Marine Mammal & Sea Turtle Work Group Meeting #1

Thursday, August 7; 2:00pm – 3:30pm

Materials:
- Table of cross-cutting issues for marine life data products (introduced at June 25th Workshop) – Page 3
- Marine mammal & sea turtle data resources list – Pages 4 - 6
- Draft Northeast species list Page 7

Call in: 877-680-1673; **Code:** 1993954#

Webinar Link: https://global.gotomeeting.com/join/597359461

Agenda:

 I.   **Introductions**

 II.   **Northeast Ocean Planning (Nick Napoli, NROC)**
 - Work group role
 - Timeline

 III.   **MDAT team: Marine Mammal & Turtle Overview (Pat Halpin, Duke University)**
 - MDAT Role
 - Objectives

 IV.   **Duke Marine Mammal and Sea Turtle Density Models (Jason Roberts, Duke University)**
 - Brief overview of methodology
 - Example results

 V.   **Data (Jason Roberts, Duke University)**
 - Summary of datasets in-hand (see attached list)
 - Opportunities to provide input on additional data resources

 VI.   **Species (Jason Roberts, Duke University)**
 - Species modeled (see attached list)
 - Grouping of rare or ambiguous species

 VII.   **Working Group Discussion; topics could include:**
 - What additional line transect surveys we should incorporate?
 - What spatial extent does NROC want?
 - Should we summarize models into multi-species summaries (e.g. all baleen whales)?
 - How to handle situations where density modeling was not possible?
   - Rare species
   - Near-shore / estuarine areas
 - How to best present model uncertainty?
 - Do members of the working group have expertise in particular species, and would they be interested in reviewing models in detail offline?
 - Should we produce alternative products, other than density models?

 VIII. **Summary and Next Steps**

Across marine life categories (marine mammals, turtles, birds and fish), there are many options to consider when creating new spatial data products. The following table presents these options using the same categories that we used to review projects in the "Draft summary of marine life data sources and approaches to define ecologically important areas and measure ocean health", presented at the June 25th Natural Resources Workshop: Data Collection, Temporal Extent, Treatment of Data, Spatial Products and Uses. This presentation of options is meant to organize the discussion about how new spatial data products can be developed.

CROSSCUTTING ISSUES	OPTIONS
DATA COLLECTION	• Sources • Geographic scope • How to integrate survey methods? • How to integrate expert knowledge?
TEMPORAL EXTENT	• How many decades of data to include? • Monthly, seasonal, annual summaries
TREATMENT OF DATA	• Summarize by species, guilds, functional groups • Incorporate migration routes? • Which environmental covariates?
SPATIAL PRODUCTS	• Tier I spatial products (observations) • Tier II spatial products (observations + habitat)
USES	• As supporting information • For environmental impact assessment and/or permitting decisions by state or federal regulatory agencies • Assessing compatibility with other uses

Marine mammal and sea turtle datasets currently in hand:

The primary species distribution product we propose to submit to NROC is a set of density models (giving animals/km^2) built from line-transect surveys using distance sampling methodology. We have assembled an extensive database of suitable surveys performed or funded by NOAA, state and academic partners, and the Navy in the northwest Atlantic.

Surveys	Started	Ended	On Effort Length (1000s km)	Effort Hours	Survey Count
NEFSC Aerial Surveys	1995	2008	70	412	8
NEFSC North Atlantic Right Whale Sighting Survey	1999	2013	438	2366	24
NEFSC Shipboard Surveys	1995	2004	16	1145	6
NJDEP Aerial Surveys	2008	2009	11	60	2
NJDEP Shipboard Surveys	2008	2009	14	836	2
SEFSC Atlantic Shipboard Surveys	1992	2005	29	1764	6
SEFSC Mid Atlantic Tursiops Aerial Surveys	1995	2005	35	196	7
SEFSC Southeast Cetacean Aerial Surveys	1992	1995	8	42	2
UNCW Cape Hatteras Aerial Surveys (Navy)	2011	2013	38	250	4
UNCW Early Marine Mammal Aerial Surveys	2002	2002	18	98	1
UNCW Jacksonville Aerial Surveys (Navy)	2009	2013	132	805	10
UNCW Onslow Bay Aerial Surveys (Navy)	2007	2011	98	563	6
UNCW Right Whale Aerial Surveys	2005	2008	114	586	3
Virginia Aquarium Aerial Surveys (in progress)	2012	2014			1

Table 1: Northwest Atlantic line transect surveys used in Duke marine mammal and sea turtle density models for the east coast of the United States and southern Canada.

We are interested in collaborating with additional partners (e.g. the North Atlantic Right Whale Consortium, the Provincetown Center for Coastal Studies, and the New England states) to further improve the models, and will approach them as part of this project.

We are of course also interested in the ongoing NOAA AMAPPS surveys. NOAA is very aware of our interest and has agreed in principle to provide those surveys to us once the AMAPPS project has reached a suitable checkpoint. We were advised that this would be no earlier than summer of 2015, and therefore do not anticipate utilizing AMAPPS for NROC.

We also maintain the OBIS-SEAMAP database of marine mammal and sea turtle sightings. OBIS-SEAMAP includes almost all of the datasets above, plus a number of additional datasets not suitable for density modeling or that preceded our cutoff date of 1991. These datasets could be summarized into secondary products such as seasonal maps of species sightings, or other products that are not "effort corrected". They could also be utilized in presence-only habitat suitability models, but that is beyond the scope of this project. (We can discuss these and other product alternatives further at the working group meetings.)

