Whale Matching with Photo ID App on OBIS-SEAMAP

April 13th, 2012

The OBIS-SEAMAP Team

Marine Geospatial Ecology Lab
Nicholas School of the Environment and Earth Sciences
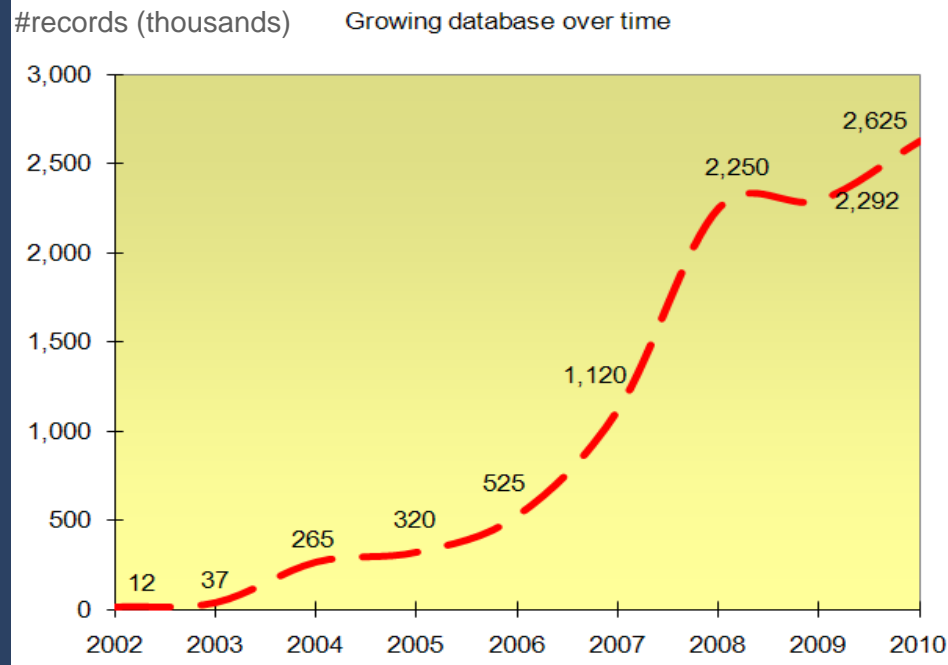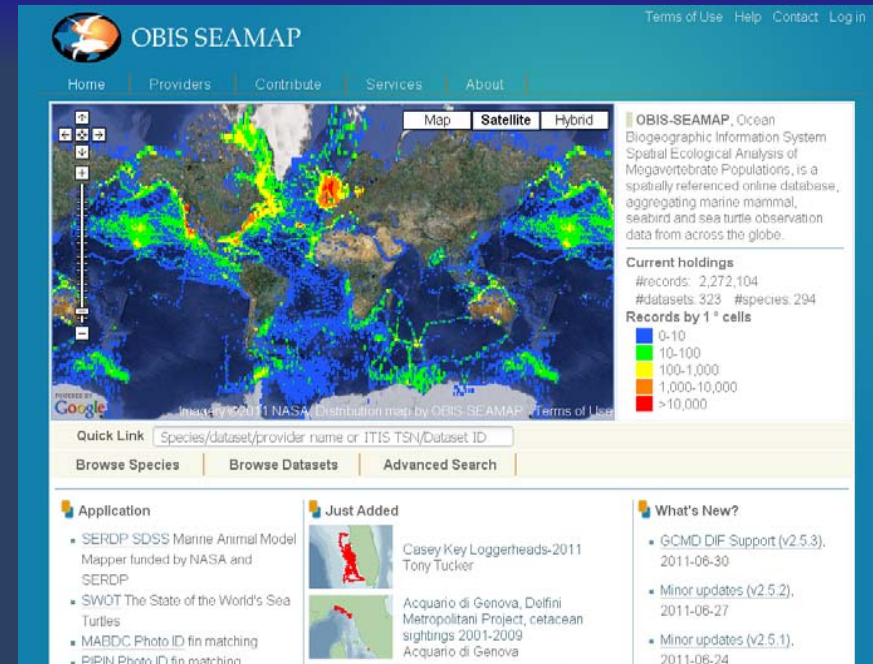Duke University

Introduction to OBIS-SEAMAP

Mesoplodon densirostris #9

Tursiops truncatus #6

Tursiops truncatus #39 Tursiops truncatus #40

Mesoplodon densirostris #25 Kogia sima #34
Stenella frontalis #2
Kogia sima #39 Mesoplodon densirostris #10
Kogia sima #27 Globicephala macrorhynchus #1

OBIS-SEAMAP

Online global biogeographic database with advanced mapping and visualization tools for marine mammals, seabirds and sea turtles.

Steadily growing in the past 10 years.

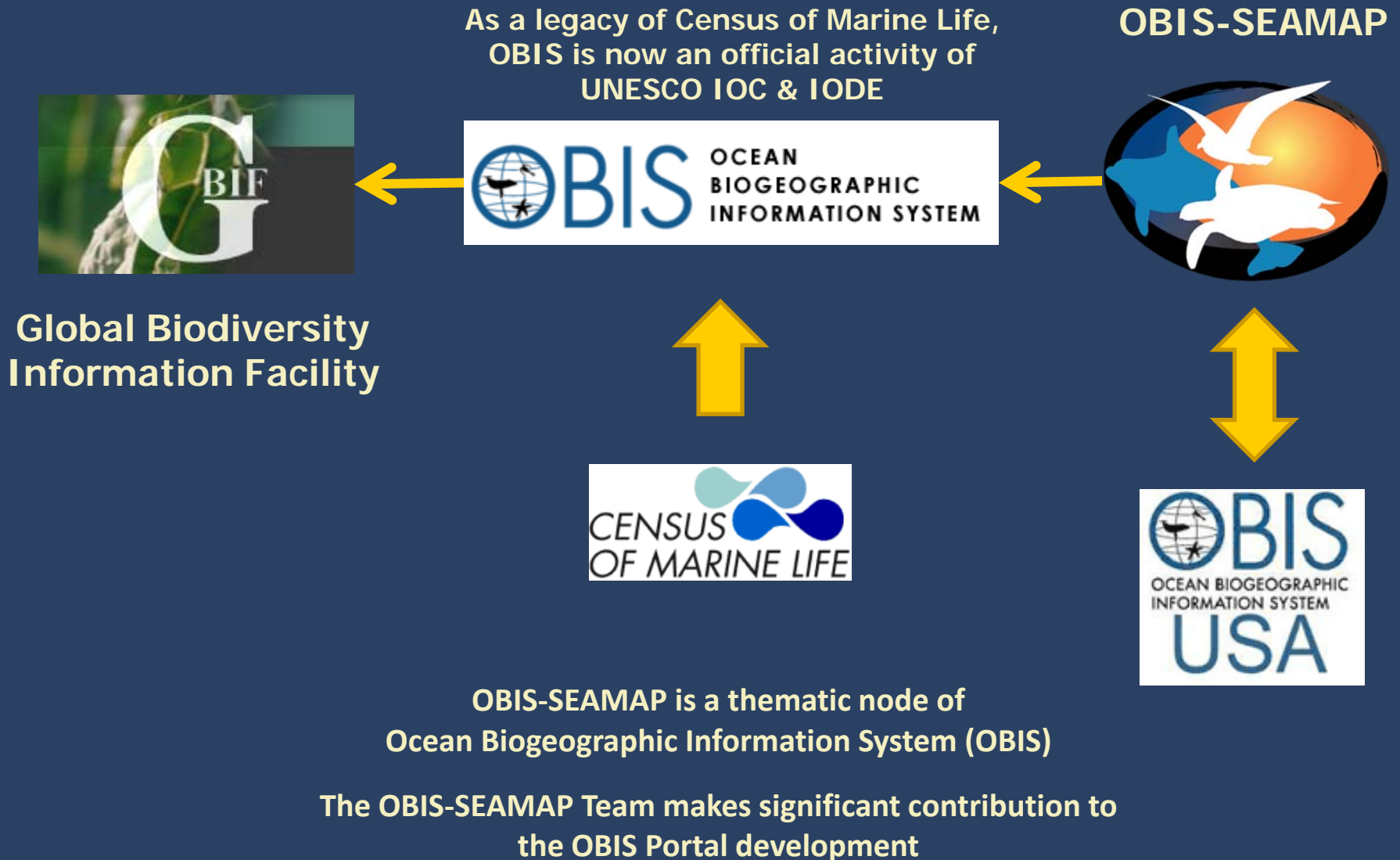Funded by NSF, NOPP, Alfred P. Sloan Foundation.

