

# FOCUSING ON BEHAVIORAL DATA GATHERING AND ANALYSIS:

## *Highlighting Video Capabilities from the Air or Shore*

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# Video/Photo PLATFORMS



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



# METHODS from Circling Aircraft *VIDEO*

## 1. PIONEERS: Bernd and his 1980s Buddies \*\*

- 🔹 Bowhead Whale Behavior - Arctic - *Baseline vs. Seismic Sounds*

## 2. 2008-2013: = SOCAL & “Pioneer” 6+ species

- 🔹 Mari & Bernd and our 2000s buddies 😊 \*\*\*
- 🔹 Navy-funded baseline Monitoring

\*\* (*Würsig et al. 1985, Richardson et al. 1990*)

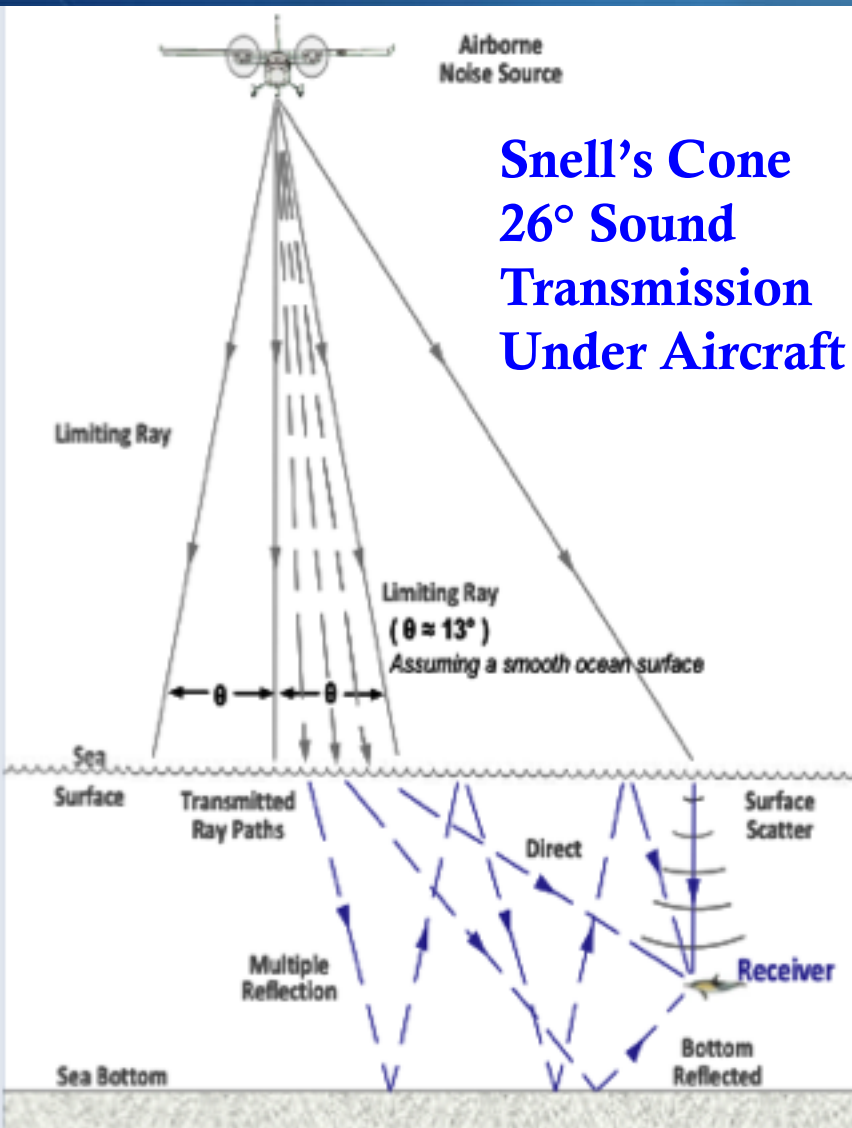
\*\*\* (*Smultea et al. 2012, 2014a,b,c*)



