



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Ecosystems and
Oceans Science

Sciences des écosystèmes
et des océans

Canadian Science Advisory Secretariat (CSAS)

Proceedings Series 2021/055

Quebec Region

Proceedings of the Regional Advisory Meeting on the Review of the Monitoring Indicators for the Banc-des-Américains Marine Protected Area, Validation of the Choice of Measures and State of Knowledge

**April 27–29, 2021
Virtual Meeting**

**Chairperson: Guy Cantin
Editor: Sonia Dubé**

Maurice Lamontagne Institute
Fisheries and Oceans Canada
850, Route de la Mer, P.O. Box 1000
Mont-Joli, Quebec G5H 3Z4

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Published by:

Fisheries and Oceans Canada
Canadian Science Advisory Secretariat
200 Kent Street
Ottawa ON K1A 0E6

[http://www.dfo-mpo.gc.ca/csas-sccs/
csas-sccs@dfo-mpo.gc.ca](http://www.dfo-mpo.gc.ca/csas-sccs/csas-sccs@dfo-mpo.gc.ca)



© Her Majesty the Queen in Right of Canada, 2022
ISSN 1701-1280
ISBN 978-0-660-42060-8 Cat. No. Fs70-4/2021-055E-PDF

Correct citation for this publication:

DFO. 2022. Proceedings of the Regional Advisory Meeting on the Review of the Monitoring Indicators for the Banc-des-Américains Marine Protected Area, Validation of the Choice of Measures and State of Knowledge; April 27–29, 2021. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2021/055.

Aussi disponible en français :

MPO. 2022. Compte rendu de la réunion sur les avis scientifiques régionale sur la révision des indicateurs de suivi pour l'aire marine protégée du Banc-des-Américains, validation du choix des mesures et état des connaissances; du 27 au 29 avril 2021. Secr. can. des avis sci. du MPO. Compte rendu 2021/055.

TABLE OF CONTENTS

| | |
|--|----|
| SUMMARY | iv |
| INTRODUCTION | 1 |
| ASSESSMENT | 1 |
| BANC-DES-AMÉRICAINS MPA AND MONITORING | 1 |
| Discussion..... | 2 |
| GENERAL METHODOLOGY: CALCULATION OF MEASURES AND STATUS EVALUATION | 3 |
| Discussion..... | 3 |
| BENTHIC HABITAT | 4 |
| Discussion..... | 4 |
| SPECIES AT RISK: ATLANTIC WOLFFISH..... | 6 |
| Discussion..... | 6 |
| QUALIFYING THE INDICATORS: EXAMPLE OF THE IPCC | 7 |
| Discussion..... | 7 |
| SPECIES AT RISK: WHALE MORTALITY/ACCIDENTS AND ENTANGLEMENTS | 7 |
| Discussion..... | 7 |
| PELAGIC HABITAT AND CLIMATE CHANGE..... | 8 |
| Discussion..... | 9 |
| PELAGIC HABITAT: KRILL AND HERRING | 10 |
| Discussion..... | 10 |
| PRESSURES: TRAFFIC (NOISE AND COLLISIONS) AND FISHING (PHYSICAL SEABED DISTURBANCES AND BIOMASS REMOVAL) | 10 |
| Discussion..... | 11 |
| PRESSURE: DISTURBANCE..... | 11 |
| Discussion..... | 12 |
| SELECTION OF KEY/PRIORITY INDICATORS TO BE USED IN INTERIM REPORTS..... | 12 |
| Discussion..... | 12 |
| REVIEW OF STATUS AND CATEGORIES..... | 13 |
| Discussion..... | 13 |
| REVIEW OF ANOMALIES FOR THE INDICATORS | 13 |
| Discussion..... | 13 |
| CONCLUSION | 14 |
| KEY POINTS FOR THE SCIENCE ADVISORY REPORT | 14 |
| APPENDIX 1—TERMS OF REFERENCE | 16 |
| APPENDIX 2—LIST OF PARTICIPANTS | 18 |
| APPENDIX 3—AGENDA | 19 |

SUMMARY

This document contains the proceedings from the meeting held within the regional peer review process on the review of the monitoring indicators for the Banc-des-Américains marine protected area, validation of the choice of measures and state of knowledge. This review process, which was held virtually via Zoom from April 27-29, 2021 gathered about thirty participants from Sciences, Marine Planning and Conservation, Species at Risk Management, Fisheries Management, Parks Canada and Aboriginal communities. These proceedings contain the key points of the presentations and discussions that occurred, and report the recommendations and conclusions that were presented during the review.

INTRODUCTION

In March 2019, the Banc-des-Américains Marine Protected Area (MPA) was designated as a marine protected area under the *Canada Oceans Act* ([SOR/2019-50](#)). It also benefits from a dual protection status under the *Canada-Quebec joint project agreement regarding the Banc-des-Américains MPA*. This MPA has three conservation objectives (COs): 1) conserve and protect benthic habitats; 2) conserve and protect pelagic habitats and forage species; and 3) promote the recovery of at-risk whales and wolffish. A draft ecological monitoring plan in support of these COs was peer-reviewed in 2018. This version listed ecosystem components and indicators that should be monitored and identified existing or to-be-developed surveys required for this monitoring.

A Banc-des-Américains MPA Monitoring Science Committee was established in January 2019 to finalize the ecological monitoring plan, oversee t

he implementation of monitoring, fill gaps (development of new surveys), and produce monitoring reports. To complete the ecological monitoring plan, it was necessary to identify priority issues and revise the indicators by defining the relevant measures to be used for each. The choice of measures was guided, among other things, by the information obtained from available databases. The spatial and temporal scales for the calculation of the measures also had to be specified. In addition, to guide the production of future monitoring reports, a proposed methodology for assessing the status of each indicator was developed to ensure that the results presented would adequately inform management. This review will provide an opportunity to present the historical data and ecological picture of the MPA at the time of its establishment.

Several participants were invited to contribute to this regional review within the terms of reference (Appendices 1 and 2). This document sets out the proceedings of this regional review, which took place on April 27–29, 2021 via the Zoom platform (virtual meeting) (Appendix 3).

