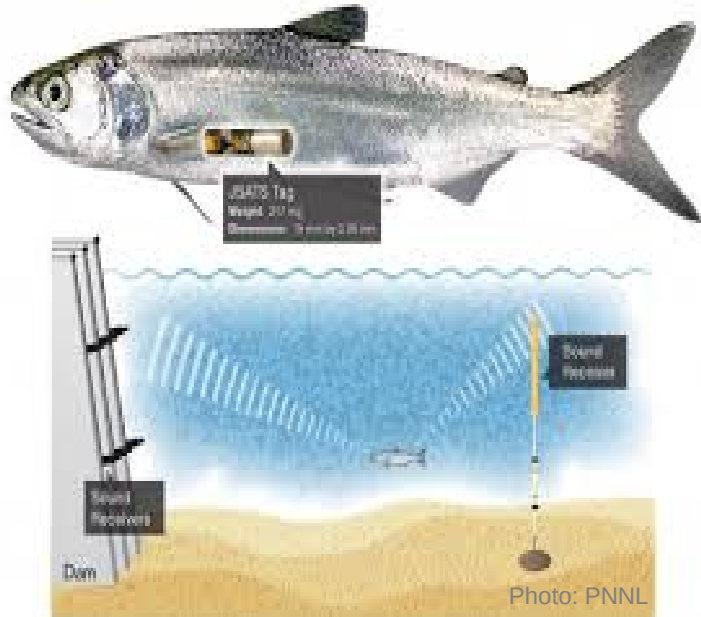
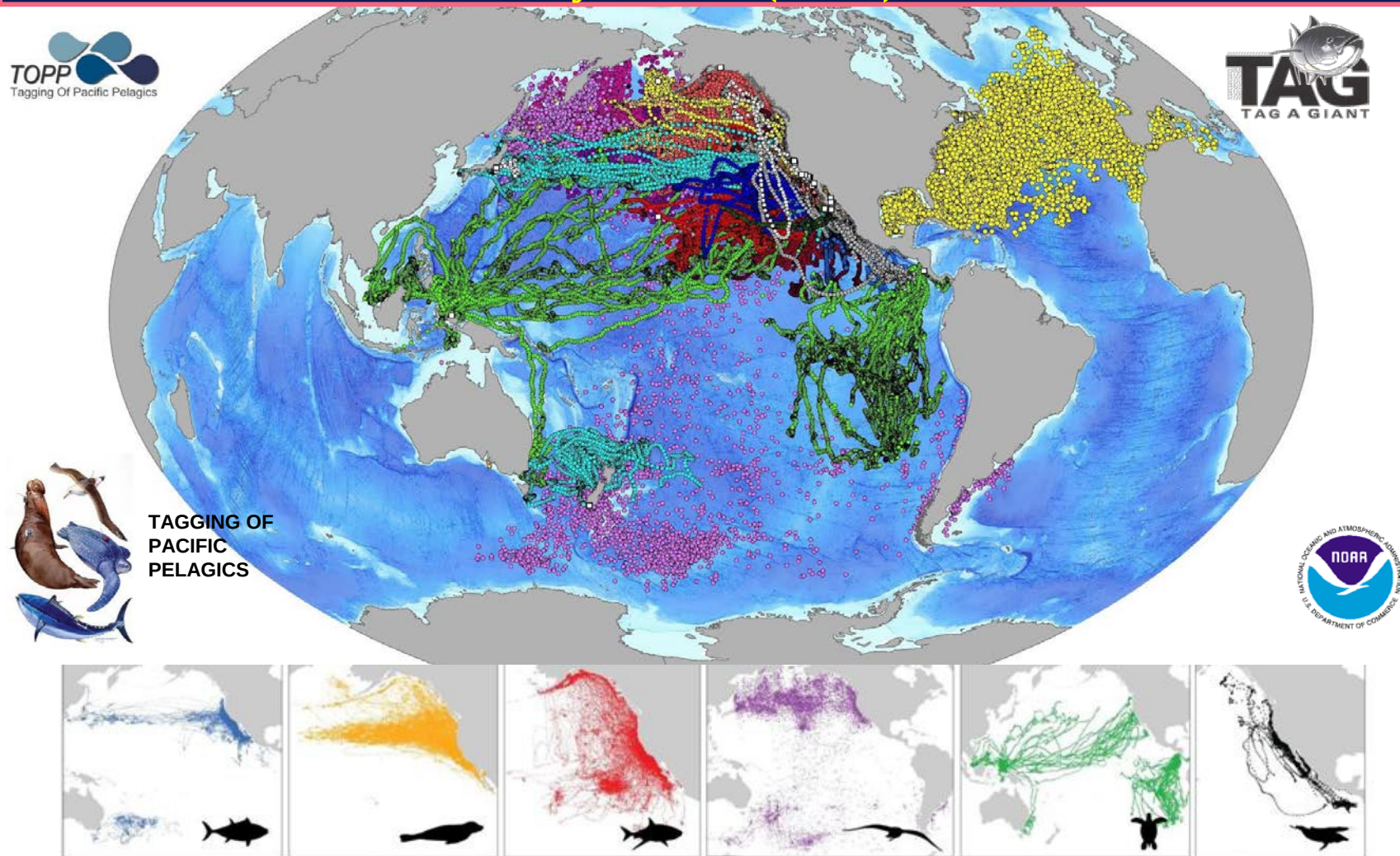




Animal Telemetry



Leveraging the Data Management Tools Developed for US Large Scale Tagging Programs into the Backbone for a Data Assembly Center (DAC) for IOOS



ATN Data Assembly Center (DAC)

- Phase I DAC development -

<http://oceanview.pfeg.noaa.gov/ATN/>

- 48 different species (sharks, sea turtles, seals, whales, tuna, squid and other taxa)
- Years: 2000-2014
- 7 tag types or platforms
- Real time reporting – e-seals and sharks.
- Data in GTS -- WMO code- Q9900....

Phase I: Who are Clients/Customers What are Requirements?

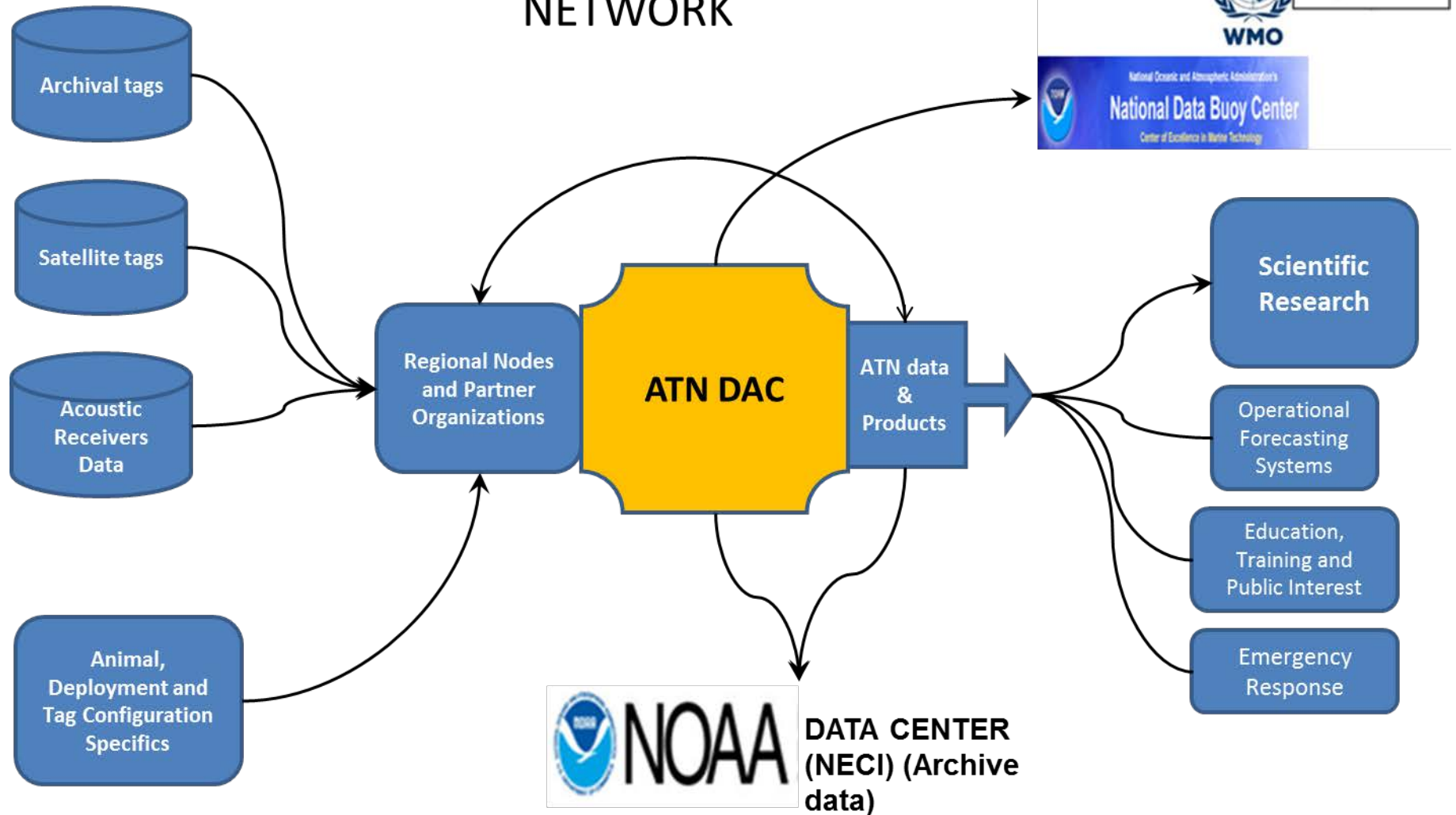
- ATN community
- Ocean Modelers US Navy NAVOCEANO and NOAA NCEP
- Restoration efforts and Fisheries/Habitat Managers
- Ecological forecasting (Species distribution and Habitat)



IOOS DMAC Requirements

- Data Delivery to GTS
- Service-oriented architecture
- Standards-Based Data Access Services
- Data Encoding
- Common Vocabularies and Identifiers
- Discovery Metadata Standards
- Storage and Archiving

DATA FLOW FOR ANIMAL TELEMETRY NETWORK

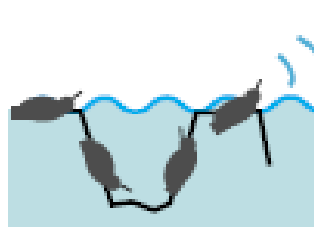


Procedures of collecting oceanographic data (Hydrographic profiles) from CTD SRDL tags on e-seals or Sharks

