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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

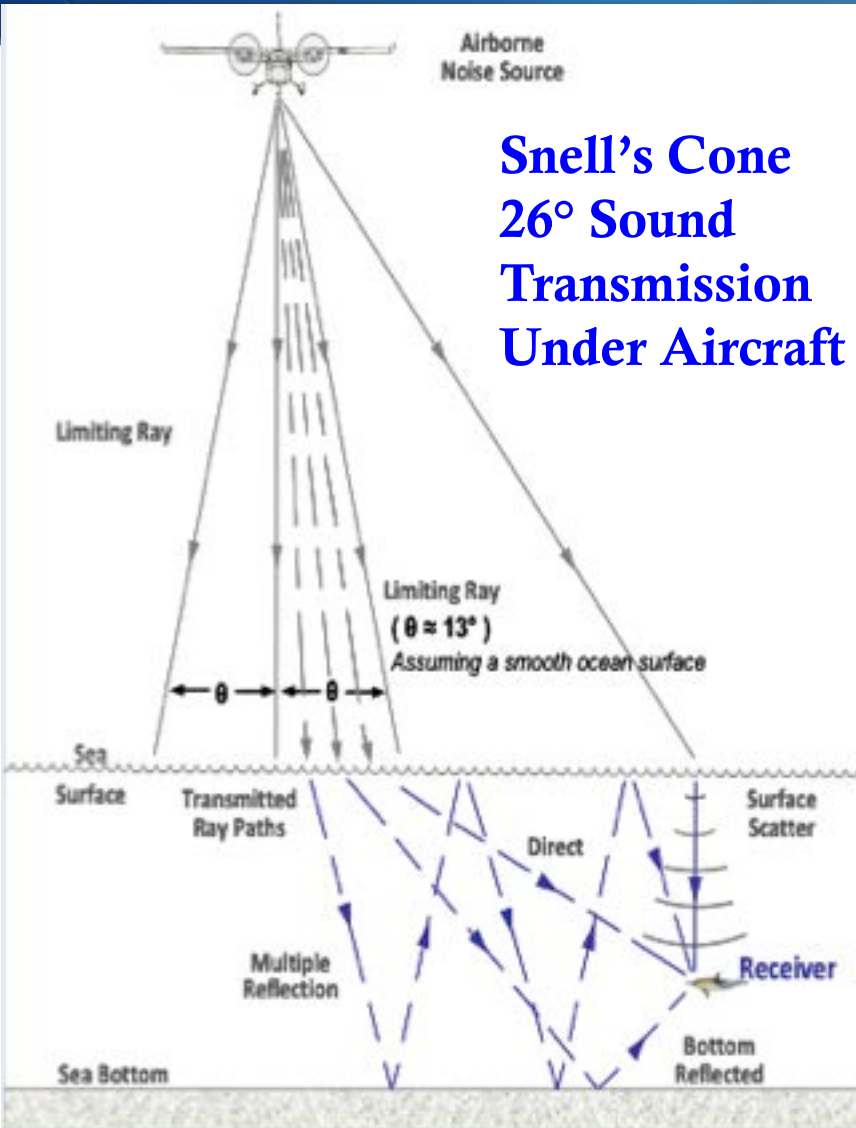
💧 Navy-funded baseline Monitoring



PLANE PLATFORM

can be *NO DISTURBANCE*

