



**North Pacific Fisheries Commission**

NPFC-2018-WS DATA01-Final Report

**Workshop on Data Requirements  
and Data Sharing for Small Scientific Committees  
on Vulnerable Marine Ecosystems and Bottom Fish**

**REPORT**

7-9 November 2018

November 2018

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**North Pacific Fisheries Commission  
Workshop on Data Requirements  
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Xiamen, China**

**REPORT**

Agenda Item 1. Opening of the Meeting

1. The 1<sup>st</sup> workshop on data requirements and data sharing for the Small Scientific Committees on Vulnerable Marine Ecosystems (SSC VME) and Bottom Fish (SSC BF) of the North Pacific Fisheries Commission (NPFC) took place in Xiamen, China on 7-9 November 2018, and was attended by Members from Canada, China, Japan, the Republic of Korea, and the Russian Federation. One expert from the United States participated remotely via Skype. The meeting was co-chaired by Dr. Bai Li (China), Dr. Cherrisse Du Preez (Canada), and Dr. Masashi Kiyota (Japan).

*1.1 Welcome Address*

2. Dr. Siqian Tian (China) welcomed the participants to Xiamen on behalf of China and Shanghai Ocean University. He pointed out that the aim of the NPFC is to ensure the long-term conservation and sustainable use of marine resources in the Convention Area while protecting the surrounding ecosystem. It is necessary to collect scientific data to understand the biodiversity in the Convention Area as well as the impact of fishing activities, and this workshop should improve the quality of data analyses and understanding of the situation in the Convention Area. China places great importance on this task and hopes that the workshop will yield fruitful results.

*1.2 Purpose of Workshop and Expectations*

3. The Co-Chairs explained the purpose of the workshop and expectations. The workshop is aimed at developing a data wish list and identifying minimum data required (1) for creating a combined footprint and effort map of all bottom fisheries and a combined assessment of significant adverse impact (SAI) on vulnerable marine ecosystems (VMEs) in the Convention Area and (2) for implementing the newly introduced adaptive management scheme for bottom fish (CMM-2018-05). To that end, scientific cooperation and the promotion of the best scientific knowledge is essential.

Agenda Item 2. Adoption of Agenda

4. Russia suggested that it present NPFC-2018-WS DATA01-WP02 under Agenda Item 8, rather than Agenda Item 3. The participants agreed.
5. Japan requested that it give a presentation on SAI assessment methods and potential VME indicator taxa under Agenda Item 3. The participants agreed.
6. The agenda was adopted without revision (Annex A). List of documents and list of participants are attached (Annex B, C).

Agenda Item 3. Data wish list for combined footprint and effort map of all bottom fisheries by gear and time for SAI assessment

*3.1 Fishing ground*

*3.2 Fishing effort*

7. Japan presented a review of the assessment of the potential impacts of Japanese bottom fisheries on VMEs within the fished seamounts (NPFC-2017-SSC VME02-WP03 (Rev 1)). Japan's SAI assessment method consists of three steps: (1) Fine-scale overlap with fishing efforts, (2) Risk scoring of underwater survey locations, and (3) Identification of VME sites. For this, Japan uses data from its scientific observer program to determine the density of fishing operations at a resolution of 30-second grids and drop camera observation from the Japanese scientific survey to determine the density of potential VME taxa at a resolution of points. Using this method, Japan has also assessed the risk of sponges and hydrocorals. It found that the frequency of sponges was low and that while a number of hydrocoral colonies were observed, their size was small and they did not provide significant habitats to other species. However, Japan acknowledged that its data are from 2009 to 2015 and said that it will provide an update using 2009-2017 data at the next SSC VME meeting.
8. The Secretariat presented the joint bottom footprint drafted by the South Pacific Regional Fisheries Management Organization (SPRFMO) in 2011 for the participants' reference.
9. The participants drafted a list of existing data for potential combined footprint and effort map from Members to better identify bottom fishing grounds in the Convention Area to define the fishing footprint and effort in relation to assessing SAI on VMEs in the Convention Area (Annex D).
10. The participants noted that there are major differences in the temporal and spatial resolutions between Members' potentially available data, which requires further discussion. It was also noted that existing data are at a much finer resolution than currently shared spatial resolution, which is at a seamount scale.
11. An expert from the USA, Dr. Amy Baco-Taylor, gave a presentation via WebEx, reviewing the data available for defining the bottom contact fisheries footprint on the seamounts of the Northwestern Hawaiian Ridge and Emperor Chain (NPFC-2018-WS DATA01-WP05).
12. The participants discussed the findings from Dr. Amy Baco-Taylor's presentation based on Global Fishing Watch automatic identification system (AIS) data and 2014-2015 autonomous underwater vehicle (AUV) survey images (NPFC-2018-WS DATA01-WP05), and made the following points:
  - (a) There are some significant data discrepancies between the fishing effort data presented and the effort data published by the NPFC. This could be due to the uncertainty and coverage of AIS data, and that the Global Fishing Watch does not distinguish between pelagic and benthic trawling. It is also possible that some vessels that are not registered as trawlers swap gear and conduct trawling and vice versa. Regardless, there is uncertainty around the Global Fishing Watch data and caution must be exercised when using such data.
  - (b) The results of the study should be verified by examining the false positive rate of the habitat suitability models (Yesson et al. 2012, 2017) and would benefit from including the risk estimates for bycatch by different gear types.
  - (c) The closure of seamounts to fishing, recommended by Dr. Amy Baco-Taylor as the precautionary approach, may make it difficult to assess SAI. Even if SAI can be assessed visually using AUV/submersible surveys, it may be difficult to determine SAI