Deployment on land



CTD Profiling
Data compression



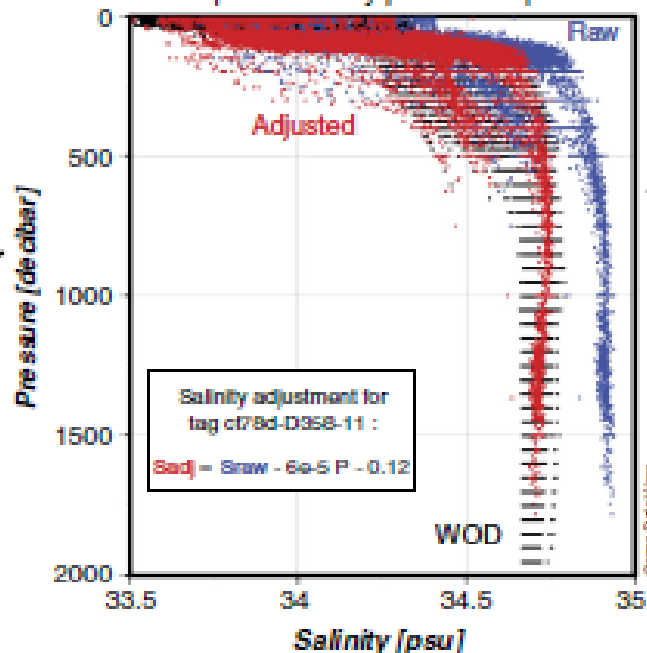
ARGOS transmission
Geo-localization



Reception
in CLS Argos,
Toulouse



Example of salinity profile comparison



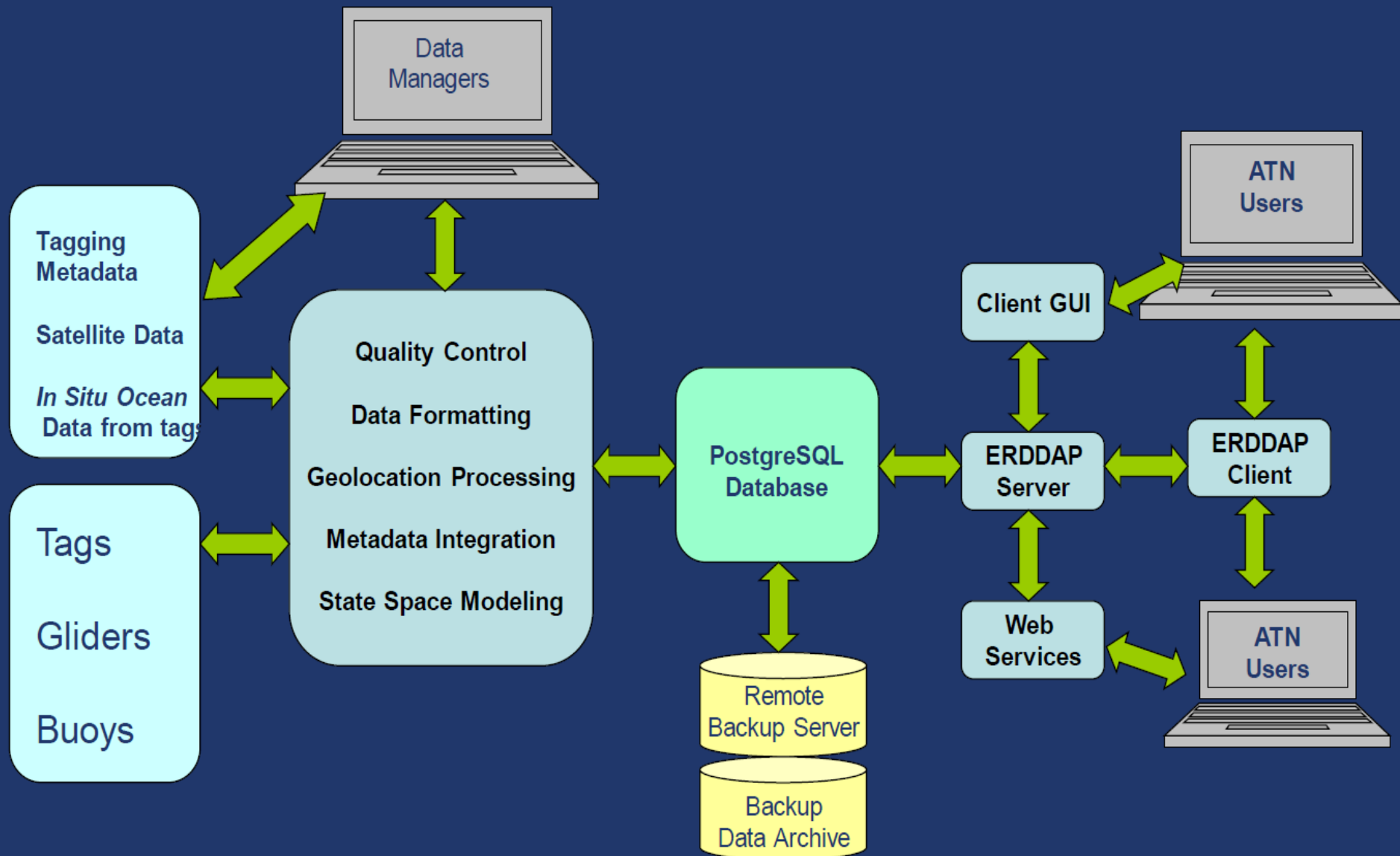
Post-processing
of CTD data



Data extraction
Storage at SMRU
Distribution to GTS

Distribution
to ocean
data centers

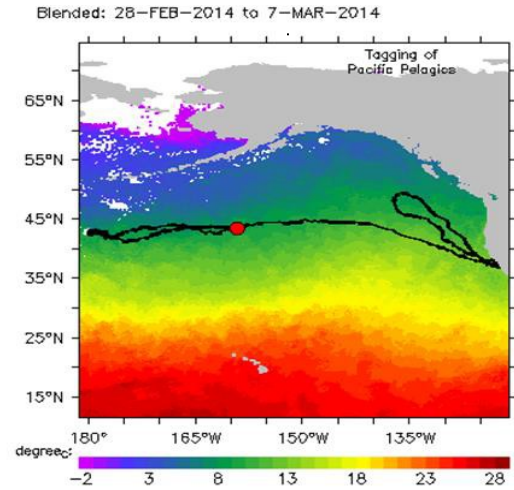
Animal Telemetry Network



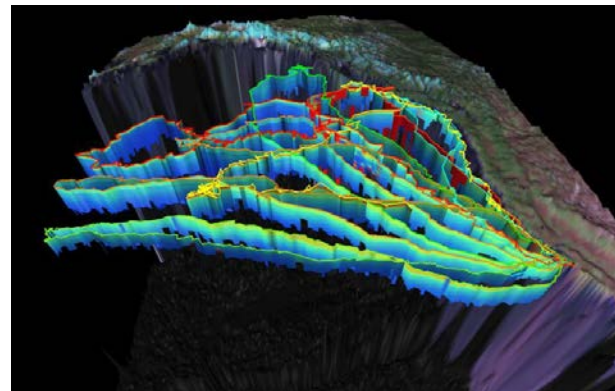
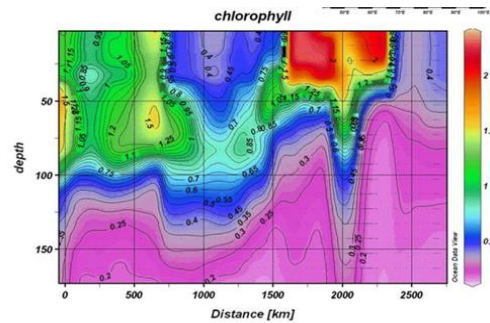
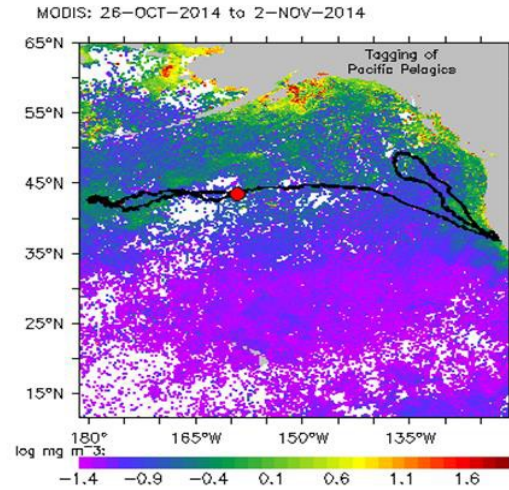
NAV OCE Continues funding about 20 SMRU tags- post-TOPP for E-Seals and Shark Oceanographic Tags-

