

Marine Mammal & Turtle Research Division Southwest Fisheries Science Center National Marine Fisheries Service, NOAA



<http://swfsc.noaa.gov/mmttd>



Southwest Fisheries Science Center
NOAA Fisheries Service





Our Mission

1. Assess* marine mammals & turtles relative to management objectives 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
- Assess condition and health
- Place the above in an ecosystem context





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

** Our mandates require research outside of U.S. waters.**

Marine mammals and turtles do not recognize political boundaries.

Our Ecosystems

Central Pacific – in support of PIFSC

- 2.2 million km²

California Current

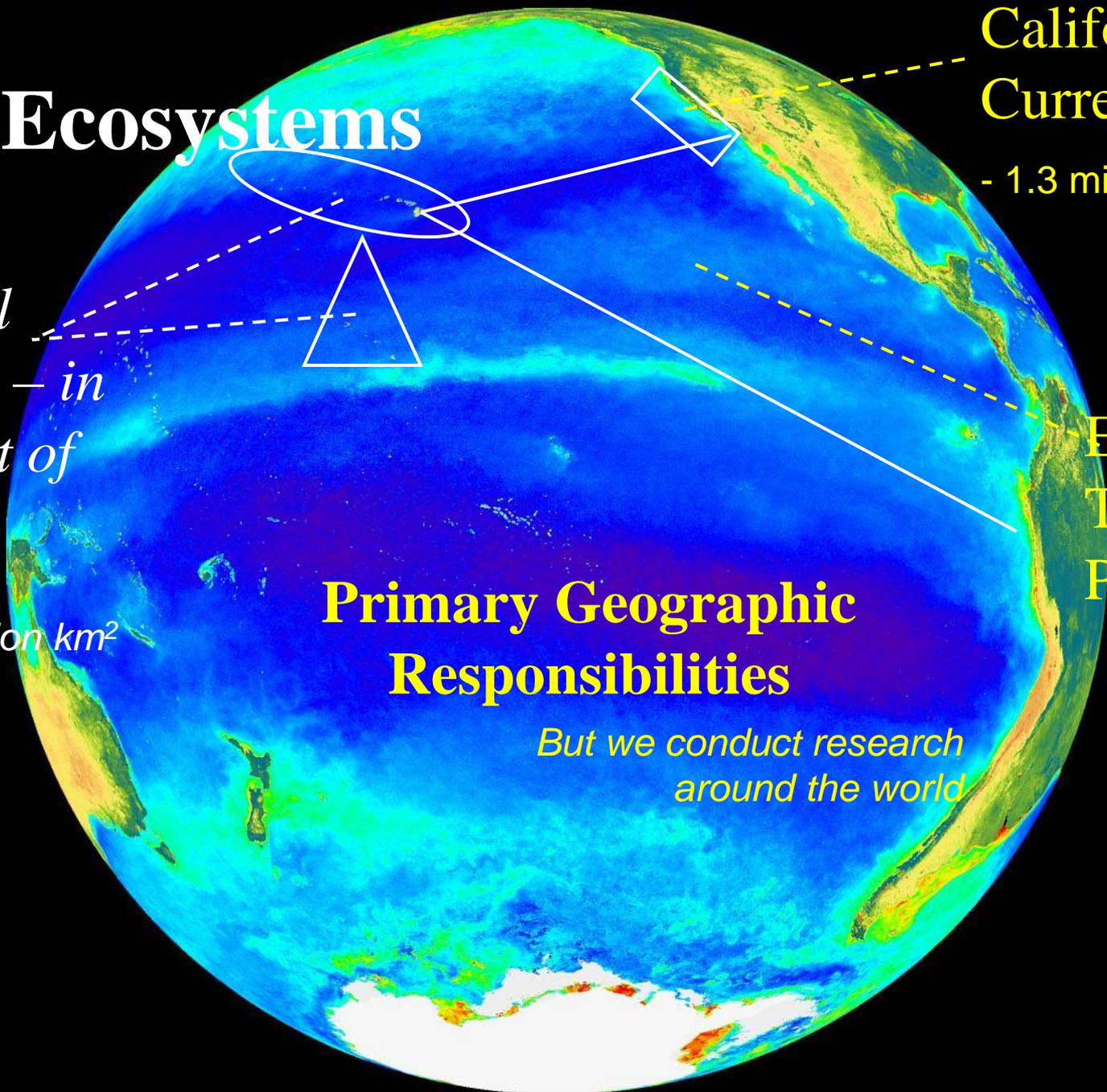
- 1.3 million km²

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

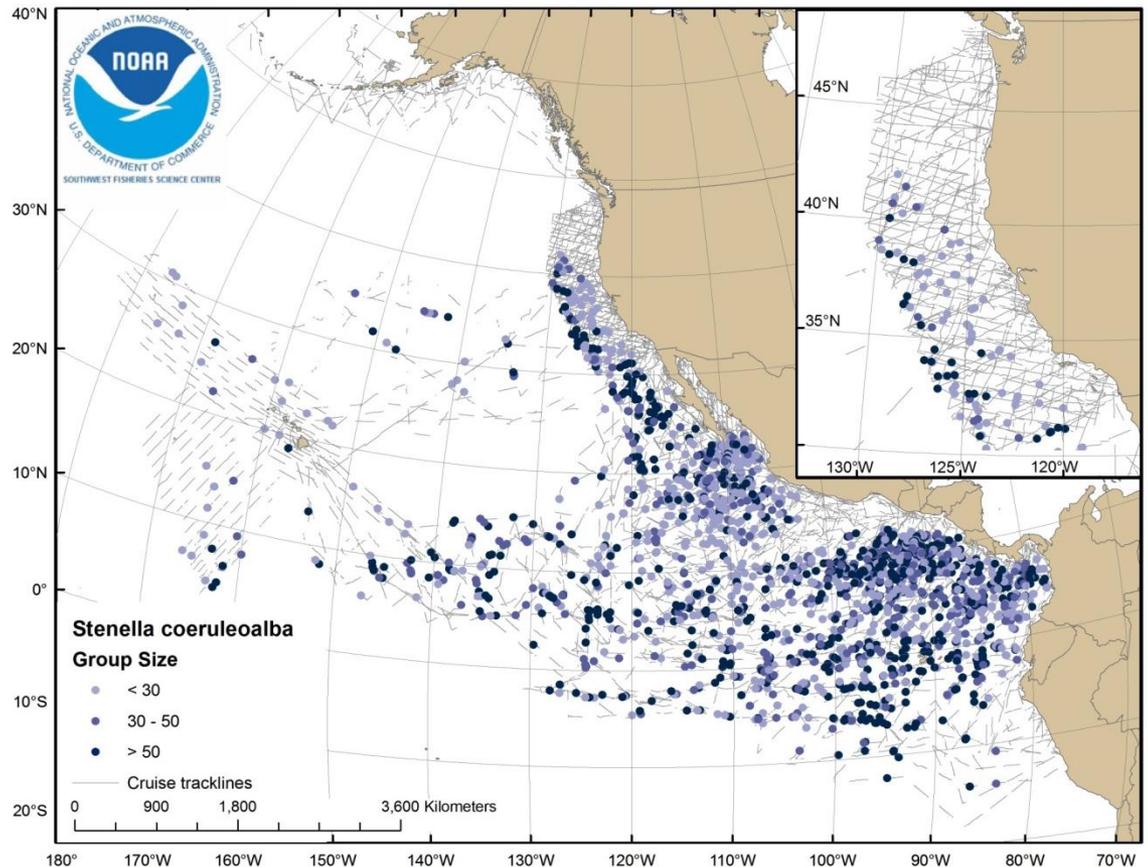
Small boat-based Research



Research Vessel Surveys

i. Abundance and Ecosystem Assessment Surveys

- California Current
 - 1996, 2001, 2005, 2008
 - Future goal: back-to-back years, every 5 years
- Eastern Tropical Pacific
 - 1986-1990, 1998-2000, 2003, 2006
 - Future goal: 5-yr cycle



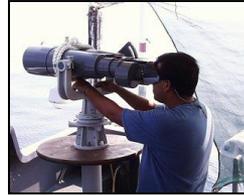
- A Multidisciplinary Approach (since 1986)

