met every second month or on an as-needed basis.

Around March of 2015, the Director General Interdepartmental Committee for the World Class Tanker Safety System (DG-WCTSS) was formed to become the focal point for activities related to the WCTSS. It, like the DG-level committee it replaced, was chaired by the DG of Marine Policy (TC). Its creation allowed the DG-IMPC to focus on ship-source pollution issues outside of WCTSS. DG-WCTSS had the mandate to provide leadership within the federal government on all aspects and phases of the WCTSS Initiative, including the identification and development of policy options and strategies for the Initiative. It included representatives from each department involved in the WCTSS Initiative, as well as a representative from TC's Marine Safety and Security. The committee generally met every quarter and its members were responsible for reporting within their own departments and coordinating and engaging their respective regions, science leads and departmental collaborators.

The director-level (or chief/manager) sub-committee (WCTSS Sub-Committee), which met once a month, was chaired by the Director, International Marine Policy, and was tasked with overseeing operational planning, horizontal reporting, and the implementation of WCTSS measures; creating and dissolving working groups; identifying horizontal issues, risks and solutions; and making recommendations to the DG-level committee. Along with its working groups, the Director-level committee was responsible for:

- Developing and updating project plans (dashboards) and an engagement strategy;
- Monitoring and reporting on the progress of specific WCTSS measures, and on any emerging issues;
- Collecting and providing information to the WCTSS Secretariat in support of the strategic environmental assessment, evaluations and audits, and other similar reviews that pertain to the overall WCTSS Initiative; and
- Providing input to government-wide reports and communication materials.

The sub-committee also had representation from partner departments as well as from TC's Marine Safety and Security.

ABOUT THE REVIEW

The TC-led horizontal implementation review was conducted between the fall of 2015 and the summer of 2016, in cooperation with ECCC, NRCan and DFO, including the CCG. It focused on the extent to which activities have been implemented as planned. It also addressed, to the extent possible, the core issues outlined in the *2009 Policy on Evaluation*, which includes both relevance and performance. The Review is expected to provide departments with an opportunity to identify areas where corrective actions might be needed, and to validate that performance information is being collected in advance of the 2018-19 evaluation.

SCOPE AND METHODOLOGY

The Review covered all 32 initiatives outlined in Table 1 (which define Phase 1A, 1B and 2 of the WCTSS Initiative) and fiscal years (FYs) 2013-14 to 2015-16. It did not include grants and contributions in any of the initiatives which were already in existence before the WCTSS Initiative was launched and which received additional monies through it (see Annex A).

In looking at relevance, the following evaluation questions were addressed:

- Are the WCTSS initiatives in line with federal roles and responsibilities?
- Are the initiatives aligned with federal government priorities?
- Are the initiatives aligned with departmental priorities?
- Are the initiatives aligned with departmental strategic outcomes?
- Is there an ongoing need/sound rationale for the initiatives?

These questions were addressed largely through literature and document reviews.

For performance, evaluators looked at implementation status, resource utilization and outputs and achievements, addressing the following questions:

- Are the initiatives being implemented as planned?
- Were funds spent as planned?
- What has been achieved to date (e.g. deliverables and outputs)

The key benchmark used to assess implementation status was the key milestone tables in foundational documents, which, for the most part, are reflected in the WCTSS Initiative's performance measurement strategy. The progress of the initiatives was measured against these tables, which contained project plans for activities and deliverables by fiscal year and the information evaluators' collected regarding them. The initiatives were classified as delayed past planned completion date, experiencing delays, on-track, or completed. Reason for delays were also examined and the initiatives were then classified in terms of the risk of completing either the initiatives themselves or the objectives of the initiatives.

The measure of funds spent as planned was the percentage of new funds spent each fiscal year, which was then averaged (weighted) across fiscal years to provide a single indicator. Reasons for variance were also analyzed.

Three other performance questions that were considered are as follows:

- Is the initiative being effectively governed?
- To what extent are program managers gathering the performance information that will be needed to evaluate outcomes in the 2018-19 evaluation?
- Are any course corrections required to mitigate risks and/or ensure the objectives/expected results of the initiatives will be fully achieved?

The methodology for the Review consisted of generating multiple lines of evidence in order to reveal issues and answer the Review questions. As should be largely evident from the foregoing, this included a literature review, a document review, and an analysis of performance and financial data. A number of interviews were planned to cover governance and areas where information might be lacking. However, for various reasons, including budgetary realignment at TC and the obvious difficulties inherent in obtaining information throughout four departments, interviews were not carried out. In the case of governance, other sources of information were used instead, such as emails, agendas, minutes of meetings, and the Terms of References (TORs) for committees and working groups.

CONSIDERATIONS

A number of considerations and limitations influenced the conduct of the Review. Foremost was the size and complexity of the WCTSS Initiative and the number of departments and people within those departments involved.

A second consideration is that it took considerable time and effort on the part of the evaluators to obtain basic information on the status of implementation of the initiatives from some departments. For two departments it took over eight months to obtain the information requested. This was in part because the dashboard information that was being collected through these departments on an on-going basis was not sufficient to meet the needs of the Review.

The time and resources it took to obtain this information had both positive and negative impacts on the evaluation. On the positive side, it led to evaluators being able to obtain financial and performance information for a full three fiscal years. In fact, evaluators accepted performance information well into FY 2016-17. On the negative side, there was insufficient time and resources remaining to conduct interviews and delve more deeply into some specific issues, such as whether delays in some initiatives could have been better mitigated and whether there were any specific examples to demonstrate economy and efficiency. These issues can be more appropriately addressed in the forthcoming summative Evaluation of 2018-19.

Finally, it was too early in the evolution of most of the initiatives to look further up the results chain at outcomes, in part because those initiatives that had been completed were reviews, which are more a means to an end in terms of outcomes; in part because a number of initiatives had been delayed by the budgetary alignment at TC, because the initiatives had just begun (e.g. Phase 2 initiatives) or other reasons.

RELEVANCE

To assess the relevance of the WCTSS Initiative, the Review examined whether the initiatives were aligned with the roles and responsibilities of the federal government, the priorities of the federal government and the four departments, and departmental strategic objectives. The assessment also involved a consideration of whether there is an ongoing need and policy rationale for the initiatives.

ALIGNMENT WITH FEDERAL ROLES AND RESPONSIBILITIES

Finding 1: The WCTSS initiatives are aligned with the roles and responsibilities of the federal government and are within the legislative authorities and mandates of the four departments involved.

Transport Canada

TC is the lead federal department responsible for regulating shipping and administers a comprehensive legal framework under a number of Acts, the most important of which is the *Canada Shipping Act, 2001*, (CSA 2001), which aims to promote marine safety and the prevention of pollution from ships. In addition to regulating shipping, the department is responsible for policy leadership, program design, regulatory enactment and enforcement of Canada's marine oil spill preparedness and response system. This includes certifying Response Organizations (ROs) and verifying their compliance with regulations.

TC is also responsible for establishing a liability and compensation regime for incidents involving ships, including ship-source oil spills. The *Marine Liability Act* regulates liability and compensation requirements for pollution damage from ships, and implements various international conventions adopted by the International Maritime Organization that Canada has ratified.

Three other Acts which TC is responsible for and which are relevant to the WCTSS Initiative are the *Canada Marine Act* (which provides for the designation of public ports and related regulatory powers pertaining to navigation, marine safety, and environmental protection at public ports), the *Pilotage Act* (which has to do with navigating high risk waterways and the need to use specially authorized pilots) and the *Canada Transportation Act* (which contains Canada's national transportation policy).

A list of WCTSS initiatives in which TC is involved, along with their relevance to TC's mandate, are outlined in Table 4.

Table 4: WCTSS Initiatives and Transport Canada's Mandate/Responsibilities

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Tanker Screening Guidelines	Under the authority of the CSA 2001. {Phase 1A}
Transport Canada Centre in Kitimat	For the inspection of vessels in the area under the authority of the CSA 2001. {Phase 1A}
Amendment to the Canada Shipping Act, 2001 and Modernization of the Environmental Response Program	CSA 2001, e.g. Part 8. {Phase 1A}

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Panel Review of Canada's Oil Spill Preparedness and Response Regime	The *Canada Transportation Act* Policy leadership, program design, regulatory enactment and enforcement of Canada's marine oil spill preparedness and response system. {Phase 1A}
Increased Tanker Inspections	Under the authority of the CSA 2001. {Phase 1B}
Review of Navigational Plans for High Risk Waters – TERMPOL	CSA 2001. (Having to do with marine navigation safety issues of Oil Handling Facilities at shipping terminals). {Phase 1B}
Review of Compulsory Pilotage and Tug Escorts	Possible marine safety measures in dangerous channels under either the *Pilotage Act*, *Canada Marine Act* or CSA 2001. {Phase 1B}
Appropriate Governance for Ports	*Canada Marine Act* {Phase 1B}
Systematic Surveillance and Monitoring of Ships – National Aerial Surveillance Program	Prevention of pollution from ships and to obtain evidence to enforce the provisions of all Canadian legislation (e.g. CSA 2001 and the *Migratory Birds Convention Act*) applicable to illegal discharges from ships. {Phase 1B}
Laying the Groundwork for the Arctic	The *Canada Transportation Act* Having to do with TC's marine transportation policy framework and programs. {Phase 1B}
Public, Private and Community Partnerships	Part 8 of the CSA 2001 (Regional Advisory Councils). {Phase 1B}
Review of Spill Treating Agents and Countermeasures	Part 8 of the CSA 2001. {Phase 1B}
Review of Liability and Compensation Regime	*Marine Liability Act*. {Phase 1B}
Modern Navigation System – Phase 1 Navigation Safety	Amendments to the *Navigation Safety Regulations* pursuant to CSA 2001 (to expand AIS carriage requirements). {Phase 2}
Ocean Networks Canada Smart Oceans Contribution Program	Section 48 of the *Canada Transportation Act* (provides the Minister of Transport the authority to enter into agreements in support of the national transportation policy or in respect to any other transportation matter that the Minister considers appropriate). {Phase 2}
Area Response Planning Pilot Project	Having to do with TC responsibilities in certification and regulation of ROs (as per Part 8 of the CSA 2001). {Phase 2}
Community Participation Funding Program	Section 48 of the *Canada Transportation Act.* {Phase 2}
Alternative Response Measures	Part 8 of the CSA 2001. {Phase 2}
Contribution to Clear Seas Centre for Responsible Marine Shipping	Related to responsibilities under the CSA 2001. {Phase 2}
Enhancements to Ship-Source Oil Pollution Fund	*Marine Liability Act*. {Phase 2}
Options for Long-Term Governance and Funding of the WCTSS	The *Canada Transportation Act* Policy leadership, program design, regulatory enactment and enforcement of Canada's marine oil spill preparedness and response system. {Phase 2}

Department of Fisheries and Oceans

DFO has the lead federal role in managing Canada's fisheries and safeguarding its waters. The Department supports strong economic growth in Canada's marine and fisheries sectors by supporting exports and advancing safe maritime trade. The Canadian Coast Guard, a Special Operating Agency within DFO, is responsible for the programs and services that contribute to the safety, security and accessibility of Canada's waterways. DFO program activities also focus on integrated management of ocean activities (e.g., Pacific North Coast Integrated Management Area Plan) and protection of sensitive or significant marine areas through the application of marine conservation tools (e.g. marine protected areas); the contribution of each species of fish to the ongoing productivity of commercial, recreational or Aboriginal fisheries; and the protection of fish habitat and the recovery of wildlife species, among other responsibilities. DFO conducts research on fisheries and marine ecosystems and provides scientific advice in these areas. Through scientific research, monitoring and data management, DFO ensures that federal and departmental policies, programs, and regulations are informed by scientific and technical information.

A list of the WCTSS initiatives in which DFO is involved (other than the CCG and CHS), along with their relevance to DFO's mandate, are outlined in Table 5.

Table 5: WCTSS Initiatives and the Department of Fisheries and Oceans' Mandate/Responsibilities (other than the CCG and CHS)

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Scientific Research and Activities	New scientific studies and advice related to spill response and clean-up. E.g. oil spill modelling, mapping near-shore habitats and benthic ecosystems and research and advice on interactions with ecosystems. {Phase 1A}
Review of Spill Treating Agents and Countermeasures	Scientific advice on new clean-up technologies. E.g. their impact on coastal, marine and estuarine cosystems. {Phase 1B}
Science and Technology for Clean-up	New scientific studies and advice for response and clean-up. E.g. analyze best available counter measure approaches and strategies for diluted bitumen under various conditions and develop a high-resolution hydrodynamic ocean modelling system to improve ECCC's spill modelling capabilities. {Phase 1B}
Area Response Planning Pilot	New scientific knowledge for response planning. E.g. identification and mapping of physical, biological and socio-economic marine sensitivities; local sea state, such as waves and ocean circulation; and the physical and chemical properties and potential behaviours of various oil products in the context of the unique ecosystems of the four local areas. {Phase 2}

The CHS, a division of the Science Branch within DFO, is responsible for charting Canadian waters. It uses the latest technology to collect high-resolution data on the depth, shape and structure of Canada's oceans, lakes and rivers; monitors tides and water levels – essential information for detecting and predicting climate change and variability, and natural hazards; and produces nautical charts and navigational products to help ensure the safe navigation of Canada's waterways. These official nautical charts and publications are produced in accordance with the *Nautical Charts and Publications Regulations* of the CSA 2001, and they are used by both the commercial shipping and recreational boating communities.

A list of the WCTSS initiatives in which the CHS is involved, along with their relevance to CHS's-DFO's mandate, are outlined in Table 6.

Table 6: WCTSS Initiatives and Canadian Hydrographic Service's Mandate/Responsibilities (DFO)

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Hydrographic/Navigational Products for Kitimat	Multibeam surveys and the creation of paper and digital format charts in metric units. {Phase 1A}
Options for a Modern Charted Navigation System	Charting Canadian waters and providing nautical charts and publications. {Phase 1B}
Laying the Groundwork for the Arctic	Survey and chart prioritization. {Phase 1B}
Modern Navigation System – Phase 1	Multibeam surveys and Enhanced Electronic Navigational Chart production. {Phase 2}

The *Oceans Act* gives the Minister of Fisheries and Oceans responsibility for the marine component of the federal search and rescue program, marine pollution response, and support to other government departments, boards, and agencies through the provision of ships, aircraft, and other marine services. Reporting to the Minister of Fisheries and Oceans, the CCG carries out these responsibilities and is the lead federal agency for ensuring an appropriate response to ship-source oil spills in Canadian waters.

With regard to the CCG's marine response role, the CCG monitors the response efforts of ship-owners and external responders, including ROs. When a marine pollution incident occurs and the polluters are known, willing and able to respond, the CCG will advise them of their responsibilities and will monitor their response as Federal Monitoring Officer, to ensure appropriate clean-up actions are taken. When the polluter is unknown, unwilling or unable to respond, the CCG will assume overall management of the response as On-Scene Commander. In either case, the CCG retains ultimate decision-making authority during the planning and response phases of a marine pollution incident and it maintains spill response equipment in over 80 equipment depot sites to provide coverage when no polluter has taken responsibility for a ship-source spill.

The *Oceans Act* also gives the Minister of Fisheries and Oceans responsibility for services for the safe, economical, and efficient movement of ships in Canadian waters through the delivery of four prevention-based programs: 1) provision of aids to navigation, 2) marine communications and traffic management services, 3) icebreaking and ice management services, and 4) waterways management services. Again, it is the CCG that delivers these programs.

The Aids to Navigation program provides devices, external to a vessel, that help mariners determine position and course; and warn of dangers, obstructions or mark the location of preferred routes. The

Marine Communication and Traffic Services program supports traffic management, incident prevention and the efficient movement of ships in Canadian waters. The Icebreaking Services program helps commercial vessels voyage efficiently and safely through or around ice-infested waters. The Waterways Management Services program identifies the bottom conditions of navigation channels and notifies mariners of restrictions or hazards to safe navigation.

The CSA 2001 provides additional powers and more detailed definitions that enable the Minister of Fisheries and Oceans to fulfill its mandate with respect to aids to navigation; vessel traffic services; marine search and rescue; and responses to ship-source pollutant spills, spills from an unknown source, and spills at oil handling facilities where a vessel is loading or unloading. The CCG's marine pollution response mandate applies to waterways subject to the CSA 2001.

The CCG is also responsible for supporting safe and efficient marine navigation, and does so through the delivery of the four prevention-based programs.

WCTSS initiatives the CCG is involved in and their relevancy to the CCG's mandate are presented in Table 7.

Table 7: WCTSS Initiatives and the Canadian Coast Guard's Mandate/Responsibilities (DFO)

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
New/Modified Aids to Navigation to Service the Kitimat Area	Aids to navigation. {Phase 1A}
Options for a Modern Charted Navigation System	Aids to navigation, marine communications and traffic management services, icebreaking and ice management services, and waterways management services. {Phase 1B}
Laying the Groundwork for the Arctic	Aids to navigation, marine communications and traffic management services, icebreaking and ice management services, and waterways management services. {Phase 1B}
Public, Private and Community Partnerships	Response planning (with interested communities and stakeholders in Northern B.C.). {Phase 1B}
Incident Command System	Lead federal agency for ensuring an appropriate response to ship-source oil spills in Canadian waters and On-Scene Commander when the polluter is unknown, unwilling or unable to respond. {Phase 1B}
Review of Spill Treating Agents and Countermeasures	CSA 2001, Part 8 - Pollution Prevention and Response, under response measures. {Phase 1B}
Modern Navigation System – Phase 1	Aids to navigation, marine communication and traffic services and waterways management services. {Phase 2}
Area Response Planning Pilot	Response planning. {Phase 2}
Alternative Response Measures	CSA 2001, Part 8 - Pollution Prevention and Response, under response measures. {Phase 2}
Options for Long-Term Governance and Funding of the WCTSS	Lead federal agency for ensuring an appropriate response to ship-source oil spills in Canadian waters and On-Scene Commander when the polluter is unknown, unwilling or unable to respond. {Phase 2}

Environment and Climate Change Canada

ECCC's mandate is to preserve and enhance the quality of the natural environment, conserve the country's natural resources, and equip Canadians with the information required to inform decision-making in the face of hazardous weather, water and climate conditions. ECCC is responsible for administering the *Canadian Environmental Protection Act, 1999* (CEPA 1999), the *Migratory Birds Convention Act, 1994*, the *Species at Risk Act* and the pollution prevention provisions of the *Fisheries Act.*

ECCC protects Canadians and their environment from the effects of emergency pollution incidents such as oil spills through the provision of science-based expert advice and regulations. In support of the Canadian oil spill prevention, preparedness and response regime, ECCC provides science-based expert advice on 1) knowledge of the environment so that risks can be identified and informed actions can be taken to protect the environment; 2) knowledge of the substances being transported and their behaviour within marine environments to help determine the effectiveness of responses; and 3) accessible, timely science to inform preparedness and response decision-making.

ECCC, in close collaboration with DFO, also contributes to safe marine transportation through the provision of weather and ocean ice information and forecasts and warnings of hazardous conditions that contribute to safe and efficient navigation and the prevention of oil spill incidents.

Table 8 below presents the relationship between ECCC's WCTSS initiatives and its departmental mandate.

Table 8: WCTSS Initiatives and Environment and Climate Change Canada's Mandate/Responsibilities

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: ■ Phase 1A ■ Phase 1B ■ Phase 2
Scientific Research and Activities	CEPA 1999 and scientific studies and advice (related to oil spill response and clean-up). E.g. spill models and countermeasures and the identification of environmental priorities in potential spill areas, including support for sea bird monitoring. {Phase 1A}
Integrated Satellite Tracking of Pollution - Satellite Based Monitoring	Environmental protection. Through detecting oily substances in water via satellite imagery and analysis. {Phase 1B}
Options for a Modern Charted Navigation System	Provision of weather forecasts and warnings, atmospheric and hydrological modelling, as well as ice information and data. {Phase 1B}
Incident Command Support	Federal Emergency Response Plan. ECCC is the primary department for the "Environment" emergency support function. Scientific advice/models in the event of an oil spill. {Phase 1B}
Review of Spill Treating Agents and Countermeasures	CEPA 1999 and scientific advice for clean-up (e.g. impact of chemicals on the environment). {Phase 1B}
Science and Technology for Clean-up	Scientific advice for response and clean-up. {Phase 1B}

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	E.g. enhanced operational 24-7 oil spill modelling response and high resolution ocean oil spill modelling capabilities. {Phase 1B}
Modern Navigation System – Phase 1	Environmental (weather, sea-state and ice condition) forecasts and warnings. E.g. enhanced weather monitoring through the deployment of smart environmental buoys. {Phase 2}
Area Response Planning Pilot Project	Scientific studies for response planning on coastline bio-physical characteristics to inform clean-up approaches; mapping habitats and ecosystems; wildlife, marine birds, and local weather/meteorological and climate conditions, such as wind and wave conditions. {Phase 2}
Alternative Response Measures	Environmental protection. Amend relevant legislation, including CEPA 1999, to make alternative response measures lawful but subject to environmental safeguards and allow for research related to clean-up/alternative response measures. {Phase 2}
Operational Science for Marine Oil Spill Response	Scientific studies in support of clean-up. To expand knowledge of the behaviour of new and additional petroleum products and the effectiveness of countermeasures. {Phase 2}

Natural Resources Canada

Under the authority of the *Department of Natural Resources Act*, NRCan has a mandate to enhance the responsible development of the oil sands and minimize the environmental impacts of the production of oil products. In addition, under the *Resources and Technical Surveys Act*, NRCan has the mandate to make a full and scientific examination and survey of the geological structure and mineralogy of Canada.

