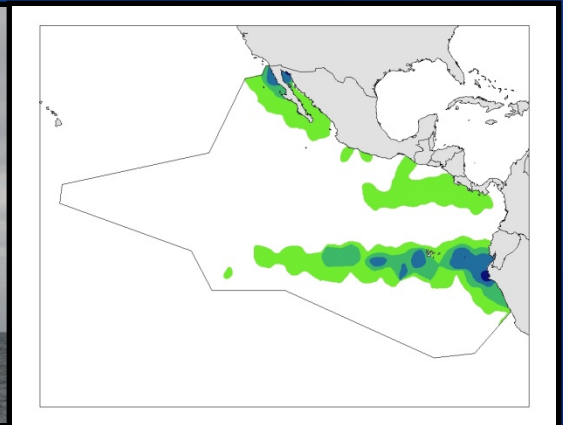


**Protected Resources Division**  
**Ecosystem Studies Program**

**Mission, Research, and  
Responsibilities**

# Mission

Collect, analyze, and apply ecosystem data to support marine mammal and turtle assessments and management

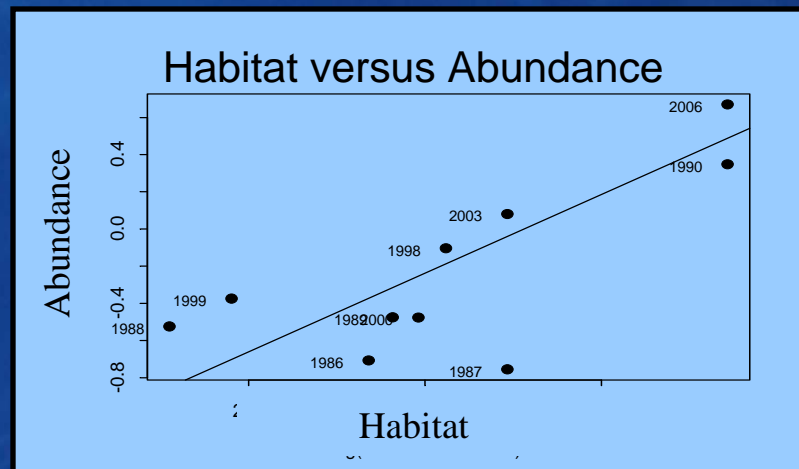


# Major Research Areas

- I. Further Develop Applications for Species-Habitat Relationships
- II. Predict Effects of Climate Change
- III. Develop Indicators

# I. Species-Habitat Relationships: Goals

- Support status and trend assessments
  - Identified projects:
    - Incorporate habitat into abundance estimation
    - Use habitat to identify management stocks
- Improve predictions of species density
  - Identified project: Incorporate mid-trophic biomass into species-habitat models
- Improve population dynamics models



# I. Critical Habitat: Goals

Mandated by the Endangered Species Act

- Develop a framework for defining critical habitat
  - Identified projects:
    - Review methods used to designate critical habitat
    - Define critical habitat for selected species