320 datasets
1935 – 2012
>2,800,000 records

National Science Foundation
WHERE DISCOVERIES BEGIN

OBIS-SEAMAP Partnership

As a legacy of Census of Marine Life,
OBIS is now an official activity of
UNESCO IOC & IODE

OBIS-SEAMAP

Global Biodiversity Information Facility

OBIS-SEAMAP is a thematic node of
Ocean Biogeographic Information System (OBIS)

The OBIS-SEAMAP Team makes significant contribution to
the OBIS Portal development

SEAMAP Online Interface

Concepts

Spatially & Temporally Interactive

Highlights

- Multi-resolution distribution map
- Explore data in space and time
- Multi-faceted search options
- Download what you see
- Association with oceanographic variables
- Histograms of oceanographic variables
- Advanced features for telemetry data
- Customized features for datasets
- Advanced visualization tools
- Time series / seasonal graphs
- Toward marine spatial planning

Data Types

Ship & aerial surveys

Telemetry tracking

Colonies & sites

Acoustic data
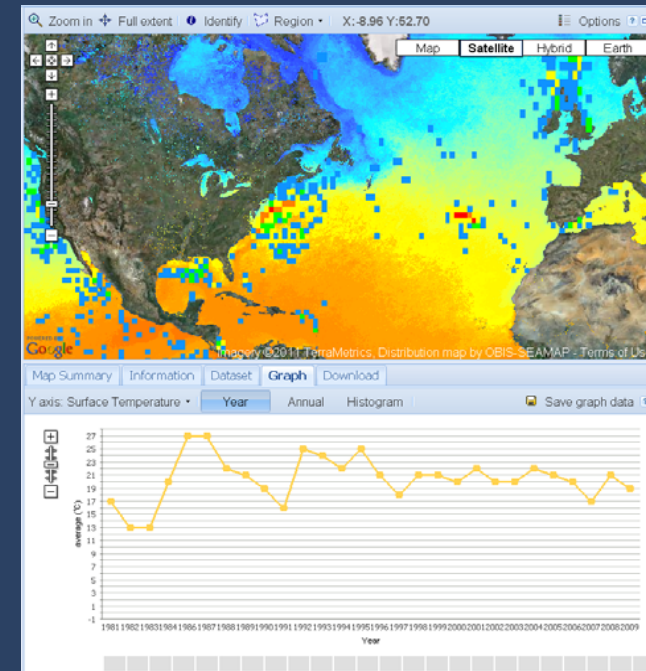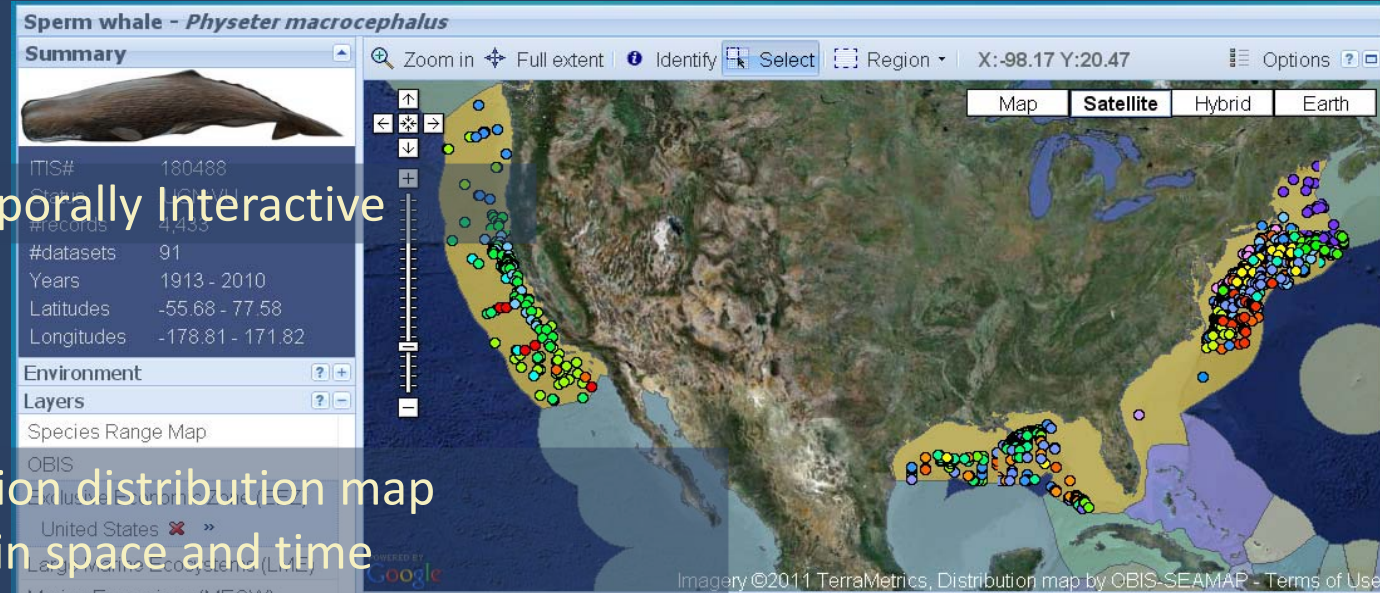
PhotoID