by gear type. That said, if closed, exploratory fishing protocols could be followed. Cameras attached to fishing gear could be useful to assess gear specific potential for SAIs in potential areas to be fished.

- (d) Members could use the framework presented by Dr. Amy Baco-Taylor to conduct further studies with their own data, upon clarifying the input and output uncertainties, and assessing the sensitivity of the results.

### 3.3 Other data

13. The Secretariat presented on Global Fishing Watch as a potential open-source tool for use in the future. Global Fishing Watch collects AIS data for all types of vessels, and estimates where and when vessels fish using its own algorithm. It is publicly available and free, and provides near real-time data with a three-day delay, since September 2016.

## Agenda Item 4. Minimum data requirements and data resolution for combined SAI assessment

### 4.1 Review of other relevant VME indicator taxa, in addition to the four existing taxa, and taxonomic resolution for VME indicators

14. Canada presented information from emerging scientific findings on Northeast Pacific Seamounts that relate to other relevant taxa under consideration to be added to the existing four NPFC VME indicator taxa (NPFC-2018-WS DATA01-WP06). Emerging scientific findings show that hydrocorals (Stylasteridae) and sponges (Porifera) are present in and adjacent to the Convention Area, that according to other RFMOs and supported by local visual observations they meet all FAO VME criteria (uniqueness/rarity, functional significance, fragility, recovery difficulties, structural complexity), that the higher density clusters of sponges and corals are primarily single taxa dominated, that the different VME coral taxa, hydrocorals, and sponges are spatially separated by distinct biogeographic or depth distributions, and that evidence of the fragility and low catchability of these two taxa demonstrates the historic bias in using fisheries data in their assessment. Therefore identifying VMEs based on the existing NPFC indicator taxa list will expectedly miss protecting high-density aggregations of hydrocoral- and sponge-dominated VMEs in the Convention Area.
15. The participants discussed whether or not the current indicator taxa are sufficient for determining VMEs, and whether or not the practices of the NPFC in relation to VMEs in the Convention Area are consistent with that of other regional fisheries management organizations (RFMOs). The participants recommend SSC VME to continue working on answering the two questions with updated research from Members.
16. Russia commented that the most suitable resolution for VME indicator taxa is genus level, which can be easily utilized by observers and is suitable for detailed mapping and modeling.

### 4.2 Combined SAI assessment

17. The Co-Chairs presented a paper by Adron *et al.* on a systematic approach towards the identification and protection of VMEs (NPFC-2018-WS DATA01-IP02) for the participants' reference. Based on the 10-step framework in the paper, the Co-Chairs proposed that participants consider the status of steps 1-7 in the context of the NPFC. For each of these steps, participants should assess whether it has been previously addressed or if it needs to be addressed, re-addressed or reviewed, and if the latter is true, what data are required. Steps 8-10 were excluded as they were considered to be management issues.
18. The participants considered the usefulness of the 10-step framework, began the work proposed above and drafted a table of the results (Annex E).

19. Canada pointed out that a PICES working group has done predictive distribution modeling in the North Pacific Ocean. The modeling includes data on environmental variables and taxa, but is primarily in national waters and not in the NPFC Convention Area, although some modeling has been done for the entire North Pacific Ocean. Canada suggested that the NPFC could apply the same methodology for predictive distribution modeling in the Convention Area.

Agenda Item 5. Benthic habitat data wish list and data review

*5.1 Bathymetry data*

*5.2 Review of scientific and fisheries independent survey data to conduct habitat mapping*

*5.3 Review of all other available data and potentially relevant information from inside and outside the Convention Area to conduct habitat mapping*

*5.4 Review of predictive models done by Members*

20. The Secretariat presented a summary of open-source bathymetry data from Earthref.org that could be used for predictive VME distribution models for the Emperor Seamounts area (NPFC-2018-WS DATA01-IP04).

