

BEHAVIORS OF SOUTHERN CALIFORNIA CETACEANS:

Observations from a small aircraft 2008-2013

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Video/Photo PLATFORMS



UAVs,
blimps,
dirigibles,
hot air
balloons,
???



METHODS from Circling Aircraft *VIDEO*

1980s PIONEERS

Bowhead Whales - Arctic
Baseline vs. Seismic Sounds

2008-2013 “PIONEERS”

Southern CA

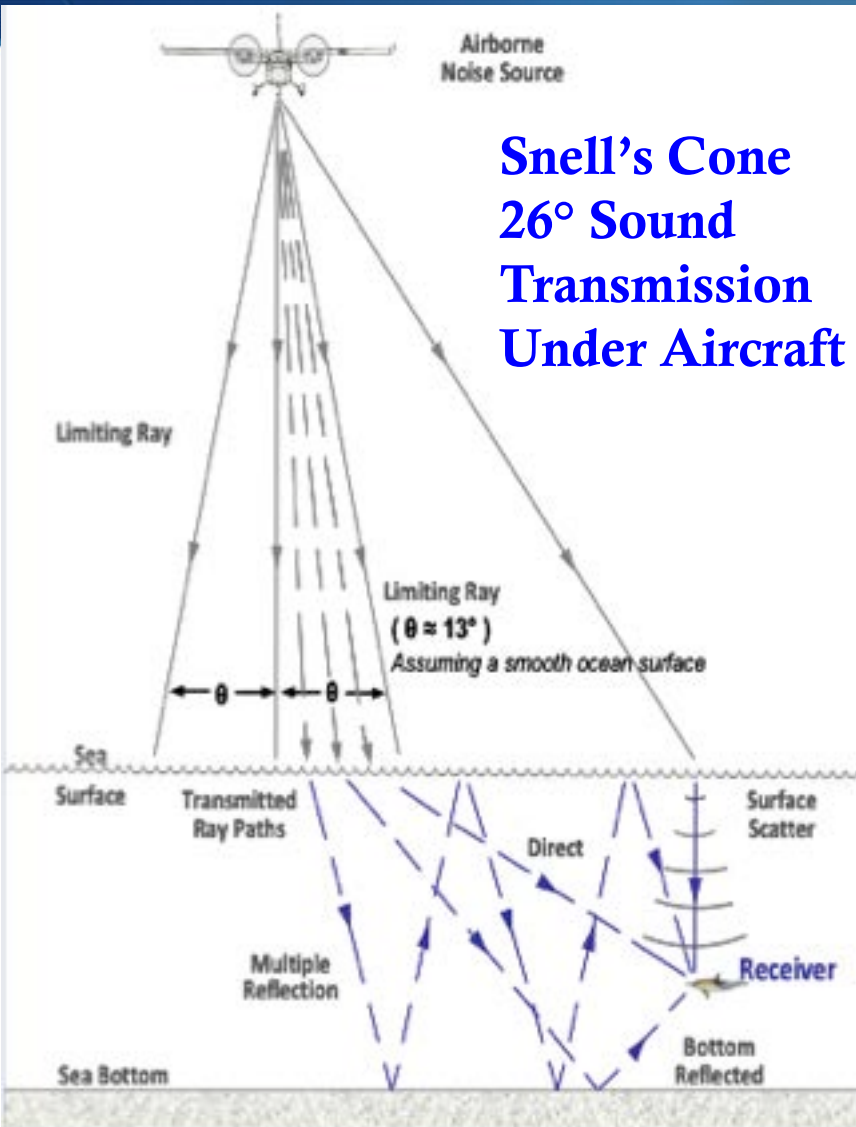
6+ species

💧 Navy-funded baseline Monitoring



PLANE PLATFORM

can be *NO DISTURBANCE*

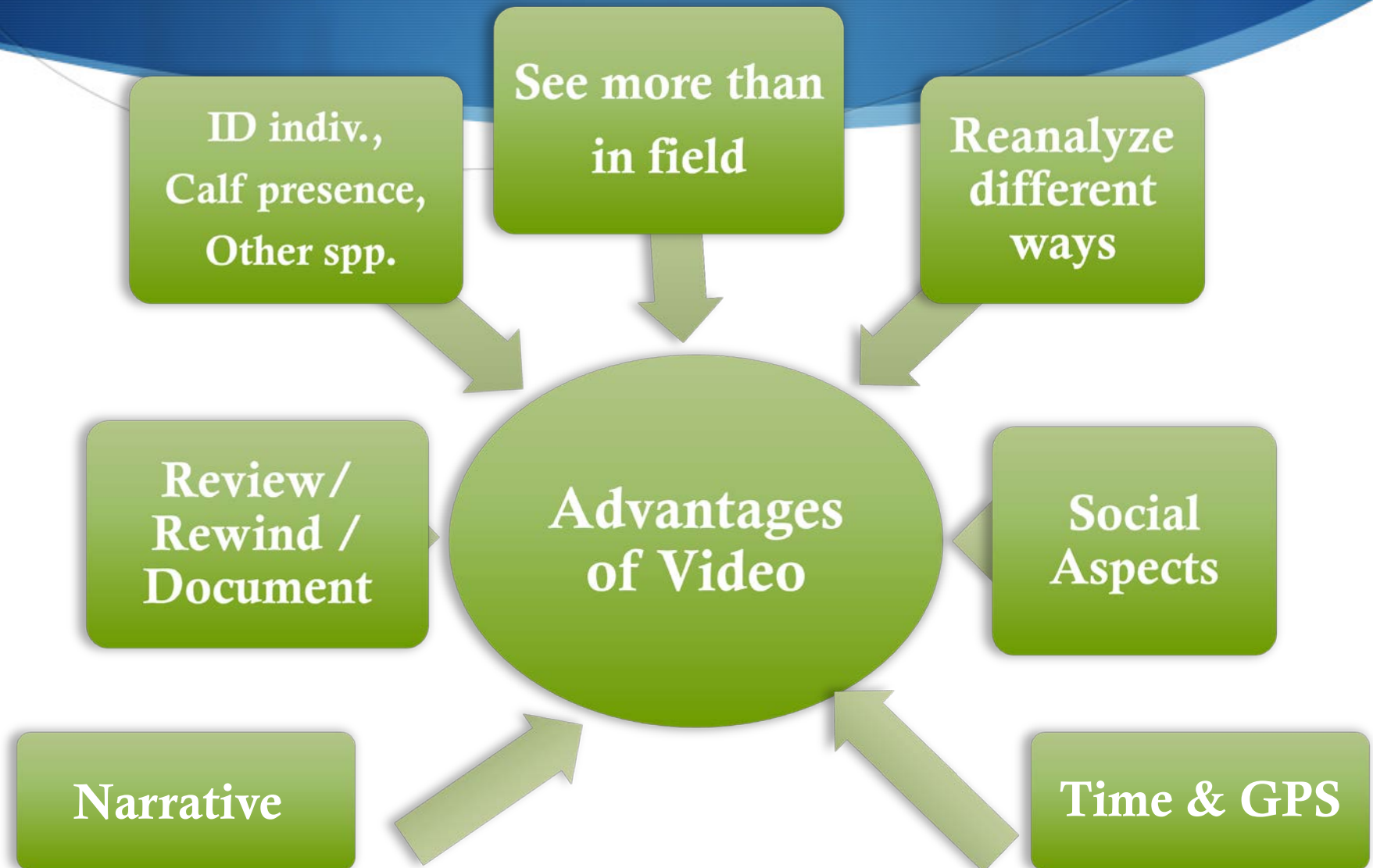


Bowhead whale and calf in the Arctic, Photo Credit: Corey Accardo (NOAA) taken May 29th 2011, Marine Mammal Permit: 782-1719

Advances in Video from Aircraft Cetacean Behavior Study – *examples*

| | # Video MP | Zoom Lens | Internal- Stabilization | ~ Cost (SONY) |
|-------------|------------------|-----------|----------------------------|------------------|
| 1986 | ? | 2.8x | Shaking | ~\$5,000 |
| 2008 | 3.3 | 12x | Shaking | ~ \$2000 |
| 2013 | 24.1 | 20x | No shaking !!!!! | ~ \$1400 |