Models
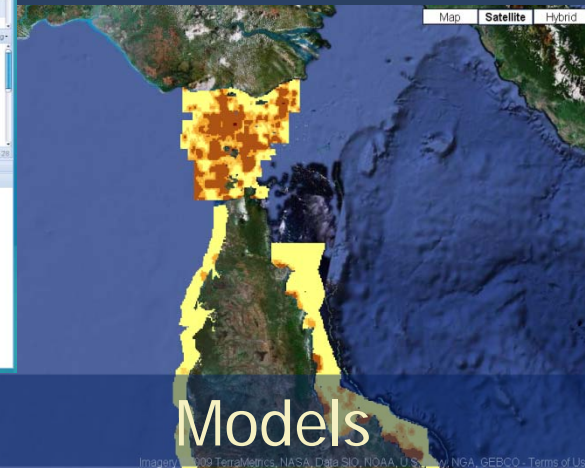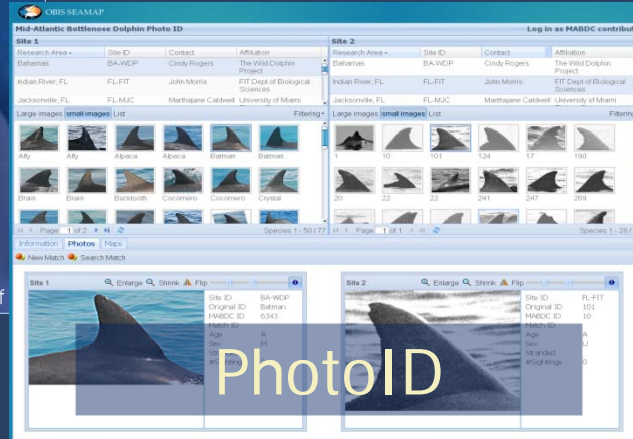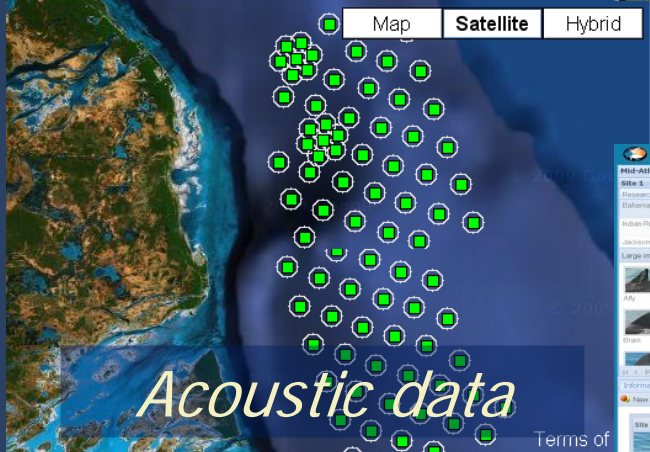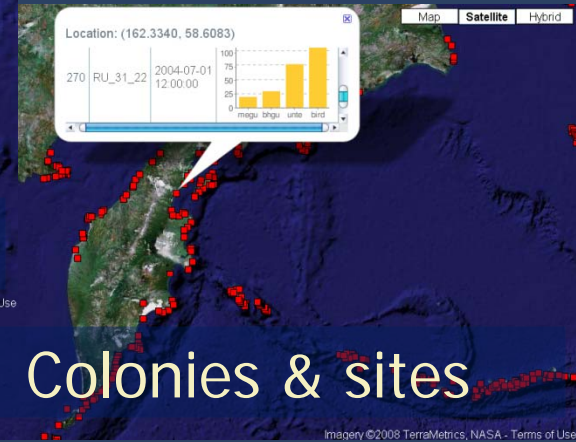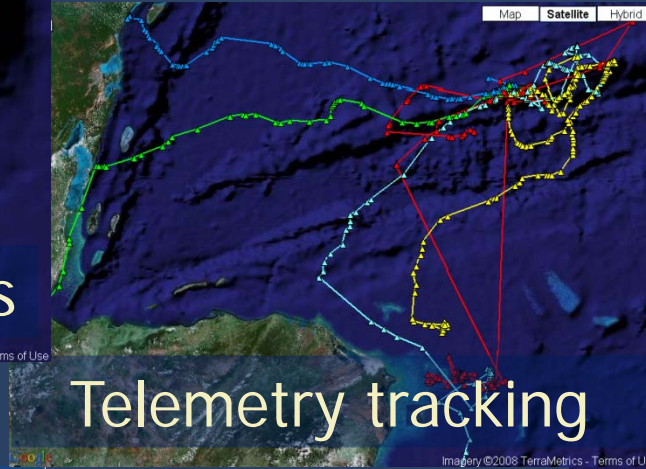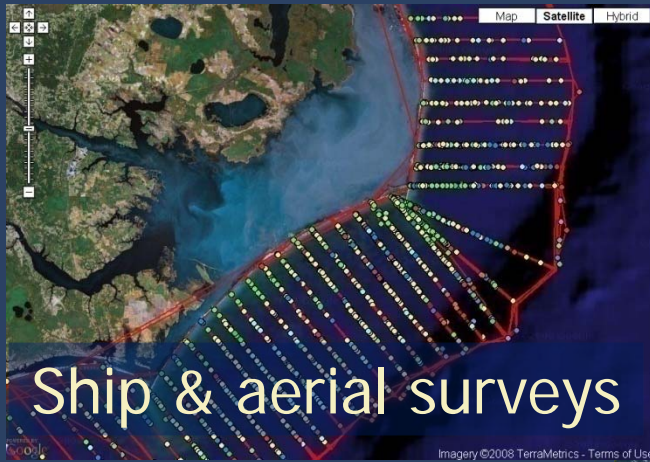
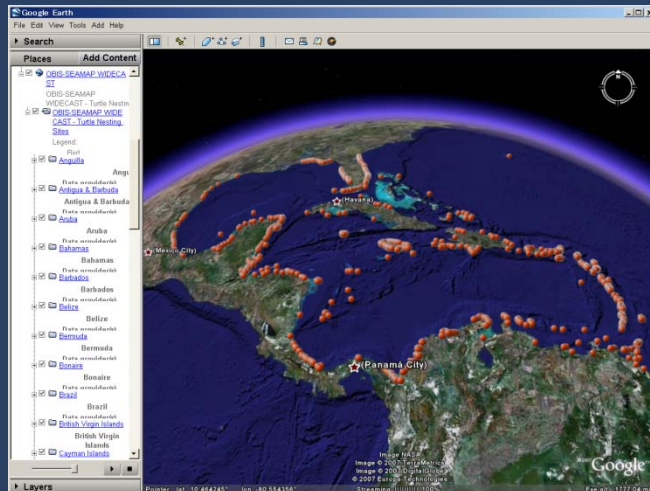# *Specialized Applications (1)*

