



***TOWARD A US ANIMAL TELEMETRY
OBSERVING NETWORK (ATN)
FOR OUR OCEANS, COASTS AND
GREAT LAKES***

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Institution: US IOOS[®]

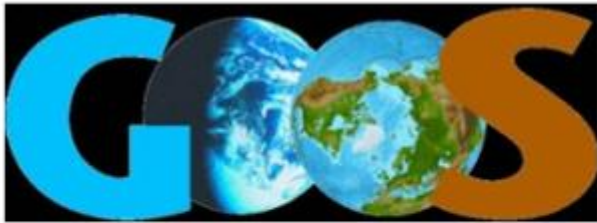
Contact info. Hassan.Moustahfid@noaa.gov

U.S. IOOS: Program Overview

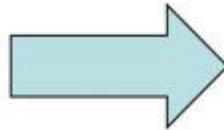


A National Endeavor

But Part of a Global Framework



Global Ocean Observing System

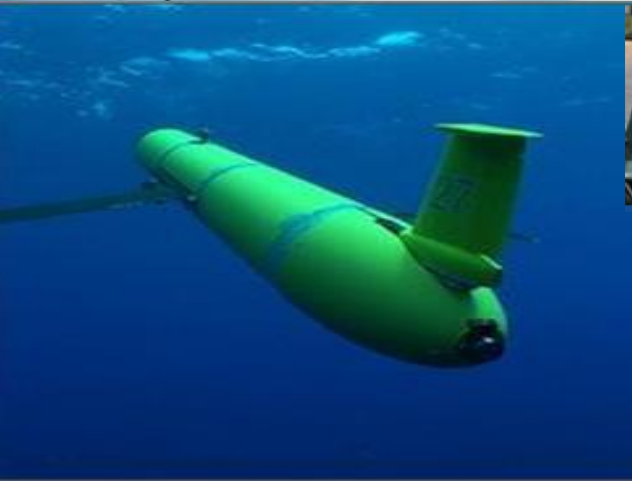


Global Earth Observation System of Systems



Enables decision making & science

Eyes on the Oceans, Coasts and Great Lakes



Observing Systems



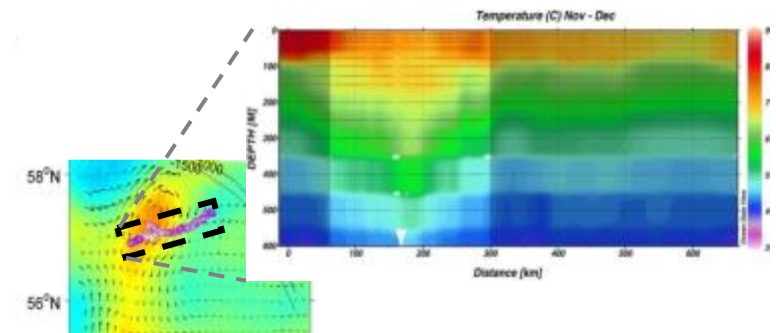
U.S. Integrated Ocean Observing System (IOOS)

Animal Telemetry: Why is it Significant?

- ❑ Animals record the ocean environment and fine-scale behavior of individuals even in the most remote regions of the world's oceans (polar oceans or remote atolls)
- ❑ Provide vertical oceanographic profiles throughout the upper 1500 m of the water column and in some cases deeper (3000m)
- ❑ Provide unique datasets for resource management, ecosystem health and ocean modelers



Photo: NOAA



Cross section of the eddy that the female elephant seal swan through. Showing its down welling nature.
(Courtesy: Costa, UCSC)

BENEFITS OF AN US ANIMAL TELEMETRY NETWORK (ATN) THROUGH US IOOS



**Improving
Ocean Forecasts**

**Defining Essential &
Critical Habitats for
Spatial planning**

**Providing Real-Time
Monitoring of Animals**

**Improving Fisheries
Management**

**Protecting
Endangered Species**



Existing ATN programs/Projects



Current ATN Developments:



Global Tagging of Pelagic Predators

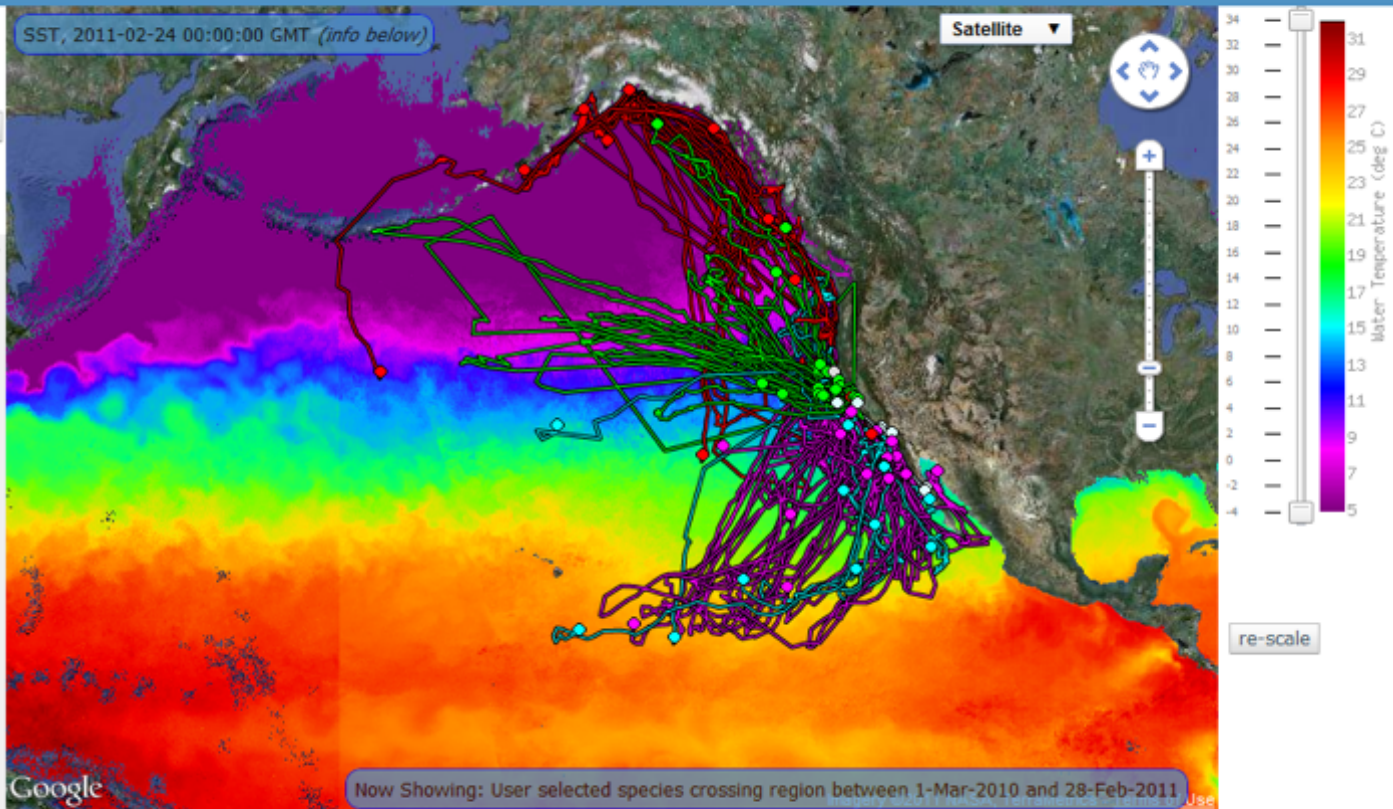
Home

Browse GTOPP tags with the tree OR use the menu below the map to extract tags in a region by species and time range.

