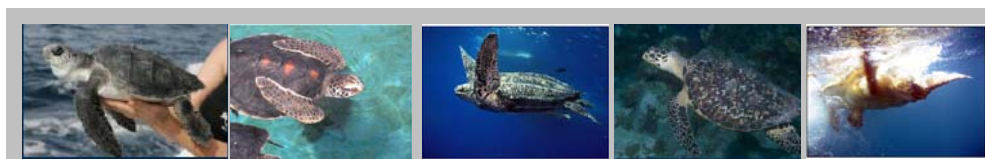


Protected Resources Division Southwest Fisheries Science Center National Marine Fisheries Service, NOAA



<http://swfsc.noaa.gov/prd.aspx>



Southwest Fisheries Science Center
NOAA Fisheries Service



Some Background

- “Protected Resources”
 - Marine mammals and marine turtles
- Why does NMFS conduct research on them?
(little or no directed take)
 - They are affected incidentally by fisheries (bycatch) and other anthropogenic factors (e.g. ocean noise, pollution)
- What do they share?
 - Many are endangered
 - Some are recovering
 - Most are affected incidentally by anthropogenic factors



Our Two Primary Mandates

Marine Mammal Protection Act – Maintain populations as functioning elements of their ecosystem

- Estimate population size
- Estimate human-caused mortality
- Determine stock structure

Endangered Species Act – Prevent extinction and recover species

- Estimate population size
- Determine trends in abundance
- Identify “evolutionary significant units”
- Identify and mitigate threats
- Designate critical habitat

Note that our mandates require research outside of U.S. EEZ (marine mammals and turtles do not recognize political boundaries)



Our Mission

1. Assess* protected species relative to management objectives in US EEZ waters or waters where the US has a vested interest
2. Identify and mitigate threats
3. Support users of our data
4. Educate and build capacity
5. Advance the science of management and conservation

*Five components:

- Estimate abundance
- Monitor status and trends
- Identify units to conserve
- Understand life history, condition, and health
- Understand ecosystem state, structure, and function