The relationship between the WCTSS initiatives in which NRCan is involved and NRCan's mandate is outlined in Table 9.

Table 9: WCTSS Initiatives and Natural Resources Canada's Mandate/Responsibilities

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Geoscience Studies for Marine Safety in the B.C. North Coast	Scientific examination and surveys of the geological structure under the *Resources and Technical Surveys Act*. Scientific studies of geohazards such as submarine slides and earthquakes on B.C.'s Northern Coast. {Phase 1B}
Review of Spill Treating Agents and Countermeasures	Responsible resource development under the

Initiative	Jurisdiction/Mandate
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	Department of Natural Resources Act. {Phase 1B}
Science and Technology for Clean-up	Responsible resource development under the *Department of Natural Resources Act*. Scientific studies on diluted bitumen samples to determine how the properties of the oil change with time and conditions in marine environments, for use in models predicting oil spill trajectories. {Phase 1B}
Alternative Response Measures	Responsible resource development under the *Department of Natural Resources Act*. To amend relevant legislation on spill clean-up originating from an offshore oil and gas installation or structure (parallel initiative). {Phase 2}
Operational Science for Marine Oil Spill Response	Responsible resource development under the *Department of Natural Resources Act*. Scientific studies on oil pre-treatment to improve the behaviour and recovery rates of heavy oil products spilled in marine environments, and foster research and development (R&D) on new and improved mechanical response technologies and processes, in collaboration with industry and universities. {Phase 2}

ALIGNMENT WITH FEDERAL GOVERNMENT PRIORITIES

Finding 2: The WCTSS initiatives are aligned with federal government priorities.

In his most recent mandate letter, the Minister of Transport has been tasked to "work with the Minister of Fisheries, Oceans and the Canadian Coast Guard and the Minister of Environment and Climate Change to improve marine safety." Delivering on this commitment could be seen as an extension of the work undertaken under the WCTSS Initiative, although perhaps with different areas of emphasis.

The WCTSS Initiative has been a federal government priority since Budget 2012, when initial funding was provided under the priority of responsible resource development. In Budget 2012 it was stated that "safe navigation of oil tankers is very important to our Government," and new and future WCTSS measures in support of responsible resource development were outlined. In the 2013 Speech from the Throne, responsible resource development was an important theme, with the Government announcing WCTSS initiatives on the horizon that it had funded "to protect against spills and other risks to the environment and local communities."

In Budgets 2014 and 2015, responsible resource development was again mentioned as "a key priority for the Government" and additional WCTSS measures were announced with the understanding that "as a trading nation, Canada relies on a safe marine transportation network to bring products and resources to markets." In Budget 2015, there was new funding: "Economic Action Plan 2015 proposes to provide $30.8 million over five years to enhance the safety of marine transportation in the Arctic and further strengthen environmental protection and marine incident prevention, preparedness and response south of the 60th parallel."

One of the main themes of Budget 2016 was "securing a cleaner, more sustainable environment" under which there were sub-themes such as protecting marine and coastal areas, protecting and restoring Canada's ecosystems and natural heritage, and investing in ocean and freshwater research. Following Budget 2016, in November 2016, the Government of Canada announced its national Oceans Protection Plan (OPP), which was very much in line with these sub-themes and which is in many ways, an extension and expansion of the WCTSS Initiative. The OPP was designed to protect Canada's oceans and help achieve a world-leading marine safety system that will improve the Government of Canada's capacity to prevent and improve response to marine pollution incidents. Among other things, the OPP includes better regulations for marine protection, expansion of the Canadian Coast Guard's role in responding to marine incidents, and new Indigenous Community Response Teams in B.C.

ALIGNMENT WITH DEPARTMENTAL PRIORITIES

Finding 3: The WCTSS initiatives are aligned with departmental priorities.

Transport Canada

The WCTSS initiative has been aligned with TC's departmental priorities since 2013-14, as outlined in its various reports on plans and priorities (RPP). In FY 2013-14, as well as FY 2014-15 and FY 2015-16, it was aligned with TC's priority of responsible resource development. In FY 2016-17 it was aligned with TC's priority to advance initiatives that promote an environmentally responsible transportation system. As stated in TC's 2016-17 RPP, the department would "take measures to improve and strengthen marine tanker safety, including the national ship-source oil spill preparedness and response regime, in-line with World Class Tanker Safety activities, Phases 1 and 2" to meet this priority.

Department of Fisheries and Oceans

In FY 2015-16, WCTSS initiatives were aligned with DFO's priority of renewing CCG assets and service delivery. It was stated in DFO's 2015-16 RPP that the department would support the 2013 Speech from the Throne commitment to act on advice from the Expert Panel on Tanker Safety to create a world class tanker safety system. As DFO stated in its 2015-16 RPP, it has been supporting this commitment in the following ways:

- Enhancing Canada's marine navigation system and its supporting infrastructure by implementing e-Navigation in Canadian waters to provide real-time information to support decision-making and to identify high-risk situations (the Modern Navigation System – Phase 1 initiative);
- Improving the aids to navigation system in Kitimat, B.C. to meet user requirements effectively and efficiently (the New/Modified Aids to Navigation to Service the Kitimat Area and the Hydrographic/Navigational Products for Kitimat initiatives);
- Designing the new Area Response Planning pilot project for delivery in four geographic areas of Canada and engage stakeholders in the planning process (the Area Response Planning Pilot Project initiative);
- Collecting and analyzing science and marine ecosystems information and data to support elements of the WCTSS initiatives (the Scientific Research and Activities and Science and Technology for Clean-up initiatives); and

- Implementing the Incident Command System to strengthen marine pollution and incident response (the Incident Command System initiative).

Environment and Climate Change Canada

ECCC's WCTSS initiatives are aligned primarily with the department's priority of a clean environment, as stated in the department's 2015-16 RPP. This priority involves working to manage substances and waste, and reduce pollution that directly or indirectly harms human health or the environment. As stated in the same RPP, the department would support this priority in the following ways:

- Conducting studies on spilled diluted bitumen in support of the federal World Class Oil Spill Preparedness and Response Regime. Studies encompass physical and chemical properties of the spilled bitumen and its fate and behaviour, as well as spill modelling, countermeasures and shoreline interactions (the Scientific Research and Activities, Science and Technology for Clean-up and Operational Science for Marine Oil Spill Response initiatives);
- Providing further scientific advice in support of spill prevention, preparedness, response and recovery, such as weather forecasting, contaminant trajectory modelling, sensitivity mapping, the establishment of clean-up priorities, and the protection of sensitive ecosystems and wildlife such as migratory birds (the Integrated Satellite Tracking of Pollution – Satellite Based Monitoring, Scientific Research and Activities, Science and Technology for Clean-up and Area Response Planning Pilot initiatives);
- Contributing scientific information on changing wind, wave and climate conditions, including extremes (Science and Technology for Clean-up); and
- Contributing to the implementation of World Class Initiatives on offshore, pipeline, tanker and rail safety, including the development of Net Environmental Benefit Analysis guidelines (the Alternative Response Measures initiative).

Some of ECCC's WCTSS initiatives are also aligned with the following departmental priorities:

- Support effective emergency response efforts associated with shipping activity, including the development of better baseline information on the distribution and abundance of birds in marine environments (Scientific Research and Activities initiative);
- Initiate work to re-design marine weather information products, with a focus on impact-based warnings to meet the needs of mariners (Science and Technology for Clean-up initiative); and
- Continue to improve weather and ice computer models in order to better predict sea ice concentration, movement, and internal ice pressure and ocean currents (Science and Technology for Clean-up initiative).

Natural Resources Canada

NRCan's priority to leverage science and technology knowledge for safety and security risk management is aligned with the WCTSS initiatives. NRCan has an important role in preparing for and managing threats and emergencies associated with natural and man-made hazards, including industrial incidents. In NRCan's 2015-16 RPP, the department committed to focusing research on interdepartmental emergency management and disseminating scientific expertise (e.g. the Science and Technology for

Clean-up, Geoscience Studies for Marine Safety in the B.C. North Coast, and Operational Science for Marine Oil Spill Response initiatives).

ALIGNMENT WITH DEPARTMENTAL STRATEGIC OUTCOMES

Finding 4: The WCTSS initiatives are aligned with departmental strategic outcomes.

The WCTSS Initiative is aligned with the following departmental strategic outcomes (SOs) and programs in the program alignment architectures' (PAA) of the participating departments (see Table 10).

Table 10: The WCTSS Initiative by Departmental Strategic Outcomes and PAA Programs

Department	Strategic Outcome (SO)	Program
Transport Canada	SO2 – Clean Transportation System SO3 – Safe and Secure Transportation System	Program 2.2: Clean Water from Transportation Program 3.2 Marine Safety
Department of Fisheries and Oceans	SO1 – Economically Prosperous Maritime Sectors and Fisheries	Program 1.8: Marine Navigation
	SO2 – Sustainable Aquatic Ecosystems	Program 2.4: Environmental Response Services
	SO3 – Safe and Secure Waters	Program 3.1: Search and Rescue Program 3.2: Marine Communications and Traffic Services Program 3.7: Hydrographic Products and Services
Environment and Climate Change Canada	SO1: Canada's natural environment is conserved and restored for present and future generations	1.1: Biodiversity –Wildlife and Habitat.
	SO2: Canadians are equipped to make informed decision on changing weather, water and climate conditions	2.1: Weather and Environmental Services for Canadians 2.2: Weather and Environmental Services for Targeted Users
	SO3: Threats to Canadians and their environment from pollution are minimized	3.1: Substances and Waste Management
Natural Resources Canada	SO2: Natural resource sectors and consumers are environmentally responsible	Program 2.2: Technology Innovation
	SO3: Canadians have information to manage their lands and natural resources and are protected from related risks	Program 3.1: Protection for Canadians and Natural Resources

In addition, evaluators were able to align each initiative with one or more of the SOs in the departmental PAAs (see Annex B).

CONTINUING NEED/RATIONALE

Finding 5: There is a continued need for WCTSS or WCTSS-like initiatives in order to enable natural resources development and export expansion through marine transportation in a manner that minimizes possible impacts on the environment and marine safety, and secures the confidence of Canadians.

The Tanker Safety Panel (of the Panel Review of Canada's Oil Spill Preparedness and Response Regime initiative) noted in its first report that Canada's strong ship-source spill preparedness and response regime was a significant factor in the limited number of oil spills in the country but that the regime was created nearly 20 years ago and since then, Canada's natural resources sector had grown, as had the volumes of oil, and hazardous and noxious substances transported within Canadian waters. In other words, part of the rationale behind the WCTSS Initiative was that it was time to review Canada's ship-source oil spill preparedness and response regime given the growth in the resources sector and the increase in vessel traffic, and make improvements where needed.

The Tanker Safety Panel made a number of recommendations, many of which have shaped subsequent WCTSS initiatives. For example, it made recommendations related to area response planning that are being addressed through the Area Response Planning Pilot Initiative. Similarly, it recommended that the Government of Canada remove legislative impediments to the use of alternative response techniques, which are also being addressed through WCTSS initiatives, two of which are the Review of Spill Treating Agents and Countermeasures initiative and the Alternative Response Measures initiative.

Another rationale for some of the WCTSS initiatives was that they were a response to recommendations that the Commissioner on the Environment and Sustainable Development (CESD) had made in its reports to improve ship-source oil spill preparedness and response. For example, the 2010 CESD Report recommended that TC and the CCG conduct a risk assessment related to ship-source oil spills covering Canada's three coasts in consultation with ECCC and the shipping industry. The WCTSS initiative includes a number of ship-source oil spills risk assessments, two of which were part of the Panel Review of Canada's Oil Spill Preparedness and Response Regime initiative.

The same audit questioned the capabilities of the CCG's Response Management System (RMS) to include other response partners quickly and efficiently during an emergency, noting that RMS was an incident management system created by the CCG and uses CCG-developed operations and documentation that are in conflict with the standard incident response system used by other government departments and industry. The WCTSS Initiative includes two initiatives that respond to this concern: the Incident Command System (ICS) initiative and the Incident Command System Support initiative.

For a final example, the 2012 CESD Report recommended that TC carry out a comprehensive risk review of the maritime transportation liability and compensation system, taking into consideration the limited ship-based oil spill response capacities and the projected increase in tanker size and traffic transporting environmentally harmful substances in Canadian waters. The WCTSS Initiative has two initiatives related to the maritime transportation liability and compensation system – one which is a review and the other which is legislative/regulatory.

Probably the most compelling rationale for the WCTSS Initiative was proposed resource development, in particular, the potential expansion of Canada's oil and gas sector in Western Canada and the sector's desire to get its products to new markets, particularly in Asia, through the expansion of pipelines and marine terminal infrastructure in B.C. At the beginning of the Review, two proposed expansions were under consideration: the Trans Mountain Expansion project (through Burnaby) and the Enbridge Northern Gateway project (through Kitimat).[3] These two developments alone were projected to increase the number of tanker trips along the B.C. coastline from 1,180 tanker trips a year to 2,280 (Government of British Columbia, 2012), and increased tanker traffic increases the likelihood of an accident. {ATIP REMOVED} In 2012, one of the preconditions the provincial government set for pipeline projects was a world-leading marine spill response regime (Government of British Columbia, 2012).[4]

In addition, a number of liquefied natural gas (LNG) projects have been proposed for the area; there have been nine proposed LNG projects for the West Coast, three of which are proposed for the Kitimat area[5] - the Kitimat LNG, Douglas Channel LNG and LNG Canada projects.[6] These three projects alone could increase LNG exports by approximately 36 million tonnes annually resulting in an increase of over 500 LNG-carrier visits per year, starting in 2016. This, in turn, would increase the risk of bunker fuel spills (fuel used for the operation and/or propulsion of the vessel). On average, Canada has had two bunker fuel spills in the 10 to 100 tonne range each year since 2003, and one spill of refined cargo every two years during the same period. It would also increase the risk of collisions with other vessels, through increasing vessel traffic.

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[3] The Government of Canada announced its approval of the Trans Mountain Expansion project along with its rejection of the Enbridge Northern Gateway project in late November of 2016, after the report of the Implementation Review had been finalized.

[4] In 2012, the Government of British Columbia set five conditions for supporting oil-pipeline development on the West Coast in its "Requirements for British Columbia to Consider Support for Heavy Oil Pipelines," including successful completion of an environmental review; world-leading marine spill response; land oil spill prevention; addressing aboriginal legal requirements, treaty rights and opportunities from such projects; and a "fair share" for British Columbia of fiscal and economic benefits.

[5] Examples of WCTSS initiatives which include the Kitimat area are as follows: New/Modified Aids to Navigation to Service the Kitimat Area; Hydrographic/Navigational Products for Kitimat; Scientific Research and Activities; Geoscience Studies for Marine Safety in the B.C. North Coast; Appropriate Governance for Ports; and Transport Canada Centre in Kitimat.

[6] It is not clear what the current status of these projects is. According to one source, the decision to designate Kitimat as a public port was based on the 5 LNG facilities that were proposed to be built in Kitimat but that as of early 2016, one project has been cancelled, 3 have been put on hold, and one is considered inactive. However, the major projects page of the Kitimat website indicates that Kitimat LNG is still subject to a final investment decision but that site preparation and other early works are ongoing, along with construction of temporary worker accommodation on the site of the former Eurocan Pulp & Paper mill. As for LNG Canada it states that the project received provincial and federal environmental assessment certificates in June 2015. In January 2016, a 40-year export licence was granted by the NEB. A decision to move the project into development could be taken in the first half of 2016, with start up around the end of the decade (pending regulatory approvals and investment decisions). Of the Douglas Channel LNG, it states that long term lease agreements have been executed with the Haisla Nation for land and water tenure. Pipeline capacity agreements with Pacific Northern Gas for long term gas supply on their existing pipeline network serving Kitimat has also been secured. The consortium expects LNG exports could start as early as 2018. There are many other resource development proposals under way in the Kitimat area, including two refineries and three new gas pipeline projects. See http://www.kitimat.ca/EN/main/business/invest-in-kitimat/major-projects.html.

Another rationale for the WCTSS Initiative, which the Tanker Safety Expert Panel also noted (in its second report), was that receding multi-year ice in Canada's North and improved vessel design and technology have increased the possibility of marine traffic in the North. These changes have also increased the possibility of resource exploration and development in the North, and given the vastness of the North, many areas still remain largely under-served and hazardous, undermining the safety of marine navigation and creating risks for the marine environment. Currently, there is little navigational infrastructure in place in the North, let alone the technology and means to clean-up oil and other chemical spills from ships; and there has been little study of the environmental consequences of natural resources development in the North. This rationale is particularly germane to Phase III of the WCTSS initiative; although some preparatory work for the North was undertaken in earlier phases, e.g. the Panel initiative and its recommendation for North of 60° and the Laying the Groundwork for the Arctic initiative.

There is clearly an ongoing need for WCTSS or WCTSS-like initiatives to upgrade the oil spill prevention, preparedness and response regime to bring it in-line with the many recommendations that have been made over the past few years, particularly in the North. {ATIP REMOVED} there is an ongoing need for initiatives like the WCTSS or similar initiatives.

In short, the initial rationale for the WCTSS Initiative (Phases 1A, 1B and 2) was multi-faceted and it has evolved over time to meet specific marine safety and environmental needs related to ship-source oil spill prevention, preparedness and response, and liability and compensation, as it has responded to CESD and Tanker Safety Expert Panel recommendations for improvement, along with emerging trends in shipping and resource development.

The WCTSS initiatives were relevant at the time they were conceived and continue to be so, and they have laid the foundations for future improvements. There is an ongoing need for other similar initiatives to further develop the integrity on the regime, until such time as the WCTSS regime as a whole has been upgraded to meet the increased risks that increased tanker traffic, arising out of the development of the oil and gas sector, poses to Canadian waters and shorelines; and until it reaches the status of a world class system in which Canadians can have confidence.

PERFORMANCE

This section presents the results of the Review as they relate to status of implementation of the initiatives, resource utilization, outputs and achievements in the context of outcomes, governance and readiness for the evaluation in 2018-19.

STATUS OF IMPLEMENTATION

Although a number of initiatives have been delayed or are experiencing delays, this is largely due to factors that could not have been mitigated and very few initiatives are at risk of not meeting their objectives.

Finding 6: A large number of initiatives have been delayed beyond their planned completion date (10 out of 32) or are experiencing delays (7 out of 32), but some of these latter initiatives might still be completed on time.

Out of the 32 initiatives, eight have been completed. Seven of the completed initiatives are reviews. TC's Tanker Screening Guidelines initiative has been counted as one of the completed reviews. However, the completion of this initiative must be qualified because the initiative had deliverables beside the review, but the review concluded that the intended regulatory approach under the CSA 2001 was not the best way to meet the objectives of the initiative. Consequently these other objectives are now going to be met through the Mandatory/Increased Tanker Inspections initiative, which has been delayed. ECCC's Integrated Satellite Tracking of Pollution - Satellite Based Monitoring is the only non-review initiative that has been completed.

A total of six initiatives are on track to be completed on time, one of which was delayed by two years at start-up (the Community Participation Funding Program), but is now on track as a one-year program instead of three-year program. It remains to be seen whether all of the funds can be spent in a year. Another of the initiatives counted as on track, the Options for Long-Term Governance and Funding of the WCTSS initiative, is only on track due to a change of plans and the decision that some of the planned deliverables were no longer needed.

The Team of International Experts on Tanker Safety initiative, was cancelled as it was decided that the initiative as conceived was not representative of the Pan-Canadian regime and portions of it duplicated the work of the Tanker Safety Expert Panel.