Photo-ID

Online interface for images and data from photo-identification catalogs to facilitate collaboration among Photo-ID researchers; Started with Mid-Atlantic Bottlenose Dolphin Photo-ID Catalog (MABDC) and expanding to other Photo-ID catalogs.
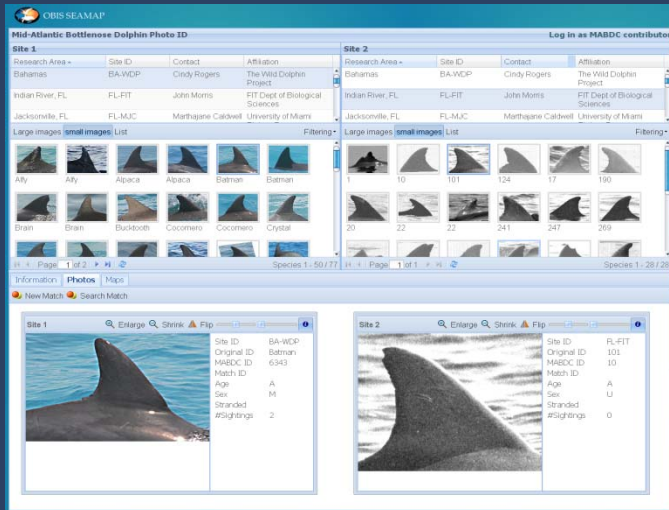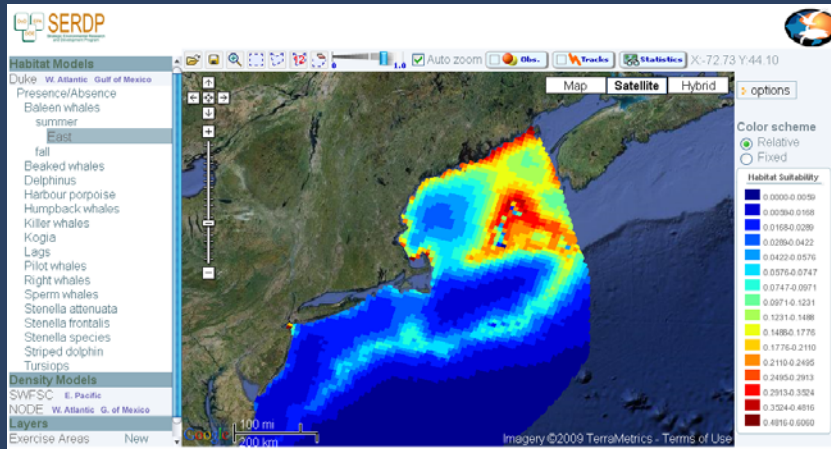

Turtle nesting data

Sea turtle nesting data from the State of the World's Sea Turtles (SWOT) and Wider Caribbean Sea Turtle Conservation Network (WIDECAST) covering all over the world;
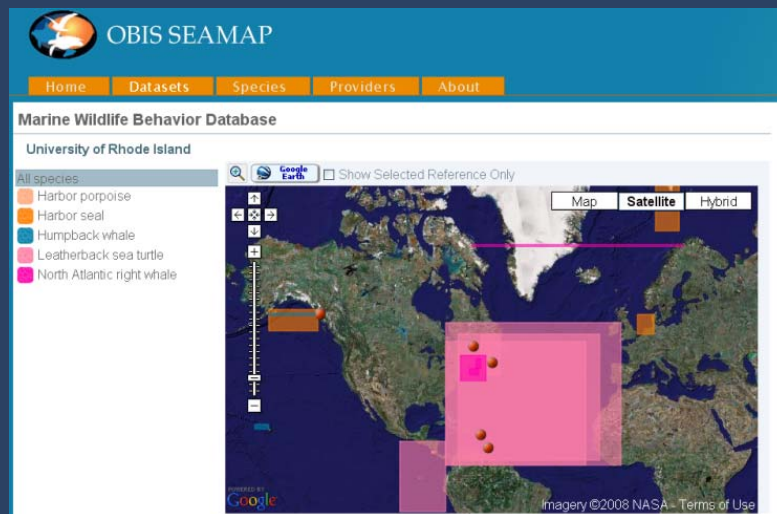Genetic sample locations are included.

Specialized Applications (2)

Habitat modeling

Spatial Decision Support System for Strategic Environmental Research and Development Program (SERDP) presenting statistically predicted habitat models for marine mammals

Wildlife behavior

Collection of geo-referenced references dealing with marine wildlife behavior researches

To learn more…

To learn more about the general features of OBIS-SEAMAP, go to :

http://seamap.env.duke.edu/seamap2.5/help/SEAMAP2_5_General_v1.pdf

(This link is also available on the OBIS-SEAMAP web site)

PhotoID Application
on OBIS-SEAMAP

Objectives

- Share the data and images through the Internet among Photo-ID researchers in the same area

- Provide friendly, efficient tools for the identification of the same animal observed in multiple sites

- Facilitate Photo-ID studies and researches on dolphin ecology, conservation etc.

- Develop a common framework that can be easily implemented to different Photo-ID catalogs (i.e. different areas, different species) with minimum modification and cost.

✓ Mid-Atlantic Bottlenose Dolphin Photo-ID Catalog (MABDC)
✓ Pacific Islands Photo ID Network (PIPIN) Catalog for Spinner Dolphins
✓ California Dolphin Online Catalog (CDOC)
✓ California Current Transient Killer Whale (CCTKW) Matching
o *Bottlenose dolphins in Gulf of Mexico, Bulgaria??*

Functionality

- Browse whale images with search functionality

- Compare whale images between sites / groups side by side

- For better comparison, manipulate the images by zooming, flipping, rotating or overlaying images

- Map the sightings of whales

- Get a potential match through the workflow for contributors' review

Fin Matching Flow (1)

Click to log in and you'll be forwarded to the login page.

After logged in, you'll be taken back to this page with "Logged in as *your account*" in the title bar.

✓ Access the online PhotoID App at http://seamap.env.duke.edu/photoid/cctkw
✓ Log in with your CCTKW account.

Fin Matching Flow (2)

From the site dropdown, select a site / group you would like to browse the images for.

The fin images of the whales observed in the selected site / group will be displayed below.

✓ First thing to do is to select a site / group from the site dropdown.
✓ The sites / groups are listed as "group_id (research area; primary contact)"

Fin Matching Flow (3)

Select a different site / group for "Site 2" so that you can compare the images between Site 1 and 2.

✓ As you are comparing the images between two sites / groups, do the same thing for "Site 2".

Fin Matching Flow (4)

To view larger images, choose "Large" or "Larger" from [Image size] dropdown.

Choose "List" to see images with animal characteristics such as IDs, age, sex, #sightings.

✓ By default, fin images are presented as small thumbnails.
✓ You can change the image size to "Large" or "Larger".
✓ "List" option presents image thumbnails with animal characteristics.

Fin Matching Flow (5)

Set up criteria in the filtering panel to get whales of your interest (e.g. adult male whales having a trailing edge at the upper half).

You can also pin-point the whale with its ID.

✓ If you are interested in animals with particular characteristics, or already know the ID of a whale, use the filtering function to get it fast.

Fin Matching Flow (6)

Think whale T132 from CWR and CA20 from SWFSC are identical?

Then, choose the images to compare them with convenient features such as "Enlarge", "Flip" or "Transparency".

✓ When you have found potentially identical whales from the two sites / groups while browsing images, choose the images.
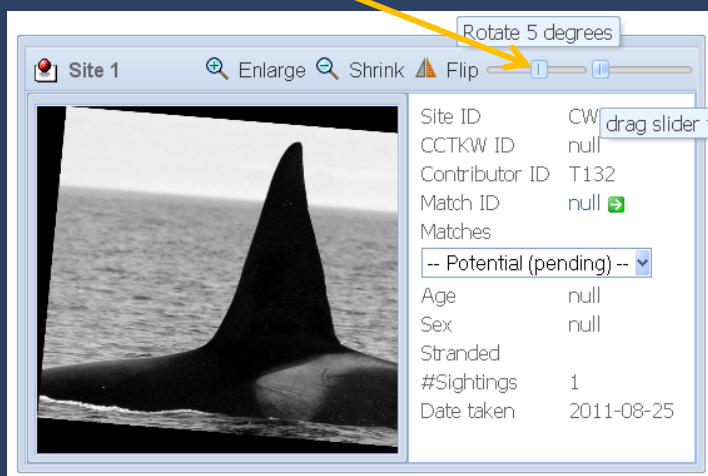✓ [Fin Matching] tab is a workplace to compare the images with convenient features.