# PLANE PLATFORM

can be *NO DISTURBANCE*

Twin Otter Circling @ 1200-1500 ft altitude & 1 km radius

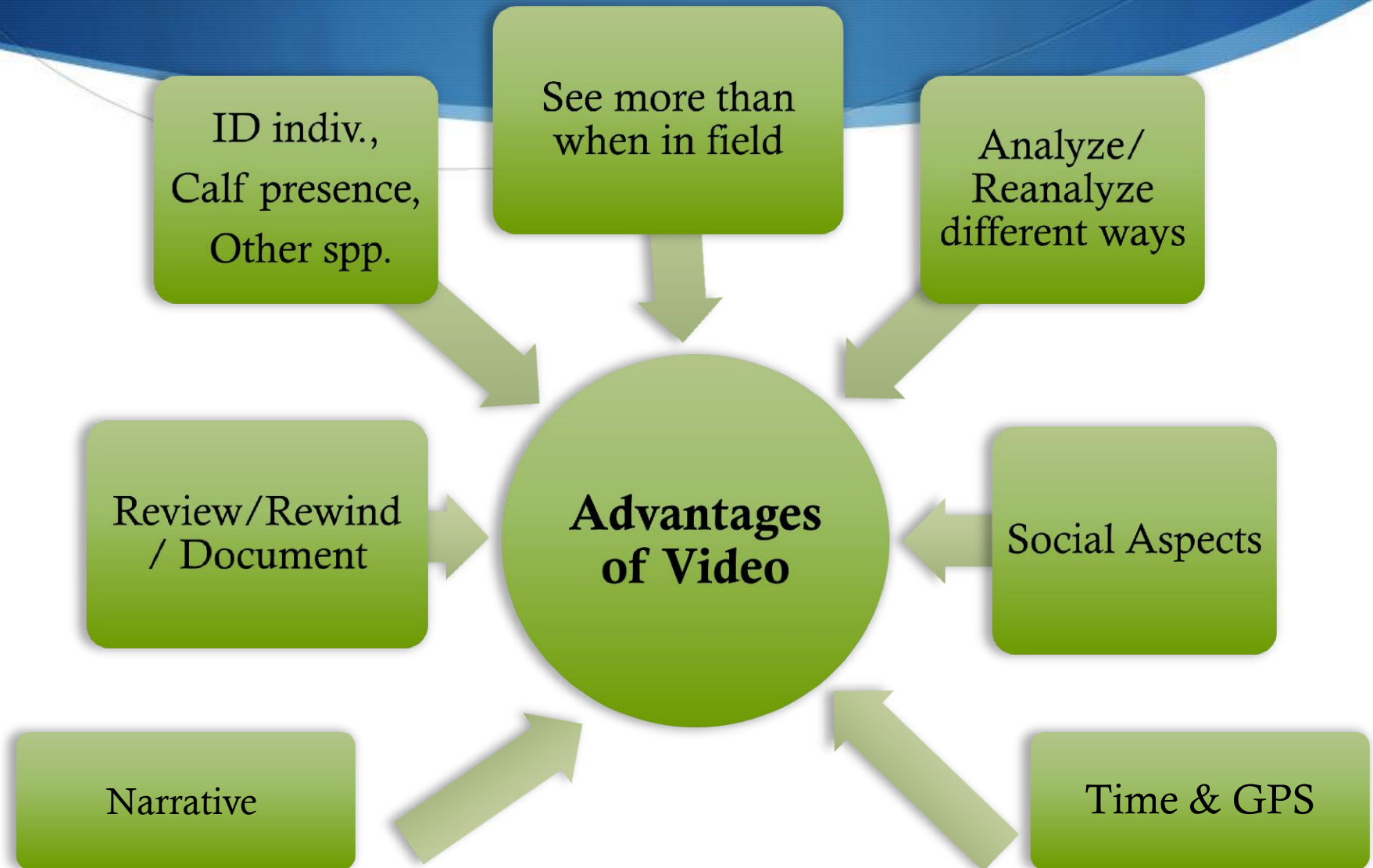


Bowhead whale and calf in the Arctic, Photo Credit: Corey Accardo (NOAA) taken May 29th 2011, Marine Mammal Permit: 782-1719

