

Using GIS to Research (and find) Seabirds

A Conservation and a Recreational Bird- Watching Perspective

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Stellwagen Bank National Marine Sanctuary



Stellwagen Sanctuary Seabird Stewards (S4)



Research

- Systematically collect baseline data on seabirds in sanctuary boundaries to compare populations over time

Education & Outreach

- Educate the public about seabirds and connect residents with their sanctuary

Citizen Science

- Train observers to join our scientists in this groundbreaking project

Birds of Stellwagen Sanctuary



Gulls and gannets are year-round visitors to
Stellwagen Bank Marine Sanctuary

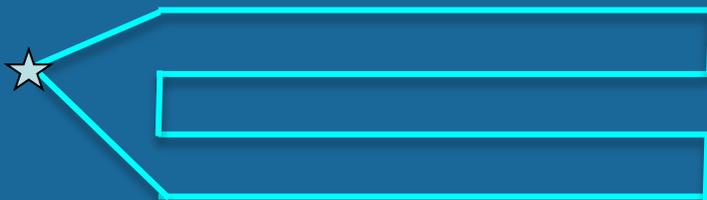
Birds of Stellwagen Sanctuary



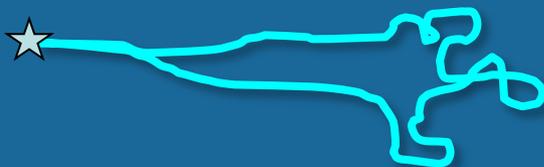
Far-flung summer visitors include shearwaters and storm-petrels



Standardized



Opportunistic



Survey Data Collection

Location

Species (and number)

Range & Bearing

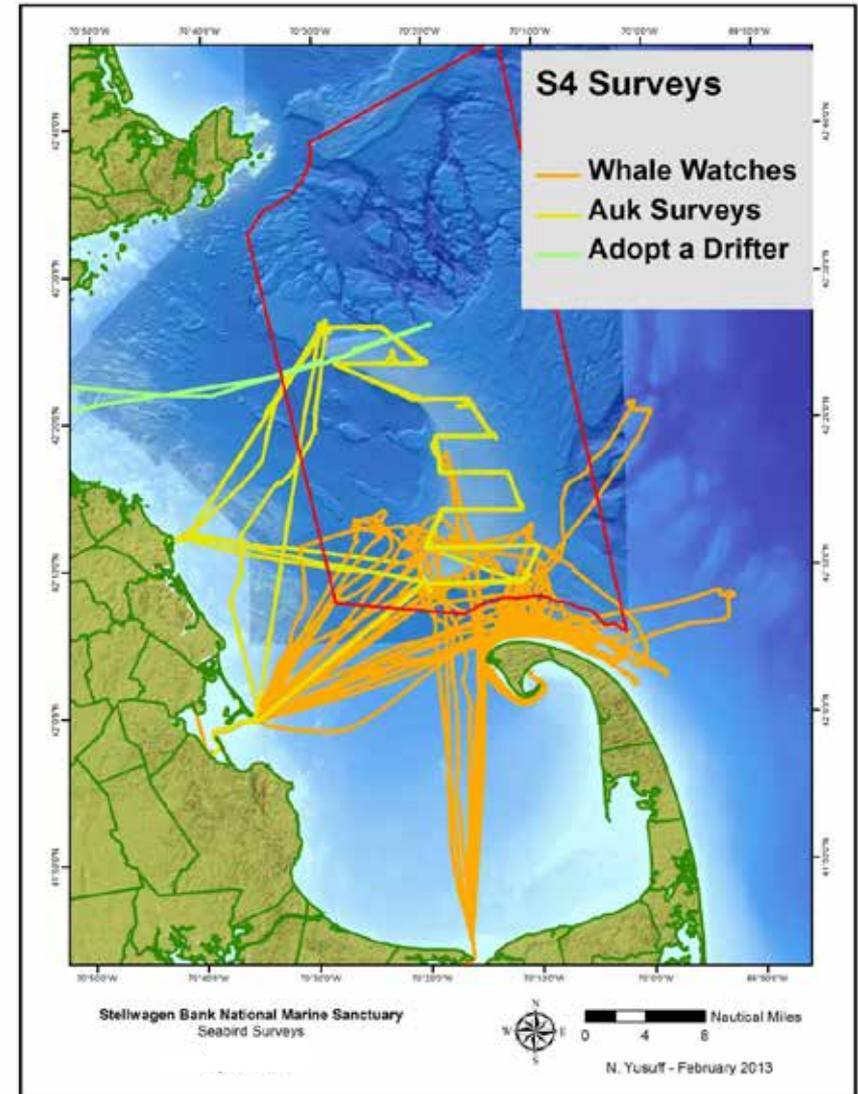
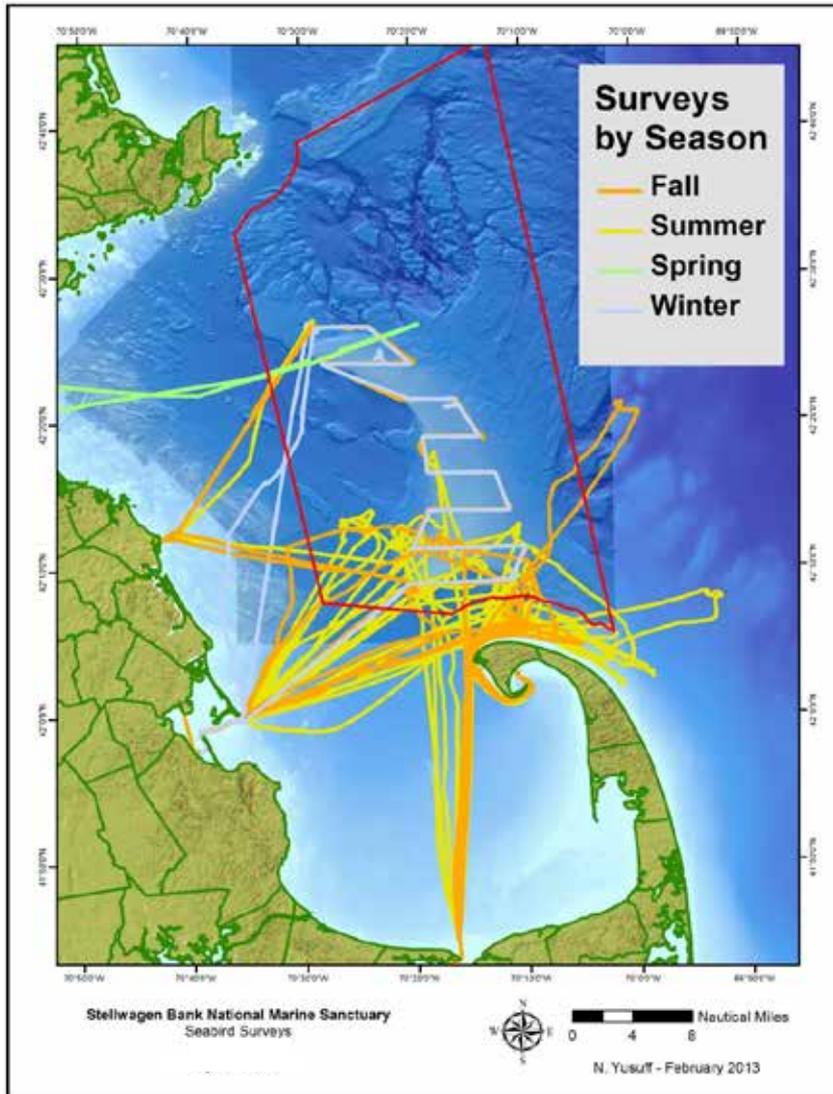
Behavior