Modern HD Video ADVANTAGES



Video & Focal Follow QUANTIFICATION

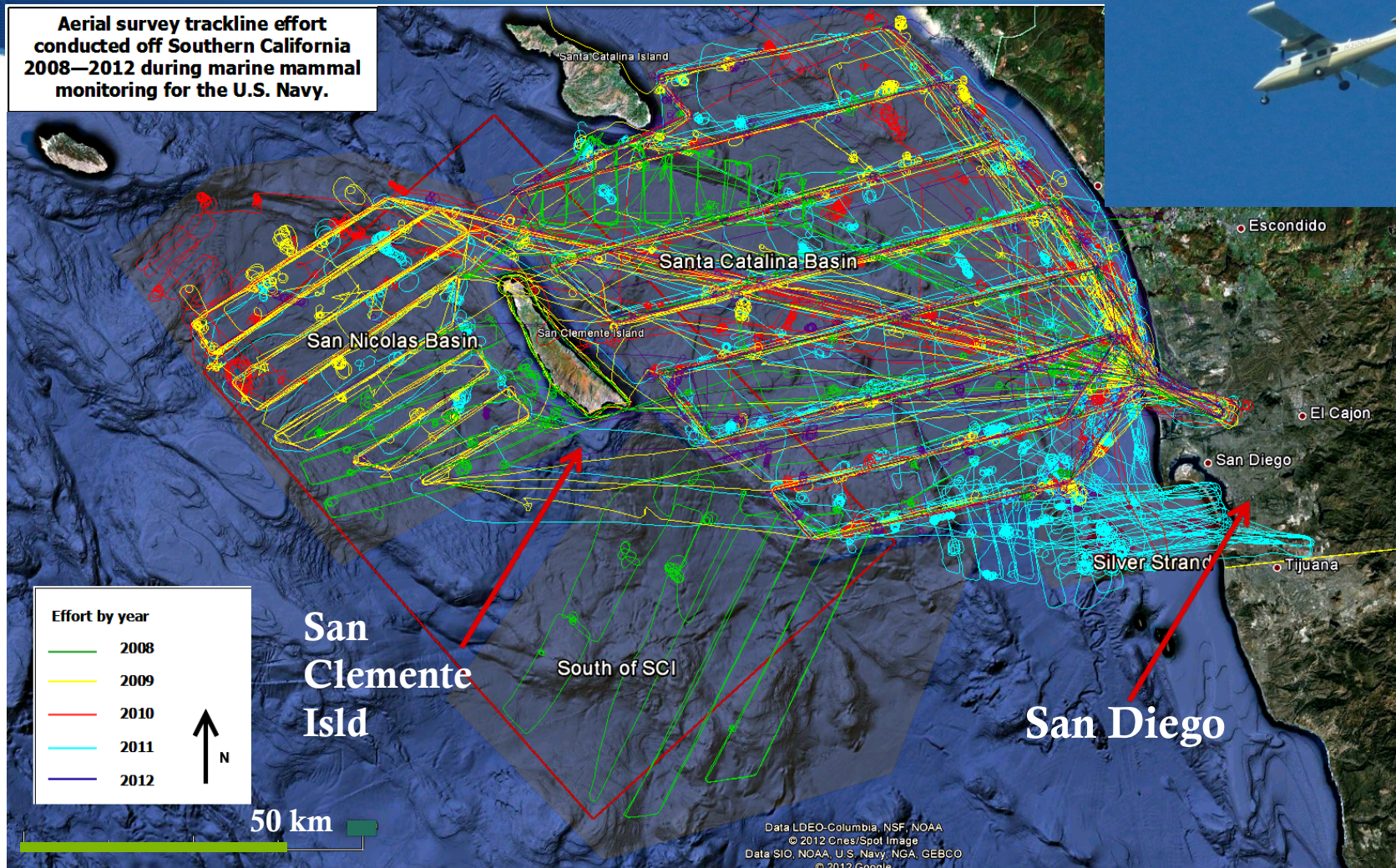
- ◆ **Social spacing**
 - ◆ *huddle or spread-out stress response???*
- ◆ **Orientation - *flee? mill? no change?***
- ◆ **Social interactions**
- ◆ **Speed**
- ◆ **Respiration & dives**
- ◆ **Individual photo-ID**
- ◆ **Activity budget**

EXAMPLES



Study Area & Effort 2008-2013

Southern California Bight, CA, U.S.



