

Marine-life Data & Analysis

PBS.org



Andreas Trepte, www.photo-natur.de



Corrie Curtice

MDAT

Northeast Regional Ocean Council
Regional Planning Body meeting

June 25, 2014



NCCOS

Overview



- Objectives
- Introduction: Marine-life Data & Analysis Team
- Data holdings & capacity
- Process & next steps

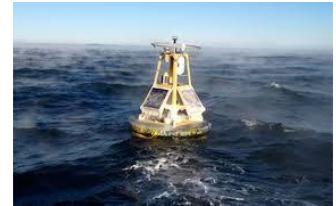


Data for spatial planning

1. develop well documented, understandable and comparable data products
2. develop products that will allow for the assessment of ecological function, vulnerability and risk, uncertainty...
3. integration of data products where possible

All development will be conducted with an eye towards anticipated end-user applications and regional marine spatial planning considerations.

Challenges



- Short-time frame requires a very rapid response capability
- Complex models require in-house expertise for interpretation
- Experience with existing processes and stakeholders is critical



NCCOS

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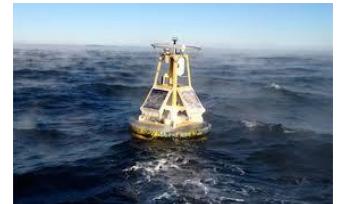
Marine-life Data & Analysis Team

Because it is absolutely essential to have first-hand knowledge of the data products and model development to properly interpret the results, we have assembled a core team of **primary data analysts and model developers**

- Marine Geospatial Ecology Lab – Duke University
- NOAA – NCCOS
- NOAA – NMFS/NEFSC - EcoAP
- Loyola University



Capabilities

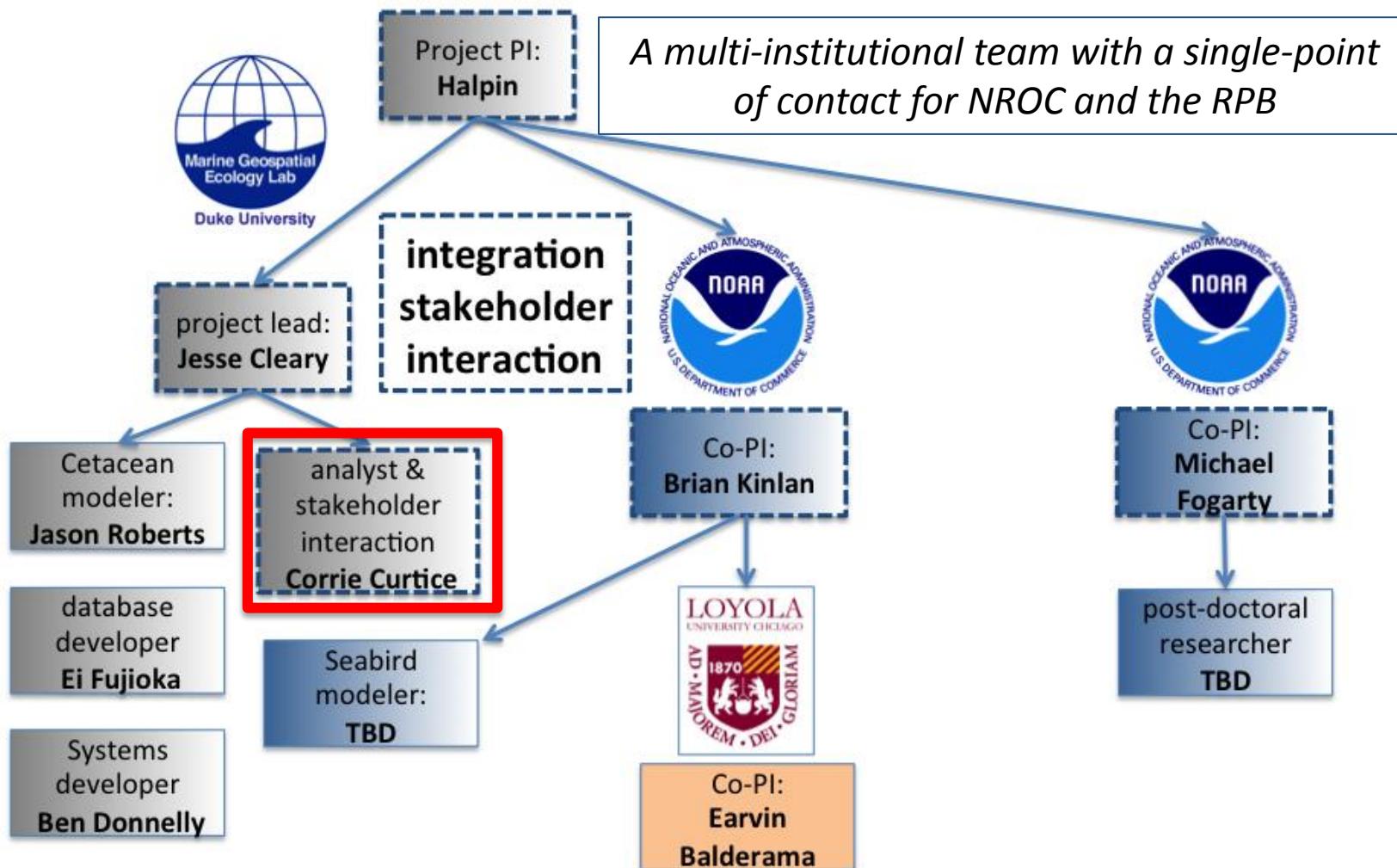


- Direct in-house expertise in the data analysis & model development processes
- Direct ability to update data products & models throughout the process
- Direct understanding of the model uncertainty and interpretation
- Direct experience translating model products into management applications
- Core data sets and models in-hand for immediate action on this project
- Our team leverages considerable resources from previously funded projects



