

# Atlantic Waterbird Use of Offshore Shoals and Survey Needs to Evaluate Wind Energy Development

Doug Forsell

USFWS, Chesapeake Bay Field Office



# Waterbirds Using Western Atlantic U.S. Waters

Species Group	North America	Western Atlantic	Approximate Numbers in North and Mid- Atlantic U.S. Waters
Loons	5	2	150,000
Grebes	4	2	2,000
Albatross	8	4	Few
Petrels	16	5	Thousands
Shearwaters	15	5	Millions
Storm-Petrels	13	3	Millions
Boobies	6	1	300,000
Pelicans	2	1	6,000
Cormorants	7	2	Hundreds of Thousands
Seaducks	15	10	1.3 Million
Geese	2	1	100,000
Raptors	3	3	Thousands
Phalaropes	3	3	Hundreds of Thousands
Jaegers	5	4	Thousands
Gulls	22	11	Million
Terns	17	8	Hundred Thousand
Skimmers	1	1	Thousands
Alcids	20	6	Tens of Thousands
<b>Total</b>	<b>164</b>	<b>72</b>	<b>7- 8 - 10 million</b>

Birds Most Abundant Over Shoals are in Red

# Marine Birds Face Many Hazards

Longlines



Graham Robertson



NOAA

Over Fishing of Forage Fish



Collisions

Greg Green

Gillnets



Tony DeGange

# Climate Change



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# Contaminants



# Oil Spills

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# Over abundance of birds that benefit from humans and prey on other waterbirds



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A. DeGange



# Introduced Predators

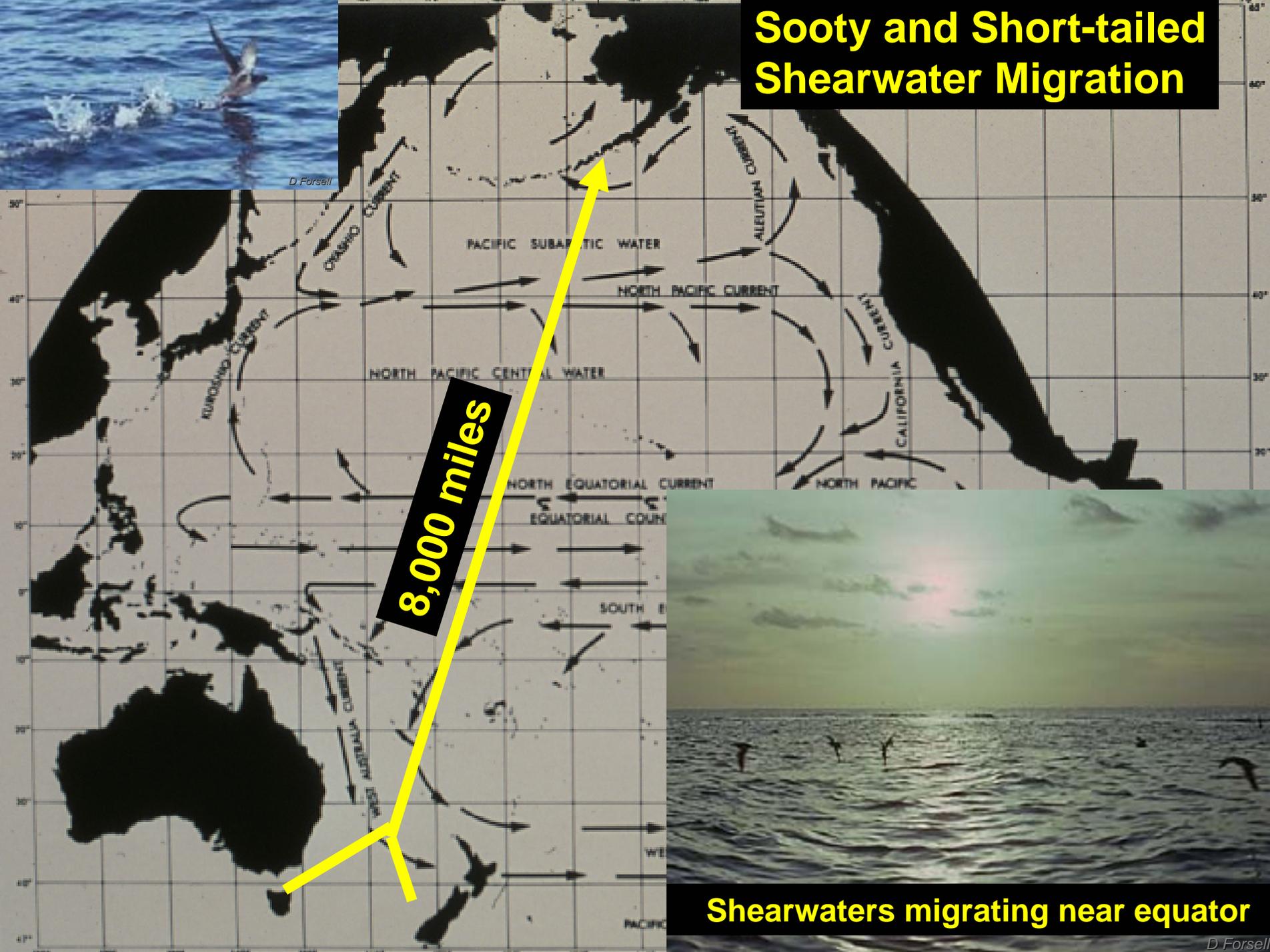


# Wind Power?

# Sooty and Short-tailed Shearwater Migration



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Shearwaters migrating near equator

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**20 Million Short-tailed Shearwaters pass through Unimak Pass to and from the Bering Sea in spring and fall, making this the most important area for this species for a few weeks each year.**



**Bird concentration areas, flyways, temporal patterns of use, and their behavior are more important when evaluating threats to birds than estimates of populations or baseline numbers**