Fin Matching Flow (7)
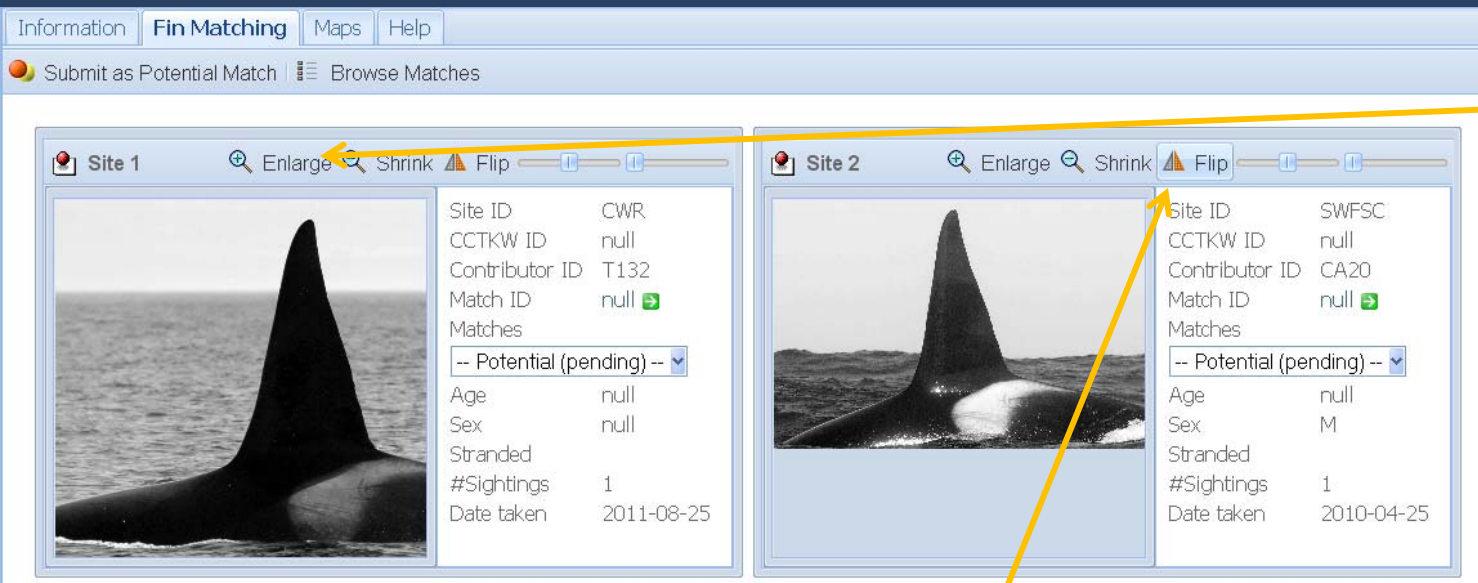
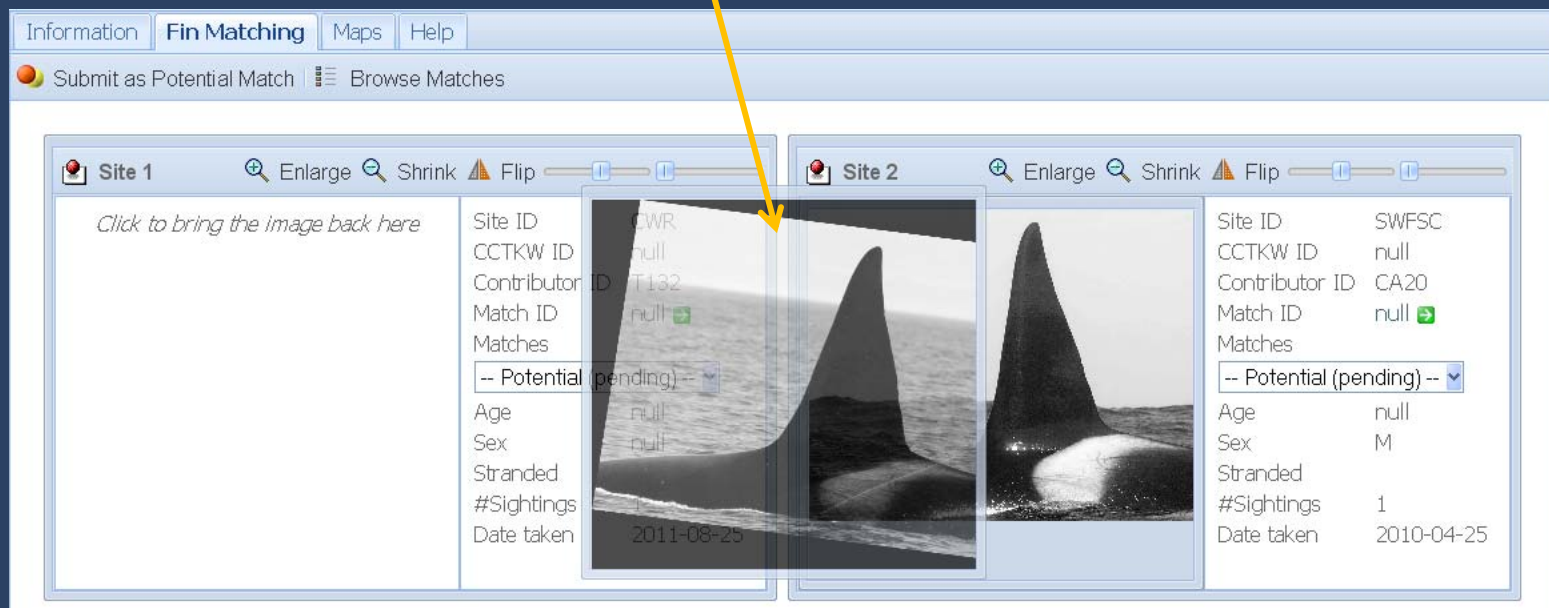Adjust the image size by clicking "Enlarge" or "Shrink".

You can rotate the image so that the fins in the two images are similarly tilted.