NCCOS

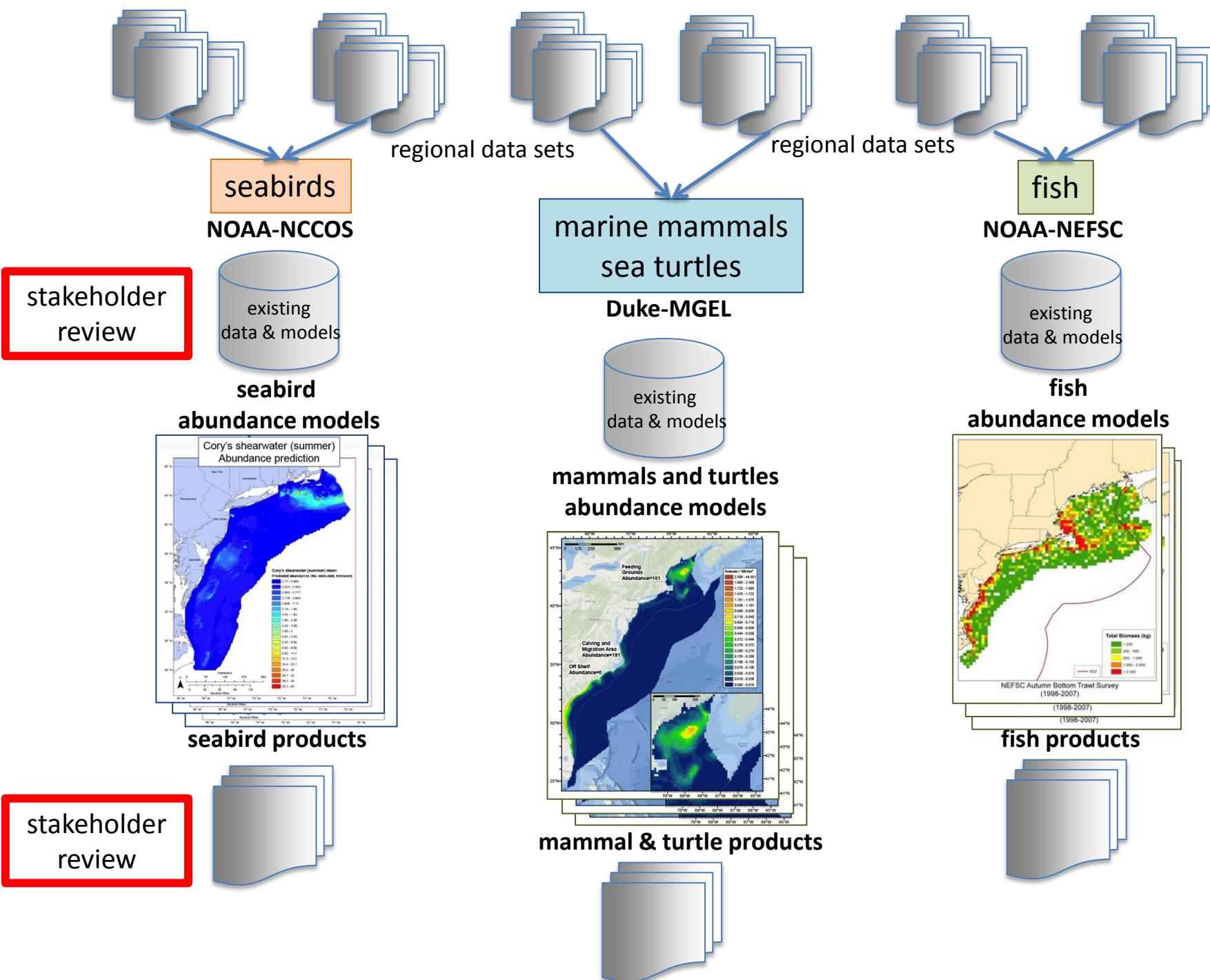
Project organization chart



Marine Mammals
& Sea Turtles

Seabirds

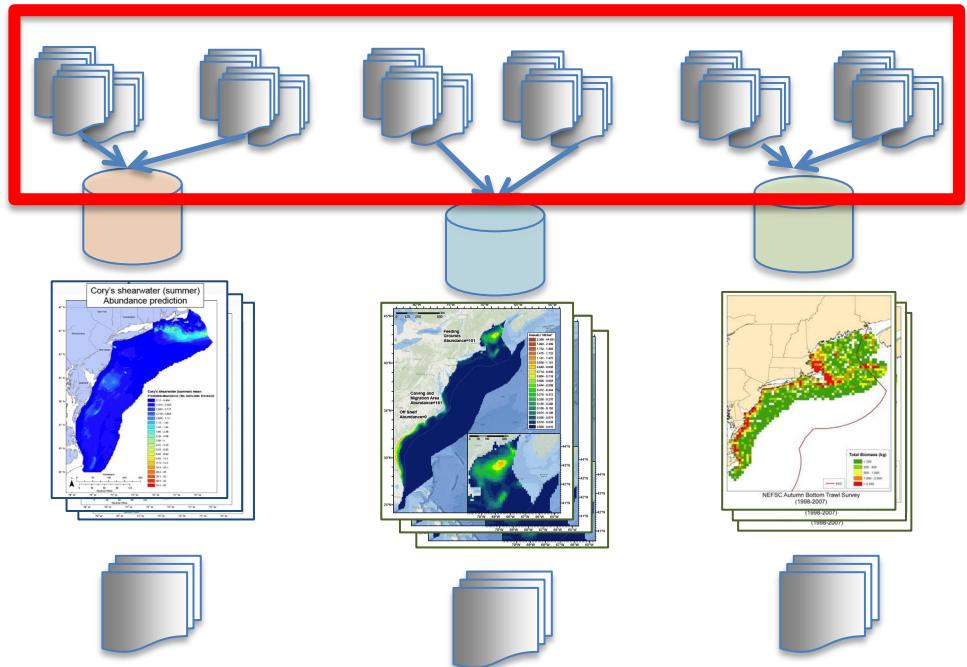
Fish



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Marine Geospatial Ecology Lab (MGEL) Capacity

- Project lead and coordination
- Marine mammal and sea turtle data & models
- Overall data integration
- Marine Spatial Planning support applications



Photo: Denise Risch, NEFSC/NOAA

MGEL Capacity

Existing Data & Model holdings



The OBIS SEAMAP dashboard displays a global map of marine biodiversity. A legend indicates color coding for different taxonomic groups. Below the map, there are links to 'Browse Datasets', 'Browse Contributors', 'Browse Species', and a 'Legend' section.

OBIS SEAMAP

Home | Contribute | Services | About

Imagery ©2014 Nasa

Browse Datasets | Browse Contributors | Browse Species | Legend

Applications

- SERDP SDSS Marine Animal Model Mapper funded by NASA and SERDP
- SWOT The State of the World's Sea Turtles
- MABDC Photo ID (Beta)
- PIPIN Photo ID (Coming soon)
- CDOC California Dolphin Online Catalog (login required)
- GOMDIS Gulf of Mexico Dolphin ID System (Beta)
- Black Sea Cetaceans Photo ID Catalog
- WIDECAST Wider Caribbean Sea Turtle Nesting Sites

What's New?

Datasets added

- Wearing Northern Elephant Seals Christophe Guinet, 14-04-29
- Neonates tagged off Brazil Yonat, 14-04-01
- Spain Tags merged Yonat Swimmer, 14-04-01

Improvements / Issues fixed / Announcements

- The issue that data downloads failed is fixed, 2014-06-04



The OBIS homepage features the USGS logo and a banner for the Ocean Biogeographic Information System USA. It includes a search bar, social media links, and a news section. The main content area is titled 'Welcome to OBIS!' and provides information about the database's capabilities and recent news.

OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

SEARCH OBIS WEB PAGES (FOR DATA GO TO SEARCH DATA)

Welcome to OBIS!

Last updated on Thu, 2011-01-13 09:49. Originally submitted by eberge on 2010-05-25 15:58.

OBIS allows users to search marine species datasets from all of the world's oceans.

With our evolving OBIS database repository, users can identify biodiversity hotspots and large-scale ecological patterns, analyze dispersions of species over time and space, and plot species' locations with temperature, salinity, and depth.

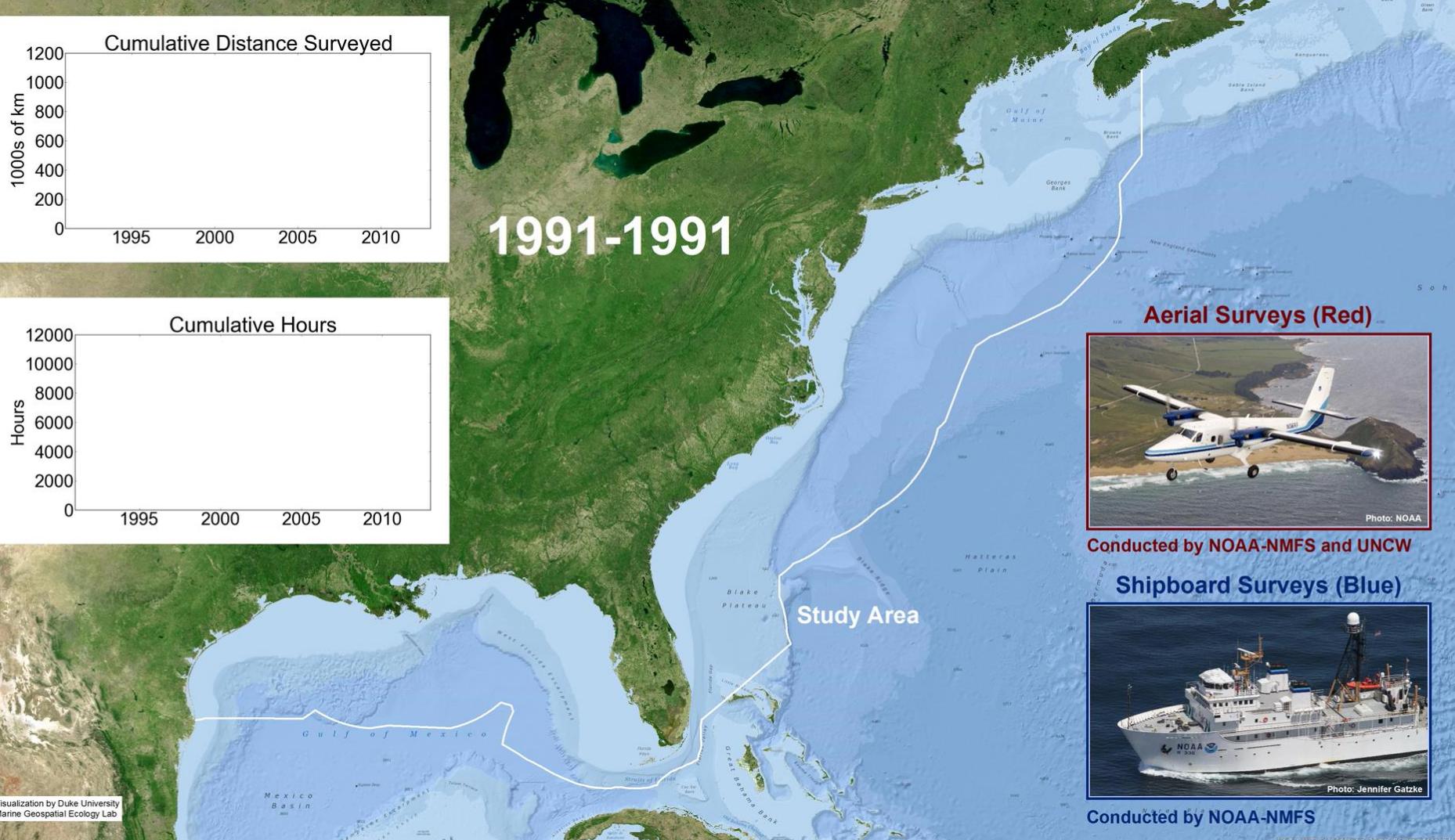
To search the database, please select the "Search Data" option in the toolbar above.

