



NOAA
FISHERIES

Northeast Fisheries Science Center Protected Species Science Program Review

North Atlantic Right Whale Studies in the Southeast US

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April 14, 2015

Southeast and Mid-Atlantic Right Whale Habitats

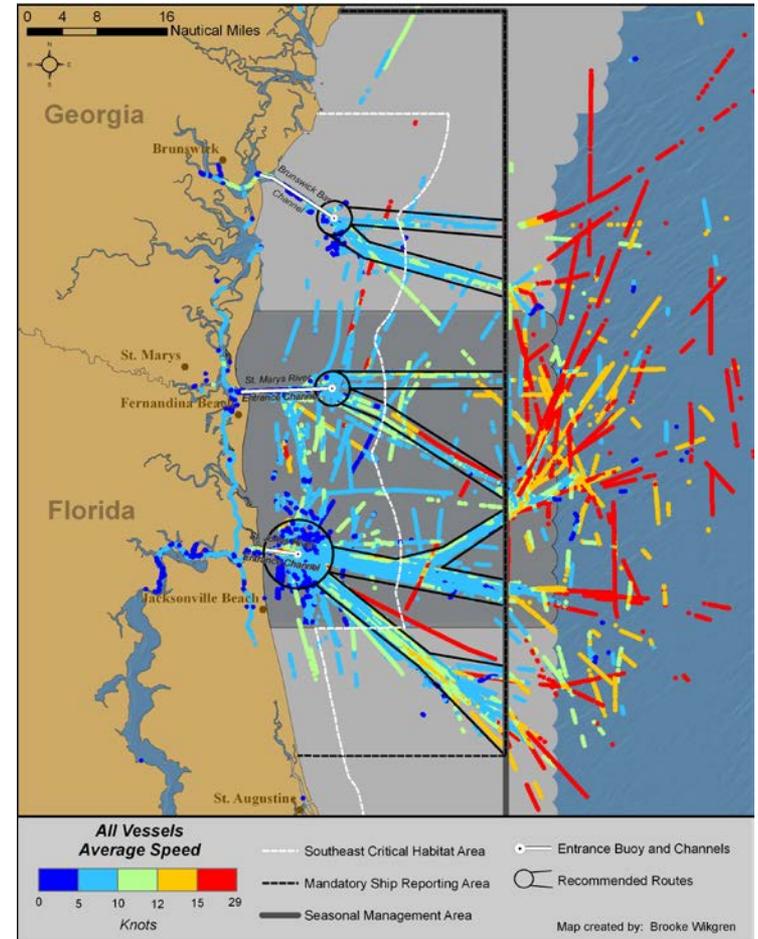
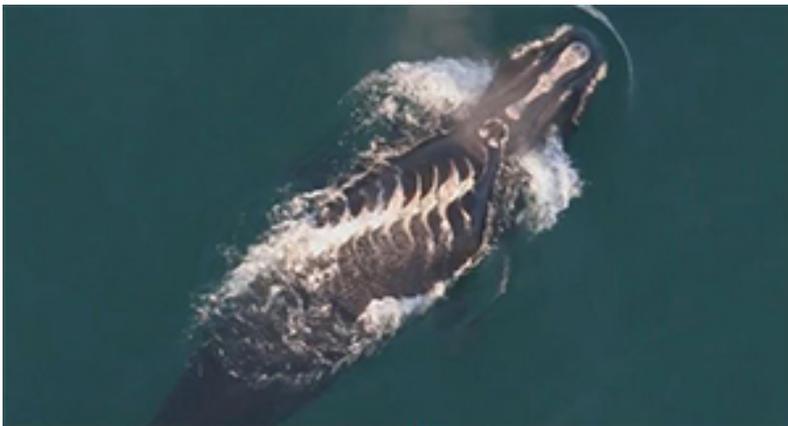


North Atlantic Right Whale Consortium
<http://www.narwc.org>

- Seasonal presence in waters south of Virginia between November and April
- Variable numbers of individual animals, but in some years up to 200 individuals from all demographic classes
- Primary calving area is off the coast of Florida and Georgia, but animals occurring throughout the season as far north as North Carolina

Risks and Mandates – Vessel Strikes

- SE Calving area includes major commercial shipping ports.
- Naval activity associated with Mayport and developing USWTR area
- Army Corps of Engineers Channel dredging/maintenance operations
- Small vessel traffic
- Risks encountered during migrations around Cape Hatteras



Southeast U.S. AIS Data, New England Aquarium
<http://www.marinegis.org/vesselMonitoring.html>

Risks and Mandates – Fisheries Interactions



EcoHealth Alliance, Permit 932-1905

- Entangled animals routinely spotted in SEUS waters, entanglements may not be from local fisheries
- Gillnet entanglement and death of a calf prompted SE U.S. gillnet exclusion area.
- Emerging fisheries issues with possible expansion of Black Sea Bass pot fishery

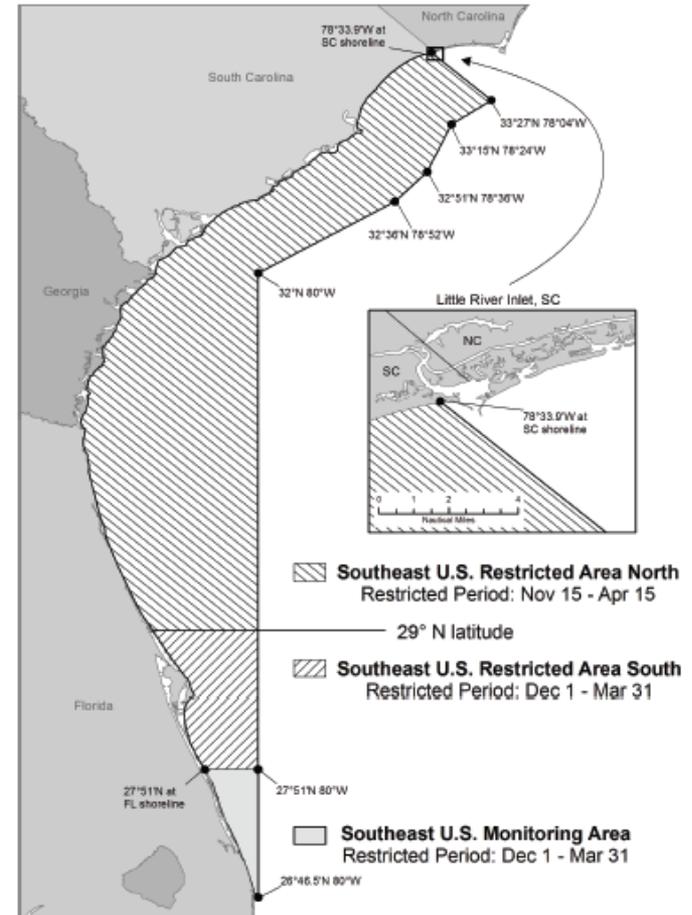


Figure 1. Southeast U.S. Restricted Area and Southeast U.S. Monitoring Area.