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

	# Video MP	Zoom Lens	Internal- Stabilization	~ Cost (SONY)
<b>1986</b>	?	2.8x		<i>Reminder: Ask Bernd</i>
<b>2008</b>	3.3	12x	Shaking ( <i>Bernd the least ☺</i> ) - <i>need chest pod</i>	~ \$2000
<b>2013</b>	24.1	20x	No shaking !!!!! WOW!!!!!!	~ \$1600

# Modern HD Video ADVANTAGES



# Video & Focal Follow QUANTIFICATION

- ◆ Social spacing
  - ◆ *huddle or spread-out stress response???*
- ◆ Relative orientation - *flee? mill? no change?*
- ◆ Touching / interaction RATES
- ◆ Affiliation/disaffiliation rates
- ◆ Speed (GPS, wake?)
- ◆ Respiration, dive, surface times
- ◆ Individual photo-ID
- ◆ Activity budget
  - ◆ **?????? PANEL IDEAS ????????**

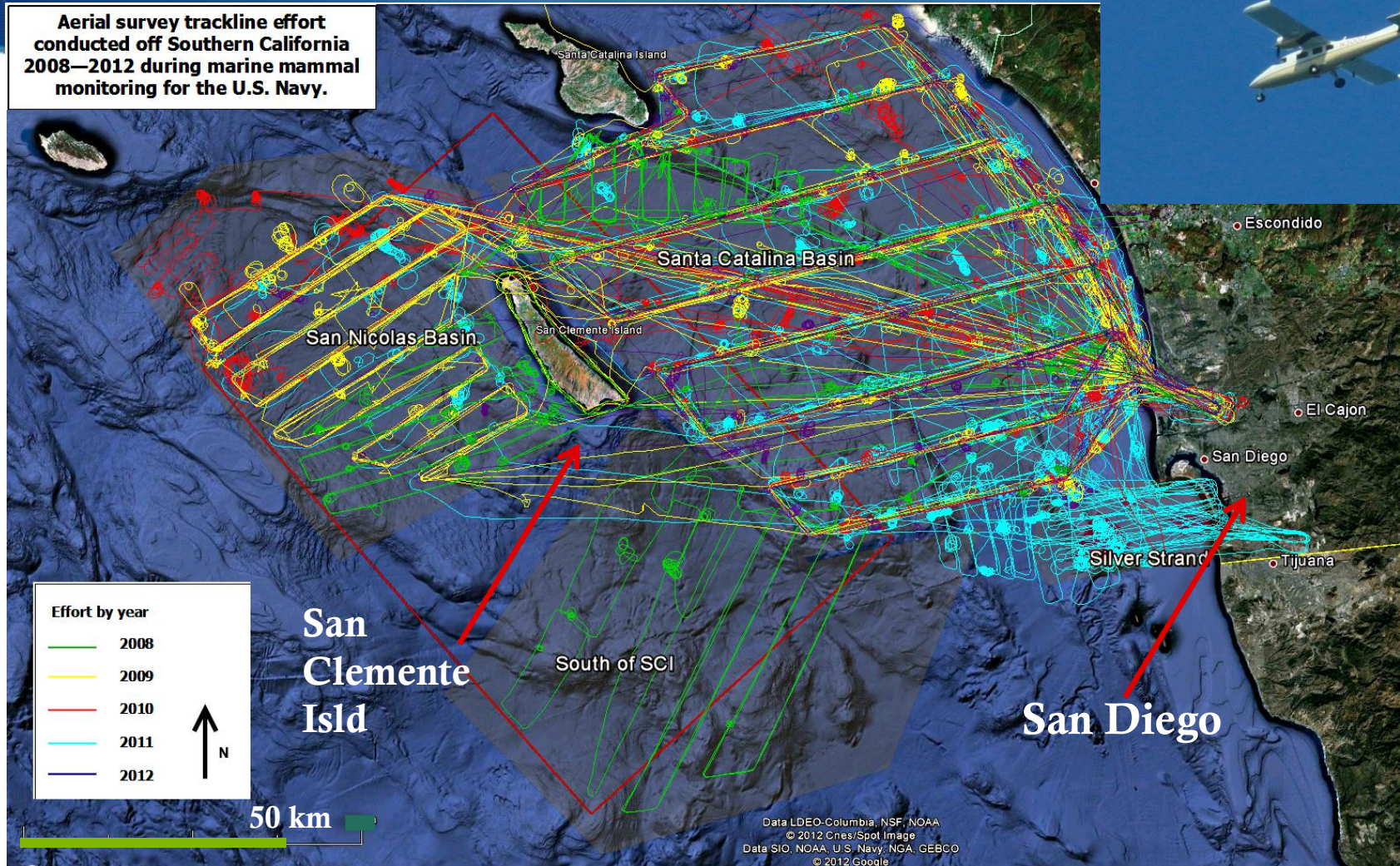
# EXAMPLES





# Study Area & Effort 2008-2013

## *Southern California Bight, CA, U.S.*



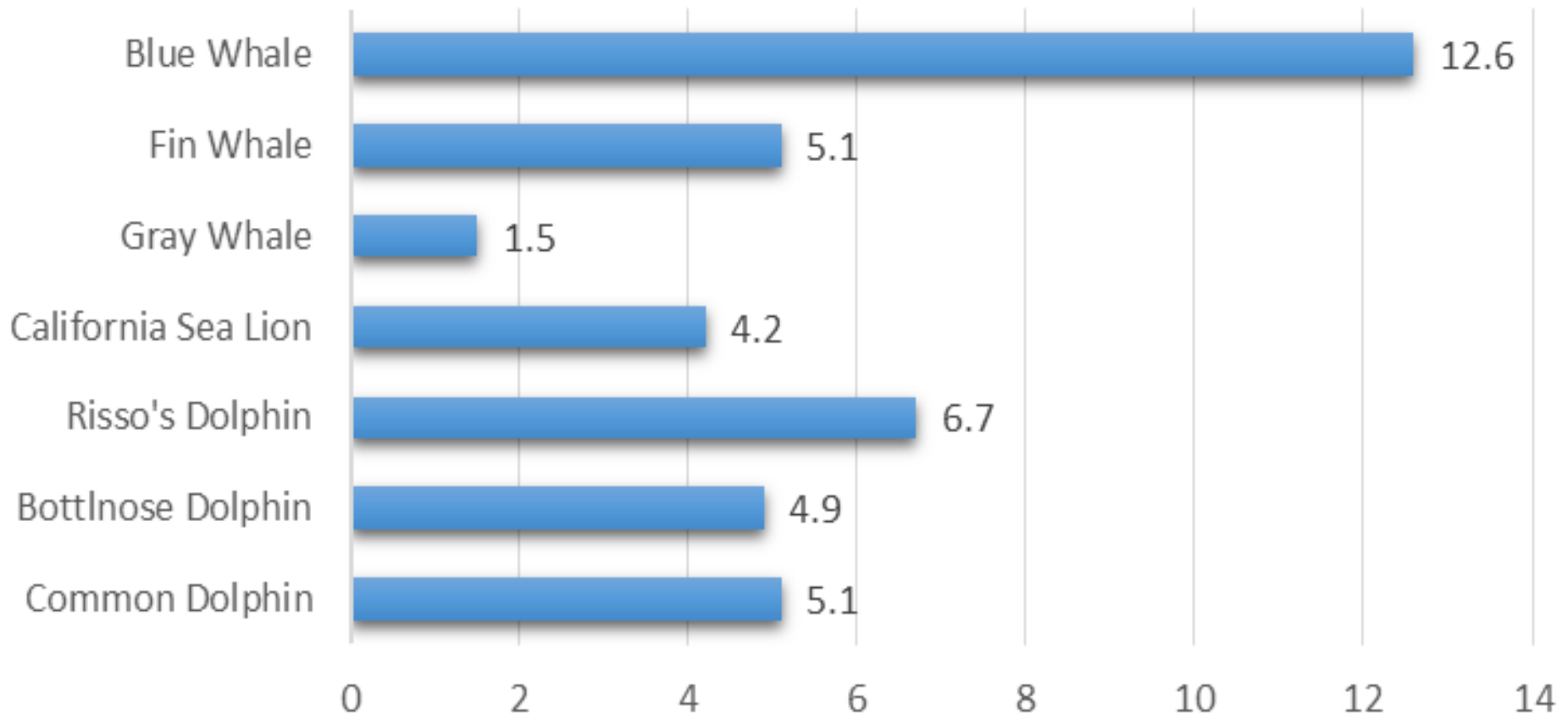
# SOCAL Individual ID – Photos



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

# Group Cohesion Index

## Mean Maximum Dispersal Distance (Adult Body Lengths)



# Species Differences: *video & photos & focal follows*

Body Size



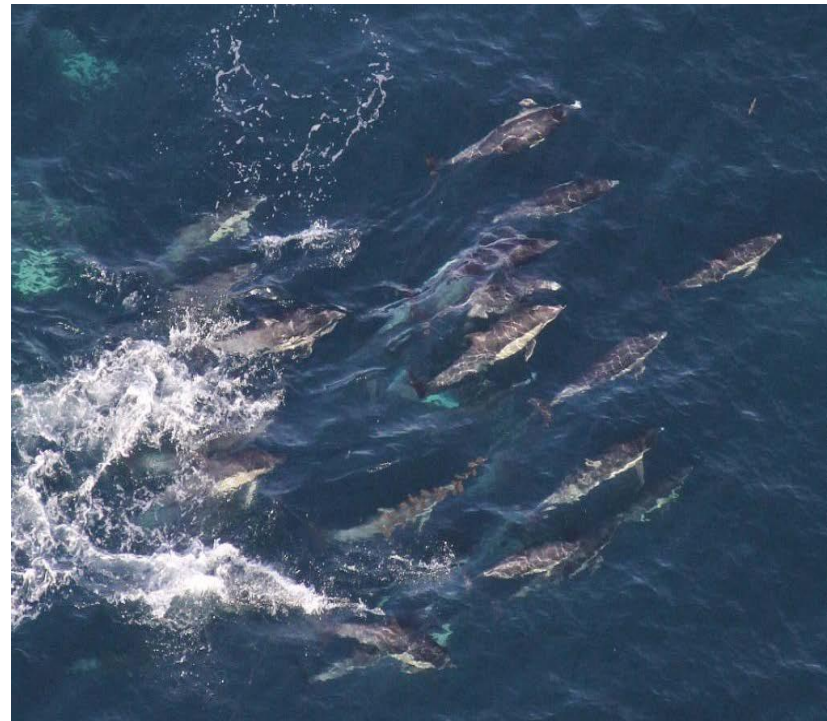
Group Size



Group Cohesion