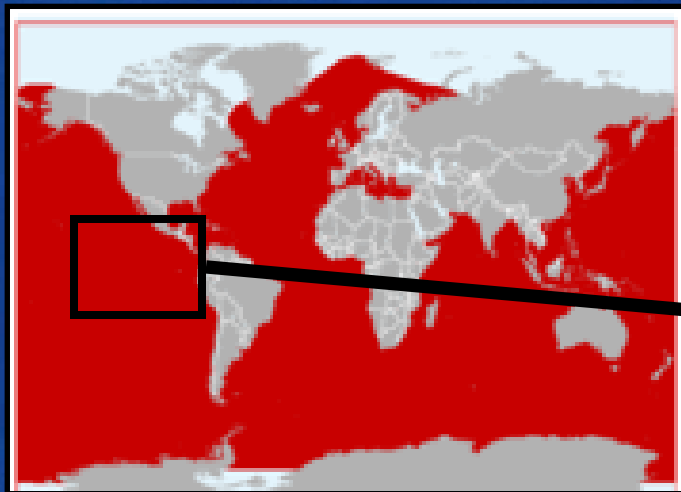


# I. Species Distributions: Goals

Marine spatial planning requires distribution maps

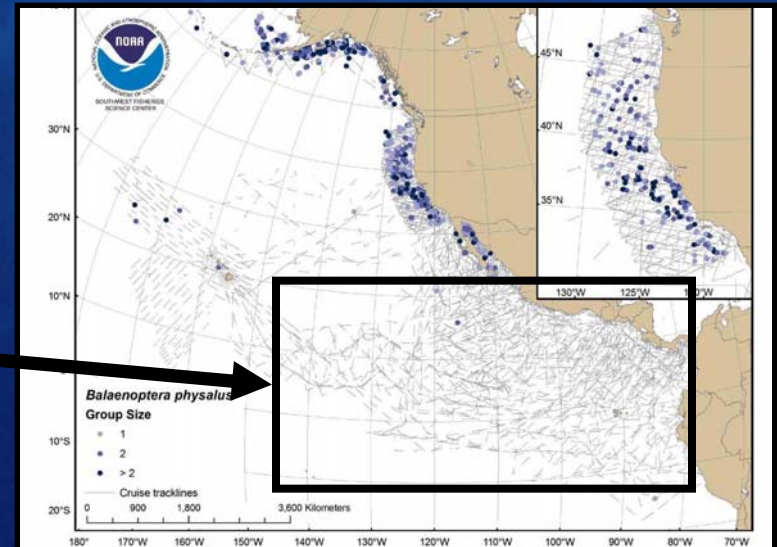
- Improve methods to derive distributions
  - Identified projects:
    - Assess risk of whale-ship collisions
    - Produce global distribution maps

IUCN Fin Whale Distribution



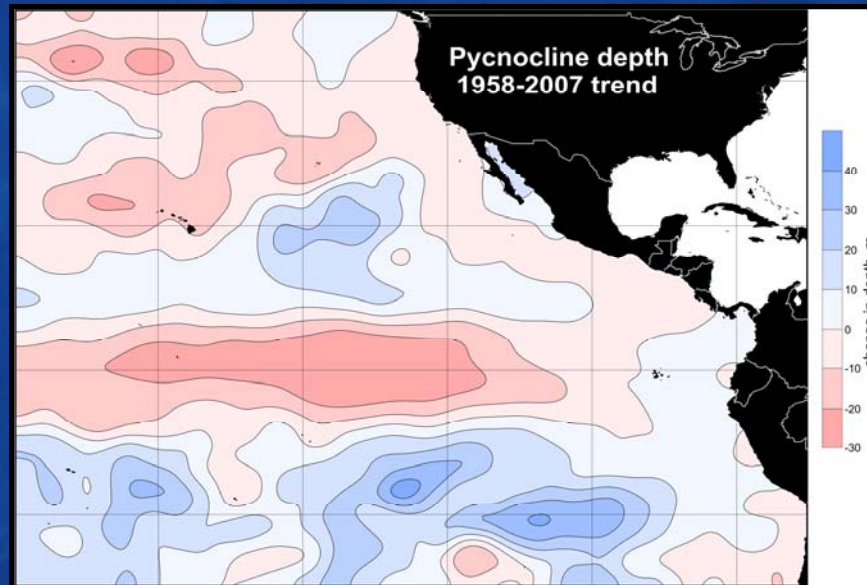
Extensive surveys in this area suggest that fin whales are not present

Fin Whale Sightings  
Southwest Fisheries Science Center Surveys



## II. Climate Change: Goals

- Explore long-term variability in oceanographic properties
  - Identified project: Examine pycnocline variations in the eastern tropical and north Pacific
- Use species-habitat relationships to predict effects of climate change
  - Identified projects:
    - Forecast climate-based changes in species distributions
    - Explore match-mismatch hypothesis



# III. Indicators: Goals

Indicator considerations:

- Link with entity of interest
- Ease of monitoring
- Identify/develop indicators
  - Identified projects:
    - Predict cetacean density from seabird metrics
    - Explore indicators of ecosystem state (e.g., flyingfishes and Halobates for ETP)
    - Identify variables that predict management stocks