21. Canada presented a data wish list for an analysis of the tradeoffs between fishing and VME protection (NPFC-2018-WS DATA01-WP04). Canada is conducting a case study in an area that covers seamounts in national waters and the Convention Area, combining spatial modeling with trade-off analysis to maintain socio-economic benefits of the sablefish fishery while promoting the conservation of VMEs. Canada has compiled sablefish landing data and developed species distribution models for six VME indicator taxa, and is assessing trade-offs between fishing and VME protection using the decision support tool Marxan. Analyses could be improved with better VME species identification, more multibeam or backscatter data, improved species distribution models, model validation with visual surveys, location of fishing activity, improved accuracy of location and value of catches, development of species distribution models for commercial species, definition of quantities of catches needed from social and economic perspectives, and quantification of how much of VME areas should be protected.

22. The participants recognized that the study conducted by Canada is a good reference for considering a similar study in the Emperor Seamounts. However, the situation in the Emperor Seamounts is more complicated as fisheries are multi-gear, multispecies and multinational, and the distribution and stock status of some of the fished species are highly variable.

23. Japan recommended that Canada model Gorgonacea separately, rather than as part of Alcyonacea soft corals, as it is one of the specific VME indicator taxa of the NPFC. Canada agreed to conduct such a model as part of its sensitivity analyses.

*5.5 Recommendation for future work (e.g., consolidation of data)*

24. The Co-Chairs presented a draft table with a benthic habitat data wish list, potential predictive models and potential collaborators for the participants' consideration. The participants considered and revised the table (Annex F).

25. During the workshop, multiple predictive models were discussed, each with benefits and limitations. Discussion on validity focused on data source; taxa, spatial and temporal resolution; and uncertainty with model predictions and sensitivity analyses.

Agenda Item 6. Timely arrangement and aggregation of the bottom fisheries information in relation to the post-encounter requirements

26. The Co-Chairs presented an updated summary comparison of VME encounter protocols in bottom fish RFMO/As (NPFC-2018-WS DATA01-IP03) and highlighted some points in the NPFC VME encounter protocol requiring additional clarification and specification:
  - (a) How quickly should an encounter be reported to avoid multiple damages to the encountered VME?
  - (b) Is there a need to restrict the behavior of the fishing vessel that hit the encounter threshold after relocation from the encounter point?
  - (c) Is there a need to restrict the behavior of other fishing vessels around the encounter location more explicitly?
  - (d) Is there a need to introduce a protected area around the location where the encounter occurred as a precautionary measure?
27. The participants discussed the points raised by the Co-Chairs. They recommended that post-encounter reporting should be done as soon as possible.
28. The participants noted that Members should include post-encounter reporting in the Annual Report.
29. The SSC VME Chair and the Secretariat, in cooperation with Members, will prepare a draft post-encounter reporting scheme based on the practices of other RFMOs for consideration by the SSC VME Members.

Agenda Item 7. Scientific information collected from the monitoring survey

*7.1 Recruitment period of North Pacific armorhead and location*

*7.2 Criteria for strong recruitment of North Pacific armorhead*

30. The Co-Chairs summarized the monitoring survey plan for the detection of strong recruitment of North Pacific armorhead and the related sections of CMM 2018-05, highlighting points requiring further clarification or specification.
31. Japan presented a more detailed overview of the monitoring survey plan based on CMM 2018-05, Annex 6-1.
32. The participants discussed the monitoring survey plan and the related sections of CMM 2018-05. They noted that the following points require further clarification or specification:
  - (a) How often/where/when must the criteria for strong recruitment of North Pacific armorhead be met? The participants' understanding was that the criteria should be met for four consecutive hauls for each of the monitoring blocks. As the hauls in each block must be conducted at least one week apart, a minimum of four weeks is needed to determine strong recruitment.
  - (b) Which areas would be closed in the case of strong recruitment? The participants' understanding was that fishing Members have the right to determine which areas would be closed. In practice, the fishing Members are Japan and Korea and they will coordinate bilaterally and with the Secretariat to ensure that there are no gaps or inconsistencies in the areas they decide to close.
  - (c) The CMM stipulates that bottom fishing with trawl gear shall be prohibited in specific areas in the Emperor Seamounts in the case of strong recruitment, but it does not explicitly prohibit other types of fishing or gear.
  - (d) Which/how many vessels should conduct monitoring surveys in each monitoring block? The participants' understanding was that, from a feasibility standpoint, surveys

do not need to be conducted by multiple/different vessels.

- (e) The monitoring survey is scheduled to start in March, while the fishing season starts in January. Would the timing of the monitoring survey change if the catch limits are reached before March? The participants pointed out the difficulties in controlling the catch limits due to the two-month delay of the monitoring surveys from the beginning of the fishing season. Japan explained that catches in the monitoring survey will not be included in the catch limit and that the monitoring survey would not be able to begin until March for practical reasons.
- (f) Data reporting is to be done as soon as possible but “as soon as possible” should be defined more clearly. The participants’ understanding was that, as surveys can be conducted as frequently as once a week, data reporting should be done within one week so that the sequence of the data being reported can be more easily understood.