Southeast U.S. Gillnet Exclusion Area,
sero.nmfs.noaa.gov

SEUS Right Whale Science and Conservation: Multi-agency, Multi-partner program

- Collaboration, support and funding from NOAA, USCG, ACOE, and Navy through ESA Section 7 agreements
- State agency partners execute data collection, coordinate disentanglement efforts and stranding response, and support analyses
- Many non-government partners conducting science program



Coordination and Setting Priorities: Southeast Implementation Team

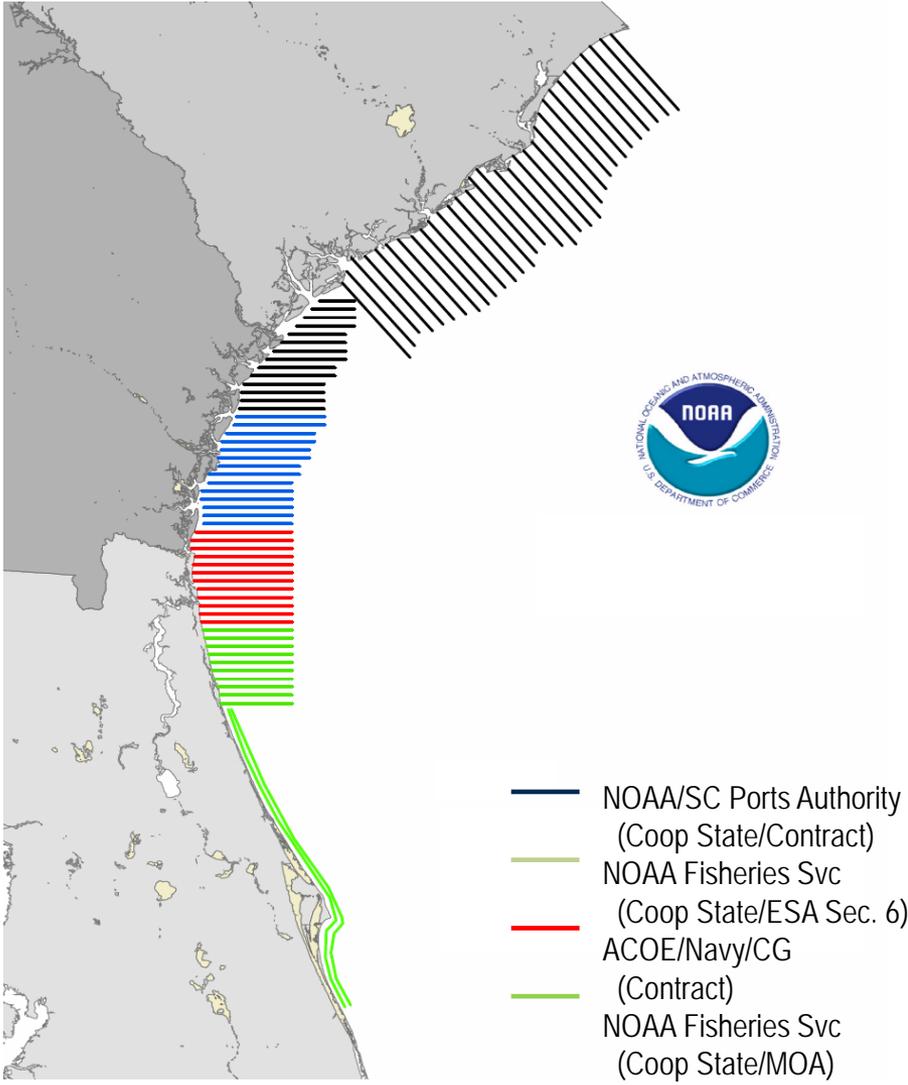
Terms of Reference

1. Coordinate and effect recovery plan implementation in Southeast U.S. while making efficient use of available resources via recommendations to NOAA Fisheries Service SERO.
2. Involve stakeholders in implementation of the recovery plan.
3. Promote creative solutions.
4. Monitor effectiveness of recovery plan implementation and adapt accordingly.
5. Identify and prioritize information needs that can be best addressed through enhanced partnerships.



Recent Efforts: Reviewing and recommending revisions to aerial survey design and objectives, developing strategy for assessing right whale use of mid-Atlantic habitats.

Data Collection: Aerial Surveys 1992-2013



NOAA Fisheries funds the majority of the SE survey effort; however, other entities provide funds as well.

GA/SC (black): Funded by NOAA and South Carolina Ports Authority (part of project submitted for ESA Section 7 consultation). GA/SC Surveys phased out after 2013/2014 calving season

NEWS (blue): NOAA Cooperative State funds provided to GDNR through ESA Section 6 grant process.

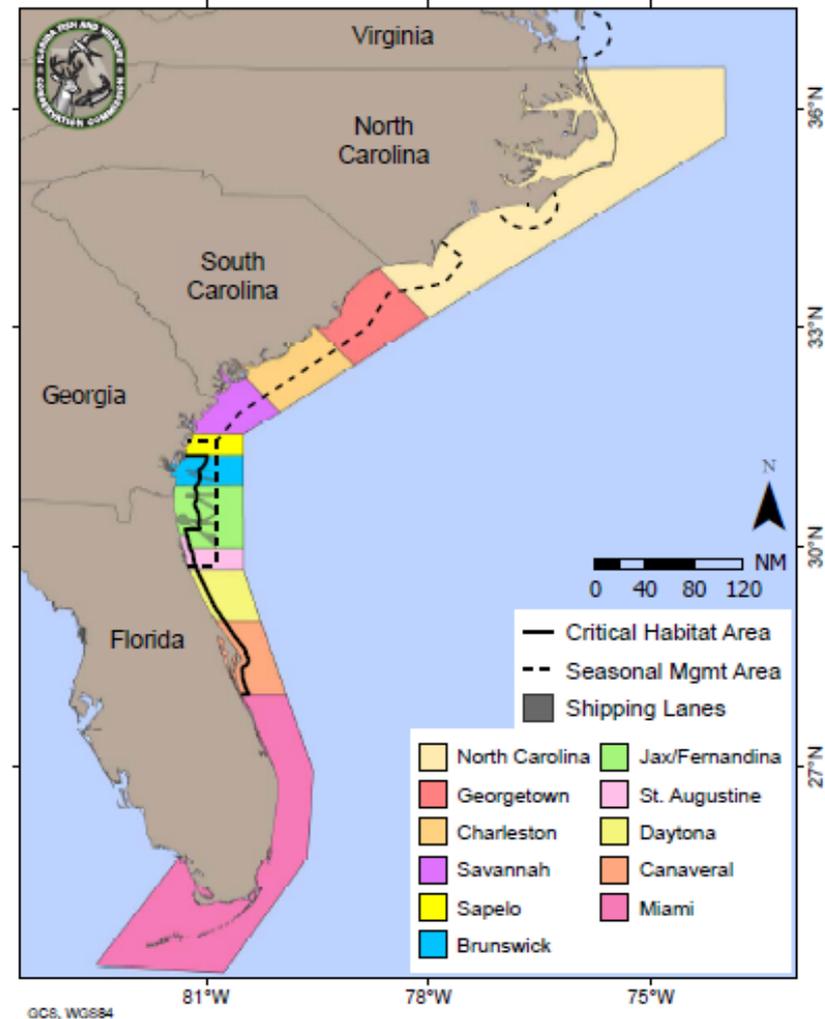
CEWS (red): ACOE/Navy/CG (requesting agencies) provides funds to NOAA (servicing agency) via Economy Act MOA.