Ecosystem Assessment

Abundance

Abundance

School Size
Calibration



Biology

Population
Structure

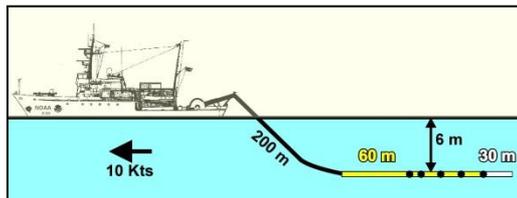
Behavior



Life
History



Acoustics



Apex
Predators



Low- and Mid-
Trophic Fishes and
Invertebrates



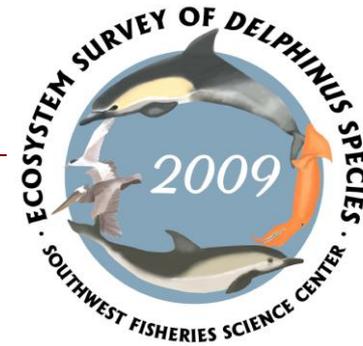
Physical and Biological
Habitat



Research Vessel Surveys

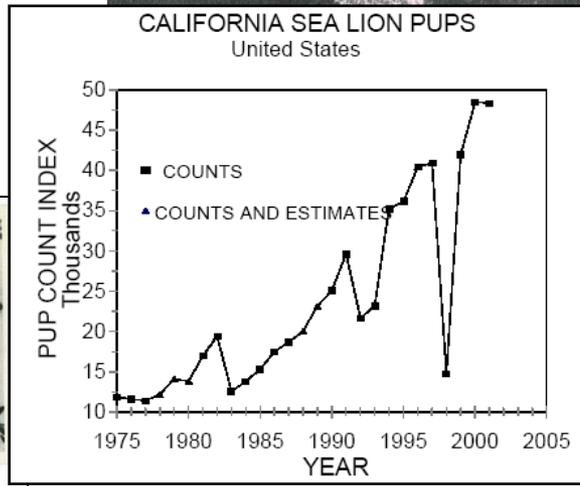
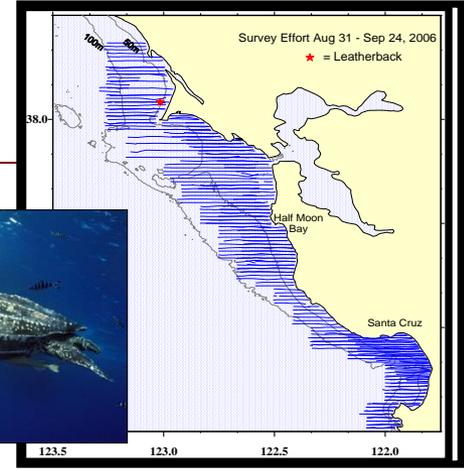
ii. Question-Based Cruises

- 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)



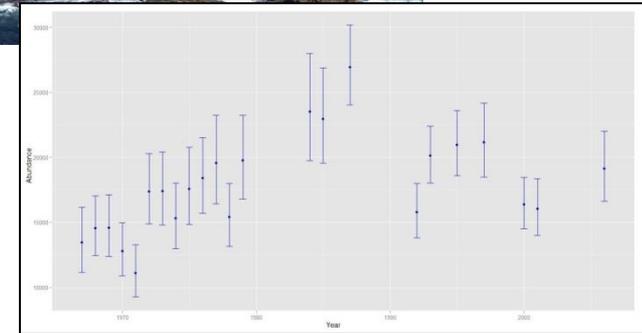
Aerial Surveys

- i. Marine turtle distribution & abundance
- ii. Cetacean abundance, condition, & life history
- iii. Pinniped abundance



Shore-based Surveys

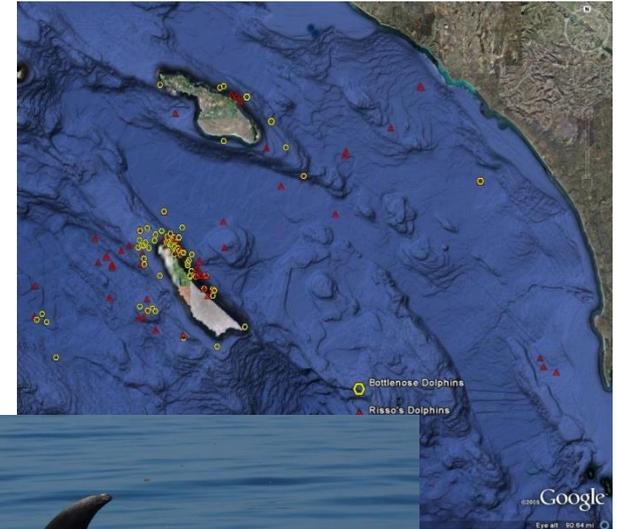
- i. Southbound gray whale population abundance survey (since 1964)