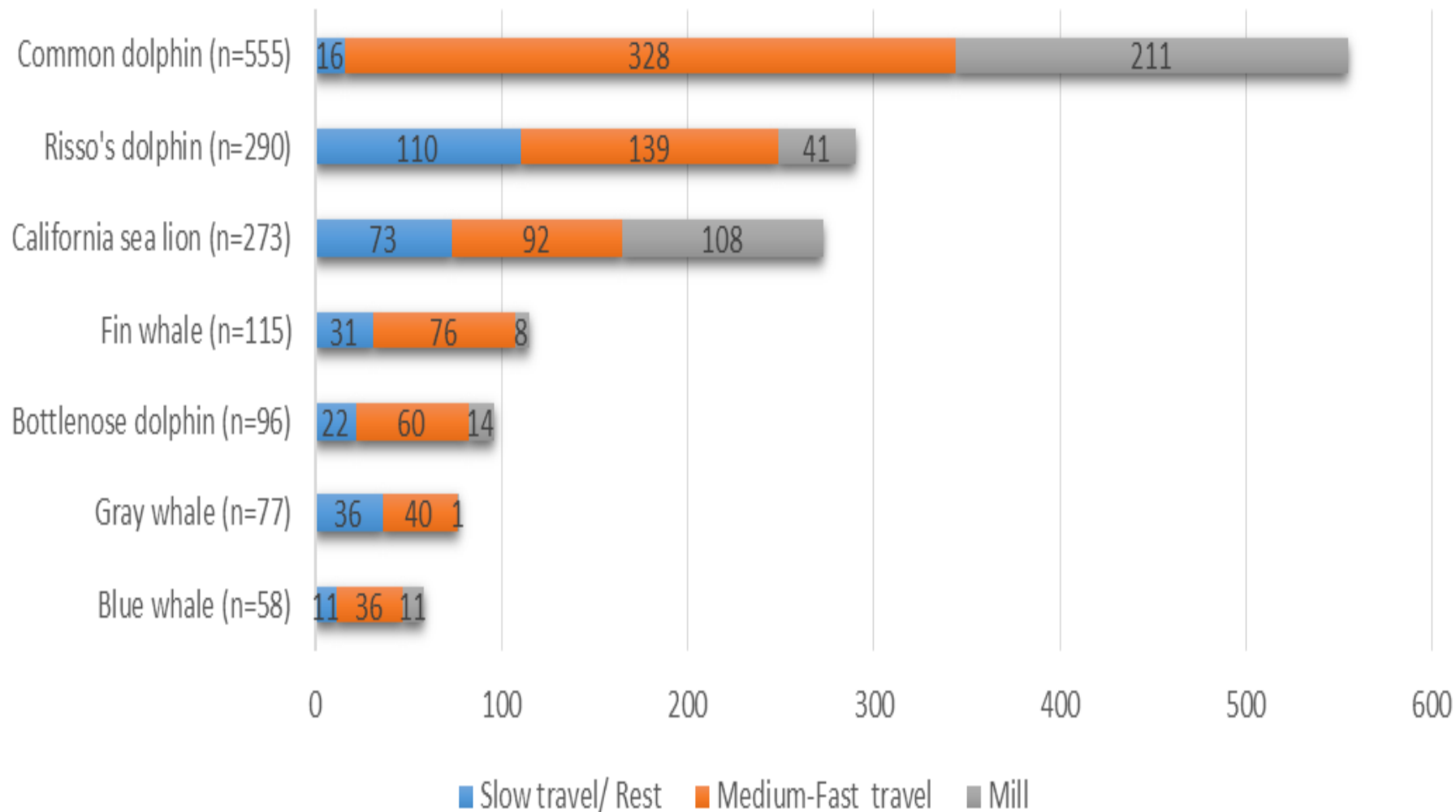
**Common dolphins  
closer together**



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

# Activity Budgets by SOCAL Species

## Initial Observed Behavior State



# Secrets LATER Revealed

*by HD Video & Photos*



# Pacific white-sided dolphin

*not seen in the field*



Taken  
from  
altitude  
1200 ft w  
400 mm  
zoom lens

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

# Sea lion not seen from the air



**California sea lion**

**Humpback whale**



# INTERSPECIFIC INTERACTIONS / COMPETITION *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*

# Mom/calf Fin Whale & N right whale dolphins

*July 2009 VIDEO = 60 min.*