Snell's Cone 26° Sound Transmission Under Aircraft

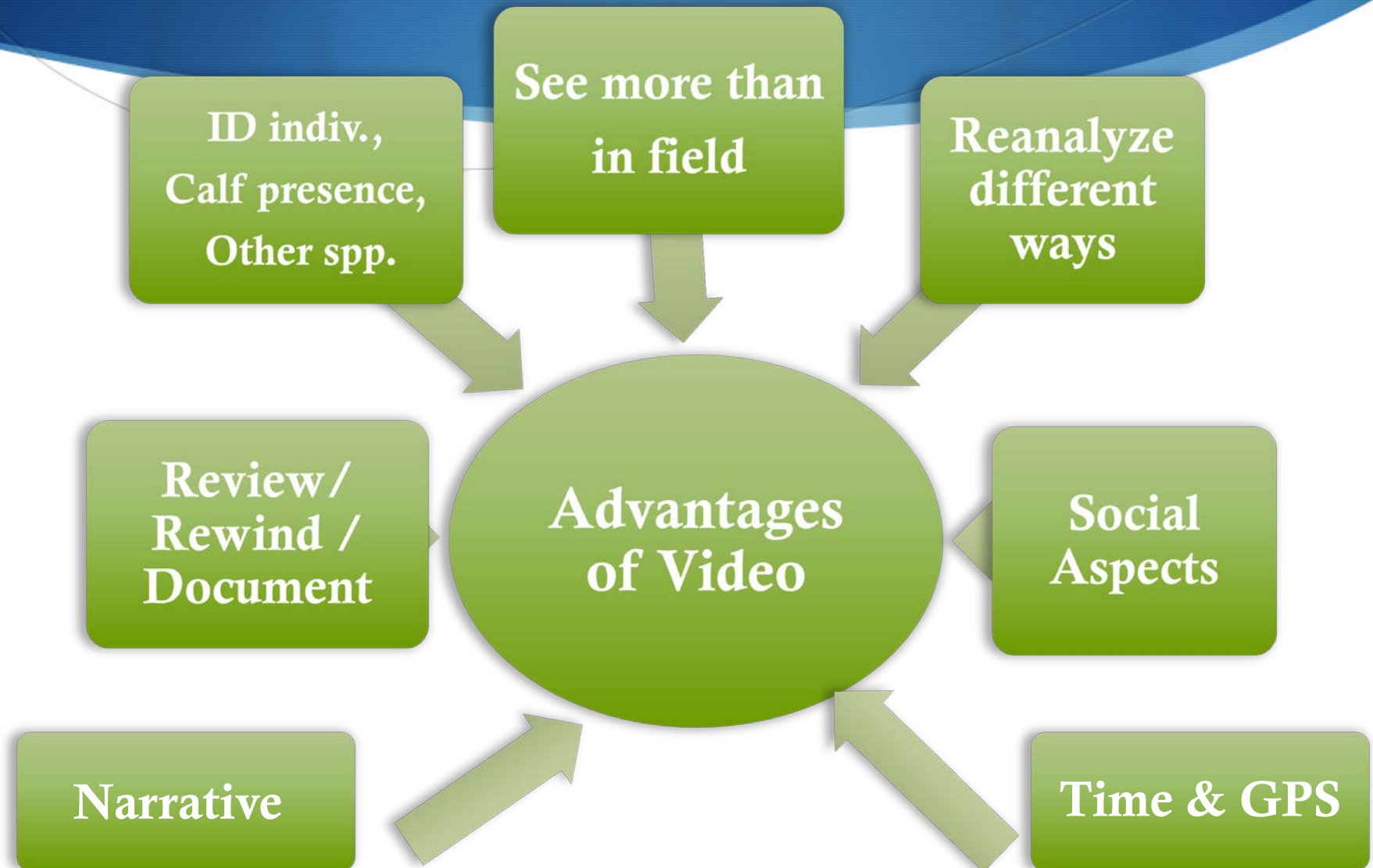


Bowhead whale and calf in the Arctic, Photo Credit: Corey Accardo (NOAA) taken May 29th 2011, Marine Mammal Permit: 782-1719