Northern Elephant Seal 133773 2014011 30 Jan 2014 to 4 Nov 2014

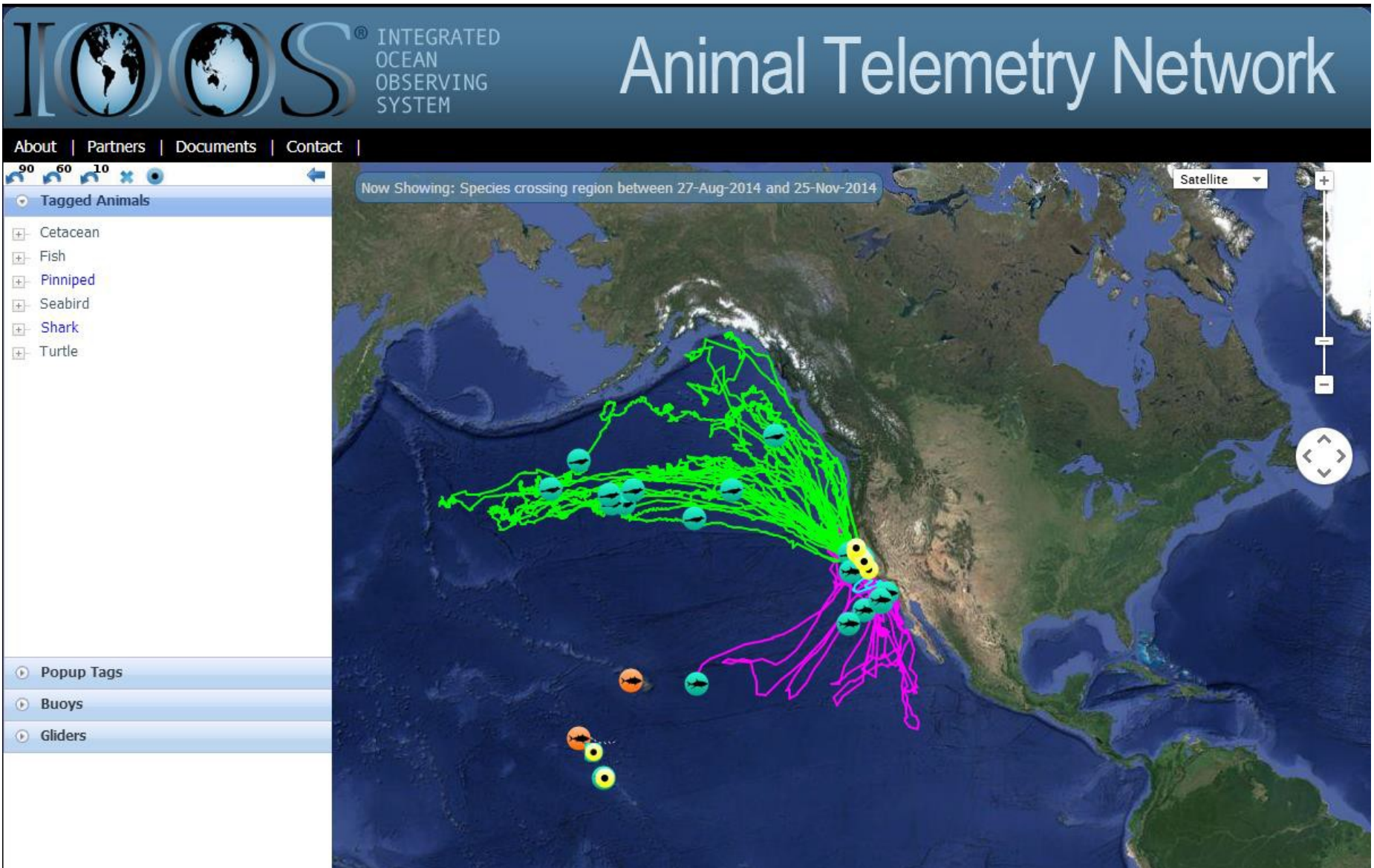
Sea Surface Temperature



Chlorophyll-a



<http://oceanview.pfeg.noaa.gov/ATN/>

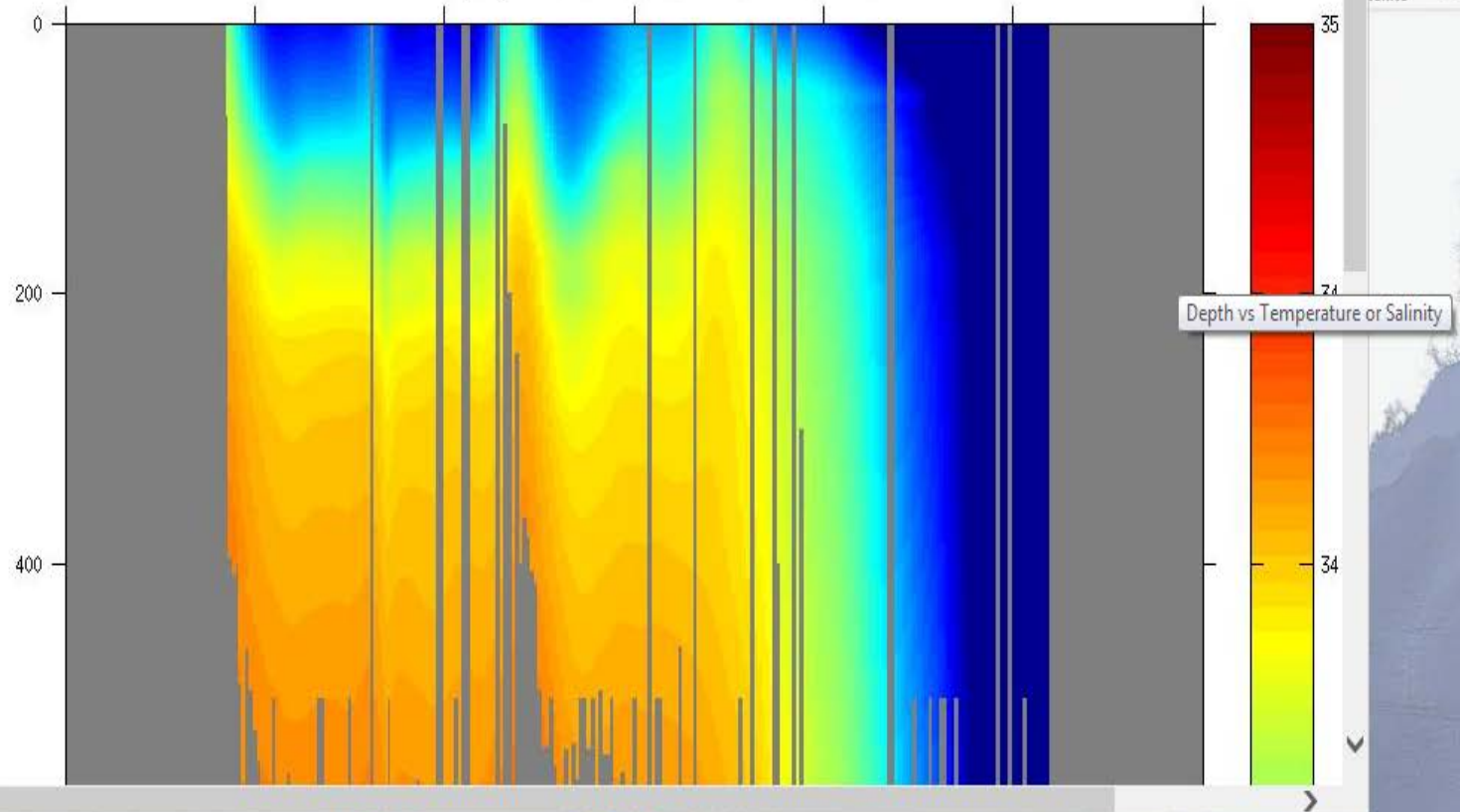


Satellite



2014014_133776

SALINITY: Elephant Seal 133776 2014-02-23 to 2014-11-19



Tagged Animals

- ☐ Cetacean
- ☒ Fish
 - ☒ Atlantic Bluefin Tuna
 - ☐ Black Marlin
 - ☐ Blue Marlin
 - ☐ Pacific Bluefin Tuna
 - ☐ Striped Marlin
 - ☐ White Marlin
- ☐ Pinniped
- ☐ Seabird
- ☐ Shark
- ☐ Turtle

Popup Tags

- ☐ Buoys
- ☐ Gliders

Added Atlantic Bluefin Tuna (all tags)

Satellite 

Environmental Data Information:

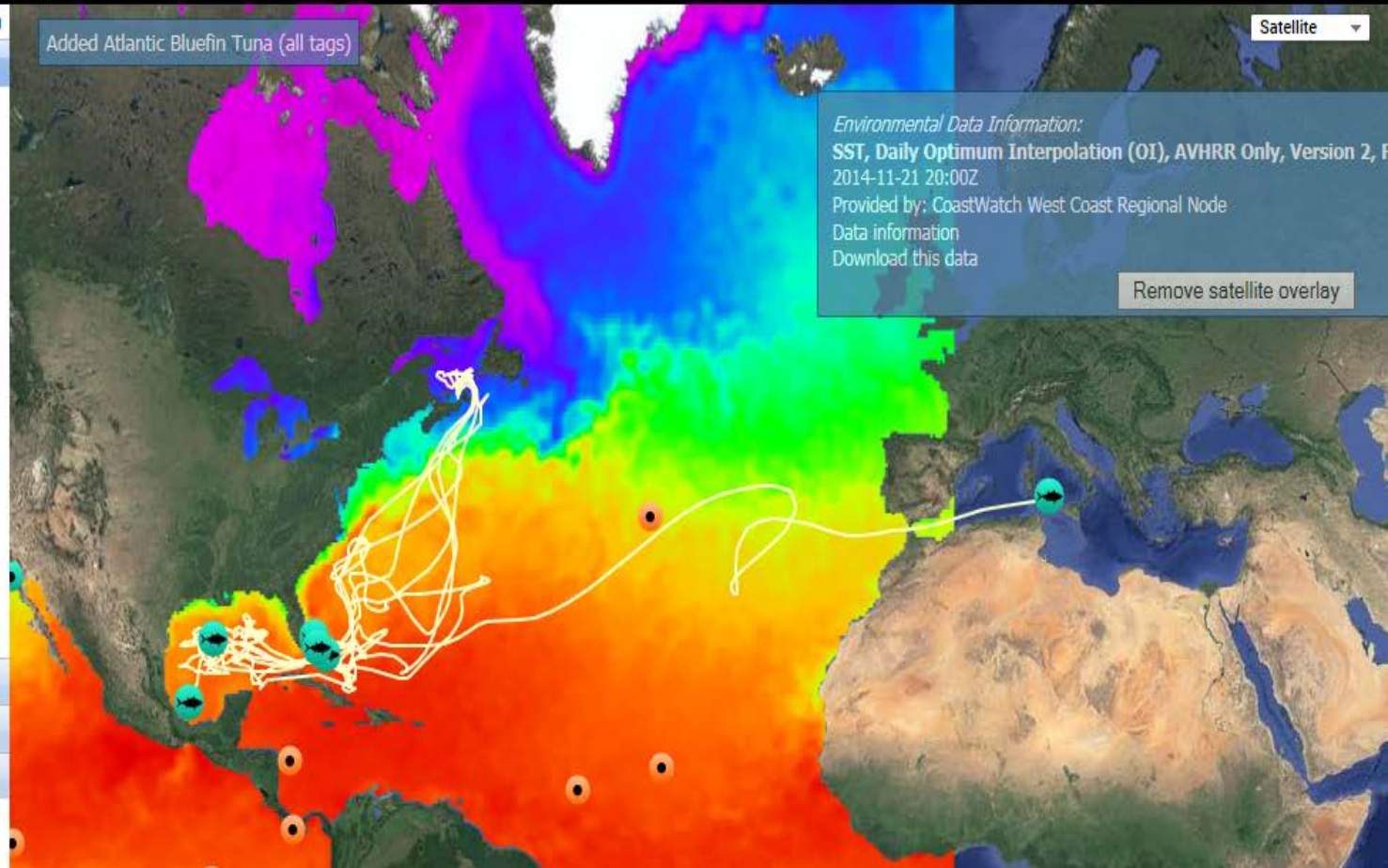
SST, Daily Optimum Interpolation (OI), AVHRR Only, Version 2, R
2014-11-21 20:00Z