Click on a species name to see recently reporting tags, click on a year to see tags reporting during that year:

Help

- [-] [+] Cetacean
- [-] [+] Fish
- [-] [+] Pinniped
- [-] [+] Seabird
- [-] [+] Shark
 - [-] [+] Blue Shark
 - [-] [+] Common Thresher Shark
 - [-] [+] Juvenile White Shark
 - [-] [+] Salmon Shark
 - [-] [+] Shortfin Mako Shark
 - [-] [+] White Shark
- [-] [+] Squid
- [-] [+] Turtle
 - [-] [+] Leatherback Sea Turtle
 - [-] [+] Loggerhead Sea Turtle



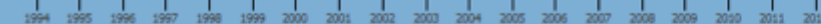
Extract tags in selected region by species and time range.

Choose species Time: Mar 01, 2010 to Feb 28, 2011 days: 364

Show tracks in region

Remove region

69 user selected tags on the map

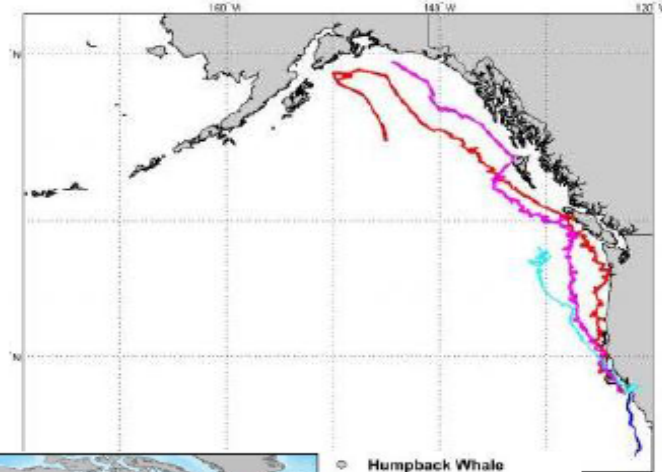
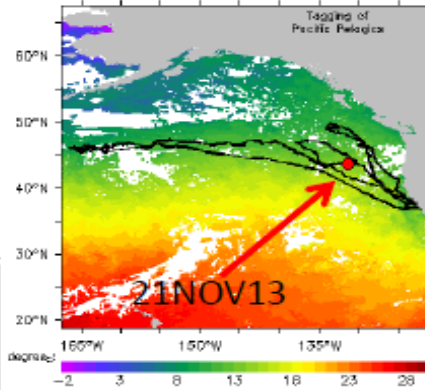


From Animals to GTS to Ocean Modelers

Rec'

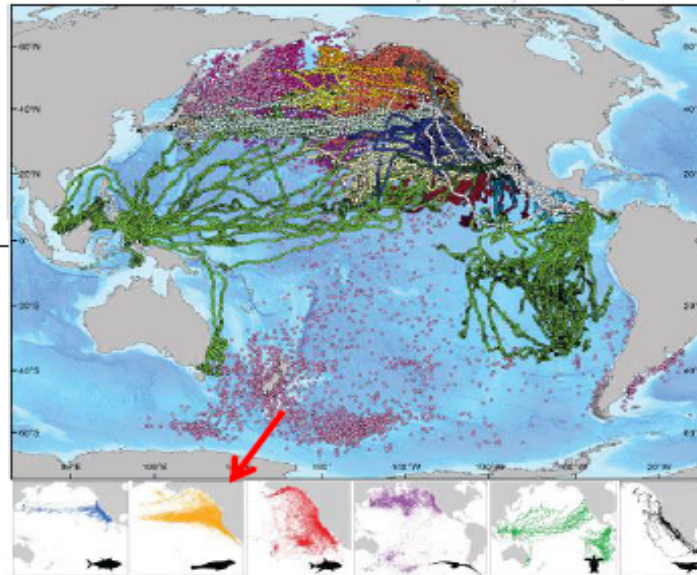
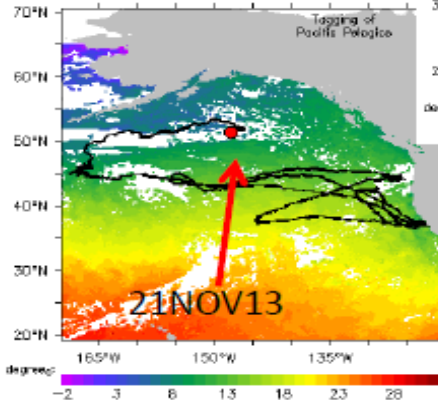
Elephant Seals with Instrument Packages

Blended: 14-NOV-2013 to 21-NOV-2013



Some tracks from 2013 CTD tags deployment of e-seals

Blended: 14-NOV-2013 to 21-NOV-2013



In the morning

th

UCSC.