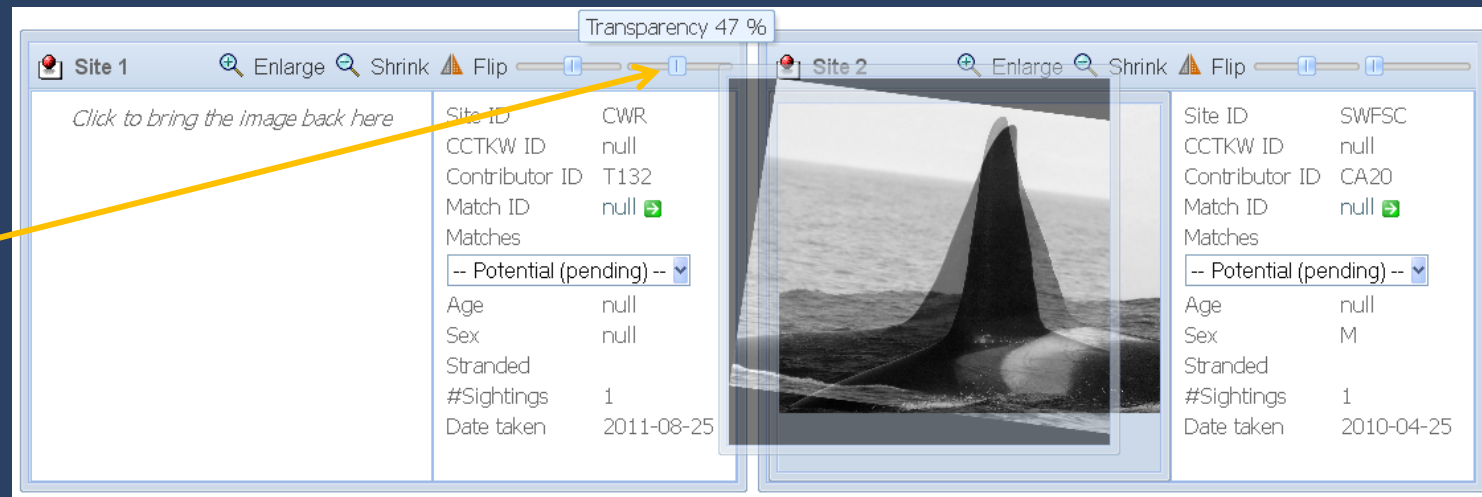If the two images are on a different side, flip one of them.

Fin Matching Flow (8)

Grab any part of the image window to move it over the other one. While doing this, the window gets transparent so that you can oversee the two images.

You can also make the transparency permanent.

Switch to [Maps] and see the sighting locations on the map, color-coded by whale.

Icons on the map is also clickable when [Identify] button is pressed.

A clickable list of sighting records is at the left.

✓ The map shows the sighting locations of the animals.
✓ Visualizing the sighting locations also helps to validate the potential match.

[Submit as Potential Match] brings up a Match-up dialog.

Review the information in the dialog and click [Submit] to initiate the workflow.

A notification email is sent to the matching team.

✓ Once you are convinced that the two whales are identical, pass around the information to the matching team for their review and consent.
✓ This initiates the workflow which mainly goes through a series of notification emails.

Fin Matching Flow (11)
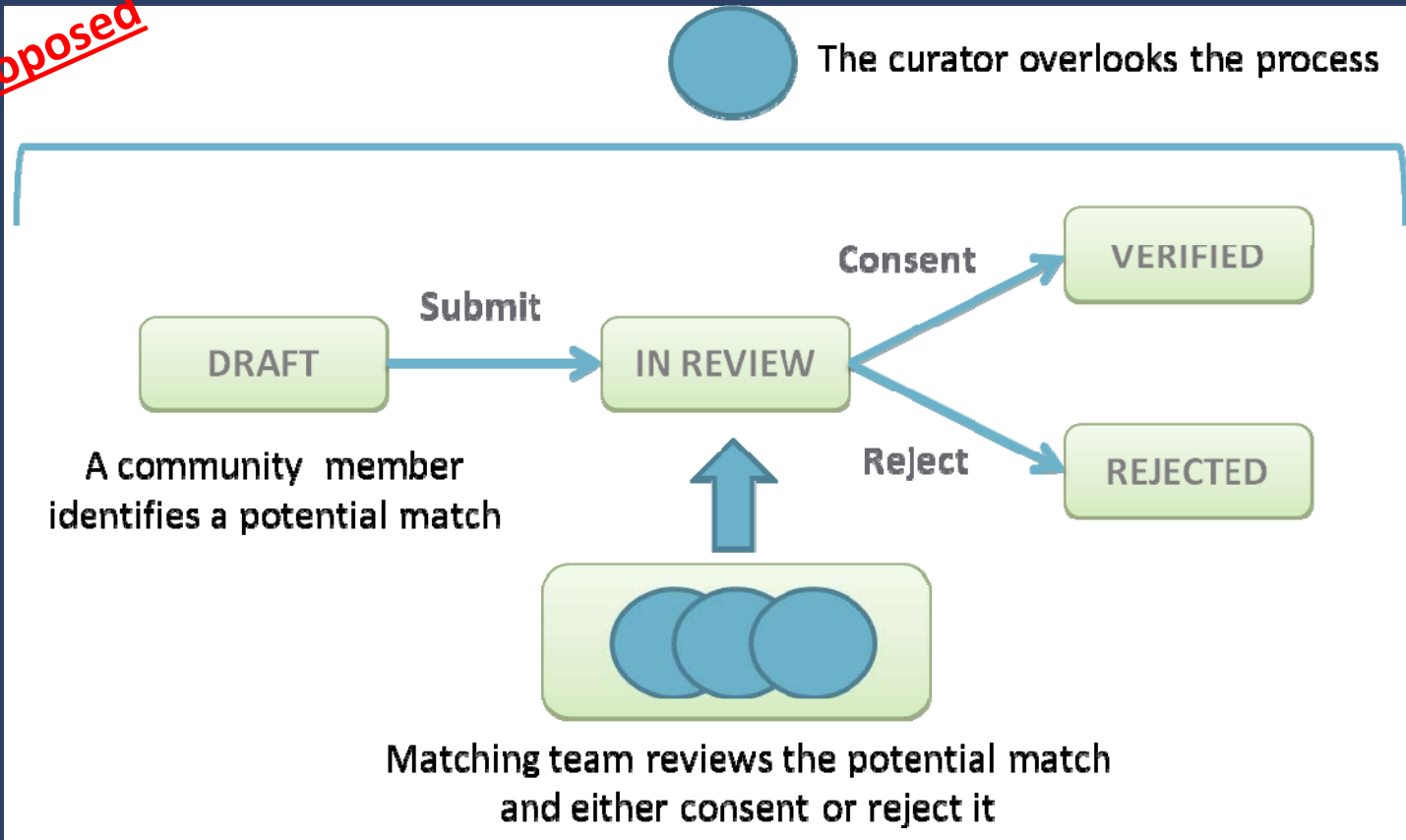
- ✓ When a potential match is found and submitted online, it's put in a 'Draft' state.
- ✓ A notification email is sent to the matching team. The match is put in a 'In Review' state.
- ✓ The matching team goes online and reviews the potential match; each member gives a consent or reject the match; If they all agree, the match is put in a 'Verified' state.
- ✓ Upon consent or rejection, the database is updated with a common unique identifier for the matching whale, and a notification email is sent to the matching team and the contributor PI's.