ASSESSMENT

The meeting chair, Guy Cantin, welcomed the participants and asked them to introduce themselves. He then briefly went over the peer review process, the meeting agenda and the objectives, which are to: 1) review the priority issues to inform the assessment of indicators; 2) validate the addition of new indicators: grey seals, scientific activities, infractions/fishing activities, new pressures, ghost gear; 3) propose methods for assessing the status of each indicator; 4) provide the rationale for and validate the monitoring measures selected for each indicator, then detail the surveys and databases to be used, and present the results (state of knowledge); and 5) select the key/priority indicators to be used in interim reports (produced between comprehensive monitoring reports).

BANC-DES-AMÉRICAINS MPA AND MONITORING

Geneviève Faille outlined the different steps taken since 2007 leading to the designation, in March 2019, of Banc-des-Américains as a marine protected area (MPA) under Canada's *Oceans Act*. Mrs. Faille introduced the members of the scientific monitoring committee (CSS-BDA) and she described the purpose, conservation objectives (CO) and priority issues related to the protection of the MPA¹. These issues relate to clarifying the conservation objectives,

¹ For CO1, the priority issues are to maintain or enhance the diversity and status of the different communities associated with benthic habitats, within the range of natural variability, and minimize the

providing guidance and an indication of expected changes, and including them in the MPA management plan. The issues may be re-evaluated periodically. Mrs. Faille also presented a summary characterization of the MPA, the management measures in place, and existing activities and prohibited activities. The Regulations made under the *Oceans Act* prohibit any activity that disturbs, damages, destroys or removes from the MPA any living organism or any part of its habitat or is likely to do so. However, exceptions to this general prohibition allow certain activities that do not compromise the achievement of the conservation objectives to be carried out in the MPA.

Geneviève Faille then presented an overview of the main ecological monitoring components for the MPA. These components stem from the conservation objectives and priority issues. Indicators (direct and indirect) detailed as measures have been identified for each conservation priority and pressure. Monitoring is conducted to assess the status and trends of the MPA and its ecological performance. To date, 15 conservation priorities, 12 pressures and 42 indicators have been identified. Mrs. Faille provided a summary of the indicators corresponding to the different conservation priorities and pressures and described the associated surveys. Some indicators have been removed (dynamics of internal currents, waves and tides, abundance and taxonomy of phytoplankton species, biomass and abundance from the mackerel stock assessment, abundance of mackerel eggs, number of collisions) and new pressures and indicators have been added (grey seals, footprint and biomass removal during scientific activities, infractions/fishing activities, number of new pressures, ghost gear). In concluding, the following questions were asked: Are the priority issues relevant and do they need to be refined? Are the new indicators relevant?

Discussion

- In connection with the MPA monitoring components, it was pointed out that the objective of this peer review is to examine the state of the MPA using the direct and indirect indicators. After a few years, it will be possible to assess trends.
- With regard to the ecological performance of the MPA and the use of a reference site (BACI [Before-After-Control-Impact] concept): it was recalled that it is still difficult to use this approach for some indicators since the MPA has already been created. Also, the approach cannot be used for indirect indicators.
- Questions were asked about why the indicator “number of collisions” was being removed. It was explained that it was considered too variable. In fact, collisions are not necessarily reported in a systematic manner, and reports on collisions are not spatially precise. Despite this source of uncertainty, the participants felt it would be useful to document collisions. It was also pointed out that data collected over several years is important information for Management. The indicator will therefore be retained. It was asked whether the QMMERN data include all the reports on collisions.
- The participants agreed that the priority issues are relevant and that the indicators that have been added seem appropriate. However, the measures need to be revised, which would be done during this peer review.

negative impacts of human activities on benthic habitat, associated communities and commercially harvested resources. With respect to CO₂, the priority issue is to minimize the negative impacts of human activities on pelagic habitat and forage species. For CO₃, the priority issue is to minimize the negative impacts of human activities in order to maintain suitable habitat for populations of at-risk whale and wolffish species.

-
- It was noted that monitoring will be adapted over time.
 - Participants mentioned that in Fig. 1 illustrating the monitoring components, a feedback loop should be added between the indicators and the objectives.

GENERAL METHODOLOGY: CALCULATION OF MEASURES AND STATUS EVALUATION

Geneviève Faille went on to present the methodology. The MPA as a whole is the scale that is prioritized. Since in some cases data resolution was unsuitable, a larger area was used, that is, an already defined area linked to the database or an area that would provide a representative picture. Given the large number of measures involved, we need a method for integrating/synthesizing the information and reporting the results in a concise and understandable manner, as well as for informing senior management and the general public effectively. Our goal is to have one or more standard, reproducible and objective methods, to classify the status of the measures, and to combine the results of the different measures to determine the status of the indicator. Mrs. Faille highlighted the importance of designing effective monitoring reports using intuitive tools. One of the chosen approaches, the anomaly method, involves identifying the variation in the estimation of a measure (directional or bidirectional) relative to a reference period. Another method, the fixed threshold, is used when threshold values with known biological effects are available. Mrs. Faille gave some examples to illustrate the methodology. In concluding, the following questions were asked: What do you think about using benthic zones and pelagic zones? Do you have any clarification questions concerning the methods for assessing the status of the indicators?

Discussion

- Some participants had questions about the subjectivity of the status categories for the ecosystem components. It was suggested that the category labels be changed to “stable, variable and changing,” which would be qualified as favourable or unfavourable over time. This would make it possible to combine the bidirectional and directional approaches. It was also proposed that the following be used: “healthy, worrisome and altered.” As well, there is always some “noise” (natural variability) in ecosystems which should not be considered as change.
- It was suggested that fewer categories (three vs. five) be used so that each category covers a wider range of data and so that a given variation is not identified as a change when it actually reflects natural ecosystem variability. This would make the assessment of status more robust and clear-cut.
- Pressures can be qualified as positive or negative (very good, good, moderate-good, moderate-poor, poor). Status is thus evaluated in a directional manner.
- It was mentioned that the anomaly method is useful for comparisons with the reference period, but that the status of indicators would be directly dependent on this period, hence the importance of accurately defining it. A few comments were made concerning the limitations of the anomaly method. It is valid only if the mean is measured continuously and the standard deviation is symmetric about the mean, which is not always the case. It was suggested that quantiles or a moving average be used. This will be revisited later.
- It was pointed out that the reference period is the historical period ending in 2018. The idea is to assess subsequent changes in the indicators, but also to provide a portrait of historical data. It was also mentioned that extreme values are just as important to consider as trends.