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

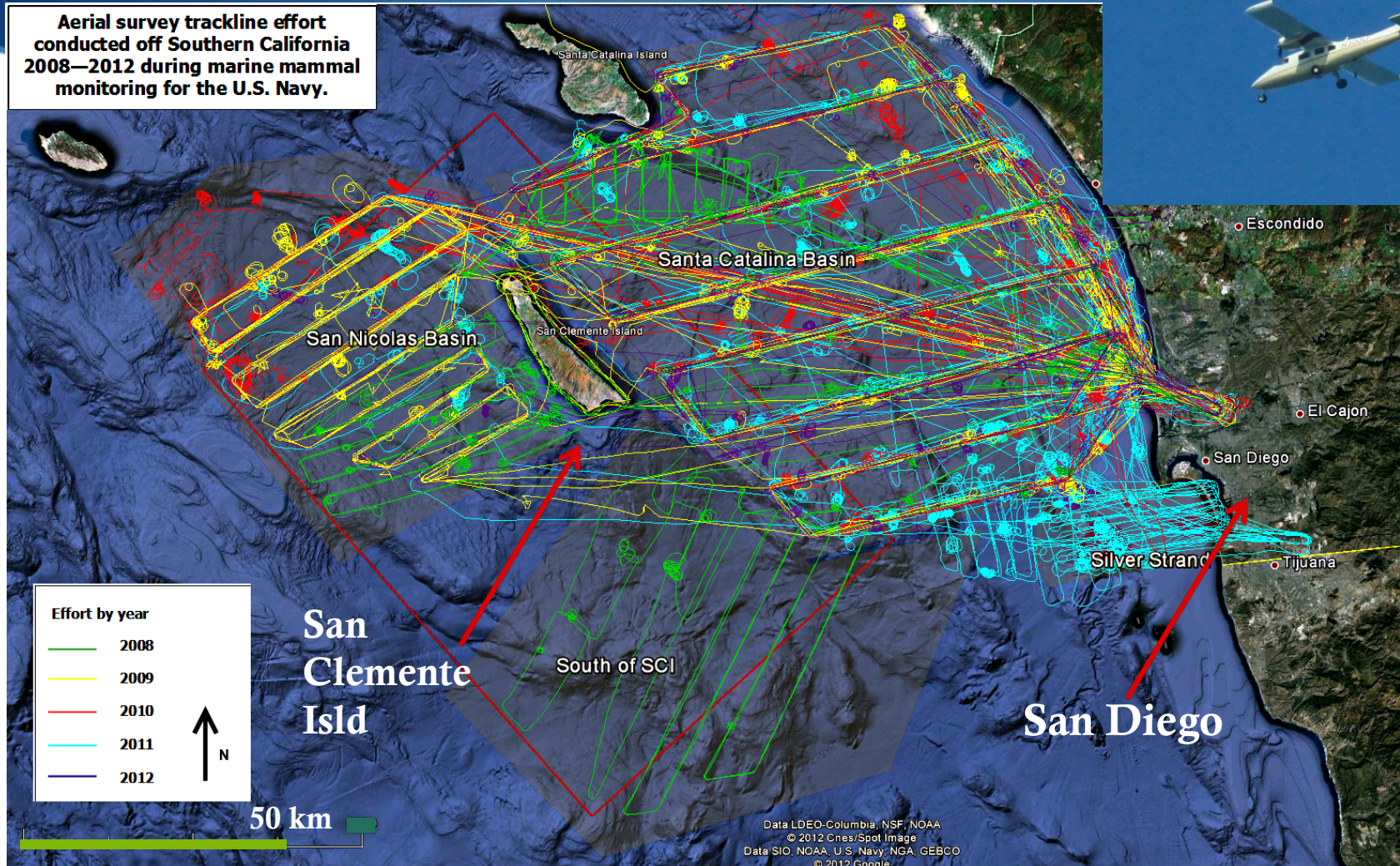
- ◆ Social spacing
 - ◆ *huddle or spread-out stress response???*
- ◆ Orientation - *flee? mill? no change?*
- ◆ Social interactions
- ◆ Speed
- ◆ Respiration & dives
- ◆ Individual photo-ID
- ◆ Activity budget

EXAMPLES



Study Area & Effort 2008-2013

Southern California Bight, CA, U.S.