Our Ecosystems

Central Pacific – in support of PIFSC

- 2.2 million km²

California Current

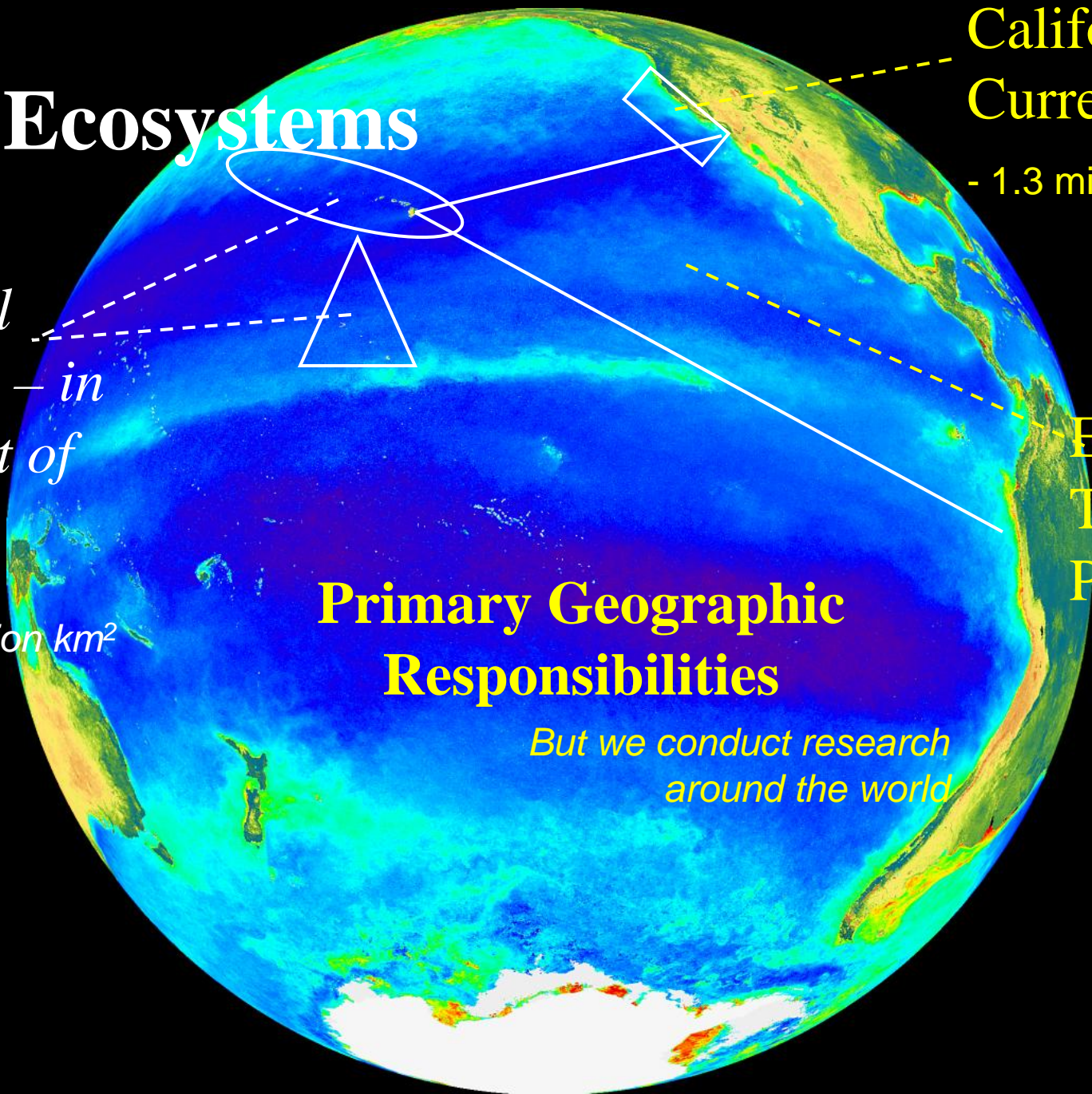
- 1.3 million km²

Eastern Tropical Pacific

- 20 million km²

Primary Geographic Responsibilities

But we conduct research around the world



Our Major Field Efforts

Research Vessel Surveys

Aerial Surveys

Shore-based Surveys

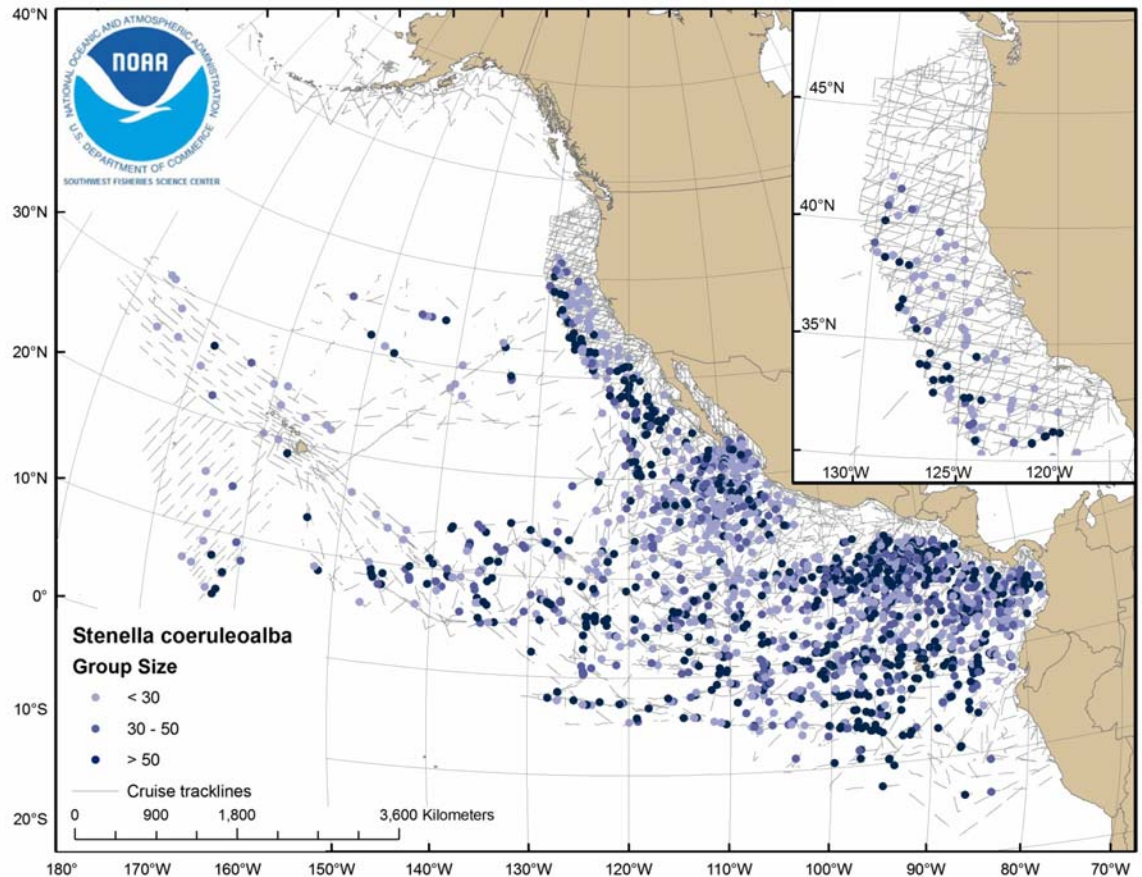
Small boat-based Research



Research Vessel Surveys

i. Abundance and Ecosystem Assessment Surveys

- California Current: 3 to 4-yr cycle
- Eastern Tropical Pacific: 3 to 4-yr cycle
- Central Pacific: irregular



- A Multidisciplinary Approach (since 1986)