Provided by: CoastWatch West Coast Regional Node

Data information

[Download this data](#)

[Remove satellite overlay](#)



Automated Data Delivery from VR4 Global & Mobile Gliders Detection of Acoustic Tags

From: vr4gservice@amirix.com

To: bob.doiron@amirix.com, glen.robinson@amirix.com, bblock@stanford.edu,
salvo@stanford.edu, tkchapple@ucdavis.edu, jjdale@stanford.edu,
mrcastle@stanford.edu, alans@mola.stanford.edu,
paulkanive@gmail.com, toleary@sonic.net, rhnixon@me.com

Date: Thu, 03 Nov 2011 17:00:27 -0300

Subject: VR4G-200056: Detected A69-1303-46111

Tag ID: A69-1303-46111

Time: 2011-11-03 19:59 +0000

Notification ID: 849

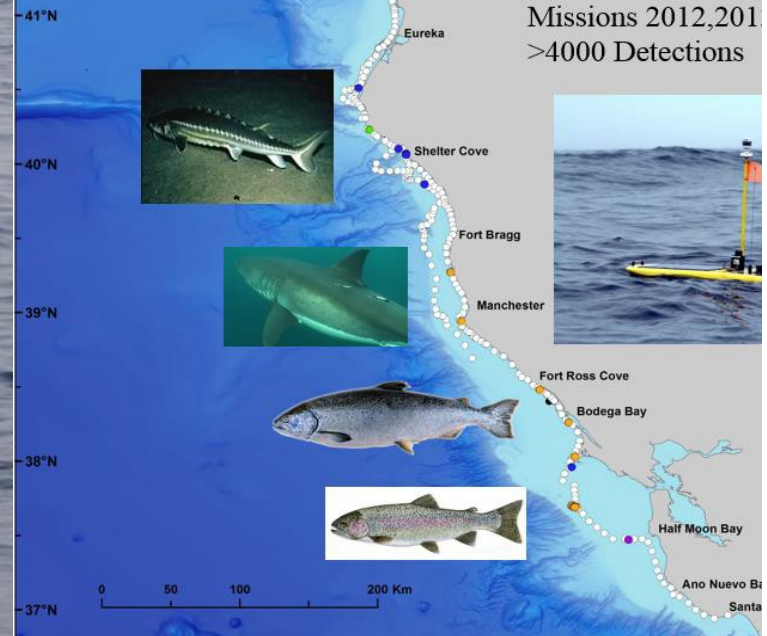
IMEI: 30-002501-021449-0



	A	B	C
1	Record ID	Date/Time	Correction
2	0601-2000	11/3/2011 15:12	A
3	0601-2000	11/3/2011 15:47	A
4	0601-2000	11/3/2011 16:34	A
5	0601-2000	11/3/2011 16:50	A
6	0601-2000	11/3/2011 16:56	A
7	0601-2000	11/3/2011 17:05	A
8	0601-2000	11/3/2011 17:07	A
9	0601-2000	11/3/2011 17:14	A
10	0601-2000	11/3/2011 17:22	A
11	0601-2000	11/3/2011 17:22	A
12	0601-2000	11/3/2011 17:27	A
13	0601-2000	11/3/2011 17:33	A
14	0601-2000	11/3/2011 17:33	A
15	0601-2000	11/3/2011 17:34	A
16	0601-2000	11/3/2011 17:36	A
17	0601-2000	11/3/2011 17:52	A
18	0601-2000	11/3/2011 17:55	A

Mobile Gliders

Missions 2012,201
>4000 Detections



New Programs with Live Data Streams we are Contributing to DAC
International Game Fish Association