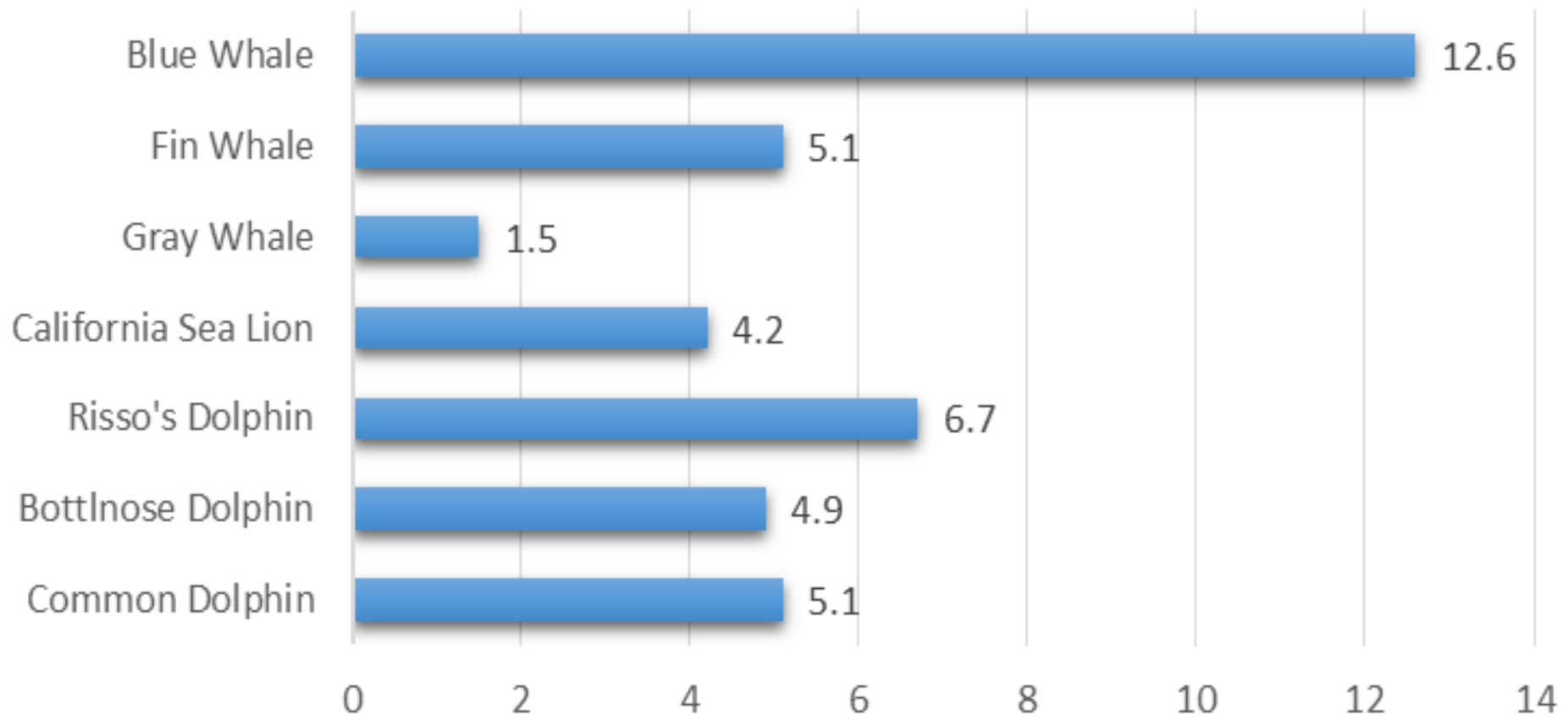
SOCAL Individual ID – Photos



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



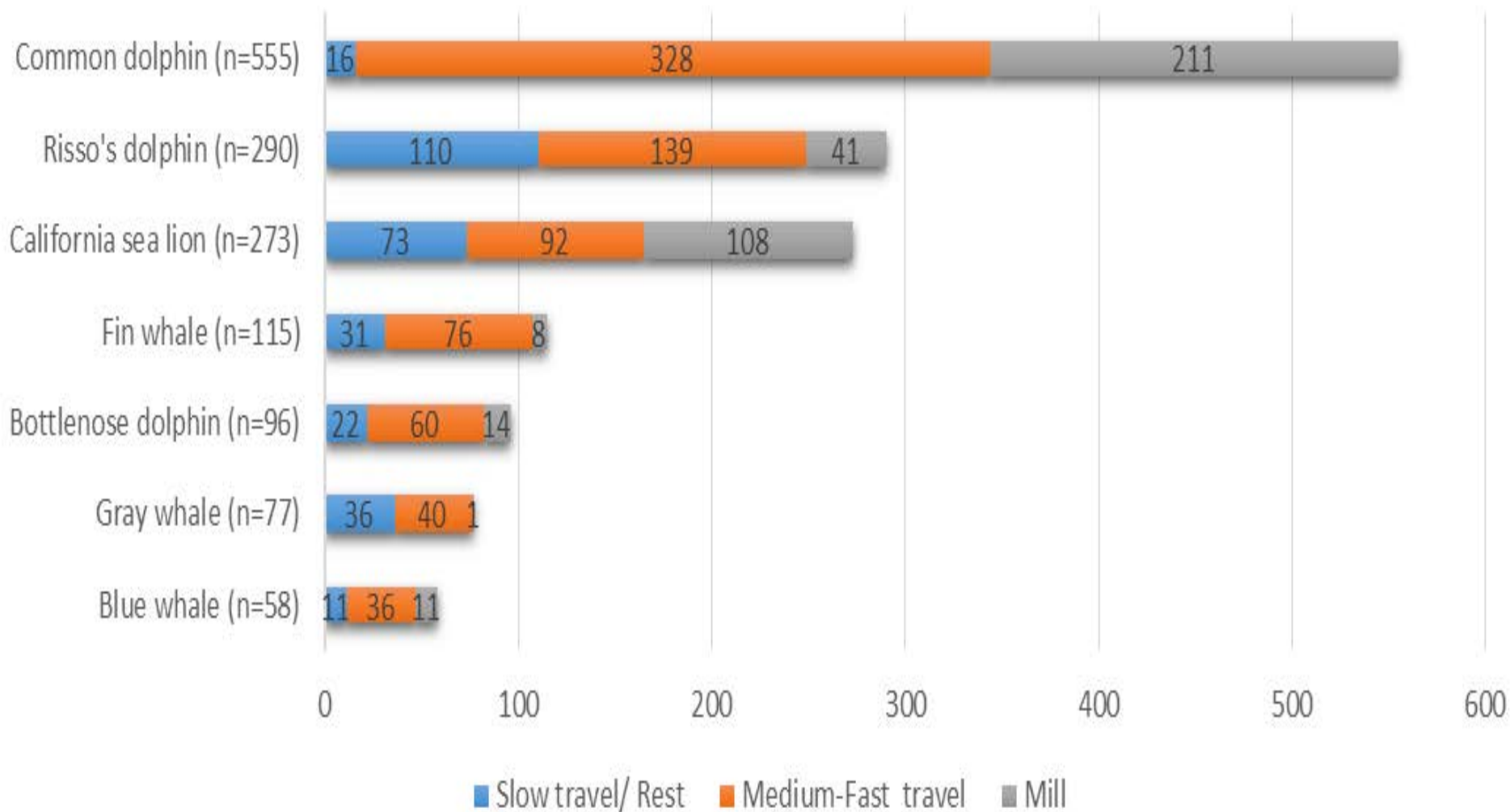
**Common dolphins
closer together**



*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)

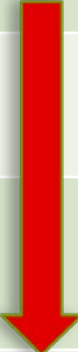
- Video from a Circling Aircraft:
- Variables collected to assess potential BEHAVIOR changes
- In and at transitions between different types of oil*