Ecosystem Assessment

Abundance

Abundance

School Size
Calibration



Biology

Population
Structure

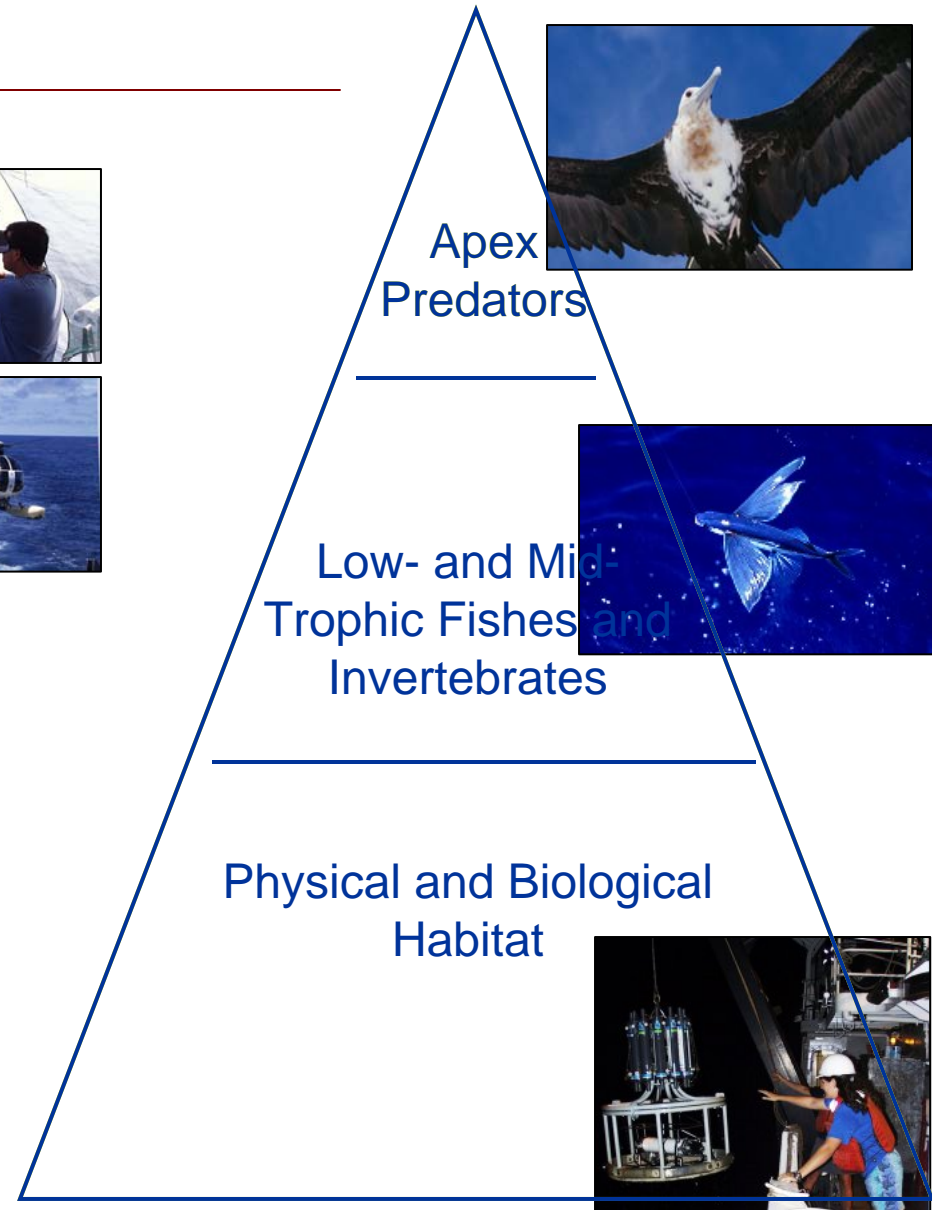
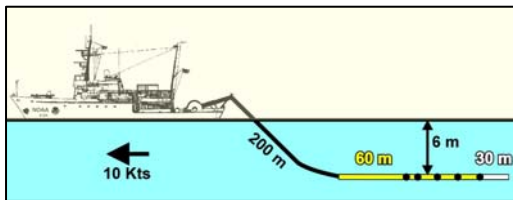
Behavior



Life
History



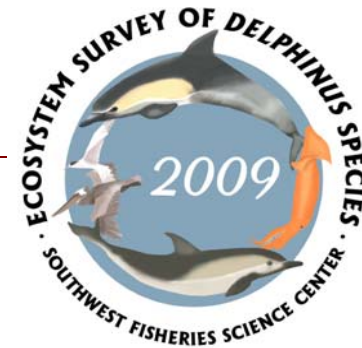
Acoustics



Research Vessel Surveys

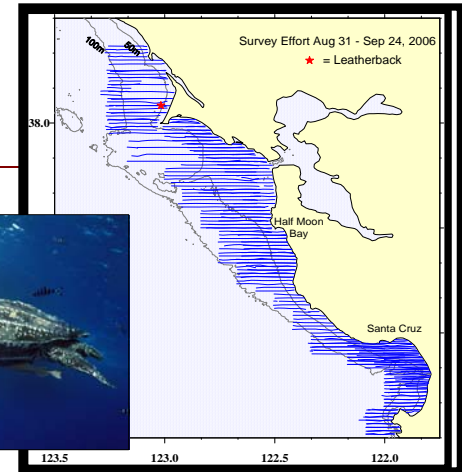
ii. Question-Based Cruises

- What is the abundance, stock structure, health status, and life history of transboundary (US-Mexico) common dolphins? (2009)
- What characterizes preferred foraging habitat of leatherback turtles in Monterey Bay? (2007)
- How can we use acoustics to monitor the critically endangered vaquita? (2007)
- How many humpback whales are there in the north Pacific (2004)
- What are the indirect effects of yellowfin tuna purse-seine interactions on spotted and spinner dolphins (2001)
- How many sperm whales are there in the northeastern Pacific (1997)
- How do we calculate abundance for cetaceans that dive deep and long? (1995)
- What characterizes preferred foraging habitat of baleen whales in the southern California Bight (1995/96)



Aerial Surveys

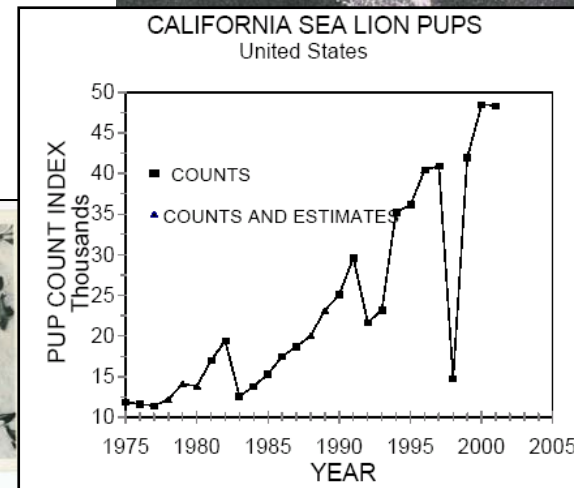
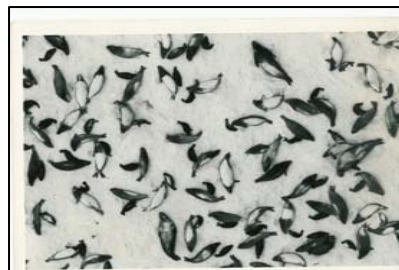
i. Marine turtle distribution & abundance