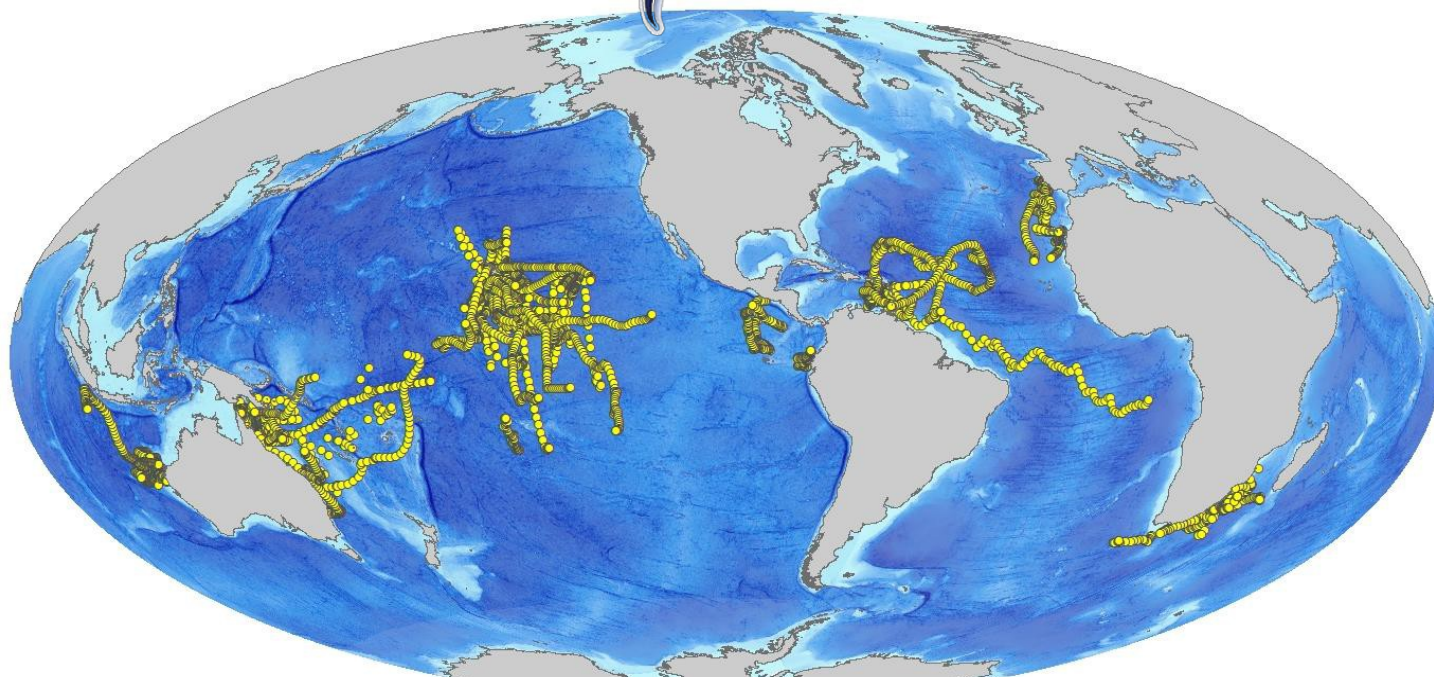
IGFA Great



Marlin Race

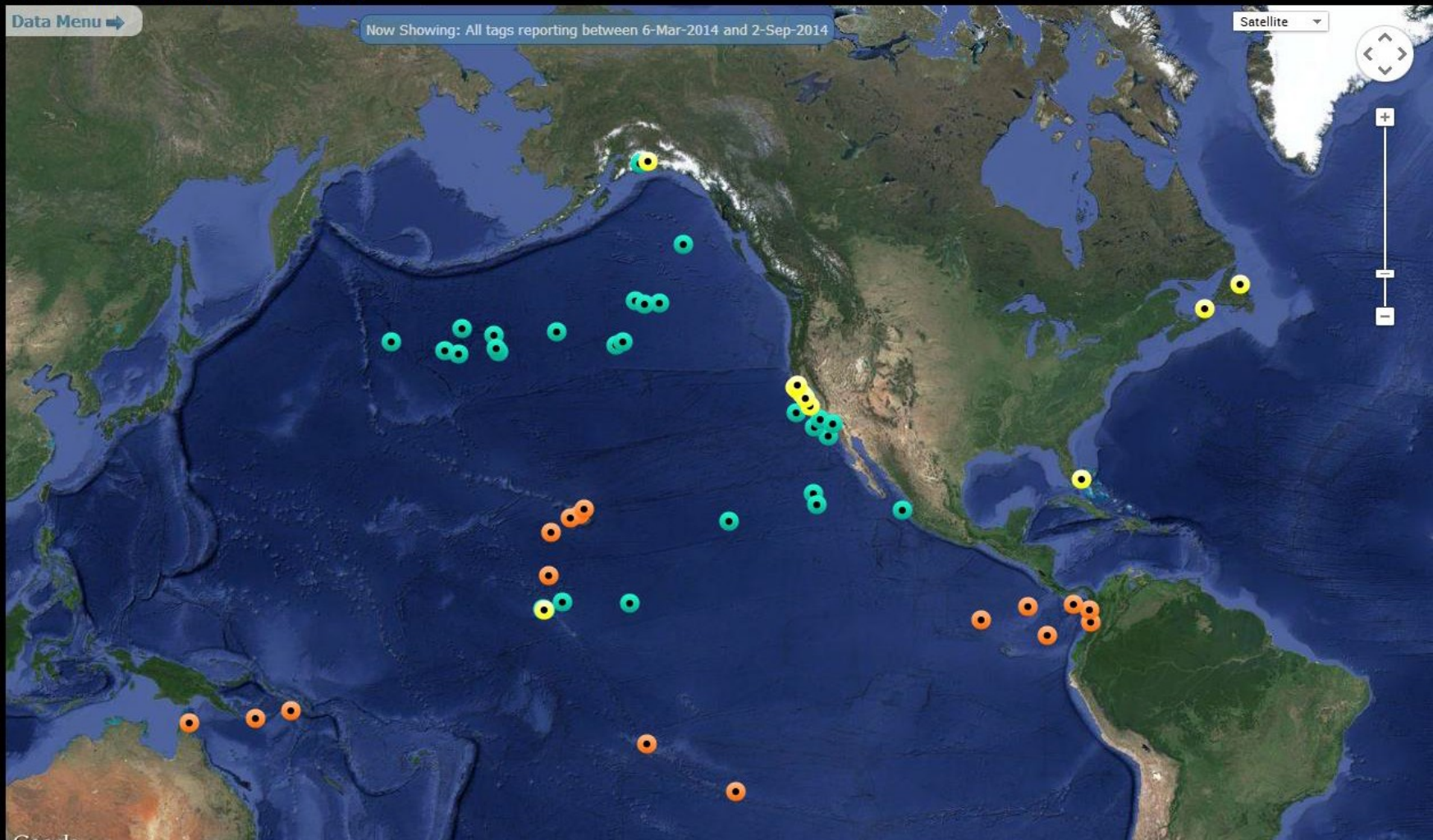


STANFORD
UNIVERSITY

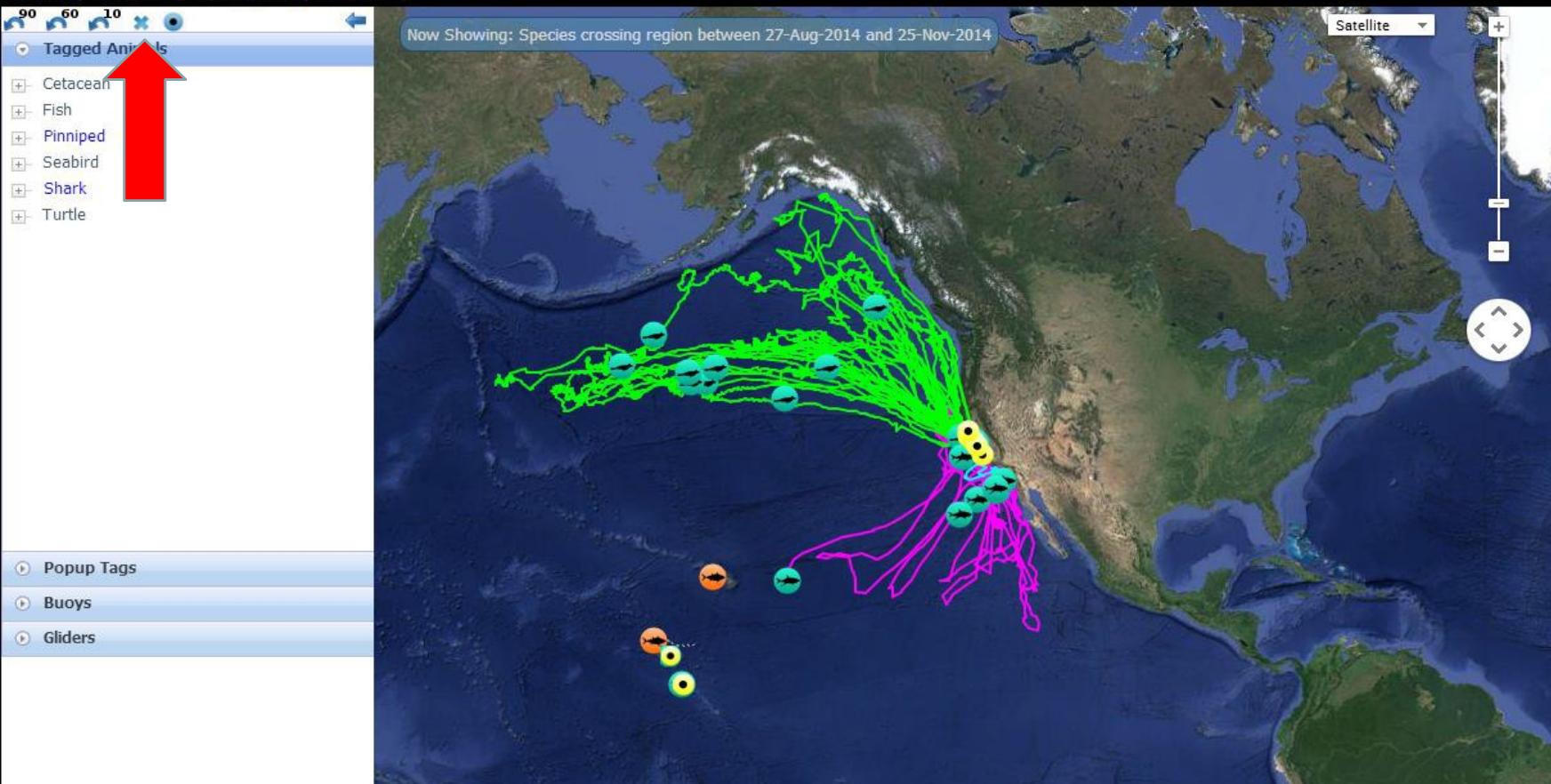


Now Showing: All tags reporting between 6-Mar-2014 and 2-Sep-2014

Satellite



Make a simple Display- Colors Represent different “Live” Tag Platforms



Click on Data Menu and options increase: Currently
We are only exposing Track data in this screen – Live Elephant Seals (green)
And Sharks (Purple). ATN can ingest any live data

Now Showing: All tags reporting between 6-Mar-2014 and 2-Sep-2014

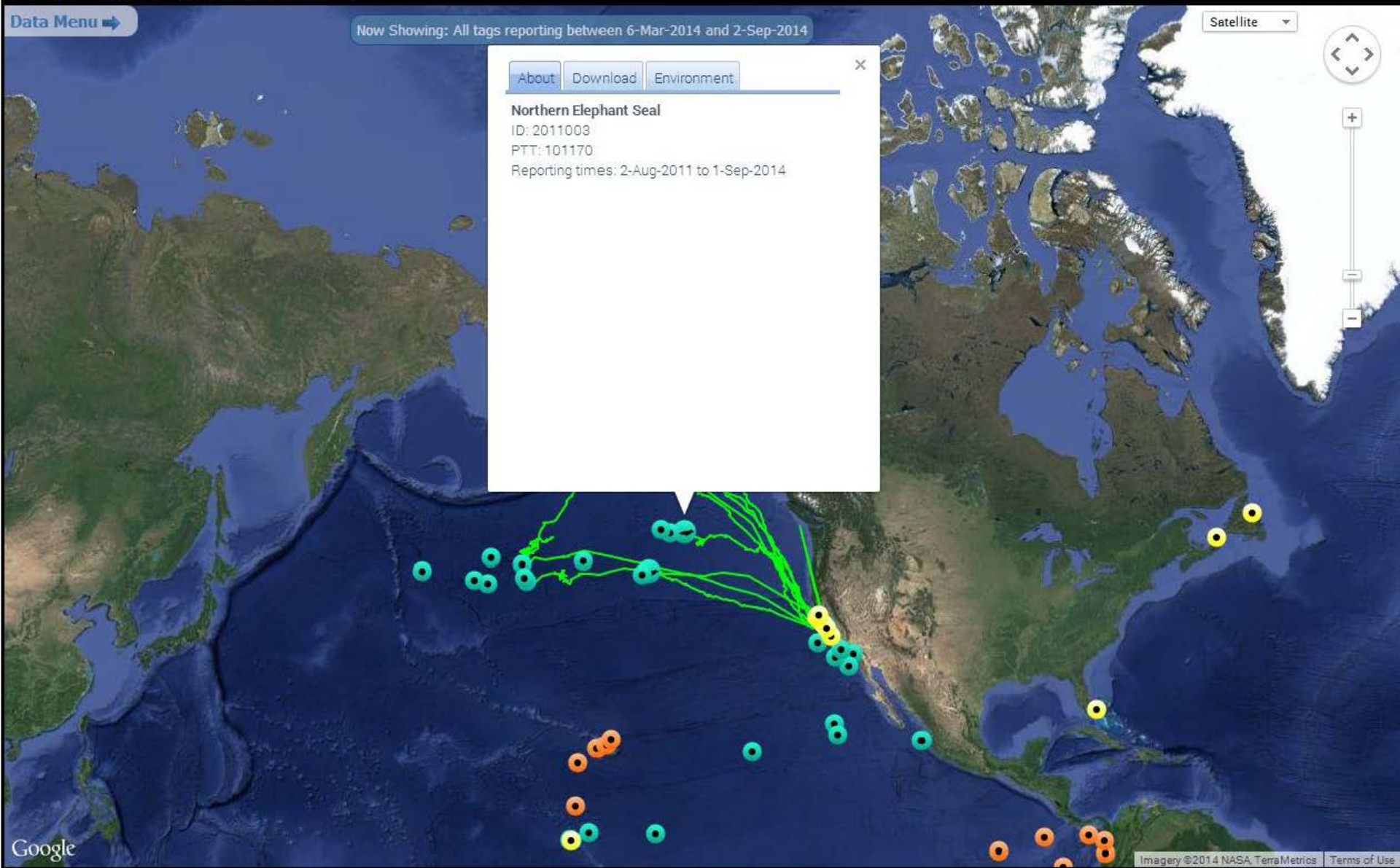
[About](#) [Download](#) [Environment](#)

