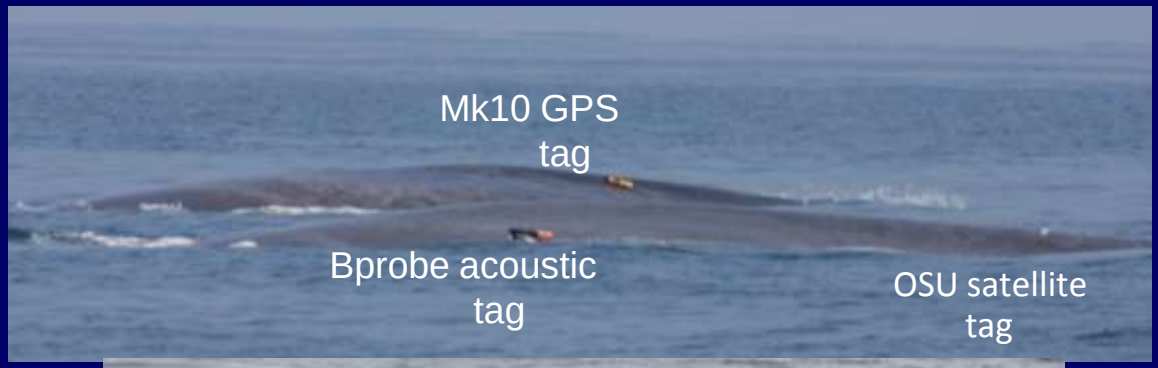
Overview and future directions for Researc
Collaborative studies

John Calambokidis
Cascadia Research

Why collaborate?

- Allow research not possible by a single group
- Use mix of complex or new approaches
- Conduct simultaneous work in multiple areas
- Gain broad scientific and political support



Types of collaborative studies

- Broad Geographic (SPLASH): Multiple research groups using similar methods

- Multi-disciplinary (SOCAL-BRS): Combining different skills for more complex studies or designs

- Comparative: Different methods for a similar objective, contrasting results provide insight.

SPLASH

Structure of Populations, Levels of Abundance, and Status of Humpbacks

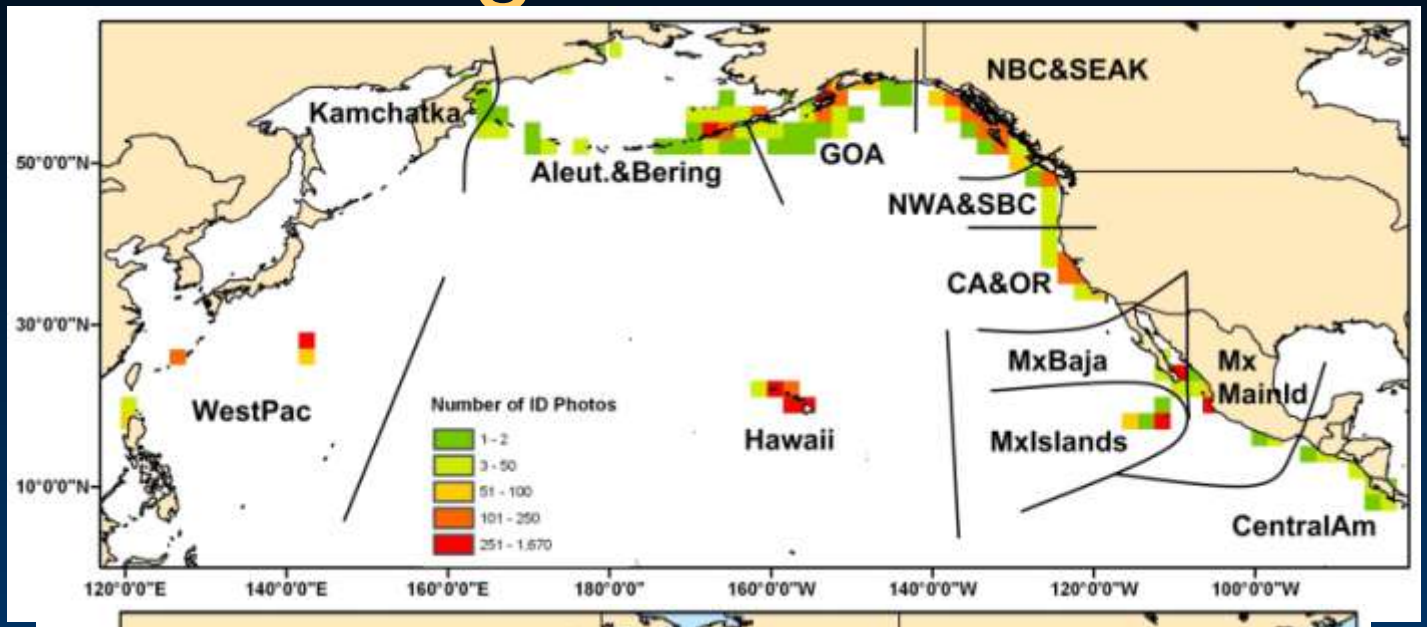
- Abundance and Trends:
  - Photo identification
  - Mark-recapture abundance
- Population stock structure
  - Movement (photo-ID)
  - Genetic studies
- Human-caused injuries
  - Fishery interactions
  - Vessel collisions