ii. Cetacean abundance, condition, & life history

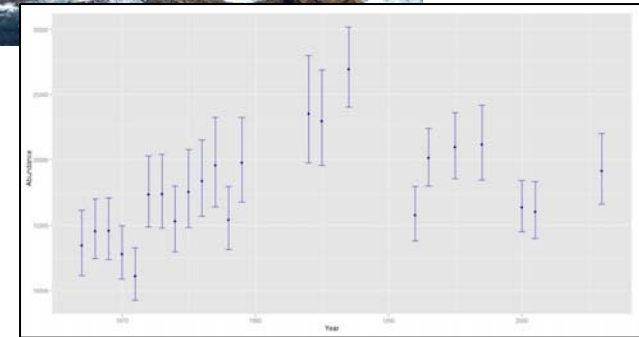


iii. Pinniped abundance



Shore-based Surveys

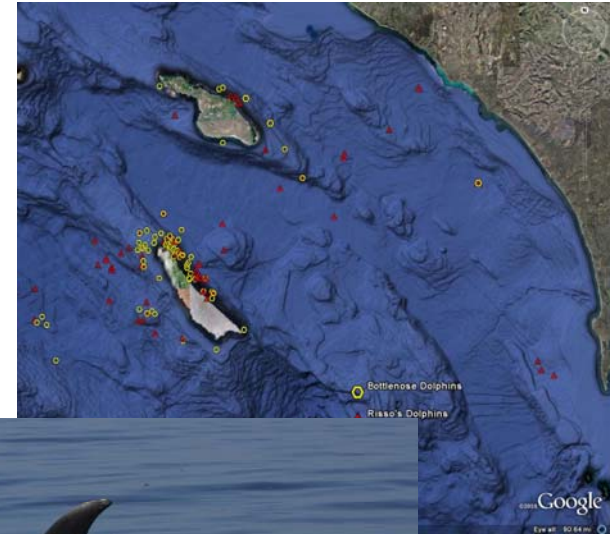
- i. Southbound gray whale population abundance survey (since 1964)



- ii. Northbound gray whale calf production survey (since 1994)

Small Boat-Based Research

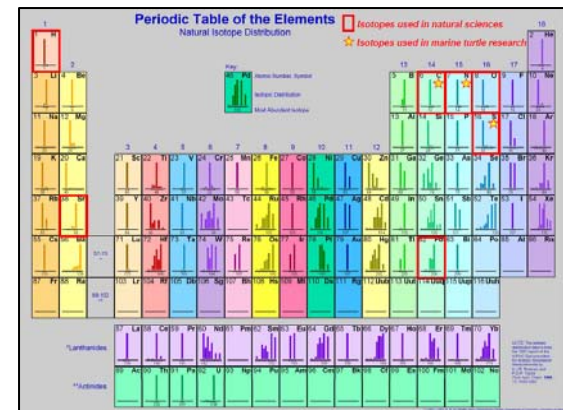
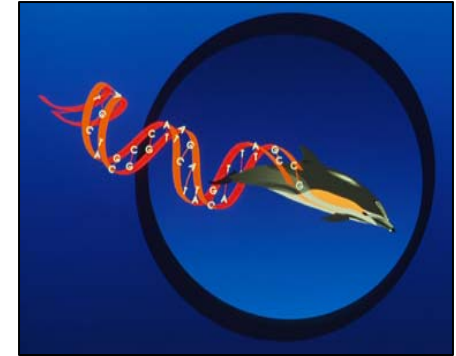
- Dolphin Health Assessment



- Green Turtle Ecology

Laboratory Research

- Molecular Genetics
- Photogrammetry
- Stable Isotopes
- Hormone Assays
- Life History
- Acoustics

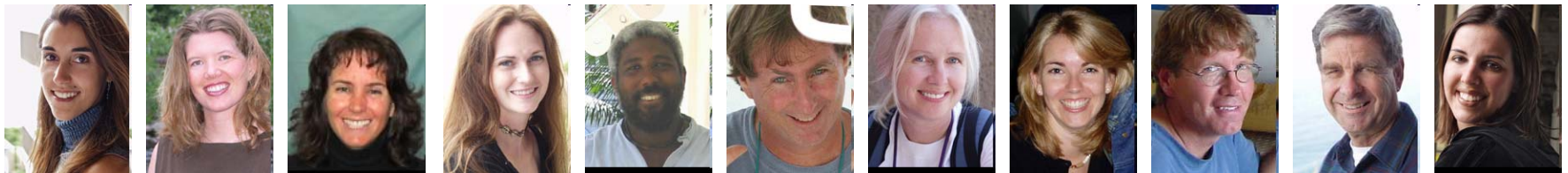




Division Scientists

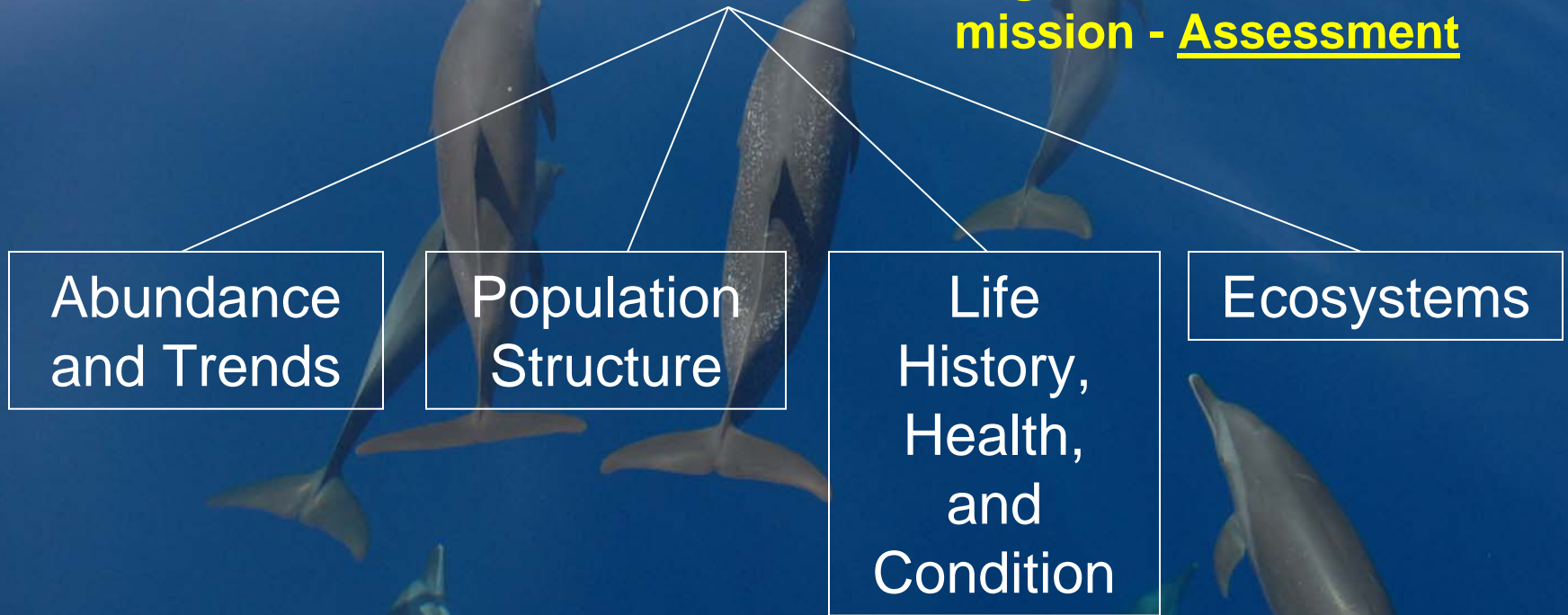
7 Science Programs & 1 Implementation Program