SEWS (green): NOAA Cooperative State funds provided to FWCC through ESA Section 6 MOA.

Data Collection: Aerial Surveys

Ship strike mitigation was the primary motivation behind the development of the aerial surveys

1. E-mail system provides near real-time notification of sightings called in from the airplanes
2. Mandated reductions in speed by dredge operators when right whales are observed in their area.
3. Dynamic management area notifications based upon sightings notifications

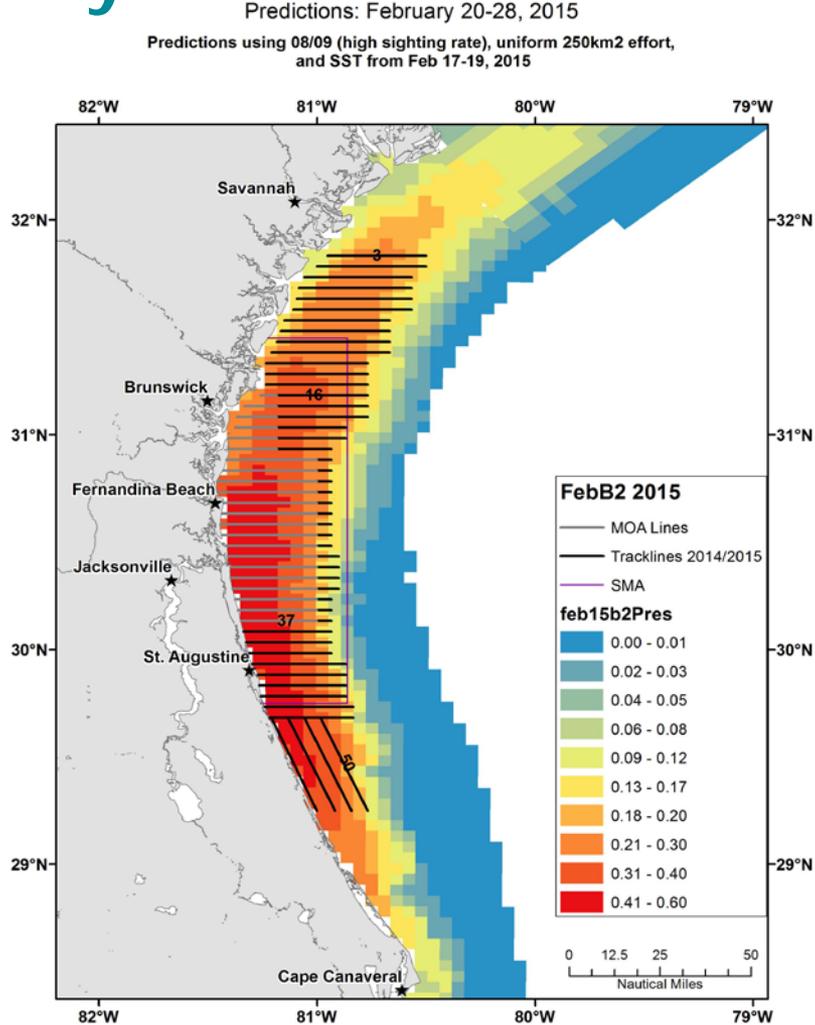


EWS Reporting areas for group email distribution

Data Collection: Aerial Surveys

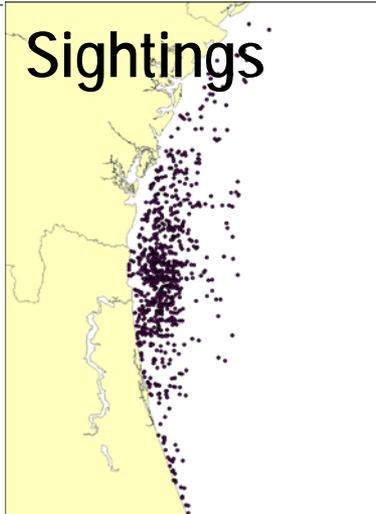
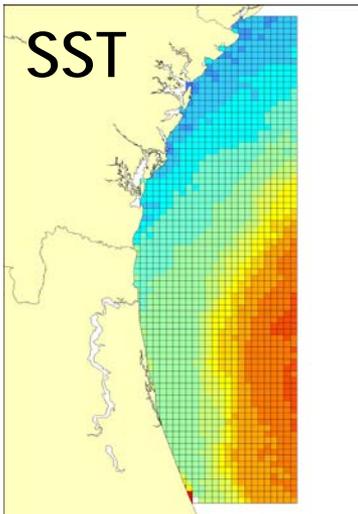
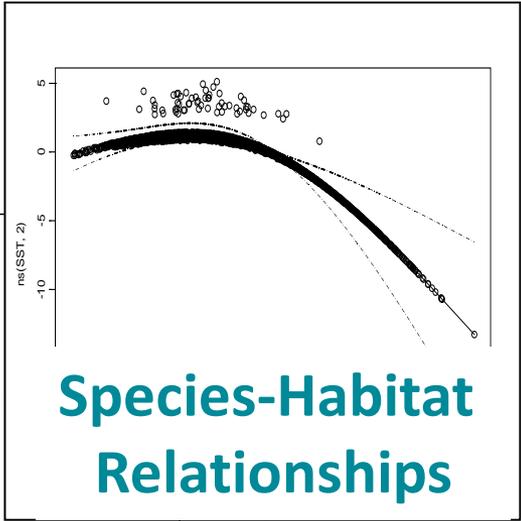
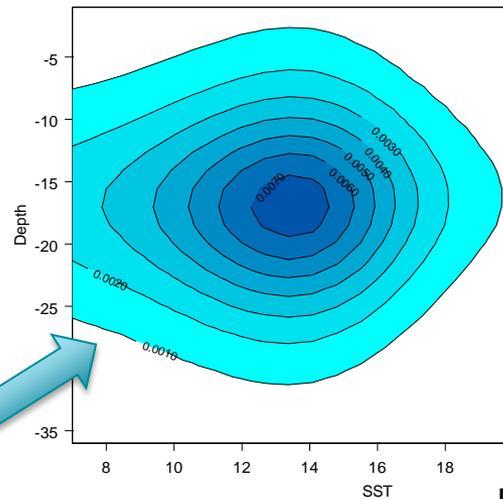
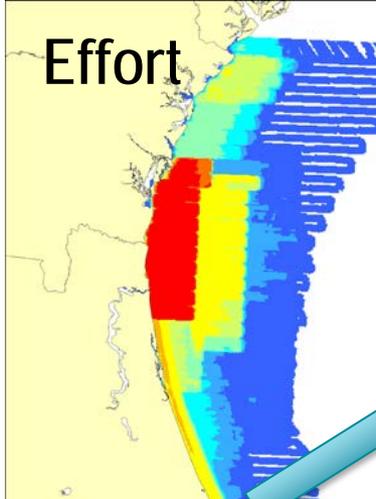
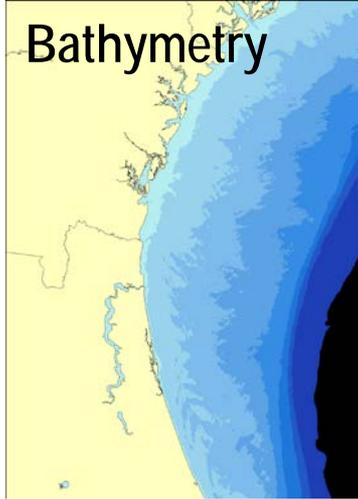
SEIT Recently Reviewed the Objectives and Design of the Aerial Survey Program