Fin Matching Flow (12)
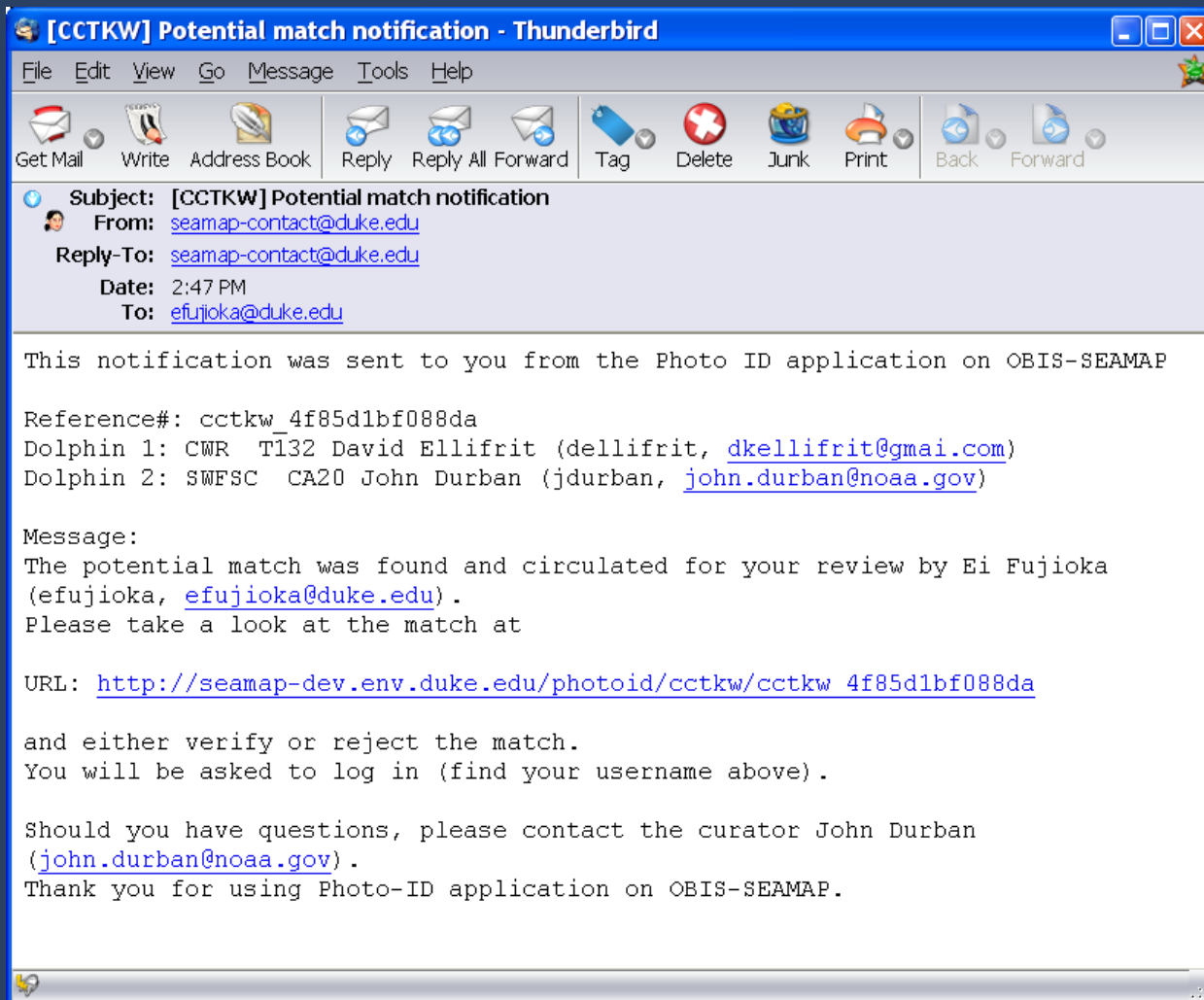
✓ In a notification email is the detail of the action and a link to the workflow for your review.

Fin Matching Flow (12)

Clicking the link in the notification email brings up the application with the workflow dialog.

Note the status is changed from 'Draft' to 'Notified'.

Click [Consent] if you agree that these two whales are identical.

✓ A click on the link in the notification email brings up the application with whales in question and workflow dialog already presented.
✓ Review the potential match and consent or reject it.

Fin Matching Flow (13)

When all the matching team gaves a consent, the workflow is complete and the match becomes official with a Match ID issued.

✓ When all the matching team gives a consent, the match becomes official and is given a Match ID.

More benefits (1)
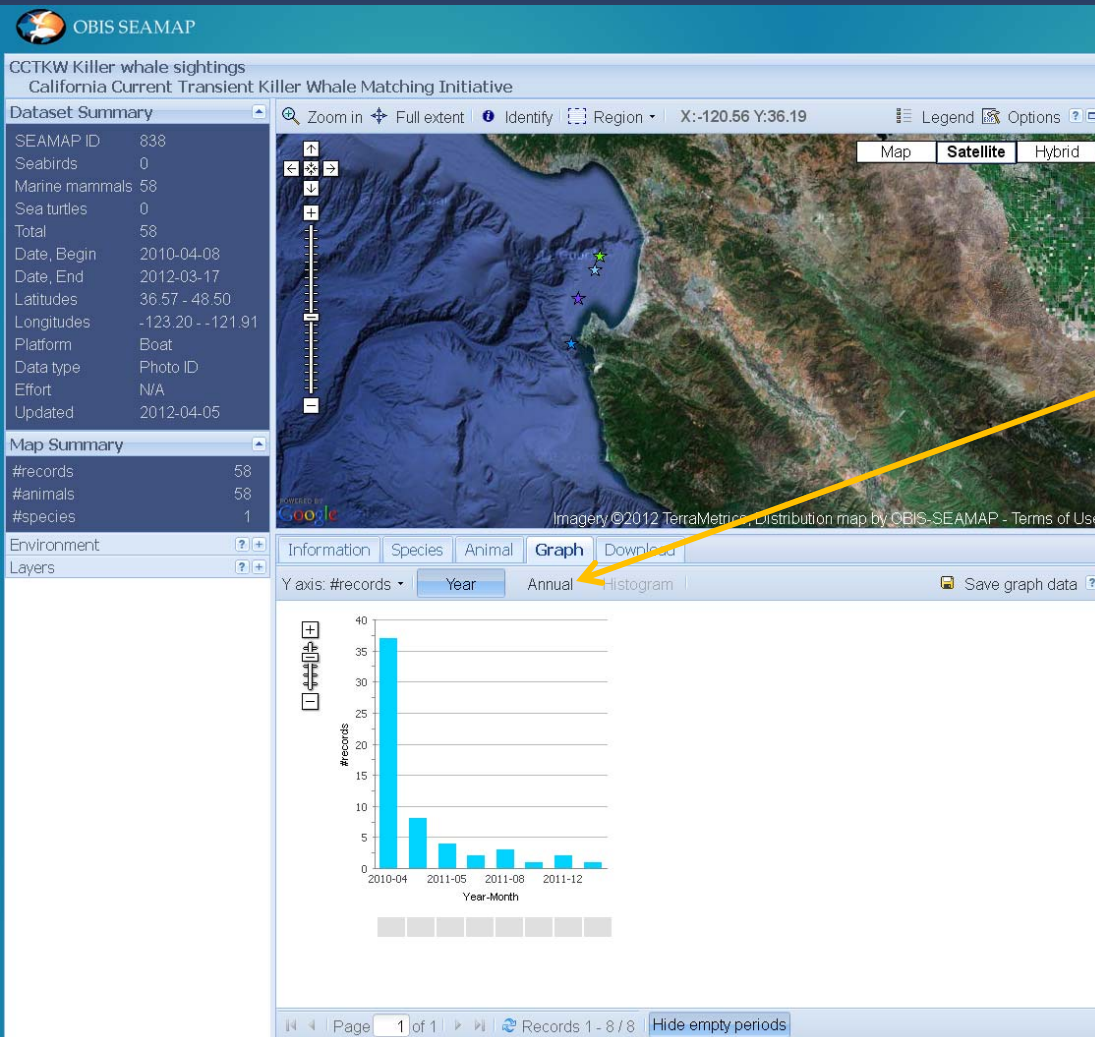

All sightings are mapped, color-coded by dolphin.