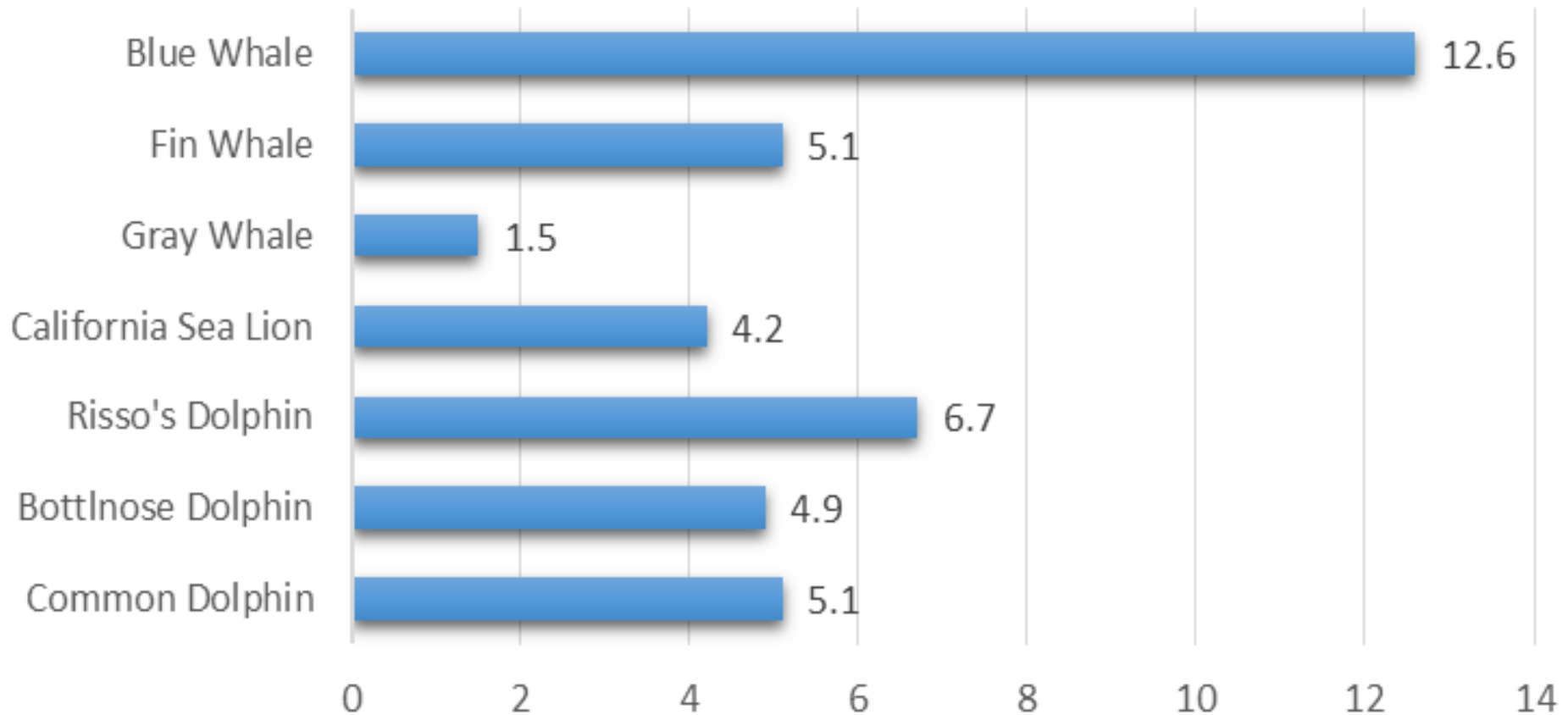
SOCAL Individual ID – Photos



Photographed 24 July 2013 by D. Steckler under NMFS permit 14451

Group Cohesion Index

Mean Maximum Dispersal Distance (Adult Body Lengths)