- Reduced focus on ship strike mitigation given the vessel speed restrictions and other management efforts in place.
- Increased focus on demographic data collection including documenting presence of animals in SEUS, documenting calving rates
- Reflects anticipated reduced effort levels and implement a more adaptive design.

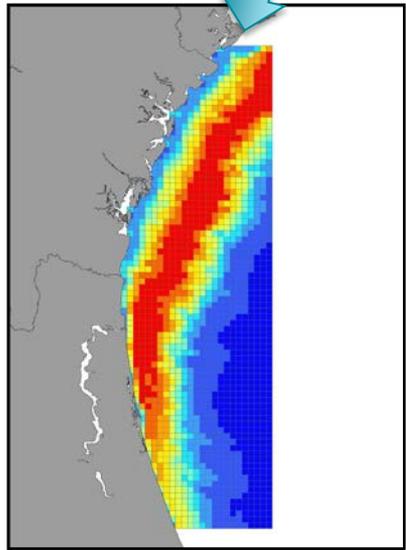


SEUS RW Aerial survey tracks overlaid with model predictions of right whale occurrence. FWRI

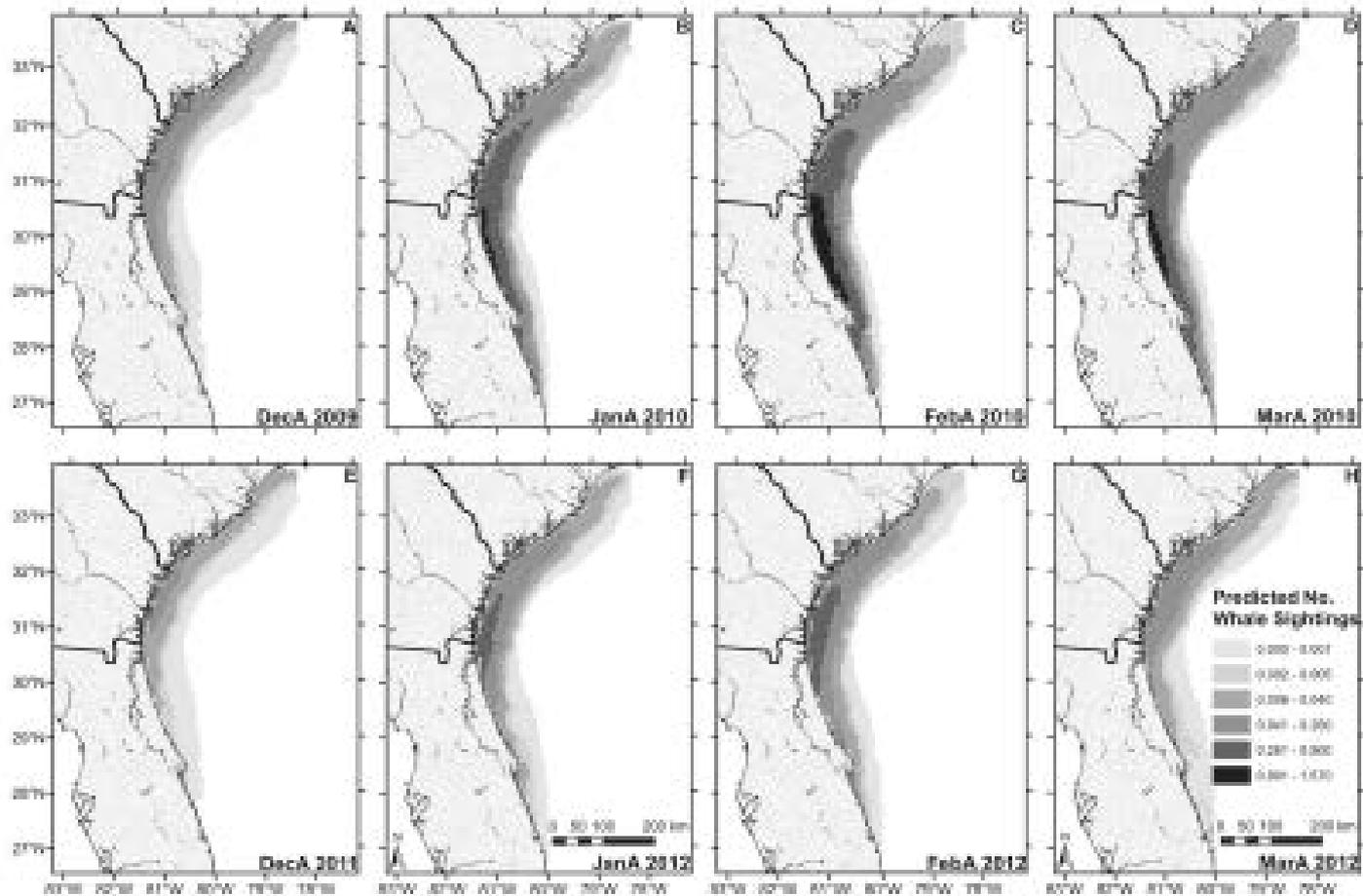
Analysis: Habitat Modeling



Predictive Maps of Animal Density



Analysis: Habitat Modeling

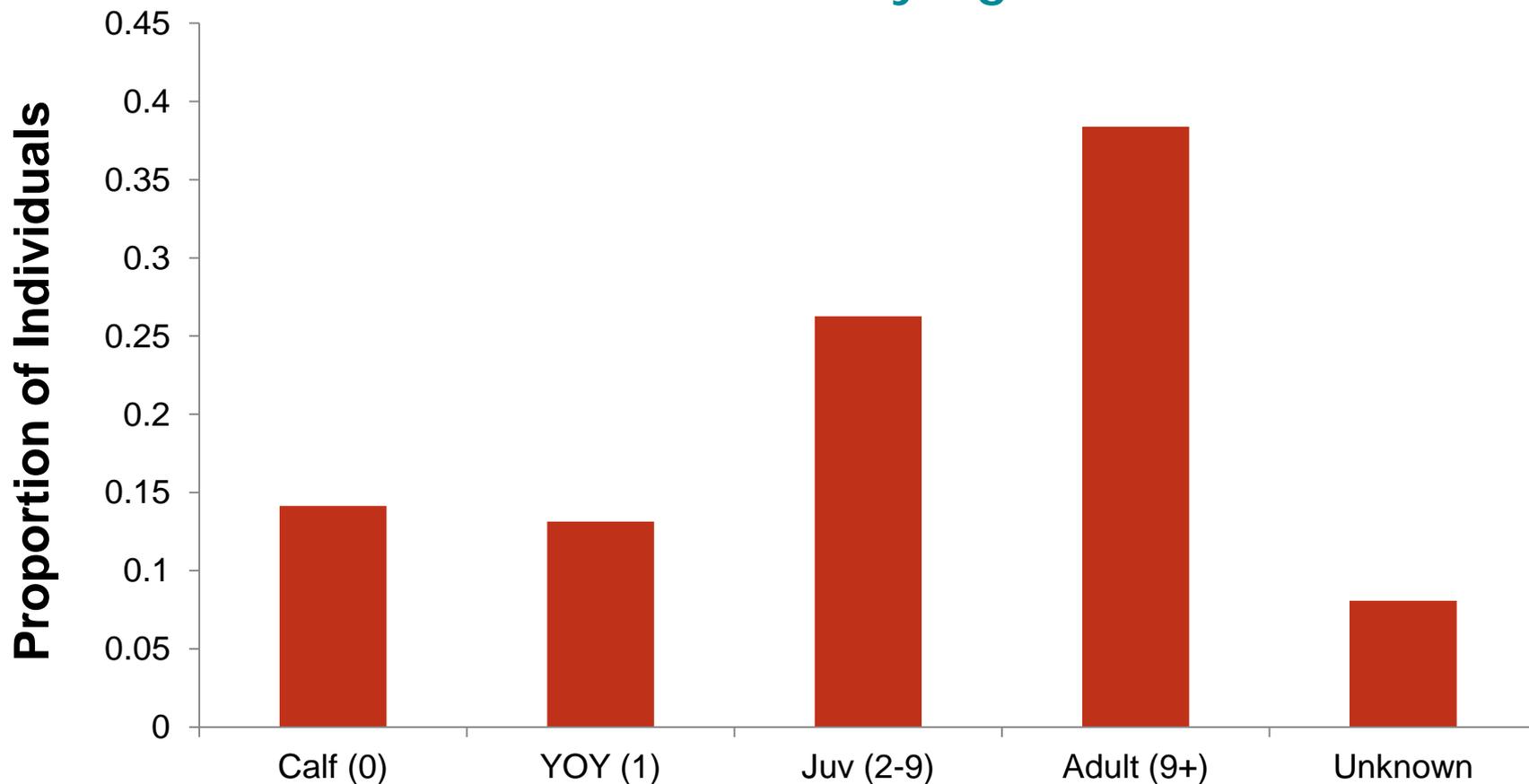


Recently Updated using data from 2003/2004 through 2012/2013 including SC/GA data.

Gowan and Ortega-Ortiz, 2014

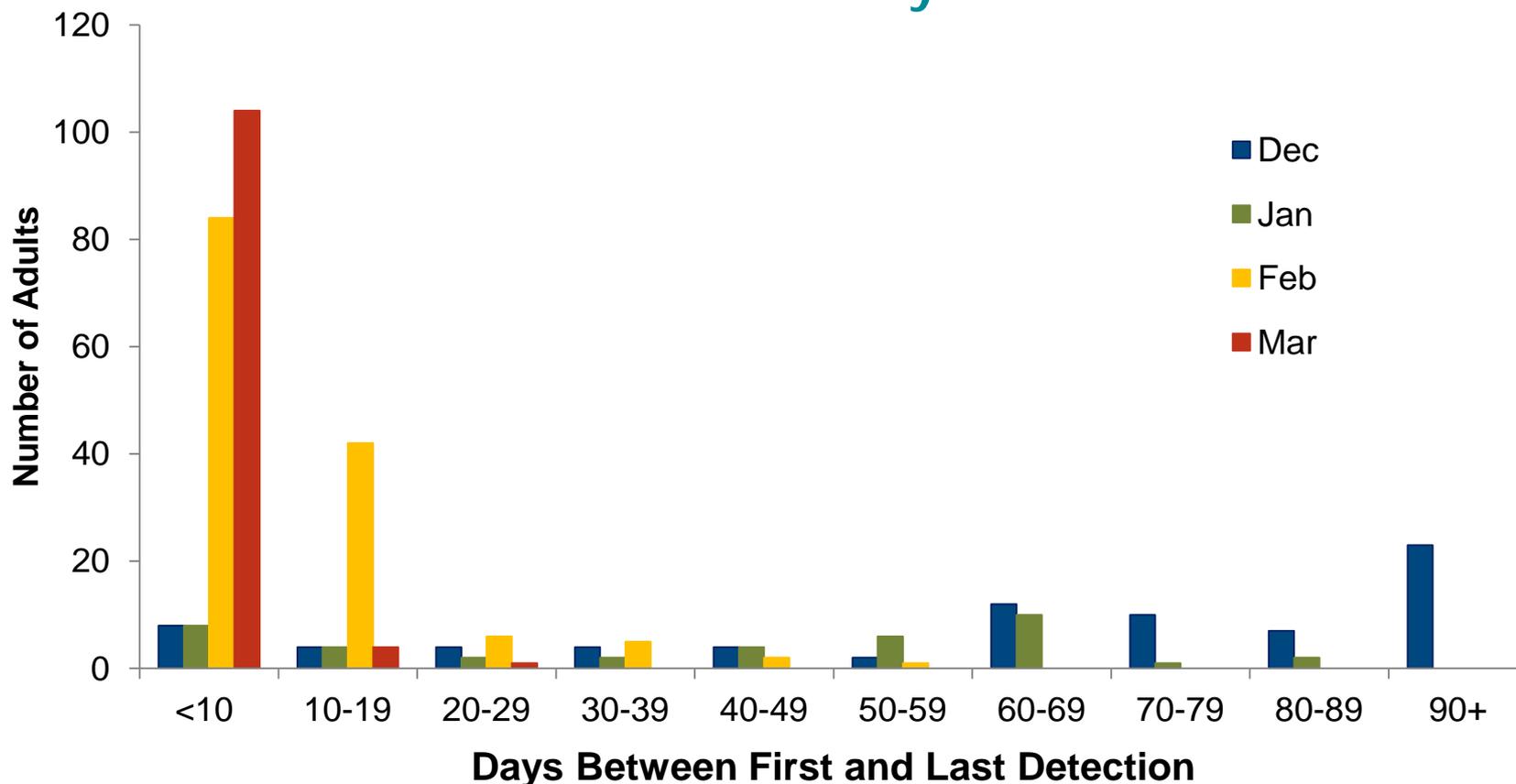
Analysis: Demographics and Residence Times