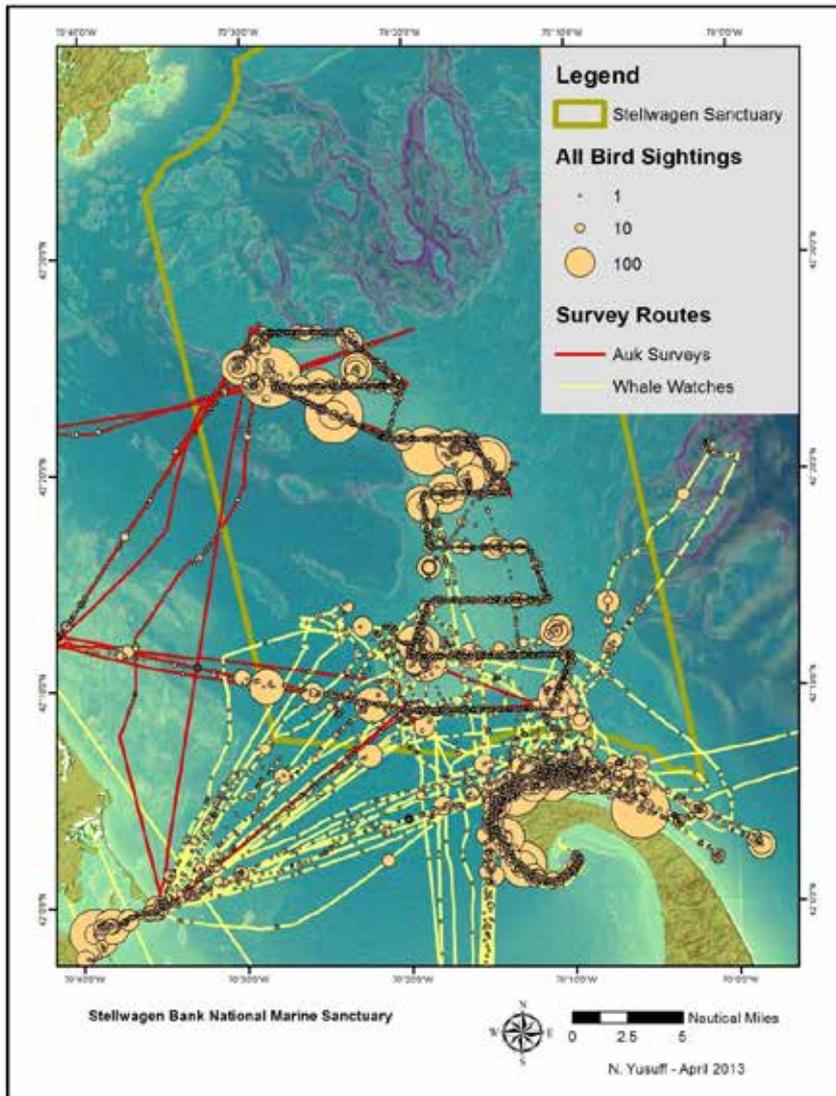
Association

Flight height

Flight direction

National Marine Sanctuaries National Oceanic and Atmospheric Administration





Summary of Data

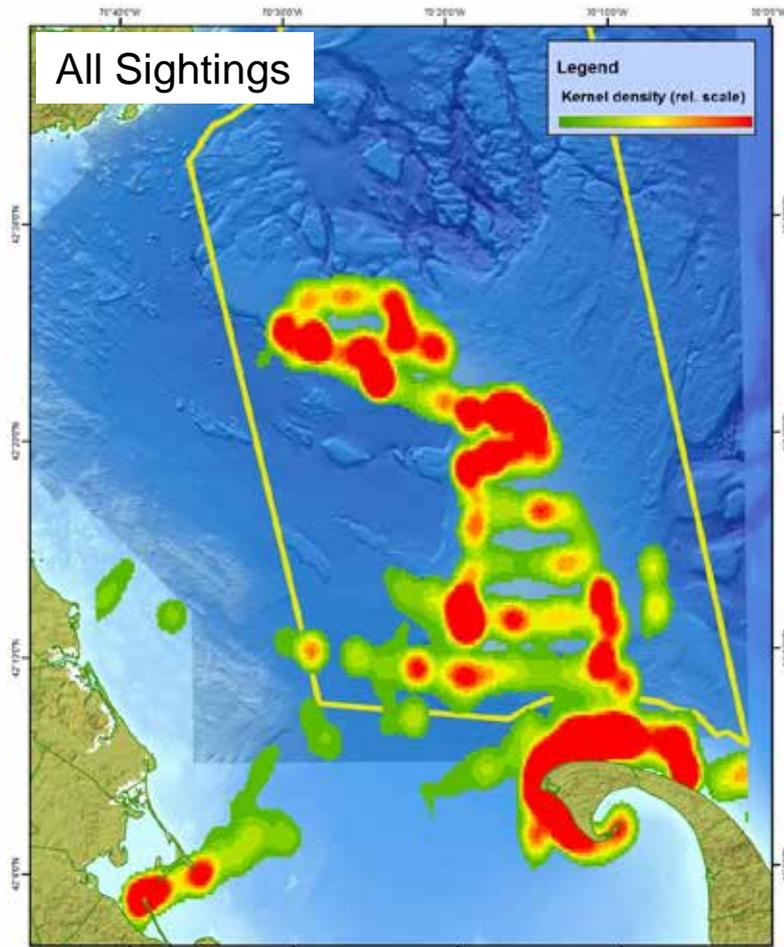
6764 Sightings of >26,000 birds
59 Species, 18 Families

179 Whale sightings
37 Notable fish sightings
19 Seal sightings
12 Butterfly sightings

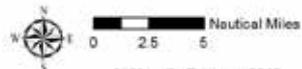
>2500 Nautical Miles traveled
44 Survey/Whale Watch trips

All Sightings

Legend
Kernel density (rel. scale)



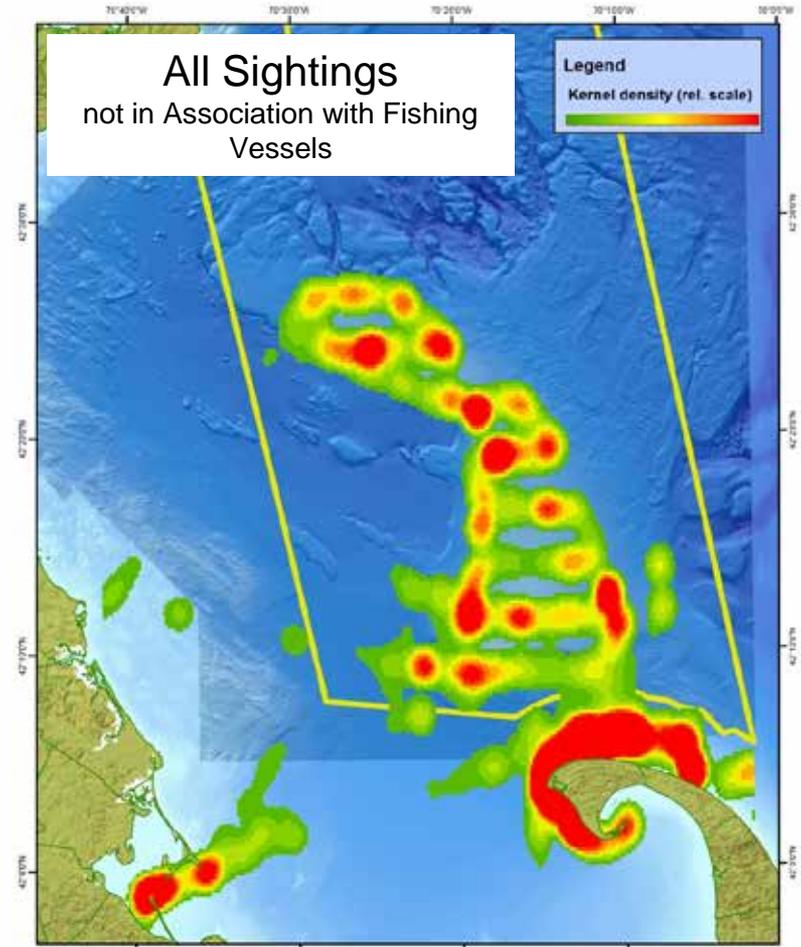
Stellwagen Bank National Marine Sanctuary
Whale Watch and Auk Surveys



N. Yusuf - February 2013

All Sightings
not in Association with Fishing
Vessels

Legend
Kernel density (rel. scale)



