

# Recreational Interactions: Growing threats to Gulf Marine Mammals



*Katie McHugh, Chicago Zoological Society / Sarasota Dolphin Research Program*

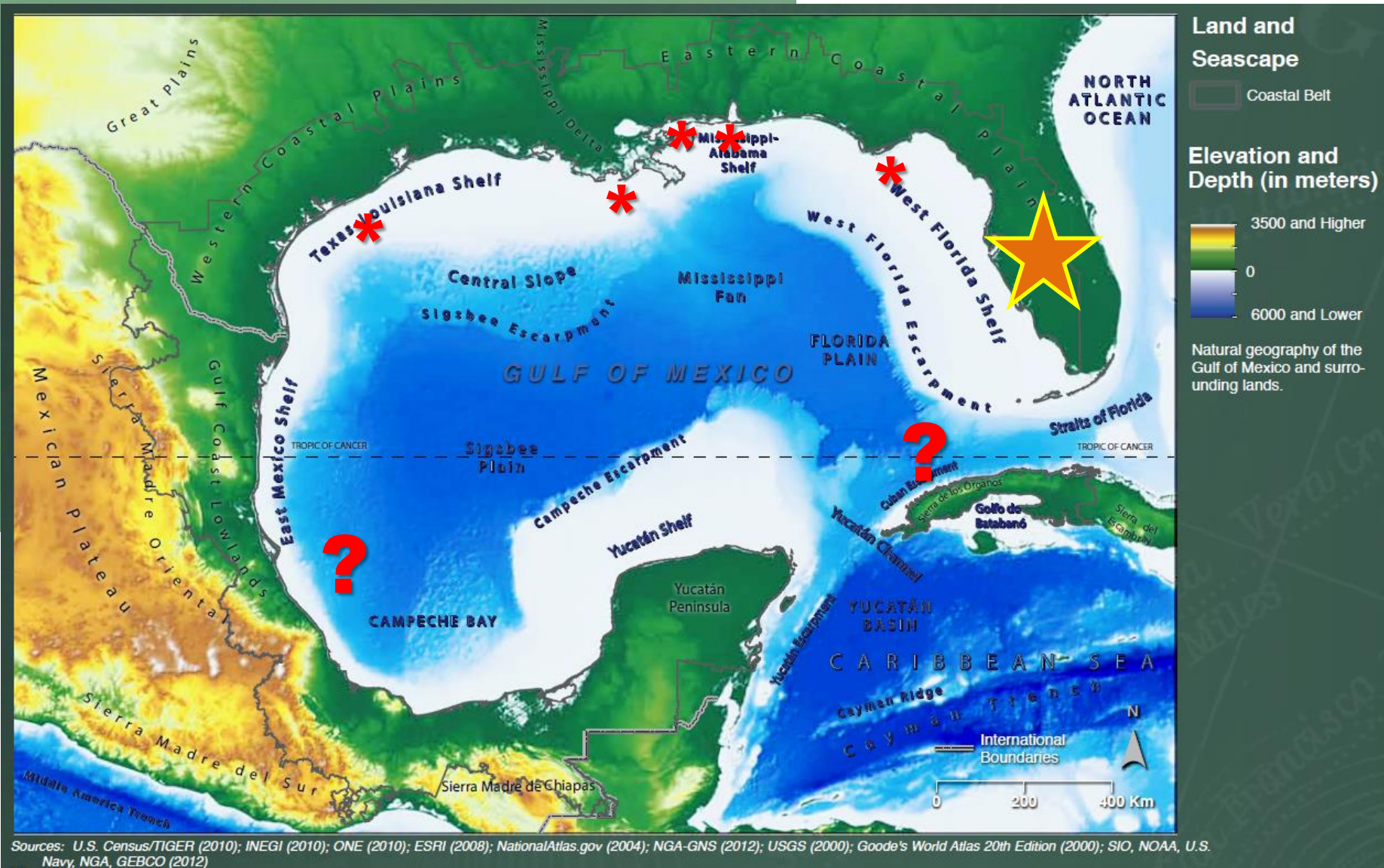
# Recreational interactions widespread



Image from Crystal River NWR website



# Recreational interactions widespread



# Complex variety of adverse interactions

- Both acute and chronic impacts
- Recreational Fishing
  - Entanglement in or ingestion of gear
  - Depredation and scavenging
  - Provisioning: unintentional & intentional feeding
  - Potential retaliation from fishermen
- Recreational Boating & Tourism
  - Boat collisions
  - Boat disturbance & harassment
  - Provisioning : food for dolphins, water for manatees
  - Swim-with activities