SEUS Individuals by Age Class



Analysis: Demographics and Residence Times

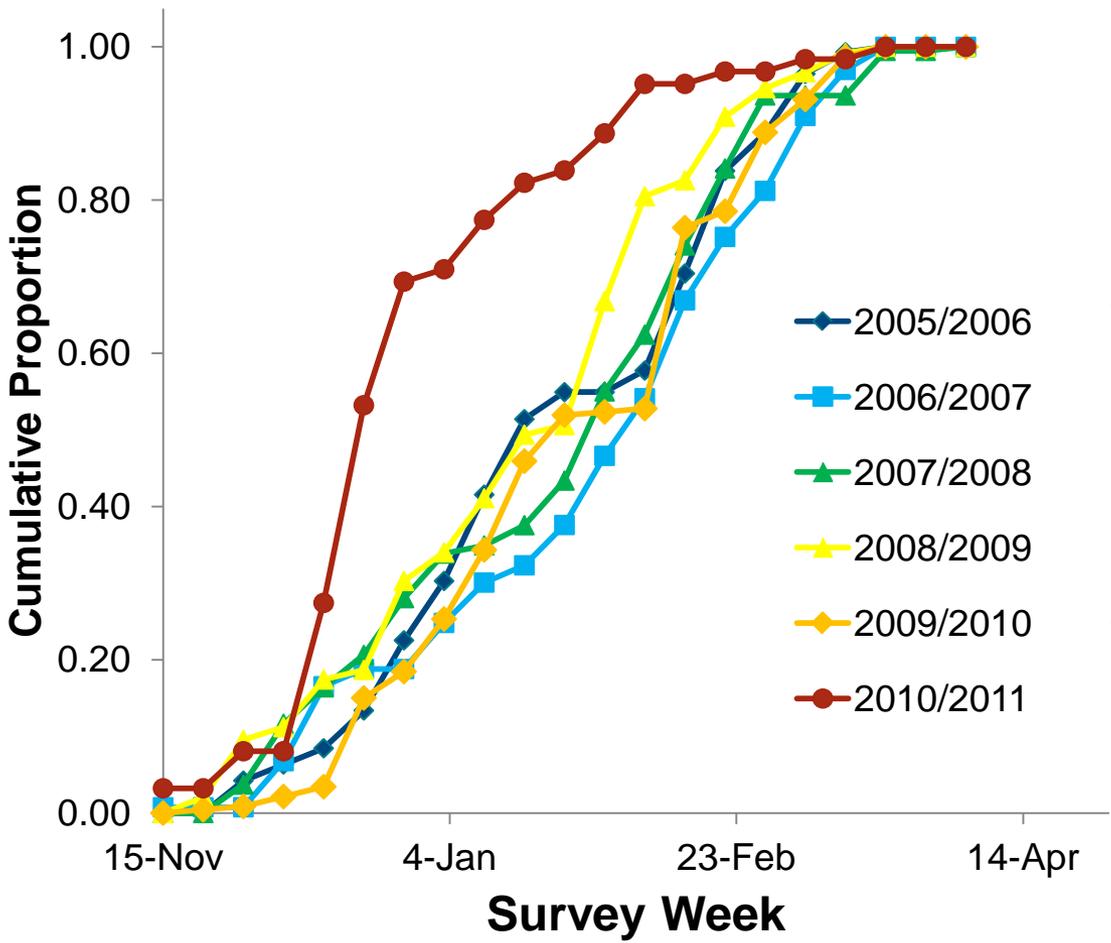
Duration in SEUS: Adults by Month of Detection



66% (52/78) of adults first detected during December have durations in the SEUS of 60 days or more. 60% of adults detected in February have durations of <10 days, many of these with single sightings.

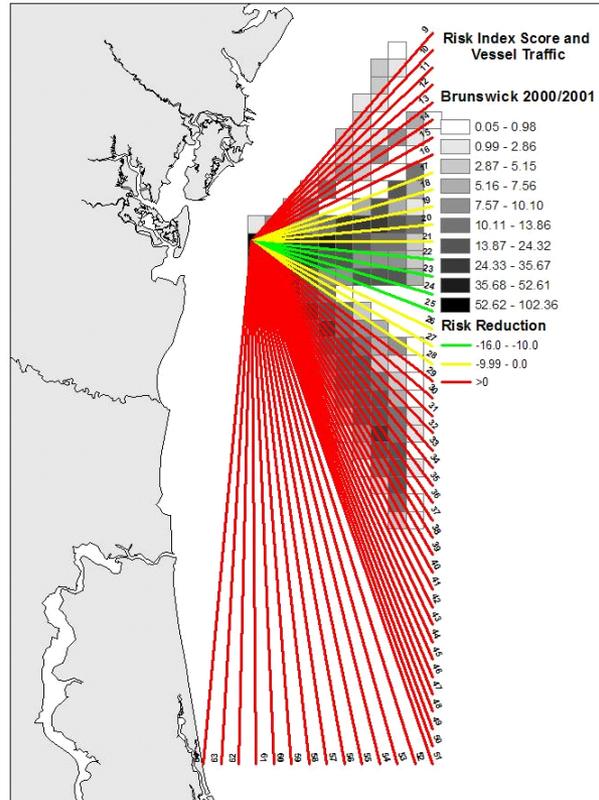
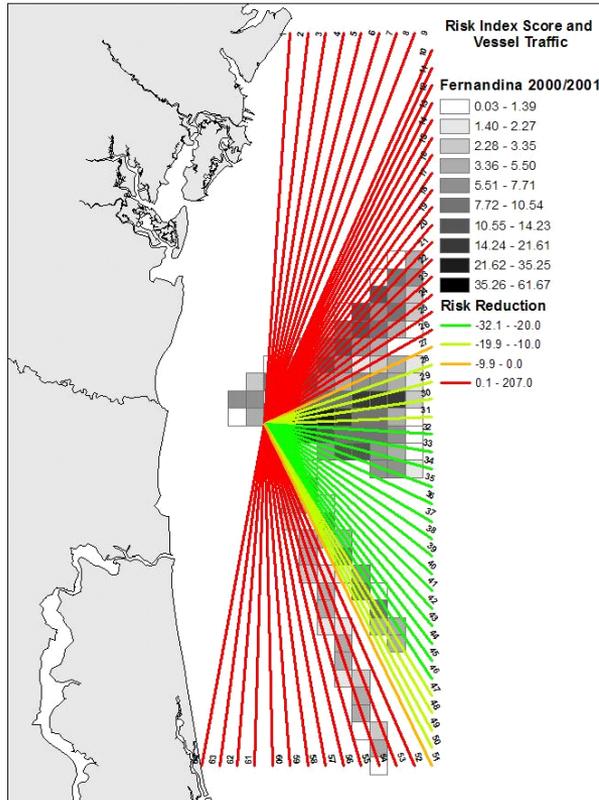
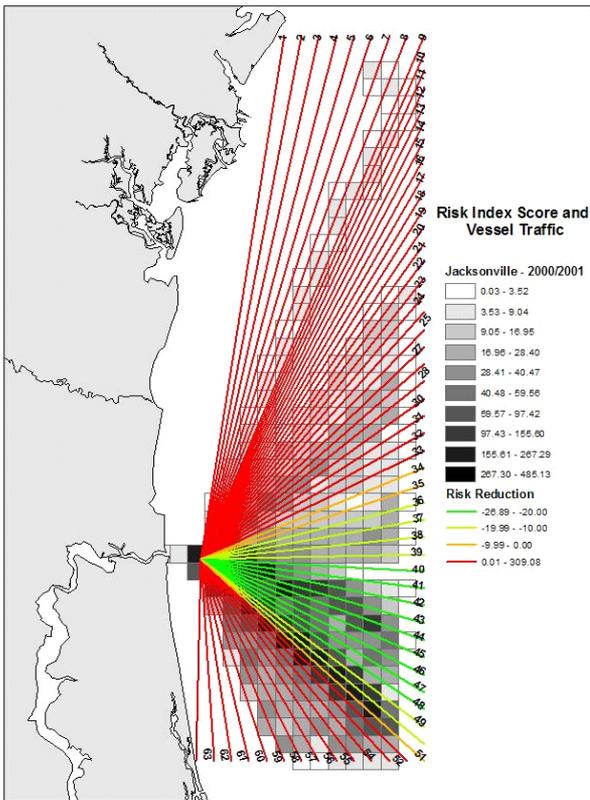
Analysis: Demographics and Residence Times