- 33. The participants requested that Japan and Korea share the outcomes of their bilateral consultation and the potential proposed modifications to CMM 2018-05 with the Members in a transparent and timely manner, before the coming SSC BF meeting.
- 34. The participants encouraged the SSC BF to modify CMM 2018-05 based on the outcomes of the consultation between Japan and Korea, together with the Secretariat, and taking into account the points highlighted by the Data Workshop as requiring further clarification or specification.
- 35. The participants encouraged the SSC BF to continue to conduct research on the relationship between environmental conditions and recruitment levels for North Pacific armorhead.

#### Agenda Item 8. Bycatch data wish list and data review

##### *8.1. Review of the data collection program*

- 36. Russia presented data on bycatch of corals during Russian long-line fishing on the Emperor Seamounts in 2018 (NPFC-2018-WS DATA01-WP02).
- 37. Korea provided an overview of its scientific observer program and VME field guide. The VME field guide that was translated into English is now in review and will be submitted to the coming SC meeting. The Members recommended that the work to develop a common NPFC VME field guide should be continued.

##### *8.2. Review of the flow of the observer reports*

- 38. The participants reviewed the flow of the observer reports. There were no updates on the current reporting procedure through Member’s annual report in the meta-data format whereas discussions are in progress toward the compilation of observer data for specific purposes such as combined SAI assessment.

##### *8.3. Review of the data and measures needed for species identification guides*

- 39. Japan presented two examples of the fish identification guides for scientific observers on Japanese vessels operating bottom fisheries in the Emperor Seamounts area (NPFC-2018-WS DATA01-IP05): (1) A pictorial guide for fish specimens collected by Japanese commercial vessels in the Emperor Seamounts with a specimen photograph and a brief description for each species and (2) Species identification of sharks and rays observed during tuna longline fisheries with illustrated keys.

##### *8.4. Recommendation for future work*

- 40. The participants recommended that each Member submit a list of all known bycatch taxa at

finest taxonomic resolution possible to the next SSC BF and SSC VME meetings to create a combined species inventory of regional bycatch.

41. The participants encouraged the SSC BF to develop an NPFC fish identification guide for scientific observers based on the guides presented by Japan. As part of this work, it may be useful to translate Japan's guides into each Member's language.
42. The Co-Chairs drew attention to SSC VME recommendations and discussions which support the objective of this workshop to aggregate data required for future combined SAI on VME assessments, which included: the recommendations to (i) continue work on standard regional bycatch identification guides for observers; (ii) consider conducting standardized training programs for observers with support from FAO (NPFC-2018-SSC VME03); (iii) consider creating standardized observer protocols for biological samples and scientifically informative photographs of VME indicator taxa (discussions at NPFC-2018-WS VME01); (iv) collect standardized scientific data on VME bycatch according to CMM 2018-05 and CMM 2017-06 and consolidate all available bycatch data to map VMEs and get more detailed information about interactions between VMEs and bottom fish (NPFC-2018-SSC VME03).

Agenda Item 9. Review of data availability against data requirements from the FAO DSF Guidelines

43. The participants reviewed and updated data availability and progress in VME protection in the NPFC against data requirements from the FAO DSF Guidelines (NPFC-2018-WS DATA01-WP01 (Rev. 1)).

Agenda Item 10. Data collection and sharing

*10.1 Data collection template (type of data and spatial-temporal resolution)*

44. The participants reviewed the NPFC bottom fisheries observer program standards: scientific component (Annex 5 of CMM 2018-05 and CMM 2017-06). They recommended that the SSC BF address the following points:
  - (a) There is duplicative information in Section B, paragraph 2, subparagraph (v) and Section H, paragraph 2.
  - (b) Section K, paragraph 4, subparagraph (a) requires the description of species by their FAO 3 letter species codes. However, some important species in the Emperor Seamounts do not have such letter species codes. It should be possible to describe such species by their name.
  - (c) The language in Section F, paragraph 1, subparagraph (d) should be reconsidered. Specifically, "indeterminate" would be more appropriate than "immature" and "not examined" would be more appropriate than "unsexed."

45. Japan presented an updated proposal of a template for collecting scientific observer data from the NPFC bottom fisheries (NPFC-2018-WS DATA01-WP03).
46. The participants reviewed the template and suggested various revisions. Members agreed to continue to work on the template intersessionally and submit a revised proposal to the coming SSC BF meeting.

*10.2 Data sharing protocols*

47. The participants began work to develop an Interim Guidance for Management of Scientific Data (Annex G) and requested that the SSC VME and SSC BF consider the draft interim guidance and continue its development.