~80 Talented and Dedicated Individuals



Division Structure

- Organized around our core mission - Assessment



- 4 Disciplines (core components of assessment), 2 Taxa
- Designed to implement research activities with maximal collaboration



Division Science Metrics

Ongoing Projects

- 37 - Abundance estimation, assessment, and reducing bycatch
- 58 - Defining units to conserve
- 24 - Life history, condition, health assessment
- 13 - Ecosystem approaches to management
- 15 – Additional strategic research

Graduate Students Advised

Currently: 13 SIO, 25 Other Universities

Past 5 years: 11 SIO, 29 Other Universities

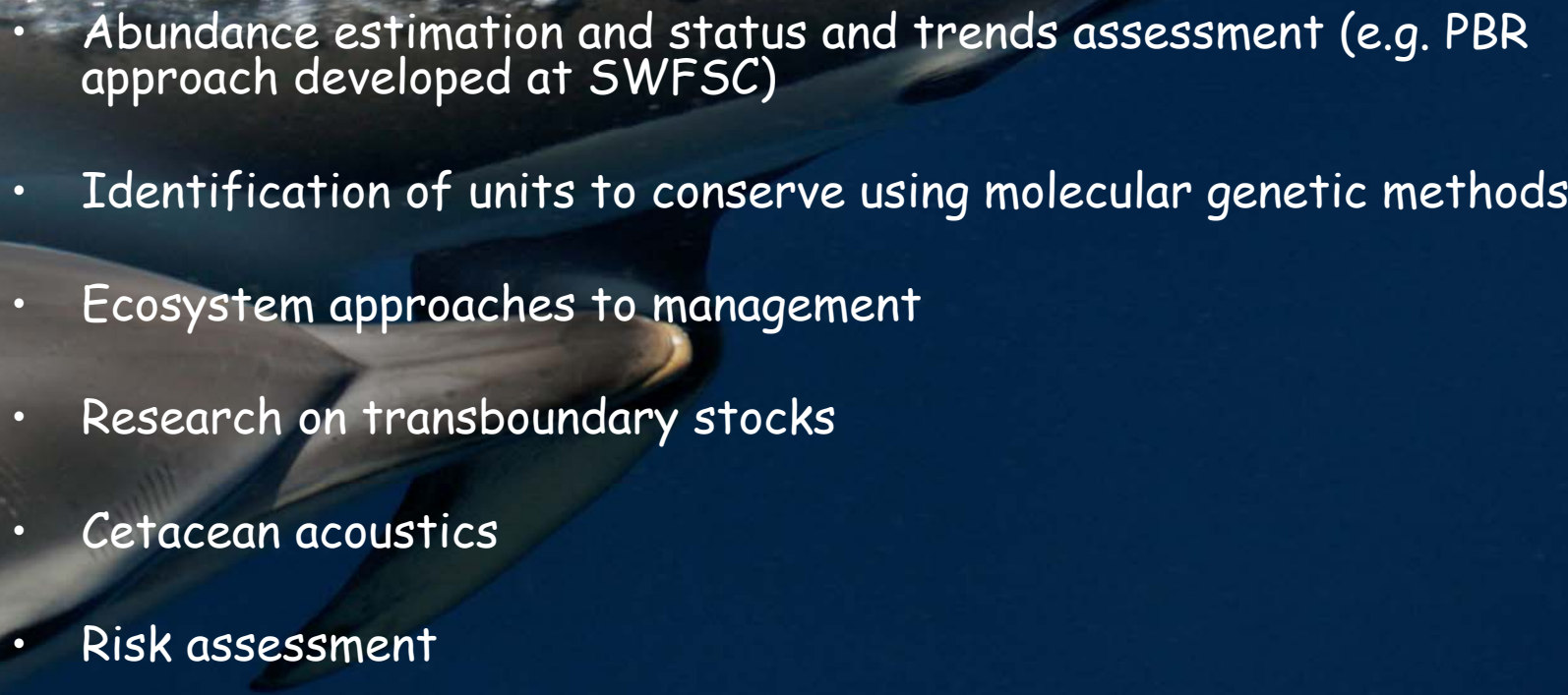
Publications (past 5 years)

280 peer-reviewed publications and book chapters (118 senior-authored)