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>

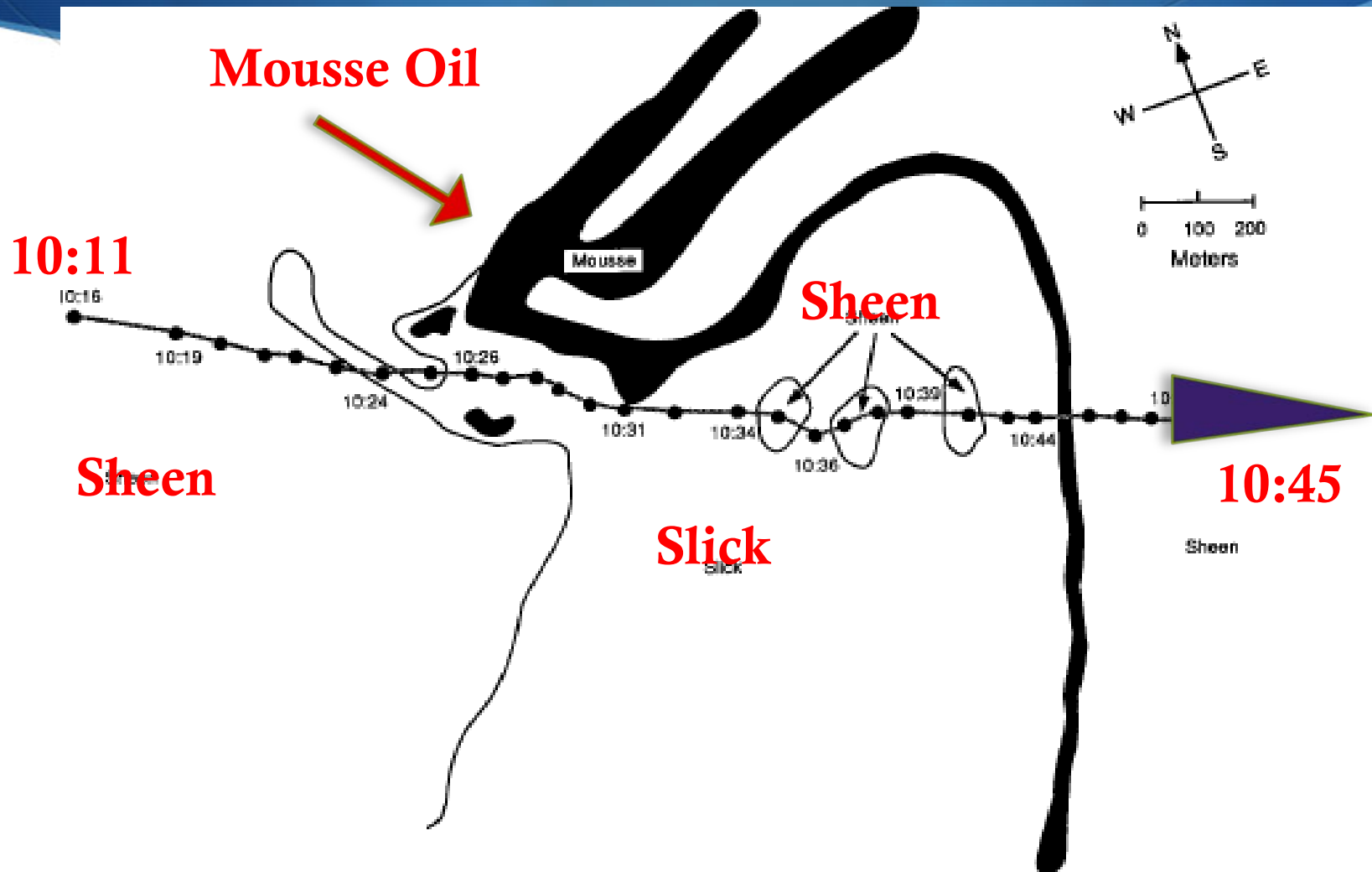


Group Reorientation Rates

(# degrees/min)