Seasonal Discovery Curves



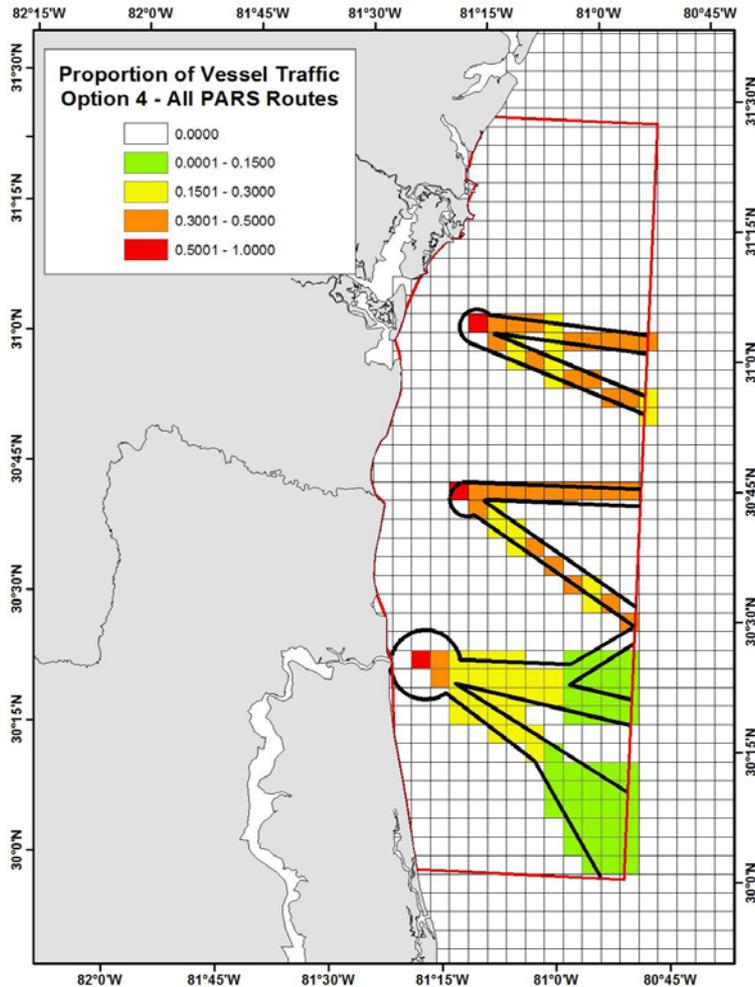
- New individuals are being observed late into the survey season with most curves not reaching asymptotes until mid to late March
- There appears to be a mid-season “surge” in new individuals in late-Jan to mid-Feb in most years
- 2010/2011 was clearly an odd year with most new animals seen early in the season and an early asymptote.

Application: Ship Strike Risk Mitigation



Possible vessel tracks into each port overlaid with density maps to identify routes with lowest risk to right whales.

Application: Ship Strike Risk Mitigation



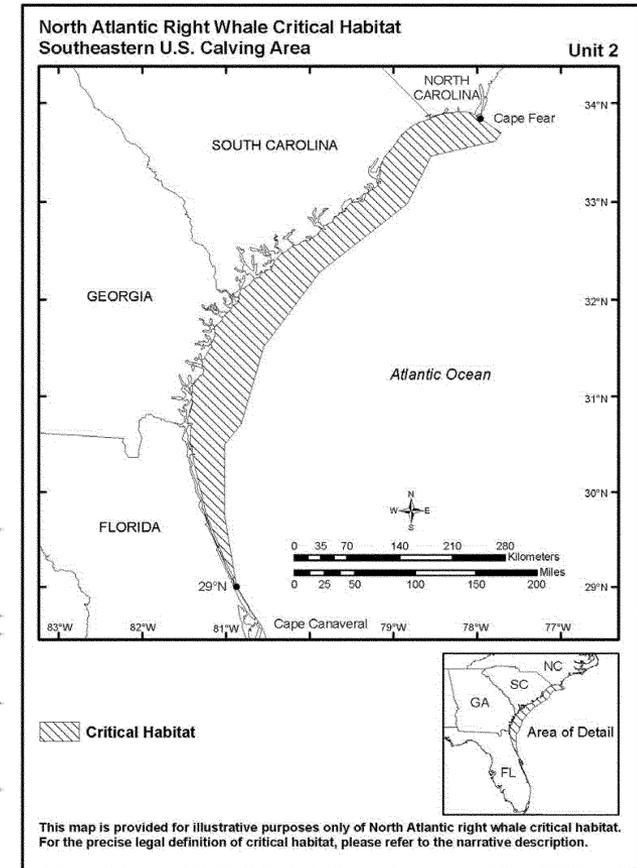
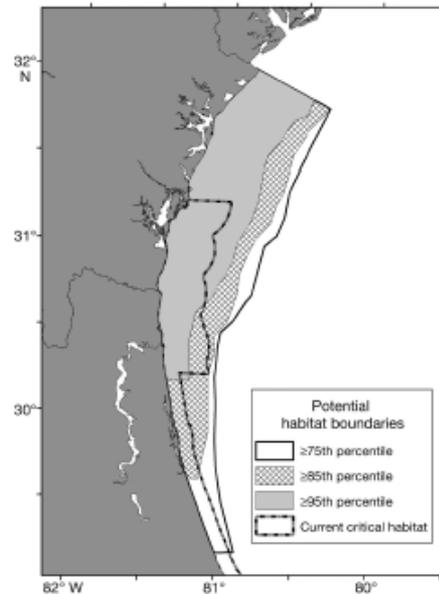
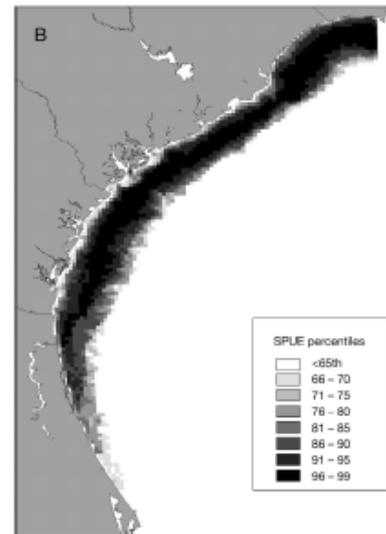
- Paths with lowest risk translated into recommended routes into port buoys
- Routes mapped on navigational charts
- Commercial vessel traffic has, over time collapsed into these recommended traffic lanes.

