NPFC-2022-SSC BFME03-IP01

Data from visual surveys conducted by NPFC Members

Canada, Japan, Korea, Russia and US provided the information about visual surveys they conducted in the Convention Area. The SWG VME collected and compiled Members' responses to the questionnaire about visual surveys.

CANADA

	Data information	**Comments**
Location	Cobb Seamount	Eastern North Pacific Ocean
Region	Northeast Pacific Ocean	
Data holder(s)	Janelle Curtis / Fisheries and Oceans Canada	
Dates	21-26 July 2012	
Raw data files		
Imagery data from video, photo, or both?	Both	
Platform used for data collection (e.g. ROV, AUV, drop camera, etc..)	ROV - video, photo AUV - photo	
Depth range of visual observations	ROV: 34-211 m AUV: 435-1154 m	
Annotated species data		
Have the visual data been annotated	Yes	
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	Yes	
Can the species data be standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video	Yes	Photos have an estimate of photo area and videos have an estimate of field of view width.

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data)?		
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	ROV photos and video – density (individuals per m^2) or relative abundance. AUV photos - density (individuals per m^2). Species counts have been standardized to the area of the images.	For ROV imagery, individual counts of NPFC VME taxa are complete and density was calculated. However, only relative abundance was recorded for other organisms.
Were NPFC VME indicator taxa present and annotated in the imagery?	Yes.	- Alcyonacea (including gorgonians) - Antipatharia - Scleractinia
Were other taxa present and annotated in the imagery?	Yes.	ROV: Because of a small quadrat size, annotated organisms were mainly small, colonial, or encrusting organisms; the small quadrats did not reliably capture VME indicator taxa for annotation. AUV: all visible benthic megafauna were annotated.
Were physical features annotated?	Yes.	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts - Other anthropogenic objects
Other supplementary data notes		
Are there supplementary spatial data collected or available for use?	Yes.	- AUV/ROV Navigation (latitude, longitude) - Altimeter (m) - CTD (conductivity, temperature, depth, oxygen) - Multibeam bathymetry
Is there bottom-contact fisheries data available? If Yes, please describe the	Yes. Sablefish fishery data from longline trap and longline hook and line gear.	Data are stored in Fisheries and Oceans' commercial catch databases and include dates,

fisheries data.		landing size in kg, and georeferenced start and end points.
Notes about annotation of biological features	ROV: Mainly annotated small, colonial, or encrusting organisms because of a small quadrat size, which did not reliably capture VME indicator taxa for annotation. AUV: all visible benthic megafauna were identified.	
Notes about annotation of physical features	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts - Other anthropogenic objects	
Associated with predictive maps/models (yes or no)	Yes	Please contact Janelle Curtis for maps/models
Cruise report or other publication	Curtis JMR, Du Preez C, Davies SC, Pegg J, Clarke ME, Fruh EL, Morgan K, Gauthier S, Gatien G, and Carolsfeld W. (2015). 2012 Expedition to Cobb Seamount: Survey methods, data collections, and species observations. *Canadian Technical Report of Fisheries and Aquatic Sciences*, 3124: xii + 145 p.	
Other associated publications	Du Preez C, Curtis JMR, Davies SC, Clarke ME, and Fruh EL. (2015). Cobb Seamount Species Inventory. *Canadian Technical Report of Fisheries and Aquatic Sciences*, 2122: viii + 108 p. Warawa D, Curtis JMR, Rooper CN, Gardner L, and Chu JWF.	

	(2020). Process for Analyzing Trade-offs between Fishing and Vulnerable Marine Ecosystem Protection. *North Pacific Fisheries Commission* NPFC-2020-SSC BFME01-WP13	
Other notes		