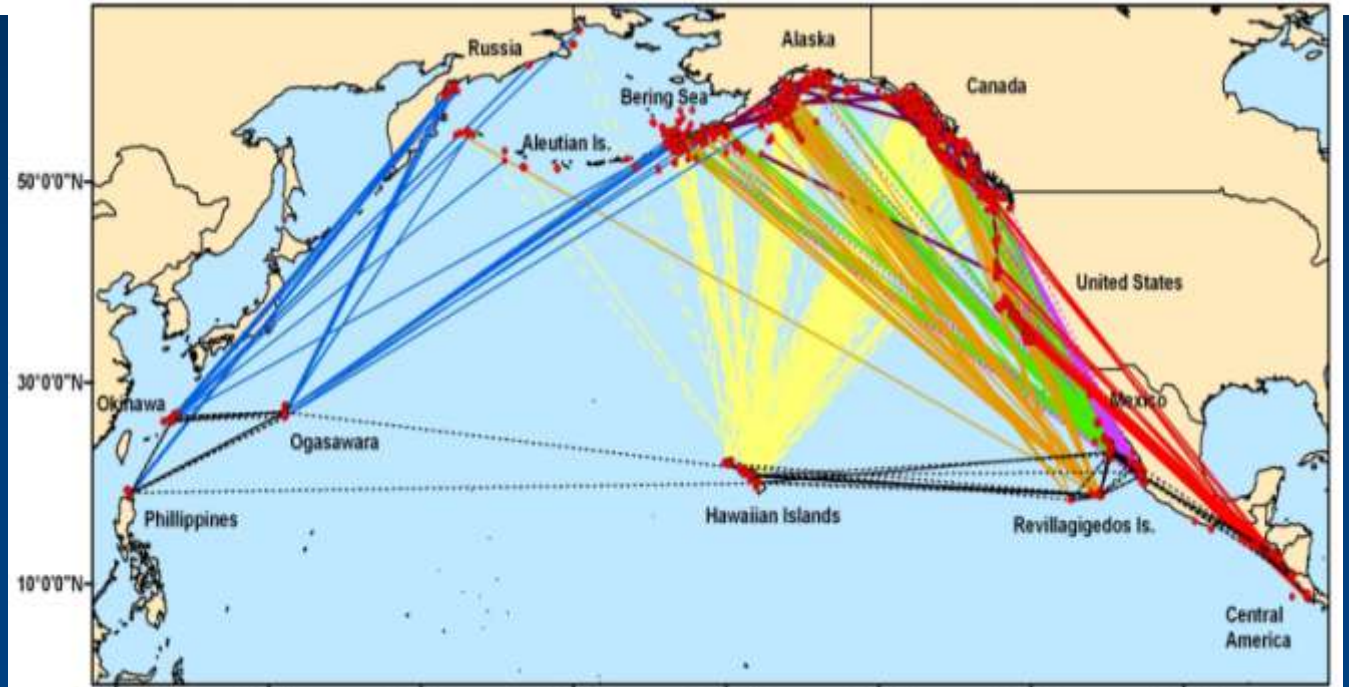
Largest collaborative study on whales

- Over 400 participants and 50 organizations
- Efforts in 10 countries throughout N Pacific

