Healthy Ocean & Coastal Ecosystem Goal

1. **Address Action 1-1: Data and methods for marine life distribution and abundance**
   - Inventory existing marine life data sources in the Northeast

2. **Address Action 1-2: Assess regional efforts to identify areas of ecological importance or measure the health of the marine ecosystem**
   - Inventory existing marine ecosystem assessment methods, concentrating on those implemented in the Northeast

1. Address Action 1-1: Data and methods for marine life distribution and abundance

Inventory of existing marine life data sources in the Northeast

a. Project name / responsible entity

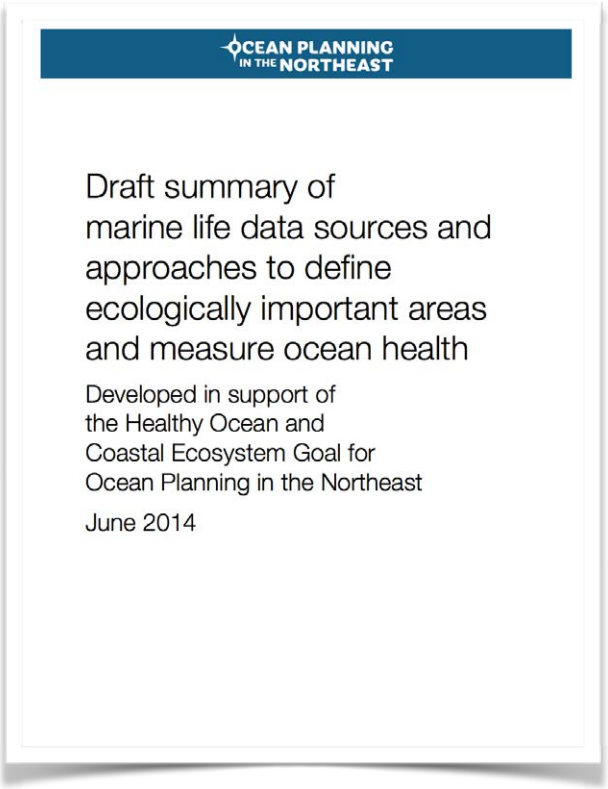
b. What marine life components?

c. How are data collected?

d. How often are/were data collected?

e. How are data treated/analyzed?

f. How has it been represented on maps?



1. Action 1-1: Data and methods for marine life distribution and abundance

CROSS-CUTTING ISSUES	OPTIONS
DATA	• Sources • Geographic scope • How to integrate survey methods? • How to integrate expert/traditional knowledge?
TEMPORAL	• How many decades to include? • Monthly, seasonal, annual summaries
TREATMENT	• Summarize by species, guild, functional groups • Incorporate migration routes? • Which environmental covariates?
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

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Marine mammals & Sea turtles

a. Quantitative survey data date back to 1970s

b. Expert/traditional knowledge is important

c. Two main types of data - structured “scientific” and “opportunistic” (also sometimes referred to locally as “on-effort” and “off-effort”)

d. Maps of seasonal distribution/abundance are commonly used

e. Migration routes are important

f. Baleen versus toothed; large whales versus dolphins; turtles

g. Common vs. rare species; Endangered Species Act status

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Marine birds

a. Quantitative survey data date back to 1970s

b. Expert/traditional knowledge is important

c. Sightings, telemetry, nesting sites

d. Forage fish concentrations as proxy?

e. Migration routes are important

f. Seabirds, diving ducks, shorebirds; common vs. rare species; Endangered Species Act status

g. Benthic habitat information?

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Fish

a. Offshore surveys (fall 1962-present; spring 1968-present; winter 1991-2009; summer 1963-1981); Nearshore surveys (by state program and NEAMAP 2007-present

b. Expert/traditional knowledge is important

c. Fishery-dependent and -independent data, acoustic data, Omnibus Essential Fish Habitat Amendment 2

d. Commercially important species, culturally important species, functional groups

e. Benthic habitat information?