JAPAN

	Data information	**Comments**
Location	Emperor Seamounts	Northern Koko, Koko, Kammu, Yuryaku, Colahan, C-H
Region	Northwest Pacific Ocean	
Data holder(s)	Oceanic Resources Group, Fisheries Resources Institute, Japan Fisheries Research and Education Agency, Japan	
Dates	2009-2017, 2019-2021	Survey takes about two weeks in summer each year.
Raw data files		
Imagery data from video, photo, or both?	Both	
Platform used for data collection (e.g. ROV, AUV, drop camera, etc..)	ROV - video, photo Drop camera system – video, photo	
Depth range of visual observations	ROV: 269-780m Drop camera: 277-1853m	
Annotated species data		
Have the visual data been annotated	Yes	
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	Yes	
Can the species data be	Yes	Photos have an estimate of photo

standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video data)?		area and videos have an estimate of field of view width by the laser pointer.
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	individuals	Count all benthic megafauna when possible.
Were NPFC VME indicator taxa present and annotated in the imagery?	Yes.	- Alcyonacea (including gorgonians) - Antipatharia - Scleractinia
Were other taxa present and annotated in the imagery?	Yes.	
Were physical features annotated?	Yes.	- Substrate type - Fishing gear and evidence of fishing related impacts - Other remarks
Other supplementary data notes		
Are there supplementary spatial data collected or available for use?	Yes.	- Research vessel Navigation (latitude, longitude) - Multibeam bathymetry
Is there bottom-contact fisheries data available? If Yes, please describe the fisheries data.	Yes. Bottom fishery data from trawl and gillnet.	Data include dates, landing size in kg, and georeferenced start and end points.
Notes about annotation of biological features	All visible benthic megafauna were identified.	
Notes about annotation of physical features	- Substrate type - Fishing gear and evidence of fishing related impacts - Other remarks	
Associated with predictive maps/models (yes or no)	Yes	
Cruise report or other	Please refer previous NPFC-	

publication	SWG or SSC documents. SWG10/WP4/J, SWG11/WP3/J, SWG13-WP10/J, NPFC01-2016-/SSC-VME01/WP03/Japan, NPFC-2017-SSC VME02-WP04, NPFC-2018-SSC VME03-WP01, NPFC-2021-SSC BF-ME02-WP09	
Other associated publications	Miyamoto M, Kiyota M, Hayashibara T, Nonaka M, Imahara Y, Tachikawa H (2017) Faunal composition of cold-water corals and other deep-sea benthos in the Emperor Seamounts area, North Pacific Ocean. Galaxea 19: 19-30. Miyamoto M, Kiyota M, Murase H, Nakamura T, Hayashibara T (2017) Consideration of grid-cell sizes in high-resolution habitat suitability analysis of cold-water corals on seamounts. Marine Geodesy 40: 205-223. Miyamoto M, Kiyota M (2017) Evaluation of cold-water corals and other benthic taxa as indicators of vulnerable marine ecosystems based on their Co-occurrence in the Emperor Seamounts area. Ecological Indicator 78: 301-310.	
Other notes		

KOREA

	Data information	Comments
Location	Koko, Kinmei, Yuryaku, Kammu, Colahan seamounts	Western North Pacific Ocean
Region	Northwest Pacific Ocean	
Data holder(s)	Kyum Joon Park / National Institute of Fisheries Science Korea	
Dates		
Raw data files		
Imagery data from video, photo, or both?	Neither. There were no visual surveys conducted by Korea	
Platform used for data collection (e.g. ROV, AUV, drop camera, etc..)		
Depth range of visual observations		
Annotated species data		
Have the visual data been annotated	No	
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	No	
Can the species data be standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video data)?	No	
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	Not applicable	
Were NPFC VME indicator	No	-

taxa present and annotated in the imagery?		
Were other taxa present and annotated in the imagery?	No	
Were physical features annotated?	No	
Are there supplementary spatial data collected or available for use?	No	
Is there bottom-contact fisheries data available? If Yes, please describe the fisheries data.	Yes. North Pacific Armorhead and Alfonsino data from bottom trawl fishery.	Data collected from Korean commercial fisheries are available including bycatches in kg and towing start and end points.
Notes about annotation of biological features	Not applicable	
Notes about annotation of physical features	Not applicable	
Associated with predictive maps/models (yes or no)	No	
Cruise report or other publication	No	
Other associated publications	No	
Other notes	No	

RUSSIA

	Data information	**Comments**
Location	Emperor Seamounts	Emperor Chain (Nintoku to Kimmei)
Region	Northwest Pacific Ocean	
Data holder(s)	National Center of Marine Biology FEB RAS, Vladivostok, Russia	
Dates	2019-2021	Survey takes about 2 months in summer each year.
Raw data files		