# Increasing problems throughout GoM

- Substantial, increasing overlap between managed species and human activities
- Growing coastal human populations, coastal development, tourism
  - Need to understand multiple complex ‘user’ groups involved
- Recent increases in rates of interaction, associated injuries and mortality, spread of unnatural behaviors through local populations
  - How do recreational impacts interact with other stressors?
- **Currently lacking effective mitigation**

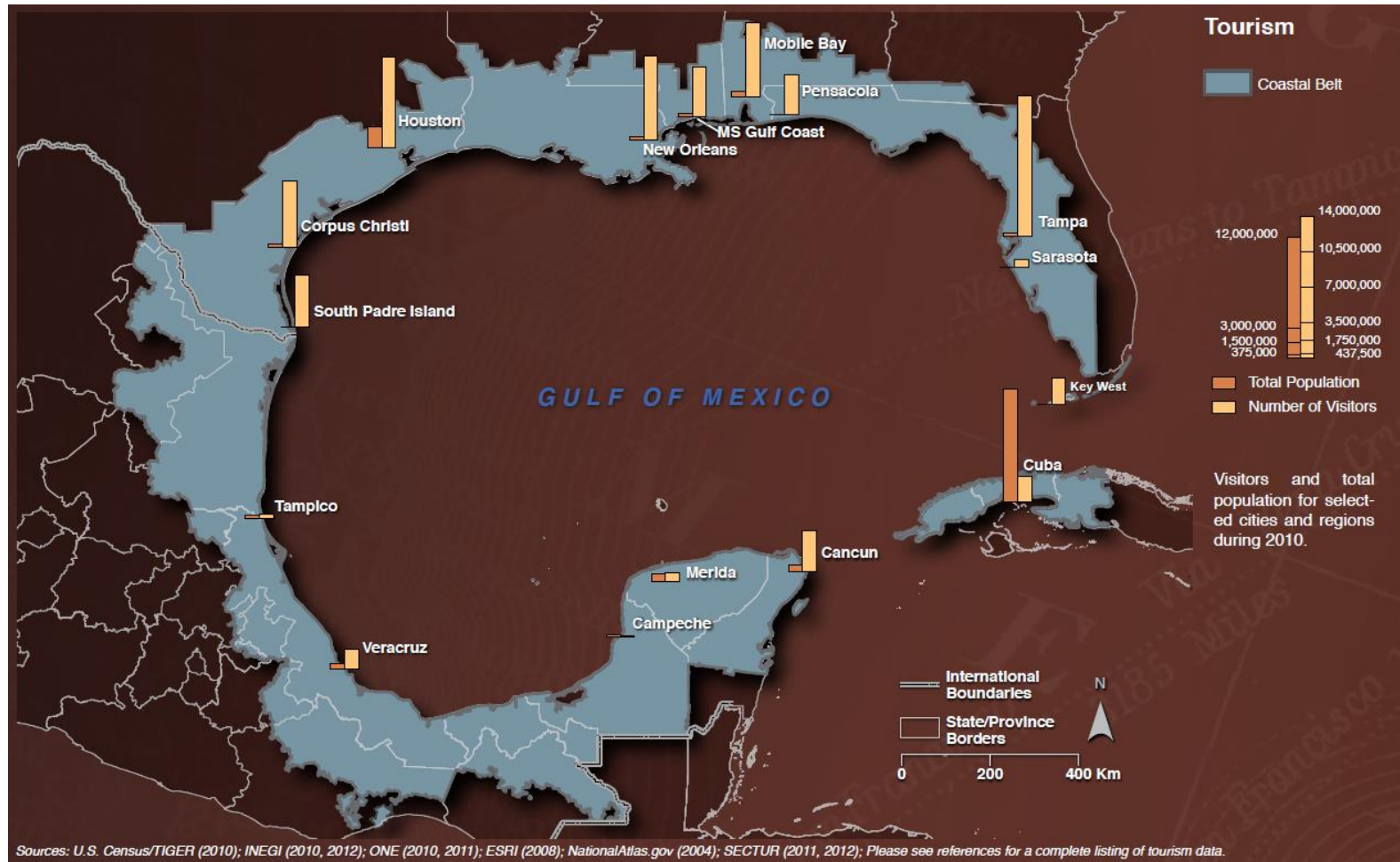


# Coastal populations are large, complex, and growing






- Already >50 million people living in coastal belt, areas of high population density. US Gulf pop expected to increase 40% from 1995-2025.
- Multiple management jurisdictions from local to international