Northern Elephant Seal

ID: 2011003

PTT: 101170

Reporting times: 2-Aug-2011 to 1-Sep-2014



Satellite

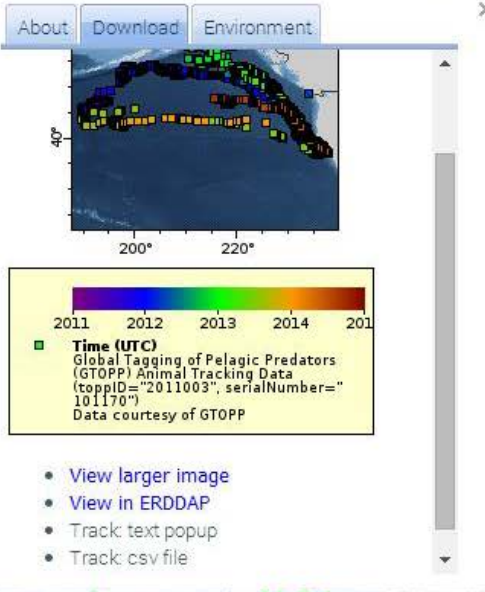


+

-

-

Now Showing: All tags reporting between 6-Mar-2014 and 2-Sep-2014



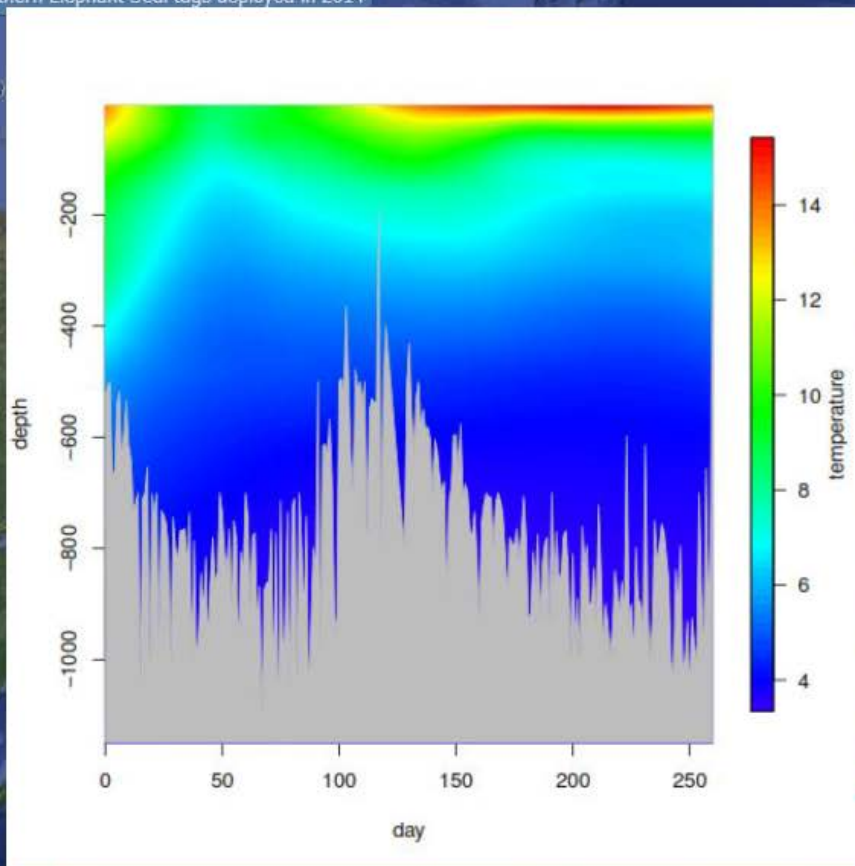
Satellite



Tagged Animals

- ☒ Cetacean
- ☒ Fish
- ☒ Pinniped
 - ☐ California Sea Lion
 - ☐ Cape Fur Seal
 - ☐ Crabeater Seal
 - ☐ Galapagos Sea Lion
 - ☒ Northern Elephant Seal
 - ☐ 2002
 - ☐ 2003
 - ☐ 2004
 - ☐ 2005
 - ☐ 2006
 - ☐ 2007
 - ☐ 2008
 - ☐ 2009
 - ☐ 2010
 - ☒ 2011
 - ☒ 2014
 - ☐ Northern Fur Seal
- ☐ Buoy
- ☐ Gliders

Added Northern Elephant Seal tags deployed in 2014



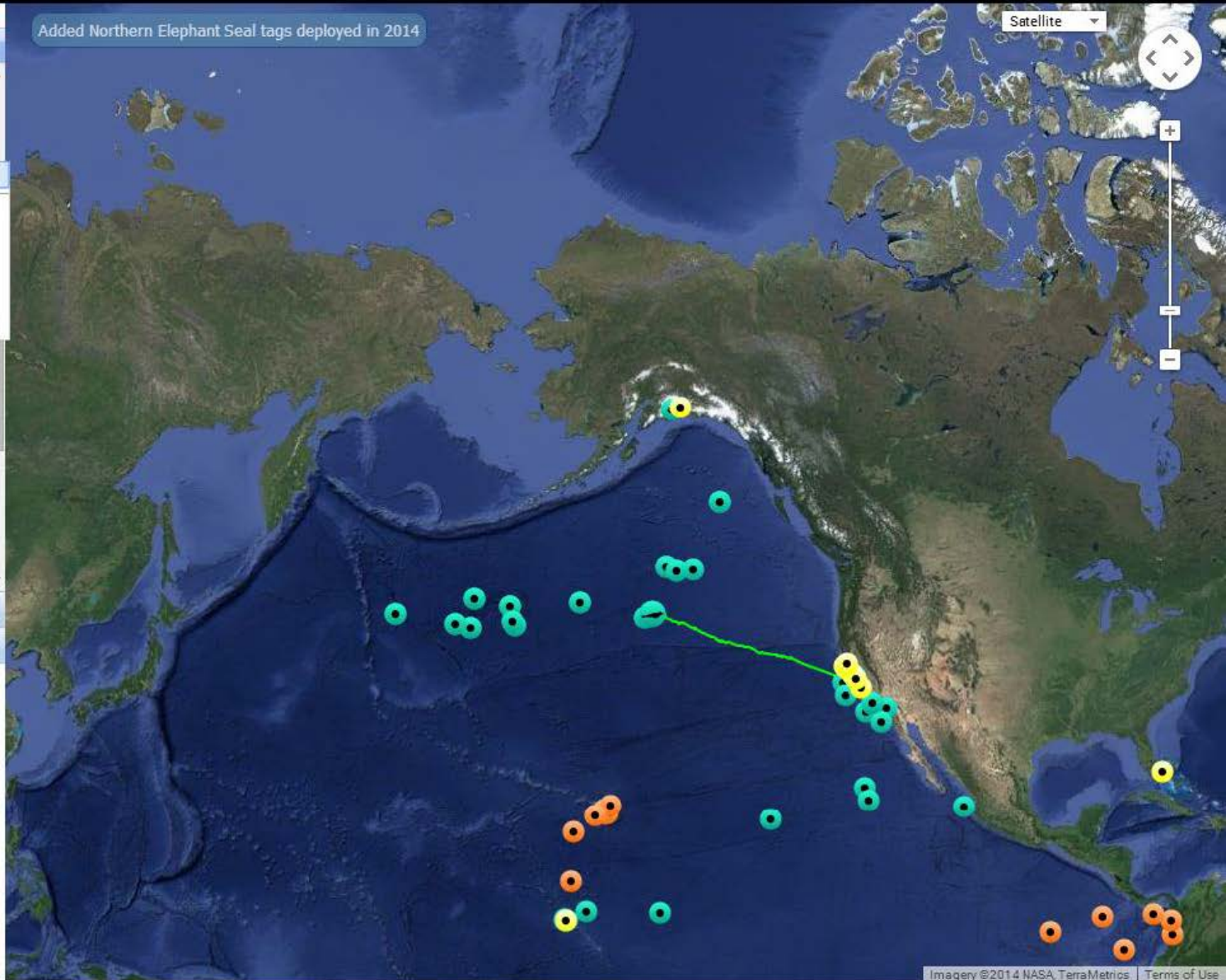
Tagged Animals

- ☐ 2010
- ☐ 2011
- ☒ 2014
 - ☒ 2014001-62036-SPOT5
 - 2014001-62036-SPOT5
 - Download Track Data:
 - text popup
 - csv file
 - kml file
 - other formats: ERDDAP
 - ☒ 2014008-120604-MK10-AI
 - ☒ 2014009-133771-SMRU-C
 - ☒ 2014010-133772-SMRU-C
 - ☒ 2014011-133773-SMRU-C
 - ☒ 2014012-133774-SMRU-C
 - ☒ 2014013-133775-SMRU-C
 - ☒ 2014014-133776-SMRU-C
 - ☒ 2014015-133777-SMRU-C
 - ☒ 2014016-133778-SMRU-C
 - ☒ 2014017-133779-SMRU-C

Buoys

Gliders

Added Northern Elephant Seal tags deployed in 2014





ERDDAP > [tabledap](#) > Make A Graph

Dataset Title: **Global Tagging of Pelagic Predators (GTOPP) Animal Tracking Data** [RSS](#)

Institution: GTOPP (Dataset ID: gtoppAT)

Range: longitude = 72.767 to 359.438°E, latitude = -77.868 to 61.106°N, time = 2002-06-26T21:10:31Z to (now?)

Information: [Summary](#) | [License](#) | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Subset](#) | [Data Access Form](#)Graph Type: **markers**X Axis: **longitude**Y Axis: **latitude**Color: **time**

Constraints

Optional
Constraint #1Optional
Constraint #2

topplD	=	"2011003"	<=	
serialNumber	=	"101170"	<=	
	>=		<=	
	>=		<=	
	>=		<=	

Server-side Functions

☐ distinct()
 orderBy (" " " " " " " ")

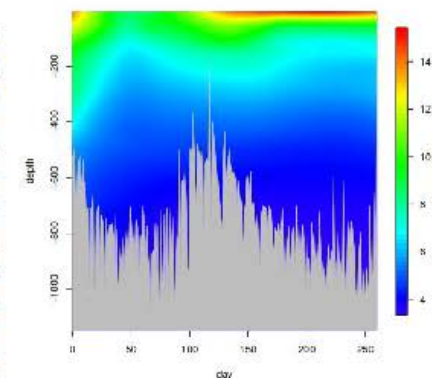
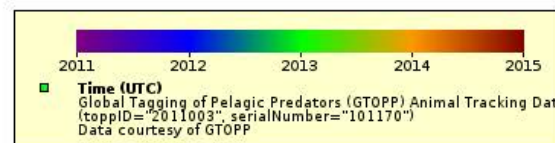
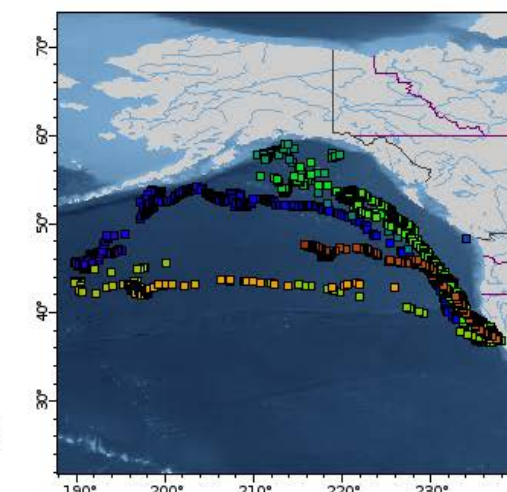
Graph Settings

 Marker Type: **Filled Square** Size: **5**
 Color:
 Color Bar: Continuity: Scale:
 Min: Max: N Sections:
 Draw the land mask:
 Y Axis Minimum: Maximum:
Redraw the Graph (Please be patient. It may take a while to get the data.)