If you want to see overview maps of OBIS content and derived information, select "Maps".

RECENT NEWS

- 2014-05-09 First OBIS Nodes Technical Training Course took place at the Project Office in Ostend, 5-9 May 2014
- 2014-03-26 World Conference on Marine Biodiversity, 12-16 Oct 2014 - Call for abstracts
- 2014-02-26 New data loaded, 26 February 2014
- 2014-02-25 OBIS Steering Group meeting report is published
- 2014-01-24 OBIS Technical Training Course, 5-9 May 2014

MGEL Capacity



MGEL Capacity

Existing Data & Model holdings

SERDP NASA NOAA

Quick Search Species/dataset/provider name or ITIS TSN/Dataset ID Full text

Map summary

#species / #taxa 0 / 0
#datasets 0
#records 0
Total of group size 0

SERDP Models

- Habitat Models
 - DUKE
 - Baleen whales
 - Summer
 - East
 - Fall
 - Beaked whales
 - Delphinus
 - Harbour porpoise
 - Humpback whales
 - Killer whales
 - Kogia
 - Lags
 - Pilot whales
 - Right whales
 - Sperm whales
 - Stenella attenuata
 - Stenella frontalis
 - Stenella species
 - Striped dolphin
 - Tursiops
 - NODES
 - SWFSC
 - Stratum Estimates
 - SWFSC

SERDP Layers

 - Observations modeled
 - Tracks modeled
 - Jacksonville USWTR

Map showing habitat suitability for Baleen whales in the North Atlantic.

Model Description

Model Type	DUKE - Habitat Model (Model Version 1)
Guild	Baleen whales
Season (*) / Region	Summer / east2

Model Statistics

Region	Effort		Habitat Suitability				
	#Obs.	Hours	Length (km)	Min	Max	Mean	Std. dev
NE2	578	4,900.41	91,792.62	0.000003	0.606017	0.035817	0.063202
SE2				0.000000	0.001337	0.000029	0.000110

Species in Guild

Scientific	Common	Status
Balaenoptera	baleen whales	N/A
Balaenoptera acutorostrata	Common Minke Whale	-
Balaenoptera borealis	Sei Whale	N/A
Balaenoptera edeni	Fin whale	Endangered

Color scheme:
Relative (radio button selected)
Habitat Suitability
0.0000-0.0059
0.0059-0.0168
0.0168-0.0289
0.0289-0.0422
0.0422-0.0576
0.0576-0.0747
0.0747-0.0971
0.0971-0.1231
0.1231-0.1488
0.1488-0.1776
0.1776-0.2110
0.2110-0.2495
0.2495-0.2913
0.2913-0.3524
0.3524-0.4816

NOAA Cetacean & Sound Mapping

Extended

1	hd	Habitat-based Density	hd
2	sde	Stratified Density	sde
3	poe	Probability of Occurrence	poe
4	rec	Records Exist	rec
5	exp	Expert-based presence	exp
6	exae	Expert-based absence	exae

Cetacean Data

Biologically important

Show data availability for Region: EC East Coast (EC) Hide rows where species is absent

NOTE: Expert-based presence for each species was designated at the temporal resolution of an entire year, such that a species is considered "present" if it is known to occur in that region at any time during the year. This tier does not provide information on species presence during specific months.

Region	Species	Package	Product	J	F	M	A	M	J	J	A	S	O	N	D
EC	Balaenoptera acutorostrata			rec	rec	rec	rec	rec	rec	hd		hd		rec	
	Balaenoptera borealis			rec	rec	rec	rec	rec	rec	hd		hd		rec	
	Balaenoptera edeni									exp				hd	
	Balaenoptera musculus									exp	rec	rec	rec	hd	
	Balaenoptera physalus										exp	rec	rec	hd	
	Delphinus delphis														
	Eubalaena glacialis														



NOAA – NCCOS & Loyola Capacity

Predict the long-term spatial distributions of marine bird species
in US Atlantic waters



NCCOS/Loyola Capacity

Seabird study area(s)

1. New York Bight

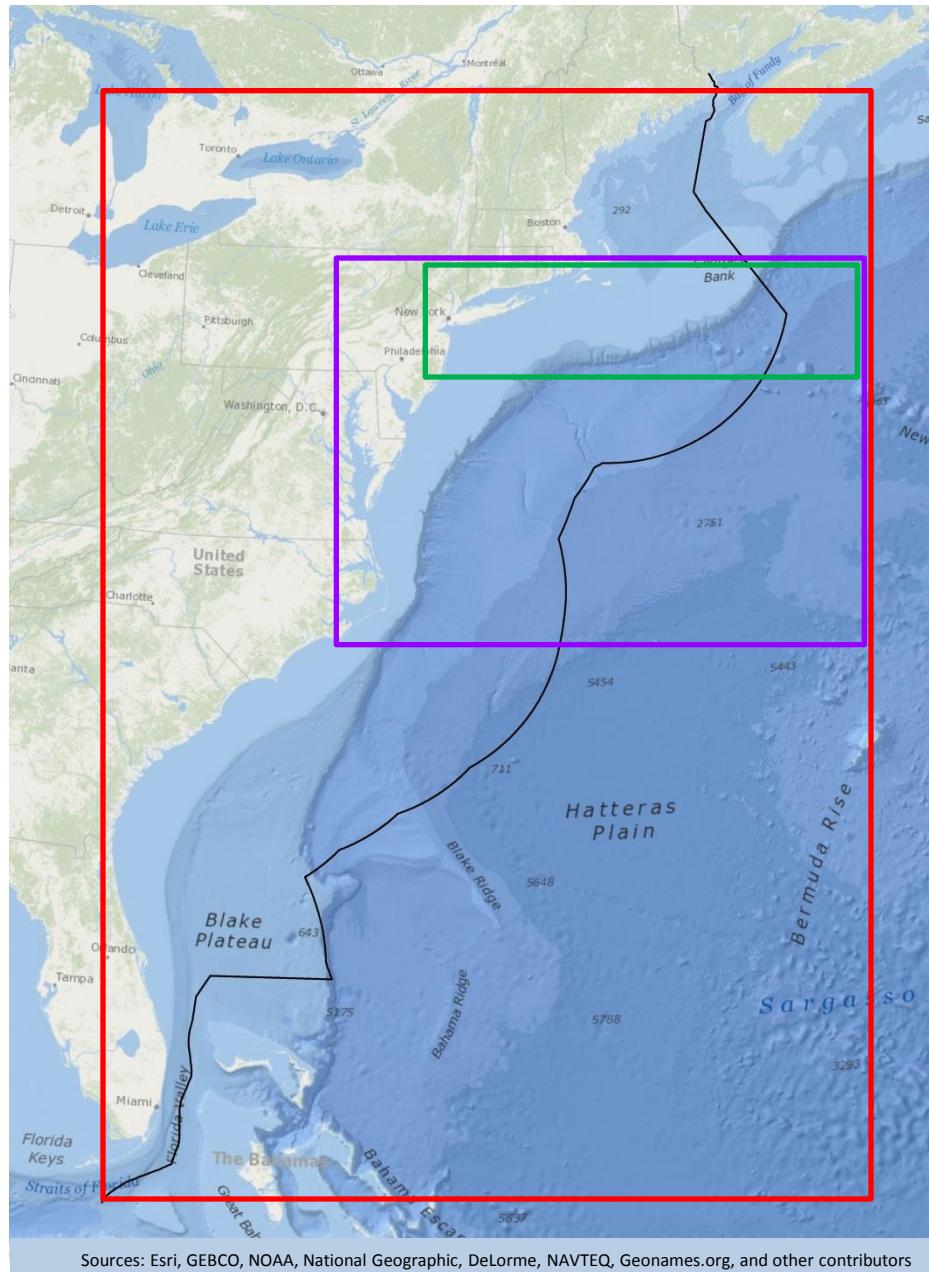
*Kinlan et al. 2012. In: NOAA
Tech. Memo. NOS NCCOS 141*