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

Dolphin Tracks & Oil



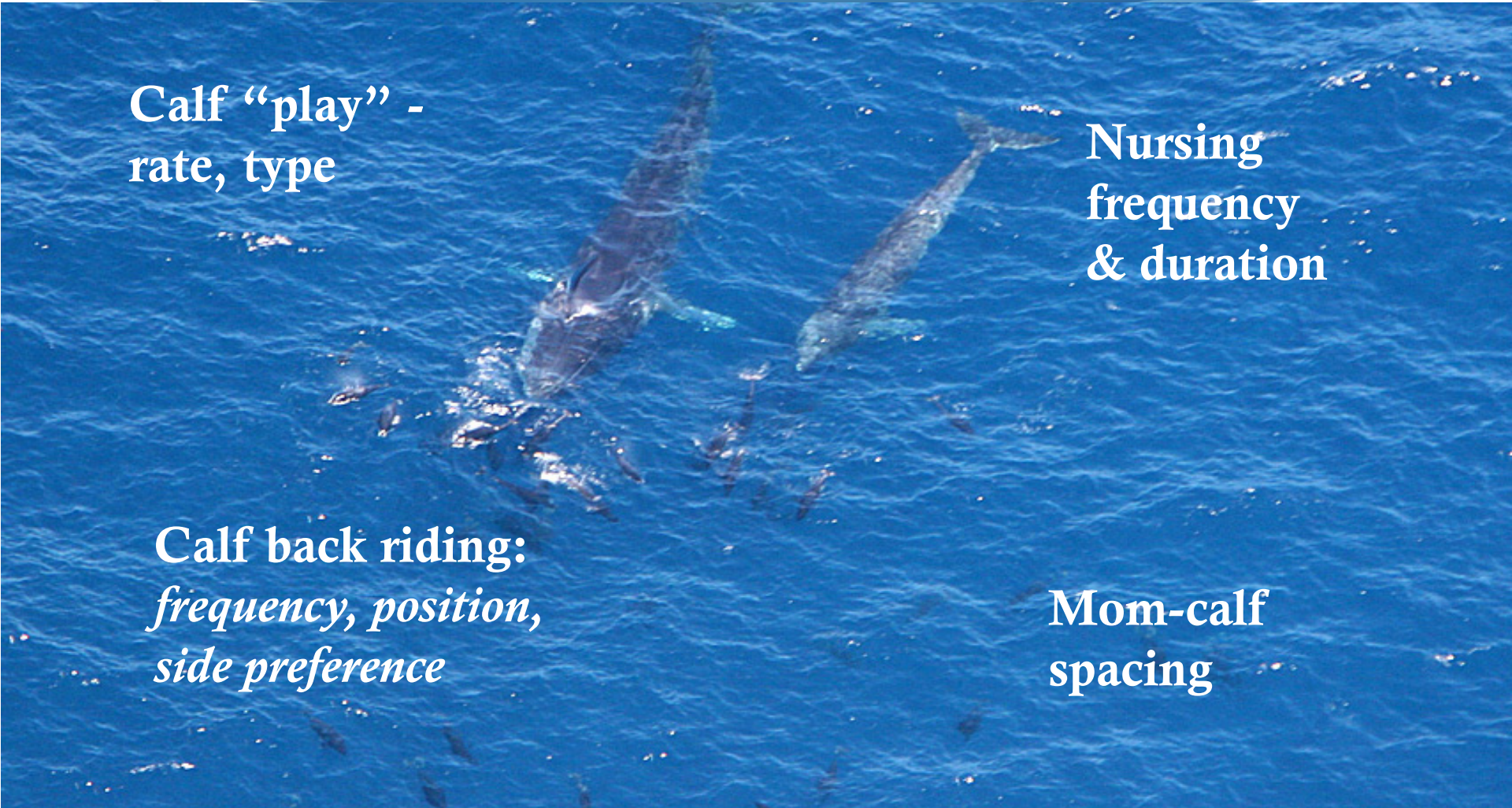
Mom/calf Fin Whale & ~1,000 N right whale dolphins