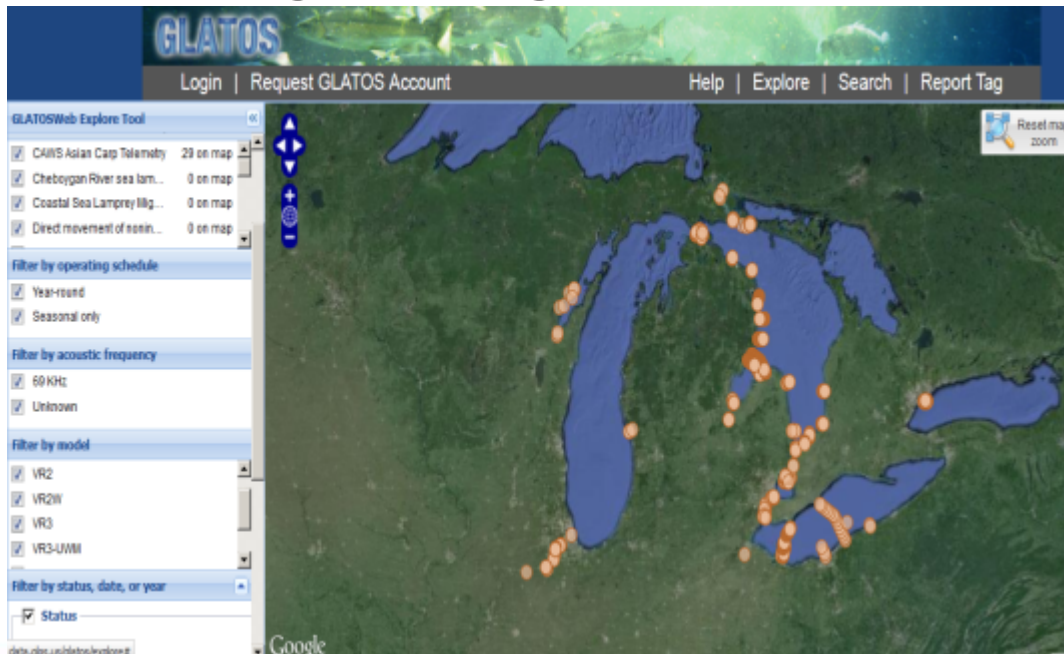
GLATOS

Great Lakes Acoustic Telemetry Observation System

To Advance the Protection and Recovery of Great Lakes Fishes

- Network of more than 400 Acoustic Receivers
- More than 2300 fish have been tagged
 - Green Bay Lake Sturgeon, Walleye, Lake Trout, River Sea Lamprey)

<http://data.glos.us/glatos/explore>



Animal Telemetry Supports Adaptive Management of Salmon and Steelhead

NANOOS
NORTHWEST ASSOCIATION OF NETWORKED OCEAN OBSERVING SYSTEMS

Stations [0,430](#)
(# ID: ohnepstations)
27 494 to -123.921°E, latitude = 46.54168 to 50.90093°N
[License](#) | [FGOC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Subset](#) | [Data Access Form](#)

Graph Type: markers @
X Axis: longitude
Y Axis: latitude
Color: platform_depth

Optional Constraint #1 @
Optional Constraint #2 @

Server-side Functions @
 district() @
orderBy: *
orderBy/Max: *

Graph Settings

Click on the map to specify a new center point. @
Zoom:



OTN Members Portal

OCEAN TRACKING NETWORK

only in current section

You are here: Home > Discovery > NE PACIFIC Ocean

NE PACIFIC Ocean

[All Public Data](#) [Other pages](#) [Collaborative Groups](#) [Collaborative Types](#) [Collections](#) [Contacts](#) [Countries](#) [Data Landfills](#) [Institutions](#) [Keywords](#) [Marker Types](#) [Published to OBIS](#) [Data Releases](#) [Species](#) [Tidal Records](#)

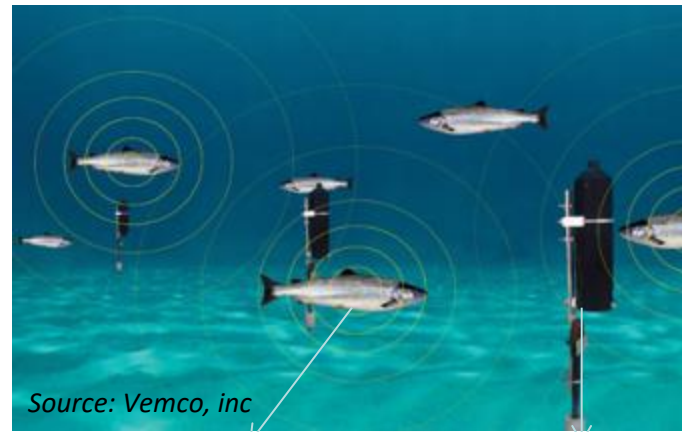
Title: **Collection Code:** NEPACIFIC. **Short Name:** NE PACIFIC Ocean. **Long Name:** Ocean Tracking Network NE PACIFIC Ocean Data Series.

Citation: Barnes, C., Grimes, C. 2005. Ocean Tracking Network Northeast Pacific Metadata and Data Series. In: Ocean Tracking Network Global Metadata and Data Atlas Retrieved January 29, 2014 from oceanttrackingnetwork.org

Status: **Devising.**

Related Collections: **Included In:** GLOBAL. **Includes:** Collections: ACSK, ADM, ALSEA, ANDRW, BALF, BEAM, BISH, BLCK, BOOONC, BRGR, BRJKN, BRKS, BURR, CAPL, CASC, CHIT, CHNR, COUR, COQT, CONVR, OPELIZ, CLUT, DION, DSO, ENGR, ERKSN, ESS, FRASER, FRSH, GDBT, GILLY, GOETZ, GRAVES, GRAWN, GRH, GUL, HAYS, HERG, HWCH, HODG, HOWE, INDRAM, JDF, KEQG, KLIM, KNIM, LDUI, LEE, LIND, LIPPY, MACFL, MEL, MILNDK, MMS, MOSER, MRS, NMR, NOAK, NSOG, NULLR, PFLG, PGS, POSS, PSS1, PSS2, PSS3, PSS4, PTATH, PWS, PWSHNE, PWSSHK, QCS, RABY, RCS, REYES, ROBD, SALMR, SEYMR, SHAW, SKEENA, SSOQ, UNP, VIP, VNCONT, VOGL, VRTT, WILL, WOOD, YRRC.

Taxonomic Coverage: **Scientific Name(s):** *Acipenser medirostris*, *Acipenser transmontanus*, *Cancer magister*, *Cyanus capillata*, *Dosidicus gigas*, *Euteractopus dolieni*, *Harencus grevus*, *Hydrolyagus colie*, *Lamna ditropis*, *Morone saxatilis*, *Nelusetta ayraudi*, *Oncorhynchus tshawytscha*, *Oncorhynchus kisutch*, *Oncorhynchus mykiss*, *Oncorhynchus nerka*, *Oncorhynchus tshawytscha*, *Ophiodon elongatus*, *Parophrys reticulatus*, *Phacelophore camtschaticus*, *Salvelinus confluentus*, *Salvelinus malma*, *Squalus acanthias*. **Common Name(s):** char, Chinese salmon, chum salmon, nasal ruffhead trout, Crabe salmon, Dolly Varden char, Kamonaco crab, French sole, flat sole, whitefish, razor flounder, northern ocean chinook



Source: Vemco, inc

Salmon tagged with Acoustic tags



Underwater Acoustic receivers



Management Response: Tiger Shark Case in Hawai'i

IOOS INTEGRATED OCEAN OBSERVING SYSTEM Contact f Follow

Pacific Islands Ocean Observing System






by observing we learn

Home Regions About Focus Areas Data Access Outreach & Education Projects

Home > Projects > Hawai'i Tiger Shark Tracking

Projects

Pick a shark:

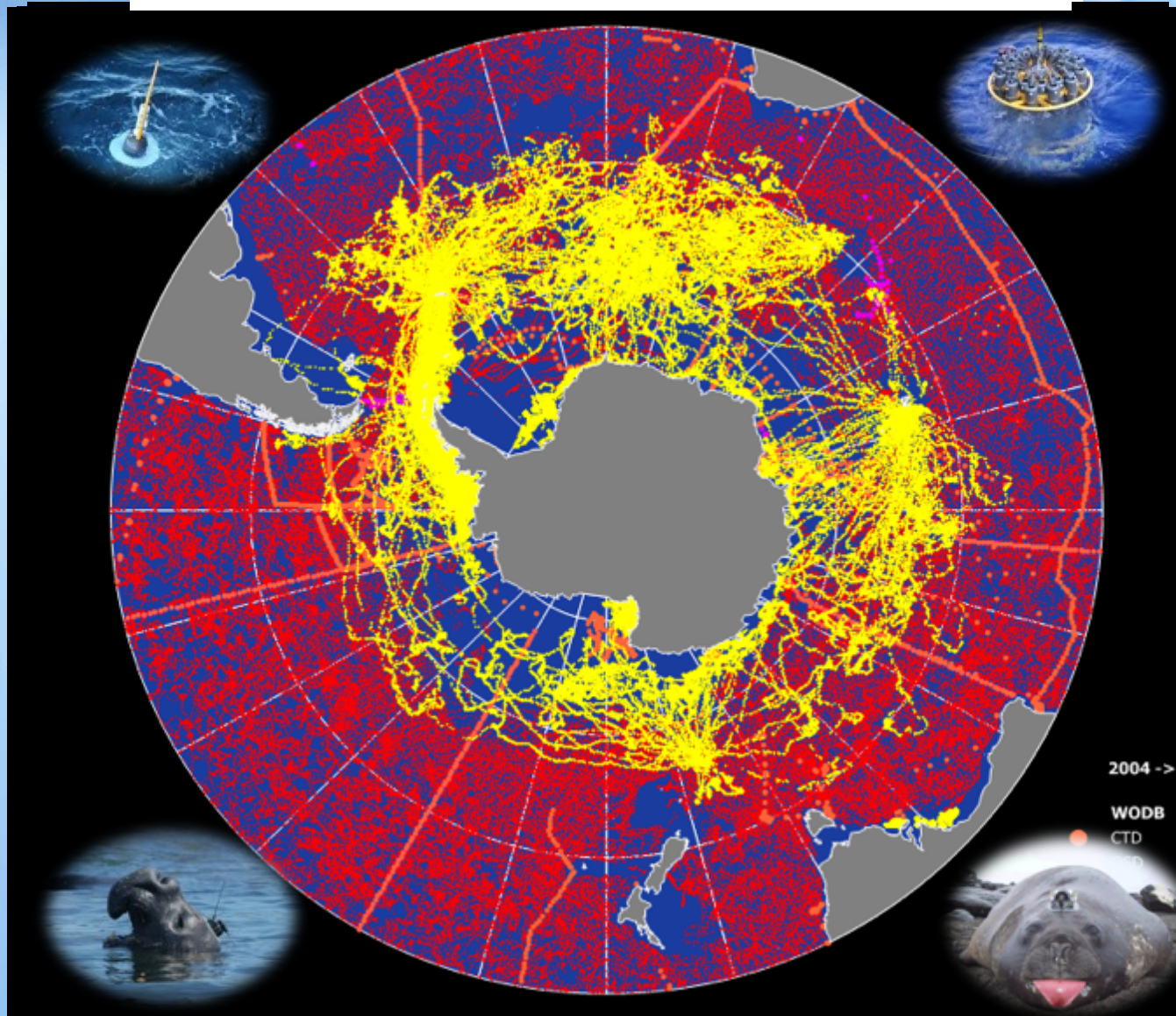
-  133361
12.3 ft (3.7 m) female
-  133362
13.5 ft (4.1 m) female
-  133368
13.4 ft (4.1 m) female
-  133369
9.3 ft (2.8 m) male
-  133370
14.2 ft (4.3 m) female