2. Mid Atlantic

NOAA Tech. Memo. forthcoming

3. All Atlantic

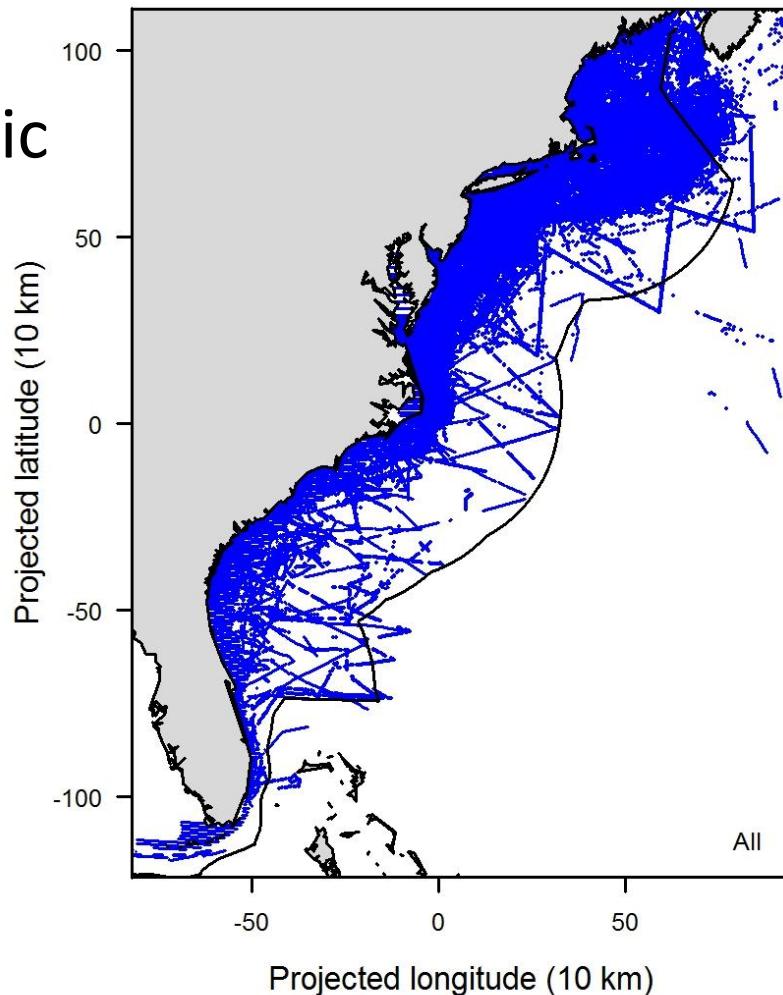
In progress



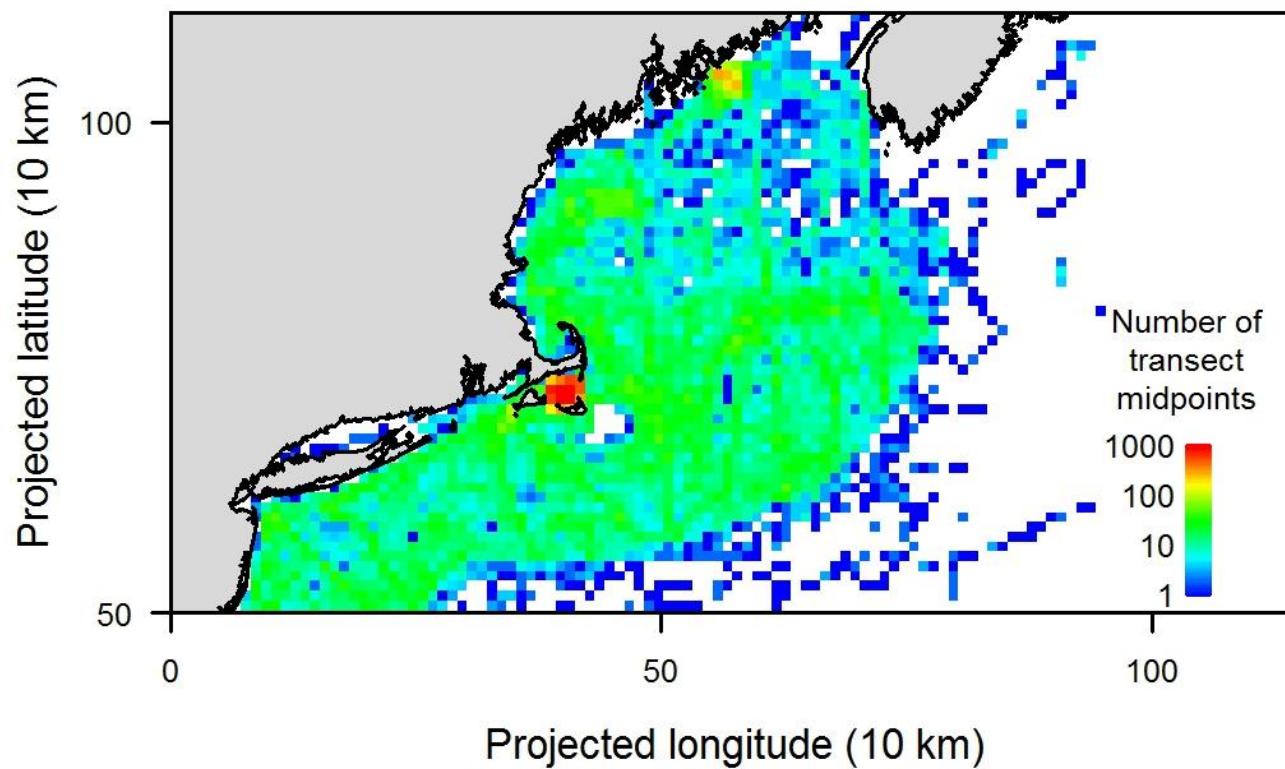
NCCOS/Loyola Capacity

Compendium of Avian
Information in the U.S. Atlantic
Outer Continental Shelf
(USGS, BOEM)

~80 datasets
1978-2014



NCCOS/Loyola Capacity



Northeast Fisheries Science Center (NEFSC)

Ecosystem Assessment Program Capacity

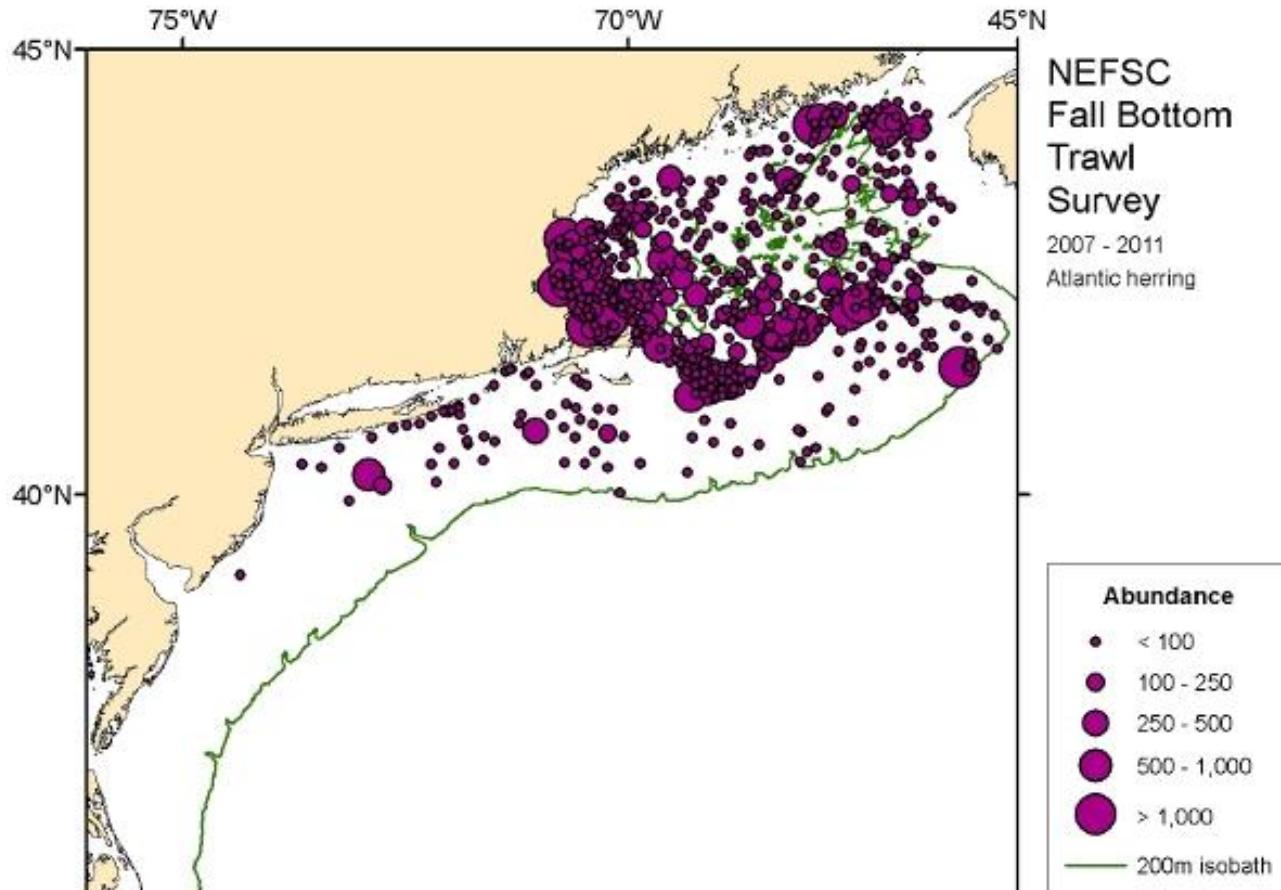
DATA SOURCES:

- Satellites
- Oceanographic Buoys
- Standardized Surveys
 - Trawl & Acoustics
 - Plankton
 - Shellfish Dredges
 - Longlines
 - Air Craft
- Ships of Opportunity
- Observer Program
- Cooperative Industry Research
- Fishery Reporting System
- Fishermen Interviews



NOAA FSV Henry B. Bigelow

NEFSC EcoAP

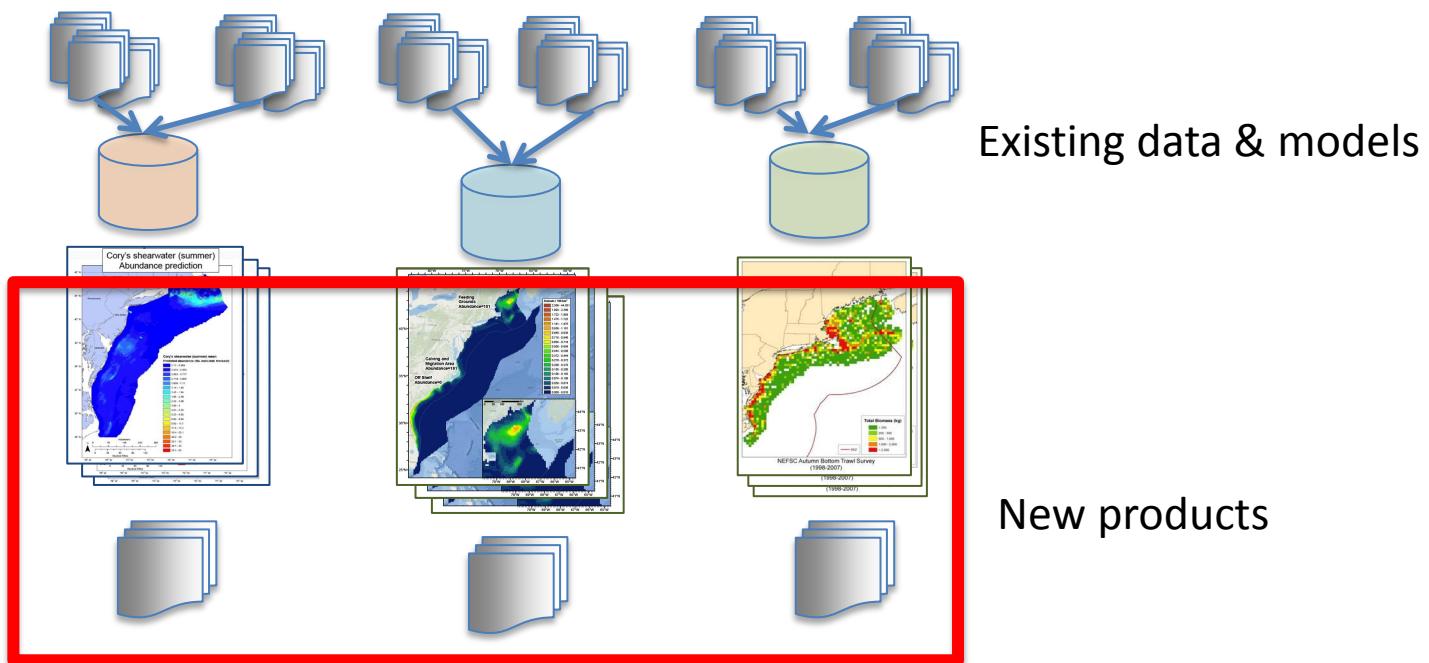


NEFSC Ecosystem Assessment Program

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Data Processing Approach

Biogeographic Data Layers

Imagery



Patterns of Human Use



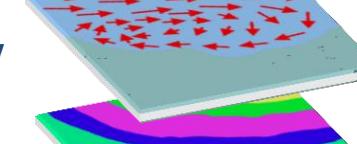
Bottom Type



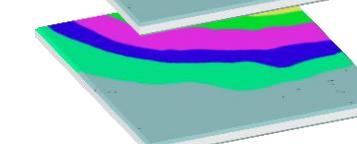
Bathymetry



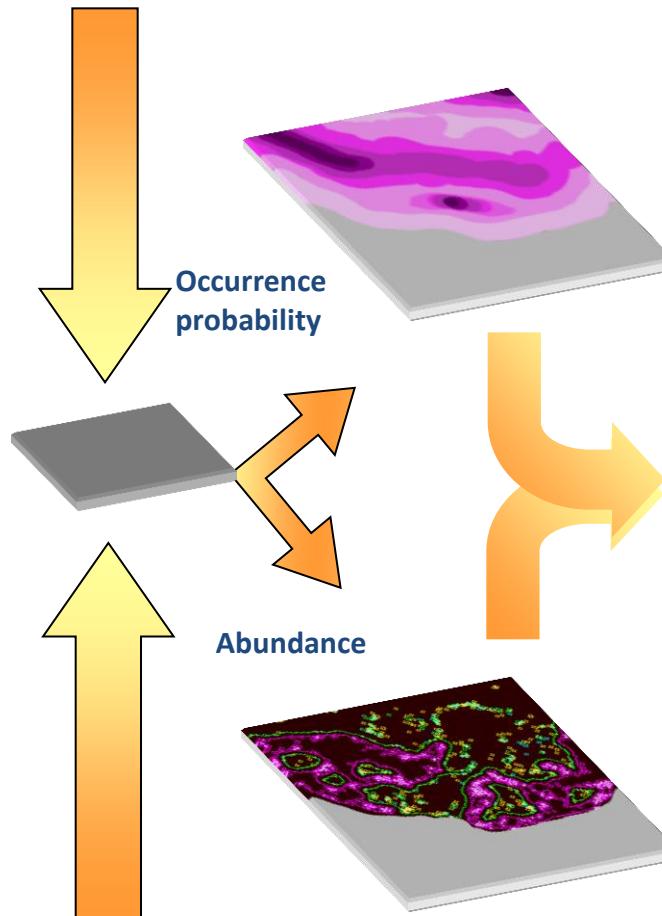
Oceanography



Species Distributions (many layers)



Combine Biogeographic Layers for Analysis



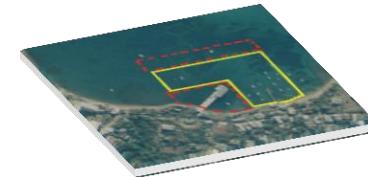
Geospatial/Ecological Analytics

Products to Aid Spatial Planning

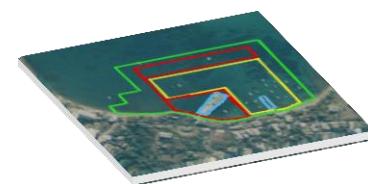
Defining and analyzing existing conditions



Defining and analyzing future conditions

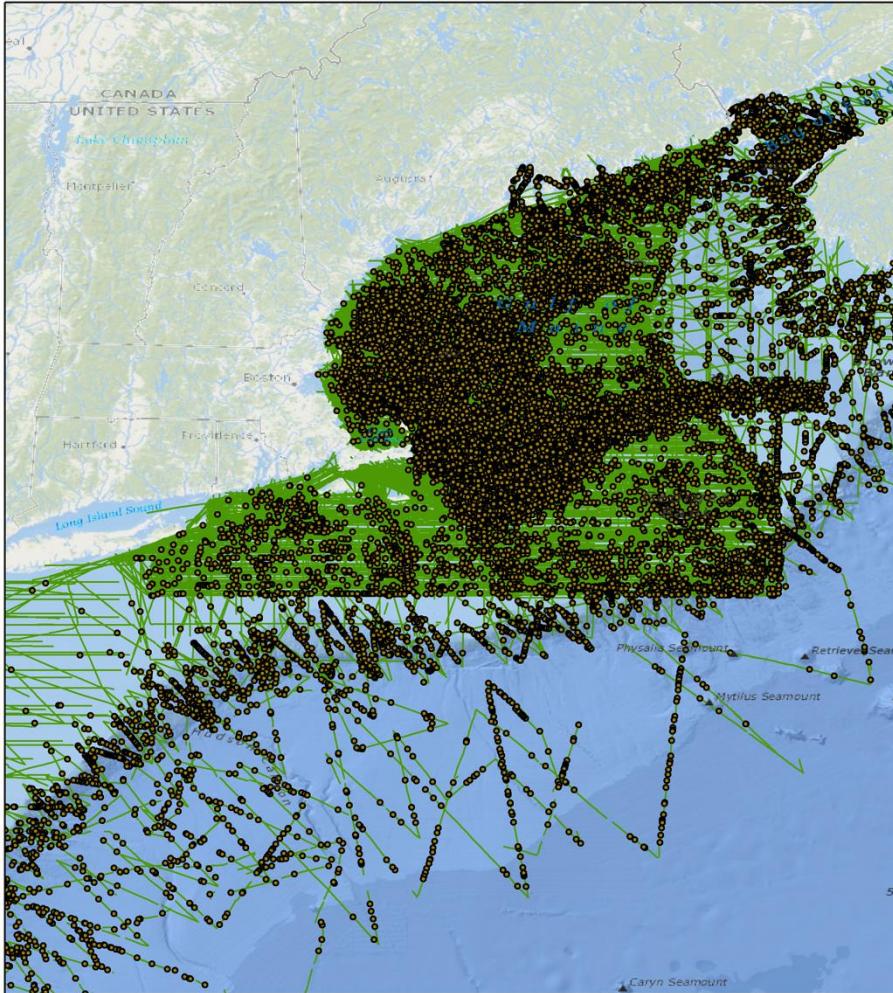


Evaluate alternative spatial plans



Analytical Products to Meet Management Objectives

Data mapping products



Can produce:

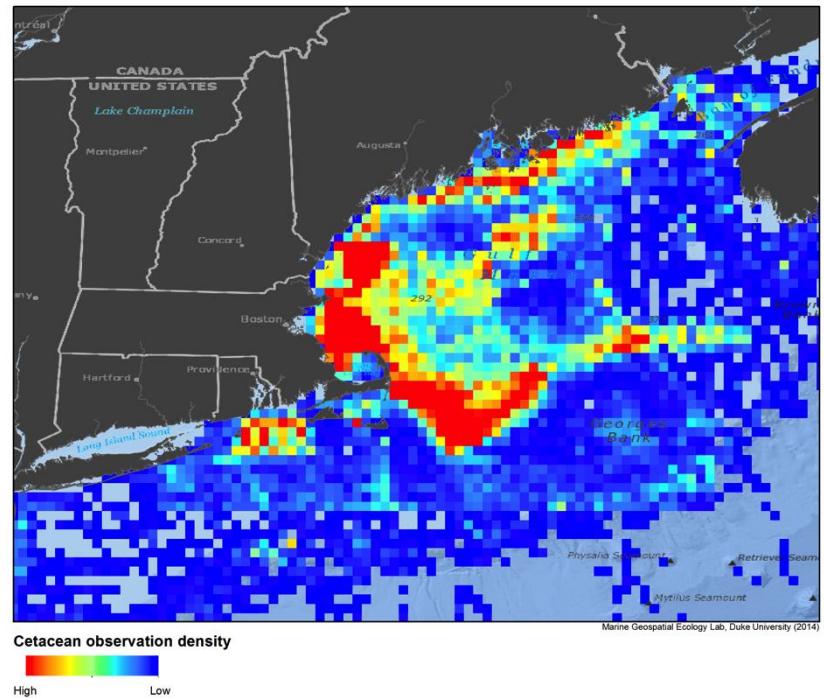
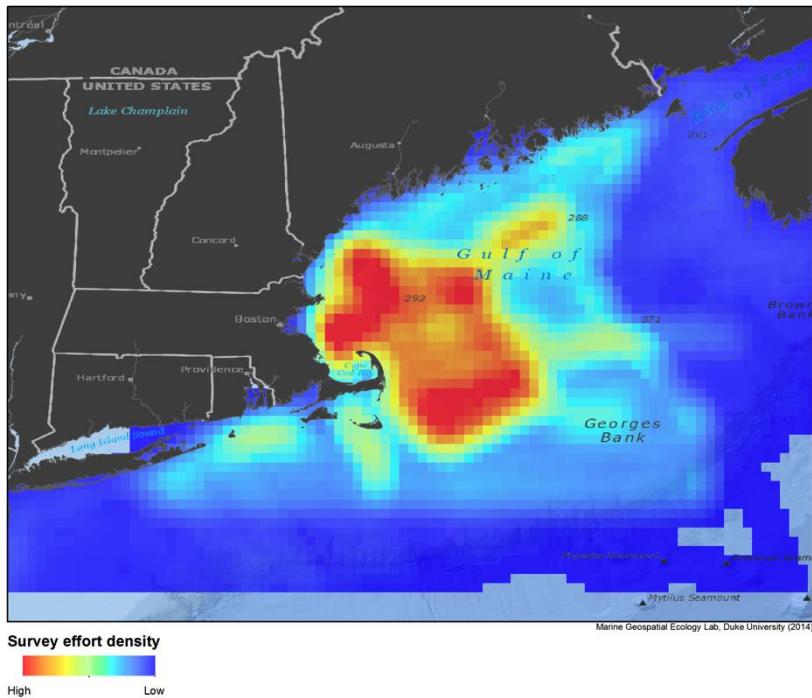
- Survey & observation density maps
 - SPUE maps
 - Hotspot maps
- By:
- Taxa
 - Season
 - Year(s)
 - Focal species (i.e. threatened and endangered)