205 government reports and meeting documents

20 based on sample requests/loans

Division Strengths

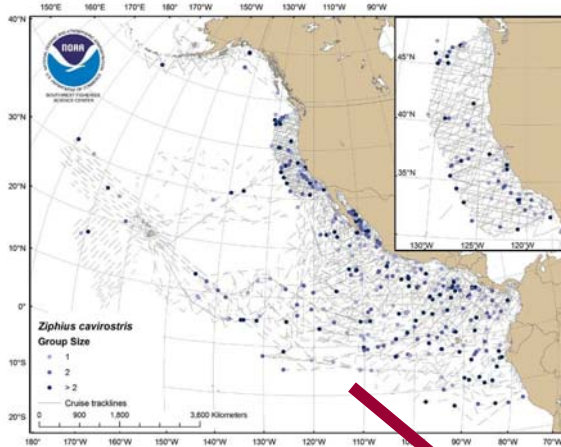
- 
- Abundance estimation and status and trends assessment (e.g. PBR approach developed at SWFSC)
 - Identification of units to conserve using molecular genetic methods
 - Ecosystem approaches to management
 - Research on transboundary stocks
 - Cetacean acoustics
 - Risk assessment
 - Use of non-lethal sampling (skin and blubber biopsies) to obtain life history parameters

The background of the slide features a close-up, top-down view of water ripples. The ripples are concentric circles of varying sizes, creating a textured, undulating pattern. The color palette is soft and monochromatic, consisting of light blues, pale greys, and off-whites, which gives the image a calm and serene appearance.

A Sampling of Research Highlights

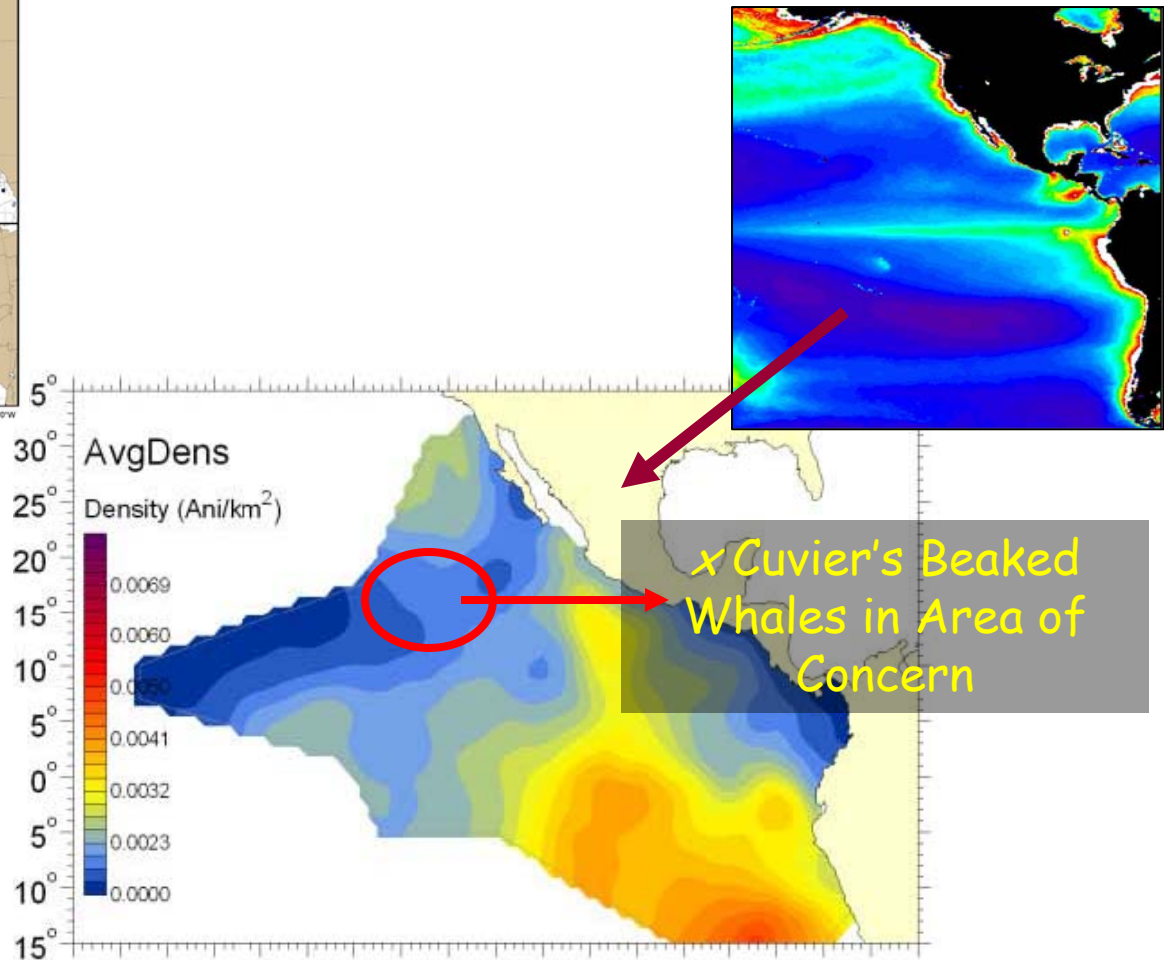
Ecosystem Data can be Used to Predict Beaked Whale Abundance and Distribution