Hawai'i Tiger Shark Tracking



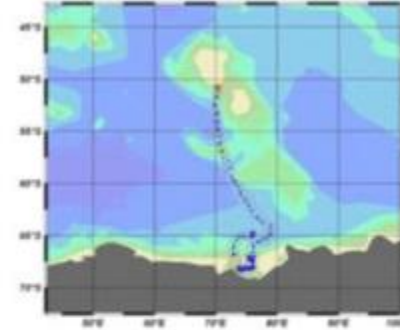
Improving Ocean Forecasts

All Sources



Source: *Southern Elephant Seals as Oceanographic Samplers (SEaOS)*

Animal Telemetry for Assessing Ecosystem Health



chlorophyll

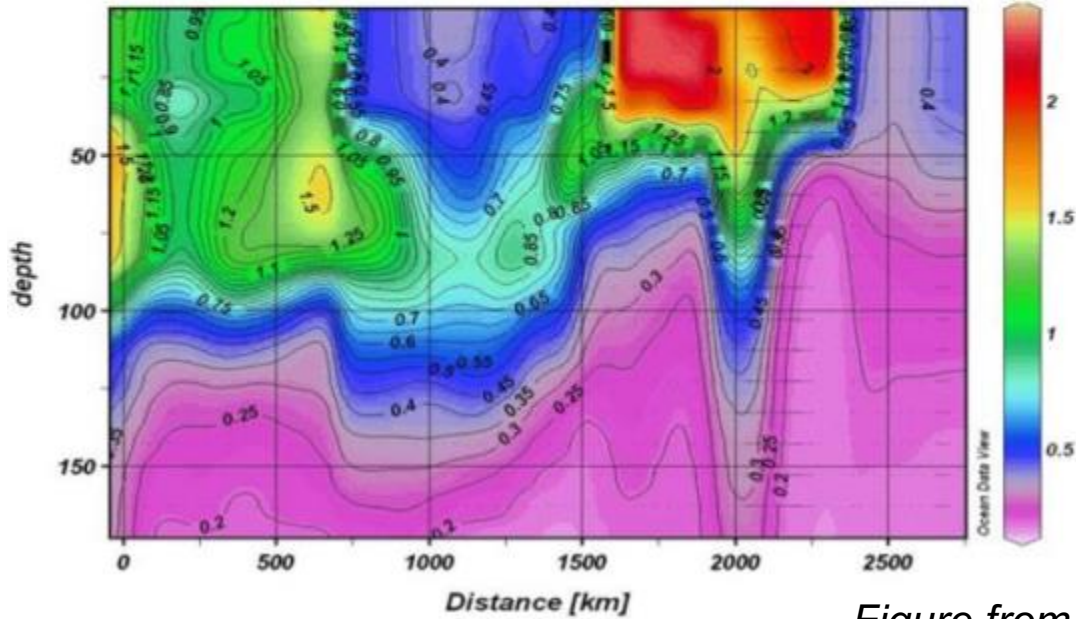
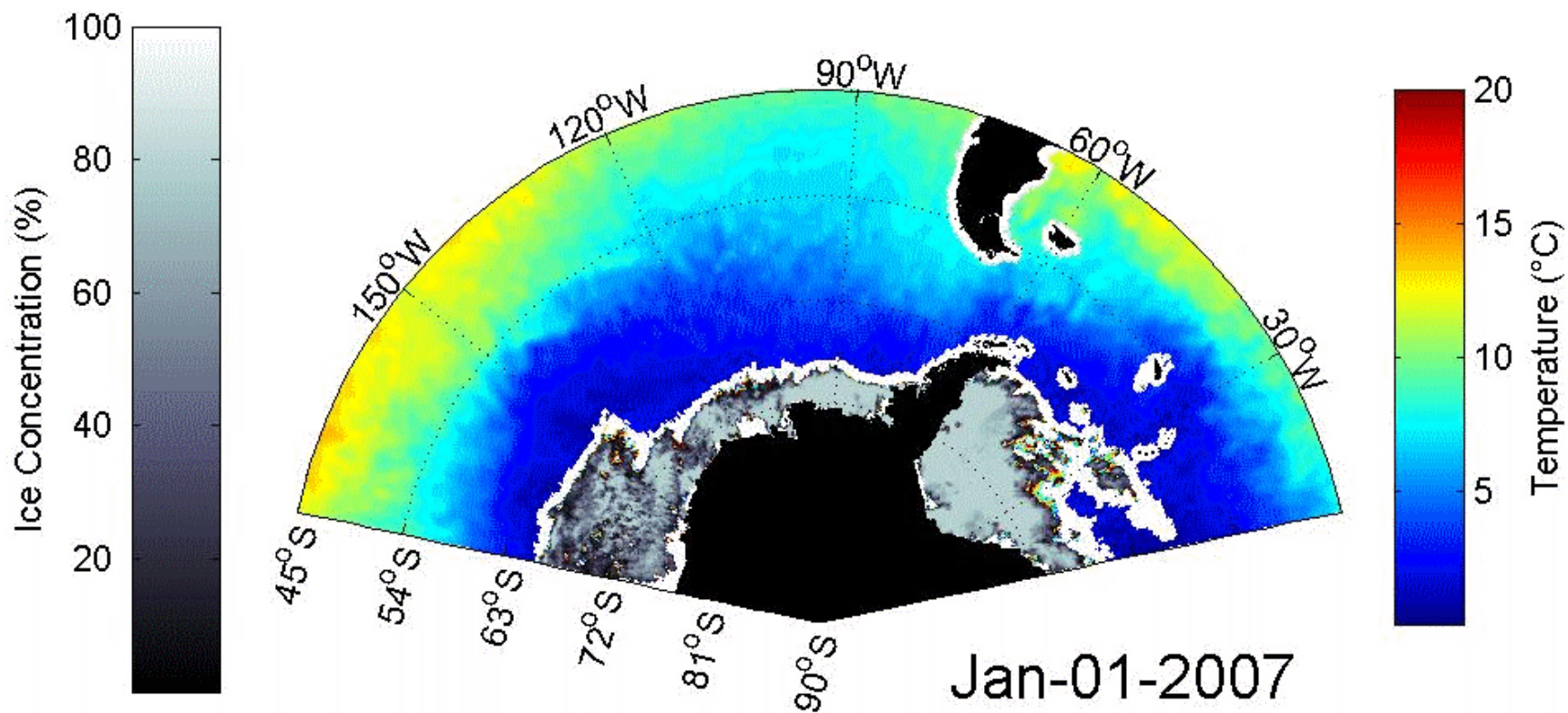
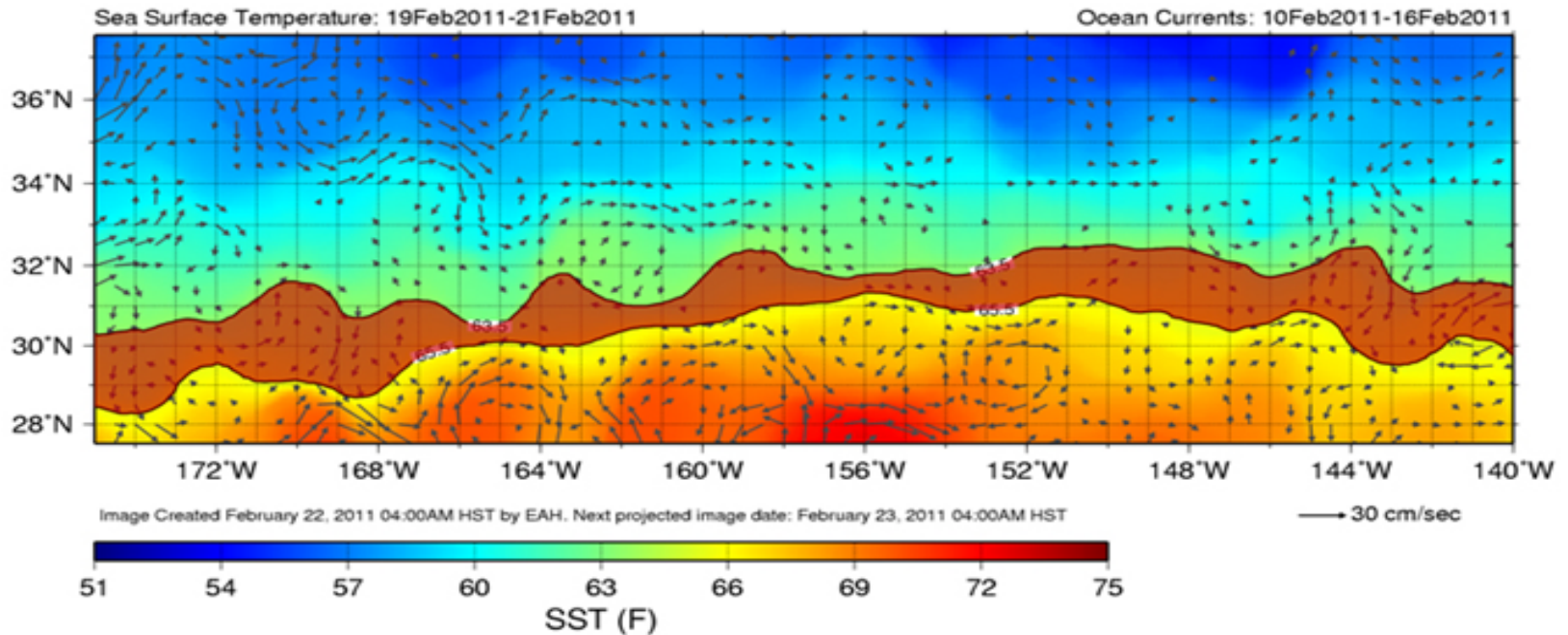