Of the 17 remaining initiatives, 6 are experiencing delays but might nonetheless be completed on-time.[7] A seventh one, the Systematic Surveillance and Monitoring of Ships (NASP) is a special case. This is because {ATIP REMOVED} However, due to budgetary realignment at TC, the NASP was required to reduce them.

[7] This is based on OPIs (offices of primary interest) reporting to evaluators that while they have experienced a number of delays they believe they can find a way to complete the project by the original end date, such as by speeding up the time it takes to complete certain components of the initiative or because several components of the initiative can be completed in a parallel fashion.

Table 11: Status of Implementation of WCTSS Initiatives

Implementation Status	# of Initiatives	Consequences
Completed	8	The initiative may or may not have experienced delays, but has been completed.
On-track	6	The initiative is on track to be completed on time and no delays were reported.
Experiencing delays	7	The initiative is underway but experiencing delays and/or has not met targets for ongoing activities. In some cases, measures have been taken in attempt to meet the original completion date. The initiative may or may not be completed on time.
Delayed	10	The initiative has been delayed (or is expected to be delayed) past its planned completion date and/or has not met targets for ongoing activities.
Cancelled	1	Cancelled at the outset

This leaves 10 initiatives, all of which have been delayed beyond their planned completion dates (these are identified later in the third column of Table 13). While this could be considered a high delay rate (31% when considering just those initiatives delayed past their planned completion dates, and 53% when adding in those experiencing delays) a look at the reasons behind the delays reveals that the initiative as a whole was implemented during unusual times, leading to a higher number of delayed initiatives than would have otherwise occurred.

Finding 7: An analysis of the reported reasons for delays indicates that the WCTSS Initiative was implemented in unusual times (e.g. budgetary realignment at TC); and this increased the number of initiatives that incurred a delay or are experiencing delays beyond what would have otherwise occurred.

One of the most common reasons for delays (see Table 12) was Administrative or HR issues (reported nine times). This includes delays due to lengthy contracting, procurement, classification and staffing processes. It also includes the departure of staff with specialized expertise and difficulty finding the specialized expertise required (e.g. specialized scientists); and delays in obtaining necessary IT services from Shared Services Canada, such as high performance computing capacity for high resolution modelling.

In some instances these delays perhaps could have been mitigated with better planning. However, in others, funds were received late in the fiscal year such that there was simply no time to complete lengthy administrative processes.

Changes in plans or circumstances, which could not have been foreseen, affected seven initiatives. This includes things such as unexpected design modifications for a construction project (ECCC's Next Generation Environmental Simulator), resource projects not being approved (which impacts the immediate need for some initiatives), a review leading to an unanticipated alternative course of action, or an assessment of an off-the-shelf software leading to its rejection and the creation of in-house custom modelling capabilities instead.

Table 12: Primary Reasons Reported for Delays by WCTSS Initiatives

Primary Reasons for Delays	# of Initiatives	Initiatives
		Phase of WCTSS: Phase 1A Phase 1B Phase 2
Administrative or HR issues	9	**Scientific Research and Activities** (Fate and Behaviour Modelling – DFO) {Phase 1A}
		Amendments to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program (TC) {Phase 1A}
		Systematic Surveillance and Monitoring of Ships – NASP (TC) {Phase 1B}
		Public, Private and Community Partnerships (CCG) {Phase 1B}
		Incident Command System (CCG) {Phase 1B}
		Science and Technology for Clean-up (Assessing Maritime Pollution Risk and Oil Sands Products and Enhanced 24-7 High Resolution Ocean Oil Spill Modelling Capabilities – ECCC; High Resolution Ocean Modelling – DFO) {Phase 1B}
		Modern Navigation System – Phase 1 (DFO) {Phase 2}
		Area Response Planning Pilot Project (TC) {Phase 2}
		Operational Science for Marine Oil Spill Response (ECCC) {Phase 2}
Changes in plans or circumstances	7	**New/Modified Aids to Navigation to Service the Kitimat Area** (DFO-CCG) {Phase 1A}
		Hydrographic/Navigational Products for Kitimat (Purchase and Install Tide Gauges and Model Currents – DFO) {Phase 1A}
		Transport Canada Centre in Kitimat (TC) {Phase 1A}
		Scientific Research and Activities (Guidance and Support to Seabird Baseline Monitoring – ECCC) {Phase 1A}
		Appropriate Governance for Ports (TC) {Phase 1B}
		Science and Technology for Clean-up (Enhancement of Operational 24-7 Oil Spill Modelling Response and Ocean Modelling Capabilities – ECCC) {Phase 1B}
		Operational Science for Marine Oil Spill Response (ECCC) {Phase 2}
TC Budgetary realignment/lack of resources	6	**Amendment to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program** (TC) {Phase 1A}
		Increased/Mandatory Tanker Inspections (TC) {Phase 1B}
		Review of Navigational Plans for High Risk Waters – TERMPOL (TC) {Phase 1B}
		Systematic Surveillance and Monitoring of Ships – NASP (TC) {Phase 1B}
		Public, Private and Community Partnerships (TC) {Phase 1B}
		Modern Navigation System – Phase 1 (TC) {Phase 2}
Technical difficulties/IT services	2	**Scientific Research and Activities** (Inventory of Marine Resources – DFO, Mapping of Near-shore Habitats and Benthic Ecosystems – DFO, Research and Advice on Interactions with Ecosystems – DFO) {Phase 1A}
		Modern Navigation System – Phase 1 (ECCC) {Phase 2}
Bad weather and mechanical failure	2	**Hydrographic/Navigational Products for Kitimat** (Multibeam Surveys in Critical Navigation Channels – CHS; Data Management and Production – CHS) {Phase 1A}
		Systematic Surveillance and Monitoring of Ships – NASP (TC) {Phase 1B}

TC budgetary realignment/lack of resources also delayed a number of initiatives (it affected six initiatives). This created an out-of-the ordinary environment for the implementation of the WCTSS Initiative, which could not have been mitigated and which ultimately increased the number of initiatives that were delayed past their end date (or are experiencing delays), beyond what might have been expected.

There were a couple of uncommon reasons for delay as well. For example, two initiatives were delayed because of technical difficulties. This includes technical difficulties associated with the deployment of navigation equipment (i.e. smart buoys) and IT not being able to provide a functional Geographic Information System (GIS) server to perform geospatial data analysis (three components of the Scientific Research and Activities initiative were affected). Finally, a couple of initiatives were delayed because of weather and mechanical failure (i.e. ships or airplanes breaking down).

Finding 8: For many of the initiatives that were delayed or are experiencing delays, there are no consequences. When consequences and other risk factors, such as new target dates and arrangements for funding are taken into account, 7 initiatives are a concern in the sense that they require closer monitoring (2) or action (5).

Some of the delayed initiatives are not a concern because the delay is of no consequence. For example, three of the delayed initiatives will be completed the following fiscal year and arrangements were made to have funds moved forward to accommodate the delays or the work will be completed with A-base resources. All three of these are science-based initiatives, i.e. DFO's and ECCC's Scientific and Research Activities initiative and DFO's Hydrographic/Navigational Products for Kitimat and New/Modified Aids to Navigation to Service the Kitimat Area initiatives.

For other initiatives, there are consequences in being delayed or reducing ongoing activities. An example of the latter is the NASP initiative. Reductions in the pollution surveillance hours and educational and awareness activities of the NASP has likely reduced the program's effectiveness as a deterrent against polluters.[8] An example of the former is initiatives that did not develop a costing strategy/model for inspections as initially planned and as a result, funding is needed to cover the cost of inspections, e.g. TERMPOL and Increased/Mandatory Inspections.

In order to get a clearer picture of which of the delayed initiatives (or initiatives experiencing delays) were a concern, evaluators ranked the initiatives according to implementation status, consequences (of not completing the initiative on time or undertaking ongoing activities to the extent planned) and other risk-related factors. These other factors are as follows:

- Number of milestones affected/delayed.
- Likeliness of completion by original end-date/whether meeting on-going targets.
- Whether there is a revised schedule or a clear plan to meet target dates.
- Whether the initiative will need additional funds to continue (based on individuals reporting this and on whether the initiative was receiving funding).
- Complexity of the initiative (number of components, dollars and departments involved).

Table 13 presents the results of this ranking. Evaluators marked initiatives that were delayed past their original end date but for which resources have been identified to complete them and where a completion strategy had been established, with a green circle (🟢), along with those on track, to indicate that the implementation status of these initiatives is not a concern. These delayed initiatives scored 2 or less on the risk scale (see Annex C for the ratings of the initiatives on the individual risk components).

[8] See footnote 12 on page 43.

One of these is the Transport Canada Centre (TCC) in Kitimat initiative. The resource projects in the Kitimat area have not yet been approved and consequently tanker traffic has not yet increased to levels that would warrant inspectors permanently housed in a TCC at Kitimat. Similarly, for the Appropriate Governance for Ports initiative, there is no urgent need for Kitimat to have a public port designation under the *Canada Marine Act*, given current traffic levels. Inspectors, when required in the Kitimat area, are travelling from Prince Rupert and Vancouver and the Governance for Ports initiative is funded with existing resources. In total, evaluators rated the implementation status of thirteen initiatives as green – not a concern (●). Initiatives that are on track are included in this total.

There are two initiatives, which are experiencing delays, and to which evaluators assigned a caution sign (◆) to indicate that these initiatives require closer monitoring or follow-up. These are 1) the Public, Private and Community Partnerships initiative (CCG) and 2) the Modern Navigation System – Phase 1 initiative as a whole. These initiatives have been experiencing multiple delays, there was no revised completion schedule, and the latter initiative is complex while the former is unlikely to be completed by the original end date, according to the assessment of evaluators. It is too early to consider whether the Modern Navigation System – Phase 1 will be completed on time and what the consequences might be since the end date for this initiative is later than most {ATIP REMOVED}Initiatives that were given a caution sign scored 3 on the risk scale.

Evaluators also assigned a caution (◆) to one component of the Hydrographic/Navigational Products for Kitimat initiative (DFO-CHS), only because delays were encountered in negotiating an implementation process for the broadcast system between CHS and CCG and no target date was provided for when it might be implemented; yet this was the raison d'être for the initiative.

Finally, there are five initiatives for which evaluators assigned a red flag ( ) to indicate that some action is required:

- Amendment to the *Canada Shipping Act*, 2001 and Modernization of the Environmental Response Program (TC)

  Original planned completion date was 2016-17.

  Whether the regulatory work will be completed by the end of FY 2016-17 will depend on whether industry consultations result in no further changes and regulatory priorities and the availability of legal drafters.

  Staffing constraints related to TC budgetary realignment slowed down the work associated with the Environmental Response Program and impeded the program's ability to meet its objectives to enhance compliance inspections at oil handling facilities.

  Alternative sources of funding might have to be found.[9]

- Increased/Mandatory Tanker Inspections (TC)

  Original planned completion date was 2016-17.

[9] In September 2016, TMX (TC management) approved the continued implementation of the ER Modernization program and as such authorized the staffing of regional positions. As such, this initiative at the time of writing the report, might be a some potential Risk instead of an identifiable risk .

TC reached 100% inspection of all foreign flagged tankers in 2014-15, as it was supposed to. However, in Q3 and Q4 of 2015-16, inspections were carried out on the basis of risk because of budgetary realignment at TC.

Drafting the amendments has been delayed by budgetary realignment as well and is expected to be completed in the fall of 2016. The cost-recovery strategy for inspections has been delayed as well, and is not expected to be implemented until 2018-19, at the earliest.

{ATIP REMOVED}

Further interim funding will be needed for FY 2017-18 and beyond.

- Review of Navigational Plans for High Risk Waters – TERMPOL (TC)

  Original planned completion date was 2013-14.

  The initiative has been experiencing delays in developing its long-term cost recovery model.

  The demand for TERMPOL reviews has been growing.

  The initiative was funded with existing resources.

  It has no resources to pursue consultations regarding regulatory options.[10]

- Area Response Planning Pilot Project (TC, CCG, DFO and ECCC)

  Original planned completion date was 2016-17.

  The deferral of engagement activities delayed other components of the initiative.

  The amount of work and sequencing of the risk analysis, planning and policy activities has resulted in overall project delays beyond 2016-17. Project completion is now planned for the first quarter of 2017-18.[11]

  The status of implementation of this initiative impacts the Community Participation Funding Program.

- Systematic Surveillance and Monitoring of Ships – National Aerial Surveillance Program - NASP (TC).

  The NASP has been experiencing delays, but the bigger concern is that due to budgetary realignment at TC, the NASP was required to reduce ongoing activities.

  The NASP was expected to increase the number of pollution patrol hours flown to approximately 2,300 hours each year nationally for the first four years (2012-16) and 2,800 hours in 2017-18 and beyond. In 2015-2016, the NASP flew only 1,939 hours on pollution patrol hours. In 2016-17, TC anticipates flying only 1,300 hours.

  It was also required to cancel educational and awareness activities; limit pollution surveillance flights on weekends and statutory holidays, and reduce overnight patrols and overtime.

[10] {ATIP REMOVED}
[11] {ATIP REMOVED}

All of these changes have resulted in reducing the NASP's effectiveness in terms of pollution prevention.[12]

It is not clear when the NASP will obtain the money to resume increases in on going activities.[13]

These initiatives obtained 4 or more on the risk scale (maximum 6). For further details about how these initiatives were rated in terms of individual risk components, see Annex C.

Table 13: WCTSS Initiatives by End-date, Implementation Status and Risk Classification

Initiative	End-date	Implementation Status	Risk Classification
	Phase of WCTSS: Phase 1A Phase 1B Phase 2		
New/Modified Aids to Navigation to Service the Kitimat Area (DFO-CCG) {Phase 1A}	2016-17	**Delayed**	●
Hydrographic/Navigational Products for Kitimat (DFO-CHS) {Phase 1A}	2015-16	**Delayed**	●
Multibeam Surveys in Critical Navigation Channels (CHS) {Phase 1A}		Completed	●
Purchase and Install Tide Gauges and Model Currents (DFO-CHS) {Phase 1A}		Delayed	◆
Data Management and Production (CHS) {Phase 1A}		Delayed	●
Tanker Screening Guidelines (TC) {Phase 1A}	2014-15	**Completed** (qualified)	✓
Transport Canada Centre in Kitimat (TC) {Phase 1A}	2016-17	**Delayed**	●
Amendment to the *Canada Shipping Act*, 2001 and Modernization of the Environmental Response Program (TC) {Phase 1A}	2016-17	**Delayed**	⚑
Team of International Experts on Tanker Safety (TC) {Phase 1A}	2013-14	**Cancelled**	●
Panel Review of Canada's Oil Spill Preparedness & Response Regime (TC) {Phase 1A}	2015-16	**Completed**	✓
Scientific Research and Activities (ECCC, DFO) {Phase 1A}	2015-16	**Delayed**	●
Wave Tank Research (DFO) {Phase 1A}		Completed	✓
Fate and Behaviour Modelling (DFO) {Phase 1A}		Delayed	●
Inventory of Marine Resources (DFO) {Phase 1A}		Delayed	●
Mapping of Near-shore Habitats and Benthic Ecosystems (DFO) {Phase 1A}		Delayed	●
Research and Advice on Interactions with Ecosystems (DFO) {Phase 1A}		Delayed	●
Enhanced R&D on Containment and Shoreline Fate and Behaviour, Spill Modelling and Countermeasures (ECCC) {Phase 1A}		Completed	✓
Guidance and Support to Seabird Baseline Monitoring (ECCC) {Phase 1A}		Delayed	●
Coordinated Identification of Environmental Priorities (ECCC) {Phase 1A}		Delayed	●
Integrated Satellite Tracking of Pollution - Satellite Based Monitoring (ECCC) {Phase 1A}	2016-17	**Completed**	✓
Increased/Mandatory Tanker Inspections (TC) {Phase 1B}	2015-16	**Delayed**	⚑
Options for a Modern Charted Navigation System (CCG-CHS of DFO) {Phase 1B}	2013-14	**Completed**	✓
Geoscience Studies for Marine Safety in the BC North Coast (NRCan)	2017-18	**On track**	●

[12] This is because the NASP's effectiveness is tied to its ability to deter polluters. This is in turn tied to the commercial shipping industry knowing that the NASP is surveilling them (education and awareness activities) and their not knowing the NASP flight schedules. With regular flight times, such as 9:00 to 5:00, Monday to Friday, polluters know they are safe to pollute outside of these times and days. Similarly, the effectiveness of deterrence, like policing, in terms of the number of violators caught or deterred is a function of the number of patrol hours.

[13] {ATIP REMOVED}

Initiative	End-date	Implementation Status	Risk Classification
	Phase of WCTSS: Phase 1A Phase 1B Phase 2		
{Phase 1B}			
Review of Navigational Plans for High Risk Waters – TERMPOL (TC) {Phase 1B}	2013-14	**Delayed**	
Review of Compulsory Pilotage and Tug Escorts (TC) {Phase 1B}	{ATIP REMOVED}	**Completed**	✓
Appropriate Governance for Ports (TC) {Phase 1B}	{ATIP REMOVED}	**Delayed**	●
Systematic Surveillance and Monitoring of Ships – NASP (TC) {Phase 1B}	{ATIP REMOVED}	**Experiencing delays**	
Laying the Groundwork for the Arctic (TC, CCG) {Phase 1B}	{ATIP REMOVED}	**Completed**	✓
Public, Private and Community Partnerships (CCG, TC) {Phase BA}	{ATIP REMOVED}	**Delayed**	◆
Incident Command System (CCG) {Phase 1B}	{ATIP REMOVED}	**Experiencing delays**	●
Incident Command Support (ECCC) {Phase 1B}	{ATIP REMOVED}	**On track**	●
Review of Spill Treating Agents & Countermeasures (ECCC, DFO, TC, NRCan) {Phase 1B}	{ATIP REMOVED}	**Completed**	✓
Science and Technology for Clean-up (DFO, ECCC, NRCan) {Phase 1B}	{ATIP REMOVED}	**Experiencing delays**	●
Enhancement of Operational 24-7 Oil Spill Modelling Response and Ocean Modelling Capabilities (ECCC) {Phase 1B}		Experiencing delays	●
Assessing Maritime Pollution Risk and Oil Sands Products and Enhanced 24-7 High Resolution Ocean Oil Spill Modelling Capabilities (ECCC) {Phase 1B}		Experiencing delays	●
High Resolution Ocean Modelling System (DFO, with input from ECCC) {Phase 1B}		Experiencing delays	●
Diluted Bitumen Wave Tank Research (DFO) {Phase 1B}		On track	●
Diluted Bitumen Characterization Research (NRCan) {Phase 1B}	{ATIP REMOVED}	On track	●
Review of Liability and Compensation Regime (TC) {Phase 1B}	{ATIP REMOVED}	**Completed**	✓
Modern Navigation System – Phase 1 (CCG, DFO, ECCC, TC) {Phase 2}	{ATIP REMOVED}	**Experiencing delays**	◆
Ocean Networks Canada Smart Oceans Contribution Program (TC) {Phase 2}	{ATIP	**On track**	●

Initiative	End-date	Implementation Status	Risk Classification
	Phase of WCTSS: Phase 1A Phase 1B Phase 2		
	REMOVED}		
Area Response Planning Pilot Project (TC, CCG, DFO, ECCC) {Phase 2}	{ATIP REMOVED}	**Delayed**	
Community Participation Funding Program (TC) {Phase 2}	{ATIP REMOVED}	**Initially Delayed** (but now on track)	●
Alternative Response Measures – legislative amendments (TC, ECCC) {Phase 2}	{ATIP REMOVED}	**Experiencing delays**	●
Operational Science for Marine Oil Spill Response (ECCC, NRCan) {Phase 2}	{ATIP REMOVED}	**Experiencing delays**	●
Contribution to Clear Seas Centre for Responsible Marine Shipping (TC) {Phase 2}	{ATIP REMOVED}	**On track**	●
Enhancements to Ship-Source Oil Pollution Fund (TC) {Phase 2}	{ATIP REMOVED}	**Experiencing delays**	●
Options for Long-Term Governance & Funding of WCTSS (TC, CCG-DFO) {Phase 2}	{ATIP REMOVED}	**On track**	●

Classification according to status of implementation and risk factors:

✓ **No Risk – Initiative Completed**

● **No Risk** - **No Concerns**

The status of implementation is not a concern – scores 2 or less on the risk scale.

These are generally initiatives that are on track in terms of status of implementation, or

They are delayed past their original end date but resources have been identified to complete them and a completion strategy has been established.