SPLASH Methods – Photo-ID and Skin sampling

Coverage of entire N Pacific





The heart of SPLASH: Collaboration

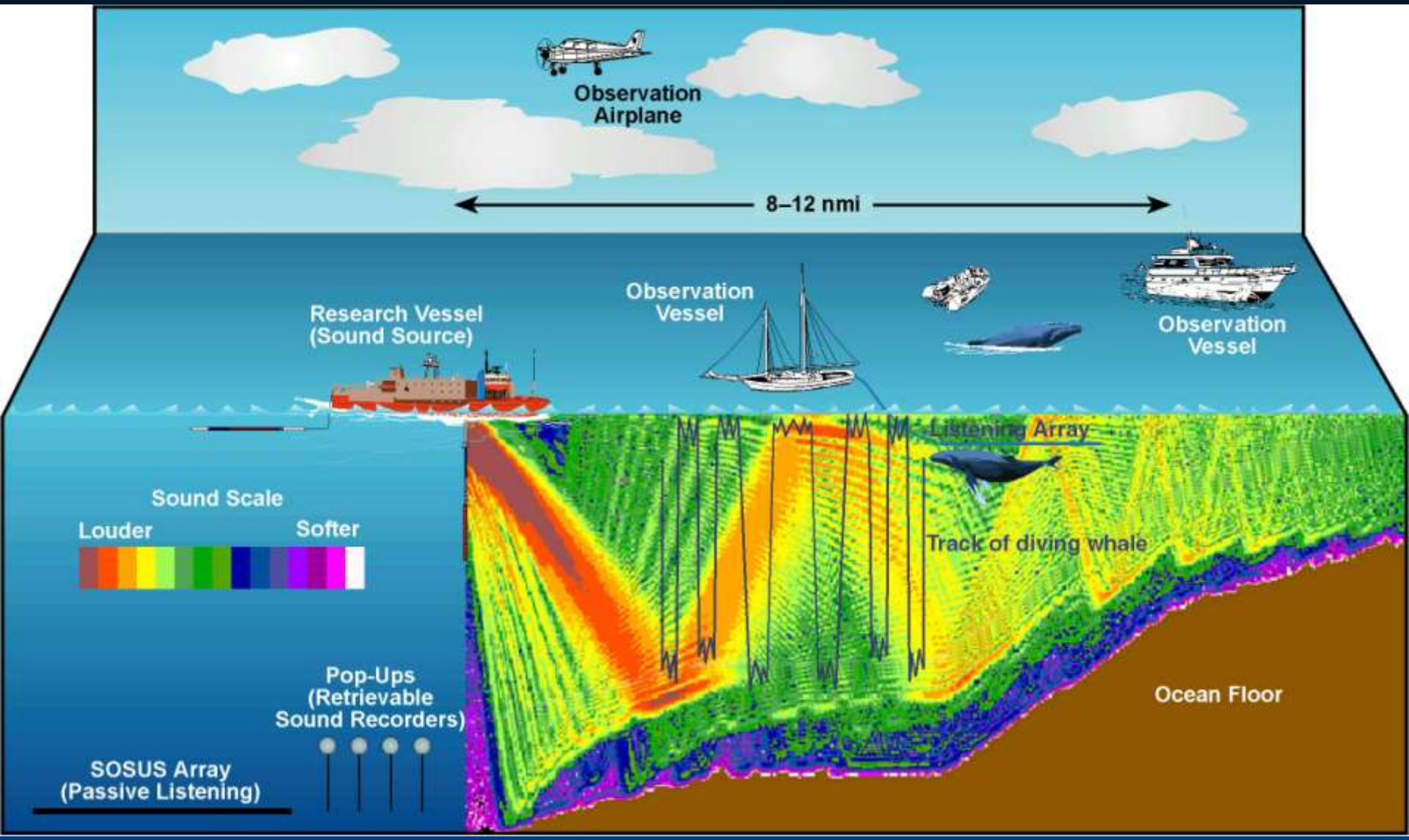
Steering Committee

Regional coordinators & agency representatives

>50 Research Groups

>400 Researchers

Studies of behavioral response to Navy sonar



Courtesy: M. Hastings

Biological and Behavioral Studies of Marine Mammals in Southern California

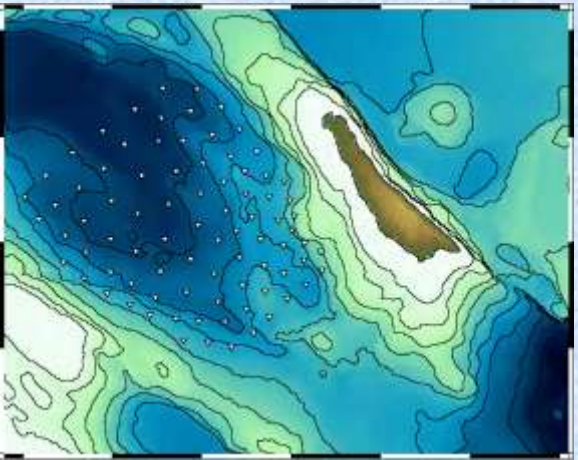
SOCAL-10 is an *interdisciplinary collaboration* designed to *increase understanding of marine mammal reactions to sound and* provide a *scientific basis for estimating* impact of Navy sonar

Photo taken under U.S. NMFS permit # 14534

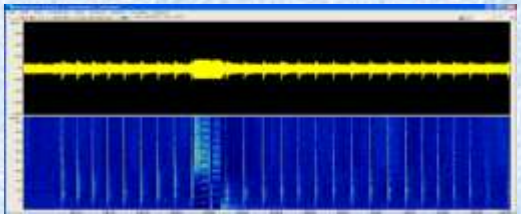
SOCAL-BRS: Multidisciplinary Approach

Visual observers, search for subjects and monitor during tagging, controlled exposure experiments (CEEs).

Photo identification used to catalog and keep track of individuals (incl. long-term) involved in CEEs.



Passive acoustics detect vocalizing whales and monitor exposures and responses during CEEs