# Shipboard Surveys - Most accurate; 300m wide; Study behavior and food habits; Can work around turbines



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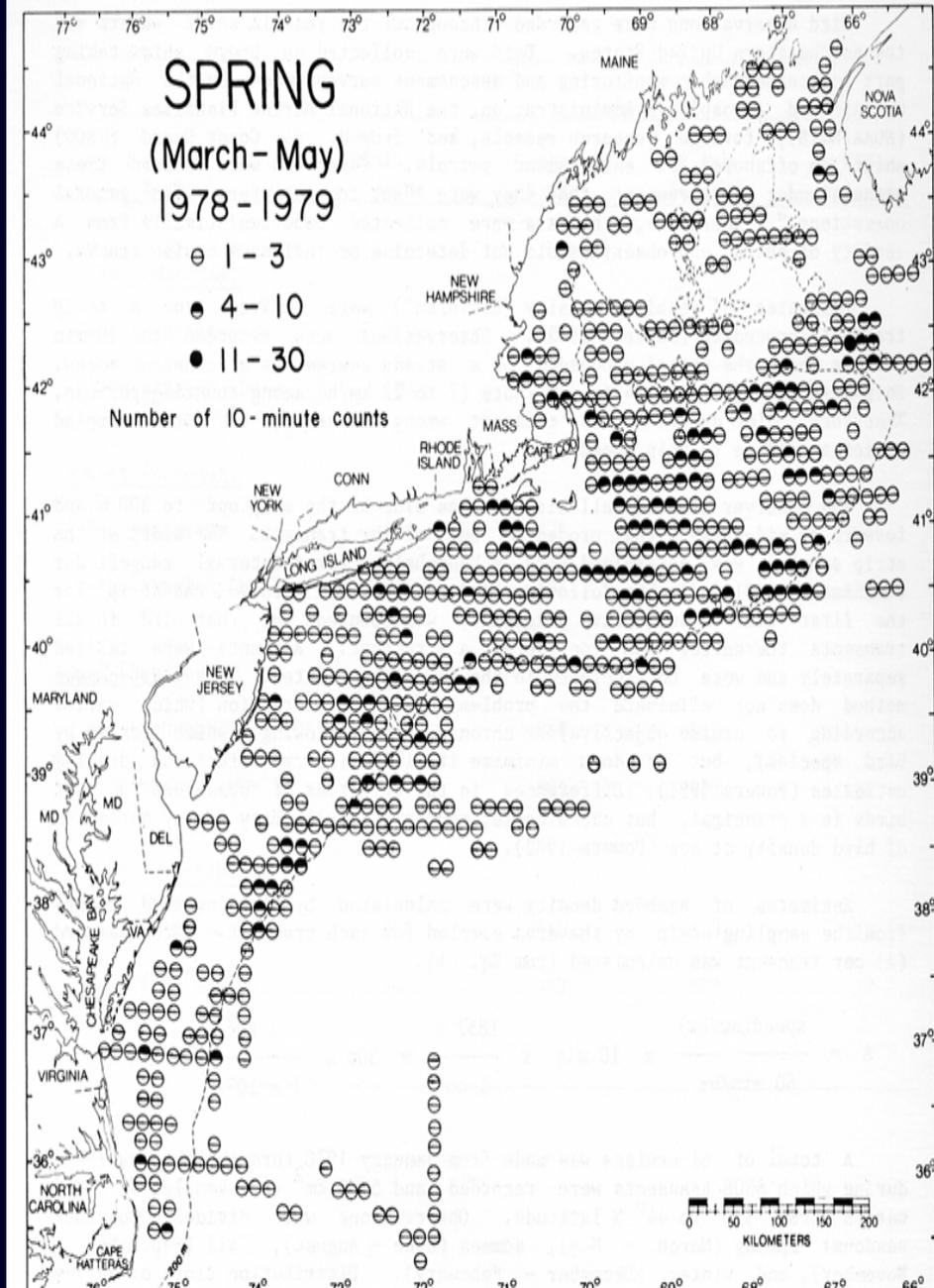
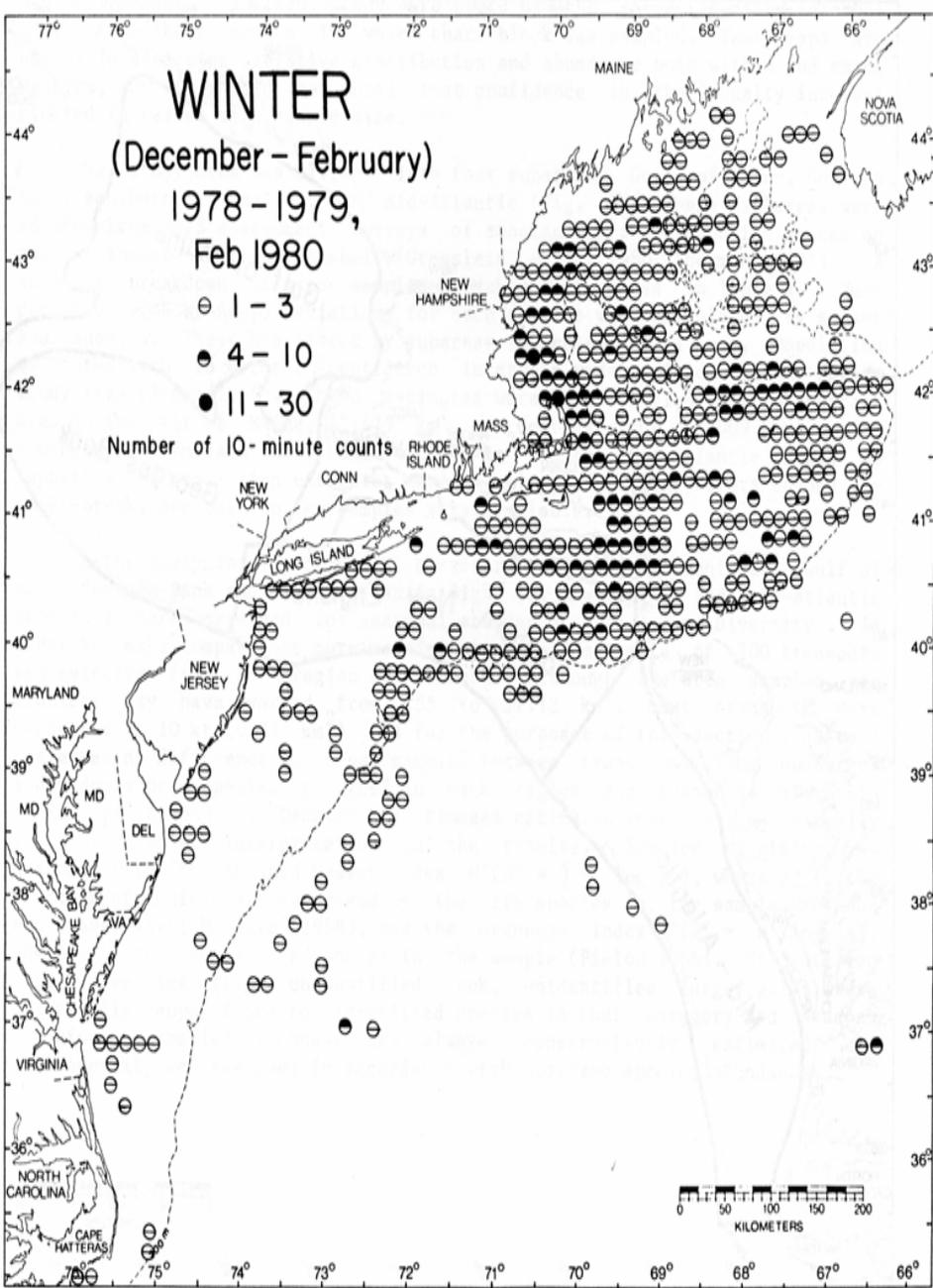
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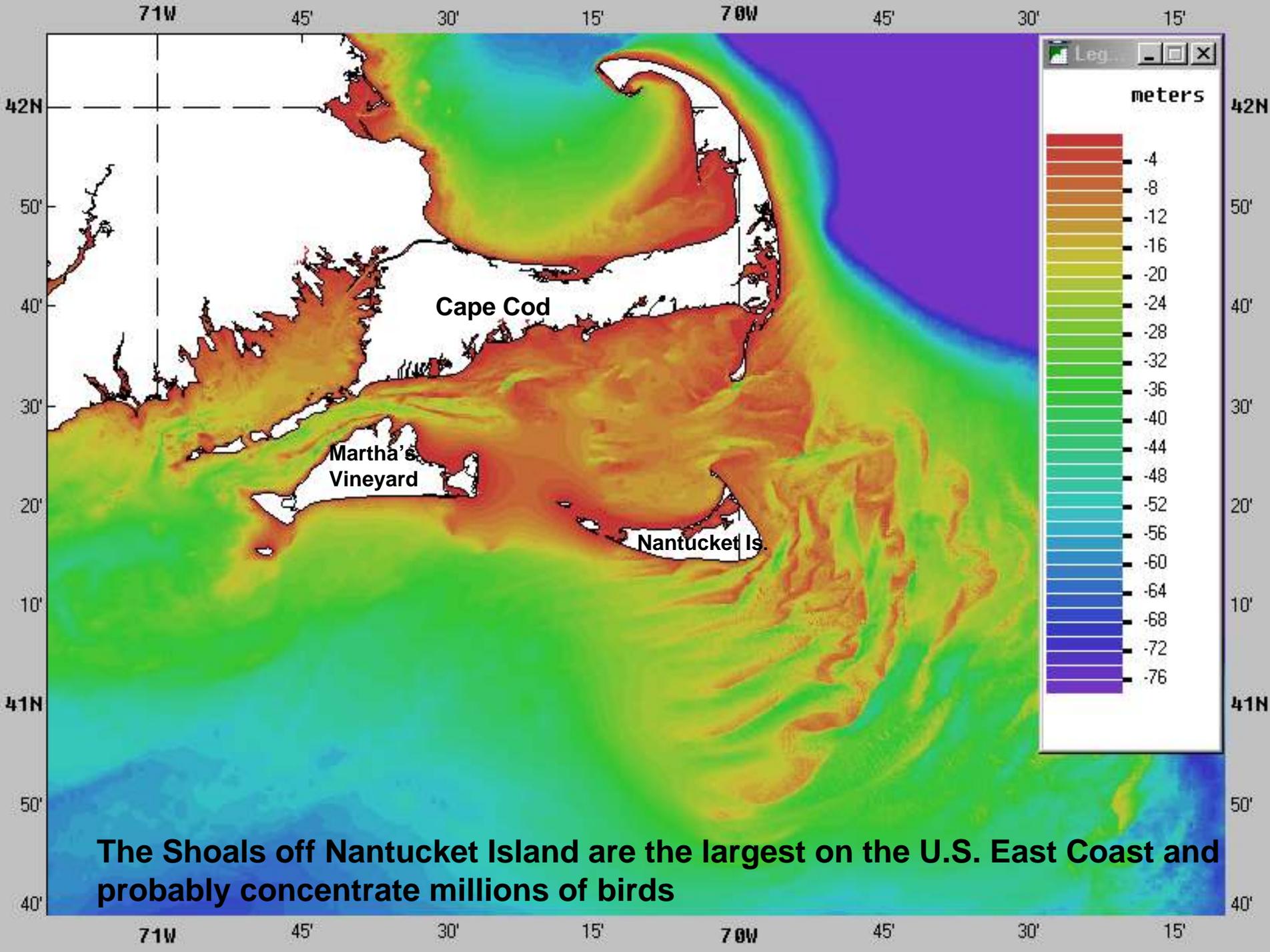