**Calf “play” -  
rate, type**

**Nursing  
frequency  
& duration**

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

**Mom-calf  
spacing**



# Fins chasing minke *video*

## March 2013



# HD Photos– Any fish ID folks in the room?

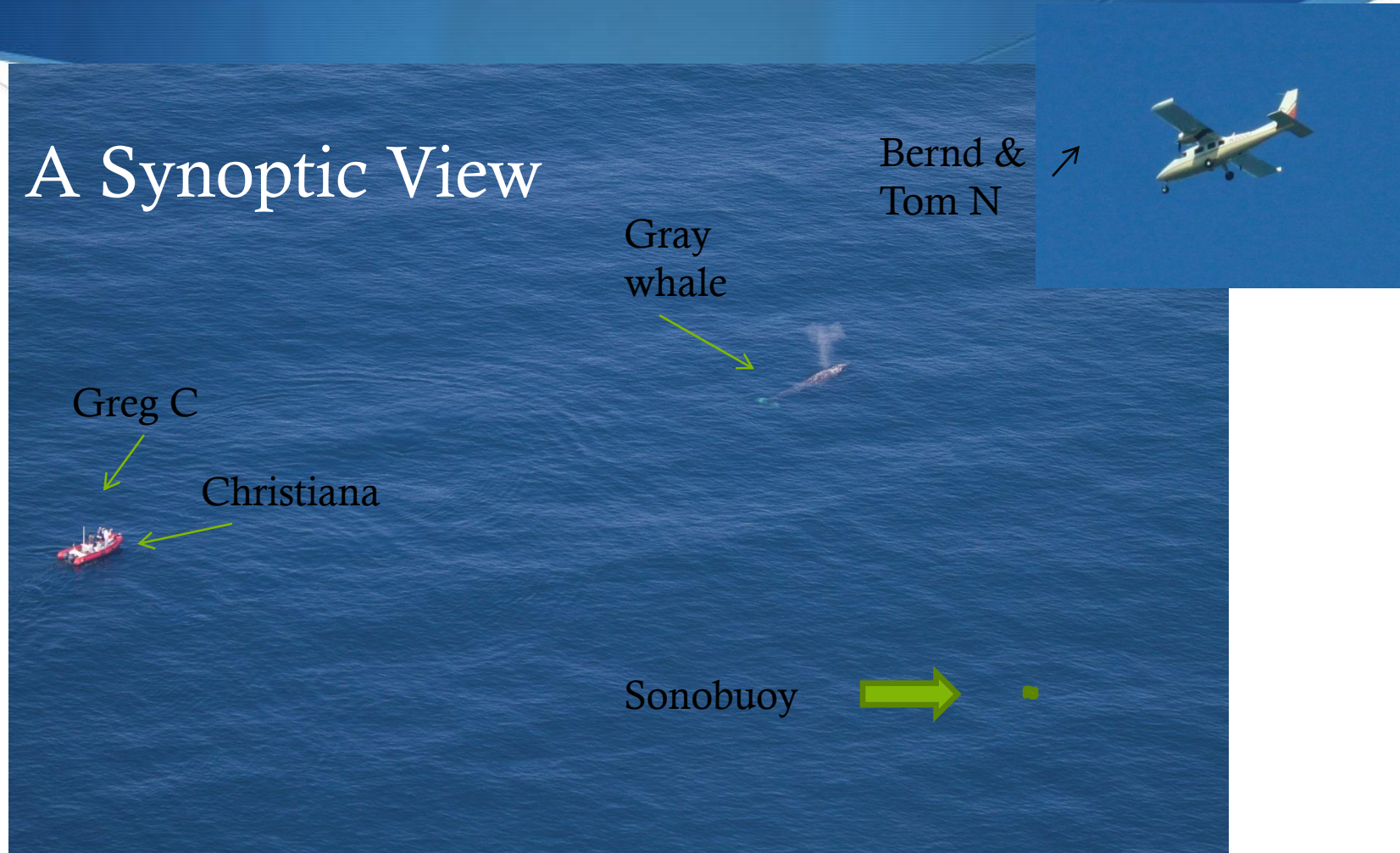


2 CA Sea lions  
mill w bait ball winter  
2013 SOCAL

# PLATFORM INTEGRATION

Visual focal behavior, video, sonobuoy recordings, real-time *Mysticetus* display, localization

## A Synoptic View



# Accomplishments

## *Multi-team Study*

### *SOCAL 2012*

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

- ◆ Linked visual sightings & whale & dolphin calls
- ◆ Directionalized / Localized calls
- ◆ Correlated calls with behavior
- ◆ Real-time mapping - *Mysticetus*
- ◆ Video-documented behavior
- ◆ Obtained photo-IDs & biopsies
- ◆ Retrieved sonobuoys



# 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
NO OIL	2.6 BL



# Group Reorientation Rates

(# degrees/min)

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



# 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.



*P.S. Go see our 6 posters*



P.S. Mari go to 6:25