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

Small Boat-Based Research

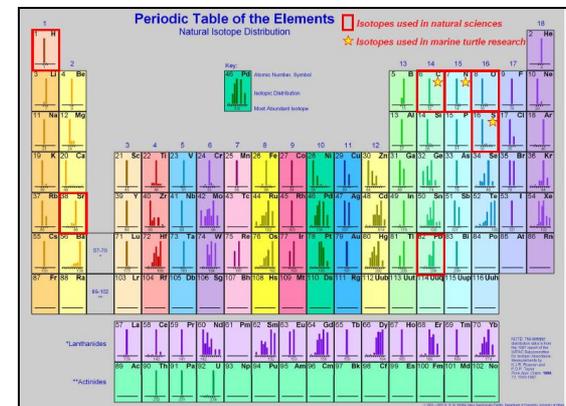
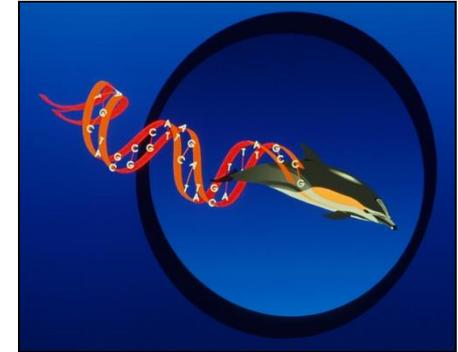
- Dolphin Health Assessment