- Cetacean observation

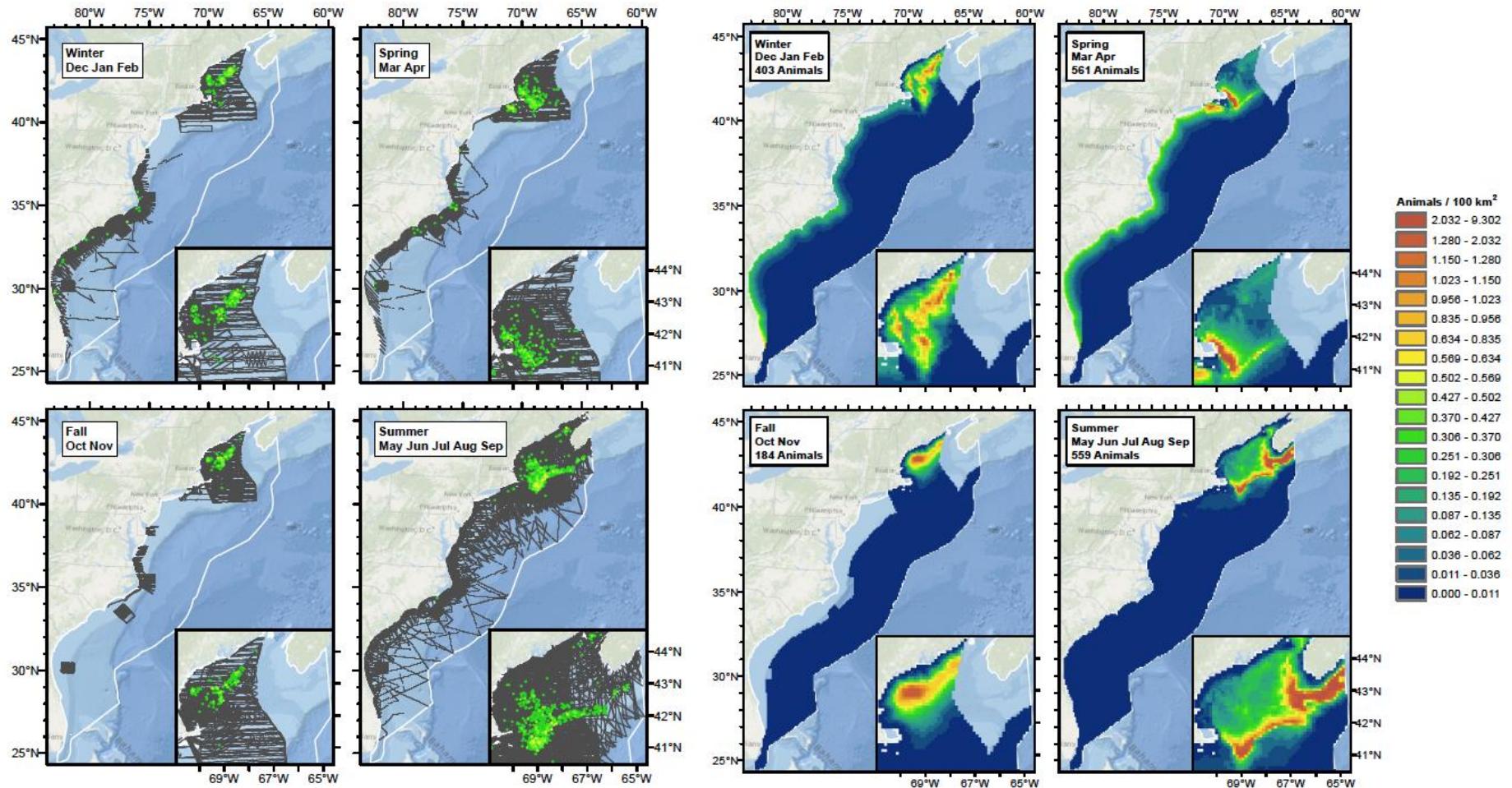
— On effort survey



Example: Survey & observation density

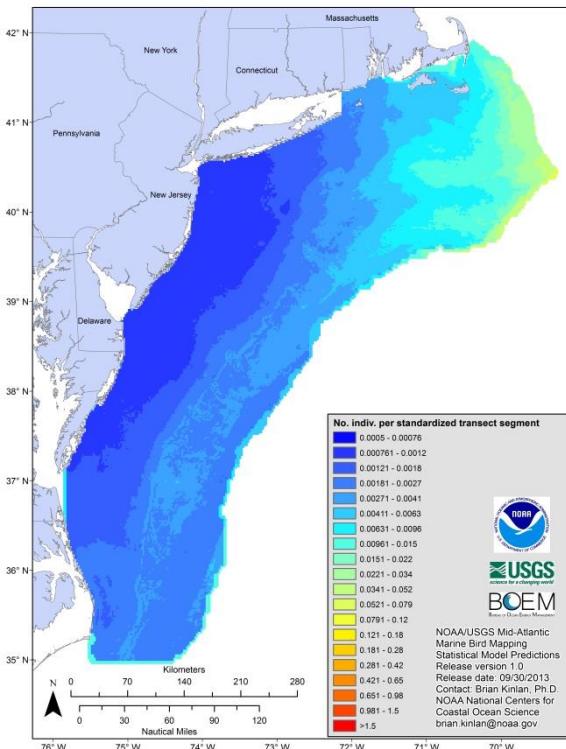


Example: Seasonal density models for North Atlantic Right Whale

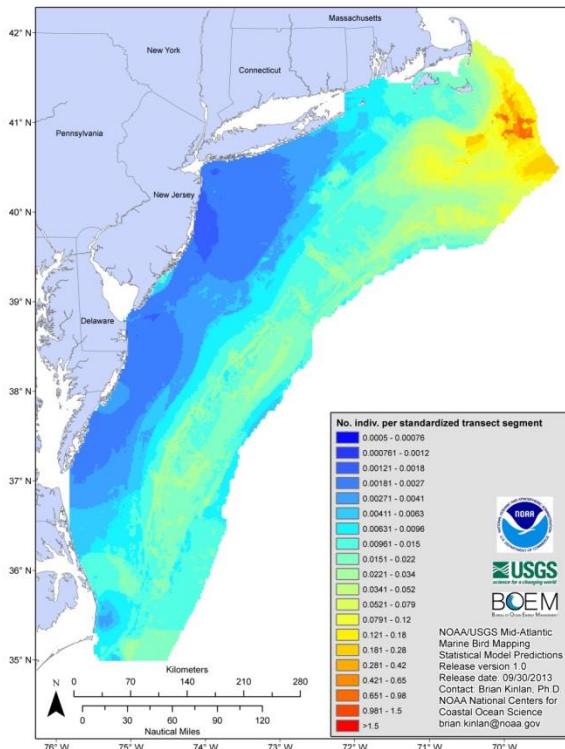


Uncertainty

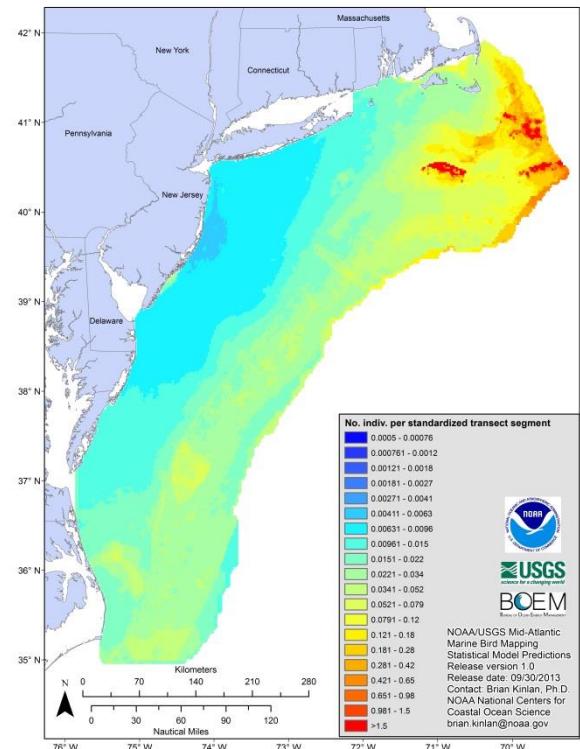
5th percentile

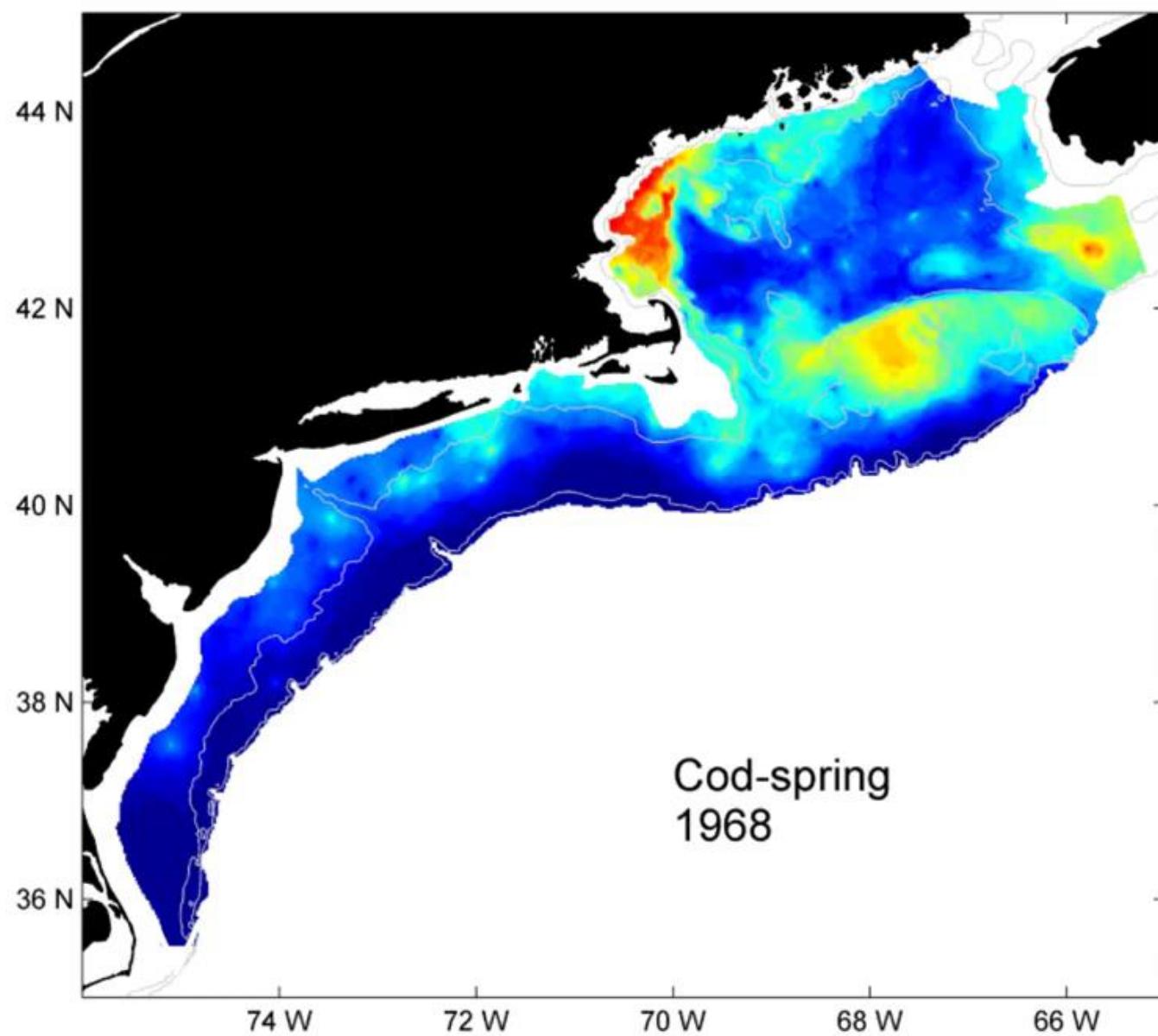


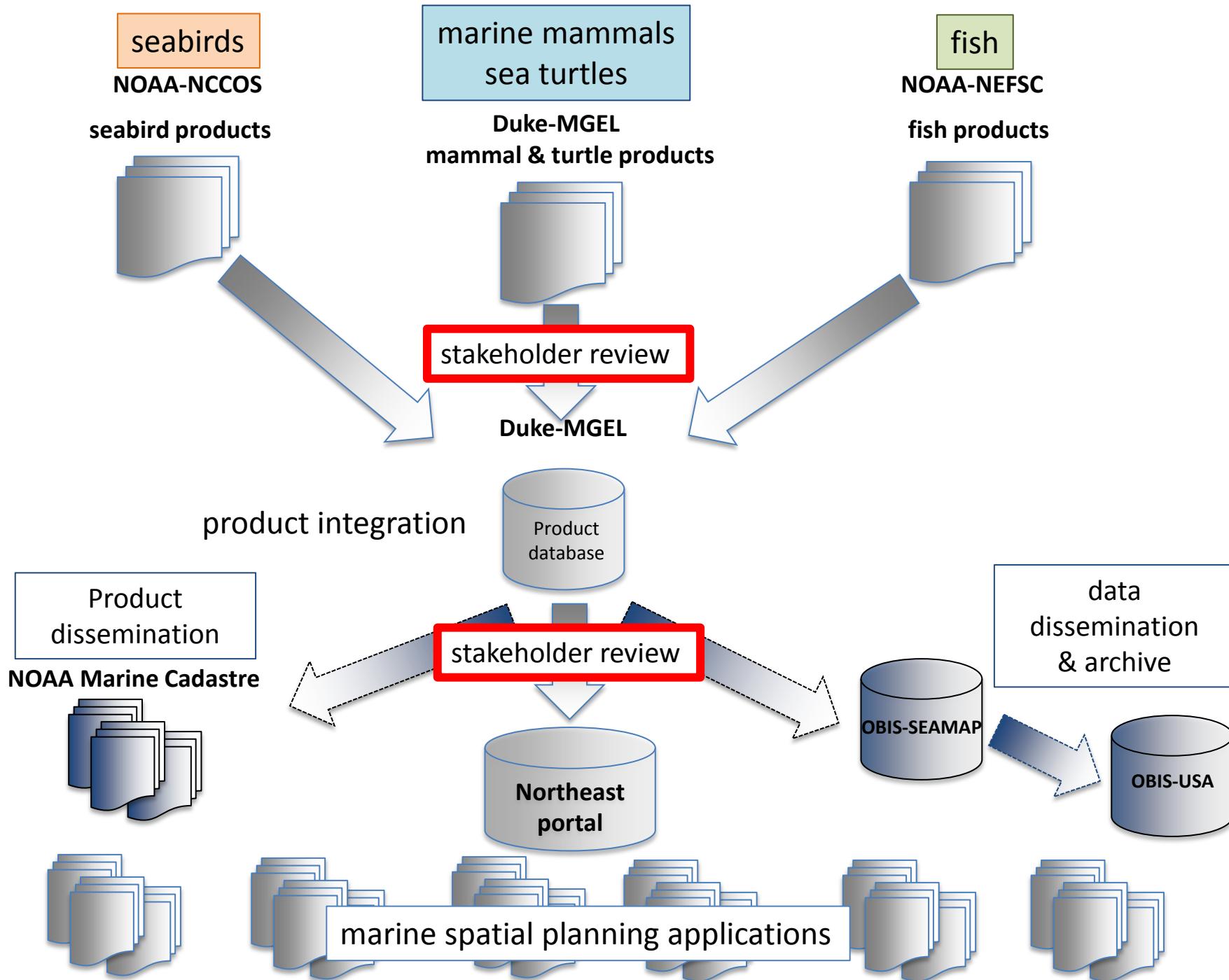
Mean abundance



95th percentile



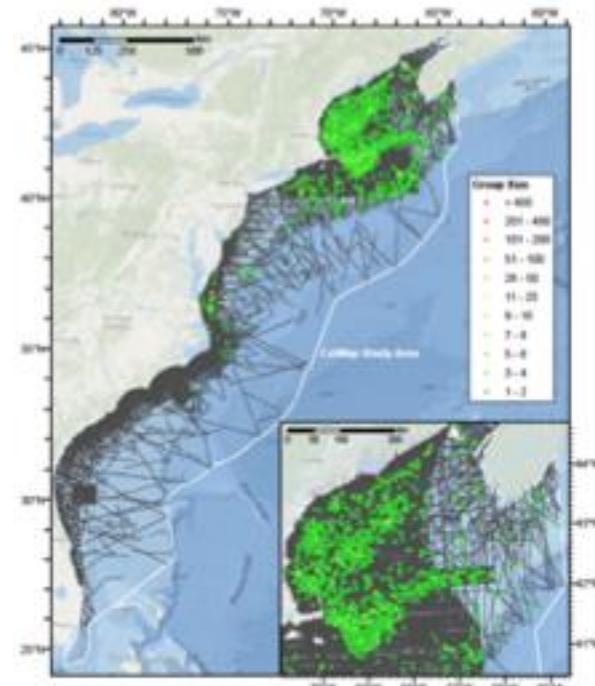




Stakeholder Input

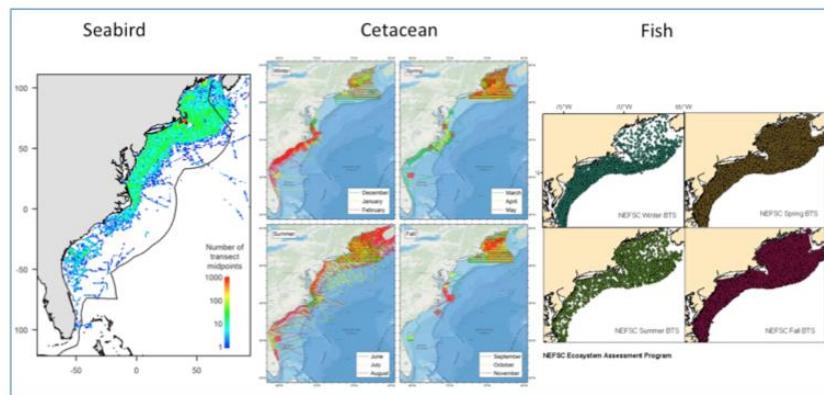
- Taxonomic breakout session (next)
 - Targeted discussion on focus, extent, resolutions
- Data provider engagement
 - Data Inventory:
 - Availability and gaps
 - State-level datasets
 - Contact us

northeast_marinelife_data@duke.edu



Stakeholder Input

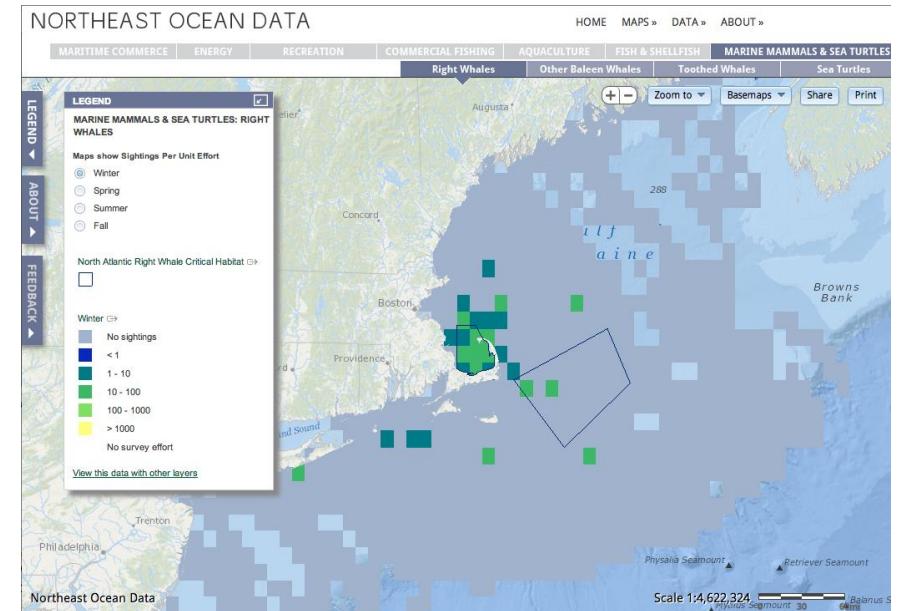
- Expert working groups (marine mammals, sea turtles, seabirds, fish)
 - Meet every 4-6 weeks, summer and fall
 - Periodic public webinars



Stakeholder Input

- Future synthesis products
 - Identify focal species
 - Mapping products and visualization options
 - Visualizing uncertainty
 - Portal integration

Integrated Data & Model Products	Map products
Data richness and density	Seasonal data richness
Areas of expected data gaps (space & time)	Seasonal data gaps
Areas of high species overlap (hot spots)	Seasonal / annual
Areas of management concern and human use	Per activity
Prey species	As available



Project timeline



Data Acquisition

Expert input/review

Data Products

Expert input/review

Analysis & Model Products

Expert input/review

Integration

Questions ! ?

- **Species** - Which species are of highest priority?
- **Resolution and Extent** - What spatial resolution of predictions and over what geographic extent would be most useful for marine spatial planning? What time scales are of interest?
- **Use** - What are the currently anticipated uses of these data for marine spatial planning?

Contact email:

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