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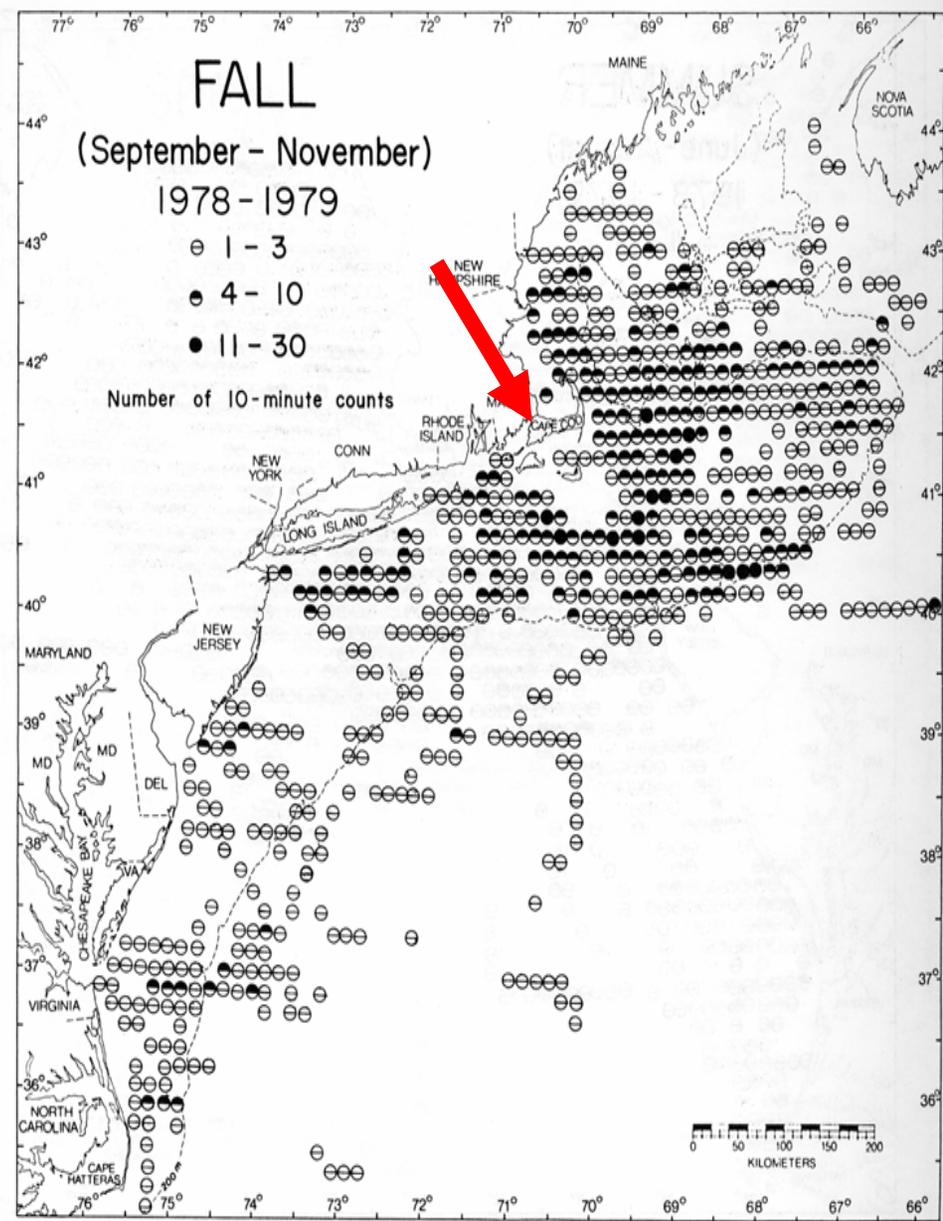
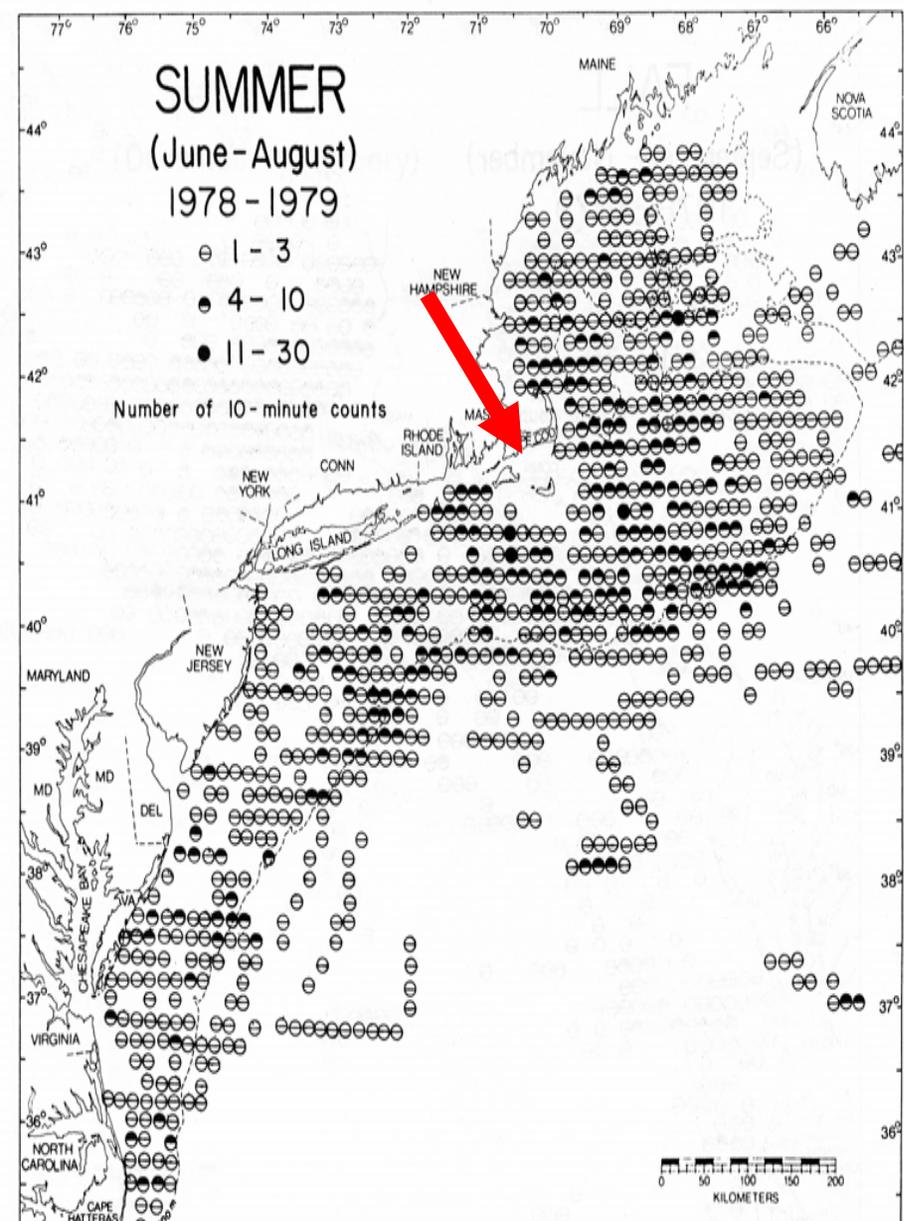
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On the Northeast U.S. Coast we have a good data set of shipboard pelagic bird surveys collected by Kevin Powers and others from Manomet Bird Observatory from 1978 to 1982.