- Green Turtle Ecology

Laboratory Research

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





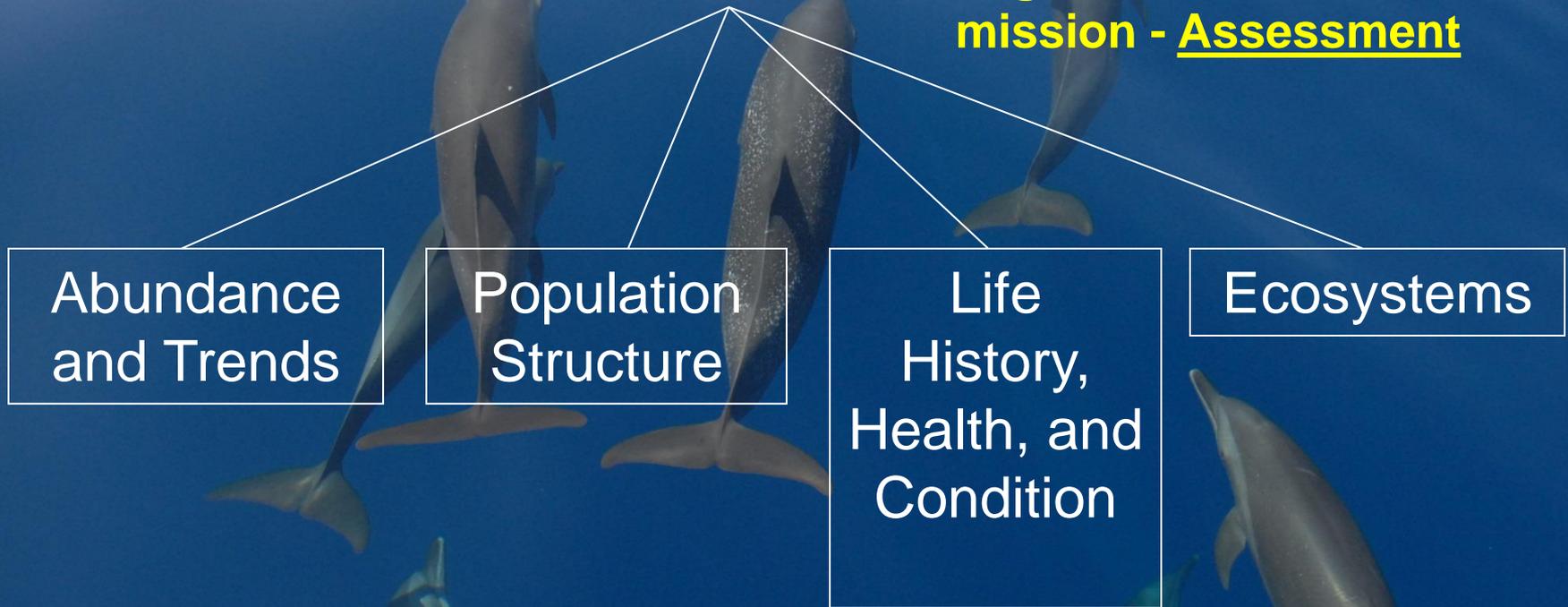
Division Scientists

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 Strengths

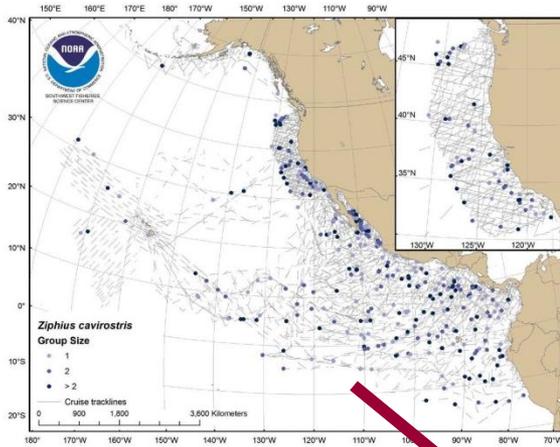
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- Abundance estimation and status and trends assessment (e.g., MMPA's Potential Biological Removal approach to management developed at SWFSC)
 - Identification of units to conserve using molecular genetic methods
 - Ecosystem approaches to management
 - Research on transboundary stocks
 - Cetacean acoustics