Stellwagen Bank National Marine Sanctuary
Whale Watch and Auk Surveys

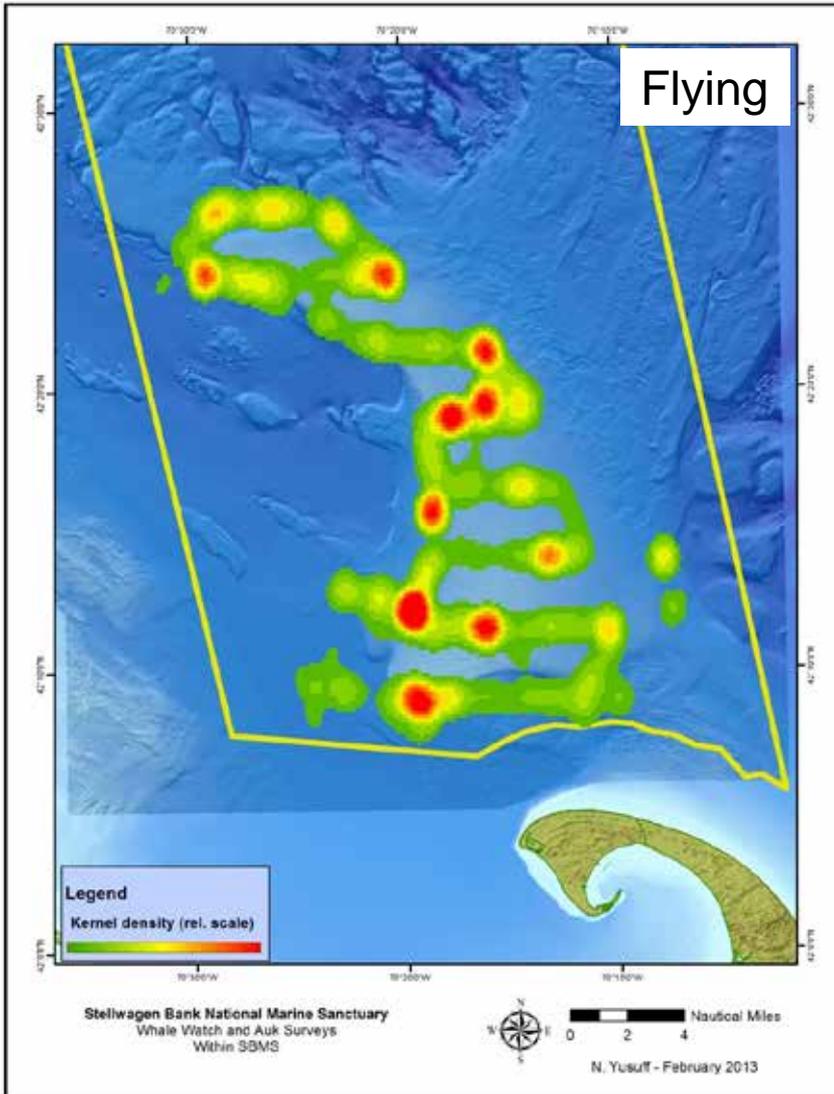


N. Yusuf - February 2013

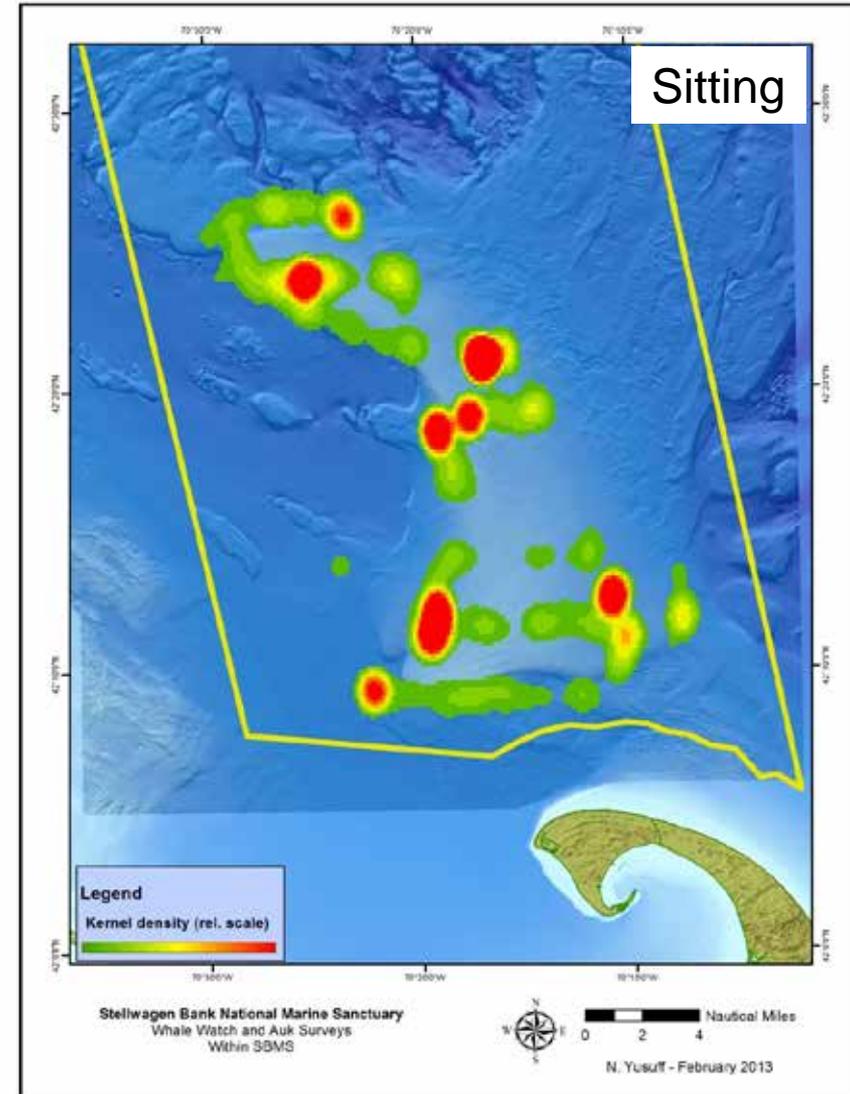
National Marine Sanctuaries National Oceanic and Atmospheric Administration