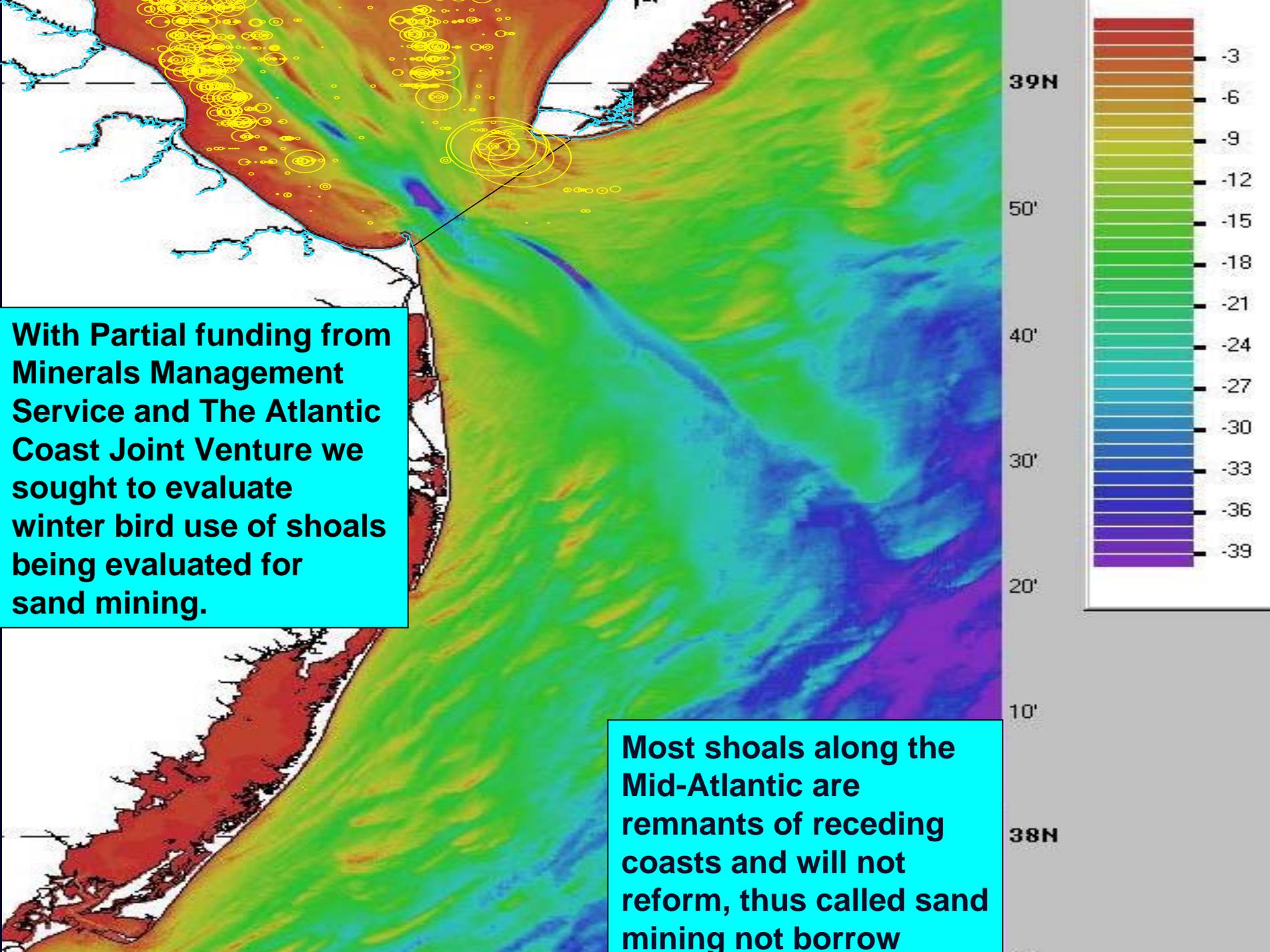
**The Shoals off Nantucket Island are the largest on the U.S. East Coast and probably concentrate millions of birds**



Unfortunately, due to the hazard of running large ships in shallow waters the Manomet data set does not include shoal areas.

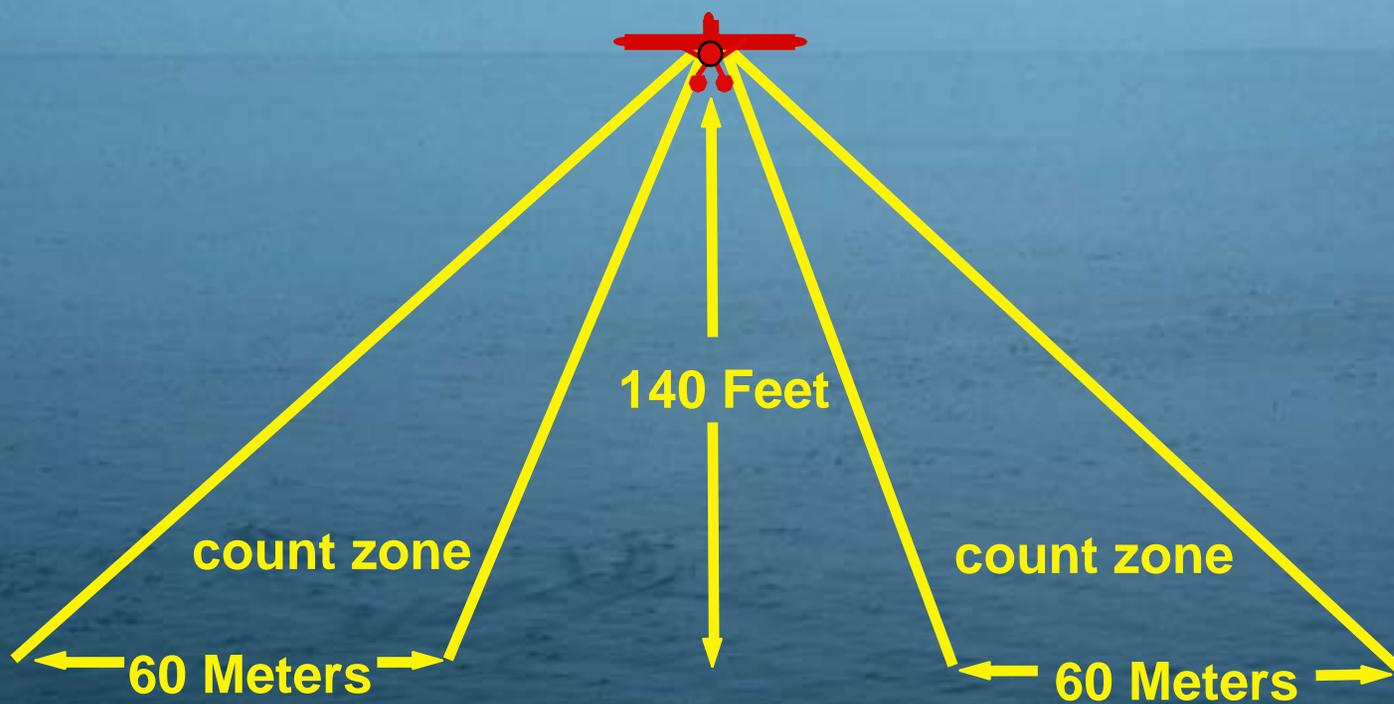
To survey bird use of shoals and to cover large portions of the coast, we use USFWS aircraft





**With Partial funding from Minerals Management Service and The Atlantic Coast Joint Venture we sought to evaluate winter bird use of shoals being evaluated for sand mining.**

**Most shoals along the Mid-Atlantic are remnants of receding coasts and will not reform, thus called sand mining not borrow**



We counted birds within a 60m strip transect on both sides of the aircraft

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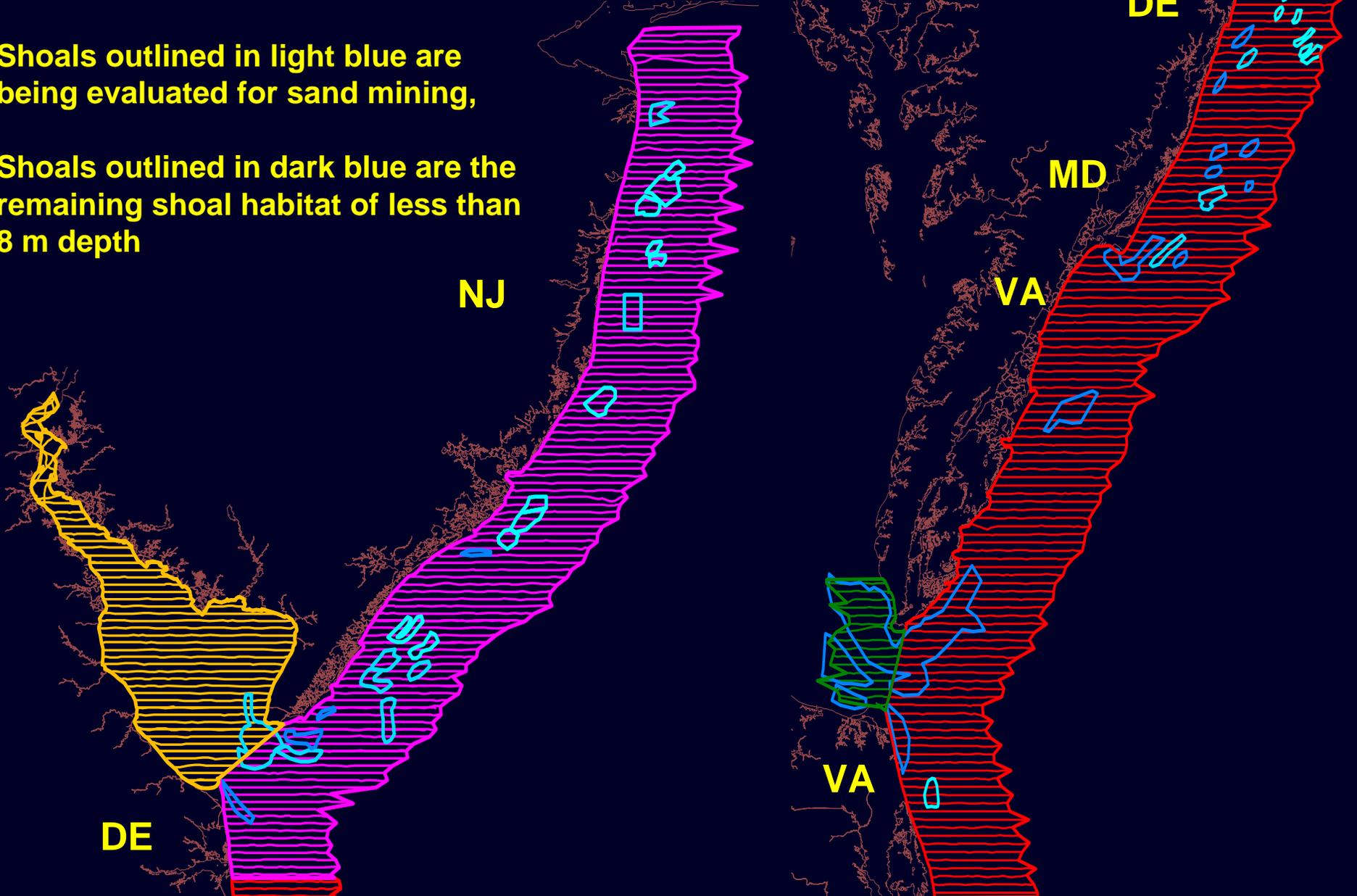
We also flew high altitude surveys of each shoal three additional times to look for flocks such as this of 5,000 Black Scoters