◆ **Some Potential Risk – Some Potential Concerns**

The initiative requires close monitoring – scores 3 on the risk scale.

These initiatives have been experiencing multiple delays, there was no revised completion schedule, and the initiatives are very complex or they are unlikely to be completed by the original end date; or

The sub-initiative is almost complete except for an issue with an important component, which had not been resolved at the time of the evaluation and which will impede the achievement of the overall objective of the initiative.

 **Identifiable Risks** - **Some Concerns Identified**

Action is required if the initiative is to be completed – scores 4 or more (maximum 6) on the risk scale.

Initiative	End-date	Implementation Status	Risk Classification
	Phase of WCTSS: Phase 1A Phase 1B Phase 2		
These initiatives have been delayed past their end dates or are experiencing multiple delays and/or ongoing objectives are not being met; and Some key milestones of these initiatives have not been, will not be or are unlikely to be completed by their original end date; and There was no revised completion strategy; and additional funds are or will likely be needed to complete them or they are very complex. Also, the delays (or not meeting ongoing activities) have consequences.			

RESOURCE UTILIZATION

Finding 9: **Overall resource utilization of new funds spent across fiscal years was close to 76%, but it varied considerably by department and initiative, generally increasing over time. There was plenty of evidence of resources being properly managed through re-profiling or cash management and very little evidence of lapsed funds.**

Reasons for variances varied by department, but were usually related to delays in receiving funds, delays in project schedules or delays in administrative processes such as procurement, contracting and staffing.

Table 14 presents the data on resource utilization (average percentage of new funds spent across fiscal years) by department and initiative. The total percentage of new funds spent by the four departments is 75.6%. NRCan had the highest percentage of new funds spent (95.4%), followed by TC (85.8%), DFO (69.2%) and ECCC (62.4%).

Table 14: Average Percentage of New Funds Spent across Fiscal Years by Department and Initiative

Department	Initiative	Total $ Allocated (new funds)	% of Budget Spent (weighted average)
	Phase of WCTSS: Phase 1A Phase 1B Phase 2		
NRCan	**Operational Science for Marine Oil Spill Response**** {Phase 2}	{ATIP REMOVED}	**99.2%**
	Geoscience Studies for Marine Safety in the B.C. North Coast {Phase 1B}	{ATIP REMOVED}	**93.7%**
	NRCan Total	{ATIP REMOVED}	**95.4%**
TC	**Modern Navigation System – Phase 1 {Phase 2}**	{ATIP REMOVED}	**100.0%**
	Ocean Networks Canada Smart Oceans Contribution Program {Phase 2}	{ATIP REMOVED}	**100.0%**
	Contribution to Clear Seas Centre for Responsible Marine Shipping {Phase 2}	{ATIP REMOVED}	**100.0%**
	Area Response Planning Pilot Project**	{ATIP	**96.5%**

Department	Initiative Phase of WCTSS: Phase 1A Phase 1B Phase 2	Total $ Allocated (new funds)	% of Budget Spent (weighted average)
	{Phase 2}	REMOVED}	
	Systematic Surveillance and Monitoring of Ships – NASP {Phase 1B}	{ATIP REMOVED}	**93.3%**
	Increased/Mandatory Tanker Inspections – {Phase 1B}	{ATIP REMOVED}	**90.2%**
	Public, Private and Community Partnerships {Phase 1B}	{ATIP REMOVED}	**89.8%**
	Panel Review of Canada's Oil Spill Preparedness & Response Regime {Phase 1A}	{ATIP REMOVED}	**85.8%**
	Transport Canada Centre in Kitimat {Phase 1A}	{ATIP REMOVED}	**79.2%**
	Amendment to the Canada Shipping Act, 2001 and Modernization of the Environmental Response Program {Phase 1A}	{ATIP REMOVED}	**78.4%**
	Options for Long-Term Governance and Funding of WCTSS {Phase 2}	{ATIP REMOVED}	**73.1%**
	Tanker Screening Guidelines {Phase 1A}	{ATIP REMOVED}	**67.5%**
	Community Participation Funding Program {Phase 2}	{ATIP REMOVED}	
	TC Total	{ATIP REMOVED}	**85.8%**
DFO	**Public, Private and Community Partnerships {Phase 1B}**	{ATIP REMOVED}	**115.7%**
	Hydrographic/Navigational Products for Kitimat {Phase 1A}	{ATIP REMOVED}	**107.6%**
	Purchase and Install Tide Gauges and Model Currents **{Phase 1A}**	{ATIP REMOVED}	140.0%
	Multibeam Surveys in Critical Navigation Channels **{Phase 1A}**	{ATIP REMOVED}	98.9%
	Data Management and Production **{Phase 1A}**	{ATIP REMOVED}	94.4%
	Modern Navigation System – Phase 1 {Phase 2}	{ATIP	**99.4%**

Department	Initiative Phase of WCTSS: Phase 1A Phase 1B Phase 2	Total $ Allocated (new funds)	% of Budget Spent (weighted average)
		REMOVED}	
	Scientific Research and Activities {Phase 1A}	{ATIP REMOVED}	**87.9%**
	Inventory of Marine Resources **{Phase 1A}**	{ATIP REMOVED}	108.4%
	Mapping of Near-shore Habitats and Benthic Ecosystems **{Phase 1A}**	{ATIP REMOVED}	99.6%
	Wave Tank Research **{Phase 1A}**	{ATIP REMOVED}	91.5%
	Research and Advice on Interactions with Ecosystems **{Phase 1A}**	{ATIP REMOVED}	81.3%
	Fate and Behaviour Modelling **{Phase 1A}**	{ATIP REMOVED}	79.8%
	Science and Technology for Clean-up {Phase 1B}	{ATIP REMOVED}	**81.3%**
	Diluted Bitumen Wave Tank Research {Phase 1B}	{ATIP REMOVED}	87.9%
	High Resolution Ocean Modelling System {Phase 1B}	{ATIP REMOVED}	65.9%
	Area Response Planning Pilot Project {Phase 2}**	{ATIP REMOVED}	**78.5%**
	Options for Long-Term Governance and Funding of WCTSS {Phase 2}	{ATIP REMOVED}	**49.5%**
	New/Modified Aids to Navigation to Service the Kitimat Area {Phase 1A}	{ATIP REMOVED}	**47.6%**
	Incident Command System {Phase 1B}	{ATIP REMOVED}	**37.1%**
	DFO Total	{ATIP REMOVED}	**69.2%**
ECCC	**Integrated Satellite Tracking of Pollution - Satellite Based Monitoring {Phase 1A}**	{ATIP REMOVED}	**112.9%**
	Scientific Research and Activities {Phase 1A}	{ATIP	**102.7%**

Department	Initiative Phase of WCTSS: Phase 1A Phase 1B Phase 2	Total $ Allocated (new funds)	% of Budget Spent (weighted average)
		REMOVED}	
	Guidance and Support to Seabird Baseline Monitoring **{Phase 1A}**	{ATIP REMOVED}	103.9%
	Coordinated Identification of Environmental Priorities {Phase 1A}	{ATIP REMOVED}	86.7%
	Enhanced R&D on Containment and Shoreline Fate and Behaviour, Spill Modelling and Countermeasures {Phase 1A}	{ATIP REMOVED}	64.9%
	Area Response Planning Pilot Project {Phase 2}	{ATIP REMOVED}	**96.3%**
	Incident Command Support {Phase 1B}	{ATIP REMOVED}	**94.9%**
	Science and Technology for Clean-up {Phase 1B}	{ATIP REMOVED}	**45.1%**
	Enhancement of Operational 24-7 Oil Spill Modelling Response and Ocean Modelling Capabilities**{Phase 1B}**	{ATIP REMOVED}	57.0%
	Assessing Maritime Pollution Risk and Oil Sands Products and Enhanced 24-7 High Resolution Ocean Oil Spill Modelling Capabilities **{Phase 1B}**	{ATIP REMOVED}	36.8%
	Operational Science for Marine Oil Spill Response {Phase 2}	{ATIP REMOVED}	**25.0%**
	Modern Navigation System – Phase 1 {Phase 2}	{ATIP REMOVED}	
	ECCC Total	{ATIP REMOVED}	**62.4%**
	Grand Total	{ATIP REMOVED}	***75.6%***

***** Excludes contribution programs which received money under this initiative.***
**** The CPCP was restructured such that it did not actually start until 2016-17.***
**** ECCC only spent 1% of the monies received in 2015-16, due to an overhaul in the technology of the buoys it was about to purchase, and it was left-out of the calculations as it would have skewed results.***

Environment and Climate Change Canada

The average percentage of ECCC funds spent across fiscal years was below 80 for two initiatives and one sub-initiative of a third initiative in which ECCC was involved. Finding and retaining specialized expertise

were identified as fairly common reasons for the lower percentages spent, including procurement/acquisition issues.

ECCC obtained its lowest percentage spent for the Operational Science for Marine Oil Spill Response initiative; an average of only 25.0% of the funds allotted to ECCC were spent across the two fiscal years of the initiative. The percentage was low in both fiscal years. Monies were received in the latter part of the first fiscal year of the initiative, and as a result, some capital items could not be purchased until the next fiscal year. There was also difficulty finding the specialized expertise needed to develop a new test tank facility, and the procurement process for the development of the tank and facilities was more complicated and lengthy than anticipated. The variance was also a result of planned stakeholder consultations and associated contracts being put on hold.

ECCC's second lowest average percentage spent was for the Science and Technology for Clean-up initiative (45.1%). This is due to the low percentage of funds spent for both the Assessing Maritime Pollution Risk and Oil Sands Products and the Enhanced 24-7 High Resolution Ocean Oil Spill Modelling Capabilities (36.8%), and the Enhancement of Operational 24-7 Oil Spill Modelling Response and Ocean Modelling Capabilities (57.0%) sub-initiatives. A large portion of the work under these sub-initiatives relies on specialized model development expertise for the 24-7 integrated oil spill modelling system. ECCC had difficulties finding and retaining the specialized personnel needed to undertake the work involved in these sub-initiatives. A sudden departure of personnel for more attractive opportunities prevented the management of the funds through re-profiling. For the third fiscal year of the former sub-initiative, difficulties with procurement/acquisition were also encountered. Funds were not re-profiled.

The percentage spent on the ECCC's sub-initiatives under the Scientific Research and Activities initiative was high across the three fiscal years with an average of 102.7%. The percentage was low however, (64.9%) for one sub-initiative, the Enhanced R&D on Containment and Shoreline Fate and Behaviour, Spill Modelling and Countermeasures sub-initiative. The percentage was lowest in the first two fiscal years; 56.5% in 2013-14 and 55.5% in 2014-15. It was almost 80% in the third fiscal year. One reason for the variance in all three years was Human Resource (HR) issues, e.g. delays in hiring, unexpected departure and difficulty finding the specialized expertise required. For the third fiscal year, difficulties with procurement/acquisition were also encountered.

As for the percentage of funds spent out of the funds allotted for ECCC's involvement in the Modern Navigation System – Phase 1, the financial data was removed from the analysis because almost all of the **{ATIP REMOVED}**allocated in 2015-16, the first year of the initiative, was carried forward. This is because there was an overhaul in the technology for buoys underway and ECCC decided to delay purchasing the buoys so that they could investigate their options. The budgeted capital amount was carried forward.

Fisheries and Oceans Canada

DFO's spending on its three science-based initiatives was generally quite high (above 80%). When DFO did experience low spending (on two sub-initiatives), it was due to unique circumstances such as difficulty in obtaining additional High Performance Computer (HPC) capacity through Shared Services Canada.

The average percentage spent on DFO's Hydrographic/Navigational Products for Kitimat initiative across the three fiscal years was 107.6%. The percentage is higher than 100 because funds were cash managed

within DFO, as they were in some other departments, such that funds that could not be used for a given initiative or component of an initiative in a given fiscal year were distributed to other WCTSS initiatives or components that could use it.

The average percentage of funds spent on DFO's Scientific Research and Activities initiative across the three fiscal years was also quite high (i.e. above 80%), at 87.9%. An exception is the Fate and Behaviour Modelling sub-initiative, which spent 79.8% across the three fiscal years. This is in large part due to expenditure in fiscal year 2015-16, when only 60.4% of the allocated funds were spent on this sub-initiative. The explanation is that DFO experienced delays in acquiring additional HPC capacity resources from Shared Services Canada. (DFO requested a carry-forward so that the ocean modelling work could continue with ECCC into 2016-17.)

The average percentage spent on DFO's Science and Technology for Clean-up initiative across its first two fiscal years was similarly high (81.3%). It would have been higher were it not for the lower average expenditure on the High Resolution Ocean Modelling System sub-initiative (66.1%). This low expenditure was, in turn, largely due to the low expenditure on this sub-initiative in fiscal year 2013-14, when only 41.1% of the funds was spent. The percentages for the two subsequent years were also relatively low (77.2% and 74.2%). The variance for all years can be explained by the difficulty in obtaining additional HPC capacity through Shared Services Canada, which was mentioned previously. HR issues, specifically related to specialized expertise, also explains the variance. Funds were carried forward to complete the modelling work and DFO explored other venues to address some of the issues with finding specialized expertise, such as collaborating with academic institutions.

Average spending on two out of the three initiatives involving only the CCG side of DFO across fiscal years was low. Administrative issues related to spending capital funds, contracting, and HR (delays in staffing) stand out as explanations for the variance on the CCG side.

The lowest average percentage of funds spent across fiscal years for any of the DFO initiatives was for the Incident Command System initiative. The average percentage spent across the three fiscal years was only 37.1%, though spending did improve over time (from 10.6% in 2013-14 to 29.0% in 2014-15 to 57.2 in 2015-16). The explanations for the variances are as follows: 1) less than the full-year allocation was provided in November 2013, giving little remaining time in the fiscal year to commence the initiative, 2) an underestimation of how long it would take to complete procurement processes through PWGSC and Shared Services for two major capital projects (the Information Management System and National Situation Centre) and 3) an underestimation of how long the HR processes associated with establishing the Office of Incident Management would take. Funds were carried forward.

The second lowest average percentage of funds spent on DFO initiatives was for the New/Modified Aids to Navigation to Service the Kitimat Area initiative (47.6%). The low average percentage was largely due to expenditure in 2013-14, when only 5.8% of the funds were spent. The explanation is that capital monies received in 2013-14 for the installation of aids to navigation were not used because of delays in the completion of Phase 1 of the review (and these aids can only be installed in the summer months). Phase II of the review was also completed later than planned (in 2015-16), due to efforts to validate findings through additional client engagement with remote and First Nation communities. This in turn led to further delays in the installation of aids to navigation and the use of capital funds in 2014-15. Consequently, only 22.3% of the funds allocated for this initiative in 2014-15 were spent. However, in 2015-16, 92.0% of the funds allotted were spent.

There were two initiatives of the remaining three in which DFO was involved and for which a low average percentage of funds across fiscal years was spent, and they involved both the CCG and the science side of DFO. The delay in consultations formed part of the reasons for the variances in the spending on these two initiatives.

There was also a low average percentage of DFO funds spent across the two fiscal years relative to those allotted for the Options for Long-Term Governance and Funding of WCTSS initiative (49.5%). In the first year of DFO's participation, only 29.1% of the funds allotted to DFO were spent. In the second year, 60.3% was spent. The explanations for the variances are: 1) delays in staffing and starting this initiative led to funds being carried forward to the next year, 2) delays in the completion of other activities and deliverables lead to delays in engagement activities with stakeholders in 2014-15, and as a result, resources were not used and many other activities were not completed, and 3) engagement activities, pushed to 2015-16.

The only other initiative in which DFO participated and for which a somewhat low average percentage of DFO funds were spent was the Area Response Planning Pilot Project initiative (78.5%); this is nonetheless above the DFO average (69.1%). The reason for the variance is delays in staffing, the delays in the development of the risk methodology, and associated consultations. Funds and associated staffing resources were carried forward by the CCG to attempt to offset the timeline implications, carrying the final planning elements into early 2017-18.

Transport Canada

Of the 13 WCTSS initiatives in which TC was involved, only four of them had an average percentage spent across fiscal years that was lower than 80. The reasons for the low expenditure were quite varied.

The lowest average percentage spent among the TC initiatives was obtained for the Tanker Screening Guidelines initiative (67.5%). This was due largely to only 20.7% of the funds being spent in fiscal year 2014-15. The explanations for the variance are "not staffing one Full-Time-Equivalent (FTE) as originally forecasted" and contracting a marine chemist as an expert witness in a prosecution for a price that was less than anticipated.

The three other relatively low spending initiatives, along with their reasons for variance are as follows:

- The Options for Long-Term Governance and Funding of WCTSS initiative (73.1%)

  The low expenditure only occurred in fiscal year 2014-15, the first year of the initiative (41.2%).

  Due to departmental budget constraints, a different procurement approach was taken to complete the governance studies, which resulted in lower expenditures.

  Work and stakeholder engagement related to the development of a long-term funding strategy for WCTSS was not undertaken. Due to a change in strategy, this work was no longer required.

- The Amendment to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program initiative (78.4%)

  The low spending occurred in 2013-14 and 2014-15 (71.8% and 65.3%, respectively).

Financial resourcing was officially received late in the fiscal year (through Supplementary Estimates B on December 23, 2013).

So, there was a surplus of funds as a result of receiving monies to pay for the cost of the new Environmental Response Program for a full fiscal year when the development of the Program had not yet been undertaken.

Similarly, during the 2013-14 fiscal year, there was a surplus because the funding that was to go to the regions was not utilized, given that the organizational structure of the Program in the regions had not yet been completed and new positions had not yet been created and classified.

The lower than anticipated legal services required for the proposed changes to the CSA 2001 also contributed to the surplus.

- The Transport Canada Centre (TTC) in Kitimat initiative (79.2%)

  The low spending occurred in 2014-15 only (55.0%).

  A mistake in the number of salary dollars allotted for the initiative through the Initial Budget Delegation was not corrected.

  Also, since it would not have made sense to establish the TTC at Kitimat with inspectors on site in the absence of additional tankers visiting Kitimat, and given the hiring of staff in the last quarter did not allow for their training in FY 2014-15, there was unused Ongoing Operation Costs funds, which were moved to fiscal year 2015-16.

Natural Resources Canada

NRCan's spending relative to allotments was high in all fiscal years for the two initiatives for which it received funding (over 90% for both initiatives for all fiscal years).

OUTPUTS/ACHIEVEMENTS

Finding 10: **A number of the expected outputs and deliverables from the WCTSS initiatives have been produced, especially in terms of advice from reviews and scientific information, both of which serve as foundations for other initiatives or components.**

However, because of delays in a number of initiatives, many outputs and deliverables are yet to come, especially in the areas of legislation/regulations and oversight.

Nonetheless, significant progress has been made.

Given the fact that very few initiatives had been completed at the time of the Review, other than the initiatives that were purely reviews, evaluators were unable to examine the extent to which the initiatives and their outputs have contributed to immediate outcomes, and this was anticipated at the start of the Review.

Only one legislative amendment has been made to date; there is now 24-7 integrated tracking of pollution in Canadian waters through satellite monitoring and new tanker screening guidelines; some community/stakeholder engagement activities have been completed; some new navigational infrastructure is in place; there has been training and exercises in support of the incident command

system under development, and there has been a great deal of output produced in the area of scientific information and advice.

In addition, there have been increases in the percentage of foreign flagged tankers that are inspected and the NASP had almost doubled its pollution patrol hours until departmental budget constraints were implemented in 2016-17. Examples of the outputs and achievements of the WCTSS initiative to date in the context of immediate outcomes are discussed in further detail below. For a more complete outline of outputs and achievements, see Annex D.

Advice

Most of the reviews, including the reviews within initiatives, have been completed. The only exceptions are the reviews embedded in the Modern Navigation System – Phase 1, which are on-going.

All of the completed reviews were used for their intended purpose, whether that be to determine what aids to navigation were needed to improve the navigational system, to determine what course of action was needed in a given area, such as governance of the WCTSS, to provide the Government of Canada with legislative or regulatory options or to inform the design of an initiative. Six of the completed reviews, along with their outcomes, were in support of safer navigation, two reviews were completed in support of improving the preparedness and response to oil spills from ships, one was competed in support of safer oil handling facilities and one was completed in support of improving the liability and compensation regime for oil spills.

In addition, the Tanker Safety Panel review, under the Panel Review of Canada's Marine Oil Spill Preparedness and Response Regime initiative made 45 recommendations to improve Canada's preparedness and response regime South of 60° and helped inform Phase II initiatives (e.g. Area Response Planning Pilot Initiative and Options for Long-term Governance and Funding of WCTSS) and beyond. In its second report, the Panel made 25 recommendations for the Arctic (North of 60°) and 17 recommendations for hazardous and noxious substances as well as one recommendation (applicable to both phases of the review) on the management of marine casualty incidents.