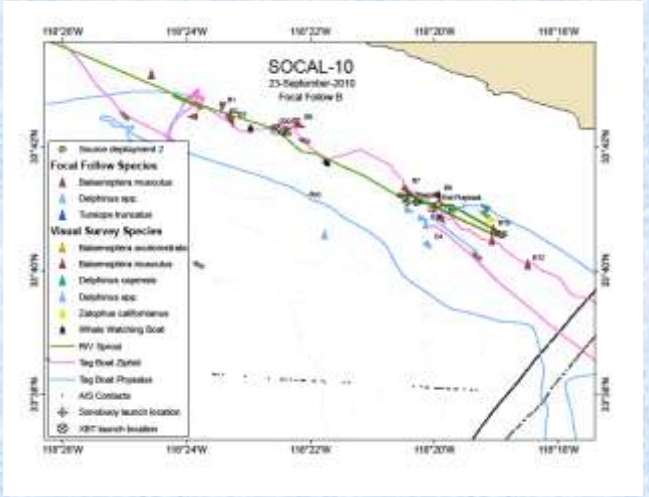


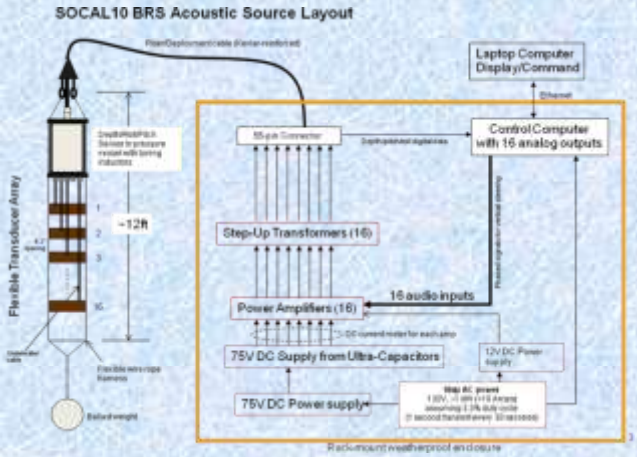
SOCAL-10: Multidisciplinary Approach

Photo taken under U.S. NMFS permit # 14534

Tagging teams deploy acoustic monitoring tags (Dtag, Bprobe/AcouSonde) with suction cups; provided visual monitoring during CEEs

Geographical Information Systems (GIS) integrate vessel position, visual sightings, and environmental data





SOCAL-10 sound source produces up to 210 dB re: 1uPa (Actual 53C sonar closer to 235 dB) in controlled sound exposures:

- Simulated mid-frequency active (MFA) sonar
- Pseudo-random noise (PRN)

SOCAL ACCOMPLISHMENTS: Controlled Exposure Experiments

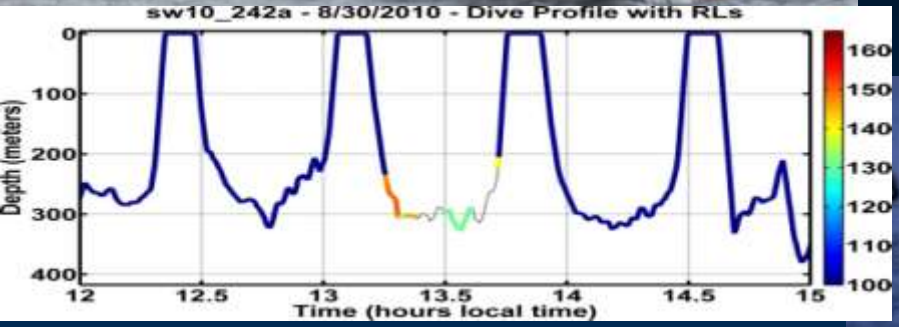
2010	Blue Whales: 19	Fin Whales: 5	Sperm Whale: 2	Risso's Dolphin: 1	Cuvier's beaked whale: 1
2011	Blue Whales: 13			Risso's Dolphin: 4	Cuvier's beaked whale: 1