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# 120 Meter Wide Survey Lines Flown Along Each Minute of Latitude From 21 Dec. 2001 To 8 Mar. 2003

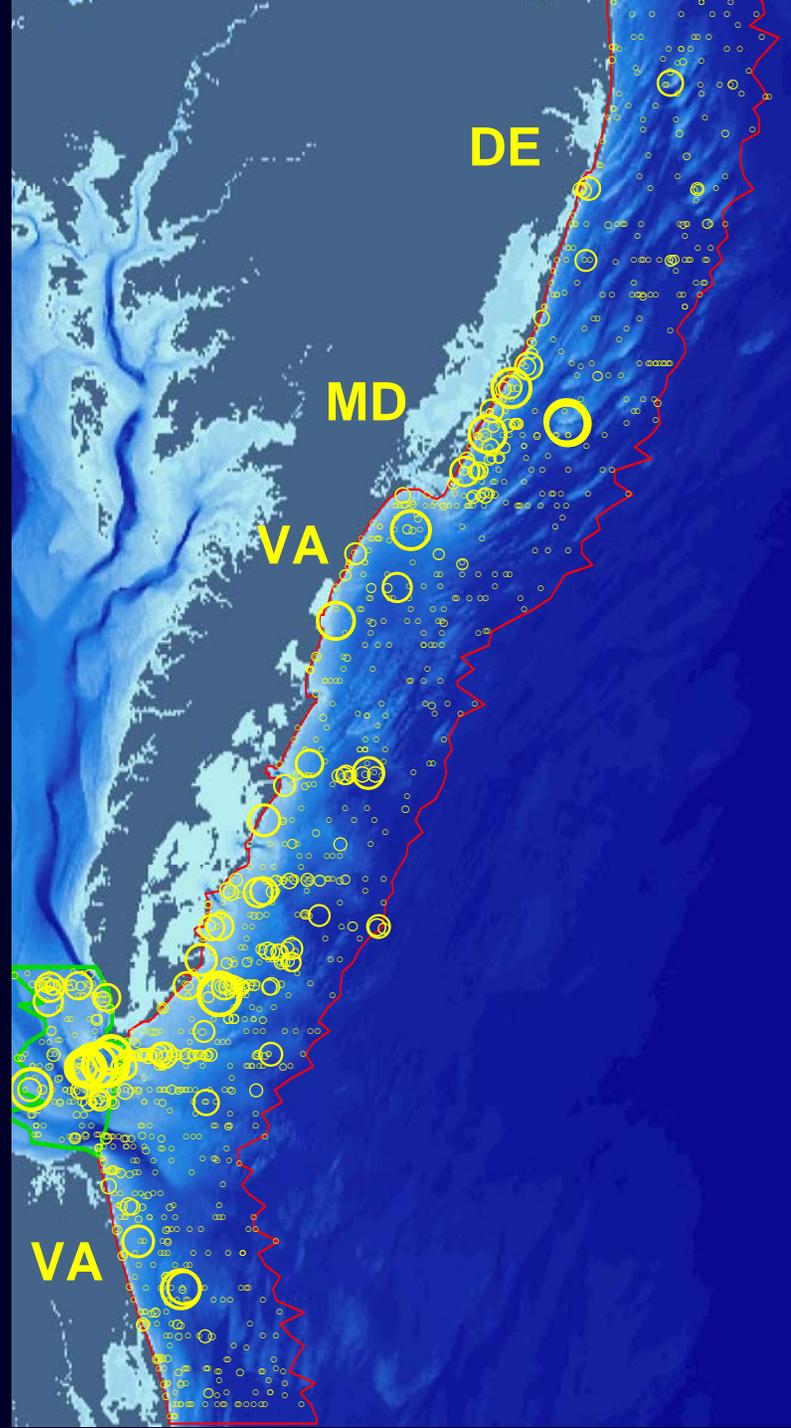
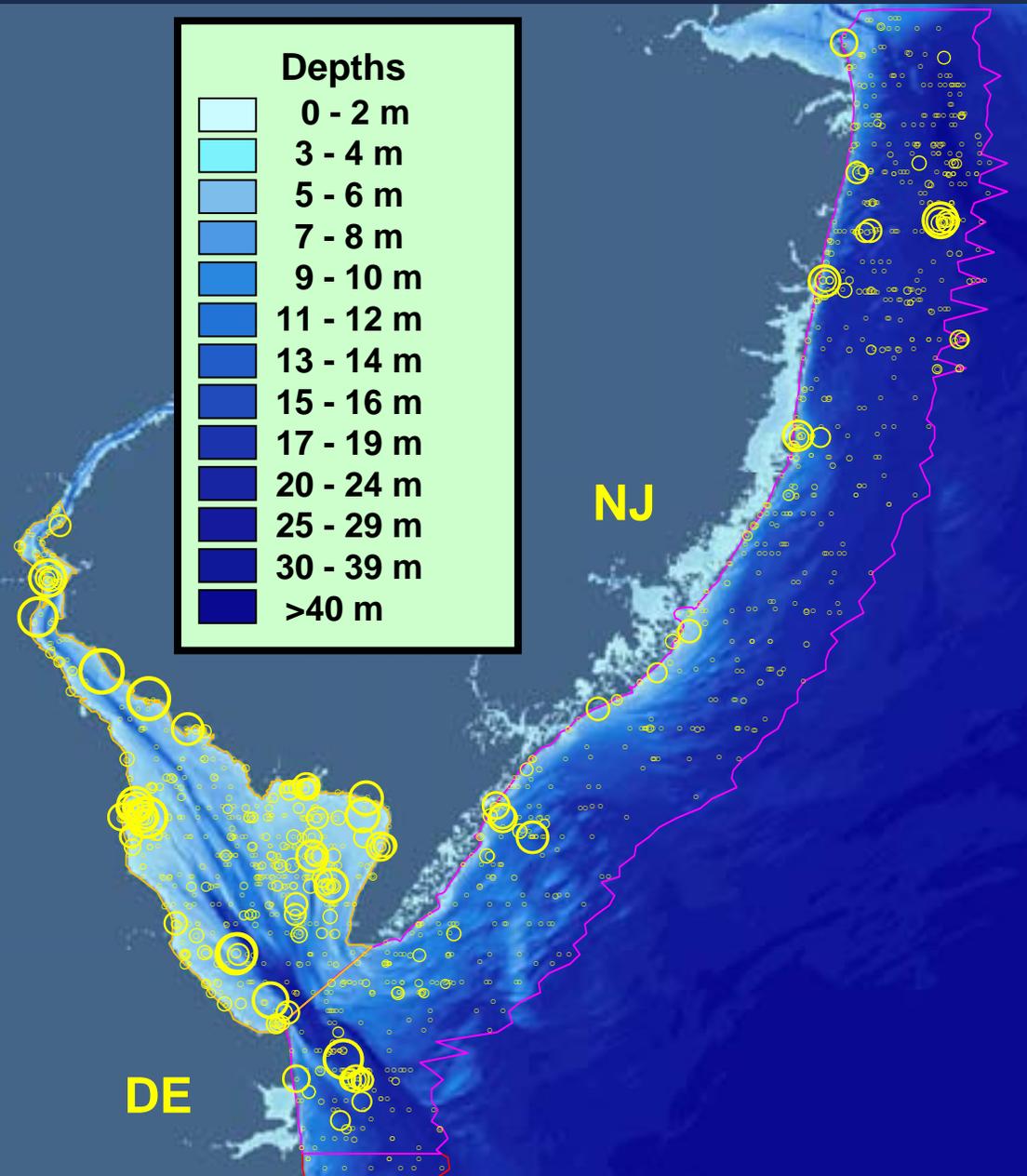
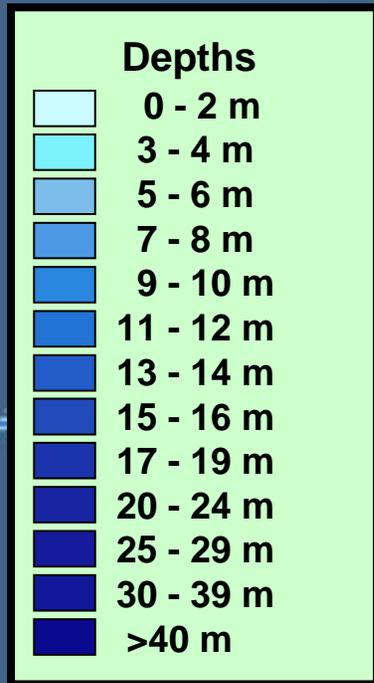
Shoals outlined in light blue are  
being evaluated for sand mining,

Shoals outlined in dark blue are the  
remaining shoal habitat of less than  
8 m depth