# Tourism is big business



- Multiple tourist hotspots around Gulf, 2<sup>nd</sup> highest economic driver in region (>\$45 billion per year – US & Mexico; Cuba likely to expand)
- Visitor #'s dwarf local populations in some areas

# Tourism is big business

Gulf Coast Tourism			
United States			
	AREA	TOURISTS	UNITS (Yearly)
	Corpus Christi	6.6 Million	Yearly visitors
	Key West	2.65 Million	Includes overnight, day trippers, and cruise passengers
	Houston	9.01 Million	Includes overnight, day trippers
	Mississippi Gulf Coast	4.9 Million	Not specified
	Mobile Bay	7.3 Million	Not specified
	New Orleans	8.3 Million	Not specified
	Pensacola	3.96 Million	Overnight visitors only
	Tampa Bay	13.93 Million	Day tripper, overnight, and VFR-staying with friends and relatives
	Sarasota	756,400	Not specified
	South Padre Island	5.15 Million (2005)	Day trippers, overnights, seasonal visitors
Mexico			
	Cancun	4.04 Million	Yearly visitors
	Merida	916,214 (2009)	Yearly visitors
	Campeche (municipio)	181,033	Yearly visitors
	Veracruz	1.95 Million	Yearly visitors
	Tampico	350,000 (2005)	Yearly visitors
Cuba			
	Cuba	2.5 Million	Yearly visitors

(Year 2010 unless noted otherwise)