 - Risk assessment
 - Use of non-lethal sampling (skin and blubber biopsies) to obtain data on life history, health, and condition

The background of the slide is a close-up photograph of water ripples. The ripples are concentric circles of varying sizes, creating a textured, undulating surface. The colors range from light, almost white, highlights to deep, dark blues and purples in the shadows of the ripples. The overall effect is a sense of movement and depth.

A Sampling of Research Highlights

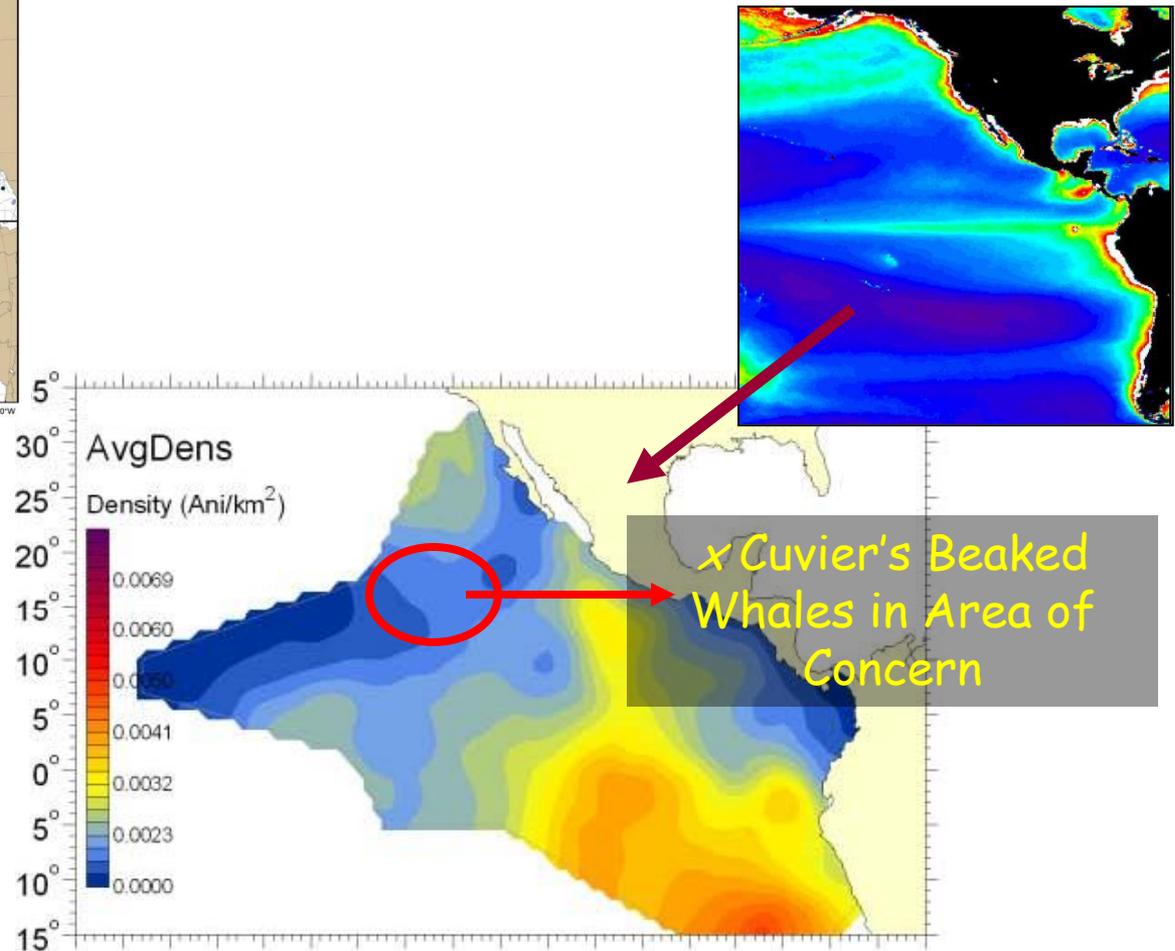
Ecosystem Data can be Used to Predict Beaked Whale Abundance and Distribution