### *10.3 Central data repository*

48. The Co-Chairs noted that the subject of the existing data repository fell outside the scope of the workshop. Therefore, discussions focused on resolution and availability of potential data for a central data repository.
49. The participants revised the drafted table for a potential combined bottom fisheries footprint and effort map (Annex D).
50. The Co-Chairs presented a draft template for recording existing taxa data for a potential combined VME map (Annex H). The participants agreed to continue developing the template intersessionally.
51. The Co-Chairs presented a draft template for recording existing multibeam data (Annex I). The participants agreed to continue developing the template intersessionally.
52. The Co-Chairs presented a draft template for recording existing predictive models (Annex F). The participants agreed to continue discussing the template intersessionally.

### Agenda Item 11. Recommendations to the SSC VME and SSC BF

53. The workshop recommended the following to the SSC VME:
  - (a) Review the draft list of potentially available data to better identify current and historical bottom fishing grounds in the Convention Area and fishing footprint and effort in relation to assessing SAI in the Convention Area (Annex D).
  - (b) Identify appropriate temporal and spatial resolution of data to be shared in order to map a combined fishing footprint and effort to better identify fishing grounds.
  - (c) Identify appropriate temporal and spatial resolution of data to be shared in order to define the fishing footprint in relation to assessing SAI.
  - (d) Continue working on whether or not the current indicator taxa are sufficient for determining VME, and whether or not the practices of the NPFC in relation to VME in the Convention Area are consistent with that of other regional fisheries management organizations (RFMOs).
  - (e) When consolidating available data and relevant information from inside and outside the Convention Area to map VMEs, consider the benefits and limitations of publicly available high-resolution fishing activity data and existing predictive species distribution models.
  - (f) Review the summary table of the status of the NPFC's identification and protection of VMEs and data requirements (Annex E).
  - (g) Consider using the summary of potential data, methods and collaborators for predictive models (Annex F).
  - (h) For the Encounter protocol (CMM 2018-05, Paragraph 4G and CMM 2017-06, Paragraph 3j), require that encounters are reported to the Secretariat as soon as possible and requirement to report encounters is included in the Annex 4 of the CMMs.
  - (i) Continue work on quick reporting protocol to avoid multiple impacts on the same VME site.
  - (j) Continue the work to develop a common NPFC VME field guide.
  - (k) Consider including standardized systematic sampling, such as photographs and biological sampling, where possible.
  - (l) Consolidate all available VME bycatch data for combined mapping assessment.
  - (m) Review updates and continue to revise the table of data availability and progress in VME protection in the NPFC against data requirements from the FAO DSF Guidelines

(NPFC-2018-WS DATA01-WP01 (Rev. 1)).

- (n) Consider the revision of Interim Guidance for Management of Scientific Data (Annex G) and continue its development.
- (o) Consider continuing to develop templates to summarize existing data potentially available on bottom fishing footprint and effort, taxa, multibeam and VME predictive modelling (Annex H, I).

54. The workshop recommended the following to the SSC BF:

- (a) Revise CMM 2018-05 taking into account the points highlighted by the Data Workshop as requiring further clarification or specification and based on the outcomes of the consultation among Members.
- (b) Continue to conduct research on the relationship between environmental conditions and recruitment levels for North Pacific armorhead to improve timely detection of the strength of recruitment.
- (c) Develop a combined bycatch taxa list at finest taxonomic resolution possible based on the lists submitted by each Member.
- (d) Develop a common NPFC fish identification guide for scientific observers based on the guides presented by Japan. As part of this work, it may be useful to translate Japan's guides into each Member's language.
- (e) Modify Annex 5 of CMM 2018-05 and CMM 2017-06 to address the points raised by the Data Workshop (paragraph 44).
- (f) Consider the draft Interim Guidance for Management of Scientific Data (Annex G) and continue its development.

Agenda Item 12. Adoption of the Report

55. The report was adopted by consensus.

Agenda Item 13. Close of Workshop

56. The workshop closed at 17:34 on 9 November 2018.

## **Annexes**

Annex A – Agenda

Annex B – List of Documents

Annex C – List of Participants

Annex D – Existing Data for Potential Combined Footprint and Effort Map of all Bottom Fisheries by Gear and Time

Annex E – Summary Table of the Status of the NPFC's Identification and Protection of VMEs and Data Requirements

Annex F – Potential Data to be Consolidated for Predictive Modeling, Potential Iterative Predictive Models and Potential Collaborators

Annex G – Revised Interim Guidance for Management of Scientific Data

Annex H – Existing Taxa Data for Combined Assessment

Annex I – Existing Multibeam Data for Combined Assessment

## Agenda

### Agenda Item 1. Opening of the Workshop

- 1.1 Welcome Address
- 1.2 Purpose of Workshop and Expectations

### Agenda Item 2. Adoption of Agenda

### Agenda Item 3. Data wish list for combined footprint and effort map of all bottom fisheries by gear and time for SAI assessment