46 Complete CEEs

3 Mock Exposure (Control)

49 TOTAL SEQUENCES

Sperm whale



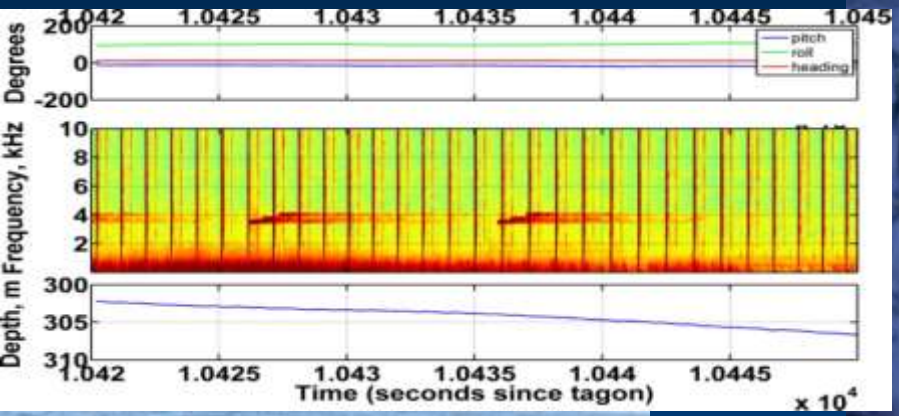
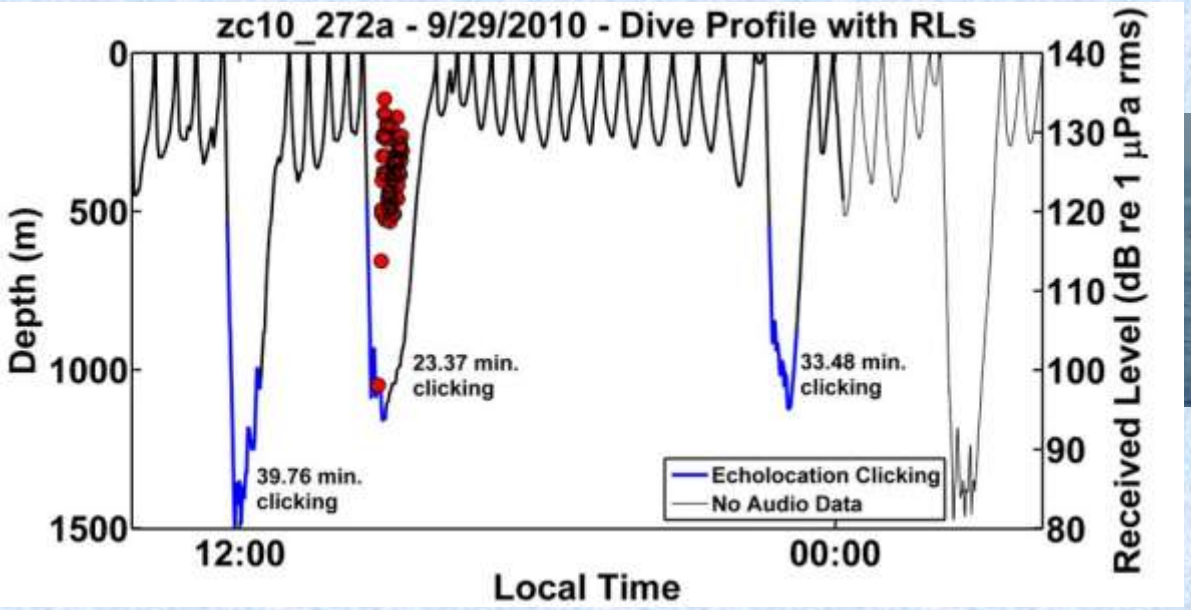