Figure from Guinet et al. 2013)



Reduce Bycatch of Loggerhead Turtles in Hawaii in Longline Fishery

avoid fishing between solid black 63.5°F and 65.5°F lines
to reduce turtle interactions



PACIFIC ISLANDS FISHERIES SCIENCE CENTER
ECOSYSTEMS AND OCEANOGRAPHY DIVISION
2570 Dole Street, Honolulu, HI 96822
<http://www.pifsc.noaa.gov/eod/turtlewatch.php>
contact: Evan.Howell@noaa.gov
Data provided by Central Pacific CoastWatch node

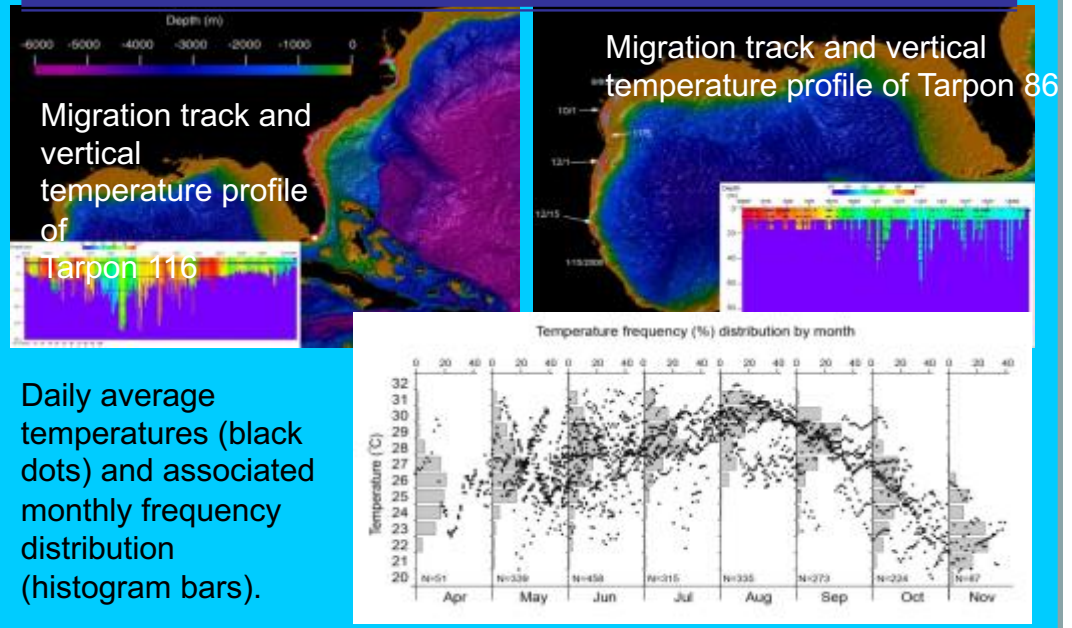
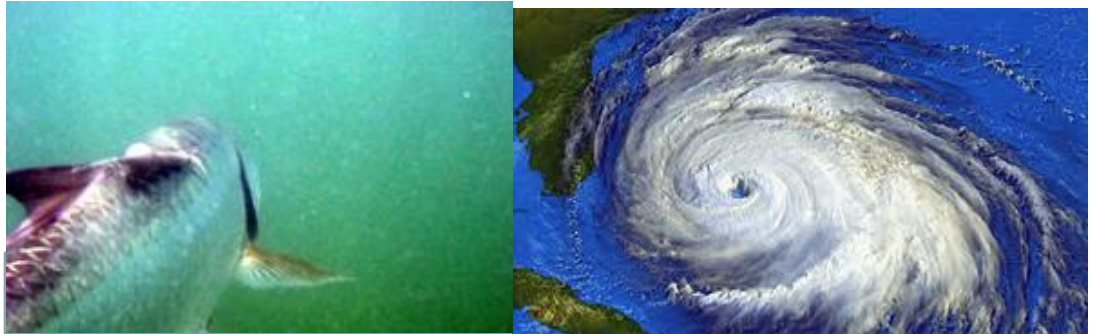
TURTLEWATCH