Species Differences

Body Size



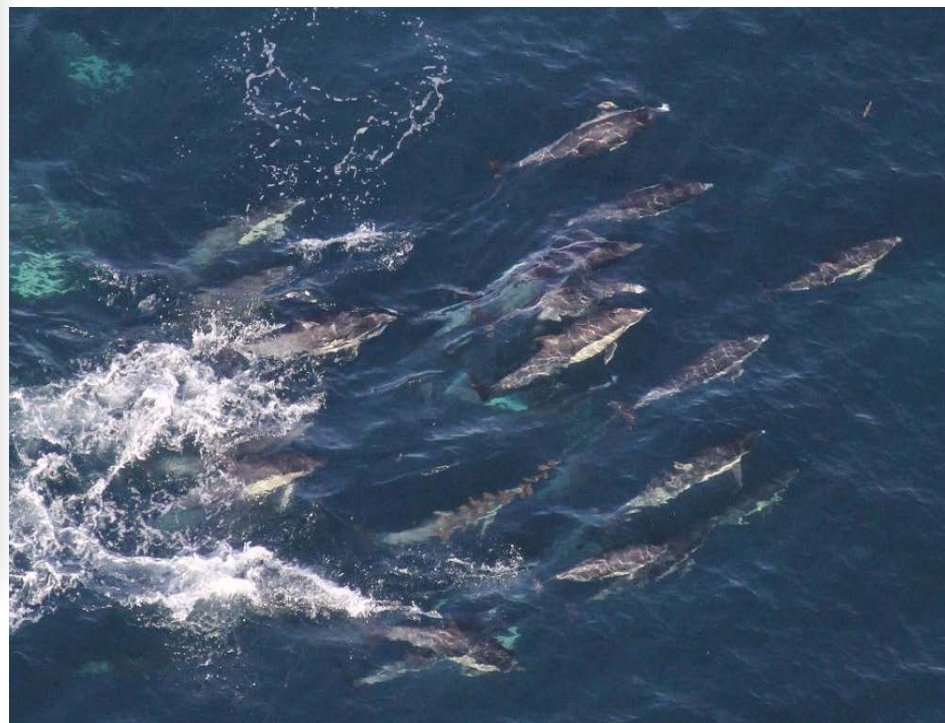
Group Size



Group Cohesion



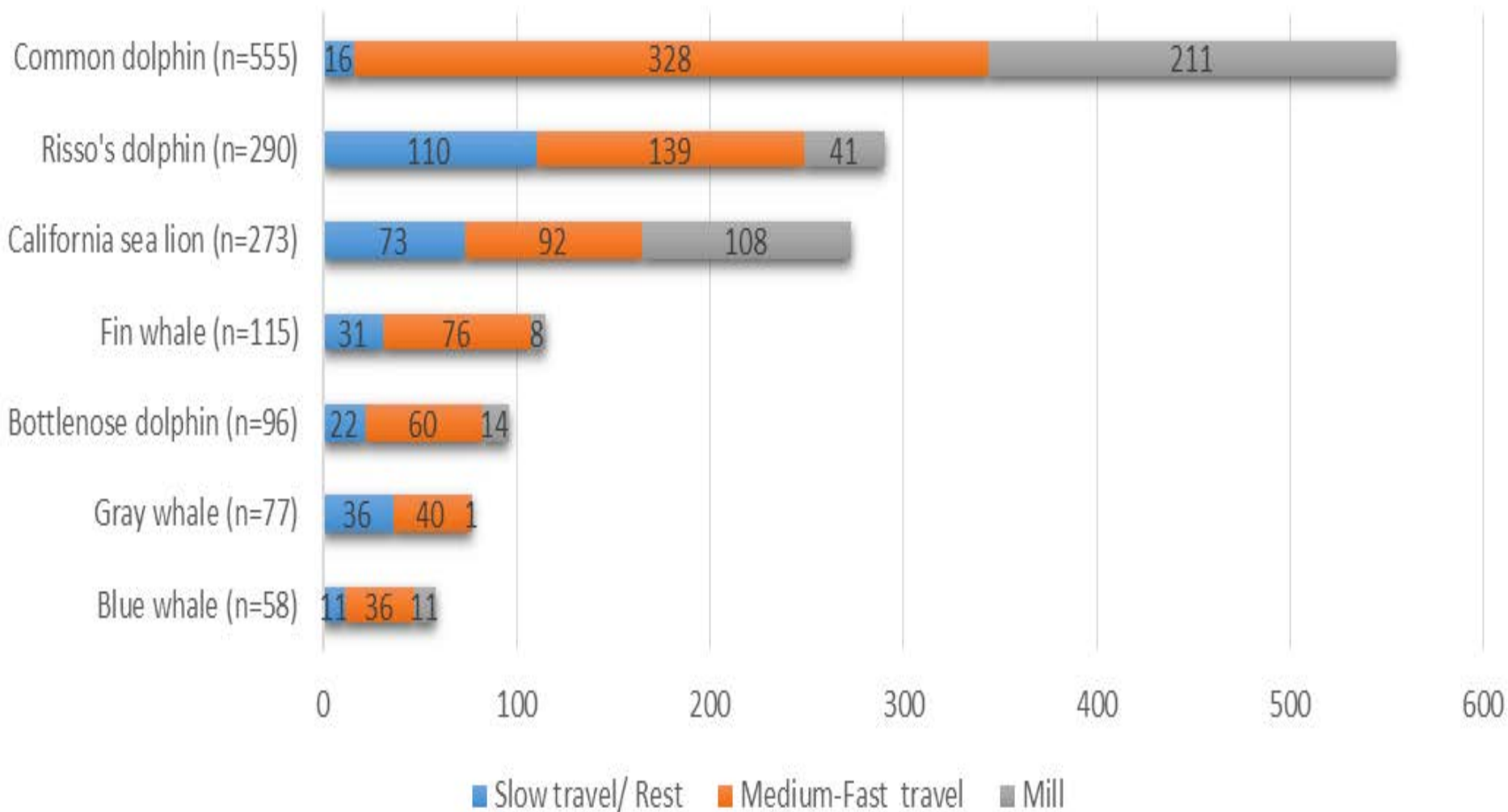
**Common dolphins
closer together**



*L. Mazzuca & B. Würsig / NMFS permit
14451*

Activity Budgets by SOCAL Species

Initial Observed Behavior State



Secrets LATER Revealed *by HD Video & Photos*



**Social – sexual
Risso's dolphins**

Pacific white-sided dolphin *not seen in the field*

Hey
look!!!
there's
multiple
calves
there!!!

Risso's dolphin calf

Hey wait!! That's *not* a Risso's—it's a *Pacific white-sided dolphin*

Taken
from
altitude
1200 ft w
400 mm
zoom lens



Sea lion not seen from the air

California sea lion



Humpback
whale



INTERSPECIFIC INTERACTIONS

on Video

Fin whale #1 = **WINS KRILL PATCH!!!**

Krill patch

Fin whale #2 = **LOSER**

Blue whale = **LOSER ☹**

*Video photo by Bernd Würsig / Permit No.
15369*



P.S. Mari go to 6:25



Video Examples - SOCAL

- ◆ Risso's group spacing, shape formation spread
- ◆ Fin whale social interactions & quantification



Bottleneck Reaction to Oil Spill

MV Mega Borg TX 1990

(Smultea & Würsig, 1995)