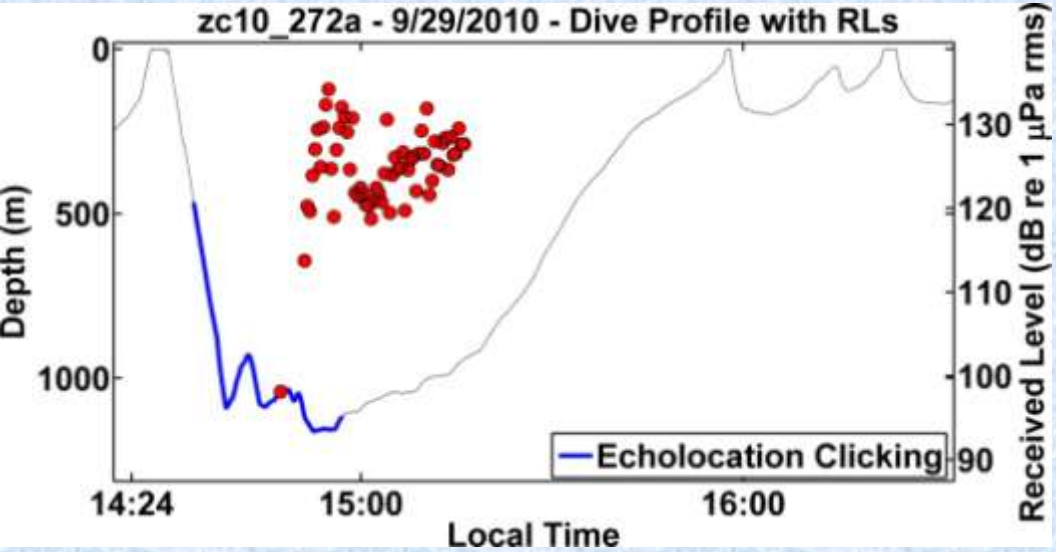
Photo from 2010 BRS

Photo from 13 Jan 1996

Sperm whale: Tagged 6 August 2010, locations through 10 October 2010 (86 days)

Cuvier's Beaked whale CEE (MFA)