<http://sos.noaa.gov/Datasets/dataset.php?id=181#>

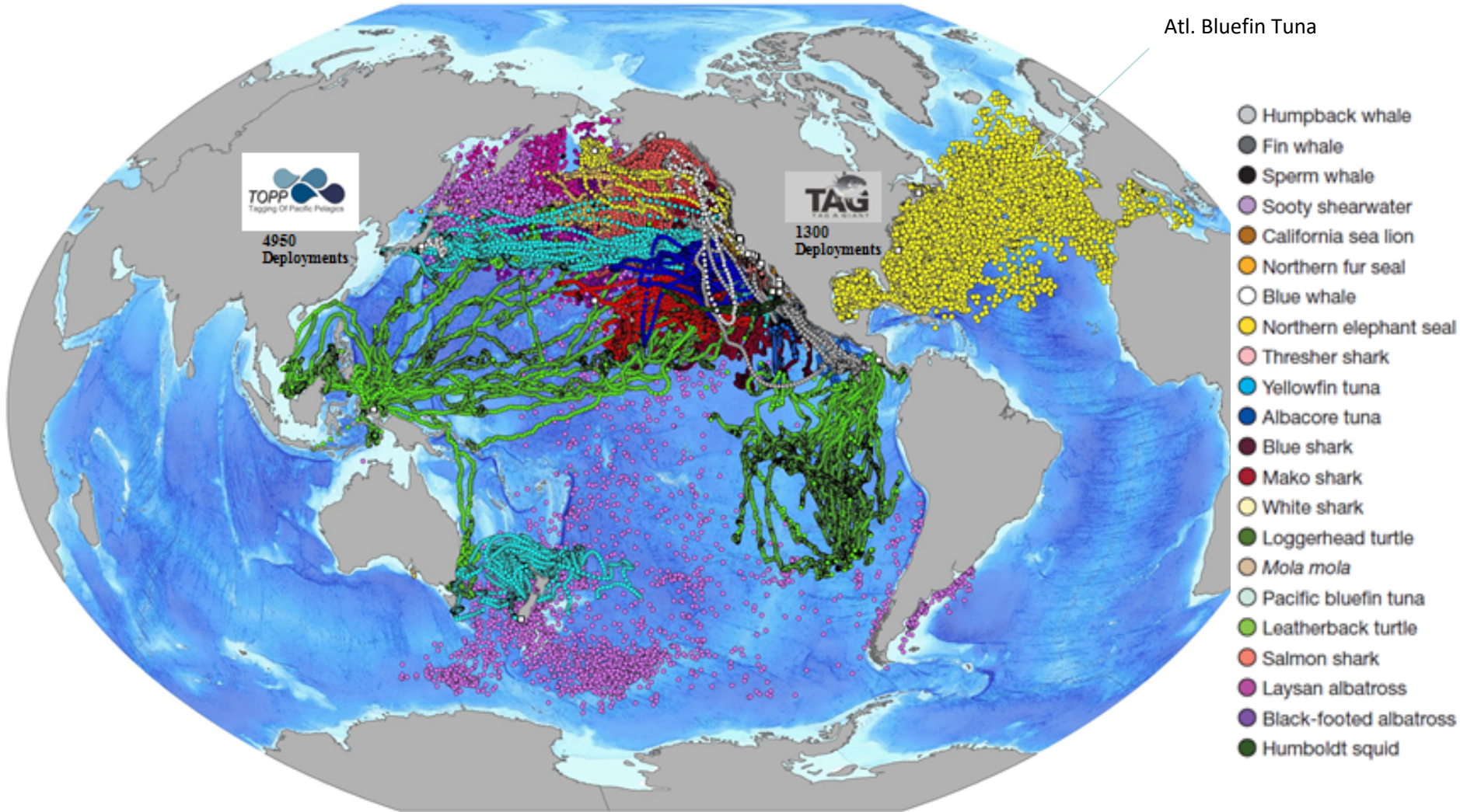
Fishing for Hurricanes

- What Do Hurricanes and Tarpon Have in Common?
- They all prefer SST greater than $26\text{ }^{\circ}\text{C} = 78.8\text{ }^{\circ}\text{F}$.
- Data collected by Sat Tags on Tarpon, i.e. could help meteorologists make more accurate hurricane forecasts.



Courtesy: Jerry Ault and Nick Shay

Defining Essential & Critical Habitat



TOPP Program + Tag Giant Program – Block et al.

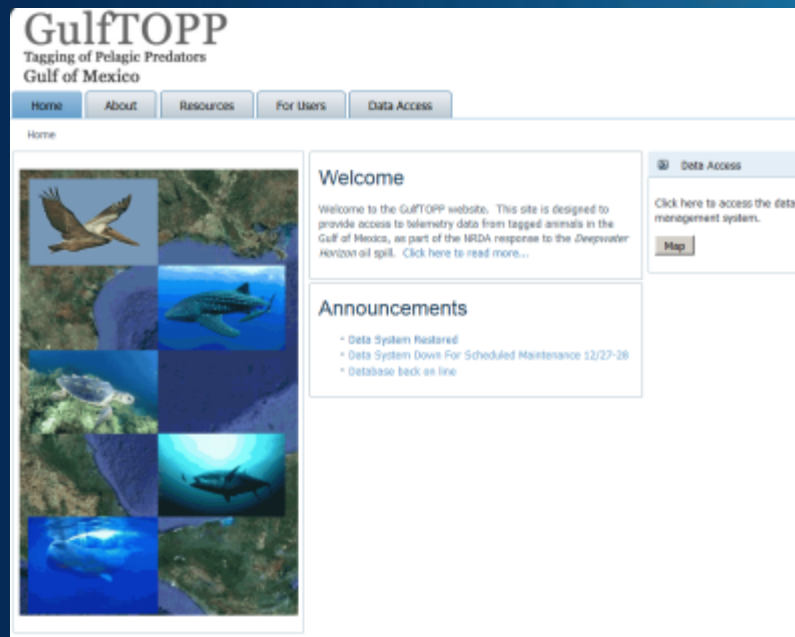
Gulf of Mexico Habitat Restoration Effort

Mapping Spawning Habitat of Bluefin Tuna in the Gulf of Mexico

Critical Area Intersects Deepwater Horizon Oil Spill.



Credit: NOAA

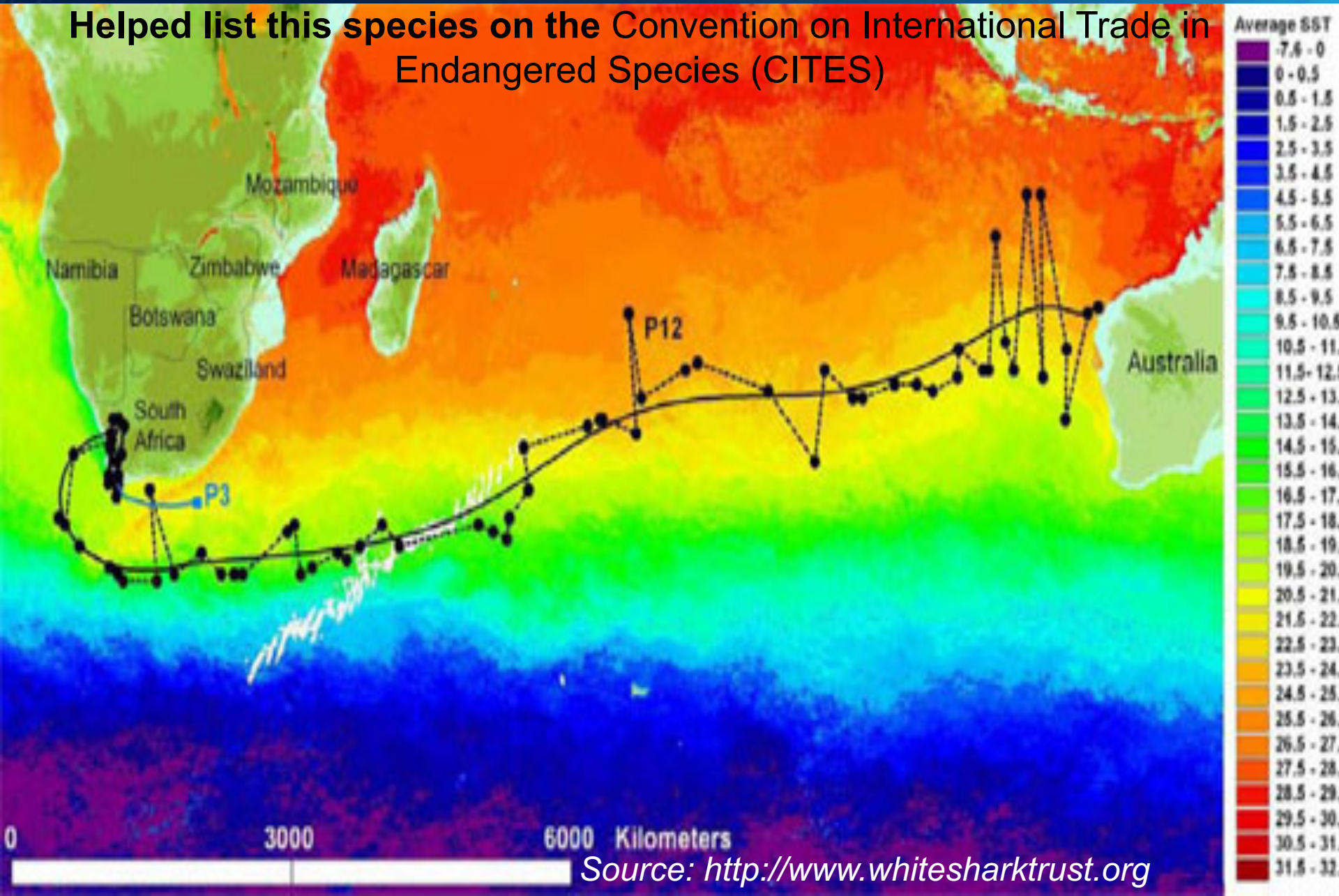
A screenshot of the GulfTOPP website. The header features the title "GulfTOPP" and subtitle "Tagging of Pelagic Predators Gulf of Mexico". Below the header is a navigation menu with buttons for "Home", "About", "Resources", "For Users", and "Data Access". The main content area is divided into several sections: a "Home" section with a grid of images showing birds, tuna, and satellite maps; a "Welcome" section with a message about the site's purpose and a link to read more; an "Announcements" section with a list of updates including "Data System Restored" and "Data System Down For Scheduled Maintenance 12/27-28"; and a "Data Access" section with a link to access the data management system and a "Map" button.