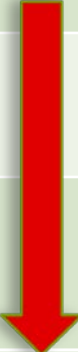
- ▶ Video from a Circling Aircraft:
- ▶ Variables collected to assess potential BEHAVIOR changes
- ▶ *In and at transitions between different types of **oil***



RESULTS *using video*



n = 9 groups

| OIL TYPE | MEAN space between dolphins |
|-------------------------|-----------------------------|
| HEAVY OIL | 1.2 BL |
| SLICK | 0.4 BL |
| SLICK / SHEEN INTERFACE | 0.5 BL |
| <i>NO OIL</i> | <i>2.6 BL</i> |

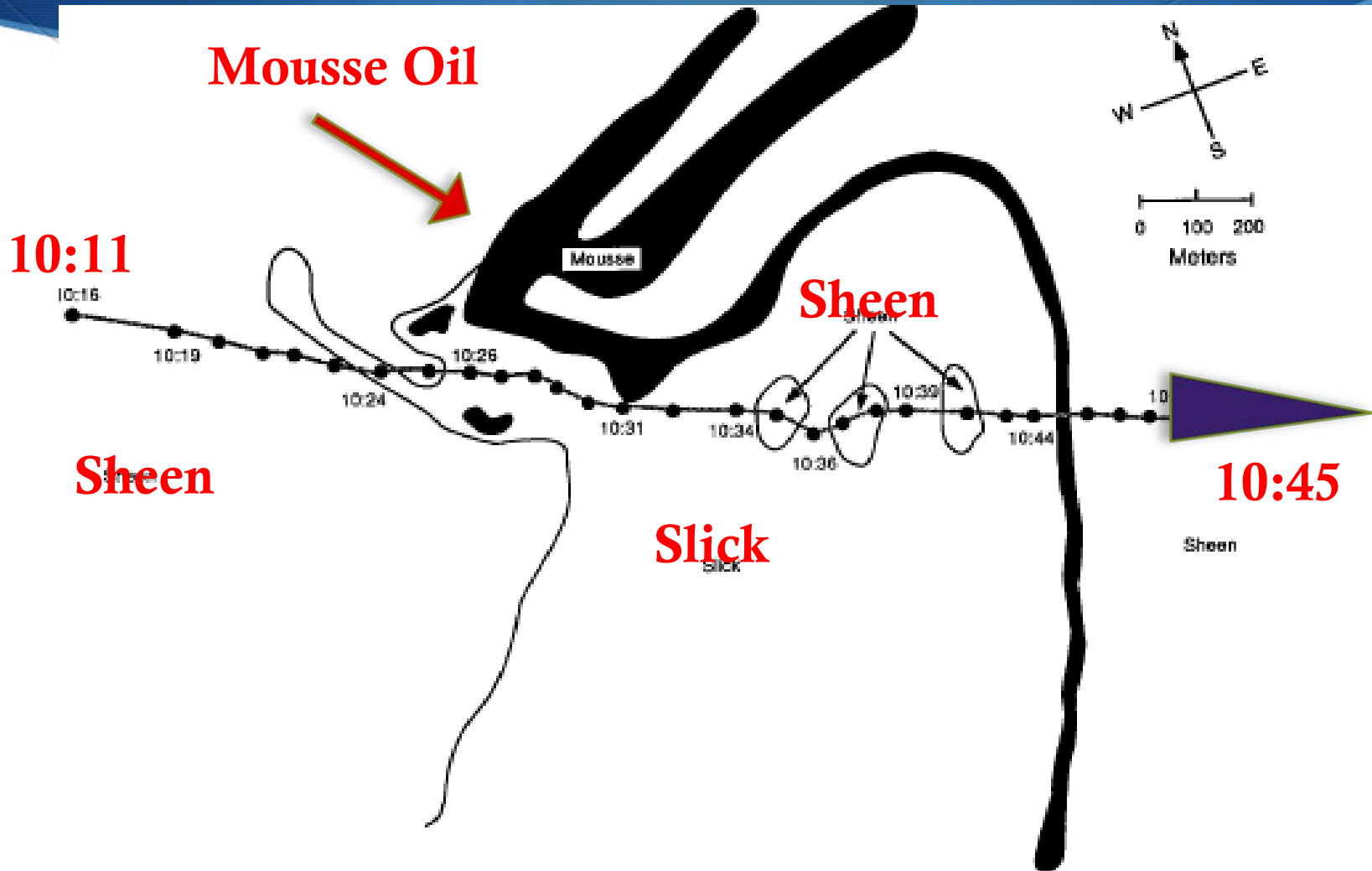


Group Reorientation Rates

(# degrees/min)

| OIL INTERFACE | RE-Orientation Rate | Group Split Up? |
|----------------|---|--|
| MOUSSE - SLICK |  |  |
| SLICK - SHEEN | | |
| NO OIL | | |