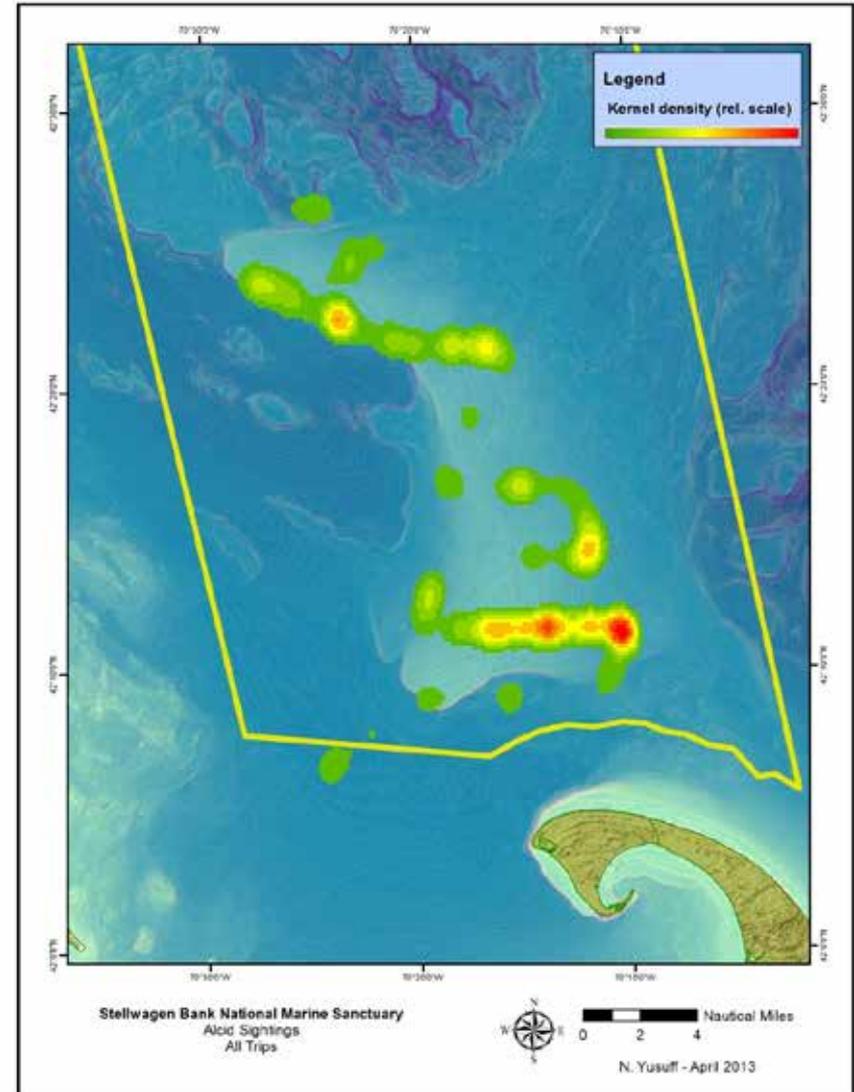
Flying

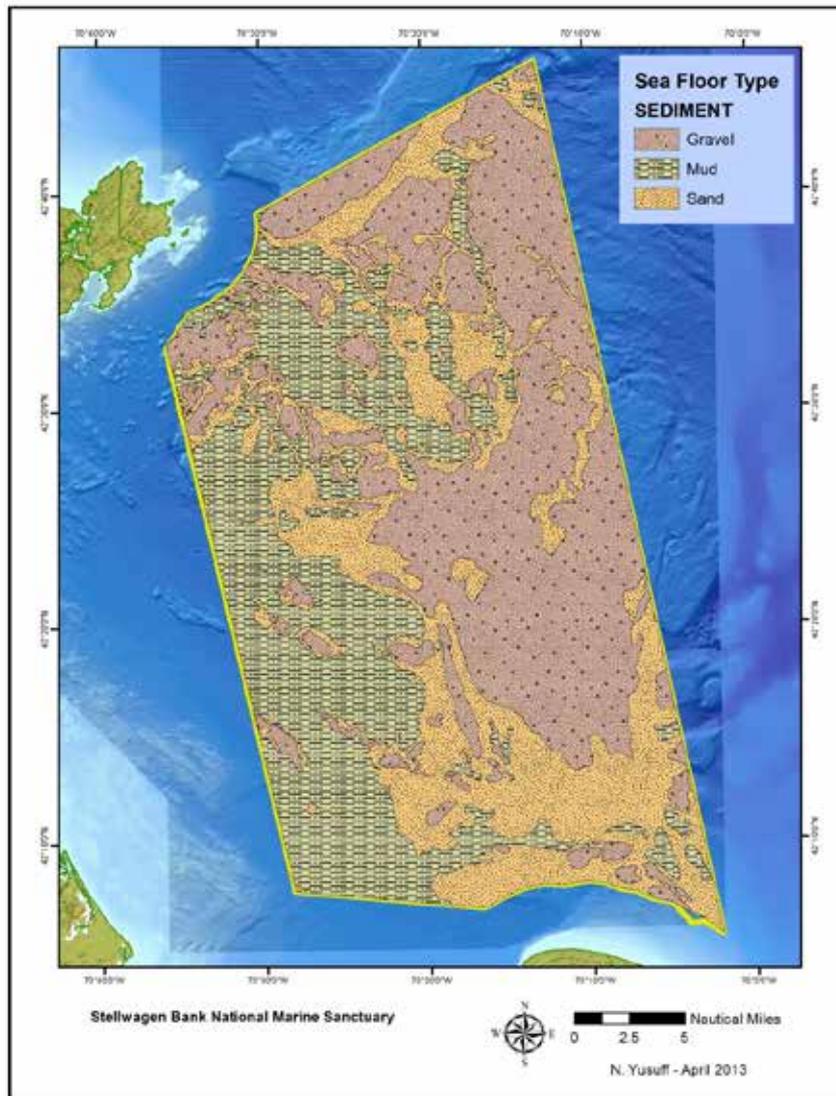


Sitting

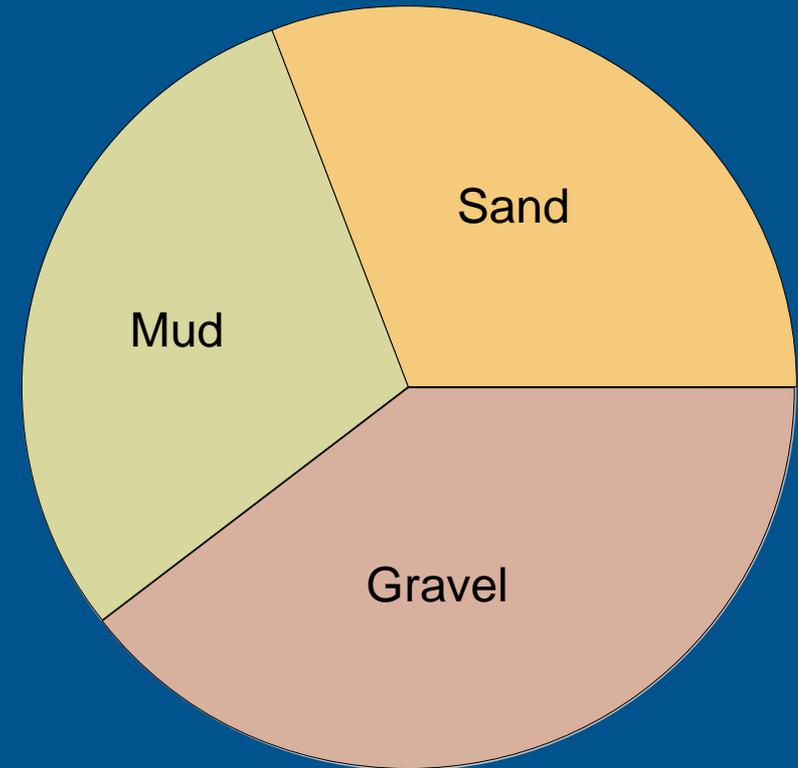


National Marine Sanctuaries National Oceanic and Atmospheric Administration

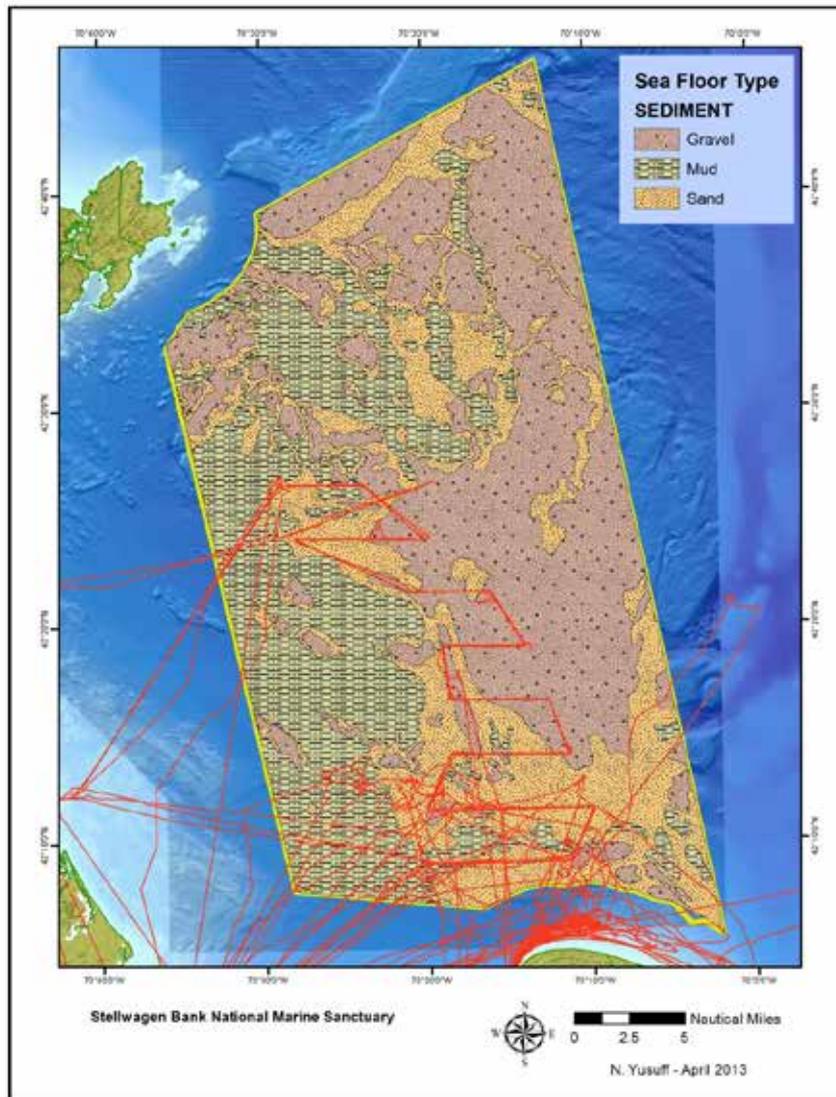




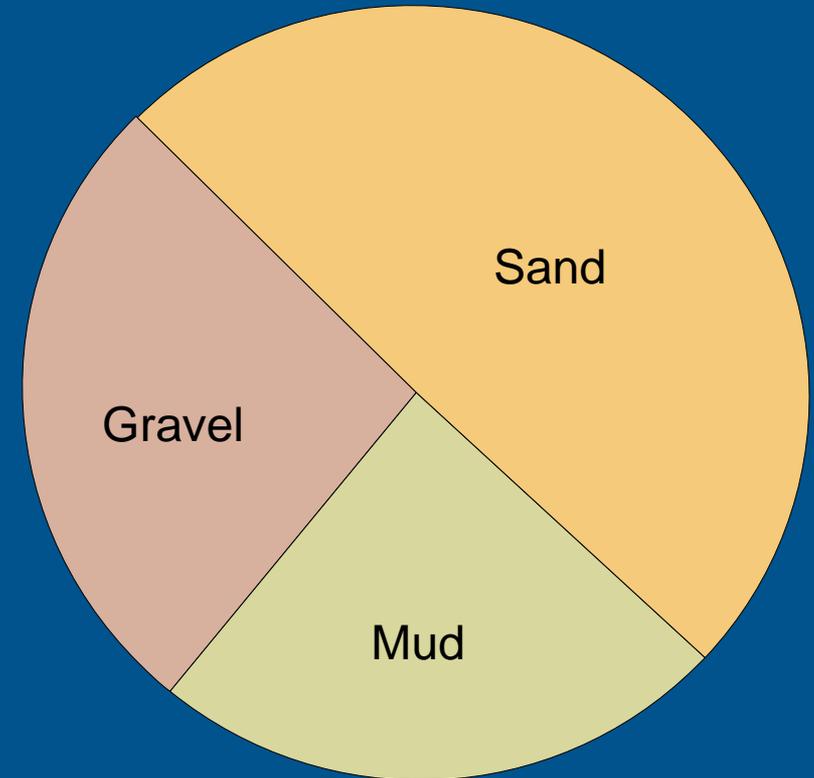
Stellwagen Seafloor



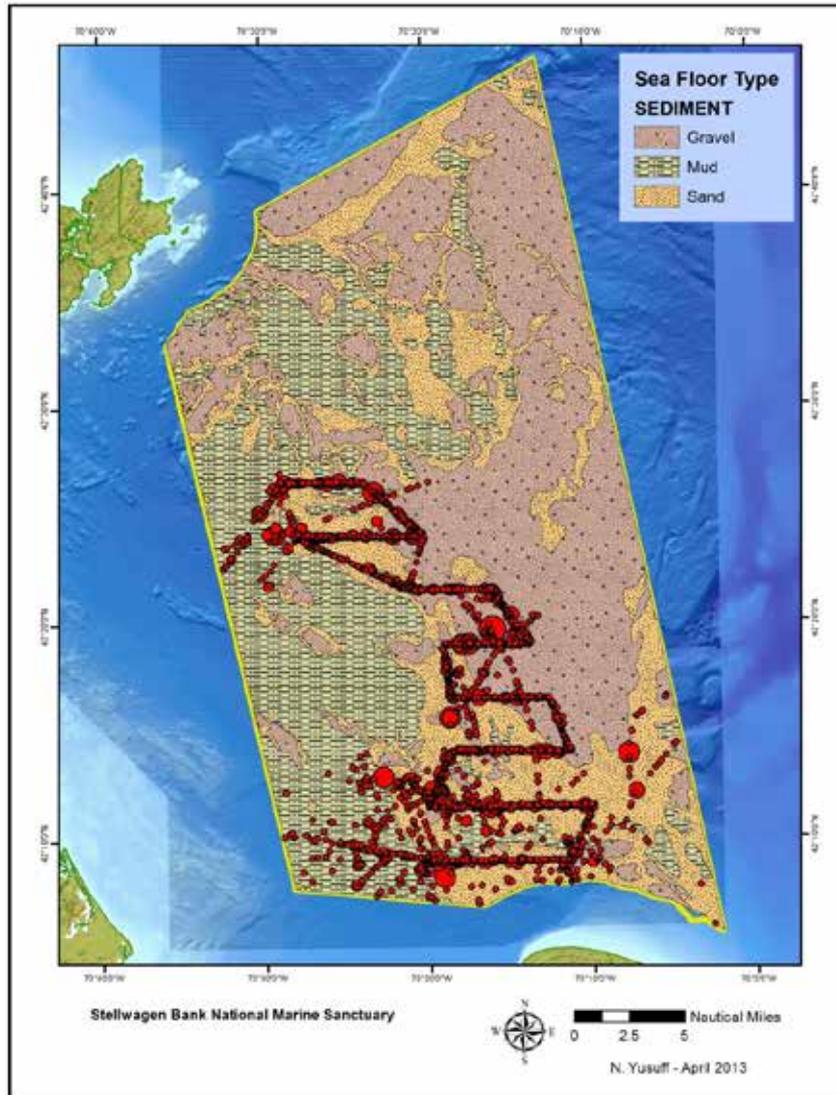
Seafloor in the sanctuary is about equal parts sand, mud and gravel.



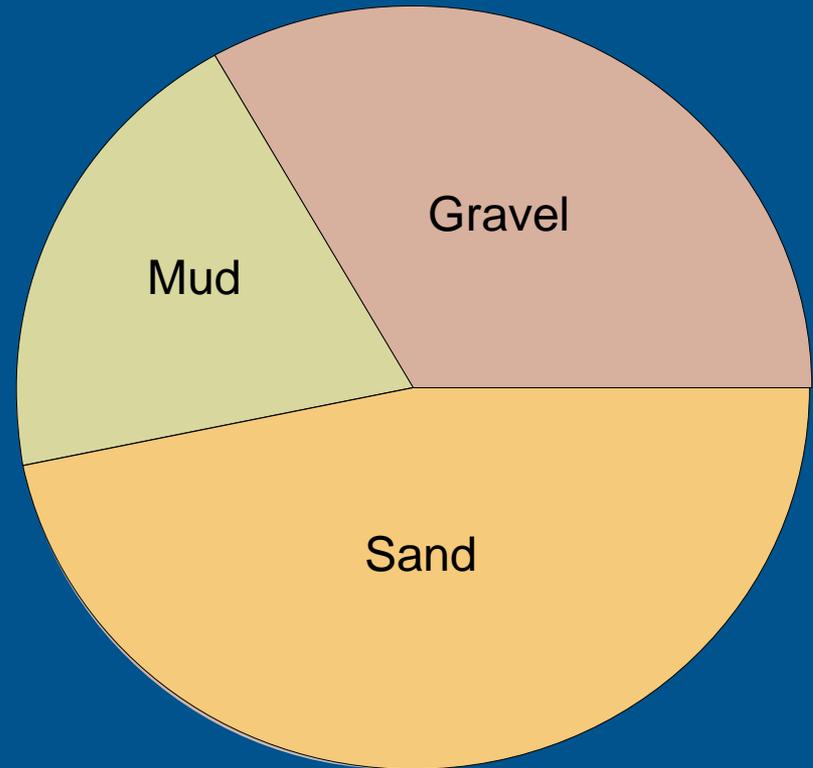
Seabird Survey Tracks



Seabird surveys over-represent sand and under-represent gravel and mud seafloor habitats.



Sanctuary Bird Sightings