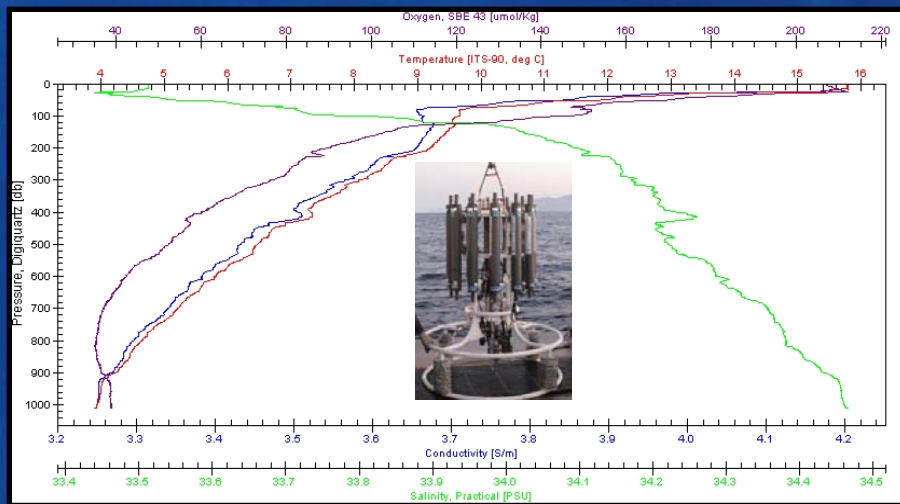
# Responsibilities

- Operations management
- Data management

# Operations Management

- Design ecosystem sampling for PRD research cruises
- Stage and de-stage research cruises
- Process and document data collected at sea (oceanographic, acoustic backscatter, net tows)
- Maintain equipment

CTD profile



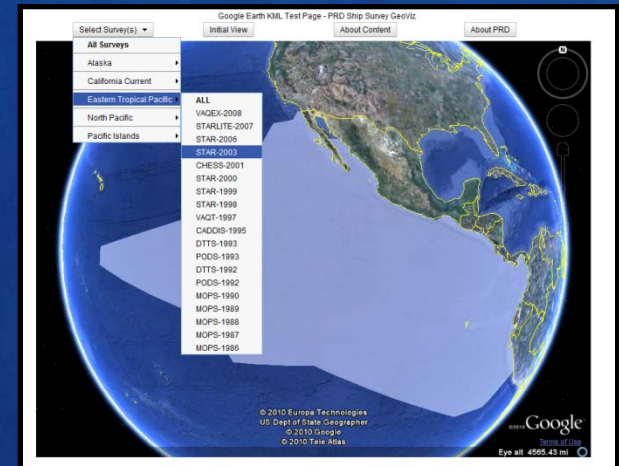
Bongo tow



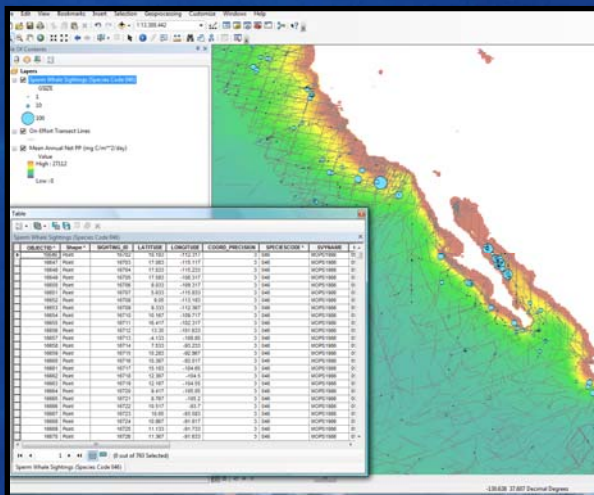
# Data Management

- Manage ecosystem data (quality check, archive, integrate)
- Maintain metadata
- Respond to data requests
- Create and maintain at-sea sample collection databases

Web-based mapping of study areas



Data visualization



Sample collection database