Cuvier's Beaked Whale Sightings

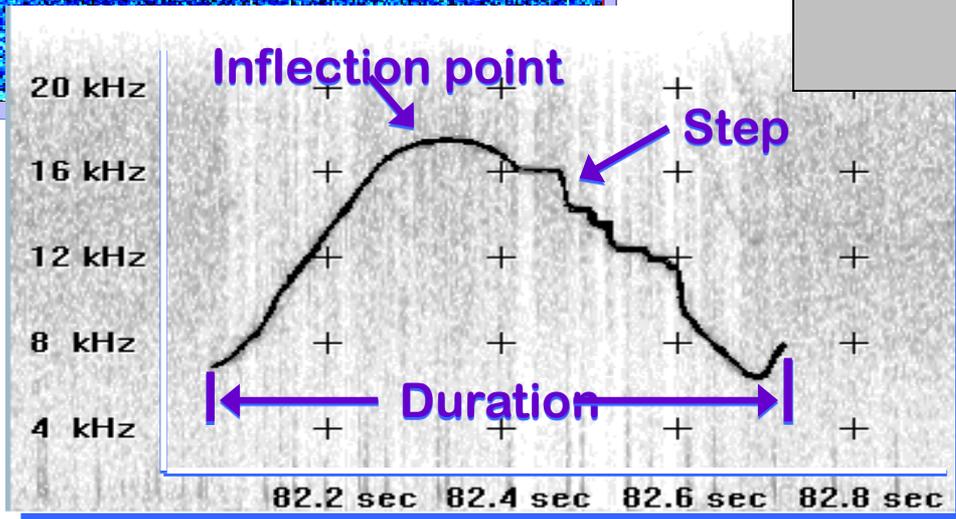
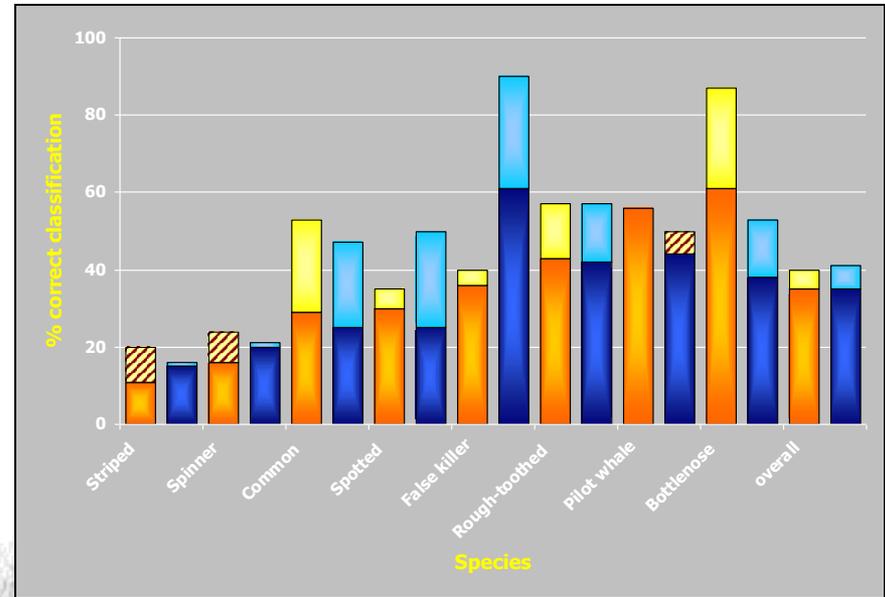
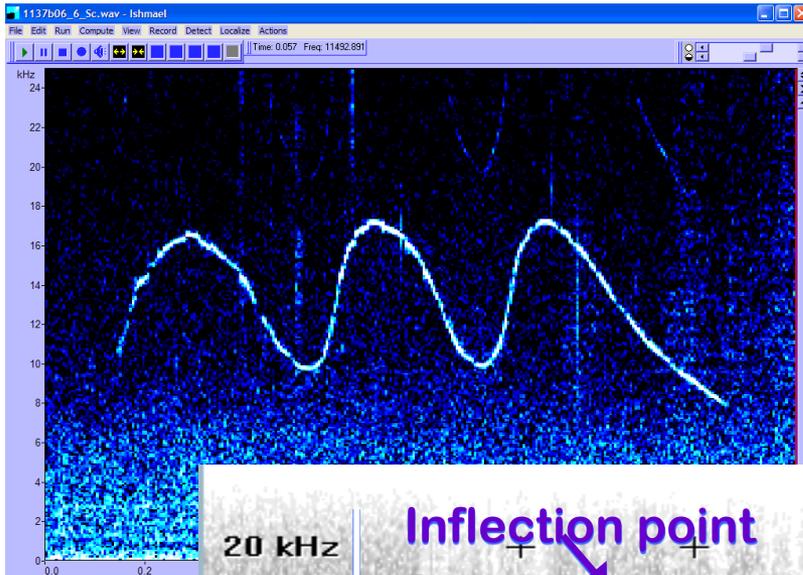