More seabird sightings are over gravel sea floor than expected.

Next Steps



- Continue analysis
 - Fish & whale data
 - Water depth
 - Historical data
- Compare data collection protocols
- Spring recruiting & training
- Add 3 more ports for weekly trips on whale watch vessels

Brookline Bird Club Pelagic Trips



The Brookline Bird Club charters a fishing boat out of Hyannis four times a year to look for pelagic birds. (June, July, August, and November)

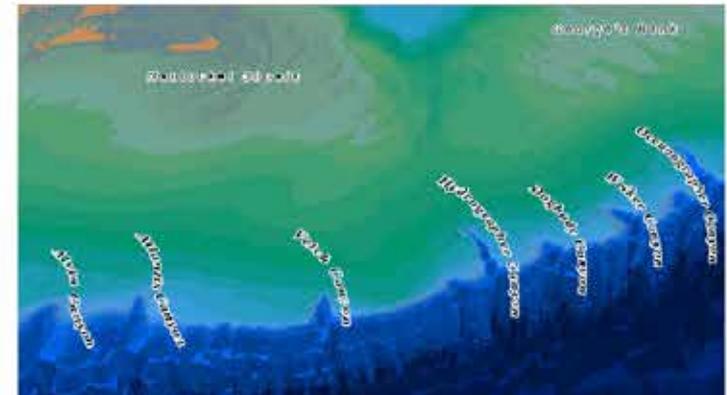
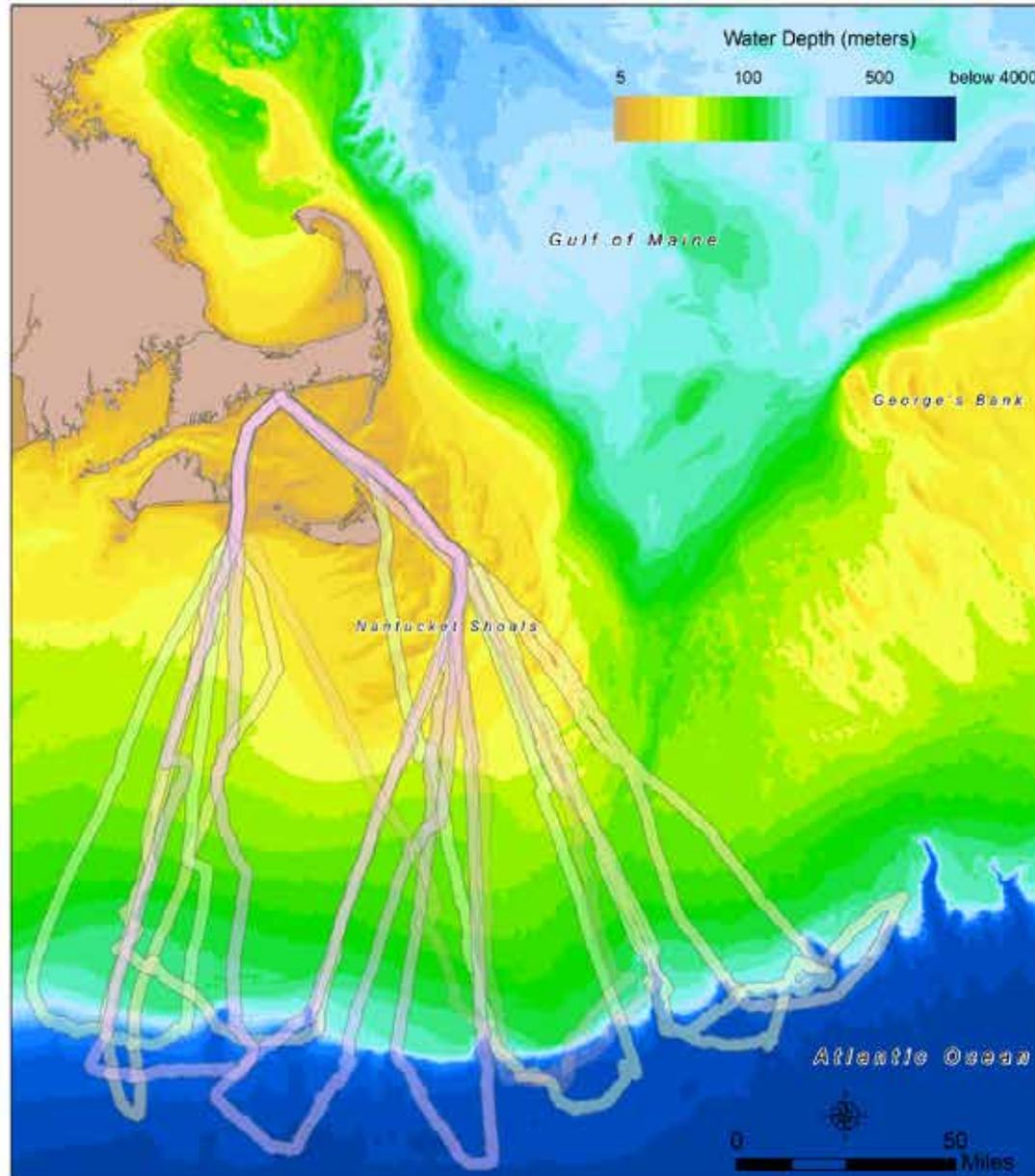
Sightings of birds have been recorded on these trips in ½ hour increments and submitted to eBird. (Thanks to Marshall Illiff)