-
- It was recalled that the conservation objectives were established with a view to conservation, which means that there is an expected direction for most of the indicators.
 - Parks Canada and the Saguenay-St. Lawrence Marine Park are also working on defining status categories and an assessment approach. It will be important to define the expected status for each indicator. It would be helpful to continue discussions on this topic in an effort to develop a more coordinated approach among the different departments.

BENTHIC HABITAT

Mrs. Geneviève Côté's presentation focused on the selection of measures and the state of knowledge related to the first conservation objective (CO1): conserving and protecting benthic habitats. The indicators selected for priority 1 (key and indicator benthic and demersal species) are as follows: cold-water indicator species (BD1), warm-water indicator species (BD2), dominant/key species (BD3), biomass of invertebrates (BD4). The sGSL multispecies bottom trawl survey is used as a source of data. The data and results are presented in terms of biomass (weight in kg/tow) and number of species. The data are averaged over three-year periods. The reference period is 2004 to 2018. The results for each measure are presented as anomalies and the status of the indicator represents the sum of the anomalies for all of the measures. The next indicator presented is tied to priority 3 (demersal communities) and consists of the demersal fish community on the plains (BD9), for which the selected measures are total biomass and total abundance of demersal fish, plus species richness, the Shannon diversity index and Pielou's evenness index. With regard to priority 4 (commercial benthic and demersal species), the snow crab indicator (BD11) was presented along with the associated measures: abundance of commercial-size male snow crab and mature females, and catch per unit effort (CPUE) in the snow crab fishery. The data for these measures come from the sGSL bottom trawl snow crab survey and from ZIFF files (reference period: 2004–2018; 3-year average). Another indicator related to priority 4 was presented: exploited groundfish (BD12). The measures are the abundance of Atlantic halibut and cod and catch per unit effort (CPUE) of groundfish. The data come from the sGSL multispecies bottom trawl survey (reference period: 2004–2018; 3-year average) and ZIFF files.

An overview of the results was presented along with certain limitations, including the small number of stations sampled in the MPA as part of the sGSL survey. Part of the MPA is not covered by the survey. Some indices are directly linked to the taxonomic level of the identifications. Suggestions were made, such as taking photographs to enable their validation. In concluding, the following questions were asked: Are the measures that were presented effective? Are there sufficient data to define a status and describe the trends in the series? Is the proposed method suitable?

Discussion

- For the sGSL survey, specifically for the less common species, it was suggested that presence/absence data or proportion/likelihood data be used instead of biomass (kg/tow).
- It was suggested that, in the figures, all the data be presented as a cloud of points around the 3-year average to better interpret the uncertainty associated with the data.
- A question was asked about how the standard deviation is calculated. At present, the standard deviation corresponds to the mean of the 3-year averages. However, it was asked why the standard deviation of all observations was not used. Three-year moving averages could be used; this would reduce fluctuations. This point will be discussed further at a later point.

-
- With regard to the indicator of dominant/key species, it was mentioned that using a new trawl in the sGSL survey could influence the catchability of certain species and affect the measures (total biomass of fixed, erect taxa, sea urchin biomass, biomass of predatory starfish). It is likely that fewer benthic and epibenthic species would be represented.
 - Participants questioned how well benthic species would be represented by the sGSL survey, given that it is aimed at sampling commercially harvested demersal species and not invertebrates. Taking this into account, concern was raised about the sustainability of using the sGSL survey to monitor the MPA.
 - Benthic imagery is used and will provide a more direct indicator for benthic species on the ridge and plains in the MPA.
 - With regard to the whole dataset derived from the sGSL survey, it was suggested that the entire stratum 416 (random tows) be taken into account, thereby making it possible to increase the number of samples (n) collected from the MPA, which is very low. This would provide a more adequate representation of the benthic and demersal species in the area. The level of confidence associated with the indicators would be higher, but less specific to the MPA.
 - The current snow crab survey in the MPA is considered to be sufficiently robust. The information is well captured by the measures presented.
 - When calculating anomalies, it was asked whether it would be possible to apply a weighting to the sum of the anomalies according to the level of confidence in the data. The suggested level of confidence is as follows: poor or good. Each indicator would be assigned a level of confidence for the data used.
 - It was asked whether the anomaly methodology is suitable when indicators do not have a normal distribution.
 - For cold-water and warm-water indicator species, it would be helpful to have information on the species' thermal limits.
 - It is important to present information on the number of tows included in each 3-year block. This is done in the research document.
 - It would be interesting to have baited imagery stations corresponding to the trawl tows of the sGSL survey, especially in the MPA.
 - For demersal and benthic species (non-commercial), there was a certain consensus with regard to reviewing the methodology in order to better reflect reality.

Each indicator was reviewed, and agreement was reached on what could be done.

- BD1: In terms of the number of rare cold-water indicator species (fish and invertebrates), it does not seem possible to assess status at present. It is important to distinguish between abundant and rare species; occurrences could be used for this purpose. The biomass of the 3 very abundant species could be presented along with the proportion of tows with presence of rarer species.
- BD1 and BD2: These two indicators need to be reviewed taking into account the introduction of a new trawl in the sGSL survey. An overview of knowledge on the BD2 indicator could be presented in the research document without indicating the status for the indicator measures. This indicator will be kept in reserve and will be reviewed if a temperature change occurs.

-
- BD3: For some dominant/key species (fixed, erect taxa, sea urchins, predatory starfish), if the spatial scale were changed (stratum 416), the indicators would become indirect ones and less relevant. In addition, for these virtually immobile taxa, the information for the stratum is not very representative of the MPA. It was decided to remove them. The imagery will be useful for tracking these taxa using the BD5 to BD8 indicators.
 - BD4: Imaging will be used to monitor the total biomass of invertebrates similarly to immobile taxa (BD3); however, abundance will be used for the assessment.
 - BD11: Acceptable as is.
 - BD12: With regard to the abundance of Atlantic halibut, considering the bottom trawl's low catchability for this species, it was agreed that this measure remains very relative. The indicator would be retained but abundance would be replaced by the proportion of tows with presence.