Application:
Users of the
marine
environment
can comply
with EIS
requirements;
avoid high
density areas

Physical and Biological Habitat

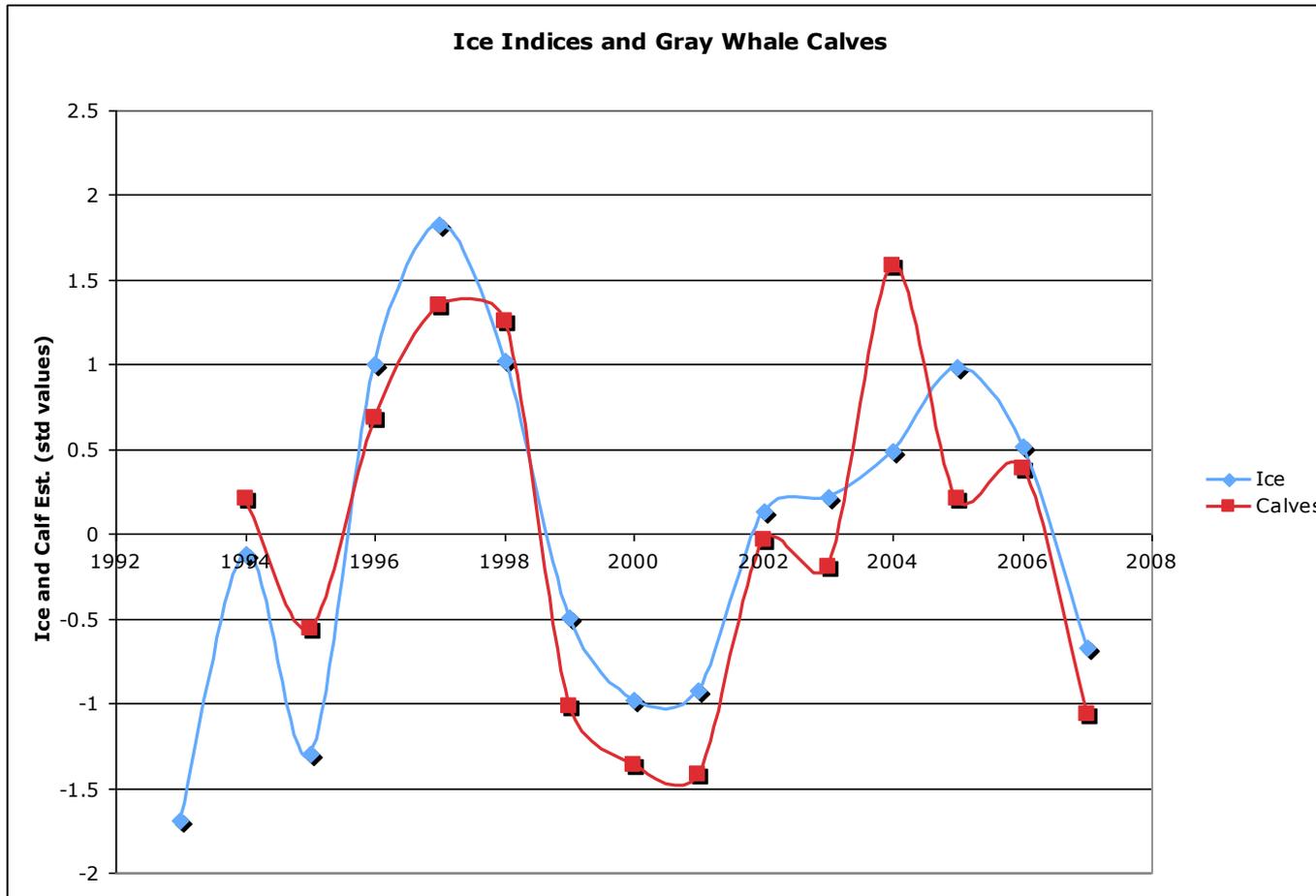


Cetacean Vocalizations can be Identified to the Species Level



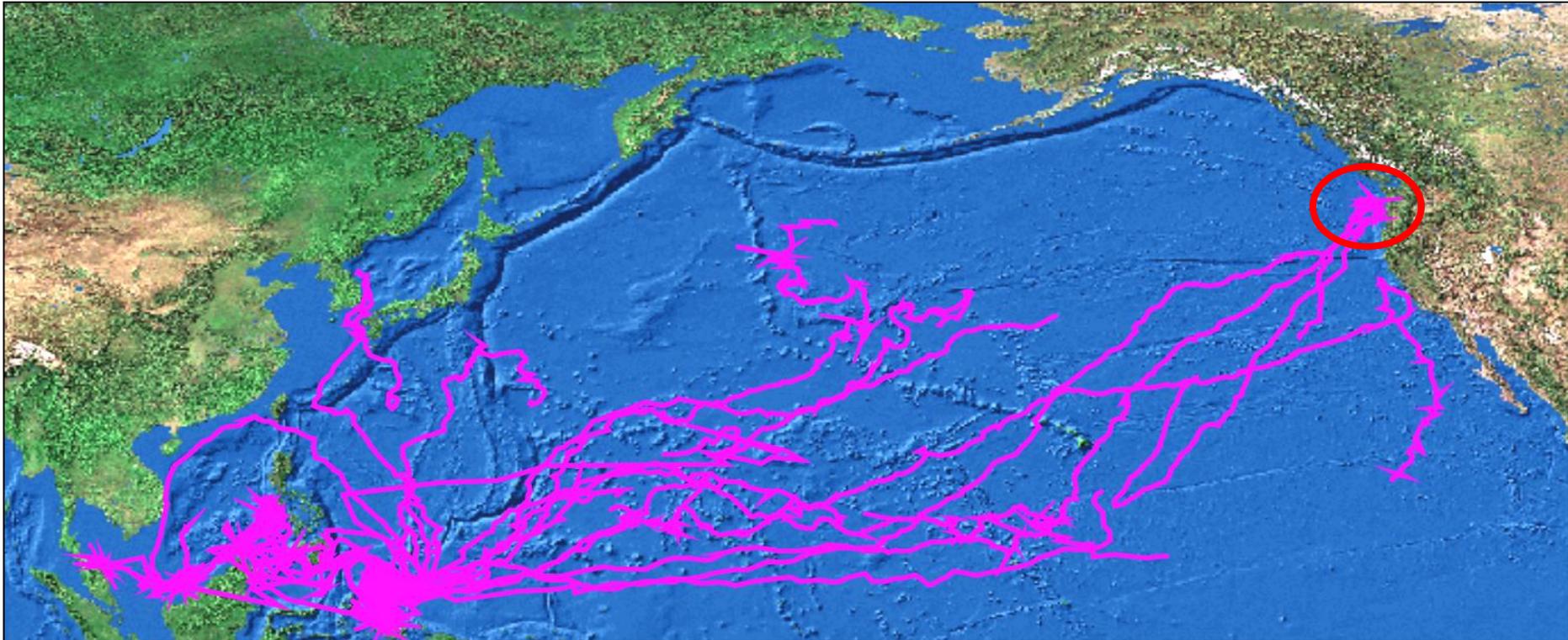
Application: Passive acoustics can potentially be used to monitor specific species

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/mmttd>