(photo by Steve Myrick)

**The ocean is a big place –
where should we go to find the
birds?**

Continental Shelf and Canyons South of Cape Cod



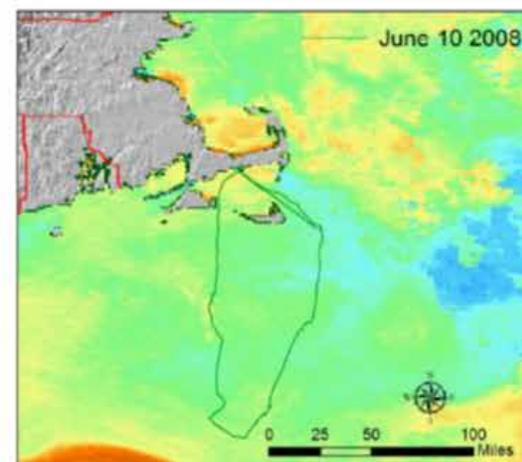
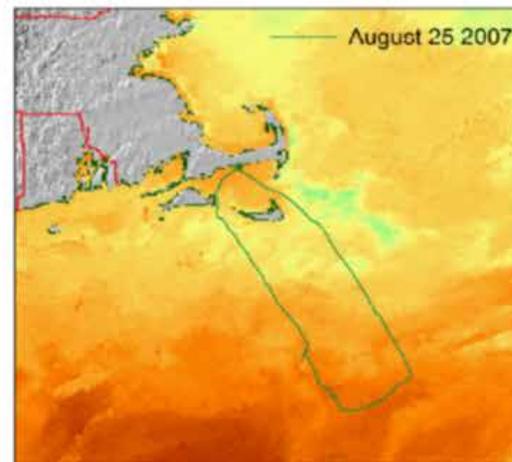
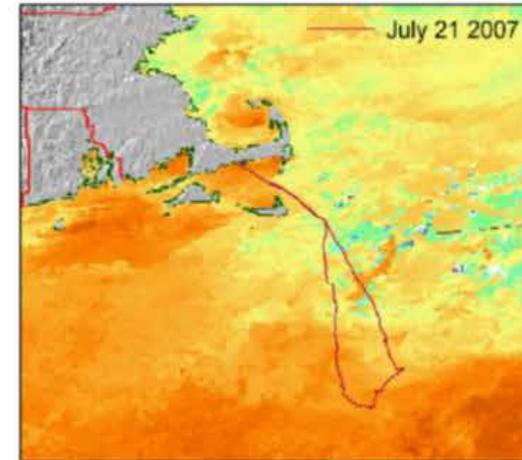
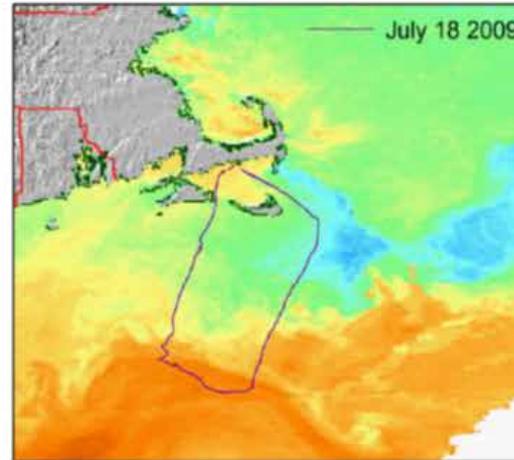
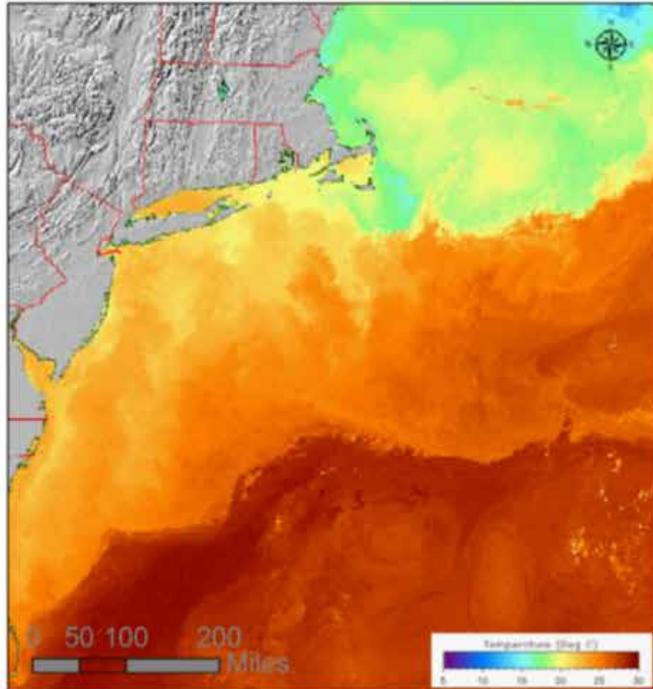
The Brookline Bird Club has been visiting the canyons on continental shelf edge south of Cape Cod since 2007. The upwelling at the shelf edge creates a nutrient-rich environment for birds and other wildlife. Highlights of birds seen (ABA Code 3 and greater) include Great Skua, Little Shearwater, White-faced Storm-petrel, Red-billed Tropicbird, and Little Gull.

Brookline Bird Club Pelagic Trips

- 21 July 2007
- 25 August 2007
- 28 June 2008
- 19 July 2008
- 23 August 2008
- 18 July 2009
- 26 June 2010
- 28 August 2010
- 16 July 2011
- 21 July 2012
- 26 August 2012



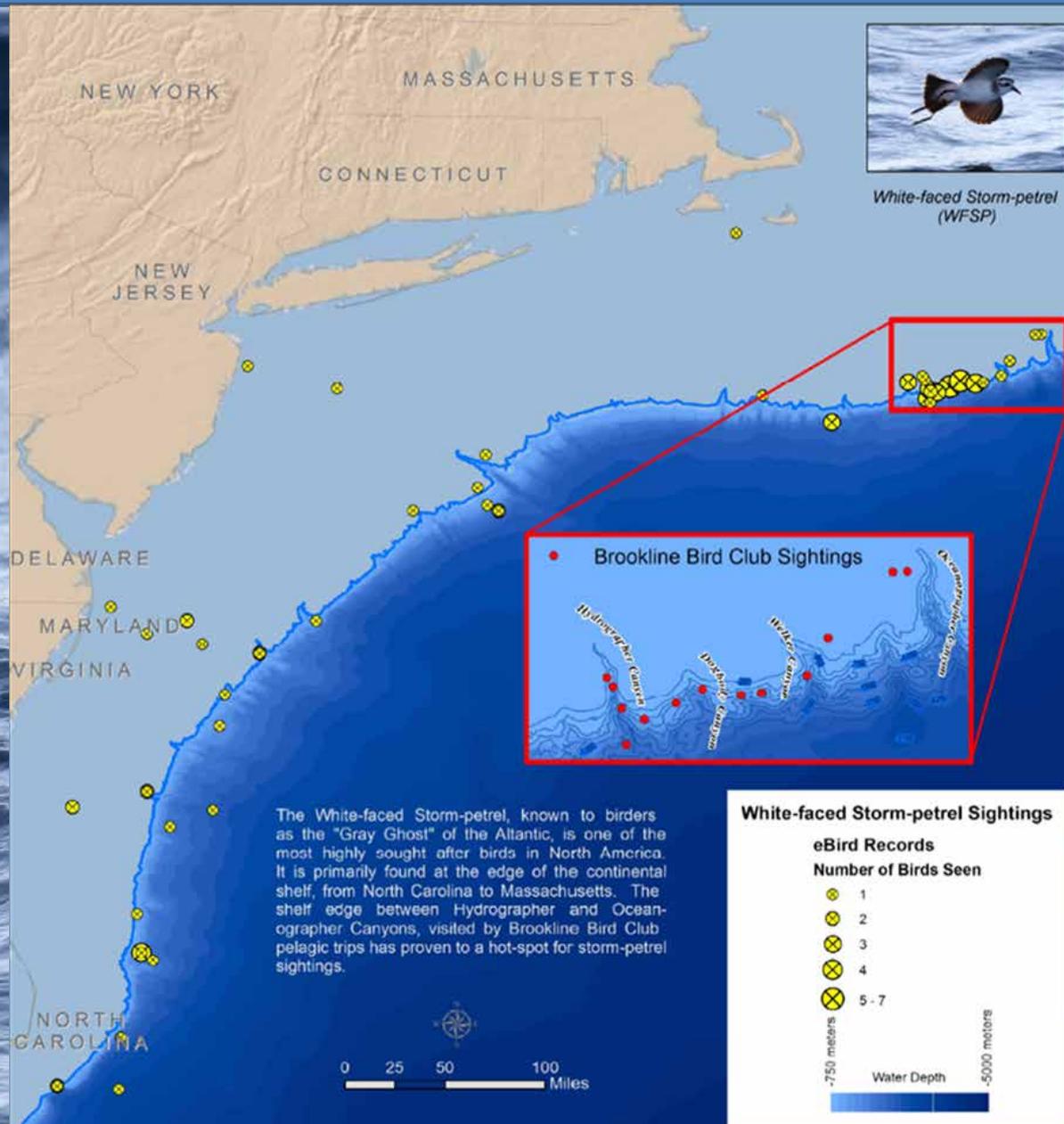
The Influence of the Gulf Stream on Massachusetts Pelagic Birds



The Gulf Stream is a powerful ocean current which delivers warm waters from the tip of Florida along the Atlantic coast. The exact position of the current changes seasonally and from year to year. Water-water eddies form on the northern fringes of the Gulf Stream, often delivering 80C water off the coast of Massachusetts. The upwelling associated with the Gulf Stream as well as the interaction with the nutrient rich waters of the Labrador current entices warm water species to migrate along the Gulf Stream. Warm water bird species, such as Audubon's Shearwater, Band-rumped Storm-petrel, Cory's Shearwater, Black-capped Petrel and Bridled Tern have been seen off the coast of Massachusetts associating with warm Gulf Stream influenced waters.