- 3.1 Fishing ground
- 3.2 Fishing effort
- 3.3 Other data

### Agenda Item 4. Minimum data requirements and data resolution for combined SAI assessment

- 4.1 Review of other relevant VME indicator taxa, in addition to the four existing taxa, and taxonomic resolution for VME indicators
- 4.2 Combined SAI assessment

### Agenda Item 5. Benthic habitat data wish list and data review

- 5.1 Bathymetry data
- 5.2 Review of scientific and fisheries independent survey data to conduct habitat mapping
- 5.3 Review of all other available data and potentially relevant information from inside and outside the Convention Area to conduct habitat mapping
- 5.4 Review of predictive models done by Members
- 5.5 Recommendation for future work (e.g., consolidation of data)

### Agenda Item 6. Timely arrangement and aggregation of the bottom fisheries information in relation to the post-encounter requirements

### Agenda Item 7. Scientific information collected from the monitoring survey

- 7.1 Recruitment period of North Pacific armorhead and location
- 7.2 Criteria for strong recruitment of North Pacific armorhead

### Agenda Item 8. Bycatch data wish list and data review

- 8.1. Review of the data collection program
- 8.2. Review of the flow of the observer reports
- 8.3. Review of the data and measures needed for species identification guides
- 8.4. Recommendation for future work

### Agenda Item 9. Review of data availability against data requirements from the FAO DSF Guidelines

### Agenda Item 10. Data collection and sharing

- 10.1 Data collection template (type of data and spatial-temporal resolution)
- 10.2 Data sharing protocols
- 10.3 Central data repository

Agenda Item 11. Recommendations to the SSC VME and SSC BF

Agenda Item 12. Adoption of the Report

Agenda Item 13. Close of the Workshop

## List of Documents

### **MEETING INFORMATION PAPERS**

Symbol	Title
NPFC-2018-WS DATA01-MIP01 (Rev. 1)	Meeting Notice and Information
NPFC-2018-WS DATA01-MIP02	Provisional Agenda
NPFC-2018-WS DATA01-MIP03	Provisional Annotated Agenda
NPFC-2018-WS DATA01-MIP04	Indicative Schedule

### **REFERENCE DOCUMENTS**

Symbol	Title
CMM 2018-05	CMM For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean
	Interim Guidance for Management of Scientific Data Used in Stock Assessments
	Terms of Reference of the VME & BF Data Workshop

### **WORKING PAPERS**

Symbol	Title
NPFC-2018-WS DATA01-WP01 (Rev. 1)	Data availability and progress in VME protection in the NPFC against data requirements from the FAO DSF Guidelines
NPFC-2018-WS DATA01-WP02	Data on by-catch of corals during Russian long-line fishery on the Emperor seamounts in 2018
NPFC-2018-WS DATA01-WP03	Updated proposal of a template for collecting scientific observer data from NPFC bottom fisheries
NPFC-2018-WS DATA01-WP04	Data wish list for an analysis of the tradeoffs between fishing and VME Protection
NPFC-2018-WS DATA01-WP05	A Review of the Data Available for Defining the Bottom Contact Fisheries Footprint on the Seamounts of the Northwestern Hawaiian Ridge and Emperor Chain
NPFC-2018-WS DATA01-WP06	Information from emerging scientific findings on Northeast Pacific Seamounts: reviewing other relevant VME indicator taxa, in addition to the existing coral taxa
NPFC-2017-SSC VME02-WP03 (Rev 1)	An assessment of the potential impacts of Japanese bottom fisheries on vulnerable marine ecosystems (VMEs) within fished seamounts of the Emperor Seamounts region

## **INFORMATION PAPERS (IP)**

<b>Symbol</b>	<b>Title</b>
NPFC-2018-WS DATA01-IP01	NAFO: 10 Years of the FAO Deep-Sea Fisheries Guidelines
NPFC-2018-WS DATA01-IP02	A systematic approach towards the identification and protection of vulnerable marine ecosystems
NPFC-2018-WS DATA01-IP03	Updated summary comparison of VME encounter protocols in bottom fish RFMO/As
NPFC-2018-WS DATA01-IP04	Bathymetry of Emperor Seamounts
NPFC-2018-WS DATA01-IP05	Fish identification guides for scientific observers on Japanese vessels operating bottom fisheries in the Emperor Seamounts area

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**Existing Data for Potential Combined Footprint and Effort Map of all Bottom Fisheries by Gear and Time**