Imagery data from video, photo, or both?	Both	Both
Platform used for data collection (e.g. ROV, AUV, drop camera, etc..)	ROV - video, photo	
Depth range of visual observations	ROV: 269-2200 m	Suitable
Annotated species data		
Have the visual data been annotated	Yes	Yes
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	Yes	Yes
Can the species data be standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video data)?	Yes	Photos have an estimate of photo area and videos have an estimate of field of view width by the laser pointer.
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	individuals	Count all benthic megafauna when possible.
Were NPFC VME indicator taxa present and annotated in the imagery?	Yes.	- Alcyonacea (including gorgonians) - Pennatulacea - Antipatharia - Scleractinia
Were other taxa present and annotated in the imagery?	Yes.	Yes
Were physical features annotated?	Yes.	- Substrate type - Fishing gear and evidence of fishing related impacts - Other remarks
Other supplementary data notes		

Are there supplementary spatial data collected or available for use?	Yes. After discussion in the relevant organization	
Is there bottom-contact fisheries data available? If Yes, please describe the fisheries data.	No	
Notes about annotation of biological features	All visible benthic megafauna were identified.	
Notes about annotation of physical features	- Substrate type - evidence of fishing related impacts - Other remarks	Yes
Associated with predictive maps/models (yes or no)	Yes	
Cruise report or other publication	Please refer previous NPFC-SWG or SSC documents. SWG10/WP4/J, SWG11/WP3/J, SWG13-WP10/J, NPFC01-2016-/SSC-VME01/WP03/Japan, NPFC-2017-SSC VME02-WP04, NPFC-2018-SSC VME03-WP01, NPFC-2021-SSC BF-ME02-WP09	Yes
Other associated publications	Dautova TN, Galkin SV, Tabachnik KR, Minin KV, Kireev PA, Moskovtseva AV, Adrianov AV. (2020) The First Data on the Structure of Vulnerable Marine Ecosystems of the Emperor Chain Seamounts: Indicator Taxa, Landscapes, and Biogeography. Russian Journal of Marine Biology. V. 45, P. 408–417. Dautova T.N. (2019)	

	Octocorallia as a key taxon in the vulnerable marine ecosystems of the Emperor Chain (Northwest Pacific): diversity, distribution and biogeographical boundary. In: K.A. Lutaenko (Ed.). Marine Biodiversity for a Healthy Ocean – Biodiversity, Functional Groups and Ocean Health. Proceedings of the Russia-China Bilateral Workshop, October 10–11, 2019, Vladivostok, Russia. Vladivostok : Publishing House of the Far Eastern Federal University. P. 68-80.	
Other notes		

OBSERVER (Dr. Amy Baco-Taylor)

	Data information	**Comments**
Location	Northwestern Hawaiian Ridge and lower Emperor Seamounts	North Pacific Ocean
Region	North Pacific Ocean	
Data holder(s)	Amy Baco-Taylor/Brendan Roark	
Dates	Fall 2014, Fall 2015	
Raw data files		
Imagery data from video, photo, or both?	Photo	
Platform used for data collection (e.g. ROV, AUV, drop camera, etc..)	AUV - photo	
Depth range of visual observations	250-700m	
Annotated species data		
Have the visual data been annotated	Yes at higher taxonomic levels for dominant 5 taxa and for all scleractinians and Coralliid	

	octocorals	
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	Yes as noted above	
Can the species data be standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video data)?	Yes	Photos have an estimate of photo area and we have length of vehicle dives and transects
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	Individual counts for coralliids and scleractinians, categorical abundance (2-5, 6-10, >10) for rest of taxa	
Were NPFC VME indicator taxa present and annotated in the imagery?	Yes.	- Alcyonacea (including gorgonians) - Antipatharia - Scleractinia - Sponges
Were other taxa present and annotated in the imagery?	Yes.	AUV: all visible megafauna of the 5 dominant taxa were annotated.
Were physical features annotated?	Yes.	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts - slope - currents and other data derived from satellites and