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

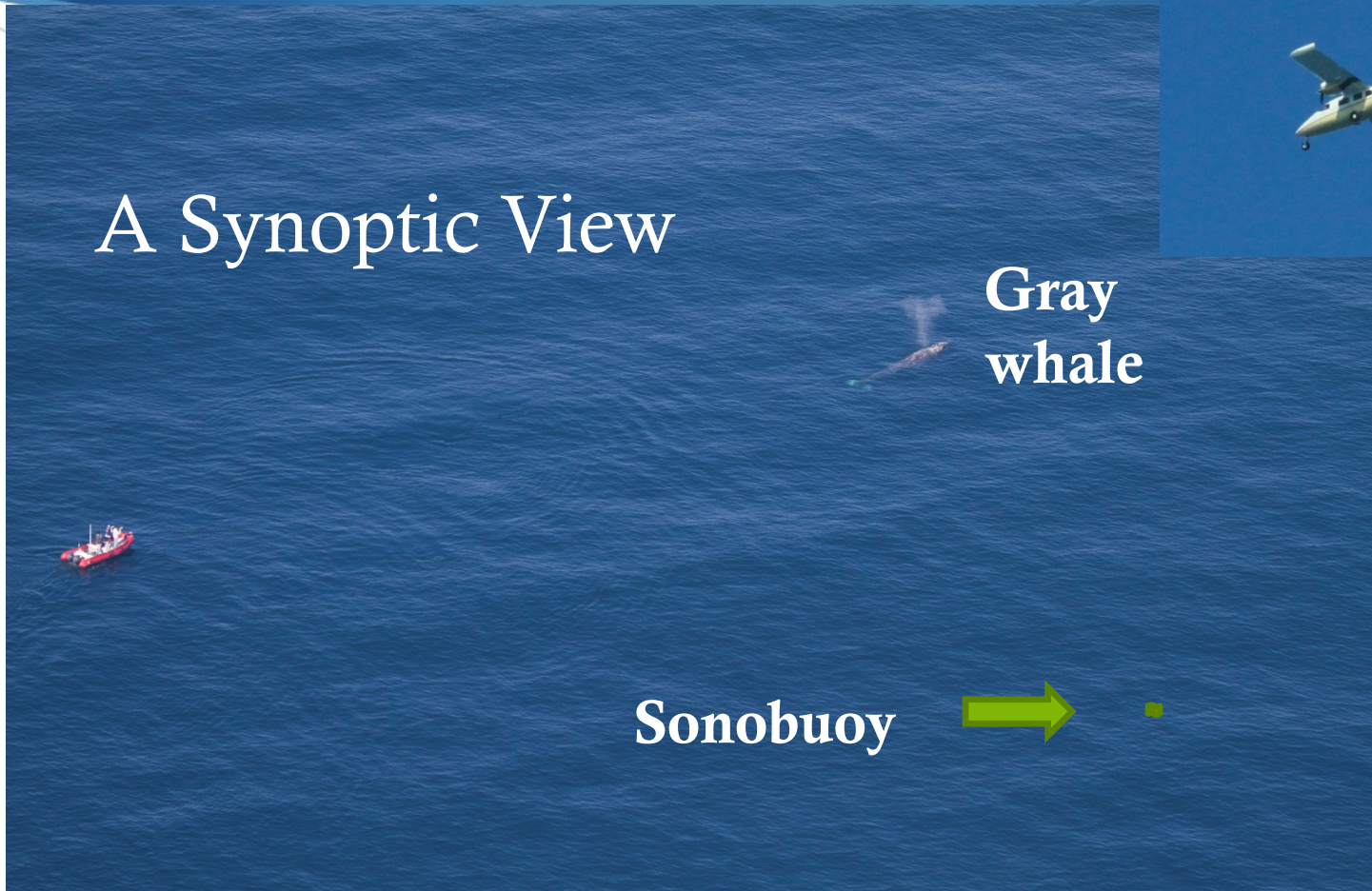
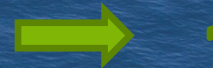


PLATFORM INTEGRATION

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 ?*



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.