Gear type	Time period	Temporal resolution	Spatial resolution
<b>Eastern North Pacific</b>			
<b>CANADA</b>			
Longline	Recent/current (1996-2018)	Set by set (1-2 days)	1'' x 1''
<b>JAPAN</b>			
TBD			
<b>RUSSIA</b>			
TBD			
<b>USA</b>			
TBD			
<b>Western North Pacific</b>			
<b>JAPAN</b>			
Trawl	Historical (1969-1981)	Month	1° (long) x 30' (lat)
	Historical (1989-present) – logbook data	Day	1° (long) x 30' (lat)
	Recent/current (from 2009) – scientific observer data	Haul by haul (finer than a day)	30'' x 30''
Gillnet	Historical (2000-present) – logbook data	Day	1° (long) x 30' (lat)
	Recent/current (from 2009) - scientific observer data	Set by set (finer than a day)	30'' x 30''
<b>KOREA</b>			
Trawl	Historical (2004-present)	Day	20' x 20'
	Recent/current (from 2013)	Haul by haul (finer than a day)	30'' x 30''

<b>RUSSIA</b>			
Longline	Historical (...)	TBD	TBD
	Recent/current (from 2014)	Set by set (finer than a day)	6''x 6''
Trawl	Historical (...)	TBD	TBD

**Minimum common resolution for combined fishing footprint and effort mapping and SAI assessments:**

(1969-1981) temporal resolution – Month, spatial resolution - 1° (long) x 30' (lat)

(After 1989) temporal resolution – Day, spatial resolution - 1° (long) x 30' (lat)

(Recent) temporal resolution – haul by haul or set by set, spatial resolution – 30'' x 30''

### Summary Table of the Status of the NPFC's Identification and Protection of VMEs and Data Requirements

(framework based on Ardron et al. 2013 "A systematic approach towards the identification and protection of vulnerable marine ecosystems")

	<b>1. Assess potential VMEs</b>	<b>2. Thresholds</b>	<b>3. Ecologically important areas</b>	<b>4. Compile taxa &amp; environmental data</b>	<b>5. Predictive distribution on models</b>	<b>6. Fishing impact</b>	<b>7. VME naturalness distribution</b>
<b>Previously addressed?</b>	Yes, partially. NPFC-2017-SSC VME02-WP02: 4 coral taxa VME indicators	Yes, partially. Based on 4 coral taxa: 50 kg threshold encounter protocol	Yes, two current examples in CMM 2018-05: closures for potential VMEs & fish stock	No	Yes, partially for the Northeast (PICES WG 32)	Partially (each Member report annually at seamount-scale "footprint" resolution	No
<b>Need to address, readdress, or review?</b>	Yes, NPFC-2018-COM04 #12: "additional VME taxa" part A & B	Yes, NPFC-2018-SSC VME03 recom. #10: Refine for taxa- & gear-specific	Yes (?), ongoing, as information becomes available	Yes, combined assessment (recom. at NPFC-2018-WS-VME01, ultimately adopted in NPFC-2018-COM04)	Yes, NPFC-2018-SSC VME03 recom. #25: Develop habitat suitability models	Yes, NPFC-2018-SSC VME03 recom. #15, 16, 18 on combined fishing footprint	NPFC-2018-SSC VME03 recom. #22, 27: on "recovery sites" + NPFC-2018-COM04 #43m
<b>If yes, data required?</b>	Comprehensive taxa list for CA with information on the 5 FAO/NPFC criteria (CCM-2017 Annex 2) provided by experts	2018-SSC VME03 recom. #10: "scientific information including bycatch levels and catchability estimates"	Location & characterization of areas of high ecological importance	The data wish list from this WS: VME & environmental data	"4"	The data wish list from this workshop: BF footprint data	"3" + "4" + "5" + "6"

## **Potential Data to be Consolidated for Predictive Modeling, Potential Iterative Predictive Models and Potential Collaborators**

### **Potential data to be consolidated for predictive modeling**

#### *Input data: taxa (point data)*

- Taxa abundance, presence-absence, or presence only data from
  - Fisheries bycatch
  - Science survey collections (e.g., university records; museum records)
  - Underwater-image derived data
    - \*Consideration: what is the probability of detecting presence (i.e., catchability or sampling effectiveness)
    - \*Consideration: taxa to be included, taxa resolution

#### *Input data: environmental (continuous data)*

- Anthropogenic
  - Fisheries bycatch
  - Naturalness (e.g., historic fishing)
  - Location of fishing activity (consider gear type)
  - Other local human impacts
- Benthic
  - Depth (e.g., at specific location; at-summit)
  - Substrate type (e.g., multibeam backscatter; online models)
  - Slope
  - Rugosity, roughness, complexity
  - Aspect
- Oceanographic (at-surface, at-depth, at-summit, and/or considering a temporal variability, such as annual mean)
  - Current flow strength
  - Current flow direction
  - Temperature (sea surface; at depth)
  - pH (alkalinity)
  - Salinity
  - Oxygen
  - Aragonite and calcite saturation states
  - Nitrate
  - Silicic acid