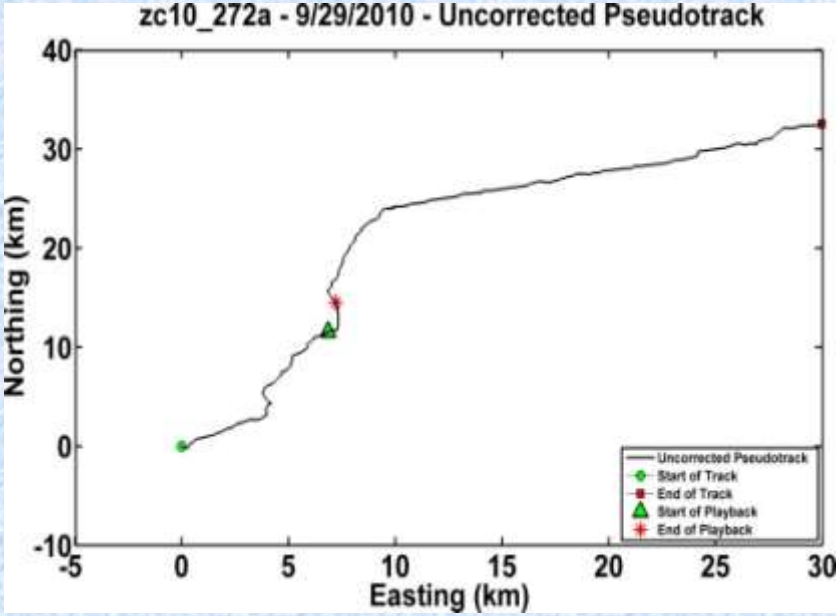
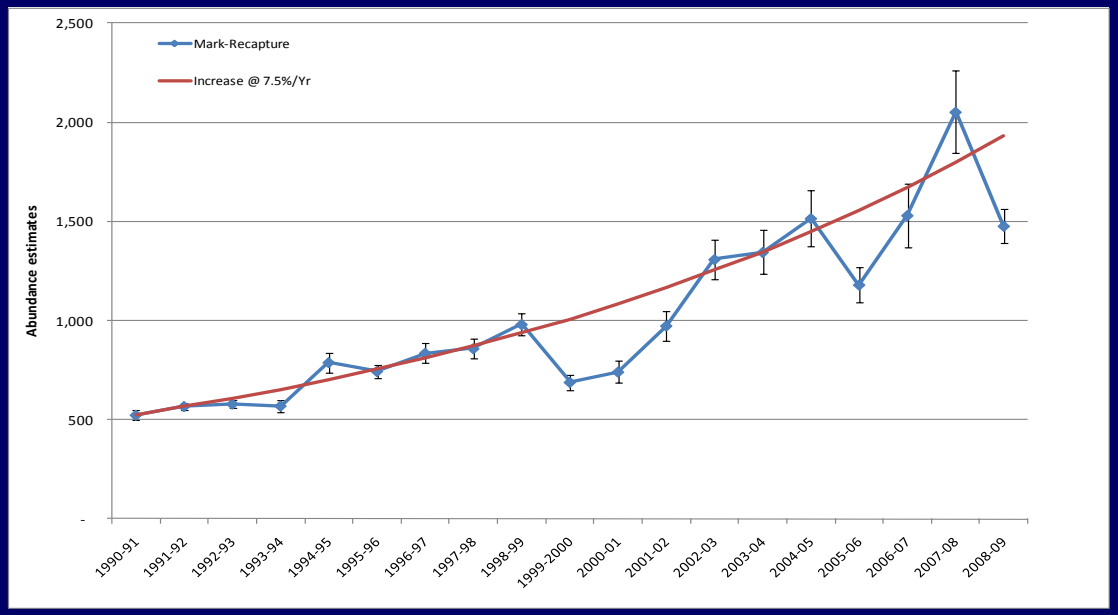
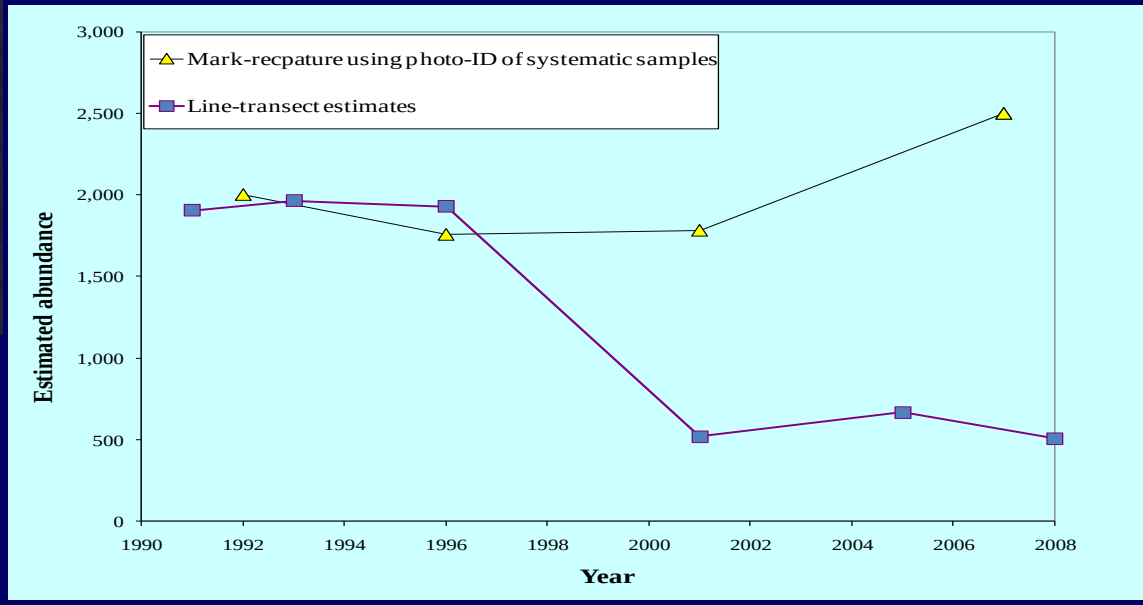


Photo taken under U.S. NMFS permit # 14534

Humpback and blue whale trends - US West Coast





Encouraging collaboration

- Collaboration allows results not achievable otherwise but does not prevent participants from publishing results on their own work
- Allow autonomy
- Provide a mechanism for group control-management
- Achieve critical mass
- Address challenges:
  - Publishing rights
  - Credit
  - Access to data and samples