Cuvier's Beaked Whale Sightings

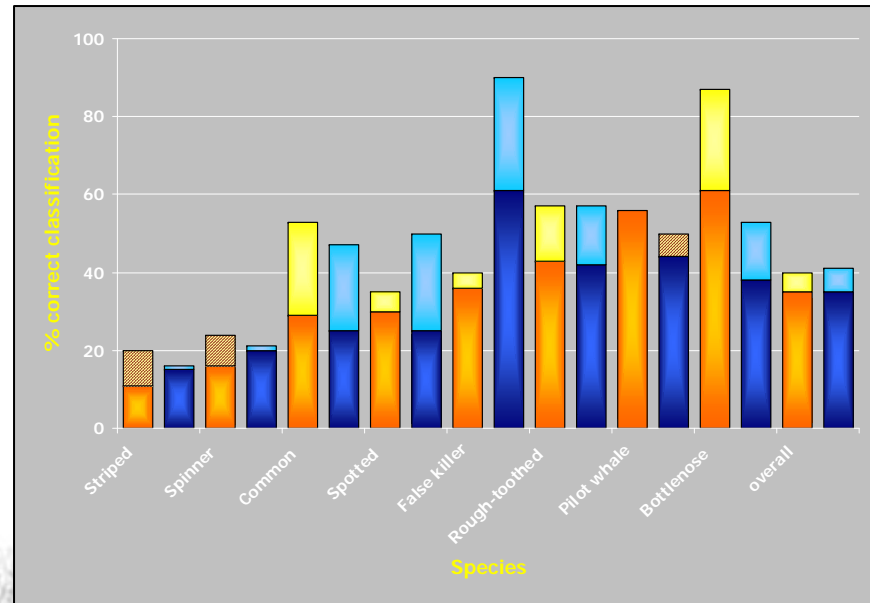
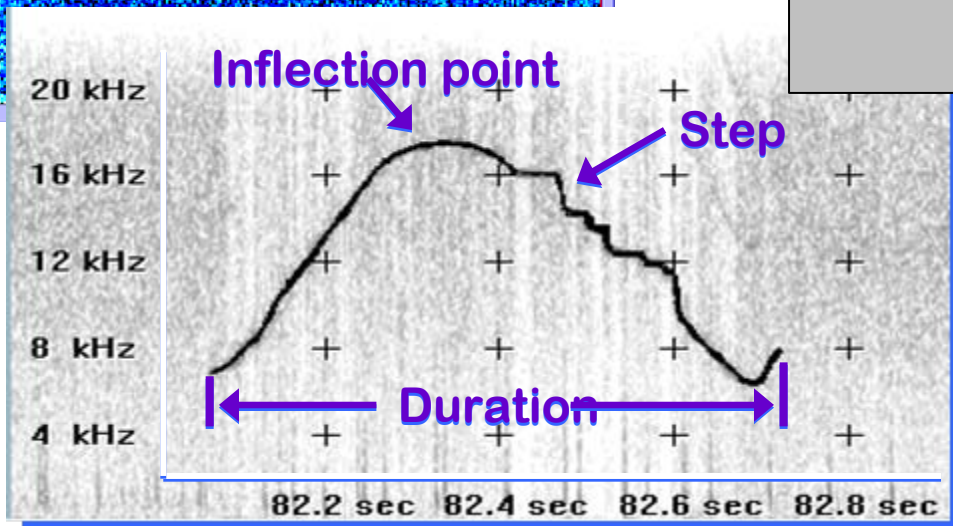
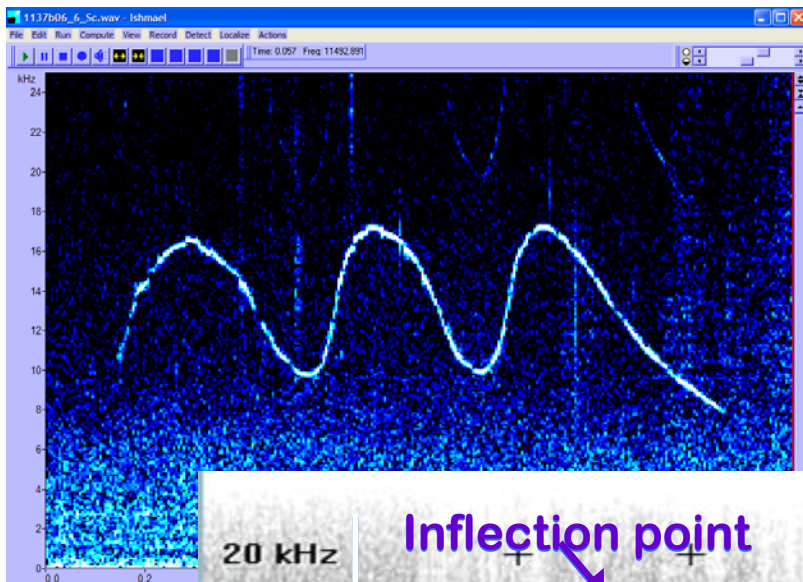


Application:
Users of the
marine
environment
can comply
with EIS
requirements;
avoid high
density areas