Dolphin Tracks & Oil



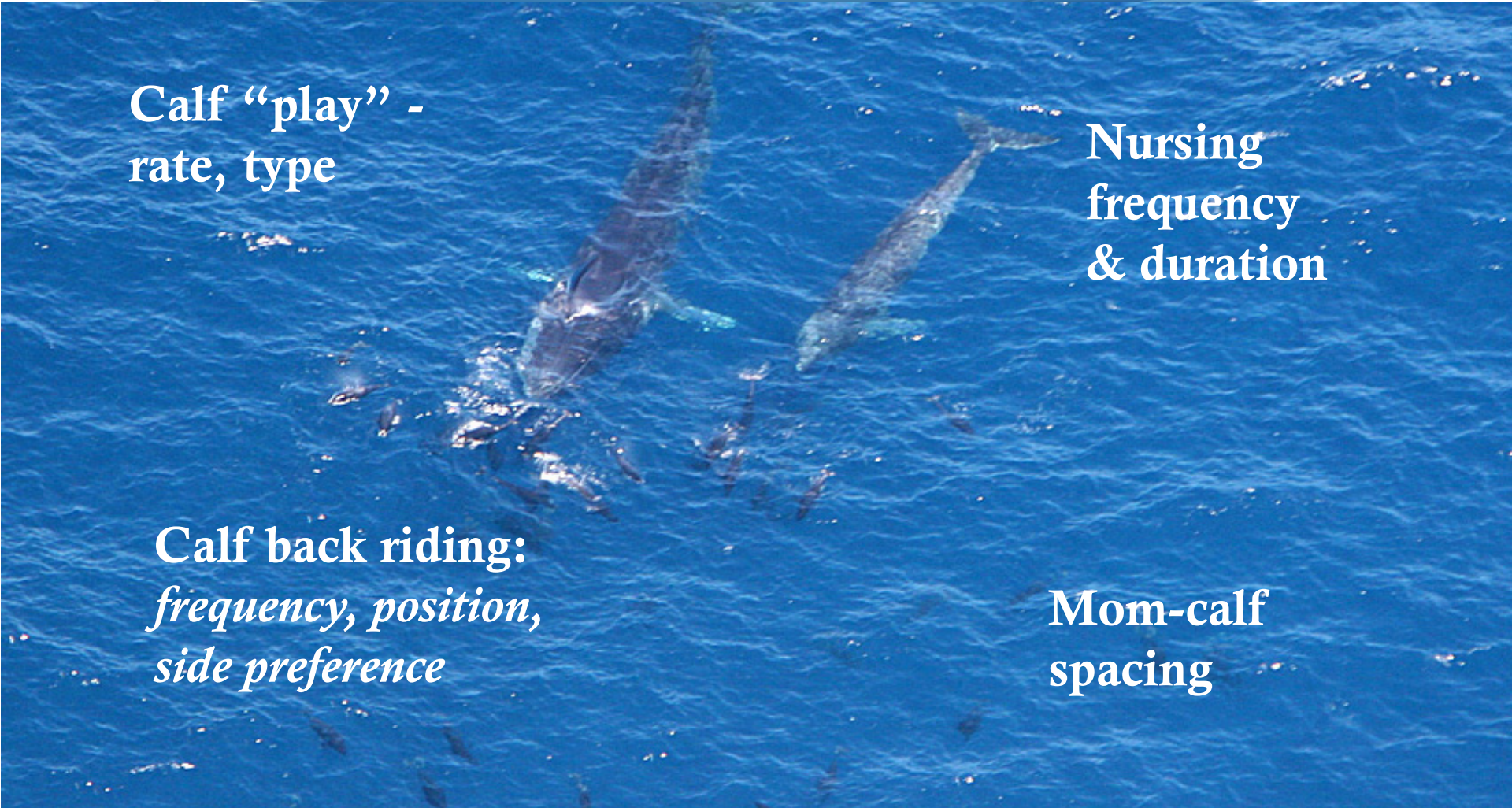
Mom/calf Fin Whale & ~1,000 N right whale dolphins

Calf “play” -
rate, type

Nursing
frequency
& duration

Calf back riding:
*frequency, position,
side preference*

Mom-calf
spacing



Fins chasing minke *video*

Play? Competition? Resource Defense?
Coordination? Socializing?



Two fin whales

Minke whale

HD Photos— Any **fish ID** folks in the room?

Herring ????
Anchovy ????