Optional:

Then set the File Type: **.htmlTable** and [Download the Data or an Image](#)or view the URL: <http://oceanview.pfeg.noaa.gov/erddap/tabledap/gtoppAT.htmlTable?>[\(Documentation / Bypass this form\)](#) [\(File Type information\)](#)

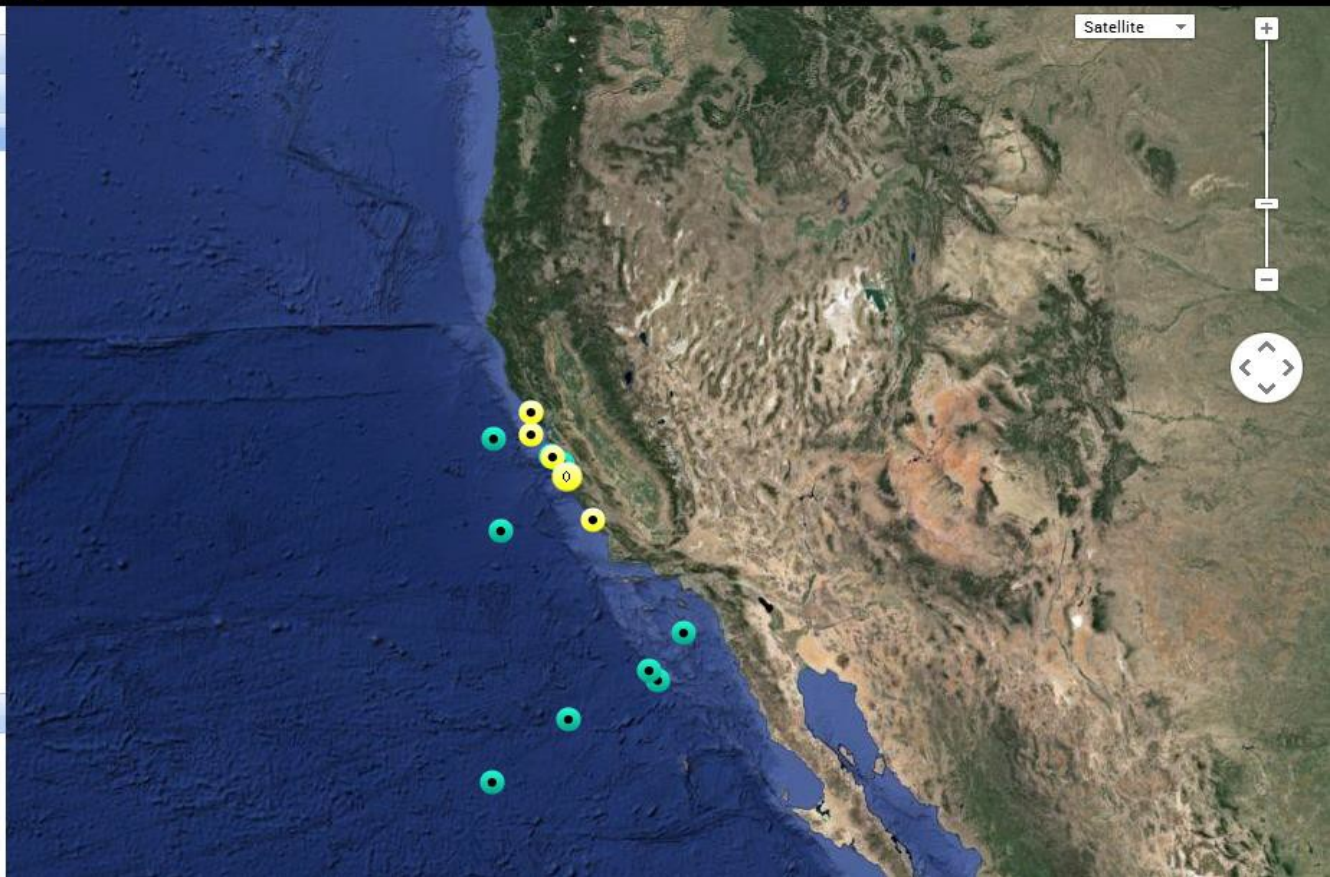
Click on the map to specify a new center point.

Zoom: [Out 8x](#) [Out 2x](#) [Data](#) [In](#) [In 2x](#) [In 8x](#)

In the ERDDAP server, users have an extensive array of options for querying, visualizing and downloading data. They can also generate a restive URL for their query, which in turn can be integrated into other applications (e.g., MatLab code, models and simulations, etc.)

90 60 10

- Tagged Animals
- Popup Tags
- Buoys
 - Ano Nuevo
 - Cambria
 - Chagos
 - Farallones
 - Hopkins
 - Palmyra
 - Tomales
- Gliders



This screen shows Live Iridium or Cell buoys in yellow
And Sat tags on mako and blue sharks in Green

About

Download

Environmental Data Information:

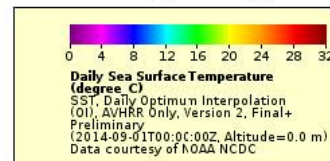
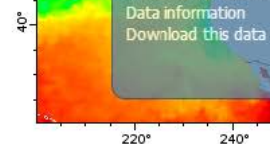
Chlorophyll-a, Aqua MODIS, NPP, Pacific Ocean (8 Day Composite)