Finally, two of the three studies carried out under the Options for Long-Term Governance and Funding of WCTSS initiative were completed in 2015-16. A draft report for the third study was received in the early fall of 2016 and is currently being finalized. {ATIP REMOVED}**Legislations and Regulations**

Of the six initiatives that involved proposed legislative or regulatory changes, only the proposed legislative amendments under the Amendment to the CSA 2001 and Modernization of the Environmental Response Program initiative was completed. These amendments, which were part of the *Safeguarding Canada's Seas and Skies Act* (formerly Bill C-3), have been in force since December 2014.

Among other things, these amendments introduced new requirements for operators of oil handling facilities (OHFs), including the requirement to notify the Minister of their operations and to submit plans to the Minister. They will also have to demonstrate how they comply with the act and the regulations.

They extend civil and criminal immunity to the agents or mandataries of response organizations engaged in response operations. They also introduce new enforcement measures for Part 8 of the Act, including

the application of the administrative monetary penalties regime contained in Part 11 of that Act to Part 8.

The proposed regulatory changes under the initiative (pursuant to the CSA 2001) have not yet been made.

Oversight

In terms of oversight, progress has been made in three initiatives in support of enhanced preparedness and response to oil spills from ships.

In addition to the legislative changes mentioned above under the Amendment to the CSA 2001 and Modernization of the Environmental Response Program initiative, the OHF inspection policies, procedures and work instructions were developed and approved in September 2014 and a number of new inspector positions were classified. However, the Modernized Environmental Response Program to enhance compliance inspections at OHFs did not occur as planned since budgetary realignment at TC impeded the staffing of inspectors for the Program.

A second oversight initiative in support of improved response is the Integrated Satellite Tracking of Pollution (ISTOP) – Satellite Based Monitoring Initiative. ECCC is now providing 24-7 integrated tracking of pollution in Canadian waters through satellite monitoring (as opposed to 18-7). This was achieved through an MOU with the U.S. National Oceanic and Atmospheric Administration (NOAA) Satellite Analysis Branch by having them agree to cover Canadian waters with other satellites during down times. ECCC in turn, covers U.S waters for them. ECCC has also arranged for access to the European Space Agency's Sentinel satellite imagery for ISTOP analysis and has made enhancements to the analysis and production software.

A total of 2,109 images were analyzed during the FY 2014-15 with 50 anomalies detected; a total of 3,623 images were analyzed during the FY 2015-16 with 57 anomalies detected. For further details see Annex D.

A third oversight related initiative is TC's Systematic Surveillance and Monitoring of Ships – NASP initiative. Despite the reductions in pollution surveillance flying hours, the NASP identified 380 pollution incidents in FY 2015-16, compared to the 322 in FY 2014-15 and 214 in FY 2013-14.

Progress has also been made in the oversight of tankers in support of increased tanker safety.

- New tanker screening guidelines were created under the Tanker Screening Guidelines initiative to further strengthen inspection requirements.

- One hundred percent foreign tankers entering Canadian waters were inspected in FY 2014-15 and the first half of FY 2015-16 under the Mandatory/Increased Inspections initiative.

- Three TI positions (inspectors) were staffed in FY 2014-15. The inspectors completed the required 18-month training program under the Transport Canada Centre (TCC) in Kitimat initiative. Inspections of foreign vessels in Kitimat began in FY 2015-16.

Scientific Information (and Advice)

A large part of the scientific output under the WCTSS initiative has been in support of improved navigational infrastructure/information and ultimately improved navigational safety in Northern B.C. For example, the CHS (DFO) conducted hydrographic surveys with multi-beam technology (100% bottom coverage) in areas along the channels of the Northern Coast of B.C. as part of the Hydrographic and Navigational Products for Kitimat initiative. The surveyed areas included Caamano Sound, west of Stephens Island, and Hecate Strait.

The scientific information collected from these surveys was used to produce navigational charts to inform mariners sailing in the Kitimat area. Under the same initiative, DFO installed three permanent tide gauges at Kitimat, Caamano Sound and the southern tip of Haida Gwaii Islands to collect information on tides, currents and water levels. This information is being used to produce charts for safe marine navigation (and also for ocean current modelling).

As a second example, thirty-two of the expected 119 modification/installation of aids to navigation have been completed (as of March 2016) under the New/Modified Aids to Navigation to Service the Kitimat Area initiative. All remaining modification/installation are expected to be completed by the end of FY 2017-18.

For other examples of DFO's contribution to improved navigational infrastructure/information, see Annex D.

NRCan has also contributed to safer navigation in Northern B.C. Among other things, it deployed new seismometer and Global Positioning System (GPS) stations in Northern B.C. (specifically in the Kitimat/Douglas Channel area) to fill a major information gap in the seismic network (through the Geoscience Studies for Marine Safety in the B.C. North Coast initiative).

Routine and real-time monitoring of seismic and GPS data from these new stations is ongoing. A seascape map has been produced indicating seabed features and geohazards of the area. Faults have been identified as active or inactive, and dozens of previously unknown landslides have been identified. A report of the findings from this preliminary review of seismicity was published in the *Geological Survey of Canada*.

NRCan has also been investigating the frequency and magnitude of submarine landslides in the Douglas Channel, which are known to have caused destructive tsunamis in the 1970's. In FY 2014-15, for example, it conducted a ship-based survey and sampling mission to determine the triggers and frequency of occurrence of recently identified submarine slide hazards in B.C.'s coastal region. A scientific cruise report was published in the *Geological Survey of Canada*.

For other examples of NRCan's contribution, see Annex D.

Other scientific instruments have been put in place by ONC as a result of TC's financial support to the ONC through the Ocean Networks Canada Smart Oceans Contribution Program. In FY 2016-17, an ocean observatory was installed in Campbell River and in Kitamat Village.

The observatories consist of a shore station, underwater platform, AIS antenna, and a radar-based Wave and Current Monitoring System (WaMoS). These ocean monitoring instruments produce baseline data of the marine environment that is used to provide warnings of marine navigation hazards (and support

emergency preparedness and responses). For example, the WaMoS is capable of measuring surface currents, wave heights, and wave direction. This information can also useful for response planning in the event of an oil spill. The scientific information generated from the observatories is made available online to the public by the ONC.

In addition, the CCG implemented the E-Navigation hub in FY 2015-16 under the Modern Navigation System – Phase 1 initiative and posted it on-line to make real-time and up-to-date information available to mariners; and completed channel bottom monitoring surveys in 8 of 14 marine waterways in B.C., Nova Scotia and Newfoundland. The CHS, for its part, completed multi-beam surveys in 13 of 20 priority ports in FY 2015-16 for the production of Electronic Navigational Charts (the remaining 7 charts are in progress). The survey and chart production work is ongoing until the end of FY 2018-19.

A great deal of scientific information has also been generated under various WTCSS initiatives in support of enhanced preparedness and response to oil spills from ships.

For example, through various sub-initiatives of the Scientific and Research Activities initiative, as well as the Area Response Planning initiative, scientific information and advice has been produced from field surveys, the sampling of near-shore habitats and benthic ecosystems, and bird tagging activities. This information was generated to produce maps, databases and species distribution models to be used as tools to inform oil spill preparedness and response planning and to provide emergency advice in the event of an oil spill. The prior identification and mapping of resources at risk from a potential oil spill are particularly important for informing spill response priorities and countermeasures at the time of an actual oil spill. Some examples of results achieved in this area are as the follows:

- DFO created an inventory of marine resources, habitats and other ecosystem uses (under the Inventory of Marine Resources sub-initiative).

- DFO conducted field survey in priority areas along the Northern Coast of B.C., including the Douglas Channel, Principe and Squally Channels, and Gwaii Haanas (as part of the Mapping of Near-Shore Habitats and Benthic Ecosystems sub-initiative).

  The field surveys produced GIS-based data that are being used for the production of benthic maps of habitats. These maps are expected to be produced by the end of FY 2016-17 once the data analysis has been completed and will be used to produce a detailed delineation of Ecologically & Biologically Significant Areas (EBSAs) under the Inventory of Marine Resources sub-initiative.

  The data is also being used to create a geospatial database of EBSA information and will be transferred to ECCC by the end of FY 2016-17 for integration into their GIS mapping tools.

- Under the Area Response Planning initiative, DFO identified and mapped coastal and marine physical, biological and socio-economic sensitivities. Over 300 datasets were produced and provided for the development of the Area Risk Assessment methodology and Area Response Plans. A large number of these files were shared with ECCC for integration into their Environmental Emergencies Mapping System (EEMAP).

  DFO also developed a peer-reviewed framework to assess aquatic species vulnerability to oil exposure and further enhance the assessment of risk from a ship-source oil spill to an area.

DFO contribution funds were provided to more than 10 indigenous groups and NGOs (e.g. fisheries organizations) to map coastal and marine traditional knowledge (e.g., traditional fisheries, culturally important marine species, harvesting areas, coastal fisheries).

- ECCC has acquired and standardized over 80 geospatial datasets into GIS mapping tools (as part of the work under the Coordinated Identification of Environmental Priorities sub-initiative) to support its EEMAP.

- ECCC also developed species distribution models in FY 2015-16 to predict habitat suitability for conservation priority species (also under the Mapping of Near-Shore Habitats and Benthic Ecosystems sub-initiative). Spatial analyses are also being conducted to develop shapefiles for high priority species from commercial landings and research databases, which are expected to be completed in FY 2016-17.

- ECCC is using marine species distribution, population structure, and habitat data obtained from marine bird surveys and tracking tags (satellite telemetry, GPS and GLS data loggers) to understand the spatial and temporal risks for marine bird populations in the event of an oil spill. The collected data are expected to be incorporated into existing and new data products and decision support tools by the end of FY 2016-17. The data products will then be incorporated, where appropriate, into ECCC's EEMAP.

For further examples of achievements in the area of the prior identification and mapping of resources at risk from a potential oil spill in support of enhanced preparedness and response to oil spills from ships, see Annex D.

A second important area of scientific inquiry under the WCTSS initiative in support of improved preparedness and response to oil spills from ships, which has generated substantial results, is the behaviour of bitumen (a type of crude oil derived from the oil sands which is mixed with various types of diluents so that it can be transported through pipelines) under various conditions and in various marine environments, and on the efficacy of oil spill remediation options (oil spill countermeasures, such as chemical dispersants) to inform oil spill preparedness and response decision-making.

The scientific information generated from this area of inquiry was produced through laboratory and tank-scale studies, and field research on the weathering behavior of various diluted bitumen samples. While the results of this research are important for first responders to an oil spill, they are also important for oil spill model development; the information generated from these studies is being used in the development of models to predict the behaviour of oil when spilled in marine environments. Some examples of this work are as follows:

- In Phase 1A of the WCTSS initiative (under the Scientific Research and Activities initiative), DFO and ECCC initiated research on the efficacy of currently available oil spill countermeasures, such as chemical oil dispersants, on two diluted bitumen products. The research continued in Phase 1B, in collaboration with NRCan, under several sub-initiatives of the Science and Technology for Clean-Up initiative.

- In Phase 2, NRCan is conducting research to determine the impacts of oil pretreatment on diluted bitumen behavior when spilled in various water environments and is assessing catalyst

possibilities for improving natural photo-oxidation processes to increase the rate of petroleum removal from water environments.

- Also, NRCan established the Oil Spill Response Science Program (OSRS) in FY 2015-16 (under the Operational Science for Marine Oil Spill Response initiative). The OSRS will facilitate new research to develop new processes for the mechanical recovery of oil products when spilled into marine environments.

As regards the models, DFO and ECCC are collaborating to create a high resolution, fully operational, 24-7 integrated oil spill modelling system by the end of FY 2017-18 as a key tool in support of oil spill preparedness and response planning, as well as during an oil spill response.

The model development work for the 24-7 integrated oil spill modelling system, like the diluted bitumen studies, began in Phase 1A under the Scientific Research and Activities initiative. Validation and testing began in Phase 1B under several sub-initiatives of the Science and Technology for Clean-Up initiative. This development work involved the creation and testing of a number of models, which will feed into the 24-7 integrated oil spill modelling system. DFO and ECCC are currently in the process of coupling these various models (i.e. *Canadian Oil Spill Modelling System (COSMoS)*, ocean circulation/coastal, atmospheric/hydrologic models, and ice-ocean prediction system) to establish the integrated 24-7 oil spill modelling system.

For further information of the scientific achievements in support of improved preparedness and response to oil spills from ships, see Annex D.

Coordinated Incident Response

To improve Canada's institutional capacity to respond to oil spills from ships, the CCG is moving to an Incident Command System, an incident management system used for the command, control, and coordination of incident response operations.

Major construction of the CCG National Crisis Management Operations Centre (SITCEN) was completed at the end of March 2016. As a result, the SITCEN is expected to be operational by the end of FY 2016-17. The CCG's ICS technical system (now called the ICS IM System) to facilitate the use of ICS at the on-scene, regional and national level is expected to be completed in FY 2016-17. Despite delays, the CCG expects to have a fully operational ICS by the end of FY 2018-19, as originally planned.

The CCG has participated in various training and exercises in preparation of the implementation of the ICS and conducted its first preliminary ICS exercise in the Arctic. For further information, see Annex D.

ECCC officials have also received ICS-specific and equivalent training and participated in a number of exercises that had a component of ICS and/or the United States Coast Guard (USCG), in preparation of the implementation of the ICS. ECCC also updated its Environmental Emergency Response Operations Plan in the fall of 2015, and since then, has made progress in defining its roles within ICS.

Under the Area Response Planning Pilot initiative, risk assessments were ongoing between FY 2013-14 and FY 2016-17, and an area risk assessment methodology was completed in FY 2016-17. A comprehensive review of emergency management policies, procedures and work instructions was

completed in the spring of 2015 and regional task forces were established in FY 2014-15. However, due to the fact that the engagement process was launched later than expected, area response plans were not developed in FY 2015-16 and will be now completed in December 2016 instead, once consultations are completed.

Community and Stakeholder Engagement

The engagement activities, including consultations embedded in a number of initiatives have either been completed or are underway, mostly in the areas of enhanced preparedness and response, improved navigational safety.

The Community Participation Funding Program initiative, initially planned for FY 2014-15, was up and running as of March 2016, to enable eligible stakeholders from local communities and Indigenous Groups areas to participate in area response planning in the four geographic covered by the ARPI to ensure that local conditions and environmental sensitivities are appropriately captured.

To date, 21 applications have received grants through the Program to participate in the engagement activities.

Under the Public, Private and Community Partnerships initiative, community engagement officers of the CCG promoted marine safety through the Nisga'a First Nations workshop; the Tripartite LNG marine shipping dialogues (federal, provincial and First Nations); the T'Sou-ke Nation marine safety and risk summit; and through developing engagement plans for the Area Response Planning Pilot Initiative.

Further, contingency plans for the key priority risk area of Burrard Inlet were reviewed and updated with stakeholders.

TC has also carried out consultations on the results of its analysis of the proposed port limits for Kitimat with the B.C.-led Kitimat Port Management Working Group in January 2016 (under the Appropriate Governance for Ports).

Members of the Working Group include project proponent representatives, local municipalities, and the local Indigenous group.

Ocean Networks Canada, under the ONC- Smart Oceans Contribution Program, has also reached out to stakeholders, through two workshops and information sessions, to enhance awareness of potential navigational hazards on the Coast of B.C.

The ONC continues to have discussions with a broad range of stakeholders to help define data products that will meet their needs.

For further examples of achievements in the area of community and stakeholder engagement, see Annex D.

Liability and Compensation

Outside of the completed review on this topic and legislative and regulatory work that is underway as a result of the review, there is nothing further to report under this output.

GOVERNANCE

Evaluators focused on the interdepartmental WCTSS Sub-Committee to assess the governance of the WCTSS Initiative, since this is the level at which monitoring and reporting on the implementation of the WCTSS initiative occurred. However, in addition to the TC-led interdepartmental DG-WCTSS Committee and WCTSS Sub-Committee, TC's Marine Safety and Security launched (in October 2014) its own director-level sub-committee (MSSE Sub-Committee on the WCTSS) and dashboards to oversee the implementation of the WCTSS initiatives being delivered under its mandate and to report on the progress of implementation to the Marine Safety and Security Executive (MSSE) and the DG-WCTSS Committee. It was chaired by the Executive Director of the then WCTSSS Secretariat.

Also, ECCC and DFO each had a coordinating body to oversee the reporting required of TC on the WCTSS initiatives under their respective mandates. Some departments set up interdepartmental working groups or committees to oversee the implementation of specific WCTSS initiatives, such as the Area Response Planning initiative, and an interdepartmental WCTSS Operational Science Working Group met monthly to discuss progress on research activities.

As for the WCTSS Sub-Committee, members were asked at the outset to be responsible for the development of project charters for each initiative, and project plans or dashboards, in order to routinely provide updates to the DG-level Interdepartmental Marine Pollution Committee, and later the DG-level WCTSS Committee, as evidenced from the minutes of the committee meetings. The updated status reports were also provided on a routine basis in advance to any scheduled DM-level Major Projects Management Office meetings and to the ADM of Policy at TC.

Finding 11: The interdepartmental governance structure, which was put in place by TC to oversee the implementation of the WCTSS Initiative, appears to have provided good oversight of the initiative as a whole. However, the interdepartmental dashboard that was used for monitoring implementation could be improved.

Evaluators found evidence, largely through a review of available minutes to meetings, agendas and related email, that the WCTSS Sub-Committee met in accordance with their TOR and addressed the areas they were supposed to address. This includes monitoring and reporting on the progress of specific WCTSS measures, the identification of emerging issues, and the development and updating of dashboards and an engagement strategy.[14]

The only shortcoming evaluators found in terms of governance was in the quality of some of the information in the interdepartmental dashboards for the purposes of monitoring the initiatives' progress or understanding the status of implementation of the initiatives. Scientists often reported what they had recently done on their initiatives (sometimes chronologically), without regard to what they had achieved in terms of the key milestones laid out in foundational documents or the WCTSS Initiative's performance measurement strategy (which were largely the same). Updates for science-based initiatives often contained highly technical language that made it difficult for evaluators to link the

[14] The MSSE Sub-Committee on the WCTSS had similar functions outlined in its TOR for the initiatives implemented by Marine Security and Safety and there is evidence from minutes of meetings, agendas and emails, that this sub-committee carried out the terms of its mandate and had a positive impact on the governance of the WCTSS initiatives under its jurisdiction.

reported results to key milestone expectations. This was also an issue when evaluators provided templates to be filled out that queried the progress made for each initiative against each initiative's particular key milestones (in part because the information initially provided was cut and pasted from the dashboards). Further, the information in the dashboard was not always properly updated (e.g. expect to be/or will be completed in March 2015 when March 2015 had long passed). [15]

Another dashboard-related deficiency was that the information on progress or outputs for the three major science initiatives (Scientific Research and Activities – Phase 1A, Science and Technology for Clean-up – Phase 1B, and Operational Science for Oil Spill Response – Phase 2) was reported under the heading "Scientific research on petroleum and spill response (salt/fresh water environments) - ECCC, DFO, NRCan," without clearly delineated sub-categories. This made it difficult to identify to which science initiative (and which phase of the WCTSS and department) the information corresponded. In fact, evaluators had difficulty deciphering how the information in the dashboards related to the key milestones of some of the initiatives even after they had collected detailed key milestone data on each initiative through their own template, which suggests that it is unlikely many other readers of the dashboard understood how the information related either.[16]

One final deficiency of the interdepartmental dashboard was that it did not include interdepartmental information on expenditures (e.g. % spent) on WCTSS initiatives, not even annually. Marine Safety and Security, and later DFO, did have dashboard information on expenditures and the information was collected on a regular basis. Without this information it is difficult to understand the true status of initiatives in terms of implementation at any point in time or how resources are being managed.

READINESS FOR THE EVALUATION IN 2018-19

The Review allowed for the opportunity to test the WCTSS Initiatives' performance measurement (PM) strategy, determine whether it has been implemented in a systematic fashion, and thus whether performance information will be available for the evaluation in 2018-19.

The WCTSS Performance Measurement Strategy proved to be an adequate guide for the Review. The logical relationships between the program activities and outputs through to immediate outcomes and beyond are for the most part sound. However, for the 2018-19 evaluation, consideration should be given to "community/stakeholder awareness" as an output in the logic model. This is because very few, if any of the WCTSS activities are related to awareness per se. They are engagement activities, many of which should probably feed into the immediate outcome of enhanced preparedness and response.