Fonnesbeck et al. 2008

Application: Critical Habitat Evaluation

- Habitat models were applied to evaluate essential features that define right whale calving habitat (water temperature and depth)
- Models were used to derive areas where these elements were most likely to occur
- Proposed rule designating and expanded critical habitat in the SE.

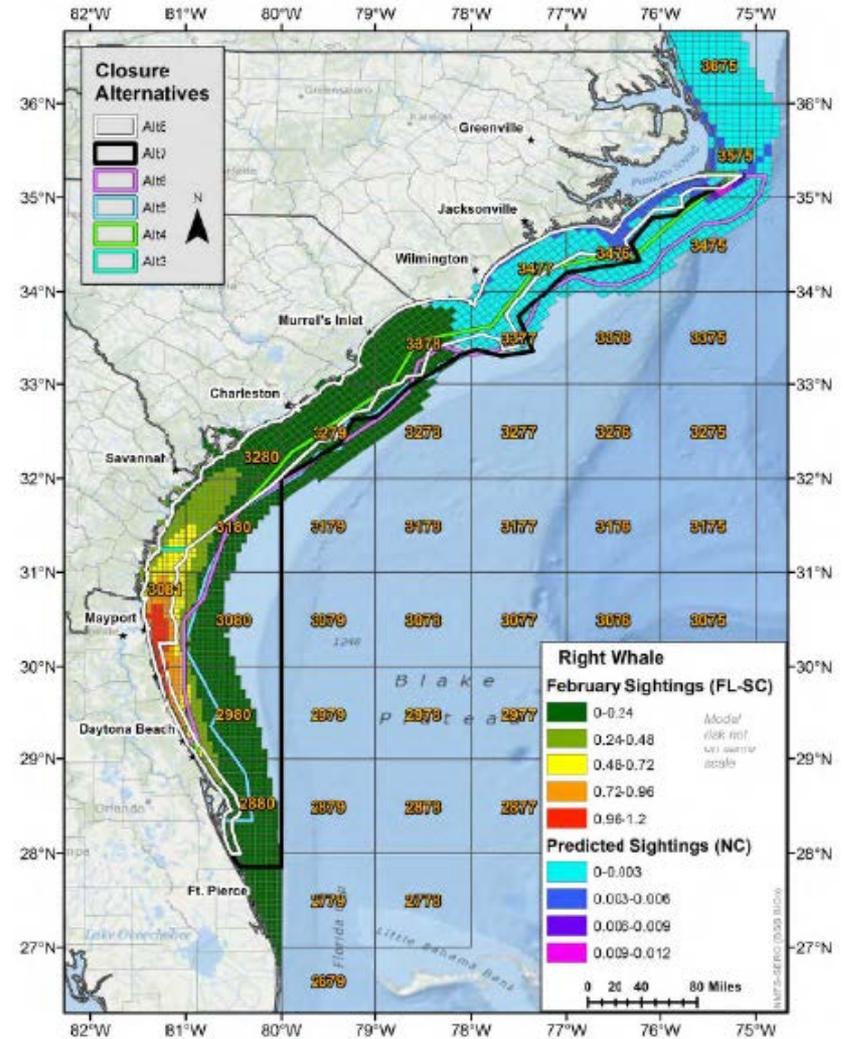
Keller et al. 2012



Fed Register 80 no. 34: 9314-9345

Application: Fisheries Interactions

- South Atlantic Fishery Management Council Regulatory Amendment 16 is considering the expansion of the Black Sea Bass pot fishery to include additional fishing during winter months in the southeast Atlantic
- Increased vertical lines creates a potential for interactions with right whales.
- Habitat models were applied to evaluate the relative risk to right whales associated with different alternatives for the fishery.



Alternative management areas overlaid with right whale habitat models (Gowan and Ortega-Ortiz 2014)

SERO, South Atlantic Fisheries Management Council

Additional Research Programs

- Duke University and Syracuse University right whale behavioral studies – including application of “DTAGS”
- Florida Atlantic University -Right whale vocalization behavior and passive acoustics
- Georgia DNR and FWRI biopsy sample collection efforts from calves
- Marine Resources Council Right Whale Conservation Program - shore based and aerial sighting studies



Shifting Focus to the Mid-Atlantic

- Relatively little data available on the distribution and habitat use by right whales in waters between the calving grounds and the northeast feeding grounds
- More difficult to undertake survey efforts since intermittently present at relatively low density
- SEIT is working to develop a mid-Atlantic strategy that will identify key issues, questions, and approaches.
- Recently SEFSC/SERO conducted a data assimilation project to compile sightings data for right whales in mid-Atlantic waters.
- Expanding passive acoustic effort into the mid-Atlantic
- Exploring less invasive telemetry tags as a tool to assess right whale movements during migration periods.



Three limpet tags were deployed on right whales in the SEUS during the winter of 2015, with two having significant attachment durations. The animals moved north along the U.S. east coast in nearshore waters. Tag durations of 15+ days.

Joint project of NMFS, Alaska Sea Life Center, University of Alaska Fairbanks, FWCC, and GA DNR.

Alignment with Research Priorities for Management

- Investigate changing seasonal behavior and distribution
- Given changing distribution, adapt population monitoring methods
- Estimate cause-specific mortality (i.e., ship strike, entanglement)
- Evaluate efficacy of ALWTRP measures
- Provide real-time monitoring of species in areas of concern to inform dynamic management decisions
- Strategic evaluation of methods – right balance of visual (vessel/ aerial) surveys, passive acoustic moorings, gliders, etc.

**All aspects of the SE Right Whale program contribute to these priorities:
Aerial Surveys, Passive Acoustics, On-water sampling, and Analysis**

Strengths

- Collaborative, multi-agency and multi-partner program
- Coordination and communication through partnership with SEIT which includes involvement of shippers and Federal agencies
- Track record of integration of data collection and analysis into actions for improving conservation and management.

Challenges

- Maintain high quality data collection in the SEUS while expanding efforts in south Atlantic and mid-Atlantic waters with limited resources
- Better define the role of passive acoustics in management and recovery actions

Recommendations

- Maintain aerial survey efforts and integrate adaptive approach to surveys
- Employ multiple tools to evaluate habitat use and risks in mid-Atlantic waters.
- Integrate demographic data from SEUS surveys into assessment models.