Physical and Biological Habitat

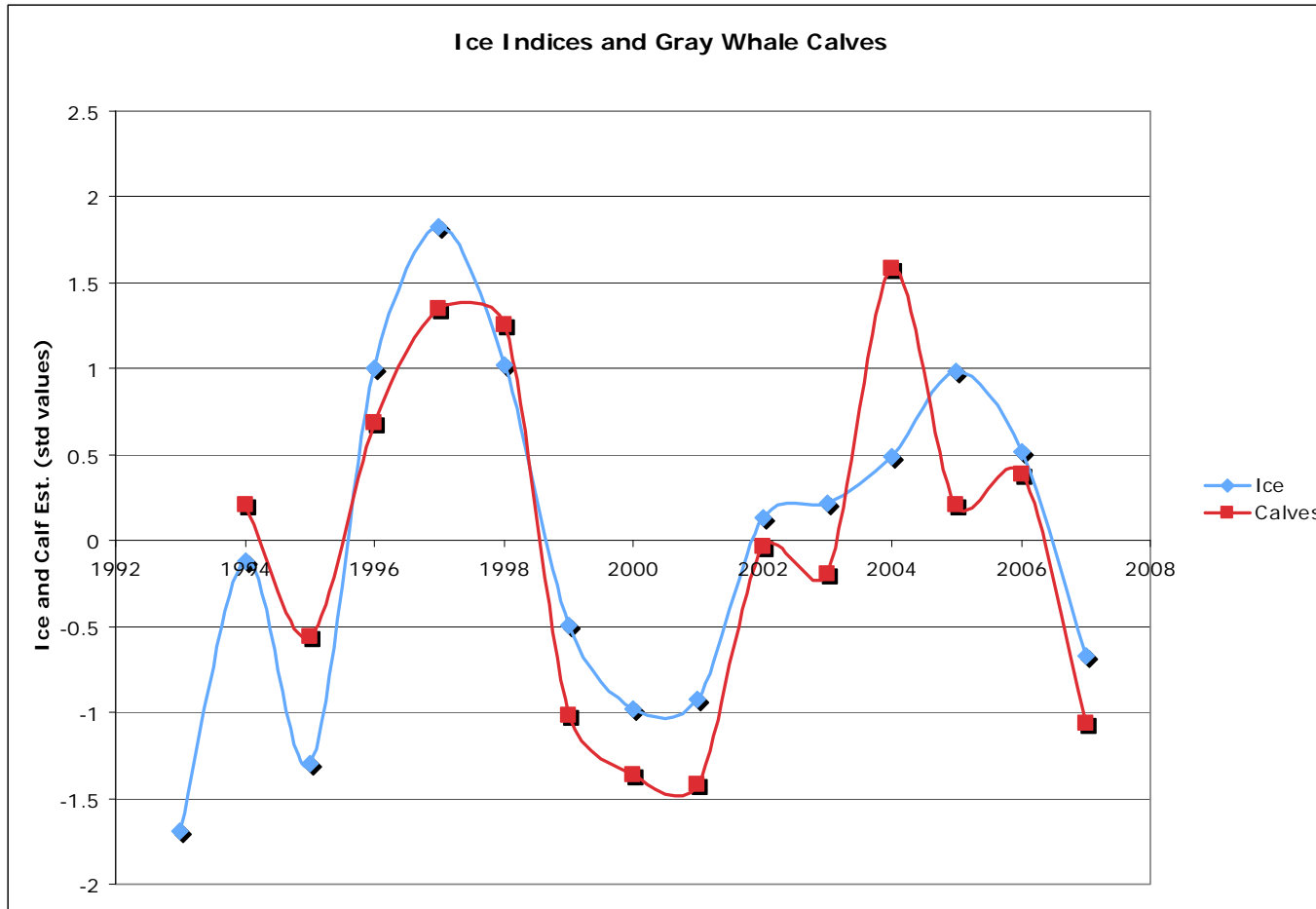


Cetacean Vocalizations can be Identified to the Species Level



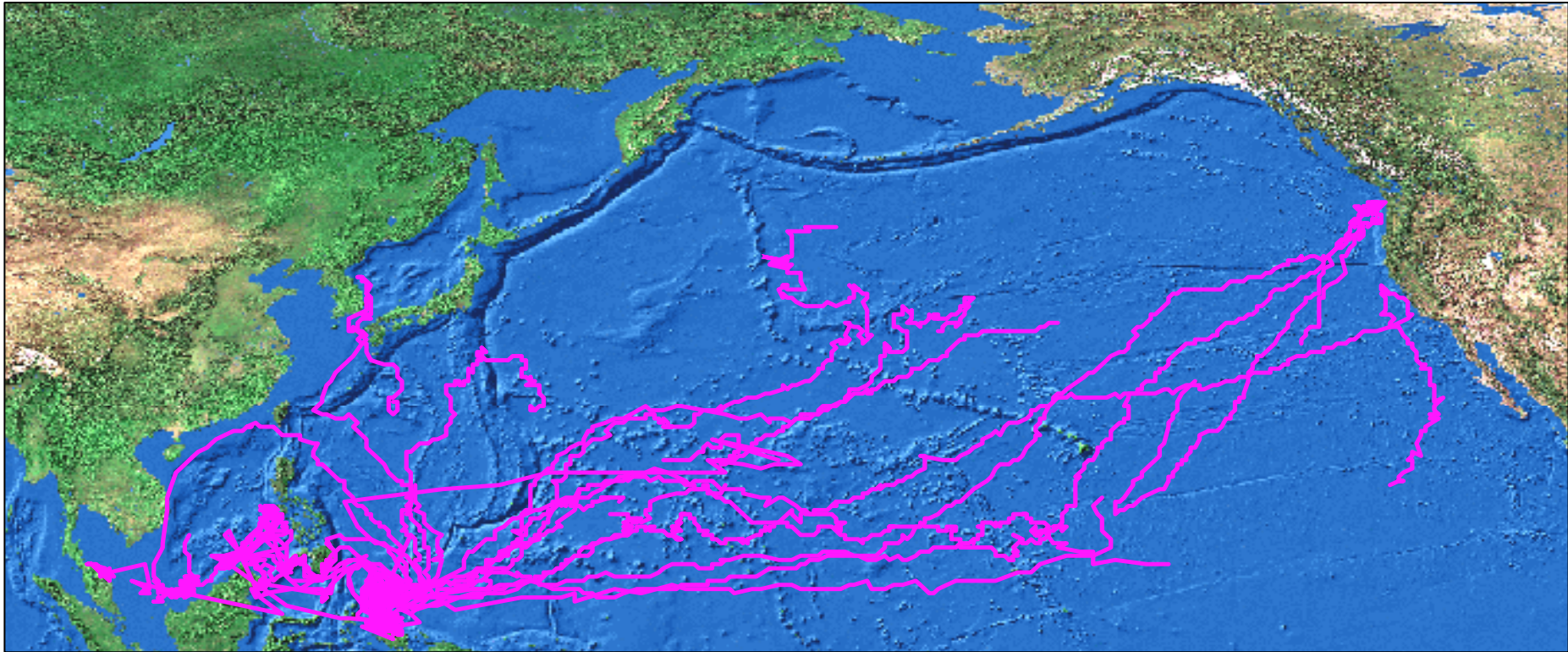
Application: Passive acoustics can potentially be used to monitor specific species

Gray Whale Calf Numbers Track Ice Condition



Application:
Climate may
affect gray
whale
reproductive
output

Satellite Telemetry of Leatherback Turtles Identifies High Use Areas



Application: Critical habitat for
Leatherbacks can be identified



Additional information at

<http://swfsc.noaa.gov/prd.aspx>