- Primary productivity (chlorophyll a)
  - Particulate organic carbon
- Geographic
  - Biogeographic region
  - Locality (Eastness, Northness)
  - Isolation/proximity

### **Potential iterative predictive models**

- Models used by Members
  - Marxan (i.e., decision-support tool)
  - Maxent (maximum entropy modelling)
  - Random Forest (can take both abundance & presence-absence data)
- Additional Models
  - GLM/GAM
  - Boosted regression models
  - Validation and sensitivity assessment (e.g., post hoc; independent data)

### **Potential collaborations**

- PICES WG 32 recently ended but their deliverables will still be made available (there is potential for a future PICES proposal on seamounts)
- Deep-sea SDM group lead by Ellen Kenchington (1<sup>st</sup> meeting May 2018; ~25 experts)

## **Interim Guidance for Management of Scientific Data ~~Used in Stock Assessments~~ (Revised)**

This Interim Guidance is intended to apply while the NPFC develops comprehensive rules and procedures governing the security of, exchange of, access to and dissemination of data held by, or accessed by Members of the Commission, its subsidiary bodies, the Secretariat, and by service providers, contractors, or consultants acting on their behalf or others so authorized for access by the Secretariat.

### 1. Objectives

The objectives of this Interim Guidance are (1) to support stock assessments [and VME assessments](#) and accumulation of scientific knowledge of fisheries resources under the Commission's jurisdiction, (2) to encourage cooperation on scientific analyses among Members, and (3) to establish an interim guidance on handling scientific data.

### 2. Scientific Data included in Members' Annual Reports

Scientific data (e.g., catch amount, number of vessels, number of fishing days and so on) included in Members' Annual Reports should be uploaded to the public section of the NPFC website for public access and use.

### 3. Other scientific data, not included in Members' Annual Reports, submitted for use in stock assessments [and VME assessments](#)

The Secretariat should not disclose Members' scientific data submitted by means other than Members' Annual Reports.

Members may cite and/or use such data when working on matters under consideration by the Scientific Committee/SSCs.

If a Member or cooperating non-Member wishes to cite and/or use these data for work that is intended to be conducted or shared outside of the NPFC, such Member or non-Member should consult with the data provider(s) through the Secretariat, stating 1) the data subject to the request, and 2) the purpose for which the data is intended to be used. The Secretariat should immediately notify the data provider(s) of the request. The data provider(s) should inform the Secretariat within 30 calendar days whether to accept or reject the request. If the data provider(s) reject the request, the data provider(s) should state the reason(s) for the rejection. If the data provider(s) accept the request, the data provider(s) may request an agreed-upon credit line in any subsequently-created product. Those who cited/used data should not distribute the data further nor use it for the purpose not declared.

If the Secretariat proposes to outsource analyses of such scientific data to a contractor, the Secretariat should seek agreement from all the data providers concerned. If all data providers do not agree, the relevant data should not be disclosed to the contractor.

### Existing Taxa Data for Combined Assessment

Potential template

Survey type	Gear type	Taxa resolution	Time period	Temporal resolution	Spatial resolution
<b>Western/Eastern NP</b>					
<b>[Member]</b>					
Fisheries					
Fisheries independent					
<b>Western/Eastern NP (outside CA)</b>					
<b>[Member]</b>					

Example input, Canada:

Survey type	Gear type	Taxa resolution	Time period	Temporal resolution	Spatial resolution
<b>Eastern NP</b>					
<b>CANADA</b>					
Fisheries	Longline	TBD	Recent/current (1996-2018)	Set by set (1-2 days)	1' (long) x 1' (lat)
Fisheries independent	Underwater image survey	≥species	2012	~1 sec	<1' (long) x 1' (lat)
<b>Eastern NP (outside CA)</b>					
<b>CANADA</b>					
Fisheries independent adjacent to CA	Underwater image survey	≥species	2017-2018	~1 sec	<1' (long) x 1' (lat)

### Existing Multibeam Data for Combined Assessment

Potential template

Seamount	Collected by	Survey and gear type	Time period	Spatial resolution	Back-scatter	Stored by	Publicly available?
Western/Eastern NP							
Seamount X							
Seamount Y							

Example input, Canada:

Seamount	Collected by	Survey and gear type	Time period	Spatial resolution	Back-scatter	Stored by	Publicly available?
Eastern NP							
Cobb	United States	Survey RB0002; SeaBeam2112 onboard the NOAA Ship RV <i>Ronald Brown</i>	2000	20 m x 20 m	No	NOAA	Y [website]
Far Cobb	na						
Cobb South	na						