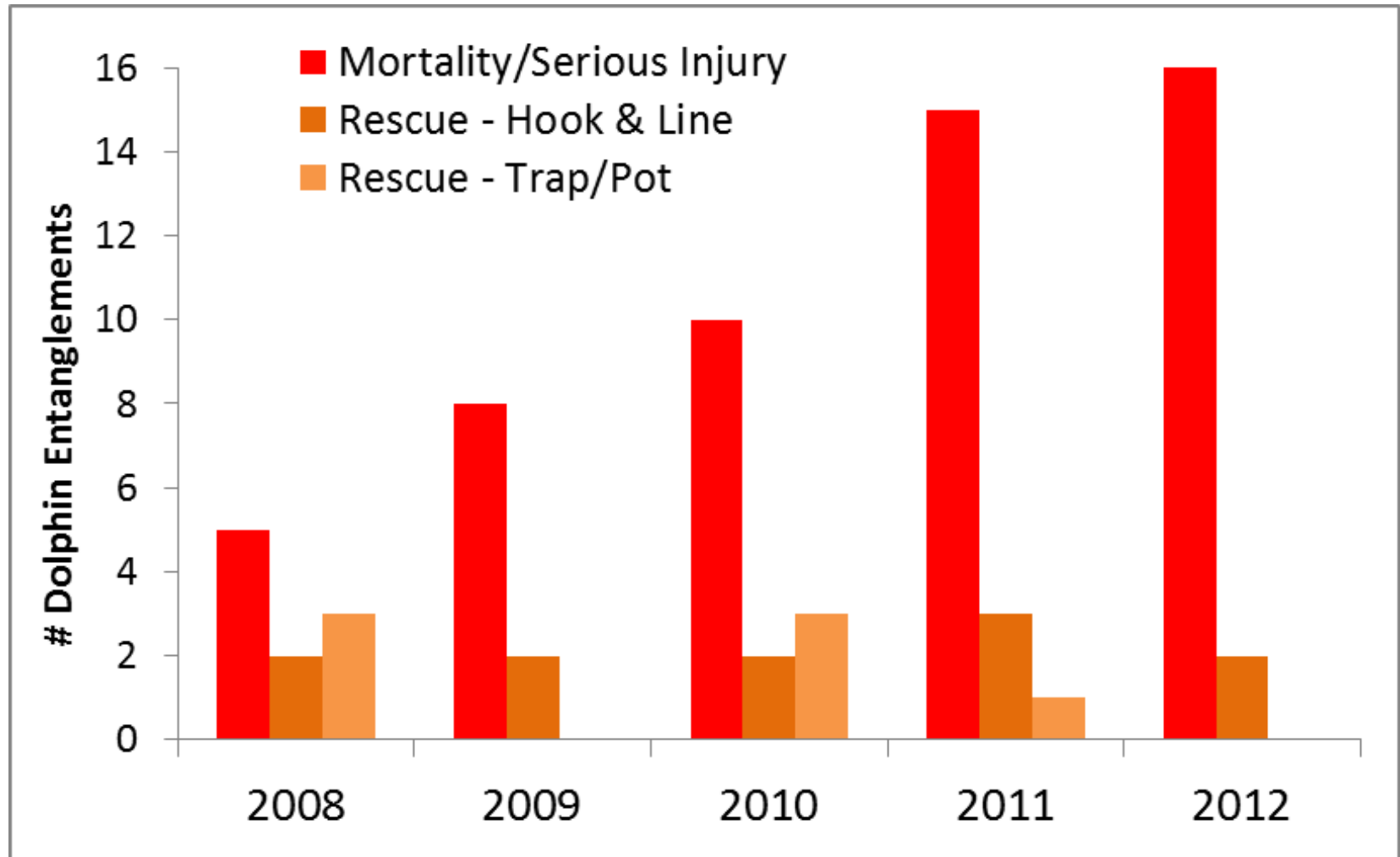


# Recreational fishing & boating are extremely popular activities

- >23 million rec fishing trips annually
  - FL alone >1 million saltwater licenses/yr
  - 47% of fish released of >173 million caught
- # registered boats in FL increased 82% from 1981-2010
  - Peak >1 million in 2007
  - Newer designs, high speed in shallow water
- Wildlife viewing increasing



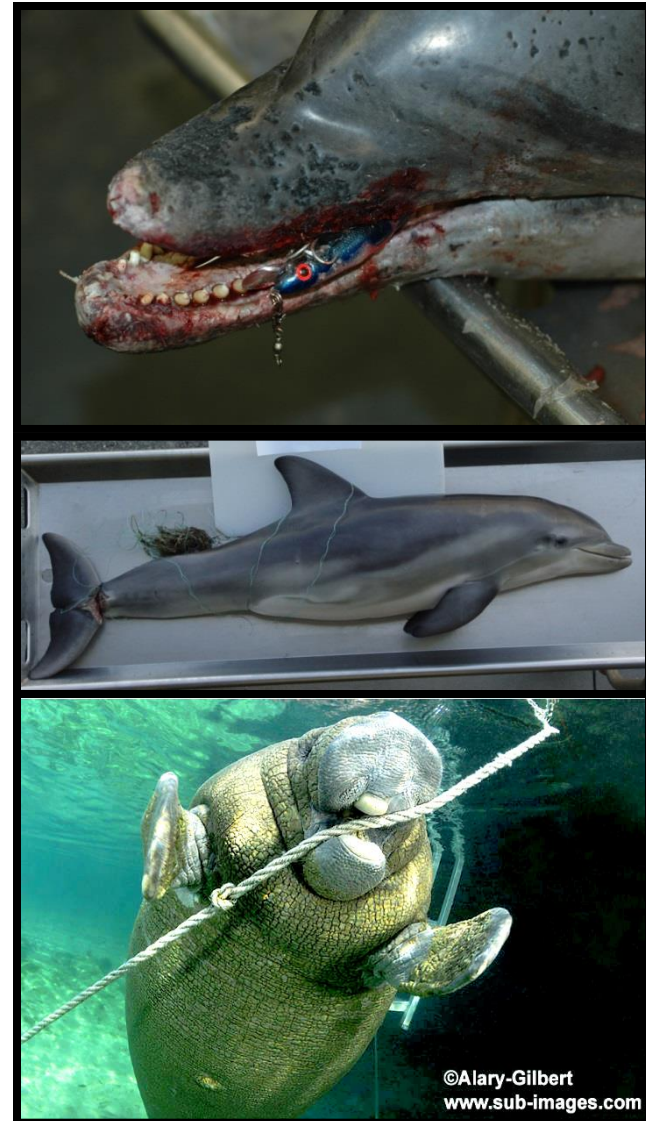
# Dolphin serious injuries & mortality



**Mortalities:** 5-15 entanglement deaths/yr (includes hook & line and trap/pot); also 15 total strandings w/ signs of boat collision. **Rescues:** ~2-5 HI/yr (majority of total)