		online databases
Other supplementary data notes		
Are there supplementary spatial data collected or available for use?	Yes.	- AUV/ROV Navigation (latitude, longitude) - Altimeter (m) - CTD (conductivity, temperature, depth, oxygen) - Multibeam bathymetry
Is there bottom-contact fisheries data available? If Yes, please describe the fisheries data.	Yes from images of bottom contact gear scars and also compilation of publicly available AIS data from 2012 -2018	
Notes about annotation of biological features	AUV: all visible megafauna of the 5 dominant taxa were annotated along with Sclearactinians and coralliids specifically	
Notes about annotation of physical features	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts	
Associated with predictive maps/models (yes or no)	Yes, in progress	Working on habitat suitability modeling for colonial scleractinians
Cruise report or other publication	Baco, A.R., *N.B. Morgan, E. B Roark, and V. Biede. In prep. Disturbance to deep-sea precious corals from fisheries impacts in the Northwestern Hawaiian Islands and Emperor Seamount Chains. Baco, A.R., *N.B. Morgan, and E. B Roark. 2020. Observations of Vulnerable Marine Ecosystems and Significant Adverse Impacts on High Seas Seamounts of the Northwestern Hawaiian Islands and Emperor Seamount Chain. *Marine Policy*. 115: 103834. https://doi.org/10.1016/j.marpol.2020.103834 Morgan, N.B. and A.R. Baco. 2020. Recent fishing footprint of the high-seas bottom trawl	

	fisheries on the Northwestern Hawaiian Ridge and Emperor Seamount Chain: a finer-scale approach to a large-scale issue. *Ecological Indicators*. 121 (2021): 107051. https://doi.org/10.1016/j.ecolind.2020.107051 Baco, A.R., E. B Roark, *N.B. Morgan. 2019. Amid Fields of Rubble, Scars, and Lost Gear, Signs of Recovery Observed on Seamounts on 30-40 year Time Scales. *Science Advances*. 5: eaaw4513.	
Other associated publications	Baco, A.R., *N.B. Morgan, E.B. Roark, M. Silva, K. Shamberger, K.M., Miller, K. 2017. Defying dissolution, discovery of deep-sea scleractinian coral reefs in the North Pacific. *Scientific Reports*. 7: 5436 | DOI:10.1038/s41598-017-05492-w Baco, A.R., F.A. Parrish, S. Auscavitch, S. Cairns, *B. Mejia-Mercado, *V. Biede, *N. Morgan, E.B. Roark, and *W.B. Brantley. Deep-Sea Corals of the North and Central Pacific. Invited Book Chapter In: *Cold-Water Corals Reefs of the World*. E. Cordes and F. Mienis editors. Springer. Revisions accepted 03/2021. In press.	
Other notes		

	Data information	**Comments**
Location	Northwestern Hawaiian Ridge and lower Emperor Seamounts	North Pacific Ocean
Region	North Pacific Ocean	
Data holder(s)	Amy Baco-Taylor/Brendan Roark	
Dates	Fall 2016, Fall 2017	
Raw data files		
Imagery data from video, photo, or both?	Video	
Platform used for data collection (e.g. ROV,	Pisces Submersibles - video	

AUV, drop camera, etc..)		
Depth range of visual observations	250-700m	
Annotated species data		
Have the visual data been annotated	In progress, screened for scleractinian locations and coralliids	
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	Dive paths are georeferenced, most images not yet	
Can the species data be standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video data)?	Yes	we have length of vehicle dives and transects and width of camera field of view
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	All taxa to near species level as individual counts	
Were NPFC VME indicator taxa present and annotated in the imagery?	Yes.	- Alcyonacea (including gorgonians) - Antipatharia - Scleractinia - Sponges
Were other taxa present and annotated in the imagery?	Yes.	all visible megafauna
Were physical features annotated?	Yes.	- Substrate type - Dominant and subdominant substrate percent cover

		- Fishing gear and evidence of fishing related impacts - slope - currents and other data derived from satellites and online databases
Other supplementary data notes		
Are there supplementary spatial data collected or available for use?	Yes.	- AUV/ROV Navigation (latitude, longitude) - Altimeter (m) - CTD (conductivity, temperature, depth, oxygen) - Multibeam bathymetry
Is there bottom-contact fisheries data available? If Yes, please describe the fisheries data.	Yes from images of bottom contact gear scars and also compilation of publicly available AIS data from 2012 -2018	
Notes about annotation of biological features	all visible megafauna were annotated for transects so far completed, substrate is in progress	
Notes about annotation of physical features	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts	
Associated with predictive maps/models (yes or no)	Yes, in progress	Working on habitat suitability modeling for colonial scleractinians
Cruise report or other publication	Baco, A.R., *N.B. Morgan, E. B Roark, and V. Biede. In prep. Disturbance to deep-sea precious corals from fisheries impacts in the Northwestern Hawaiian Islands and Emperor Seamount Chains. Baco, A.R., *N.B. Morgan, and E. B Roark. 2020. Observations of Vulnerable Marine Ecosystems and Significant Adverse Impacts	