Also, the strategy is not overly burdensome in terms of the information it requires and it uses a large number of standard indicators (e.g. number inspected, percentage compliant, number of reviews or scientific studies completed, compliance rate, etc.). The suggested measures for the indicators are sound. However, the logic model for the initiative is too complex as it is difficult to see how the outputs

[15] Note that at its March 13, 2015 meeting, the MSSE Sub-Committee on the WCTSS did raise the issue of the need to ensure that their WCTSS dashboard was updated by the OPIs on a regular basis, and that it portrays the initiatives accurately and clearly and that OPIs were to update their initiatives in the dashboard on a monthly basis at a minimum via a call out or meetings with AMSW (World Class Tanker Safety System Secretariat).

[16] Evaluators did not find any shortcomings with the MSS dashboards they reviewed, which also fed into the interdepartmental dashboard. The dashboard DFO recently developed to feed into the interdepartmental dashboard provides quality information as well.

feed into the immediate outcomes or to follow the initiatives through to their immediate outcomes. This is in part because of the complexity of the WCTSS Initiative and the fact that a number of outputs feed into several immediate outcomes.

Some simplification of the logic model could be possible. For example, the "compensation and liability regime" output could be deleted because it has no outputs other than advice and legislation/regulations, which are already covered in the logic model. The immediate outcome of "engaged communities/stakeholders" could be deleted if it could be conceptualized as an output. The immediate outcomes of "enhanced physical and institutional response capacity" could possibly be combined into "enhanced response capacity," and if the initiatives having to do with oil handling facilities relate only to response plans and measures, the immediate outcome of "safer shores or oil handling facilities" could also be deleted.

As for the availability of performance data for the WCTSS Initiative, ECCC tracks the scientific publications produced by DFO, NRCan and ECCC with WCTSS funding and has developed a summary report. Science results are shared annually with not only federal departments but also the broader international scientific community through the annual Arctic and Marine Oil Spill Program (AMOP) Technical Seminar. Evaluators learned that the CCG is in the process of updating their performance outcomes and measures.

While the interdepartmental dashboard does provide a basis for the collection of some of the information required of the WCTSS PM strategy (e.g. how many reviews completed as planned and how many aids to navigation have been deployed), it is more oriented to providing a snap-shot of the latest progress in implementation. Having said this, evaluators were able to obtain most of the required information from OPIs through various departmental coordinators, for the purposes of the Review.

Finding 12: **Evaluators were able to obtain the performance information required for the Review through various departmental coordinators and believe that the Review has served to prepare for the 2018-19 evaluation and improve the WCTSS Initiative's performance measurement strategy.**

The performance information needed for the evaluation of 2018-19 appears to be available, although the strategy calls for a large role on the part of TC's evaluation shop to create the information through various lines of inquiry at the time of the evaluation.

Evaluators found that performance information was available or will be available for all output and outcome areas. For example, the standard indicator for the legislation/regulations output is the number of legislative/regulatory upgrades completed relative to the number planned, and it was readily available. Similarly, for advice, the number of reviews completed as planned is the standard and available indicator, along with whether the reviews served their intended purposes. Other examples are the number of scientific studies completed for the scientific information and advice output; and the number of navigational aids deployed per year, along with the number of charts and surveys completed, for the navigational information output.

A good number of appropriate indicators are also available for oversight. Examples of these indicators, some of which form the basis of indicators for measuring the immediate outcomes, include the following:

- Number and percentage of foreign-flagged tankers inspected;
- Number of satellite images analyzed;
- Number of patrol hours flown verses the number of patrol hours forecasted;
- Number of commercial vessel over-flights per flight hour;
- Quantity of oil observed (litres) on the ocean's surface per year;
- Number of ship source pollution spills identified verses total pollution spills detected by the NASP aircraft;
- Number of Automatic Identification System (AIS) targets per year;
- Number of domestic and foreign commercial movements in Canada by year and region;
- Number of OHF inspections and number compliant by year and region; and
- Number of training sessions held and people trained.

Some performance information, such as for the community/stakeholder awareness output, was not available at the time of the Review because it was too early to obtain it, given the status of the initiatives that involved engagement. However, evaluators believe the information will be available for the evaluation in FY 2018-19. This includes the number of meetings with stakeholders, the number of stakeholder information packages distributed, and the number of web site hits. Another example of an indicator not obtained by evaluators but which is believed to be available is the number and percentage of foreign flagged tankers that are compliant. Again, these are standard indicators.

There are also examples of performance indicators for outputs and outcomes that have been changed by OPIs over the course of the Review to better align with available data or better reflect what needs to be measured. For example, for the Area Response Planning initiative, the revised output indicators include the following:

- The number of meetings with Response Organizations (RO) and experts to validate the Area Risk Assessment methodology (instead of number of risk assessments validated by ROs, local stakeholders, and experts' input);
- The number of area risk assessments conducted (instead of extent to which risk assessments are updated with ROs, local stakeholders, and experts' input); and
- The number of meetings with Response organizations and experts to validate the Area Risk Assessment methodology (instead of number of risk assessments validated by Response Organizations, local stakeholders, and experts).

Changes were also made to measure some of the immediate and longer-term outcomes (e.g. safer shore facilities, safer navigation and environmental protection of marine areas through oil spill prevention). For example:

- The number of accidents reported by tankers in port compared to the number of accidents reported by all ships in ports over time (instead of number of ship accidents/incidents per number of ship movements in shore facilities);
- The number and volume of ship-source spills reported by region over time (instead of number and volume of ship-source spills per geographic area); and

- The number of navigation accidents reported over time (instead of number of navigation accidents/incidents in relation to km covered).

At least two of the above indicators will need to be compared with some sort of benchmark such as “per the number of vessel movements” (with a movement meaning every time a ship (or vessel) commences and ceases to be underway) or “per the volume of oil shipped.”

Most of the intermediate and longer term outcomes will be measured at the time of the evaluation by TC’s evaluation shop through a number of lines of inquiry such as comparative studies, interviews, surveys and possibly a panel of experts.

RECOMMENDATION

The evaluation made the following recommendation, addressed to TC.

Recommendation: When developing a tracking scheme to monitor the implementation of Oceans Protection Plan initiatives, it is recommended that TC:

1. ensure that it is able to track the WCTSS initiatives distinctly within that scheme; and

2. apply lessons learned from monitoring WCTSS implementation. Specifically, it is recommended that TC track and request from the partner departments the following information:

- **a list of all expected and completed milestones and timelines by fiscal year for each initiative based on what is described in foundational documents and performance measurement strategies; and**

INTERDEPARTMENTAL EXPENDITURE INFORMATION, SPECIFICALLY, THE TOTAL DOLLARS ALLOCATED AND THE PERCENTAGE OF DOLLARS SPENT BY FISCAL YEAR FOR EACH INITIATIVE.

ANNEX A: GRANT AND CONTRIBUTION PROGRAMS FUNDED UNDER THE WCTSS INITIATIVE

Associated Initiative Phase of WCTSS: Phase 1B Phase 2	Contribution/Grant Program	Department	Total New Funding	New/Existing Program
Contribution to Clear Seas Centre for Responsible Marine Shipping (TC)	Contribution to Clear Seas Centre for Responsible Marine Shipping {Phase 2}	TC	{ATIP REMOVED}	New
Operational Science for Marine Oil Spill Response (ECCC and NRCan)	Oil Spill Response Science Program {Phase 2}	NRCan	{ATIP REMOVED}	New
Area Response Planning Pilot Project (TC, CCG, DFO and ECCC)	Community Participation Funding Program {Phase 2}	TC	{ATIP REMOVED}	New
	Academic Research Contribution Program Contributions to Support Organizations Associated with Research, Development, Management, Promotion of Fisheries and Oceans-Related Issues Aboriginal Aquatics and Resource and Oceans Management Program {Phase 2}	DFO	{ATIP REMOVED}	Existing (Top-up)
Ocean Networks Canada Smart Oceans Contribution Program (TC)	Ocean Networks Canada Smart Oceans Contribution Program {Phase 2}	TC	{ATIP REMOVED}	New
Science and Technology for Clean-up (DFO, ECCC and NRCan)	Academic Research Contribution Program {Phase 1B}	DFO	{ATIP REMOVED}	Existing (Top-up)
	Centre for Offshore Oil, Gas and Energy Research (COOGER) {Phase 1B}	DFO	{ATIP REMOVED}	Existing (Top-up)

ANNEX B: WCTSS INITIATIVES AND DEPARTMENTAL STRATEGIC OUTCOMES

Initiative	Strategic Outcome (SO)			
Phase of WCTSS: Phase 1A Phase 1B Phase 2	**DFO**	**ECCC**	**NRCan**	**TC**
New/Modified Aids to Navigation to Service the Kitimat Area {Phase 1A}	SO1, SO3			
Hydrographic/Navigational Products for Kitimat {Phase 1A}	SO1, SO3			
Tanker Screening Guidelines {Phase 1A}				SO3
Transport Canada Centre in Kitimat {Phase 1A}				SO3
Amendment to the *Canada Shipping Act*, 2001 and Modernization of the Environmental Response Program {Phase 1A}				SO2
Team of International Experts on Tanker Safety {Phase 1A}				SO2
Panel Review of Canada's Oil Spill Preparedness and Response Regime {Phase 1A}				SO2
Scientific Research and Activities {Phase 1A}	SO2	SO1		
Integrated Satellite Tracking of Pollution – Satellite Based Monitoring {Phase 1A}		SO3		
Increased Tanker Inspections{Phase 1B}				SO3
Options for a Modern Charted Navigation System {Phase 1B}	SO1, SO3			
Geoscience Studies for Marine Safety in the B.C. North Coast {Phase 1B}			SO3	
Review of Navigational Plans for High Risk Waters – TERMPOL {Phase 1B}				SO3
Review of Compulsory Pilotage and Tug Escorts {Phase 1B}				SO3
Appropriate Governance for Ports {Phase 1B}				SO3
Systematic Surveillance and Monitoring of Ships – NASP {Phase 1B}				SO2
Laying the Groundwork for the Arctic {Phase 1B}	SO1			SO3
Public, Private and Community Partnerships {Phase 1B}	SO2			SO2
Incident Command System {Phase 1B}	SO2, SO3			
Incident Command Support {Phase 1B}		SO2, SO3		
Review of Spill Treating Agents and Countermeasures {Phase 1B}	SO2	SO3	SO2	SO2
Science and Technology for Clean-up {Phase 1B}	SO2	SO1, SO3	SO2	
Review of Liability and Compensation Regime {Phase 1B}				SO2
Modern Navigation System – Phase 1{Phase 2}	SO3	SO2		SO3
Ocean Networks Canada Smart Oceans Contribution Program {Phase 2}				SO2, SO3
Area Response Planning Pilot Project {Phase 2}	SO2, SO3	SO1, **SO2**,		SO2

Initiative	Strategic Outcome (SO)			
Phase of WCTSS: Phase 1A Phase 1B Phase 2	**DFO**	**ECCC**	**NRCan**	**TC**
		SO3		
Alternative Response Measures – legislative amendments {Phase 2}	SO2	SO3		SO2
Community Participation Funding Program {Phase 2}				SO2
Operational Science for Marine Oil Spill Response {Phase 2}		SO3	SO2	
Contribution to Clear Seas Centre for Responsible Marine Shipping {Phase 2}				SO2
Enhancement to Ship-Source Oil Pollution Fund {Phase 2}				SO2
Options for Long-Term Governance and Funding of WCTSS {Phase 2}	SO2, SO3			SO2

Strategic Outcomes Legend	
DFO	SO1: Economically Prosperous Maritime Sectors and Fisheries SO2: Sustainable Aquatic Ecosystems SO3: Safe and Secure Waters
ECCC	SO1: Canada's natural environment is conserved and restored for present and future generations SO2: Canadians are equipped to make informed decisions on changing weather, water and climate conditions SO3: Threats to Canadians and their environment from pollution are minimized
NRCan	SO2: Natural resource sectors and consumers are environmentally responsible SO3: Canadians have information to manage their lands and natural resources and are protected from related risks
TC	SO2: Clean Transportation System SO3: Safe and Secure Transportation System

ANNEX C: WCTSS INITIATIVES AND INDIVIDUAL RISK COMPONENTS

Initiative*	Original end date	Multiple milestones delayed	Timely completion unlikely	No completion strategy	Additional funding likely needed	Comp-lexity	Consequences
New/Modified Aids to Navigation to Service the Kitimat Area (DFO-CCG)	{ATIP REMOVED}		✓				
Hydrographic/Navigational Products for Kitimat (DFO-CHS)	{ATIP REMOVED}		✓				
Transport Canada Centre in Kitimat (TC)	{ATIP REMOVED}		✓				
Scientific Research and Activities (ECCC, DFO)	{ATIP REMOVED}		✓			✓	
Appropriate Governance for Ports (TC)	{ATIP REMOVED}		✓				
Incident Command System (CCG)	{ATIP REMOVED}	✓				✓	
Science and Technology for Clean-up (DFO, ECCC, NRCan)	{ATIP REMOVED}	✓				✓	
Community Participation Funding Program (TC)	{ATIP REMOVED}						
Operational Science for Marine Oil Spill Response (ECCC, NRCan)	{ATIP REMOVED}	✓				✓	
Alternative Response Measures – legislative amendments (TC and ECCC)	{ATIP REMOVED}		Obtained federal government authorization				
Enhancements to Ship-Source Oil Pollution Fund (TC)	{ATIP REMOVED}		Obtained federal government authorization				
Public, Private and Community Partnerships (CCG, TC)	{ATIP REMOVED}	✓	✓	✓			
Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC)	{ATIP REMOVED}	✓		✓		✓	
Amendment to the Canada Shipping Act, 2001 and Modernization of the Environmental Response Program (TC)	{ATIP REMOVED}	✓	✓	✓	✓		✓ Funding needed to complete the initiative.
Increased/Mandatory Tanker	{ATIP	✓	✓	✓	✓		✓

Initiative*	Original end date	Multiple milestones delayed	Timely completion unlikely	No completion strategy	Additional funding likely needed	Comp-lexity	Consequences
Inspections (TC)	REMOVED}						{ATIP REMOVED}
Review of Navigational Plans for High Risk Waters – TERMPOL (TC)	{ATIP REMOVED}	✓	✓	✓	✓		{ATIP REMOVED} {ATIP REMOVED}
Systematic Surveillance and Monitoring of Ships – NASP (TC)	{ATIP REMOVED}	✓	✓	✓	✓	✓	{ATIP REMOVED} {ATIP REMOVED}
Area Response Planning Pilot Project (TC, CCG, DFO, ECCC)	{ATIP REMOVED}	✓	✓	✓	✓	✓	✓ It is unlikely that the options for a national implementation of ARP will be developed on time given the delays in the Pilot initiative; this could lead to a funding lapse between the Pilot and start-up of the national program. Status of this initiative impacts the CPFP.

*If there is no check mark (✓), it means the factor does not apply. In other words, the absence of a check mark for "no completion strategy" means that there is a completion strategy for this initiative. If there is no check mark for consequences, there are no consequences.

ANNEX D: LIST OF OUTPUTS AND ACHIEVEMENT, 2013-2016

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Safer Navigation	
New/Modified Aids to Navigation to Service the Kitimat Area (DFO-CCG)	• Phase I of the review of the Aids to Navigation System for the Kitimat area was completed in 2014-15. Phase II was completed in 2015-16 and Phase III was completed in 2016-17. • As of March 31, 2016, 32 of 119 existing aids to navigation were modified/installed. {Phase 1A}
Hydrographic/Navigational Products for Kitimat (DFO-CHS)	Multibeam Surveys in Critical Navigation Channels: • Detailed hydrographic surveys using multi-beam technology were completed in 2016-17 in Caamano Sound, west of Stephens Island, and along all major proposed tanker traffic routes. Surveys of Hecate Strait began in April 2015 and data collection has been ongoing. {Phase 1A} Purchase and Install Tide Gauges and Current Modelling: • Three permanent tide gauges were installed in 2015-16 at Kitimat, Caamano Sound and the southern tip of Haida Gwaii Islands. These gauges are collecting data which will aid current models and enable the broadcast of water level information. {Phase 1A} Data Management and Production: • In 2015-16, 20 of the planned 25 new navigational charts were created and released for use by mariners. Sailing directions, and 2015 and 2016 Tides and Current Tables were also published and released. As of June 2016, 1 of the 5 remaining charts for overview coverage has been developed. • {Phase 1A}
Options for a Modern Charted Navigation System (CCG-CHS of DFO)	• {ATIP REMOVED}This led to a Phase II modernization initiative that was subsequently approved by the federal government in February 2014 (the Modern Navigation System – Phase I initiative). {Phase 1B}
Geoscience Studies for Marine Safety in the BC North Coast (NRCan)	• NRCan conducted a ship-based survey (seabed mapping) and sampling mission to determine the triggers and frequency of occurrence of recently identified submarine slide hazards in British Columbia's coastal region. {Phase 1B} • A scientific cruise report was published, titled "CCGS Tully 2014007PGC cruise report." By Lintern, D. G.; et al. Geological Survey of Canada, Open File 7761, 2015. {Phase 1B} • Routine monitoring of seismic and GPS data from new stations is ongoing. A seascape map has been produced indicating seabed features. Faults have been identified as active or inactive. Dozens of previously unknown landslides have been identified. {Phase 1B} • A report of the preliminary review of seismicity is in press. Brillon, C. (2016). "North Coast Geohazards – 2016 Seismology Update," Geological Survey of Canada, Open File 8052. {Phase 1B} • Age dating of major submarine slides has been completed and publication of the manuscript is anticipated in the fall of 2016. {Phase 1B} • The numerical model for submarine slope stability, Kitimat delta, has been developed and publication is planned for the end of December 2016. {Phase 1B}
Review of Navigational Plans for High Risk Waters – TERMPOL (TC)	• TC revised the TERMPOL Review Process (TRP) and published the updated TRP Manual in December 2014 to clarify the scope and intent of TERMPOL, focusing on navigation safety and marine pollution prevention, and encouraging proponents to engage local waterways users, particularly indigenous groups, in the preparation of surveys and studies. {Phase 1B} • The revised manual was made available to stakeholders in January 2015. {Phase 1B}
Review of Compulsory	• The review indicated that existing measures are well-established; no compliance issues were noted. As

Initiative	Completed Activities / Deliverables Phase of WCTSS: Phase 1A Phase 1B Phase 2
Pilotage and Tug Escorts (TC)	a result, no new requirements were needed at this time and any future changes related to larger tankers or new tanker routes could be addressed through both voluntary and regulatory measures. • {Phase 1B} • The review concluded that this was not the approach to take and consequently this component of the initiative was transferred to the Increased Tanker Inspections initiative, which then became the Increased/Mandatory Inspections initiative. {Phase 1B}
Appropriate Governance for Ports (TC)	• An evaluation of public port boundaries based on current and projected traffic, and main environmental features was completed in 2013-14. {Phase 1B} • TC reviewed non-designated ports, taking into consideration the level of tanker traffic and forecasted volumes of LNG, and concluded that only the port of Kitimat should be proposed for public port designation at this time. {Phase 1B} • TC presented the results of its analysis regarding the port limits to the Working Group in January 2016. Consultations with industry stakeholders, key First Nations and the local community on the proposed port limits and the draft practices and procedures are now being proposed to take place in the fall of 2016, to align with the timing of the engagement strategy regarding the moratorium on crude oil tanker traffic in northern BC. {Phase 1B}
Laying the Groundwork for the Arctic (TC, CCG)	• Service, program and policy reviews were completed in 2013-14. Based on a thorough analysis of marine traffic levels, risks, and other factors, TC and CCG have identified Northern Marine Transportation Corridors on a preliminary basis. The Corridors would be a strategic framework to guide federal investments in marine transportation in the Arctic. {Phase 1B} • Reports on five technical studies were completed in March 2014. A report titled "Initiative on Marine Corridors in Canada's Arctic: General Review of Levels of Service and Engineering Studies" was also produced. {Phase 1B} • This review has laid the groundwork for subsequent initiatives in the Arctic (e.g. Arctic Hydrography and Charting in Phase III) and will serve as a guide to federal investments in marine transportation in the Arctic. {Phase 1B}

Modern Navigation System – Phase 1 (CCG, DFO, ECCC and TC)	• A prototype of the four-season lighted navigation buoys was deployed for testing in 2015-16. Testing has continued in 2016-17. {Phase 2}
	• The E-navigation hub was completed; the portal was posted online in August 2015. The link was distributed to the national and regional e-Navigation committees and shared with the United States Coast Guard (Additions are expected as data are made available). {Phase 2}
	• All three radar installations at Prince Rupert were completed by August 31, 2016. {Phase 2}
	• 13 port surveys (multi-beam) have been completed and the data is being processed to produce charts and products; 7 new electronic navigational charts (ENCs) are in production. {Phase 2}
	• A study on Canadian Operational Hydrographic Capacity and Capabilities was completed. The final report on Hydrographic Capacity and New Technologies for Dynamic Hydrographic Products and Services was produced. {Phase 2}
	• The following observational equipment was deployed by CCG in 2016-17 for ongoing data collection at test ports Port of Metro Vancouver, Fraser River, Port of Saint John NB and Port Hawkesbury NS): {Phase 2}
	  • 4 ADCP current meters were installed at both Saint John NB and Port Hawkesbury (3 deployment and recovery cycles). {Phase 2}
	  • 2 ADCP meters were installed in Port of Metro Vancouver (2 deployment and recovery cycles).