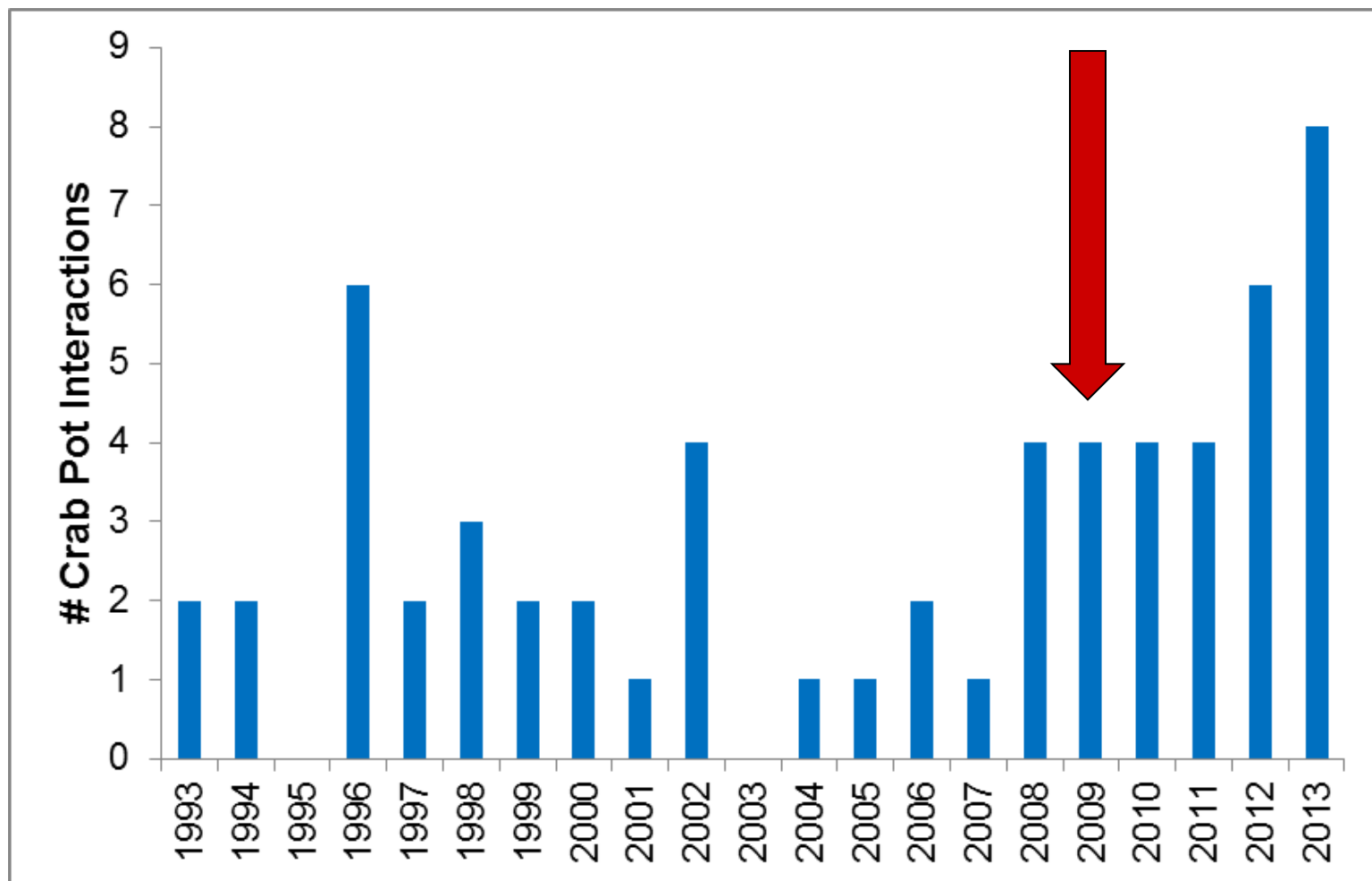
# Fishing injury trends & trap/pot gear

- Issues for both species in FL:
  - During 1997-2009, 5.5% of dolphin and 7.6% of manatee strandings
  - Proportion increasing over time on FL Gulf coast
- Primarily involve hook & line (~75%) or trap/pot (~21%) gear
- Need to understand mechanisms of entanglement and sources of gear
  - Sarasota Bay monitoring dolphin interactions with both fisheries