SPECIES AT RISK: ATLANTIC WOLFFISH

Renée Gagné presented the bycatch of Atlantic wolffish (EP2) in relation to the conservation priority for the species and CO3. The measures used are the Atlantic wolffish bycatch in the commercial fishery (snow crab, Atlantic halibut longline fishery) recorded by at-sea observers and scientific trawl surveys. The bycatch in the snow crab fishery (in crab traps), the main commercial fishery in the MPA, is almost non-existent. With regard to trawl use, Atlantic wolffish bycatch has been confirmed, but the number of fish harvested and occurrences are low. Longlines are likely to capture Atlantic wolffish more often. The data were processed and extracted using the boundaries of the Banc-des-Américains MPA. Total Atlantic wolffish bycatch by the commercial fishery consists of the sum of catches kept and returned to the water (in kilograms). The biomass and abundance of all Atlantic wolffish caught were calculated for the two scientific surveys.

The results and the limitations were presented. At-sea observers are only present on a certain number of fishing trips. Therefore, the information collected is incomplete. Logbook data were not included because they are not validated by a legal authority, and so the consistency of the data is uncertain. Based on the analysis of the available data and the limitations identified, it is not possible to assess the status of this indicator. It was nonetheless suggested that the indicator be retained to provide complementary information for the first monitoring report. Its usefulness can be re-evaluated then.

Discussion

- It is better to avoid using the term “bycatch” for the scientific survey; instead “catches” should be used. For fisheries, it is preferable to use the term “bycatch” or “incidental catches.”
- With regard to the sGSL survey, the participants questioned the relevance of retaining the indicator of Atlantic wolffish abundance and biomass in the MPA as this could produce an ambivalent interpretation. In fact, if an increase in bycatch occurred, this change could be viewed as negative, given that a larger number of fish would be harvested. On the other hand, the change could be seen as positive since an increase in bycatch would point to a larger population. We will retain this indicator for the time being given the scarcity of data sources. Considering the low level of catches observed, biomass will be replaced by occurrence or the proportion of tows with catches.

-
- With respect to the at-sea observer program, it was suggested to discuss in relation to the proportion of activities rather than biomass.
 - In the summary table for all indicators, it was proposed that a column be added presenting the confidence level of the data and the calculated measure. Later, the sum of anomalies for an indicator could be weighted according to the level of confidence. For the Atlantic wolffish, the participants agreed on the use of “poor” given its low catchability.

QUALIFYING THE INDICATORS: EXAMPLE OF THE IPCC

In the discussion on how to qualify the level of confidence regarding indicators, Denis Chabot presented a figure taken from a study by the Intergovernmental Panel on Climate Change (IPCC), which takes into account the level of confidence (“high, medium, low”) in relation to the evidence (“robust, medium, limited”) provided by the data.

Discussion

- In our case, the Y-axis could be associated with the quantity of data (frequency, time series, seasonal and spatial coverage, etc.) and the X-axis with quality (gear-catchability, selectivity, taxonomic precision, etc.).
- In this peer review, a summary evaluation of the level of confidence was performed qualitatively for each measure, but the scientific committee could examine this evaluation in greater depth. This information is considered useful for encouraging reflection and subsequent work.
- Similar work was done for the assessment of Atlantic halibut and the approach used should be consulted.

SPECIES AT RISK: WHALE MORTALITY/ACCIDENTS AND ENTANGLEMENTS

Renée Gagné provided an overview of whale mortality/accidents (EP6) and entanglements (Pr10) in relation to the whale conservation priority and CO3. The measure retained for the EP6 indicator is the total number of sightings of sick or injured individuals, live strandings and carcasses identified. From 2012 to 2020, a monthly report on the cases identified by the Quebec Marine Mammal Emergency Response Network (QMMERN) call centre was sent to Marine Planning and Conservation. The data are integrated across a larger area than the MPA to provide general information on all recorded mortalities and accidents. The data cover all cetacean species. For the Pr10 indicator, the measure presented (number of entanglements) corresponds to the total number of whales entangled in fishing gear reported to the QMMERN.

The results and limitations were presented. QMMERN data were filtered for the municipalities of Gaspé and Percé, providing a general overview of whale accidents and mortalities (it is not specific to the Banc-des-Américains MPA). Since injured or sick whales keep moving and carcasses may drift away from their point of origin, we cannot obtain precise information on the time and place of the incident. These data may underestimate the actual number of incidents that occur in the area.

Discussion

- Several sources of uncertainty related to the QMMERN data were mentioned:
- Even if these indicators are not specific to the Banc-des-Américains, some participants questioned whether an increase in sightings could be linked to heightened awareness and interest in whales among the general public leading to more reports.

-
- It was noted that an increase could also be associated with years where a larger number of whales frequented the area, as well as a larger number of vessels. It was pointed out that the carcasses of some species are more likely to sink than to drift, which adds to the uncertainty.
 - This indicator must be interpreted by taking into account the many uncertainties identified. The associated level of confidence is qualified as “low.” It was nonetheless decided to retain the indicator, because the information can assist in interpreting other indicators. It was noted that it is important to link the interpretation of this indicator to the vessel traffic indicator.
 - A major peak was noted in the number of incidents involving harbour porpoises. The potential causes should be explored: predation by grey seals, etc. This species has a significant impact on the trend of the indicator.
 - The relevance of retaining only species with at-risk status, as specified in CO3 (promoting the recovery of at-risk whale and wolffish species), was questioned. The participants felt it was important to collect information on all whale species while emphasizing species at risk. The indicator could be divided into two distinct measures, that is, species at risk and other species (divided into subgroups), or large whales and other cetaceans.
 - The collision indicator was discussed again after it was ultimately retained following the discussions on day 1. Certain biases need to be considered; for example, in the case of large merchant ships, collisions with whales often go undetected whereas collisions with whale-watching tour vessels are detected. It was suggested that an indicator of risk of collision be used (as described in G2T3M work) either as a replacement for or in addition to the number of collisions. This index comes from modelling that tracks the presence of whales in relation to vessel traffic. It was pointed out that this avenue would require a great deal of work and effort.
 - Questions were raised about the method that should be used for this indicator: by anomaly or quantile. It was concluded that it is impossible to assess status, owing to the many uncertainties involved. Instead, raw data would be presented.