Marine mammal and sea turtle sightings occurring in the surveys listed above:

Family	Scientific Name	Common Name	Sightings	Modeled as group
Cetaceans	Balaenoptera acutorostrata	Minke whale	1010	
	Balaenoptera borealis	Sei whale	589	
	Balaenoptera musculus	Blue whale	7	
	Balaenoptera physalus	Fin whale	1730	
	Delphinus delphis	Common dolphin	803	
	Eubalaena glacialis	North Atlantic right whale	1595	
	Globicephala	Unidentified pilot whale	670	Pilot whales
	Grampus griseus	Risso's dolphin	514	
	Hyperoodon ampullatus	Northern bottlenose whale	3	Beaked whales
	Kogia	Unidentified small sperm whale	3	
	Kogia sima	Dwarf sperm whale	1	
	Lagenorhynchus acutus	Atlantic white-sided dolphin	1677	
	Lagenorhynchus albirostris	White-beaked dolphin	12	
	Megaptera novaeangliae	Humpback whale	2700	
	Mesoplodon	Unidentified beaked whale	82	Beaked whales
	Mesoplodon bidens	Sowerby's beaked whale	8	Beaked whales
	Mesoplodon densirostris	Blainville's beaked whale	2	Beaked whales
	Mesoplodon mirus	True's beaked whale	2	Beaked whales
	Orcinus orca	Killer whale	4	
	Phocoena	Harbor porpoise	2781	
	Physeter macrocephalus	Sperm whale	247	
	Stenella attenuata	Pantropical spotted dolphin	4	
	Stenella coeruleoalba	Striped dolphin	84	
	Stenella frontalis	Atlantic spotted dolphin	7	
	Stenella longirostris	Spinner dolphin	1	
	Tursiops truncatus	Bottlenose dolphin	477	
	Ziphiidae	Unidentified beaked whale	2	Beaked whales
	Ziphius cavirostris	Cuvier's beaked whale	21	Beaked whales
Pinnipeds	Caniformia	Unidentified seal	909	Seals
	Halichoerus grypus	Gray seal	24	Seals
	Phoca vitulina	Harbor seal	250	Seals
Turtles	Caretta	Loggerhead turtle	470	
	Chelonia mydas	Green turtle	3	
	Dermochelys coriacea	Leatherback turtle	232	
	Lepidochelys kempii	Kemp's ridley turtle	59	

Table 2: Cetacean, pinniped, and turtle sightings from the datasets above that occurred between Delaware Bay and the Bay of Fundy (39-45 °N, 64-75 °W) and are suitable for density modeling. Species marked in gray cannot be modeled due to insufficient sightings. Species

marked in other colors will be modeled as the designated group, due to insufficient sightings or ambiguous taxonomic identifications. All models are habitat-based (they predict density from environmental covariates) and will incorporate additional sightings north and south of the focal region, when appropriate. For some species, such as Atlantic spotted dolphin, this will allow models to still be built for the NROC region despite the few sightings that occur there.

Species - common name	Marine Life Group	Federal					State			Other			
		ESA	MMPA	EFH	FWS BCR30 Priority	MBTA	E, T, SC	Ocean Plans	Managed fishery	Keystone	Likely to interact with priority human uses	Range info, migratory, etc.	MDAT no. of observations
Atlantic white-sided dolphin	Mammals		X										1677
Blainville's beaked whale	Mammals		X										2
Blue whale	Mammals	E	X				MA, NY (E)						7
Cuvier's beaked whale	Mammals		X										21
Dwarf sperm whale	Mammals		X										1
Fin whale	Mammals	E	X				ME, NH, MA, RI, CT, NY (E)	MA SSU					1730
Gervais beaked whale	Mammals		X										
Gray seal	Mammals		X										
Harbor porpoise	Mammals		X				CT, NY (SC)						2781
Harbor seal	Mammals		X										
Harp seal	Mammals		X										
Hooded seal	Mammals		X										
Humpback whale	Mammals	E	X				ME, MA, RI, NY (E)	MA SSU					2700
Killer whale	Mammals		X										4
Minke whale	Mammals		X										1010
North Atlantic right whale	Mammals	E	X				ME, MA, RI, NY (E)	MA SSU					1595
Northern bottlenose whale	Mammals		X										3
Pilot whale, long-finned	Mammals		X										670 (Pilot whale)
Pygmy sperm whale	Mammals		X										
Risso's dolphin	Mammals		X										514
Sei whale	Mammals	E	X				ME, MA, NY (E)						589
Short-beaked common dolphin	Mammals		X										
Sowerby's beaked whale	Mammals		X										8
Sperm whale	Mammals	E	X				ME, MA, NY (E)						247
Striped dolphin	Mammals		X										84
True's beaked whale	Mammals		X										2
White-beaked dolphin	Mammals		X										12
Green sea turtle	Turtles	T					MA, CT, NY (T)						3
Hawksbill sea turtle	Turtles	E					MA, RI, CT, NY (E)						
Kemp's ridley sea turtle	Turtles	E					ME, MA, RI, CT, NY (E)						59
Leatherback sea turtle	Turtles	E					ME, NH, MA, RI, CT, NY (E)						232
Loggerhead sea turtle	Turtles	T					ME, MA, NY (T)						470