Options for Spatial Data Products

What is the purpose of the spatial data product (map)?

- Species observations
- Species observations and their habitat

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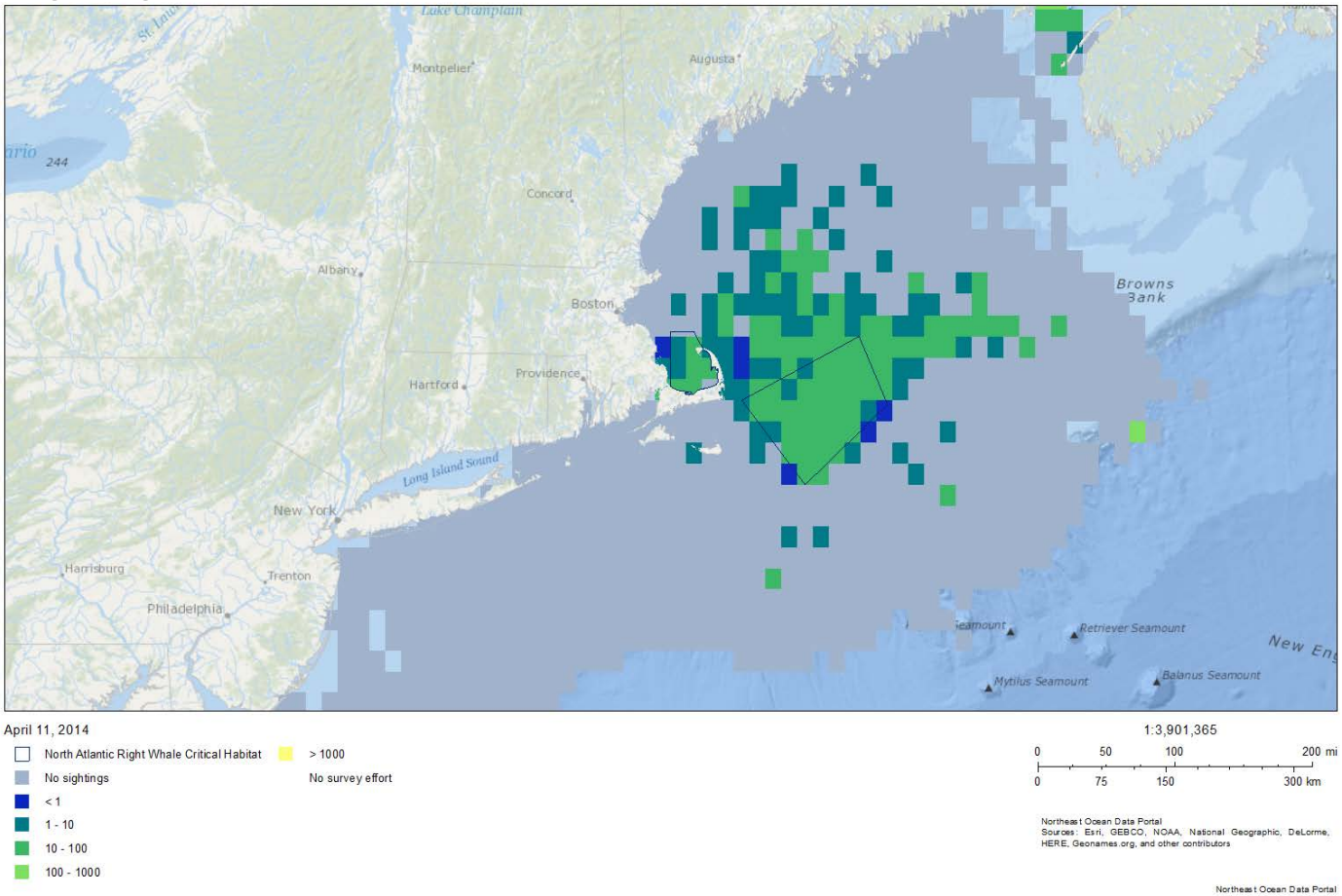
Tier I: Static representation of species observations at a certain time