PELAGIC HABITAT AND CLIMATE CHANGE

Marjolaine Blais presented the pelagic habitat indicators for the conservation and protection of pelagic habitats and forage species (CO2). They are nutrients (P1), phytoplankton (P2—chlorophyll *a*) and zooplankton (P3). The data used for all the indicators come from expanded areas representative of the MPA, given the limited number of observations obtained within the MPA and given that oceanic processes occur on a large scale. The data come from various sources: AZMP surveys, helicopter-borne surveys, multidisciplinary surveys, Canadian Ice Service, remote sensing (SST). Nutrient measures are: mean winter concentration of nitrates in the surface layer (0–50 m), mean annual concentration of nitrates in the intermediate layer (50–150 m) and the mean annual N: P ratio in the intermediate layer (50–150 m). The chlorophyll *a* measure consists of the mean annual chlorophyll *a* content in the 0–100 m layer. Zooplankton is measured using the mean annual dry weight of the mesozooplankton (<1 cm) and the mean annual abundance of small calenoid species, large calenoid species and non-copepods. The results were presented. Since 2015, the pelagic habitat has undergone moderate changes relative to the reference period. Nitrate inventories have increased, chlorophyll *a* inventories have followed a sawtooth pattern, and there has been a notable change in the zooplankton community. The limitations related to these indicators are as follows: missing information on the characteristics of the spring bloom (problematic coastal aspect), and zooplankton data collected during multidisciplinary surveys not included.

Climate change indicators were also presented, that is, the physicochemical conditions of pelagic habitat (Pr1) and of deep benthic habitat (> 100 m) (Pr2). Climate change affects all the conservation priorities, except substrate characteristics. Three subindicators are used for each indicator. The first subindicator—physical conditions in the surface layer—is measured using the mean sea surface temperature (May-Nov) obtained from satellite data (SST), the mean temperature (August-Sept.) (0–30 m) and mean salinity level (August-Sept.) in the surface layer (0–30 m) in summer. The second subindicator—ice conditions—is measured by the first day and last day of ice cover, as well as the length of the ice season. A third subindicator—physical conditions in the cold intermediate layer—is measured by the mean summer temperature (August-Sept.) in the cold intermediate layer (CIL) (40–100 m), the depth of the upper boundary of the CIL (2° C) in summer (August-Sept.) and the volume of the CIL (1 °C) in summer (August-Sept.). For the Pr2 indicator, the first subindicator—physical conditions on the seabed in summer—is measured using the mean summer temperature (August-Sept.) on the bottom (>100 m) and the mean summer salinity (August-Sept.) on the bottom (>100 m). The second subindicator is related to the dissolved oxygen saturation on the seabed (>100 m). Sea floor acidification represents the third subindicator; it is measured using the mean saturation rate of aragonite and calcite on the seabed (>100 m). In concluding, the status of the “climate change” pressure has been mainly moderate-good since 2015. In the pelagic zone, conditions tend to be warmer in the surface layer and the CIL, and the ice-free period has increased. In the benthic zone, conditions tend to be warmer and are likely to generate significant metabolic stress related to acidification. It was noted that the small amount of data related to acidification in the MPA is a limitation.

Discussion

- It was pointed out that the deep pelagic zone would be a better term to use than the benthic zone. It is important to clarify the terms used, in addition to specifying the distance from the bottom (1 m, 10 m, >10 m). Plains habitat could be also be used.
- With regard to acidification, it was recommended that a separate indicator be created that would not modulate the other measures for the benthic zone (temperature, salinity, dissolved oxygen). The problem stems from the fact that the acidification data from the past are too fragmentary. Some participants recommended that all of these indices be processed separately. Others judged that they should be amalgamated to simplify the approach; however, it is important to properly interpret the indices in successive reports submitted to Management. It was decided to create a separate indicator for acidification.
- For the climate change indicators, the participants considered the reference period that should be used, as this period could differ among indicators. It seems appropriate to keep a longer time series.
- It seems questionable to consider climate change as a pressure, because it is actually a signal. It is important to especially consider the trend of the associated indicators. Above all, their direction needs to be determined in order to tie them to the other indicators. Participants were in agreement regarding the importance of semantics. It is also essential to distinguish between a direct indicator and an indirect indicator. Indicators of climate change are classified as indirect indicators, but nonetheless considered pressures.
- There seems to be fairly good confidence in the various indicators presented, with the exception of acidification given the lack of data. The anomaly method seems appropriate.

PELAGIC HABITAT: KRILL AND HERRING

With regard to pelagic habitat, Jean-Martin Chamberland presented the indicators for krill (P4) and herring (P5). In the case of krill, the data come from an acoustic survey (2008–2018) and the nGSL multispecies survey. The measures used are the wet weight of krill and the wet weight of the two main species (*Thysanoessa raschii*, *Meganyctiphanes norvegica*). The data are currently being analyzed. In terms of limitations, it was mentioned that the acoustic survey of krill was stopped in 2018 and the nGSL survey is not really designed to measure krill. With regard to herring, the data come from the commercial fisheries in the sGSL, the acoustic survey in Chaleur Bay—Miscou, the Teleost survey in the sGSL and experimental surveys on spawning grounds. The spawning stock biomass (SSB) for spring spawners (RP) and fall spawners (RA) was presented. The precautionary approach is used to establish the categories for qualifying the status of the SSB measures and the scores for calculating the status of the indicator.

Discussion

- With regard to the level of confidence in the herring indicator, it was emphasized that it should be addressed at the same scale as the spatial scale of the survey.
- There appeared to be a consensus concerning the status presented (moderate-poor) for the herring indicator (RP+RA).
- Herring data from the sGSL survey could also be examined, but resources for processing them remain limited.
- In the case of krill, data for calculating the measures will eventually be available.