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	• {Phase 2} • Cross channel current profiling is being done at the Port of Metro Vancouver. {Phase 2} • New Tide gauges were installed at the Port of Metro Vancouver and Port Hawkesbury. {Phase 2} • Adaptive finite element grids for the Finite Volume Current Ocean Model (FVCOM) were developed for these 4 test ports. {Phase 2} • The CCG has completed 8 of the 14 proposed channel bottom monitoring surveys. {Phase 2} • 6 research study presentations were made at the 2016 Canadian Hydrographic Conference. {Phase 2}
Ocean Networks Canada Smart Oceans Contribution Program (TC)	• TC signed a multi-year agreement with Ocean Networks Canada (ONC) in 2014-15 to support ONC's work in transforming oceanographic data into navigational information that will help prevent marine accidents and warn of navigational hazards. {Phase 2} • The installation of ocean observatories in Campbell River and Kitamaat Village were completed in March 2016. WaMos radars to collect oceanographic data were also installed in Campbell River. • {Phase 2}

Contribution to Clear Seas Centre for Responsible Marine Shipping (TC)	• Multi-year contribution agreement from May 4, 2015 to March 31, 2019 was signed to support the establishment of the Clear Seas Centre as a leading, independent source of information and best practices for the marine transportation of oil and liquefied natural gas (LNG) commodities. {Phase 2}
	• The Centre was established and launched their operations. They have developed a website to share information, findings and promote their activities, as well as facilitated research which led to the development of assessment reports on the following topics: {Phase 2}
	  • Socio-economic benefits of marine shipping for Canada and Canadian population; {Phase 2}
	  • Socio-economic and environmental risks of marine shipping; and {Phase 2}
	• Improvements to prevention, preparedness and response measures. {Phase 2}

Safer Tankers	
Tanker Screening Guidelines (TC)	• A report of a review of the Ship Inspection Reporting Program (SIRE) was produced in 2013-14. The initial regulatory changes proposed under this initiative were not pursued due to the results of the SIRE review and legal advice. {Phase 1A} • Instead, the objectives of the initiative will be met under the Increased/Mandatory Tanker Inspections initiative, which will amend the *Vessel Pollution and Dangerous Chemicals Regulations* to require tankers to undergo annual inspections. {Phase 1A} • Screening guidelines for tanker safety inspections were completed in 2014-15 and the newly developed Tanker Screening Guidelines are in place. {Phase 1A} •
Transport Canada Centre in Kitimat (TC)	• For the purposes of servicing the Kitimat area, three TI positions (inspectors) were staffed in 2014-15 and the required 18-month training program was completed by the inspectors in the spring of 2016. • {Phase 1A} • • Inspections of foreign vessels in Kitimat began in 2015-16, with inspectors coming from Vancouver and Prince Rupert. {Phase 1A} •

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Integrated Satellite Tracking of Pollution - Satellite Based Monitoring (ECCC)	• A total of 50 anomalies were detected in Canadian navigable waters in 2014-15, and 57 were detected in 2015-16. {Phase 1A} • Presentations about ISTOP were given at the National Oceanic and Atmospheric Administration (NOAA) marine workshop, DND, RCMP, Parks Canada, CBSA and DFO. {Phase 1A} •
Increased/Mandatory Tanker Inspections (TC)	• Service Standards were developed in the summer of 2014 and a training curriculum was developed in the fall of 2014. {Phase 1B} • The cost-recovery strategy was developed in 2015-16, with implementation planned for 2017-18. • {Phase 1B} • Proposed amendments to the *Vessel Pollution and Dangerous Chemicals Regulations*, which would provide the government the basis for a user fee to recoup inspection costs from vessel owners, are targeted to be published in *Canada Gazette* in 2016-17. {Phase 1B} • A 25% increase in tanker inspections was achieved in 2013-14. In 2014-15, 100% of foreign tankers entering Canadian waters were inspected. In Q1 and Q2 of 2015-16, a 100% inspection rate was maintained, and in Q3 and Q4, inspections were done on a risk basis rather than as a target (79% of tankers were inspected on their first visit). Inspections continued on a risk basis in 2016-17. {Phase 1B}
Systematic Surveillance and Monitoring of Ships – NASP (TC)	• For 2013-14, the NASP almost met its target for pollution surveillance (2,300 hours) by flying 2,253 hours. In 2014-15, the NASP flew 2,092 hours. In 2015-16, the aircraft flew 1,939 hours for pollution patrols. {Phase 1B} • The number of pollution incidents identified by the NASP has been increasing despite the reduction in the amount of flying hours. The NASP identified 214 pollution incidents in 2013-14, 322 in 2014-15 and 380 in 2015-16. {Phase 1B}
Safer Shore Facilities	
Amendment to the *Canada Shipping Act, 2001* and Modernization of the Environmental Response Program (TC)	• The Inspection Program for Oil Handling Facilities (OHFs) was developed and the necessary policy, procedures and work instructions were put in place in September 2014. {Phase 1A}
Geoscience Studies for Marine Safety in the BC North Coast (NRCan)	• NRCan has been carrying out studies and gathering data to improve our knowledge of earthquakes and resultant ground shaking in the Kitimat/Douglas Channel area, and to provide technologies for their real-time monitoring by industry and emergency management organizations. It has also been investigating the frequency and magnitude of submarine landslides in Douglas Channel, which are known to have caused destructive tsunamis in the 1970's. {Phase 1B} • In 2013-14, NRCan established new seismometer and GPS stations in Northern British Columbia to fill a major gap in the seismic network, permitting much greater accuracy in determining earthquake locations and magnitudes, and in defining where deformation is occurring in the region. {Phase 1B}
Enhanced Preparedness and Response Capacity	
Amendment to the *Canada Shipping Act*, 2001 and Modernization of the Environmental Response Program (TC)	• The proposed changes to the CSA 2001 received Royal Assent in December 2014 and amendments are in force. {Phase 1B} • A discussion paper on the regulatory development associated with the Bill was produced and presented to industry in the spring of 2016, which will serve as the starting point for consultation with industry. • {Phase 1B} • If there are no further changes needed following industry consultation, the regulatory drafting package will be ready for legal drafting to begin. The proposed regulations are targeted to be published in

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	Canada Gazette, Part I in early 2017. {Phase 1A}

Scientific Research and Activities (ECCC, DFO)	Wave Tank Research (DFO): {Phase 1B}
	• Wave tank research studies were initiated in Phase 1A and complementary studies were also undertaken in Phase 1B (Diluted Bitumen Wave Tank Research) to examine the fate and behaviour of diluted bitumen products and their toxic effects in order to be able to respond to oil spills. The results of and preliminary findings in Phase 1B have resulted in the following publications: {Phase 1A}
	  • A report on the preliminary findings of the behaviour of two diluted bitumen products published on the ECCC website in 2013-14. The publication was a joint authorship with ECCC and NRCan. {Phase 1A}
	  • A manuscript on the "Fate of Access Western Blend diluted bitumen treated with dispersant and mineral fines in a wave tank" has been submitted to Marine Pollution Bulletin for publication. {Phase 1A}
	  • A manuscript titled "Fate of Cold Lake Blend diluted bitumen treated with dispersant and mineral fines in a wave tank" was published in Environmental Engineering Science (3:251-261, 2015). {Phase 1A}
	  • Presentation on "Fate of Diluted Bitumen Spilled in Aquatic Environments: Relevance to Environmental Impacts" to the National Academy of Sciences, 9-10 Mar 2015, available at: http://nas-sites.org/dilbit/march-9-11-2015/ {Phase 1A}
	  • Presentation on "Diluted Bitumen Research in Marine Environments Environmental Impacts of Crude Oil Released into Aqueous Environments" to the Royal Society of Canada, 9 Apr 2015, https://rsc–src.ca/en/stakeholder–consultations). {Phase 1A}
	  • A manuscript with poster titled "Fate of Chinese and Canadian Oils Treated with Dispersants in a Wave Tank" was published in Proceedings of the AMOP Technical Seminar, June 2015. {Phase 1A}
	• Meso-scale shoreline studies on diluted bitumen penetration and retention were conducted. Final reports were delivered (March 31, 2016) and made available to all stakeholders to inform cleanup countermeasures and endpoint decisions. {Phase 1A}
	Fate and Behaviour Modeling (DFO): {Phase 1A}
	This component primarily focused on the collection of data to inform the ocean model development work associated with the coupled ocean-atmospheric model system in Phase 1B of the initiative (High Resolution Ocean Modeling). {Phase 1A}
	• Under the Fate and Behaviour Modeling component of the initiative, a joint plan for the development of an integrated modelling system has been developed in collaboration with EC based on the CONCEPTS MOU. Different groups are making progress on the components (e.g. high resolution atmospheric model, hydrological model, high resolution ocean model). {Phase 1A}
	• High performance computing hardware was installed in January 2015 and made available for use in June 2015 to provide computer resource requirements for the development of the high resolution coastal ocean model for the north coast of BC. {Phase 1A}
	• Coastal Radar (CODAR) antennas were installed in Hecate Strait and at Bonilla Lighthouse in 2015 to provide real time surface currents data which will be used in data assimilation in the model. {Phase 1A}
	• By the end of March 2016, about 200 low-cost satellite tracked drifters have been deployed on the north coast to collect data to be used in models. This will provide key information on drift pathways and drift speeds for emergency response planning. {Phase 1A}
	• A data report has been completed describing the data collected from July 2013 to June 2014. A second data report was produced describing the data collected from July 2014 to July 2015. This data will inform risk assessment work and the follow-up model work under Phase 1B (High Resolution Ocean Modeling). {Phase 1A}
	• A mission to recover and deploy current meter moorings and sediment traps in the north coast of BC for data collection was completed in August 2015. An oceanographic mission dedicated to the Douglas

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	Channel was completed in November 2015 where current meter moorings were also deployed. {Phase 1A} • The collection of oceanographic information and data under this component of the initiative is used for model development that will inform spill preparedness and response planning. The model work in Phase 1A (Fate and Behaviour Modeling), as well as the supporting work in Phase 1B (High Resolution Ocean Modeling), have resulted in the production of the following reports and publications: {Phase 1A} • A data report titled "Physical, chemical and biological oceanographic data collected in Douglas Channel and the approaches to Kitimat, June 2013-July 2014", published in Canadian Data Report of Hydrography and Ocean Sciences. (196 (2):66, 2015). {Phase 1A} • A data report titled "Physical, Chemical, and Biological Oceanographic Data Collected in Douglas Channel and the Approaches to Kitimat, August 2014 to July 2015", in preparation for Canadian Data Report of Hydrography and Ocean Sciences. {Phase 1A} • A report titled "Oil spill trajectory on the northern British Columbia Coast: results from a series of numerical simulations" was published in the Canadian Technical Report of Hydrography and Ocean Sciences. (306:27, 2015). {Phase 1A} • A manuscript titled "Sub-tidal circulation in a deep-silled fjord: Douglas Channel, British Columbia". In preparation for Journal of Geophysical Research. Submitted: June 2016. {Phase 1A} • A manuscript titled "Using Low- Cost Satellite-Tracked Drifters to Determine Oil Spill Trajectories: A Case Study in Douglas Channel, BC". In preparation for Marine Pollution Bulletin. Expected completion: July 2016. • {Phase 1A} • A manuscript titled "RADARSAT – its capability for detection of crude oil and surfactants on the ocean surface". Unpublished manuscript prepared by Will Perrie. Complete. {Phase 1A} • A manuscript titled "Tidal Circulation along the Northern Coast of British Columbia, Canada". In preparation. Canadian Technical Report of Hydrography and Ocean Sciences. Expected completion: August 2016. • {Phase 1A} • A manuscript titled "Influence of wave-induced stokes drift on the trajectories of potential oil spills in the Hecate Strait waters". Submitted to the Proceedings of the AMOP Technical Seminar. June 2016. {Phase 1A} • A manuscript titled "An estimate of the fraction of spilled diluted bitumen that sinks in coastal waters". Submitted to the Proceedings of the AMOP Technical Seminar, June 2016. {Phase 1A} • A manuscript titled "The Surface Drifter Program on the North Coast of British Columbia, April 2014 to November 2015". In preparation for Canadian Technical Report of Hydrography and Ocean Sciences. Expected completion: August 2016. {Phase 1A} • A manuscript titled "Effects of rainfall on oil droplet size and the dispersion of spilled oil with application to Douglas Channel, British Columbia, Canada", submitted to Marine Pollution Bulletin. Accepted: June 2016. {Phase 1A} • A manuscript titled "Application of an Oil Weathering Model to Douglas Channel". In preparation for Canadian Technical Report of Hydrography and Ocean Sciences. Expected completion: July 2016. {Phase 1A} Inventory of Marine Resources (DFO): {Phase 1A} • In 2014-15, an inventory of marine resources, habitats and other ecosystem uses was created to identify and address any information gaps. {Phase 1A} • Discussions with Environment Canada and BC Government on the existing databases and information collected were initiated to identify data gaps in the marine resource inventory and to assist with planning field studies. {Phase 1A} • The discussions resulted in exploring resource mapping tools that will be used for spill response planning and initiating work to update the existing species/habitat/fisheries geospatial data layer.

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2

	{Phase 1A}
	• The discussions also resulted in planning field studies in the Douglas Channel area to produce GIS-based data to be used in the development of benthic maps of the habitat. (Surveys on priority areas were undertaken in 2014-15 and 2015-16 under DFO's Mapping of Near-Shore Habitats and Benthic Ecosystems sub-initiative below.) {Phase 1A}
	Mapping of Near-Shore Habitats and Benthic Ecosystems (DFO): {Phase 1A}
	• A side-scan sonar was purchased in 2013-14 to carry out the field work in Principe and Squalley Channels. The videos from the surveys were used to develop data extraction protocols for mapping habitat features and benthic ecosystems. The data will be used to support the development of models to predict habitat suitability for conservation priority species. {Phase 1A}
	• Field surveys were completed in 2014-15 for the Douglas Channel and approaches. Biological samples were taken for taxonomic verification of biodiversity. Sampling of sensitive beaches were also taken in collaboration with ECCC in the Kitimat arm. {Phase 1A}
	• Field surveys were completed in Gwaii Haanas NMCA in the summer of 2015. {Phase 1A}
	• Detailed maps of near-shore habitats and the benthic ecosystems are being produced using the collected data from the surveys. {Phase 1A}
	• Distribution models have been developed to predict habitat suitability for conservation priority species.
	Research and Advice on Interactions with Ecosystems (DFO):{Phase 1A}
	• The following publications have been produced, to date, under this component using the information and data from the Inventory of Marine Resources sub-initiative and the Mapping of Near-Shore Habitats and Benthic Ecosystem sub-initiative: {Phase 1A}
	  • A manuscript, in collaboration with ECCC, titled "Factors Influencing Intertidal Biota Distribution on BC's North Coast: Considerations for Oil Spill Contingency Planning and Response", submitted to the Proceedings of the AMOP Technical Seminar, June 2016. Joint publication is currently in preparation. {Phase 1A}
	  • A manuscript titled "ShoreZone Verification in Preparation for Marine Oil Spills", submitted to the Proceedings of the AMOP Technical Seminar, June 2016. {Phase 1A}
	  • A presentation titled "Decision Support System in Support of the Departmental Early Response to Oil-Spills in Douglas Channel: a Proof of Concept (PoC)", July 2016. Poster and technical report are in preparation. {Phase 1A}
	  • A manuscript, in collaboration with ECCC, titled "A collation of the literature and databases examining the fate, behaviour, toxicity, and treatment of oil spilled the marine environment", in preparation for publication in the Canadian Technical Report of Fisheries and Aquatic Sciences, 2016. {Phase 1A}
	Enhanced R&D on Containment and Shoreline Fate and Behaviour, Spill Modelling and Countermeasures (ECCC and DFO): {Phase 1A}
	• A peer-reviewed report, titled 'Properties, Composition and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands', was produced in 2013-14 presenting preliminary research on the general behaviour of diluted spilled bitumen products. (Note that this report is the same report that is listed above in DFO's Fate and Behaviour Modeling work as it has incorporated supporting findings from both DFO and ECCC's components of the Scientific Research and Activities initiative, including the preliminary work from Phase 1B (components of the Science and Technology for Cleanup initiative). {Phase 1A}
	• Baseline data for the environmental implications of 3 diluted bitumen samples was collected in 2014-15 and this data was incorporated into the supporting model development work being undertaken in Phase 1B of the initiative. {Phase 1A}
	  • Artificial weathering of samples. Buoyancy and fate and behaviour studies on initial 3 diluted

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	bitumen products and evaporative weathering studies on 3 diluted bitumen samples (March 2015); and photo-oxidation studies (March 2016) {Phase 1A} • Fate and behaviour studies, buoyancy study, literature review that examined the properties, composition, fate and behaviour of 4 diluted bitumen products (March 2016) {Phase 1A} • Shoreline data surveys of selected Kitimat areas and marine transportation routes were conducted between September 2013 and the summer of 2015. This data was used to inform work associated with the development of the coupled ocean-atmospheric model system. Summary details were also published in the proceedings of the Arctic and Marine Oil Spill Pollution Conference in June 2014 and 2015. {Phase 1A} • Initial consultations with B.C and Federal government partners, and First Nations (March 2014); and consultations with Western Canada Marine Response Corporation response contractors, industry in Kitimat (March 2015). Continued consultations and technology transfer with all of the above (March 2016) {Phase 1A} • Shoreline aerial survey and post shoreline classification for the following areas: Upper Douglas Channel and Granville Channel (March 2014), Lower Douglas Channel and Islands (March 2015), and Banks Island, Haida Gwaii (March 2016) {Phase 1A} • Shoreline ground survey, sampling and post baseline laboratory analysis for the for the: Upper Douglas Channel, Lower Douglas Channel, and Haida Gwaii (March 2015) {Phase 1A} • Shoreline fate and behavior studies including: portable instrument on-site detection laboratory evaluation of suitable technologies (March 2014); procurement and field trials of nearshore oil-in-water technologies (March 2015); shoreline trials, manual/guideline preparation, field validation and report preparation (March 2016) {Phase 1A} • In September 2015, a suite of atmospheric prediction models to support oil spill preparedness and response were developed in research mode at increasing resolution (2.5 km, 1 km, 0.25 km) centered on Douglas Channel (Vancouver area). {Phase 1A} • The atmospheric model was converted into a development model in October 2015 and follow-up work on the atmospheric model for integration into the coupled ocean-atmospheric model system continued under ECCC's work in Phase 1B (Science and Technology for Cleanup initiative). {Phase 1A} • Modelling studies were also completed to study the following (December 2015): {Phase 1A} • Reduction of dilbit-brine interfacial tension under various conditions of dilbit-chemical dispersant interactions; {Phase 1A} • Dilbit-suspended sediment interaction using one standard reference material from NIST and various conditions of dilbit-chemical dispersant interactions; {Phase 1A} • Dilbit-suspended sediment interaction using natural sediments under various conditions of dilbit-chemical dispersant interactions; {Phase 1A} • Physical properties of dilbit-suspended sediment aggregates (building state-of-the art settling column); and {Phase 1A} • The development of dilbit droplet formation under various conditions of dilbit-chemical dispersant interactions. {Phase 1A} • Work related to countermeasures included an evaluation of surfactant behaviours of products in other spill treating agent classes when mixed with oil (December 2014); and effectiveness testing of dispersants on dilbit products and heavy oils using laboratory tests; and effectiveness testing of surface washing agents on dilbit products and heavy oils using existing laboratory test (June 2015). {Phase 1A} Guidance and Support to Seabird Baseline Monitoring (ECCC): {Phase 1A} • All Global Location Sensing (GLS) and GPS data logger deployments on focal alcid species in Spring/Summer 2013, retrieval and deployment retrieval trips in Spring and Summer 2014, and