The Nature Conservancy's Right Whale Sightings-Per-Unit-Effort map



Describes a spatial pattern

Nothing on map where we have zero observations

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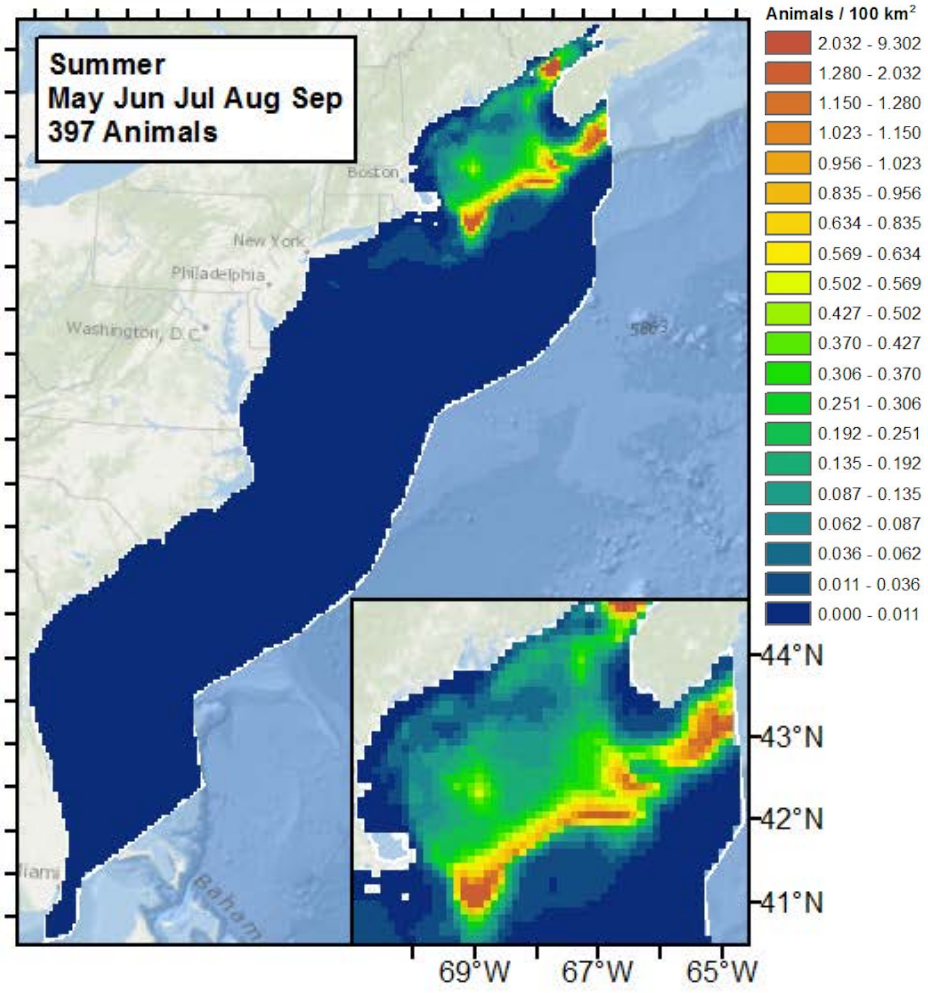
Tier II: Static representation of species observations plus habitat information at a certain time

Duke University North Atlantic right whale density model



Uses relationships between whale abundance and habitat information at observed locations to estimate whale density where we have zero observations

Estimates whale density everywhere we have habitat data (environmental covariates)

Habitat data in this model:

Depth
Slope
Distance to shore
Distance to isobath
Sea surface temperature (SST)
Distance to closest SST front
Kinetic energy
Distance to closest eddy
Sea surface wind speed
Chlorophyll concentration
Net primary productivity

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How are data represented on maps?

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