PRESSURES: TRAFFIC (NOISE AND COLLISIONS) AND FISHING (PHYSICAL SEABED DISTURBANCES AND BIOMASS REMOVAL)

Geneviève Faille outlined the pressure related to noise and collisions in relation to CO3. The indicators are anthropogenic noise (Pr6), for which no data are processed at present; intensity of traffic (Pr7) which is a proxy for noise; and vessel speed (Pr9), which is a proxy for risk of collision. The AIS database from 2012 to 2019 was used and analyzed by Innovation Maritime. Two types of ships were retained: commercial (merchant and passenger ships) and maritime operations. With regard to intensity of traffic (Pr7), the measures used are total number of transits for commercial vessel traffic and maritime operations, as well as the total transit time in the Banc-des-Américains MPA for these two categories. With regard to vessel speed (Pr9), the measures are mean speed of commercial vessels and ships used for maritime operations as well as the number of transits reaching a speed greater than 10 knots. For pressure related to noise and collisions, questions were raised concerning the time period that should be used (annual, monthly, a specific period).

Mrs. Faille outlined the pressure associated with physical seabed disturbances and biomass removals in relation to CO1 and CO3. The data come from ZIFF files and scientific surveys. For physical seabed disturbances, the indicators are: Pr 11—footprint of the snow crab fishery with the measures of catch per unit effort for snow crab and the affected area, Pr12—footprint of the groundfish fishery with the measures of catch per unit effort of the longline fishery and affected area, Pr13—footprint of scientific activities plus all areas affected by the three scientific surveys (sGSL multispecies, sGSL crab and imaging), and Pr14—infractions related to fishing activities, which were not assessed. For biomass removals (Pr15, Pr16, Pr17), the measures are snow crab exploitation rate and biomass of snow crab landings (Pr 15), biomass of longline landings (halibut and other groundfish species) (Pr16) and biomass removal by scientific activities (Pr17).

Discussion

- With regard to the period to be used for pressure related to noise and collisions, it was suggested that an annual period be used (mean annual), as it is more inclusive. It would be interesting to have a visual representation of the raw data.
- Questions were raised about the merits of having ships slow down in the Banc-des-Américains area, which could reduce noise levels and the risk of collision, but would increase the time spent in the area. The measure total transit time in the MPA was eliminated, because it is too difficult to interpret.
- The average vessel speed indicator (commercial and maritime operations) could be modified by drawing inspiration from the work done by the Saguenay-St. Lawrence Marine Park, as suggested. They use an indicator of likelihood which integrates the risk of collision and the number of ships as a function of speed.
- Some participants indicated that the traffic-related indicators were more multiplicative than additive.
- With regard to traffic-related indicators, quantiles may seem more relevant than anomalies. The length of the time series and data density should be considered when selecting a method. This point will be revisited later.
- The level of confidence in traffic measures is considered good.
- With regard to fishing-related indicators, some participants felt that the method for calculating the spatial footprint of the snow crab fishery and the longline fishery should be reviewed. The current method overestimates the areal extent and provides a strong, negative signal related to fishing activity in the area. It would be possible to include this indicator without a precise estimate of area, by using a different calculation method, such as the number of pixels affected. It will be important to consider the cumulative effect of repeated activities carried out in the same location. More to follow.
- It was also mentioned that it is important to consider that the footprint of traps does not correspond solely to the area covered, since traps move and are pulled over the bottom when being hauled up.
- The level of confidence in fishing-related indicators is considered good.
- With regard to the footprint of scientific activities, the graph with the mean could be presented without indicating status. It would nonetheless be possible to interpret the results.

PRESSURE: DISTURBANCE

Renée Gagné presented the indicator “intensity of observation and recreational activities” (Pr8) in relation to CO3. The indicator is designed to include information on commercial marine observation activities and recreational boating activities. At present, only the commercial observation component is addressed because no data are available on recreation boating activities. Measures include the following: total number of marine observation tours, average duration of these trips, number of marine observation vessels and length of the marine observation season. These measures are used to assess the intensity of marine observation activities in general in the area of the Banc-des-Américains MPA. The main threats associated with these activities are disturbances caused by ship noise and the risk of disturbance to and collisions with marine mammals.

In 2015, DFO tasked the Marine Mammal Observation Network (MMOM) with preparing an initial portrait of marine observation activities in the Banc-des-Américains area. In 2020, a data capture sheet was provided to facilitate the compilation of data on marine observation tour companies with an approved activity plan. This annual monitoring will make it possible to gather the necessary information to document the intensity of marine observation activities in the MPA. Several types of data collected in recent years can be used to document the selected measures. As these data come from different sources (e.g., MMOM, operators holding an activity plan approved for the Banc-des-Américains MPA) and serve different purposes, they cannot be compared and are detailed for each source separately. Since there are no historical data for this indicator, the processing and the evaluation of measures will be executed in the future when several years of monitoring data on commercial tourism activities in the Banc-des-Américains MPA are available. Accordingly, the status of the indicator has not been assessed. Other, more precise indicators for marine observation activities in the MPA will be developed from AIS data in the coming years.

Discussion

- Questions were raised about the usefulness of information on the average duration of marine observation trips given that part of the time is spent outside of the Banc-des-Américains (travelling to and from the area). It would be more relevant to have data on the duration of the observation activity itself.
- It would be useful to have information on the number of outings per month, during the busiest months.
- From monitoring AIS parameters, it was noted that travel speed will eventually be integrated to better assess the risk of collision.
- It was pointed out that in general for all indicators, it would be helpful to take into account the multiplicative effect of the measures. The correlation between the indicators could also be examined more closely.
- Special attention should be given to species at risk in relation to this pressure.
- Participants agreed that the AIS data will be very useful (observation time, species at risk, etc.). Also, the level of confidence in this indicator should be good with the addition of AIS data.

SELECTION OF KEY/PRIORITY INDICATORS TO BE USED IN INTERIM REPORTS

Geneviève Faille presented the key/priority indicators to be used in interim reports (every three years), which are more succinct than comprehensive monitoring reports. The criteria used to select the indicators are as follows: ease of calculation (access to data), capacity to trigger management action in response to a change observed in the short-term, and their specificity to the MPA. The list is more closely linked to pressure indicators: traffic intensity, intensity of observation and recreational boating, vessel speed, fishing and footprint of the snow crab fishery, fishing and footprint of the groundfish fishery, footprint of scientific activities, infractions/fishing activities, biomass removal by scientific activities, number of new pressures.

Discussion

- Some participants indicated that the indicators selected for interim reports to some extent reflect what can be done with information that is available quickly. The goal is to simplify

the work as much as possible in order to be able to produce these reports frequently. This also supports the implementation of adaptive management.