# All Birds

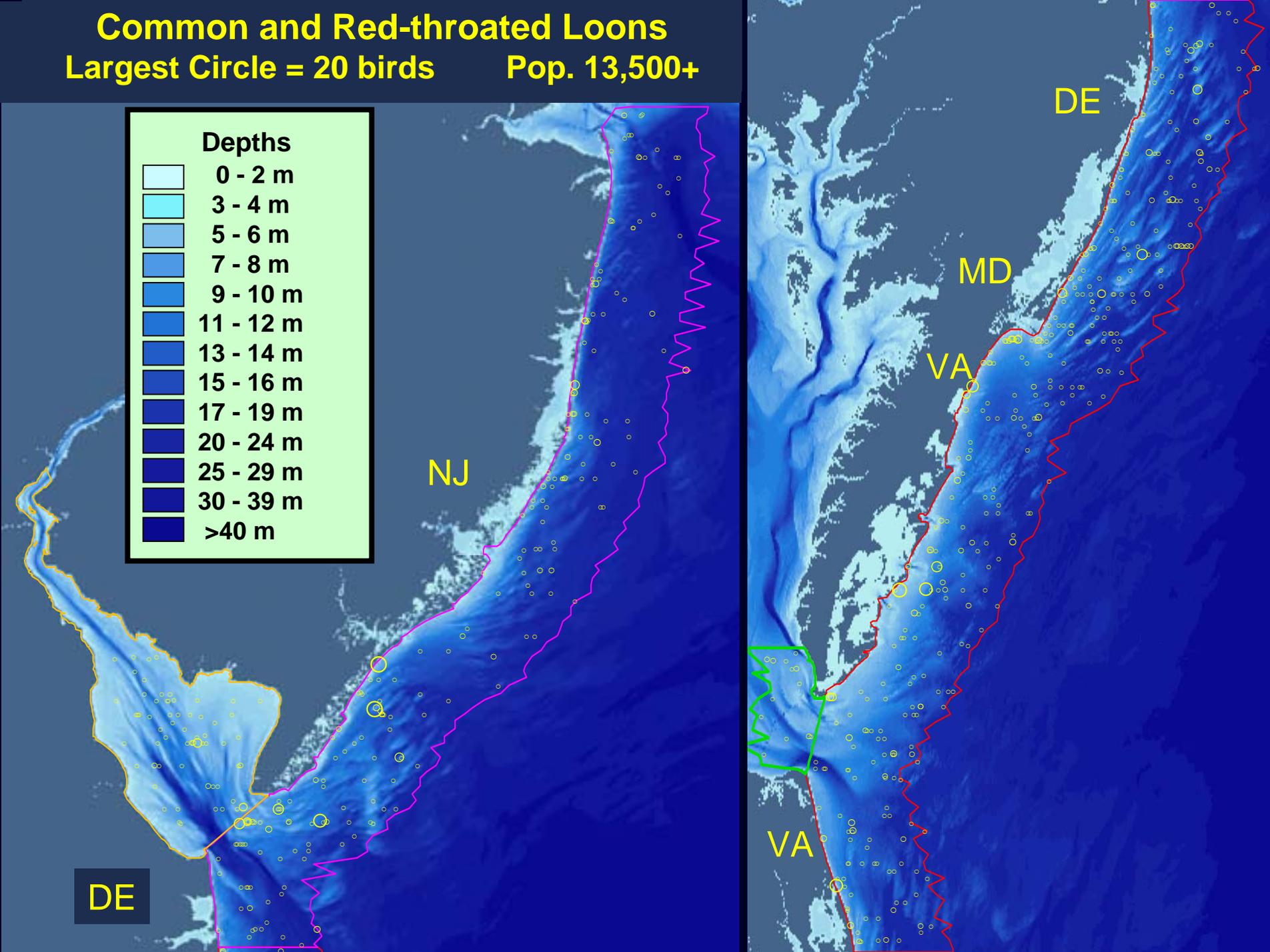
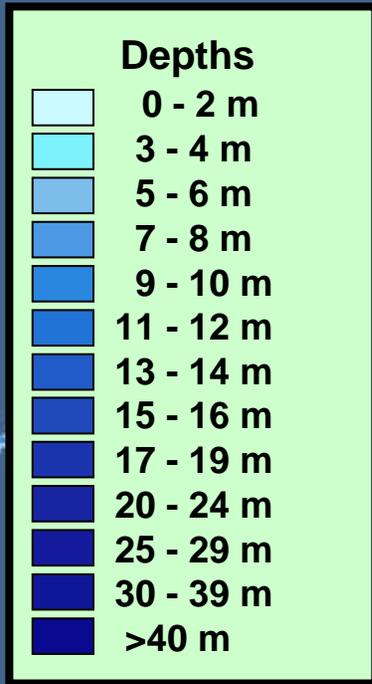
Largest Circle = 600 birds Pop 289,000+



# Common and Red-throated Loons

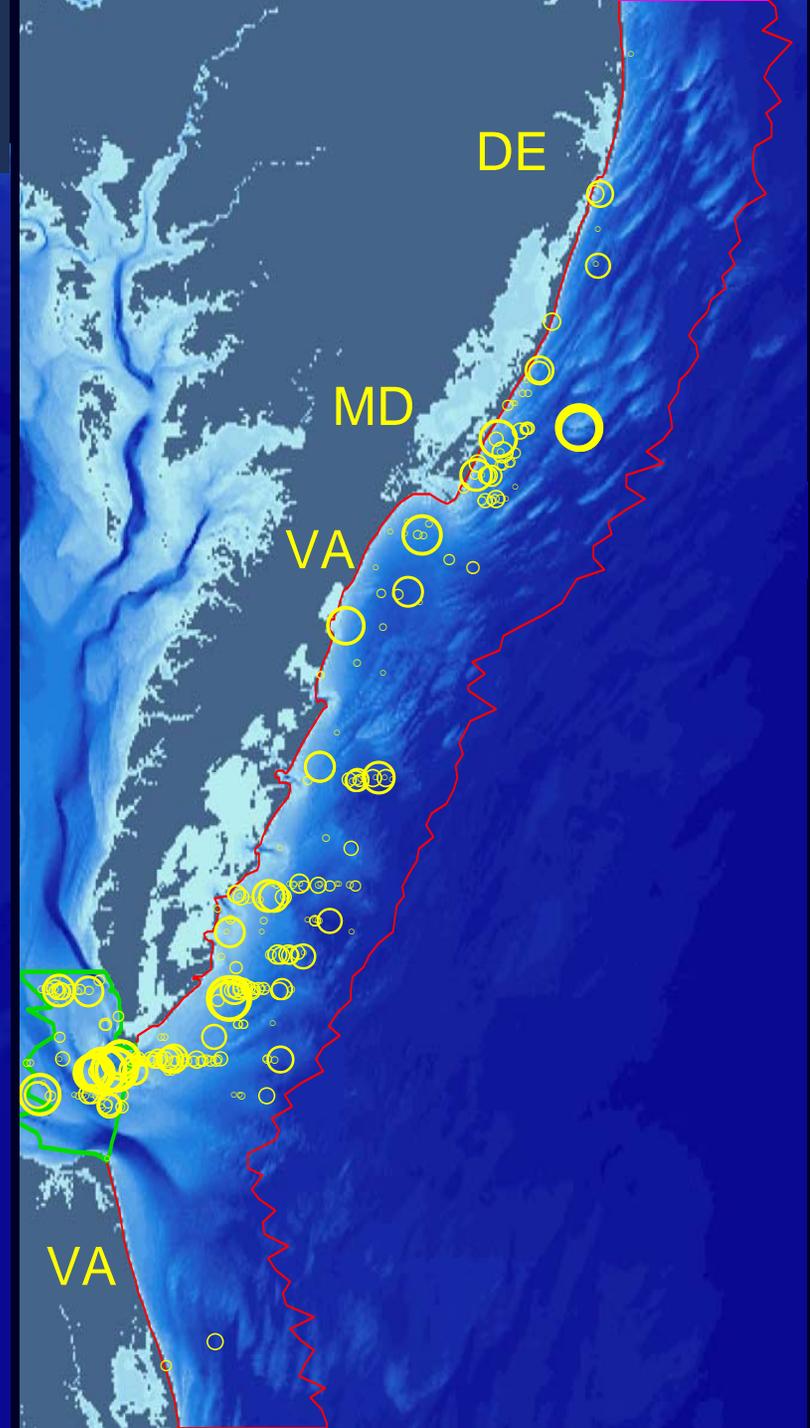
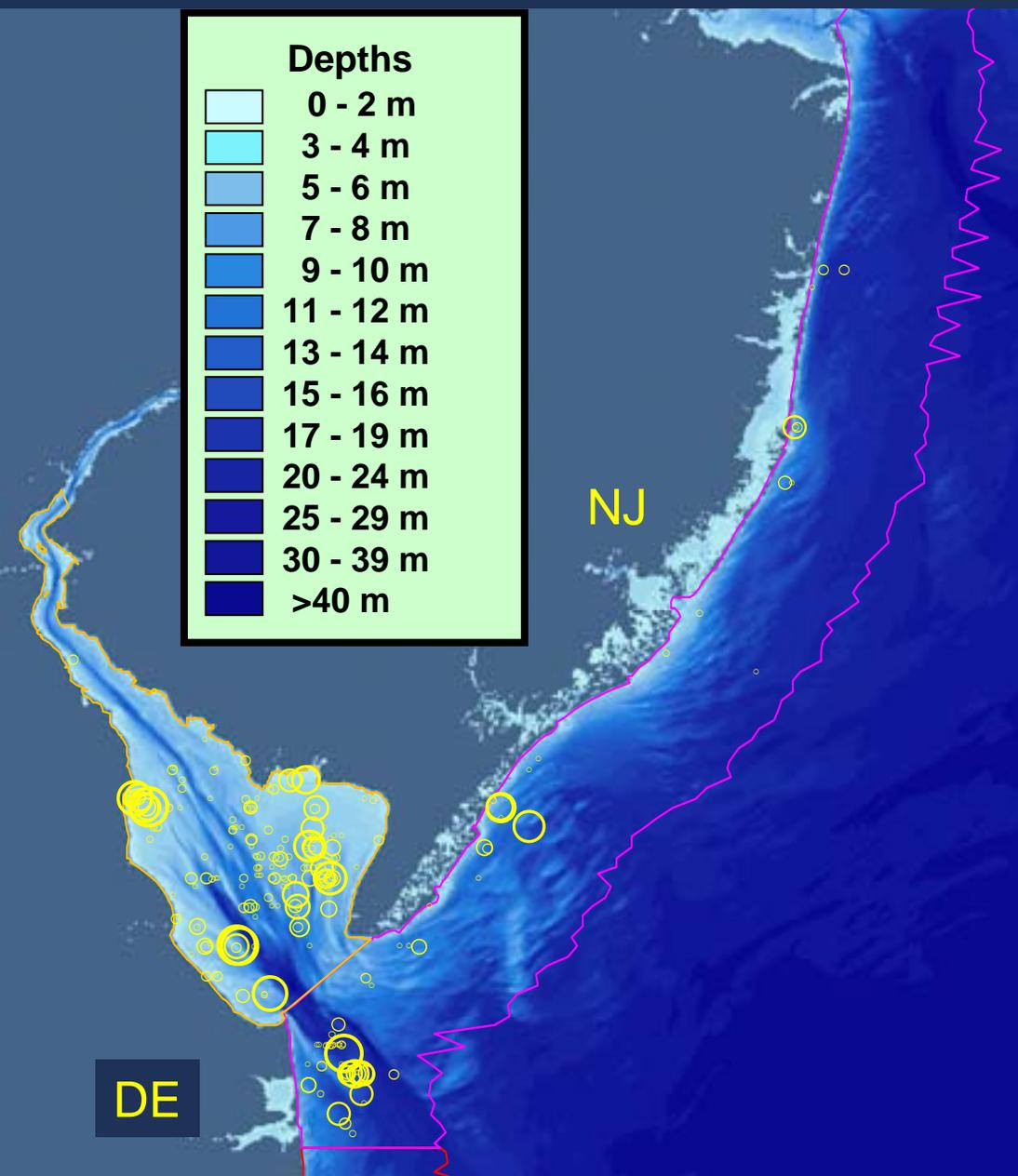
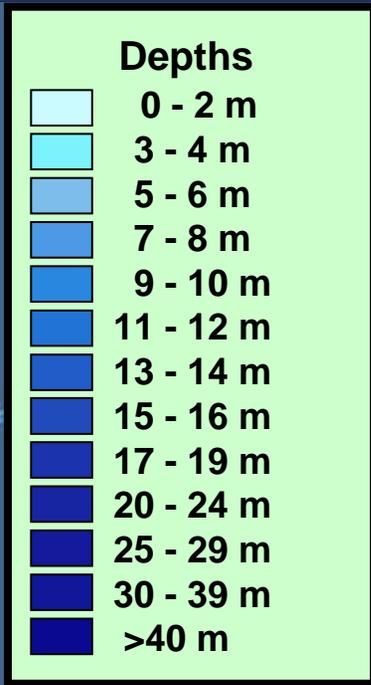
Largest Circle = 20 birds