Initiative	Completed Activities / Deliverables Phase of WCTSS: Phase 1A Phase 1B Phase 2

	retrievals in Spring/Summer 2015 were completed. Also, in 2014, satellite telemetry (PTT) deployments were conducted for focal seaduck and diving duck species, as well as Marbled Murrelets. Many satellite tags remained active, continuing to generate data in 2015-16 and beyond. The data is being used, alongside existing datasets, to develop a suite of data products and decision support tools for the purposes of emergency planning, preparedness, and response {Phase 1A}
	• Two peer-reviewed journal articles were produced in 2015-16 using the data generated from the bird tagging activities: {Phase 1A}
	  • A manuscript titled "First evidence of east-west migration across the North Pacific", published in Marine Bird Ibis. (157(4):877-82, 2015). {Phase 1A}
	  • A manuscript titled "Marbled Murrelet *Brachyramphus marmoratus* movements and marine habitat use near proposed tanker routes to Kitimat, B.C.", in Marine Ornithology, in press. {Phase 1A}

Integrated Satellite Tracking of Pollution - Satellite Based Monitoring (ECCC)	• Manning of the ISTOP desk became a 24-7 program in 2016. {Phase 1A} • PCI software was purchased to evaluate new techniques to detect oil spills. {Phase 1A}
Systematic Surveillance and Monitoring of Ships – NASP (TC)	• In 2013-14, 2014-15 and 2015-16, capital projects were completed on the aircraft to increase the capability and resulted in betterment of the aircraft. In 2015-16, a second user console was installed in one of the surveillance aircraft to be used on a trial basis prior to installing one on the other two aircraft. This capability is available in other Countries and Canada is trying it to see if it is effective for Canadian operations as well. {Phase 1B}

Incident Command System (CCG)	• Using ICS Canada curriculum as a baseline, four ICS modules were created (ICS-100, 200, 300 and 400) in 2014-15.{Phase 1B}
	• The following ICS training was provided for CCG and identified DFO employees: {Phase 1B}
	  • 2014-15: ICS-100 (325 employees), ICS-200 (100 employees)
	  • 2015-16: ICS-100 (1670 employees), ICS-200 (245 employees), ICS-300 (130 employees), ICS-400 (45 employees) {Phase 1B}
	• Construction of the National Situation Centre (SITCEN) was completed by the end of March 2016, with enhanced operational capability achieved by September 2016 and full operational capability by March 2017. {Phase 1B}
	• Completion of the ICS information management system is underway (planned for Q4 of 2016-17 with full implementation of ICS planned for 2017-18). {Phase 1B}

Incident Command Support (ECCC)	• In the fall of 2015, ECCC updated its Environmental Emergency Response Plan (EERP) to reflect CCG's emergency response plan using the ICS system, and since then, has made progress in defining its roles within ICS. {Phase 1B} • Also in 2014-15, CCG led an ICS-200 and ICS-300 training course for ECCC experts (80% of ECCC environmental officers were trained up to ICS-200). {Phase 1B} • Training in 2015-16 focused on ECCC's implementation of the ICS response structure. Also in 2015-16, an ICS-200 and ICS-300 training course was delivered for ECCC experts in Montreal. {Phase 1B} • In 2016, a one-day course was provided (I-402 - An Overview for Executives and Senior Officials) in the National Capital Region (Gatineau). This standard course introduced the ICS and provides the foundation for executive understanding and participation in the ICS. {Phase 1B} • A consultant also provided expert advice on ICS to develop a Guide for implementing ICS for Environment Canada's Environmental Emergencies Program to fulfill Environment Canada's mandate and policies for response to environmental emergencies. {Phase 1B}

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Review of Spill Treating Agents and Countermeasures (ECCC, DFO, TC and NRCan)	• The review produced a report in the fall of 2013 with options and recommendations for any necessary legislative and regulatory changes. {Phase 1B} • This lead to the federal government approving an initiative to lift legal impediments to using spill-treating agents, i.e. the Alternative Response Measures (TC, CCG and ECCC) initiative of Phase II of the WCTSS. {Phase 1B}

Science and Technology for Cleanup (DFO, ECCC and NRCan)	Enhancement to Operational 24-7 Oil Spill Modelling Response and Ocean Modeling Capabilities (ECCC):
	{Phase 1B}
	• A working prototype of the Canadian Oil Spill Modelling System (COSMOS), to be used in advising marine oil spill response/clean-up, was developed in 2015-16. A first version of COSMOS was finalized by the Canadian Center for Meteorological and Environmental Predictions (CCMEP) in June 2016. {Phase 1B}
	• Adaptation and testing of hydrological models "Watroute" (river flow prediction for input to ocean models) and RBM (river water temperature for input to ocean models), in experimental mode was completed in March 2016. {Phase 1B}
	• An improved Global Ice-Ocean Prediction (GIOPS v2.1) system and an experimental Regional Ice-Ocean Prediction system (RIOPS v1.1) were developed and implemented within ECCC's CCMEP operational IT infrastructure in June 2016. These two systems will produce the boundary conditions for the DFO very high resolution coastal ocean model. {Phase 1B}
	Assessing Maritime Pollution Risk and Oil Sands Products and Enhanced 24-7 High Resolution Ocean Oil Spill Modelling Capabilities (ECCC with input from DFO): {Phase 1B}
	• Physical/Chemical properties data from 2013-14, including evaporation of six dilbit products, have been incorporated into existing oil spill modelling software (OilMap) and tested. {Phase 1B}
	• A list of spill-treating agents (STAs) and countermeasures were evaluated for their effectiveness with diluted bitumen products (a type of crude oil derived from the oil sands which is mixed with various types of diluents so that it can be transported through pipelines), in 2013-14. {Phase 1B}
	• The STA and countermeasures data were published in the Proceedings of the AMOP Technical Seminar.{Phase 1B}
	• Conducted new research to determine the effectiveness of countermeasures and support their controlled use: {Phase 1B}
	  • Testing of 3 dilbit products at varying temperatures and weathering states to assess the time window-of-opportunity for the effective use of dispersants (December 2014); {Phase 1B}
	  • Development of an improved method for testing the effectiveness of surface washing agents (September 2015); and {Phase 1B}
	  • Evaluation of the effectiveness and toxicity of spill treating agent products to determine products suitable for use in Canada (March 2016). {Phase 1B}
	High Resolution Ocean Modelling System (DFO): {Phase 1B}
	• The second version of the high resolution coastal model to be integrated in the coupled ocean-atmospheric model system was delivered to ECCC in September 2015. A third version is to be delivered in March 2016. This model will help understand how oil will be transported in marine environments during a spill. {Phase 1B}
	• Joint work between DFO and ECCC was initiated on the coupling of the numerous model components (high resolution atmospheric model, hydrology model, Northeast Pacific model, and the high resolution coastal model). Discussions between ECCC, DFO and SSC on the integration of the model components and computer capacity enhancements began in February 2015. {Phase 1B}

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2

	Diluted Bitumen Wave Tank Research (DFO): {Phase 1B}
	• An interdepartmental report was publicly released on the ECCC website in January 2014, titled "Properties, Composition and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands". This is the same report mentioned above in ECCC and DFO's components under Phase 1A (Scientific Research and Activities initiative). {Phase 1B}
	• A summer field experiment was completed in June 2015 in the Douglas Channel to characterize the annual differences in microbial populations and their ability to biodegrade (in-situ and ex-situ) various diluted bitumen products. {Phase 1B}
	• A winter field experiment was completed in March 2016 in the Douglas Channel to characterize the seasonal effects on microbial populations and their ability to biodegrade diluted bitumen products. {Phase 1B}
	• The data from the field studies is being used to model the suspended sediment settling rates and formation of oil-particle aggregates. {Phase 1B}
	• Publications as a result of the wave tank research studies in Phase 1B, are as follows: {Phase 1B}
	  • A manuscript titled "A numerical model to simulate the fate and transport of diluted bitumen products in marine environment" was published in the Proceedings of the International Oil Spill Conference (IOSC), 2014. {Phase 1B}
	  • A manuscript titled "V-DROP: A comprehensive model for droplet formation of oils and gases in liquids - Incorporation of the interfacial tension and droplet viscosity" has been published in Chemical Engineering Journal (253:93-106, 2014). This is the model that was presented at the International Oil Spill Conference in May, 2014. {Phase 1B}
	  • A manuscript titled "Bitumen on Water: Charred Hay as a PFD (Petroleum Flotation Device)", was accepted for publication in the Journal of Marine Science and Engineering (3, 2015). The project was funded under Government of Canada G&C that was provided to Saint Mary's University. {Phase 1B}
	  • A manuscript titled "A-DROP: A predictive model for the formation of oil particle aggregates (OPA)", published in Marine Pollution Bulletin (106: 246-259, 2016). {Phase 1B}
	  • A manuscript titled "Oil droplets transport due to irregular waves: Development of large-scale spreading coefficients", published in Marine Pollution Bulletin (104: 279-289, 2016). {Phase 1B}
	  • A manuscript titled "The dynamics of diluted bitumen derived oil-mineral aggregates, Part I", published in Canadian Technical Report of Fisheries and Aquatic Sciences (3157: viii-44, 2016). {Phase 1B}
	  • A manuscript titled "Seasonality and physical control of water properties and sinking and suspended particles in Douglas Channel, British Columbia", published in Canadian Technical Report of Fisheries and Aquatic Sciences (308: iv-26, 2015). {Phase 1B}
	  • A poster titled "Field studies to monitor indigenous microbial respiration to determine the potential biodegradation of naturally and chemically dispersed crude oil, condensate and diluted bitumen" was presented in Proceedings of the AMOP Technical Seminar, June 2016. {Phase 1B}
	  • A presentation with poster titled "Analysis of BTEX in diluted bitumen using purge and trap GC-MS technology, published in the Proceedings of the AMOP Technical Seminar, June 2016. {Phase 1B}
	  • A presentation with manuscript titled "An estimate of sinking rate of spilled diluted bitumen in sediment laden coastal waters", published in the Proceedings of the AMOP Technical Seminar, June 2016. {Phase 1B}
	  • 5 abstracts were submitted to the AMOP Technical Seminar in Halifax in June 2016. {Phase 1B}
	Diluted Bitumen Characterization Research (NRCan): {Phase 1B}
	• NRCan conduced advanced petroleum analyses on the diluted bitumen, conventional crude and petroleum products used in the research undertaken in Phase 1A (Scientific Research and Activities initiative) and incorporated its results into the interdepartmental report, published by ECCC in January

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
	2014. This is the same interdepartmental report mentioned in DFO's Diluted Bitumen Wave Tank Research component and in the Scientific Research and Activities initiative. {Phase 1B} • Partial results were presented and two working papers were also prepared by NRCan for the AMOP Technical Seminar in June 2015 and 2016. {Phase 1B}
Area Response Planning Pilot Project (TC, CCG, DFO and ECCC)	• Annual reports (year 1 and 2 research) were produced on the fate and effects of oil products on fisheries. Note that this research was undertaken and reports were produced in Phase 1A (Scientific Research and Activities initiative) and Phase 1B (Science and Technology for Cleanup initiative). These reports are used to inform the work in ARP. (See the mentioned initiatives for a list of publications.){Phase 2} • Marine Migratory Bird sensitivity data were collected in the four identified ARP planning pilot areas, using aerial and boat-based surveys, and through implementing satellite telemetry, GPS and GLS 'tagging' projects on focal species of particular conservation concern. The data will be incorporated into existing and new data products and decision support tools by the end of 2016-17. {Phase 2} • Guidelines for prioritizing key environmental sensitivities in each of the four geographic areas of response were established by ECCC. Implementation of the guidelines began in 2014-15. {Phase 2} • The area risk methodology has been developed and the final report on this (including the completion of the four area risk assessments) is due by TC in December 2016. {Phase 2} • The target completion date for the development of the Response Plans was revised to February 2017 (consultations are underway until mid-December 2016). {Phase 2}
Alternative Response Measures – legislative amendments (TC and ECCC)	• Drafting of the amendments to the CSA 2001 and CEPA to allow for the use of alternative response measures was 90% completed before being put on hold in the fall of 2015. Policy approval is being sought under another initiative to formalize the drafting and table the Bill in Parliament. {Phase 2}
Operational Science for Marine Oil Spill Response (ECCC, NRCan)	• Evaluations of spill-treating agent (STA) efficacy and toxicity undertaken for the establishment of a list of approved STAs in offshore oil platforms was completed in February 2016 by ECCC. {Phase 2} • Results from NRCan's initial research on the pre-treatment of heavy oil products before they are transported through pipelines, in order to improve oil's behavior and recovery rates when spilled in marine environments, were published in the Proceedings of the AMOP Technical Seminar in June 2016 ("Impacts of Pretreatment on Properties and Behaviour of Diluted Bitumen in Water"). A presentation was also given ("Test Tank Studies of the Effect of Oil Viscosity on Oil-Sediment Interactions in Fresh Water"). {Phase 2} • Previous to this, NRCan published "A Comparative Analysis of Environmental Behaviour of Diluted Bitumen and Conventional Crudes" in the Proceedings of the AMOP Technical Seminar (June 2015), in collaboration with the Government of Alberta; and "Properties, Composition and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands" in 2014, in a government report published in collaboration with ECCC and DFO. {Phase 2} • ECCC has carried out oil detection and monitoring studies to support spill countermeasures decision making and published results in a peer-reviewed paper was presented at the AMOP Technical Seminar, June 2014. {Phase 2} • NRCan has established a new contribution program, the Oil Spill Response Science Program (OSRC), to support R&D on new mechanical technologies and processes to more effectively recover heavy oil spilled in marine environment, and to date, one contribution agreement was signed in August 2016 and another is expected to be finalized by February 2017. {Phase 2} • A review of the terms and conditions for the OSRS Program was completed and a second call for proposals was launched in November 2016. The original scope on mechanical recovery was expanded to include chemical treatment and bioremediation. Proposals are due by January 25, 2017. {Phase 2}

Initiative	Completed Activities / Deliverables Phase of WCTSS: Phase 1A Phase 1B Phase 2
	• ECCC developed a new Shoreline Cleanup Assessment Technique (SCAT) Manual and Job Aids, with publication scheduled for 2016-17. {Phase 2} • ECCC's Canadian Wildlife Service developed the National Wildlife Emergency Response Framework, a suite of policy, contingency planning, and technical guidance documents covering key elements of wildlife emergency response operations pertaining to Migratory Birds and Species at Risk under ECCC jurisdiction. {Phase 2} • ECCC's Next Generation Environmental Simulator is currently in design phase, and once operational, studies will be launched to evaluate the "window of opportunity" for response options undertaken. Construction is scheduled to begin in August 2016. {Phase 2} • ECCC is also finalizing the development of appropriate deployable oil spill detection and monitoring methods to aid response and regulatory decision-makers. To support these methods, baseline environmental shoreline surveys will be conducted throughout the summer of 2016 in selected areas of Port Hawkesbury NS, Bay of Fundy NB, St Lawrence River and Vancouver BC. {Phase 2} • NRCan is completing benchmarking tests at lab-scale of pre-treatment approaches and in the newly-constructed spill tank test facilities (built in 2015-16) of the set of 7 diluted bitumen products and 1 conventional crude (samples are from 2013-14 and 2014-15 work in Phase 1B). {Phase 2}
Engaged Communities/Stakeholders	
Public, Private and Community Partnerships (CCG, TC)	• The CCG Western Region hired two community engagement officers in 2014-15 to promote the marine safety system with First Nations and other stakeholders.{Phase 1B} • Canada's Marine Oil Spill Information Kit is in its final drafting stage and is expected to be completed by the CCG in 2016-17. The guide is comprised of Pillar I – Prevention; Pillar II – Preparedness and Response; and Pillar III – Liability and Compensation. {Phase 1B} • A review was carried out by TC to improve the effectiveness of the Regional Advisory Councils (RACs). Revised Terms of Reference, which articulated a strengthened mandate for the RACs, were approved in March 2015. {Phase 1B}
Area Response Planning Pilot Project (TC, CCG, DFO and ECCC)	• The Minister of Transport approved the engagement activities to support Response Organizations in the development of Area Response Plans in February 2016 and engagement activities are well underway. {Phase 2}
Community Participation Funding Program (TC)	• The CPFP was launched on March 8, 2016 via the ARPI Stakeholder Information Package. • As of July 2016, 21 applications have been approved and have received grants for the Area Response Planning Engagement Activities. {Phase 2}
Contribution to Clear Seas Centre for Responsible Marine Shipping (TC)	• Multi-year contribution agreement from May 4, 2015 to March 31, 2019 was signed to support the establishment of the Clear Seas Centre and their operations. {Phase 2} • The Centre has convened workshops and conferences to enable more productive conversations related to sustainable marine shipping as well as distributed educational material and conducted public outreach. {Phase 2} • They have also undertaken fact finding visits with foreign countries and organizations such as the International Maritime Organization to identify and document best practices worldwide. {Phase 2}
Ship-Source Oil Spill Compensation and Liability	
Review of Liability and Compensation Regime (TC)	• The review focused on the domestic Ship-Source Oil Pollution Fund (SOPF) and what enhancements were necessary to make Canada's liability and compensation regime world-class. {ATIP REMOVED}The review led to federal government approval of the components of the Phase II initiative, Enhancements to Ship-Source Oil Pollution Fund (which was re-approved under the new government). {Phase 1B}

Initiative	Completed Activities / Deliverables
	Phase of WCTSS: Phase 1A Phase 1B Phase 2
Enhancements to Ship-Source Oil Pollution Fund (TC)	• A new levy system is planned for development, and once developed and approved, amendments can be made to the *Marine Liability Act* to implement the new levy system. {ATIP REMOVED}{Phase 2}
Other	
Panel Review of Canada's Oil Spill Preparedness and Response Regime (TC)	• A Secretariat to support the Panel was created at Transport Canada in 2012-13. {Phase 1A} • The risk assessment South of 60º was completed in January 2014 and the risk assessment North of 60º was completed in June 2014. {Phase 1A} • The first report, 'A Review of Canada's Ship-source Oil Spill Preparedness and Response Regime – Setting the Course for the Future, Phase I', was published in December 2013. {Phase 1A} • The federal government is responding to 42 of the 45 recommendations made in the first report. These recommendations helped inform Phase II initiatives (e.g. Area Response Planning Pilot Initiative and Options for Long-term Governance and Funding of WCTSS) and beyond. {Phase 1A} • The second report, 'A Review of Canada's Ship-source Oil Spill Preparedness and Response: Setting the Course for the Future, Phase II – Requirements for the Arctic and for Hazardous and Noxious Substances Nationally', was published in April 2015. {Phase 1A} The Panel made 25 recommendations for the Arctic (North of 60º) and 17 recommendations for hazardous and noxious substances as well as one recommendation (applicable to both phases of the review) on the management of marine casualty incidents. {Phase 1A} Consultation sessions on the recommendations put forth in the second report are underway. {Phase 1A}
Options for Long-Term Governance and Funding of WCTSS (TC with CCG-DFO)	• A task force was established in 2014-15.{Phase 2} • CCG completed a Marine Services Fees Impact Assessment in March 2016. {Phase 2} • Two of the three governance studies were completed by TC in 2015-16. A draft report for the third study was received in the early fall of 2016 and is currently being finalized. {Phase 2} {ATIP REMOVED}

ANNEX E: MANAGEMENT ACTION PLAN

Recommendations	Proposed Actions	Forecast Completion Date	OPI
When developing a tracking scheme to monitor the implementation of Oceans Protection Plan initiatives, it is recommended that TC: 1. ensure that it is able to track the WCTSS initiatives distinctly within that scheme; and 2. apply lessons learned from monitoring WCTSS implementation. Specifically, it is recommended that TC track and request from the partner departments the following information: • a list of all expected and completed milestones and timelines by fiscal year for each initiative based on what is described in foundational documents and performance measurement strategies; and • interdepartmental expenditure information, specifically, the total dollars allocated and the percentage of dollars spent by fiscal year for each initiative.	The Oceans Protection Plan (OPP), announced by the Prime Minister November 7, 2016, includes significant investments in science initiatives that builds on the previous Government's WCTSS science initiatives. Tracking of all initiatives will be done through new comprehensive OPP tools and dashboards in support of the Deputy Minister level OPP Committee governing the initiatives.	April 2017	Transformation