2 CA Sea lions

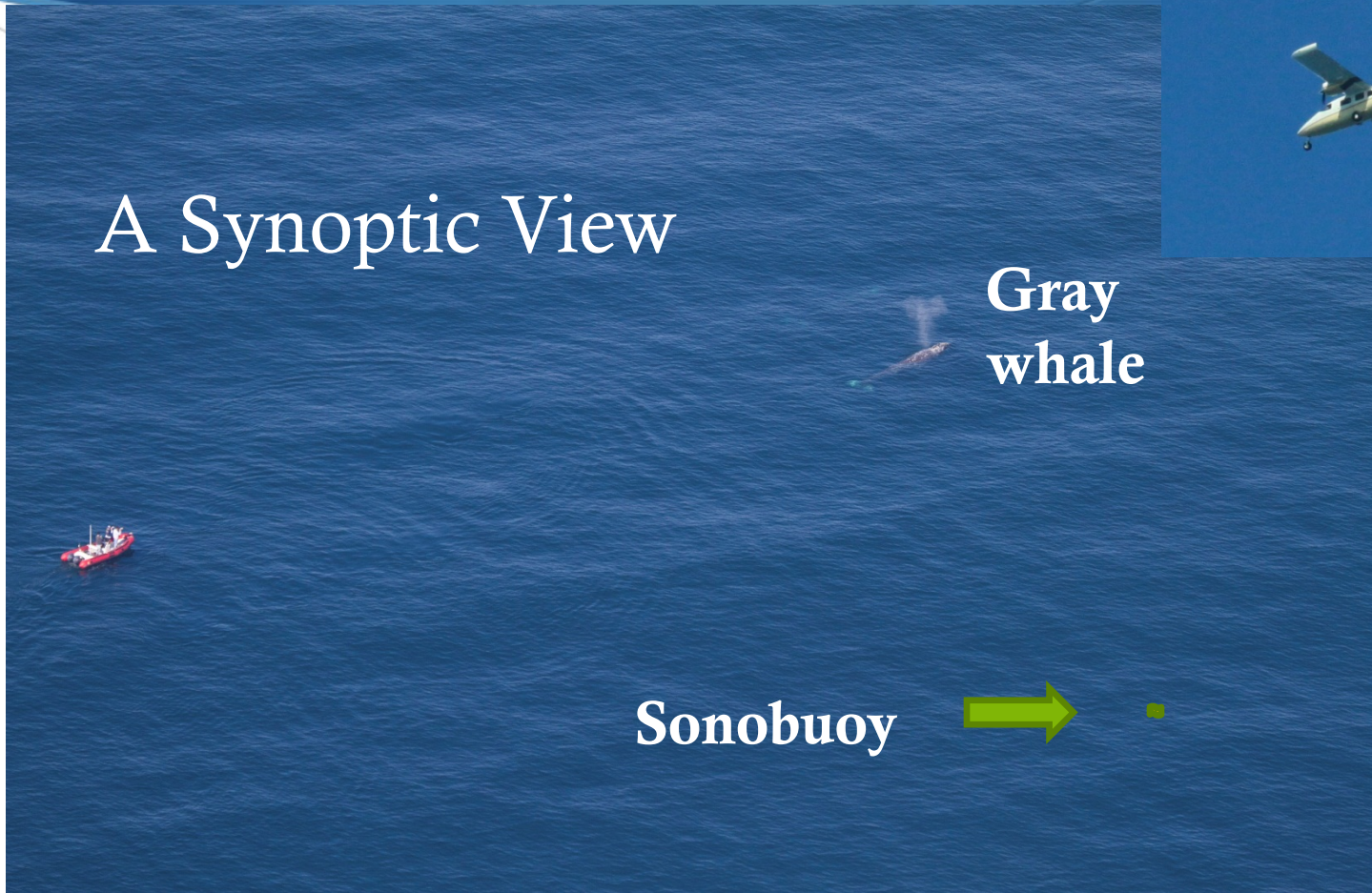
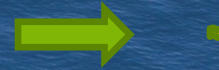
The image shows an aerial view of the ocean. On the left, two California sea lions are swimming, their heads and flippers visible above the water. To their right, a large, dense school of small fish is visible, appearing as a textured, shimmering area. Two black arrows point from the text '2 CA Sea lions' to the two sea lions. In the upper right quadrant, there is text identifying the school of fish as 'Herring ????' and 'Anchovy ????'.

PLATFORM INTEGRATION

A Synoptic View

Gray
whale

Sonobuoy



Accomplishments

Multi-team Study

SOCAL 2012

US Navy, SES,
Bio-Waves,
Scripps',
Mysticetus, HDR,
Texas A&M

- ◆ Linked visual sightings & calls
- ◆ Localized calls
- ◆ Correlated calls & behavior
- ◆ Real-time mapping - *Mysticetus*
- ◆ Video
- ◆ Photo-IDs & biopsies
- ◆ Retrieved sonobuoys



Blue whale circles vessel *people watching ?*



© SES 2010

Thank you

I'M NOT JUST BEING PARANOID, MARGRET. HIS BREATH SMELLS LIKE DOLPHIN AND I EVEN FOUND A FLIPPER IN HIS COAT POCKET YESTERDAY. I REALLY THINK EARL'S HITTING THE BOTTLENOSE AGAIN.