Courtesy: Barbara Block, Stanford Univ.



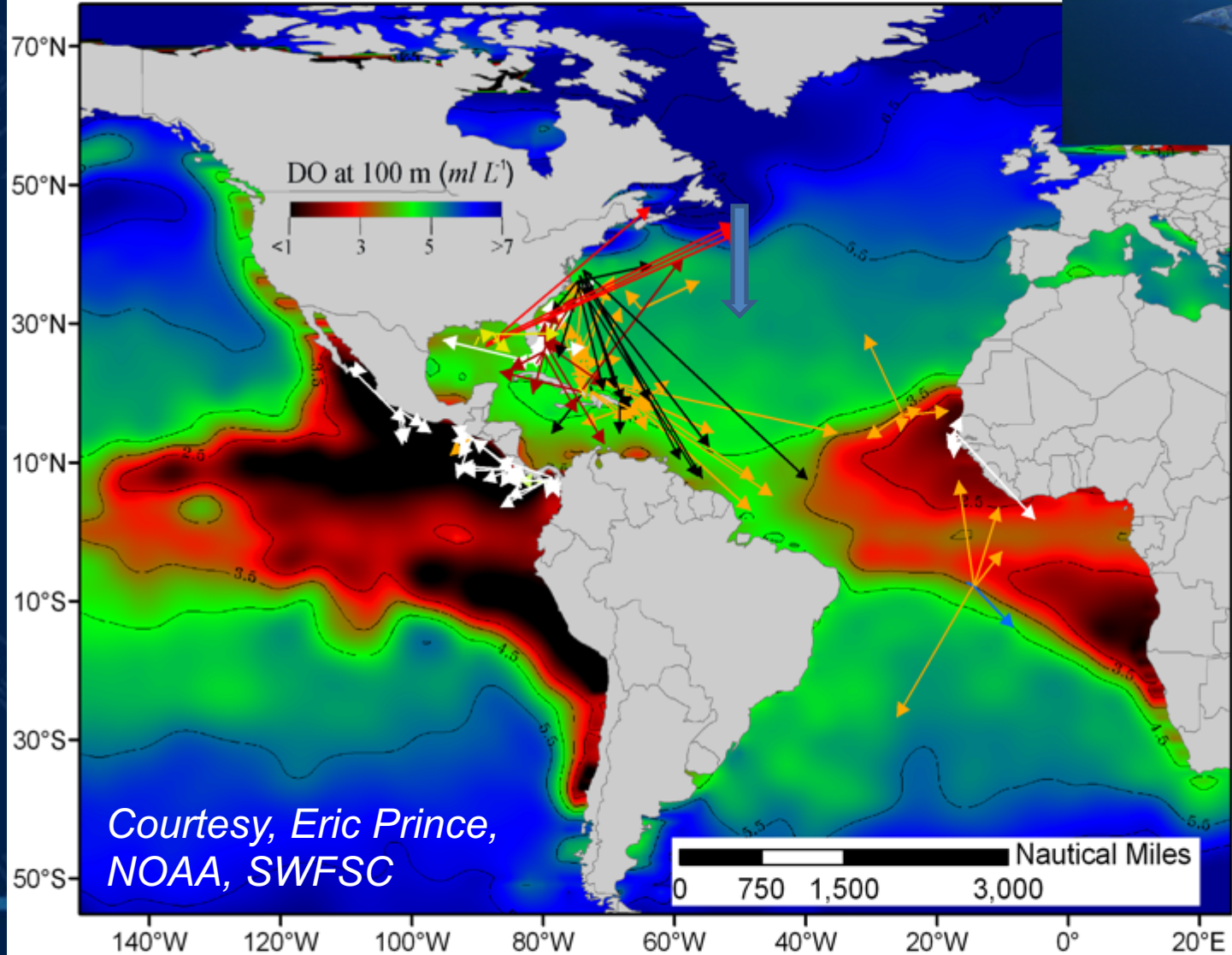
Transoceanic migration of a white shark from South Africa to northwestern Australia

Helped list this species on the Convention on International Trade in Endangered Species (CITES)



Ocean-Based Habitat Compression

Billfish Losing Ocean Habitat to Oxygen Minimum Zones



- Blue Marlin
- Sailfish
- Swordfish
- Yellowfin Tuna
- Bluefin Tuna
- Blue Shark
- Longbill Spearfish
- Bigeye Tuna
- Escolar
- Black Marlin
- White Marlin

IOOS ATN Contribute to MBON and GEO BON

- IOOS ATN to provide data and information on Marine Biodiversity (Aquatic species presence and abundance) to meet:
 - 1- National MBON and Biodiversity Targets
 - 2- International Biodiversity effort such as GEO BON and CBD Aichi Biodiversity Targets 2020.

Attaining an Operational Marine Biodiversity Observation Network (BON) Synthesis Report



GEO GROUP ON EARTH OBSERVATIONS
BIODIVERSITY OBSERVATION NETWORK (GEO BON)



 Convention on Biological Diversity

[The Convention](#) [Cartagena Protocol](#) [Nagoya Pr](#)



Strategic Plan for Biodiversity 2011-2020

Global Workshop (Brasilia, March 2012)

[> Convention > Strategic Plan 2011-2020 > Aichi-Targets](#)

Key Elements

Aichi Biodiversity Targets

ATN in Apps



Source: NOAA



Source: GTOPP, Stanford Univ.

Questions



Courtesy Dan Costa UCSC



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Please Visit the U.S. IOOS Website
<http://www.ioos.noaa.gov>

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