Pop. 13,500+

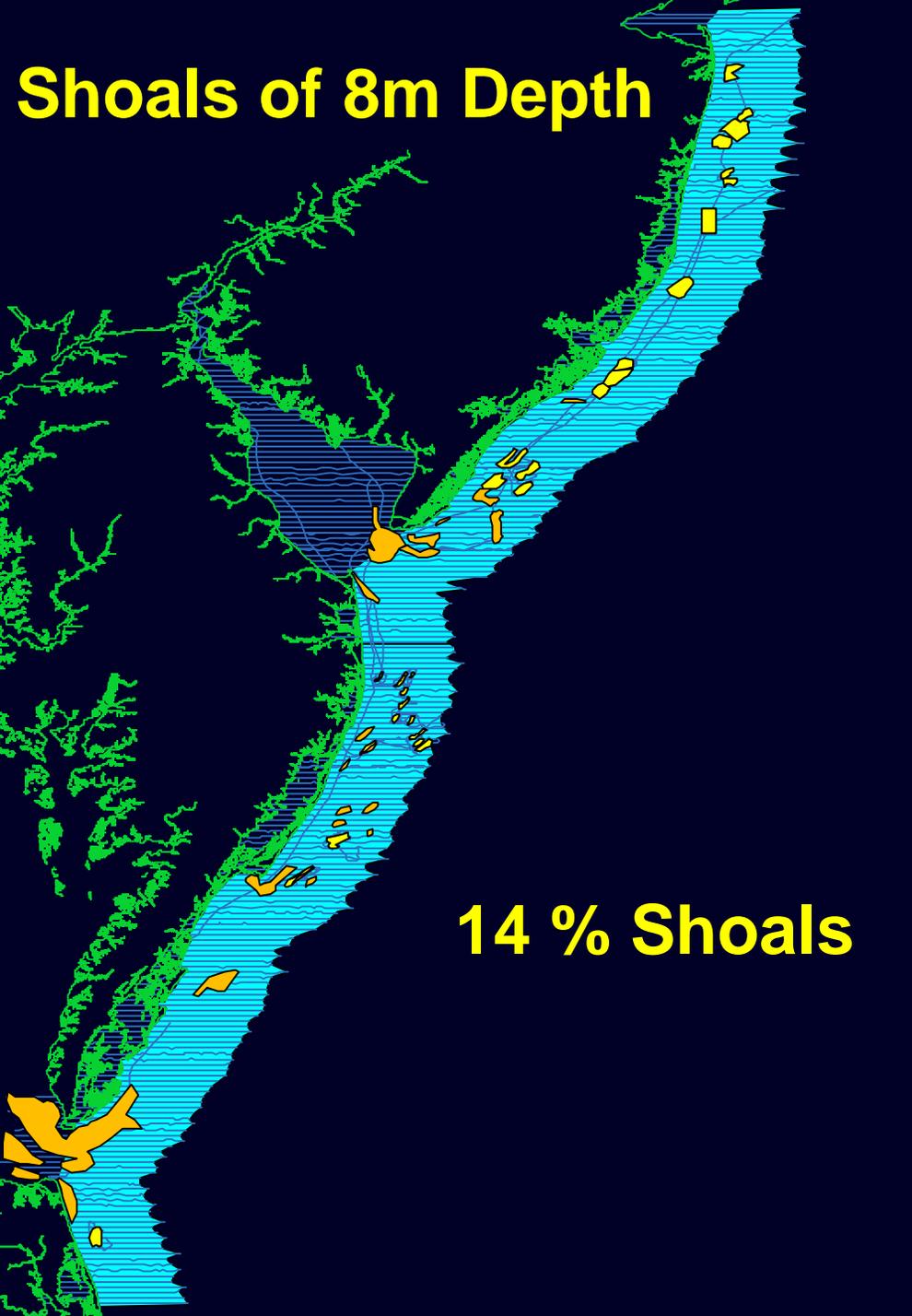


# All Scoters

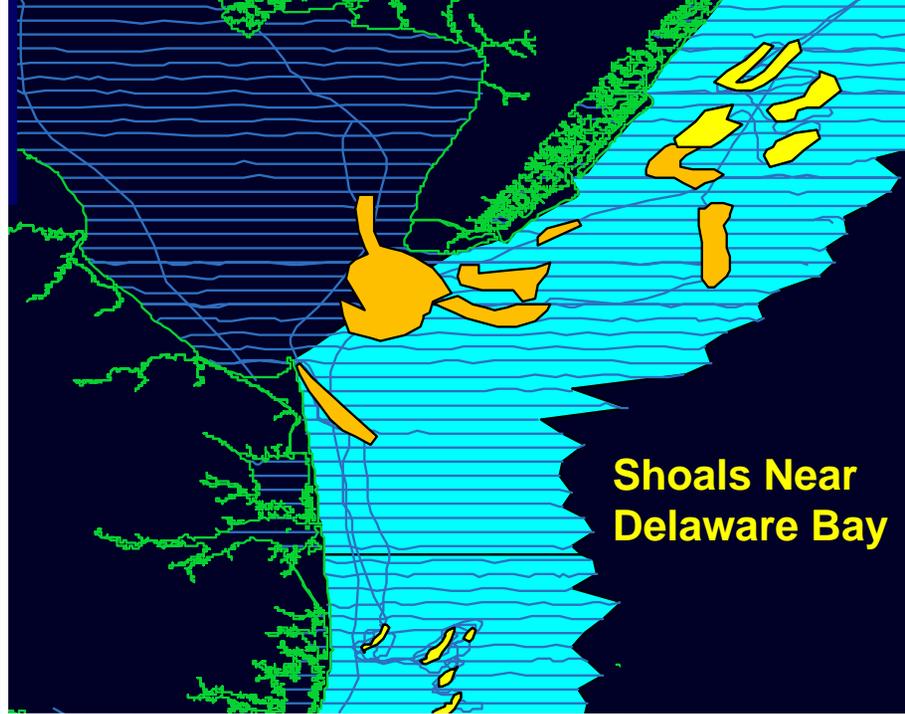
Largest Circle = 500 birds Pop. 59,000+



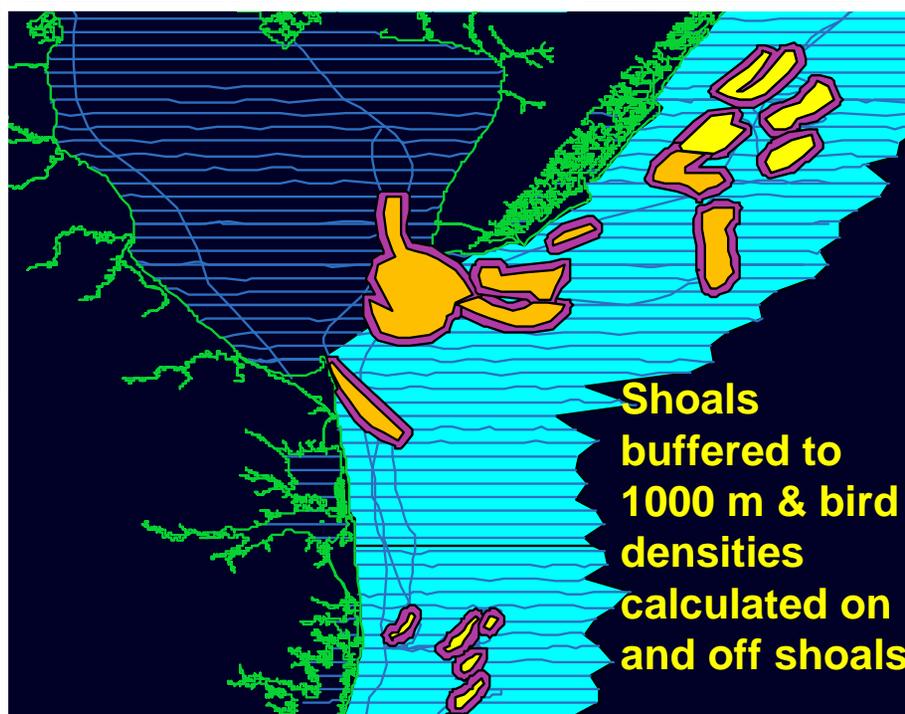
# Shoals of 8m Depth



14 % Shoals

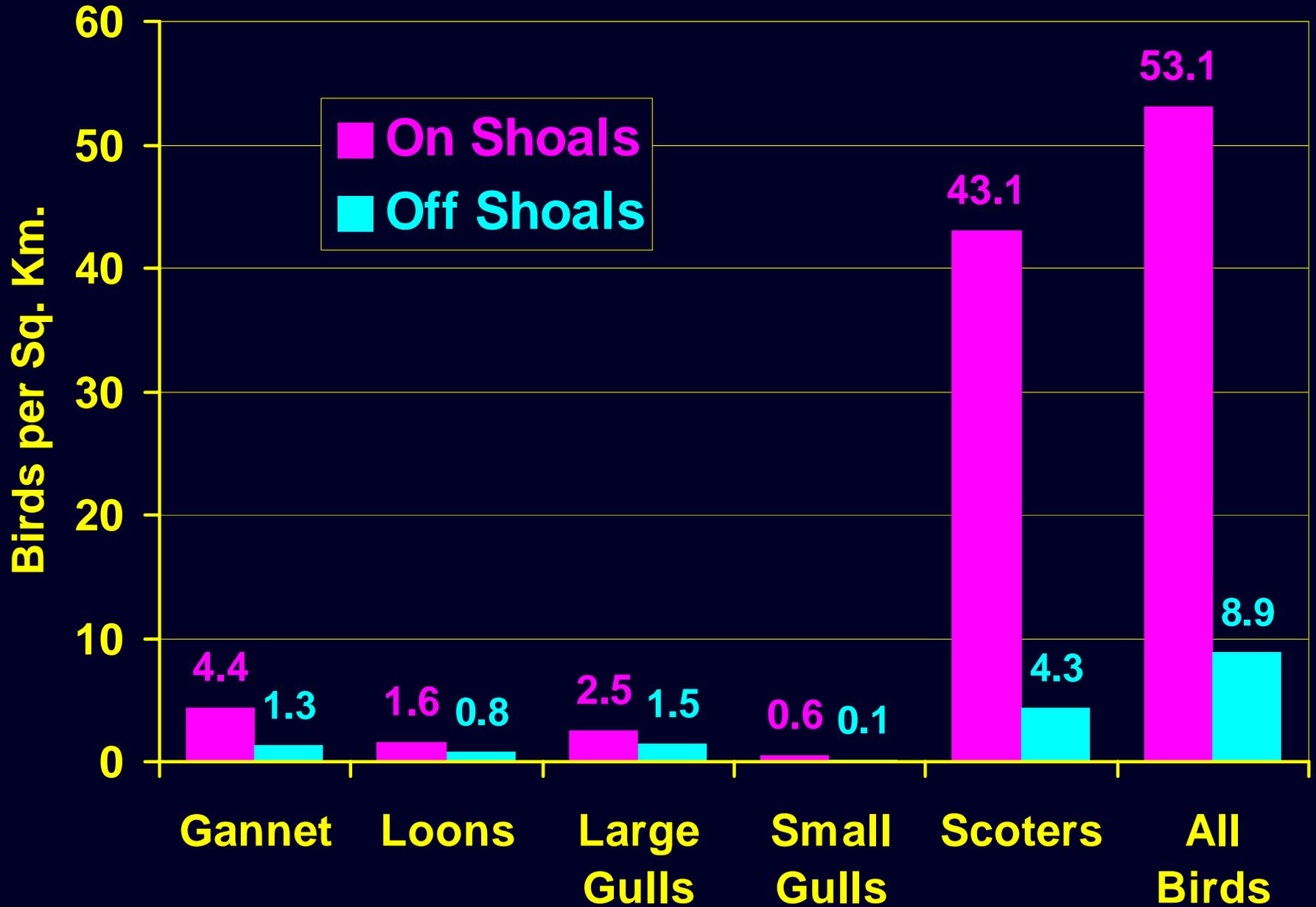


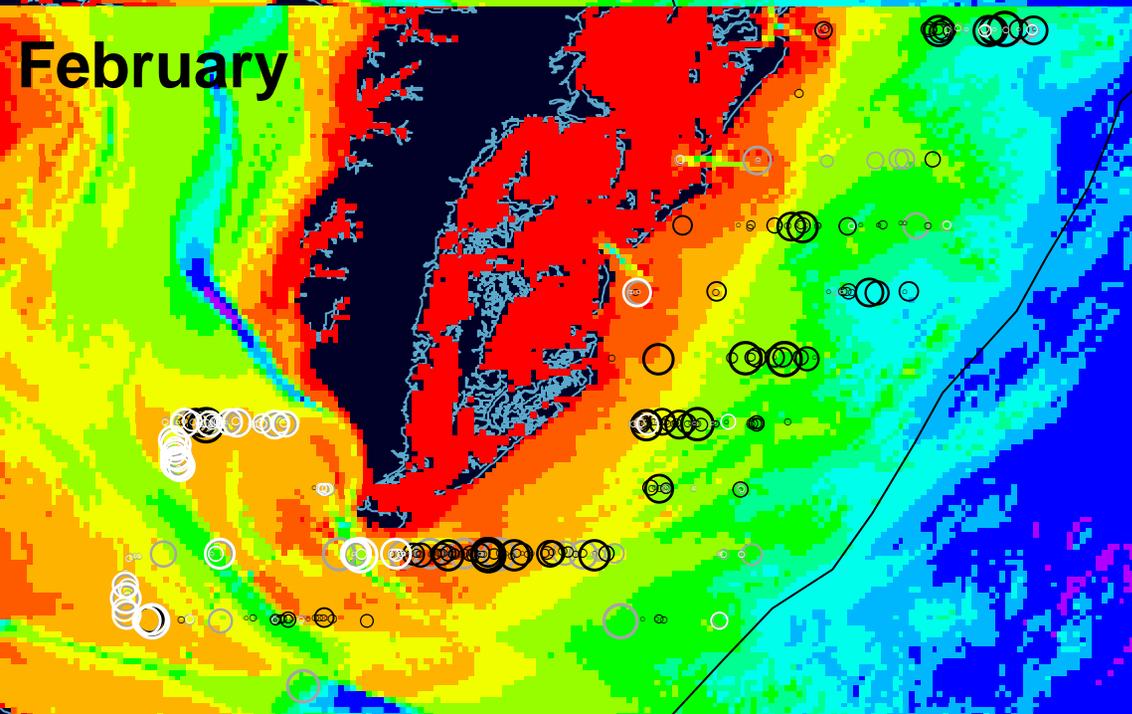
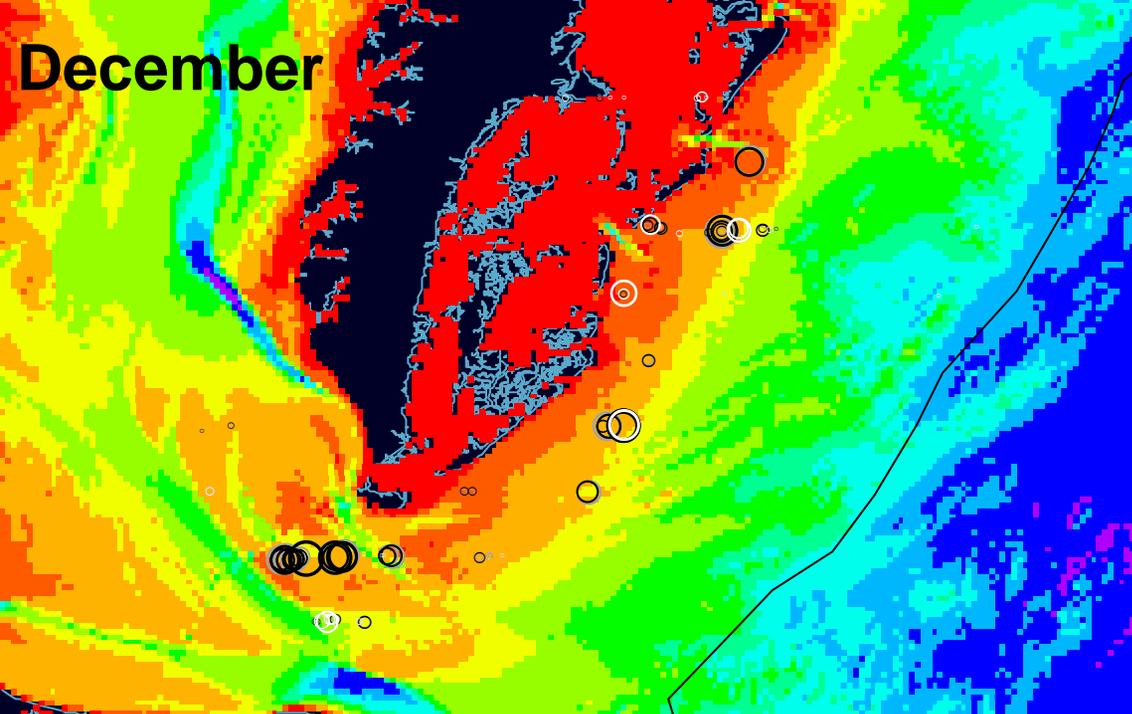
Shoals Near Delaware Bay



Shoals buffered to 1000 m & bird densities calculated on and off shoals

# Density of Waterbirds in Relation to Shoals



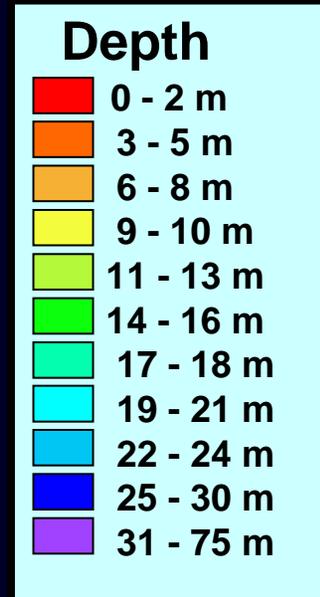


# Scoters Near Mouth of Chesapeake Bay

Largest Circle = 500 birds

Distribution was seldom the same between the two years or even within the same year, so may need 3 years?