- It was suggested that recognized bioindicators related to the pressure “pollution” be used.
- In addition to priority indicators related to pressures, it is necessary to have a few general indicators related to the conservation objectives (e.g., use of the area by whales, diversity and biomass data from the snow crab and groundfish survey).
- If the objective of interim reports is to trigger a process (e.g., complete assessment, information for Management), we need to have thresholds beyond which the process would be triggered. This is an interesting comment which could stimulate reflection and future work.
- A question was raised about the desired state of health of the MPA. Maintaining the existing diversity is one aspect that was mentioned, among others.

REVIEW OF STATUS AND CATEGORIES

Three categories related to status were proposed instead of five: healthy/poor/slight change; worrisome/average/moderate change; altered/high/significant change. The presented table links them to the different methods: directional anomaly, bidirectional anomaly, fixed threshold (e.g., dissolved O₂, aragonite saturation, herring).

Discussion

- It was agreed that reducing the number of categories to three is an improvement.
- Assessing the status of an indicator requires that we examine existing conditions in the MPA in relation to the reference conditions. While this is an interesting approach, it cannot be applied to all of the indicators.
- It was pointed out that it is not necessary to standardize the approach for all indicators. It is better to deal with the indicators one by one. However, certain methods may be applicable to a set of indicators.
- It would be a good idea to hold discussions on the different approaches with the different authorities (e.g., DFO vs. Parks Canada) to draw inspiration from one another.

REVIEW OF ANOMALIES FOR THE INDICATORS

Daniel Ricard presented an excerpt from the Teleost survey (tows) in the sGSL in stratum 416 with the catch data for three stenothermal species (Canadian plaice, witch flounder, Greenland halibut) targeted by the BD1 indicator. A mean and a standard deviation are obtained for each year. The objective here is to show that when the log of catches is considered, the distribution is unimodal and symmetric with regards to the central tendency measure. A log transformation of the measures is therefore recommended. Quantiles could also be used. Basically the same perspective is obtained. Other potential approaches were also advanced, including the possibility of using modelling when there are several zero values.

Discussion

- It was pointed out that when the data were transformed, a normal distribution was obtained and that it is more suitable to use the anomaly method.

-
- In the table, it would be useful to include a column with the data characteristics (e.g., discrete or continuous data, a lot of zeroes) in order to justify the statistical approach used.
 - It was recalled that the objective of the MPO is to conserve the same reference period for a given indicator over time (no change in reference mean and standard deviation). It is nonetheless necessary to use different reference periods depending on the indicators and the available data (surveys). Harmonization can be carried out when appropriate.
 - When longer time series data are available, it is suggested that a shorter period be used, which is more concise in the context of the creation of the MPA.
 - It appears that a moving average would not be suitable since data are aggregated in 3-year blocks.
 - It was mentioned that simulations and power analyses could make it possible to assess and ensure the robustness of the indicators, but this would require a significant investment of time.

CONCLUSION

KEY POINTS FOR THE SCIENCE ADVISORY REPORT

The key points from the meeting were presented and the participants provided comments for the preparation of the science advisory report. Certain additions, deletions and other modifications were made. Only substantive comments are reported here:

- Under the theme “conservation priorities, pressures and indicators,” it was specified that further to the review, an acidification indicator would be created (separate from Pr2) to permit more accurate interpretation.
- With regard to the databases that must be processed, it was specified: “according to their nature and statistical properties.”
- In the highlight on the assessment of status, in the case of 1) directional, it is specified: “when the change has a *a priori* favourable or unfavourable direction,” and in the case of 2) bidirectional, we would say: “when there is no expected direction for the change. In this case, only the magnitude of the change is evaluated.”
- With regard to status categories, it will be specified that there are three categories.
- For the key point dealing with the summation of anomalies, the comment about the possibility of weighting the summation of anomalies according to the level of confidence in the data was taken into consideration. This suggestion will be studied. For the time being, the key point has not been modified.
- When it is a question of “existing” databases, it is more accurate to talk about “processed” data.
- The participants agreed on the wording of the key point concerning the level of confidence: “A level of confidence was evaluated for each of the 24 indicators, based on the quality and quantity of available data.”
- Clarifications were made to the key points on measures, which were reworded.
- In the key point on the impossibility of assessing certain indicators, it was decided that the BD indicators would be removed, because results should be obtained soon from the research document (based on comments received). “Due to a lack of data” was also

removed. The lack of data will be mentioned in the table of the research document as applicable.

- With regard to the key point on priority indicators, “every three years” would be specified.

APPENDIX 1—TERMS OF REFERENCE

Review of the monitoring indicators for the Banc-des-Américains Marine Protected Area, validation of the choice of measures and state of knowledge

Regional Advisory Meeting - Quebec Region

April 27–29, 2021

Virtual meeting

Chairperson: Guy Cantin

Context

In March 2019, the Banc-des-Américains Marine Protected Area (MPA) was designated as a marine protected area under the *Canada Oceans Act* (SOR/2019-50). It also benefits from a dual protection status under the *Canada-Quebec joint project agreement regarding the Banc-des-Américains MPA*. This MPA has three conservation objectives (COs): 1) conserve and protect benthic habitats; 2) conserve and protect pelagic habitats and forage species; and 3) promote the recovery of at-risk whales and wolffish (Gauthier et al. 2013). A draft ecological monitoring plan in support of these COs was peer-reviewed (and listed ecosystem components and indicators that should be monitored and identified existing or to-be-developed surveys required for this monitoring) in 2018 (Faille et al. 2019; DFO 2019).

A Banc-des-Américains MPA Monitoring Science Committee was established in January 2019 to finalize the ecological monitoring plan, oversee the implementation of monitoring, fill gaps (development of new surveys), and produce monitoring reports. To complete the ecological monitoring plan, it was necessary to identify priority issues and revise the indicators by defining the relevant measures to be used for each. The choice of measures was guided, among other things, by the information obtained from the available databases. The spatial and temporal scales for the calculation of the measures had also to be specified. In addition, to guide the production of future monitoring reports, a proposed methodology for assessing the status of each indicator was developed to ensure that the results presented would adequately inform management. This review will provide an opportunity to present the historical data and ecological picture of the MPA at the time of its establishment.