The Brookline Bird Club pelagic bird watchig trips from Cape Cod target areas with warm Gulf Stream water incursions in years when they are near the Massachusetts coast.

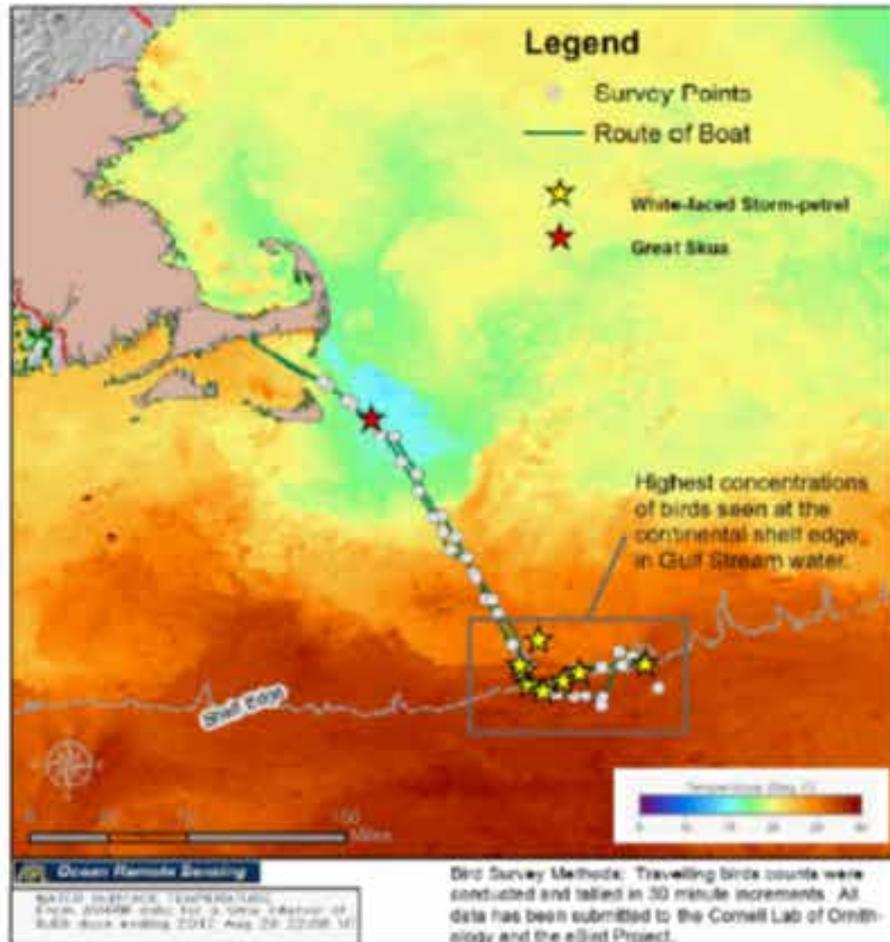




Brookline Bird Club Pelagic Trip August 28-29, 2010

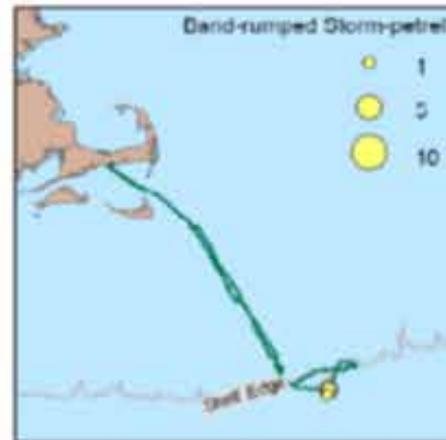
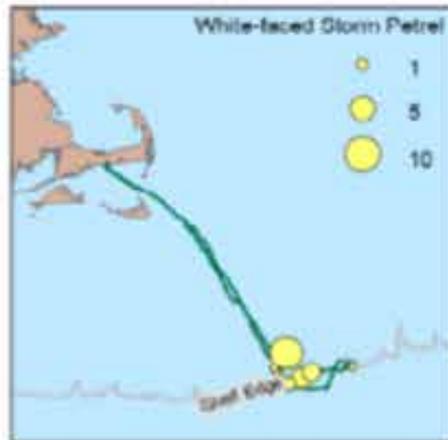
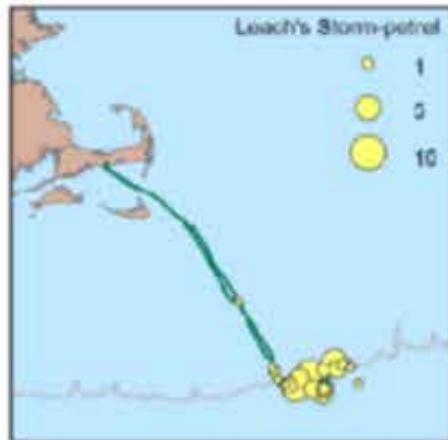
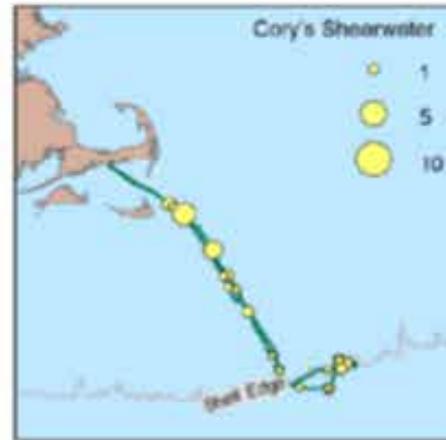
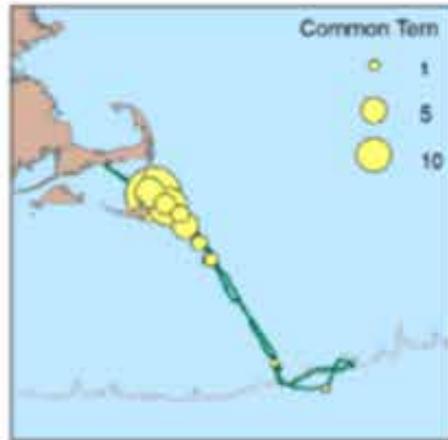
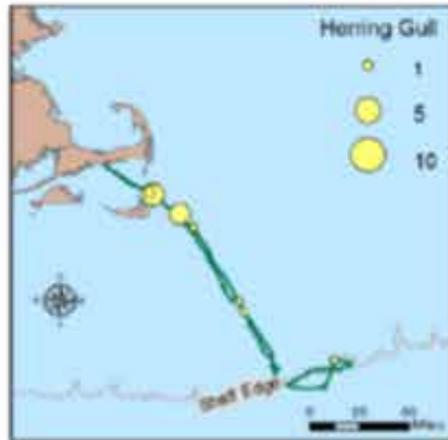
Birds observed:

Common Loon 9
Cory's Shearwater 15
Great Shearwater 40
Manx Shearwater 5
Audubon's Shearwater 5
Wilson's Storm-Petrel 1256
White-faced Storm-petrel 22
Leach's Storm-Petrel 83
Band-rumped Storm-petrel 10
Northern Gannet 34
Great Skua 1
Pomarine Jaeger 1 (Hydrographer Canyon)
Parasitic Jaeger 2 (Nantucket Shoals)
Long-tailed Jaeger 2 (Nantucket Shoals)
Herring Gull 30
Lesser Black-backed Gull 2
Great Black-backed Gull 16
Common Tern 131