	on High Seas Seamounts of the Northwestern Hawaiian Islands and Emperor Seamount Chain. *Marine Policy*. 115: 103834. https://doi.org/10.1016/j.marpol.2020.103834 Morgan, N.B. and A.R. Baco. 2020. Recent fishing footprint of the high-seas bottom trawl fisheries on the Northwestern Hawaiian Ridge and Emperor Seamount Chain: a finer-scale approach to a large-scale issue. *Ecological Indicators*. 121 (2021): 107051. https://doi.org/10.1016/j.ecolind.2020.107051 Baco, A.R., E. B Roark, *N.B. Morgan. 2019. Amid Fields of Rubble, Scars, and Lost Gear, Signs of Recovery Observed on Seamounts on 30-40 year Time Scales. *Science Advances*. 5: eaaw4513.	
Other associated publications	Baco, A.R., F.A. Parrish, S. Auscavitch, S. Cairns, *B. Mejia-Mercado, *V. Biede, *N. Morgan, E.B. Roark, and *W.B. Brantley. Deep-Sea Corals of the North and Central Pacific. Invited Book Chapter In: *Cold-Water Corals Reefs of the World*. E. Cordes and F. Mienis editors. Springer. Revisions accepted 03/2021. In press.	
Other notes		

	Data information	**Comments**
Location	Northwestern Hawaiian Ridge and lower Emperor Seamounts	North Pacific Ocean
Region	North Pacific Ocean	
Data holder(s)	Amy Baco-Taylor/Brendan Roark	
Dates	Fall 2021	
Raw data files		
Imagery data from video, photo, or both?	Video	
Platform used for data	ROV Lu'u'kai - video	

collection (e.g. ROV, AUV, drop camera, etc..)		
Depth range of visual observations	250-1000m	
Annotated species data		
Have the visual data been annotated	In progress	
Have the visual data been georeferenced (latitude and longitude matched to the species records)?	Dive paths are georeferenced, most images not yet	
Can the species data be standardized to area (i.e. is there an estimate of area viewed such as image area (m^2) for photo data or field of view width (m) for video data)?	Yes	we have length of vehicle dives and transects and width of camera field of view
What are the units of the species data (e.g. presence only, presence-absence, area-standardized abundance)?	All taxa to near species level as individual counts, study was focused specifically on scleractinian reefs	
Were NPFC VME indicator taxa present and annotated in the imagery?	In progress	- Alcyonacea (including gorgonians) - Antipatharia - Scleractinia - Sponges
Were other taxa present and annotated in the imagery?	In progress	all visible megafauna
Were physical features annotated?	In progress	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts - slope - currents and other data derived

		from satellites and online databases
Other supplementary data notes		
Are there supplementary spatial data collected or available for use?	Yes.	- ROV Navigation (latitude, longitude) - Altimeter (m) - CTD (conductivity, temperature, depth, oxygen) - Multibeam bathymetry
Is there bottom-contact fisheries data available? If Yes, please describe the fisheries data.	Yes from images of bottom contact gear scars and also compilation of publicly available AIS data from 2012 -2018	
Notes about annotation of biological features	In progress	
Notes about annotation of physical features	- Substrate type - Dominant and subdominant substrate percent cover - Fishing gear and evidence of fishing related impacts	
Associated with predictive maps/models (yes or no)	Yes, in progress	These data are being used to improve on models made from initial data in previous studies, ms on earlier data in prep
Cruise report or other publication	Silva-Aguilera, M, *N.B. Morgan, E. B Roark, and V. Biede, K. Shamberger, A. Baco. In prep. Habitat suitability modeling of deep-sea scleractinian coral reefs in the North Pacific.	
Other associated publications		
Other notes		