Fin images are displayed in [Animal] tab. Selecting one or several of them updates the map to show the sightings of the particular whale(s).

✓ Sighting data from CCTKW database is registered as an OBIS-SEAMAP dataset with all advanced mapping & visualization tools available.

✓ http://seamap.env.duke.edu/dataset/838 (not yet published)

More benefits (2)

The time-series graph visualizes #sightings over time.

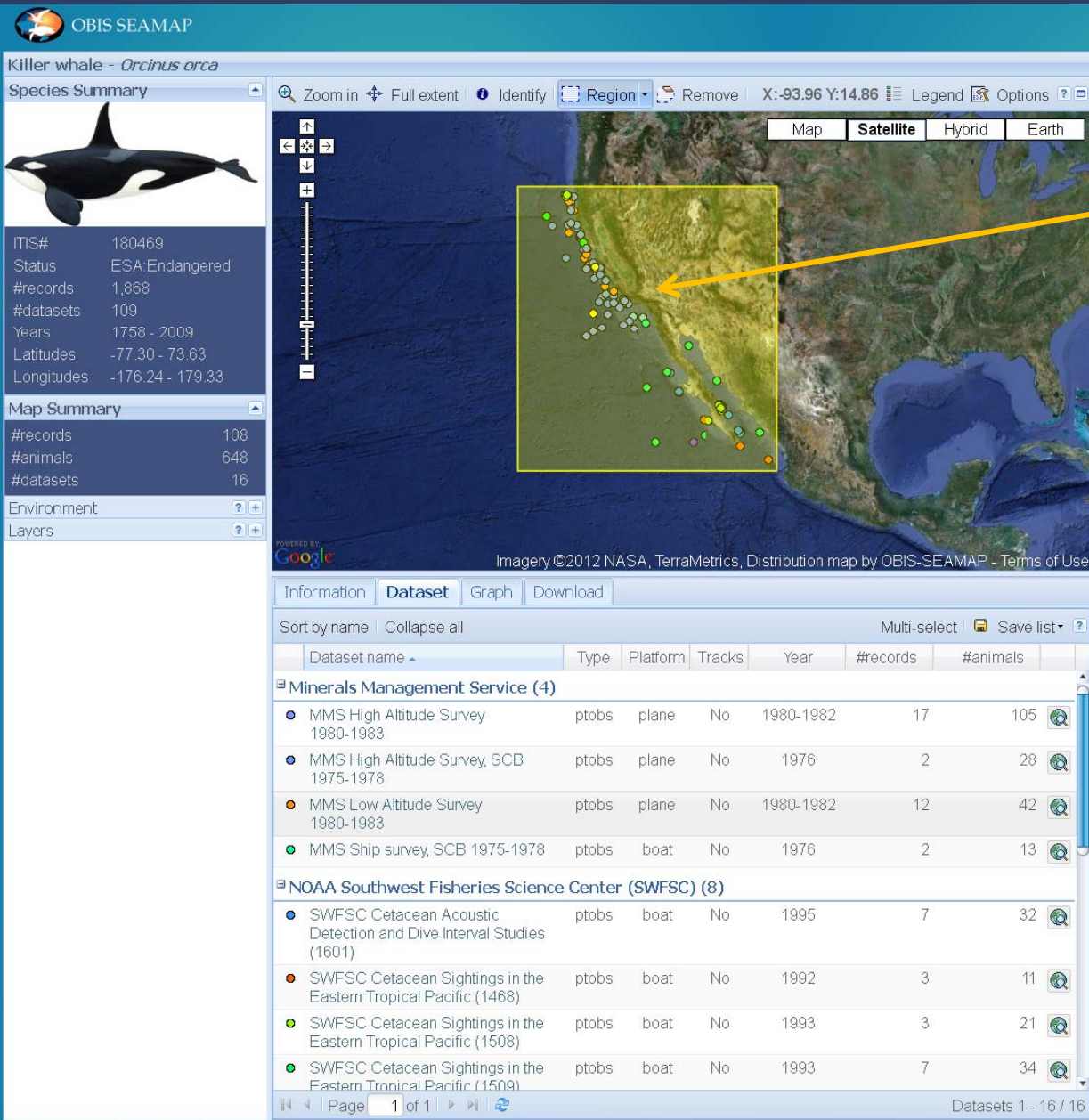The time period is selectable among years, months or days with the navigation bar.

You can even switch to seasonal changes (four seasons or 12 months).

You can also specify your time period of interest (e.g. winter) and the map shows the sightings in that period.

✓ One of the advanced tools is the interactive time-series graphing.
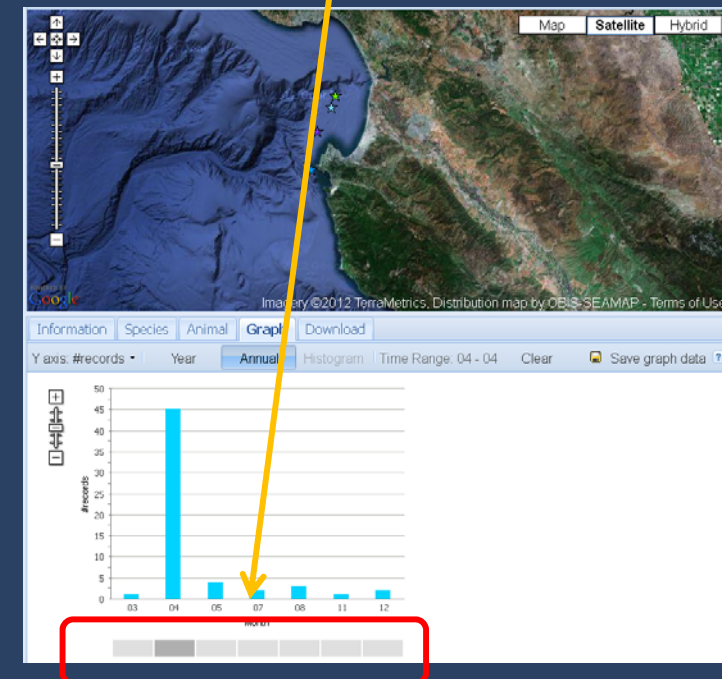
More benefits (3)

You are able to extract killer whale sightings along the west coasts from any OBIS-SEAMAP datasets.

✓ Sighting data from CCTKW are explored with other killer whale sightings from all the OBIS-SEAMAP datasets.
(CCTKW sighting data will be published upon approval and are not visible in the above screen shot)

OBIS-SEAMAP

marine megavertebrate geo-archive

http://seamap.env.duke.edu

Thank you

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