Provided by: CoastWatch West Coast Regional Node

Data information

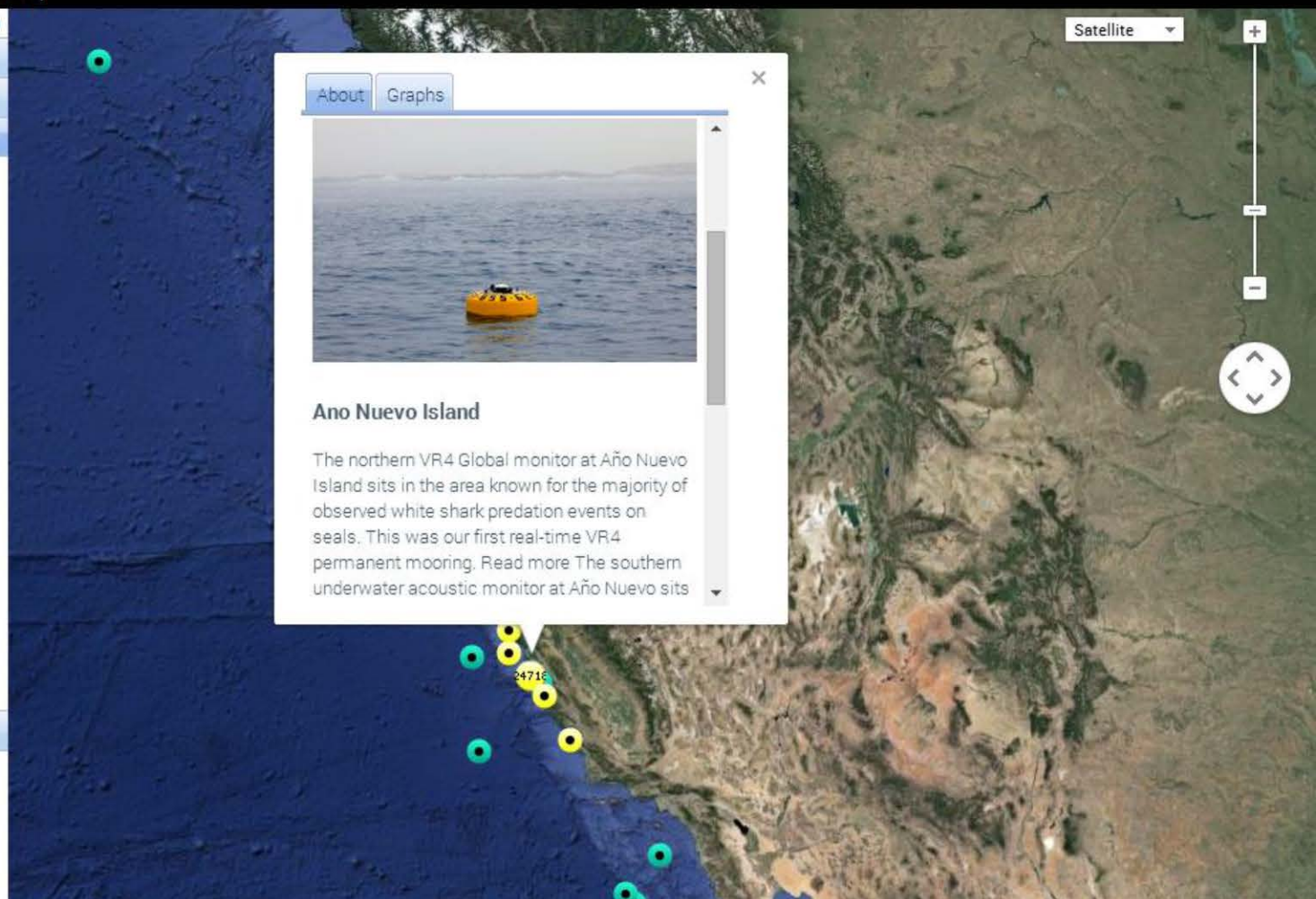
Download this data

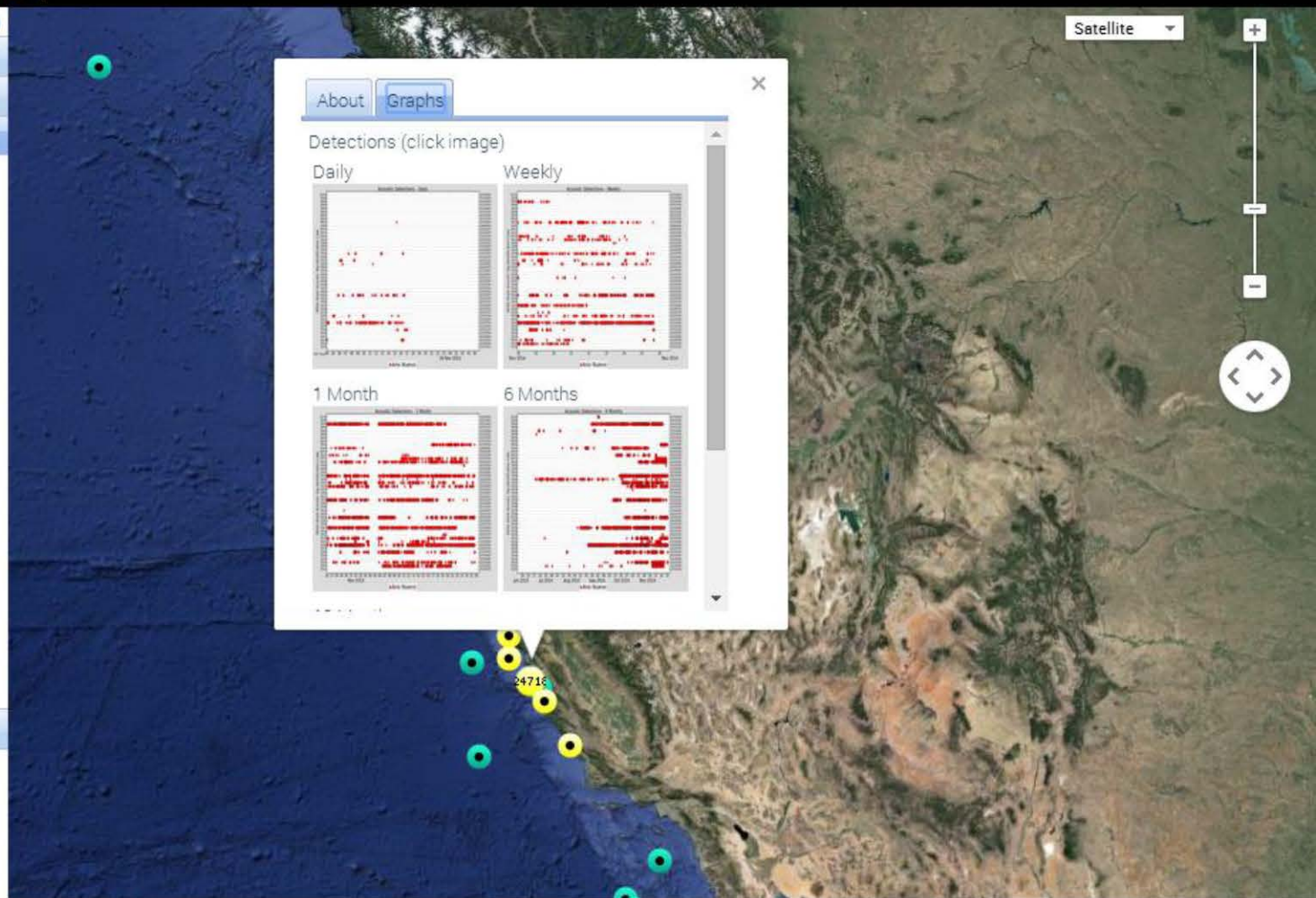
Remove satellite overlay

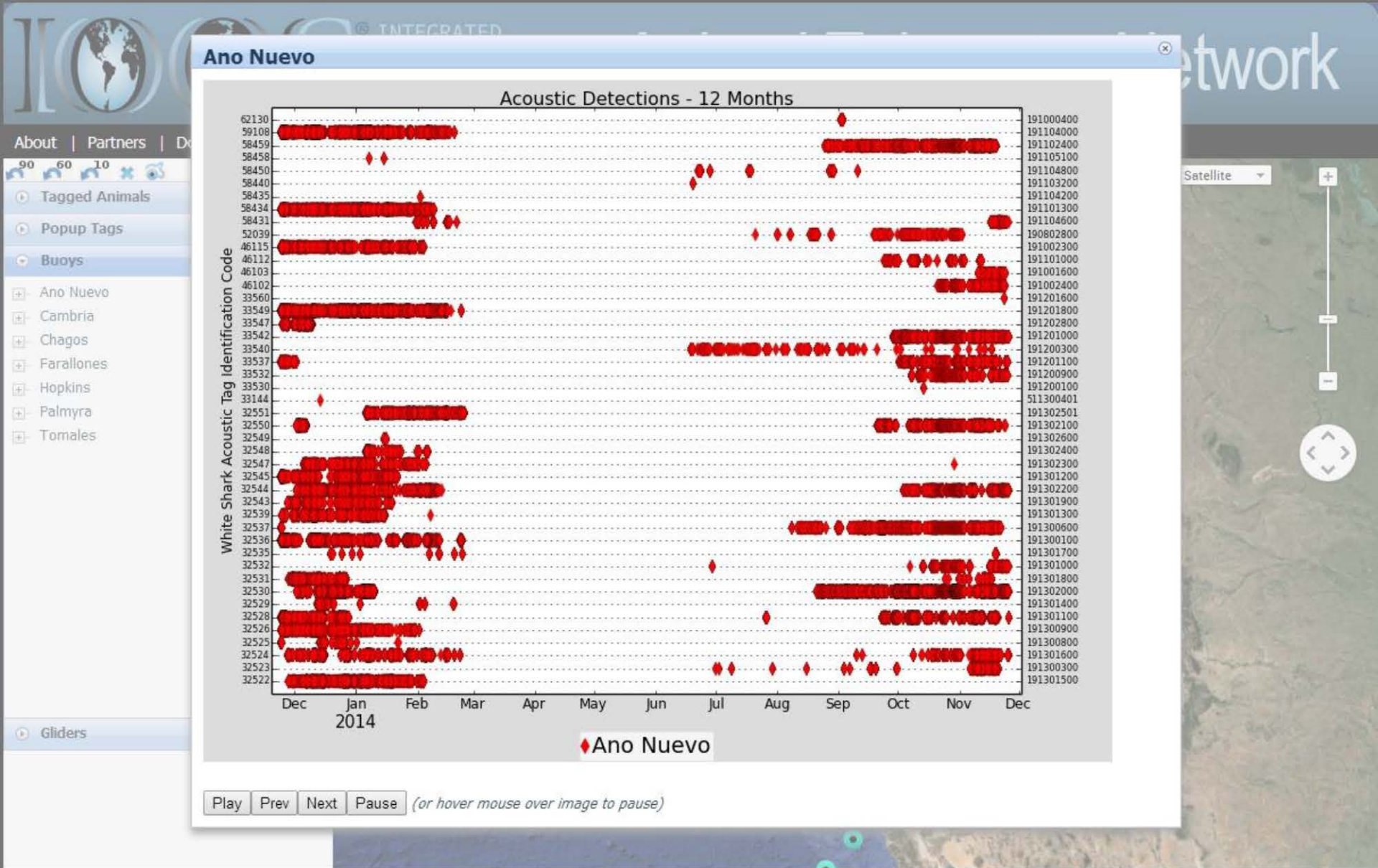


Show chla on map

Coming soon: show environmental data at any time

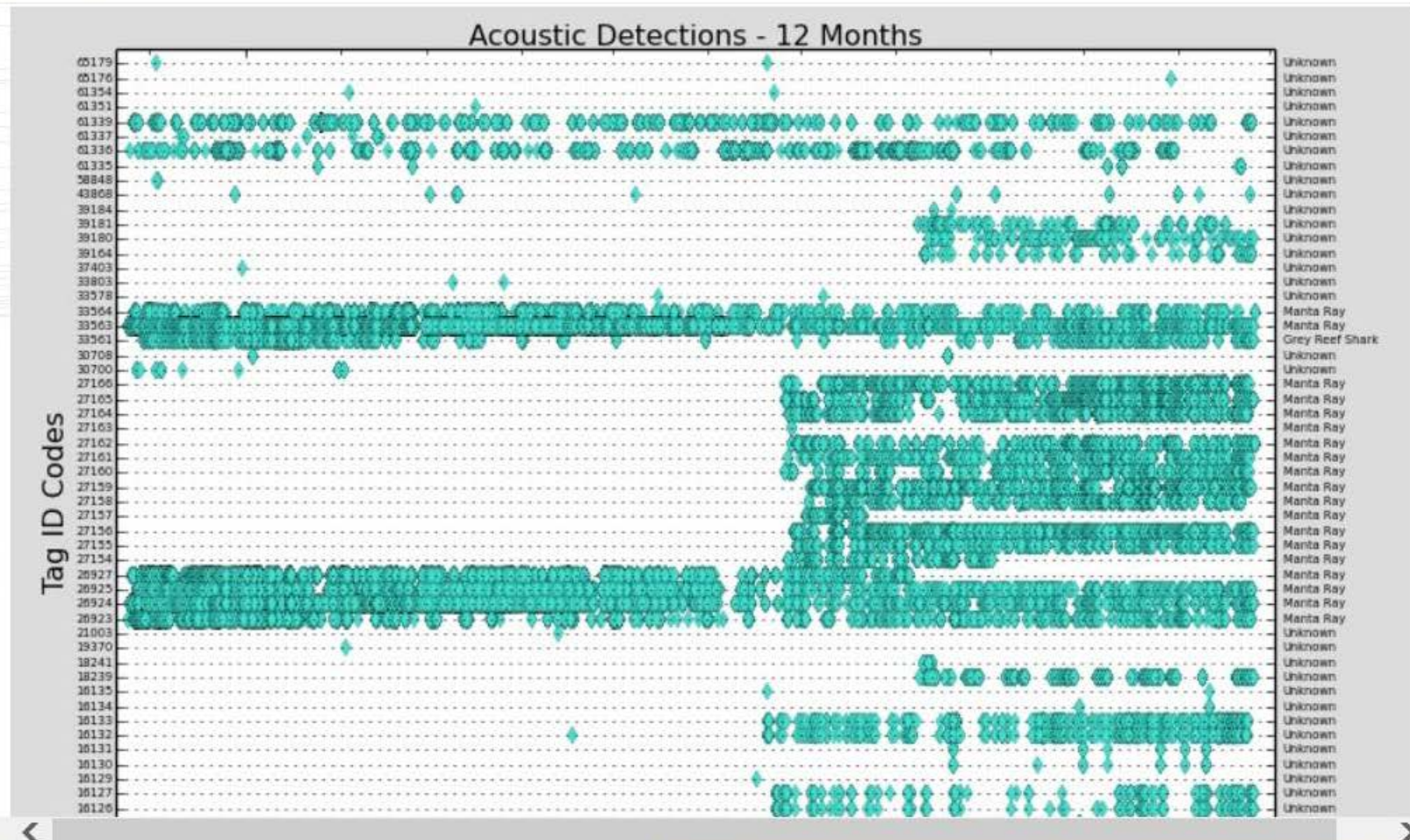






Text Box shows Live data and archived data simultaneously

Palmyra



Next Steps – Phase II Priorities

Integration of External Datasets

- RAs
- BOEM/ONR MARES project
- NOAA other agencies such as FWS, USACE etc.
- Other non-federal data

Potential Datasets/RAs

- AOOS- Arctic ATN AFSC NMML datasets (Josh London)
- PacIOOS- Sharks data (HIMB, Kim Holland)
- GLOS- GLATOS datasets (Chris Holbrook, Chuck Krueger)
- SECOORA- FACT datasets, SESFC billfish datasets
- NERACOOS- Gulf of Maine Salmon group (John Kocik) and Shark Program datasets
- MARACOOS- MATOS, Hudson, Chesapeake, ACT datasets
- NANOOS- NWFSC datasets+ WA, OR states datasets (HYDRA?)
- CenCOOS- SWFSC datasets (Salmon, marine mammals etc)
- GCOOS- iTAG (sue Barbieri), Tuna, Sturgeon, Sperm whales
- SCCOOS – SEFSC Marine Mammals group (Dewar Heidi), Cal Long Beach (Chris Lowe) ?
- CARACOOS- NOAA NCOOS, Caribbean Acoustic Tracking Network (CATn) (Simon Pittman and Bryan Legare)?

Potential Immediate Actions

- RAs data managers to connect to IOOS PO and ATN DAC managers:
 - 1- to identify potential data providers in their region
 - 2- to explore ways to leverage existing ATN data management practices.
 - 2- to explore setting machine to machine connections (ERDDAP or other services that can be accessed by ATN ERDDAP)
- Other actions....