- Surf Scoters
- Black Scoters
- Unidentified Scoters



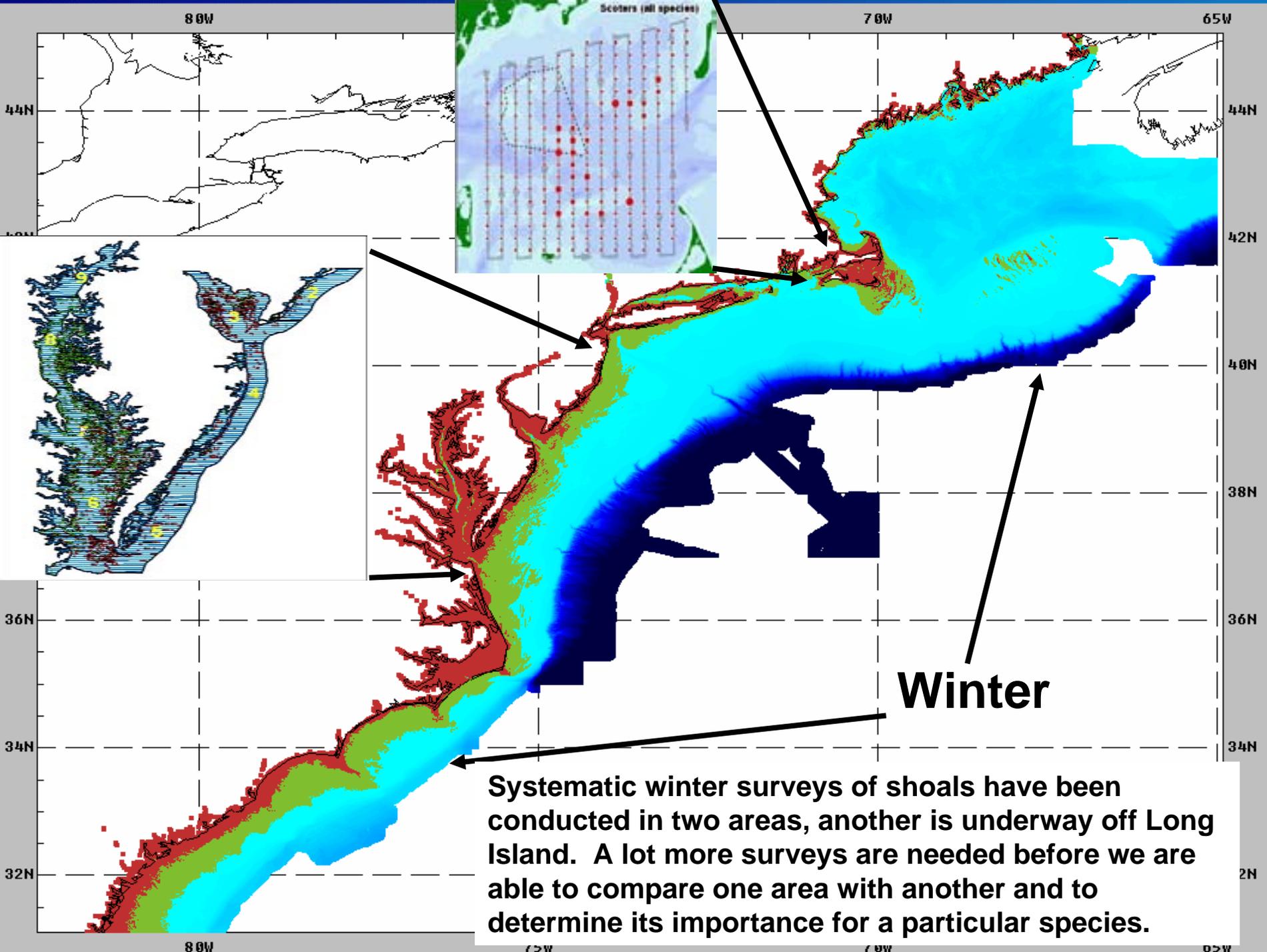
# Understand Ecological Linkages



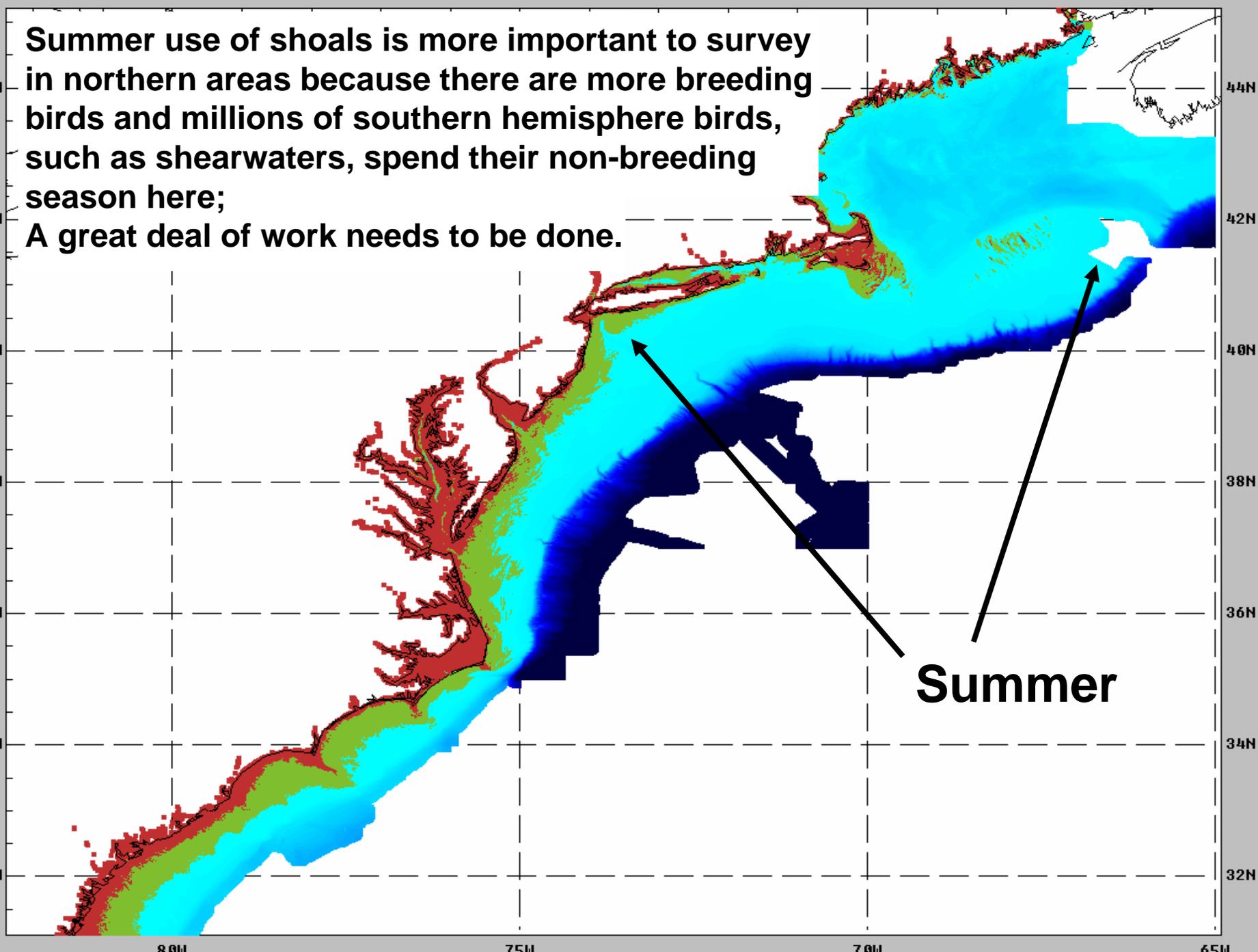
**Eat up to one  
1 Kg per Day**

**Bivalves  
Gastropods  
Amphipods  
Small Crabs & other Crustaceans  
Some Polychaetes & Annelids  
Fishes and Fish Eggs?**

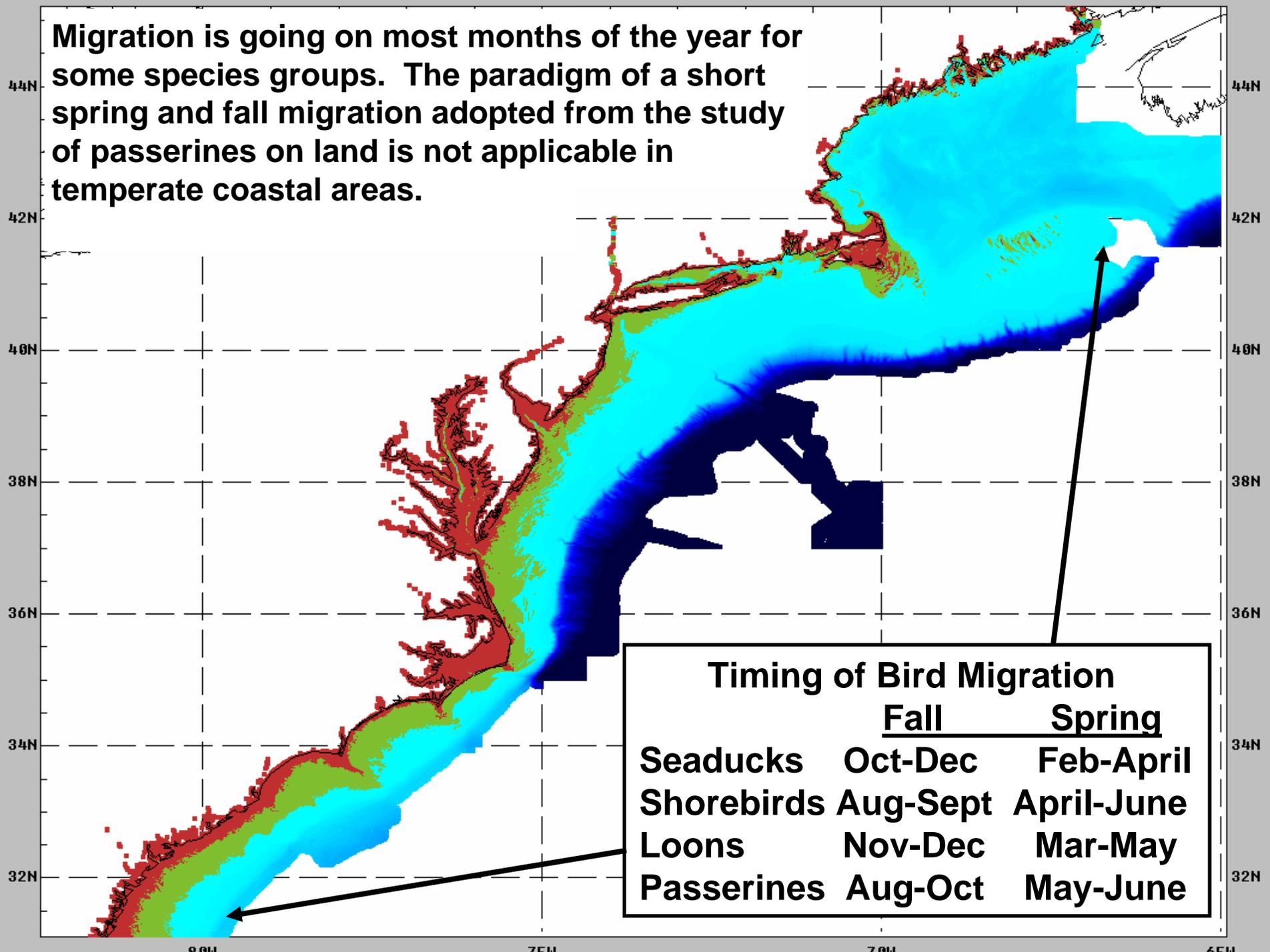




**Summer use of shoals is more important to survey in northern areas because there are more breeding birds and millions of southern hemisphere birds, such as shearwaters, spend their non-breeding season here;  
A great deal of work needs to be done.**



Migration is going on most months of the year for some species groups. The paradigm of a short spring and fall migration adopted from the study of passerines on land is not applicable in temperate coastal areas.





Assateague Island after storm



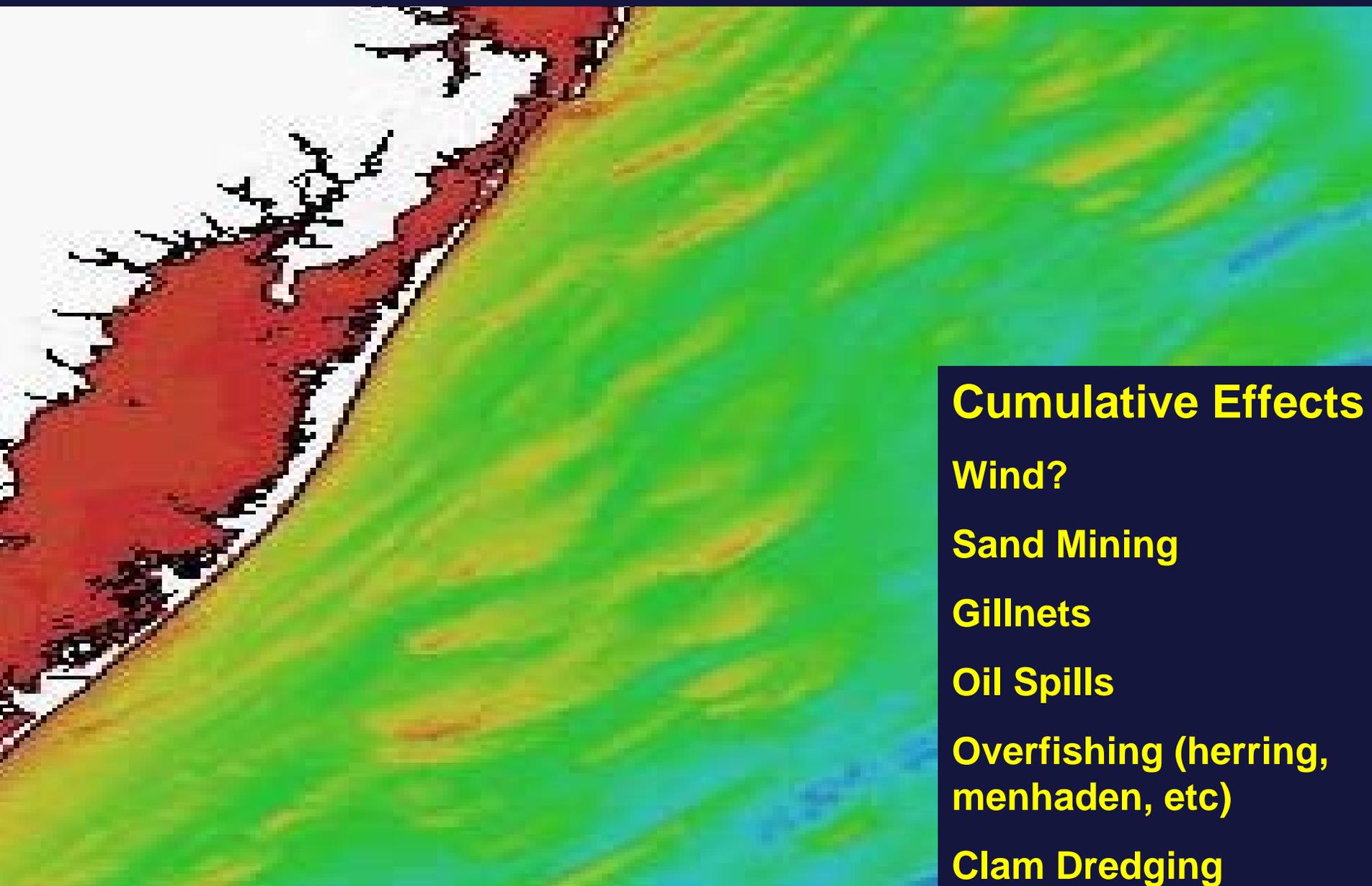
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Assateague Island in foreground, Ocean City Maryland in distance showing retreat of shoreline and need for beach building

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**Shoals near cities are wanted for sand mining**  
**Shoals away from cities are wanted for wind power development**  
**Little consideration of cumulative effects, sanctuaries may be needed**



## **Cumulative Effects**

**Wind?**

**Sand Mining**

**Gillnets**

**Oil Spills**

**Overfishing (herring,  
menhaden, etc)**

**Clam Dredging**

# Conclusions

- Identify bird use of shoals (3 years minimum)  
(seasonal, annual, magnitude of use)**
- Determine what draws the birds to the shoals**
- Determine the foods of birds on shoals and the  
effects of sand removal on the foods**
- Evaluate effects of wind power development in  
conjunction with other activities that impact  
shoals or birds**
- Migration period about 10 months per year**