Objectives

The objectives of this review are to:

1. Review the priority issues identified to guide the evaluation of indicators
2. Validate the addition of new indicators: grey seal, scientific activities. Fishing violations, new pressure, ghost gear.
3. Propose methods to assess the status of each indicator.
4. Justify and validate the choice of monitoring measures for each indicator. Detail the surveys and databases to be used, and present the results (state of knowledge).
5. Selection of key/priority indicators for use in interim reports (between full monitoring reports).

Expected Publications

- Science Advisory Report
- Proceedings
- Research Document

Expected Participation

- Fisheries and Oceans Canada (Sciences, Marine Planning and Conservation and Fisheries management sectors)
- Parks Canada
- Aboriginal communities/organizations
- Environmental non-governmental organizations

References

- DFO. 2019. [Review of ecosystem features, indicators and surveys for ecological monitoring of the Banc-des-Américains Marine Protected Area](#). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2019/033.
- Faille, G., Laurian, C., McQuinn, I., Roy, V., Galbraith, P., Savenkoff, C., Côté, G. and Benoît, H.P. 2019. [Review of the indicators and recommendations for an Ecological Monitoring Plan for the Banc-des-Américains Marine Protected Area](#). DFO Can. Sci. Advis. Sec. Res. Doc. 2019/065. v + 53 p.
- Gauthier, P., Gauthier, J., et Bernier, J. 2013. [Rapport de l'atelier de consultation intersectorielle sur le site d'intérêt du banc des Américains en vue de l'établissement d'une zone de protection marine](#). Rapp. manuscr. can. sci. halieut. aquat. 3021 : iv + 85 p.

APPENDIX 2—LIST OF PARTICIPANTS

| Name | Affiliation |
|--------------------------|---|
| Arsenault, Lisa | AGHAMM |
| Blais, Marjolaine | DFO Science, Quebec region |
| Bouchard, Éline | DFO Fisheries Management, Quebec region |
| Cantin, Guy | DFO Science, Quebec region |
| Chabot, Denis | DFO Science, Quebec region |
| Chamberland, Jean-Martin | DFO Science, Quebec region |
| Côté, Geneviève | DFO Science, Quebec region |
| Cyr, Charley | DFO Science, Quebec region |
| Daze Querry, Natasha | DFO Marine Planning and Conservation, Quebec region |
| D-Tremblay, Laurence | DFO Species at Risk, Quebec region |
| Dubé, Sonia | DFO Science, Quebec region |
| Faille, Geneviève | DFO Science, Quebec region |
| Gagné, Renée | DFO Marine Planning and Conservation, Quebec region |
| Galbraith, Peter | DFO Science, Quebec region |
| Gendreau, Yanick | DFO Science, Quebec region |
| Harvey, Valérie | DFO Science, Quebec region |
| Juillet, Cédric | DFO Science, Quebec region |
| Lehoux, Caroline | DFO Science, Quebec region |
| Lévesque, David | DFO Science, Quebec region |
| Ménard, Nadia | Parks Canada |
| Méthé, Denise | DFO Science, Gulf region |
| Nozères, Claude | DFO Science, Quebec region |
| Pomerleau, Corinne | DFO Science, Quebec region |
| Ricard, Daniel | DFO Science, Gulf region |
| Roux, Marie-Julie | DFO Science, Quebec region |
| Roy, Virginie | DFO Science, Quebec region |
| Sainte-Marie, Bernard | DFO Science, Quebec region |
| Starr, Michel | DFO Science, Quebec region |
| Thorne, Marilyn | DFO Science, Quebec region |
| Turgeon, Samuel | Parks Canada—PMSSL |
| Valentin, Alexandra | DFO Species at Risk, Quebec region |

APPENDIX 3—AGENDA

Review of the Monitoring Indicators for the Banc-des-Américains Marine Protected Area, Validation of the Choice of Measures and State of Knowledge

April 27–29, 2021

Virtual meeting (Zoom)

Chairperson: Guy Cantin

April 27, 2021—Tuesday

| | | |
|-------|---|-----------|
| 9:00 | Introduction, Review of the Terms of Reference and Agenda | G. Cantin |
| 9:20 | BDA context, Review of priority issues (Obj.1) and new indicators (Obj.2) | G. Faille |
| 10:00 | Discussion | All |
| 10:30 | Break | |
| 10:45 | Methods to assess the status of each indicator (Obj. 3) | G. Faille |
| 11:00 | Discussion | All |
| 12:00 | Lunch | |
| 1:00 | Benthic habitat: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | G. Côté |
| 1:30 | Discussion | All |
| 2:45 | Break | |
| 3:00 | Species at risk—Atlantic wolffish: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | R. Gagné |
| 3:15 | Discussion and summary of the day | All |
| 4:00 | End of the day | |

April 28, 2021—Wednesday

| | | |
|-------|---|---------------------|
| 9:00 | Review of day 1 | G. Cantin |
| 9:15 | Species at risk and pressure—Cetacean mortality and entanglements: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | R. Gagné |
| 9:30 | Discussion | All |
| 10:00 | Pelagic habitat and climate change: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | M. Blais |
| 10:30 | Break | |
| 10:45 | Discussion | All |
| 11:30 | Pelagic Habitat—Krill and Herring: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | J-M. Chamberland |
| 11:45 | Discussion | All |
| 12:00 | Lunch | |
| 1:00 | Pressure—traffic and fisheries: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | G. Faille |
| 1:30 | Discussion | All |
| 2:30 | Break | |

| | | |
|------|---|----------|
| 2:45 | Pressures—disturbance: choice of measures, database used and state of knowledge (Obj. 3 and Obj. 4) | R. Gagné |
| 3:00 | Discussion and summary of the day | All |
| 4:00 | End of the day | |

April 29, 2021—Thursday

| | | |
|-------|--|-----------|
| 9:00 | Review of day 2 | G. Cantin |
| 9:15 | Selection of key/priority indicators for use in interim reports (Obj. 5) | G. Faille |
| 9:30 | Discussion | All |
| 10:15 | Break | |
| 10:30 | Highlights review | All |
| 12:00 | Lunch | |
| 1:00 | Highlights review | All |
| 2:30 | End of the meeting | |