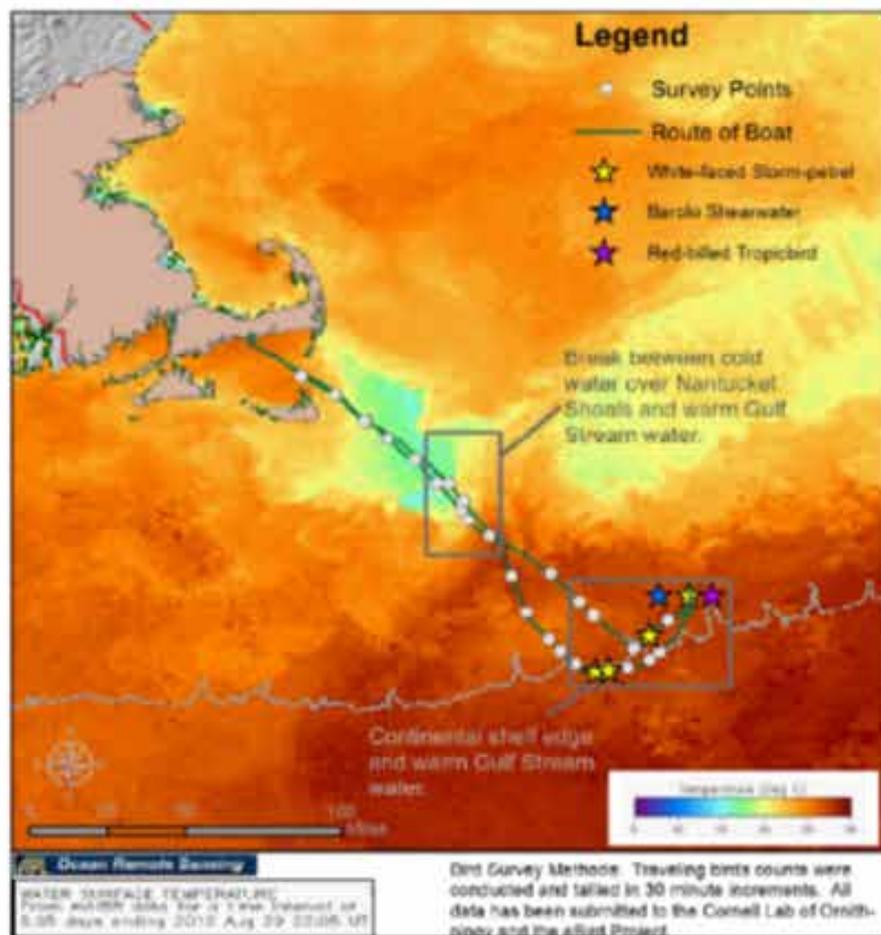


(Courtesy of Brookline Bird Club and Rick Heil)

Brookline Bird Club



Brookline Bird Club Pelagic Trip August 25-26, 2012



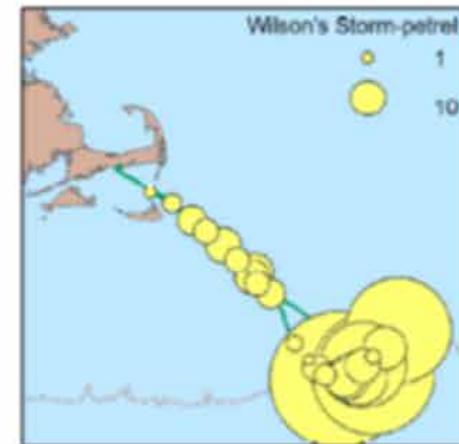
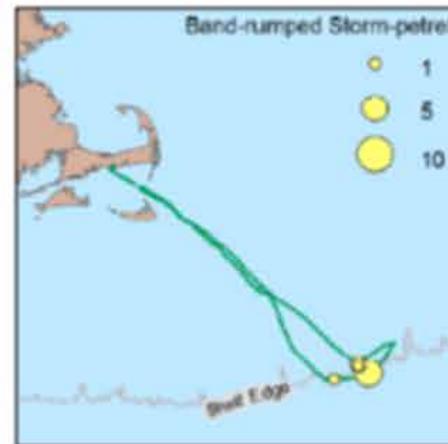
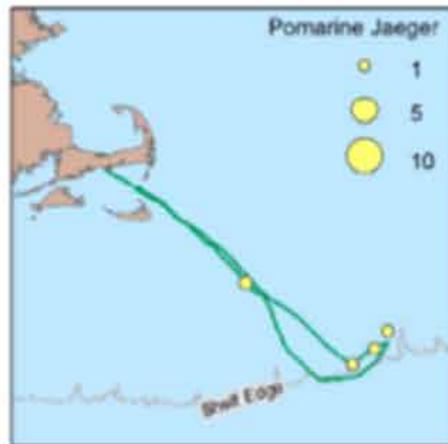
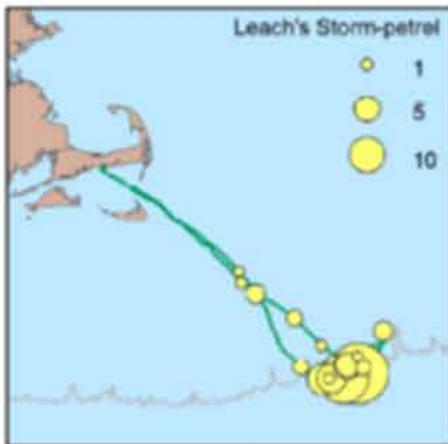
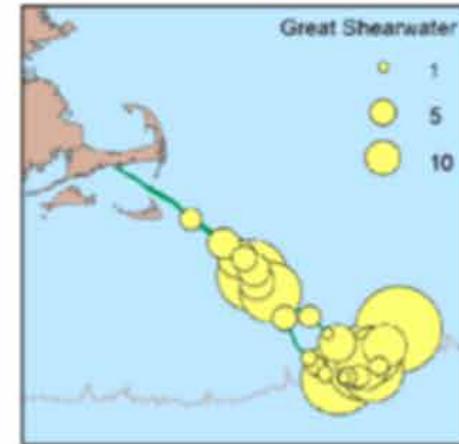
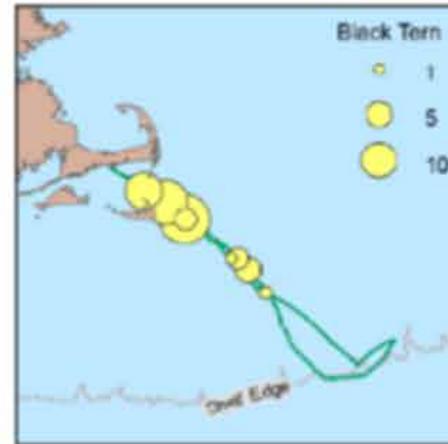
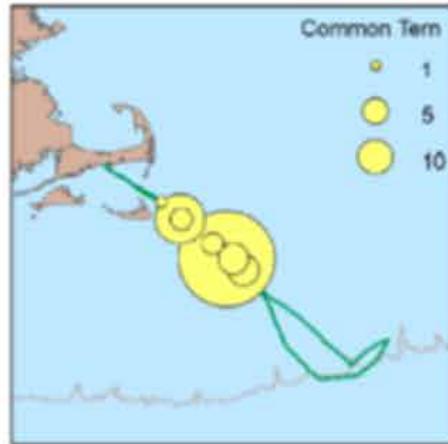
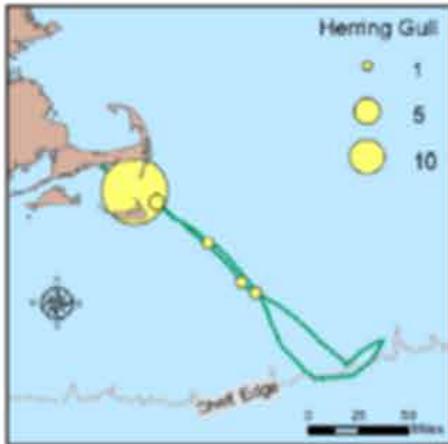
The Aug 25-26 Brookline Bird Club pelagic trip to Dogbody, Oceanographer, and Welker Canyons was undoubtedly the best New England pelagic ever. All the shearwaters and storm-petrels currently on the MA state list were seen, including the White-faced Storm-petrel and Barolo Shearwater. Highlights:

- Barolo Shearwater- 1 Oceanographer Canyon
- Band-rumped Storm-petrel- 9
- Audubon's Shearwater - 3
- Leach's Storm-petrel- dozens
- Long-tailed Jaeger – 1
- Pomarine Jaeger – 4
- Black Terns – many
- Migrating Hudsonian Godwits – 10
- Red-billed Tropicbird- 1 juvenile
- Bridled Tern- 1
- White-faced Storm-petrel- 7

(courtesy of Brookline Bird Club)



Brookline Bird Club





Barolo Shearwater, Oceanographer Canyon
August 26, 2012

Where should the
Brookline Bird Club go?

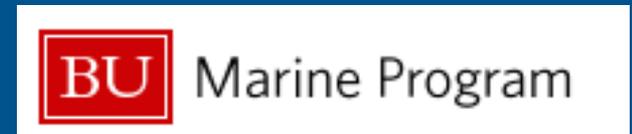
- Shelf edge
- Area with warm Gulf Stream water
- Areas with sharp temperature breaks



Thanks to the
Brookline Bird Club!



Collaboration



Brookline Bird Club
100th Anniversary Celebration
Celebrating 100 Years Of Birding In Massachusetts





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Photo: Evelyn Ganson