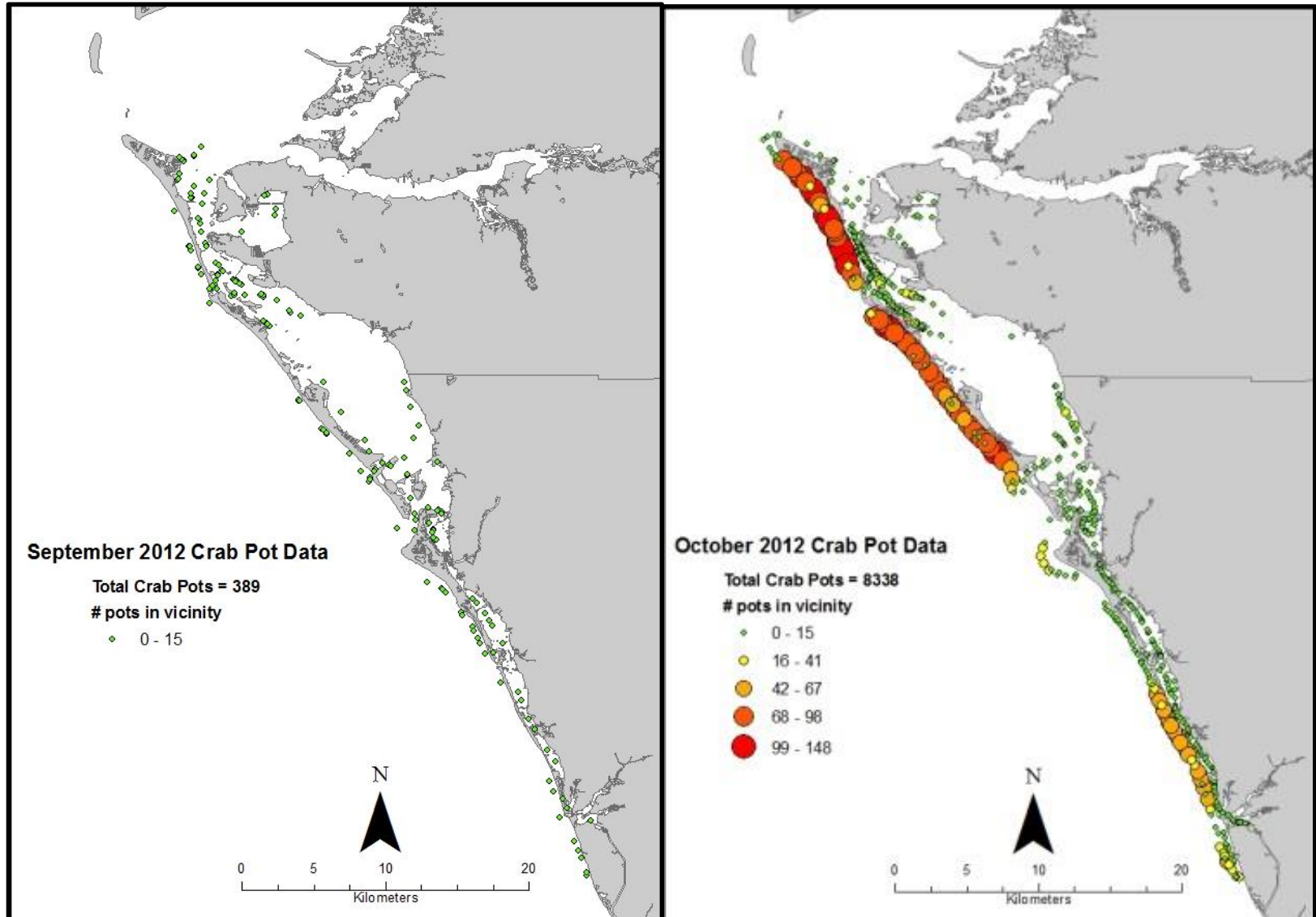




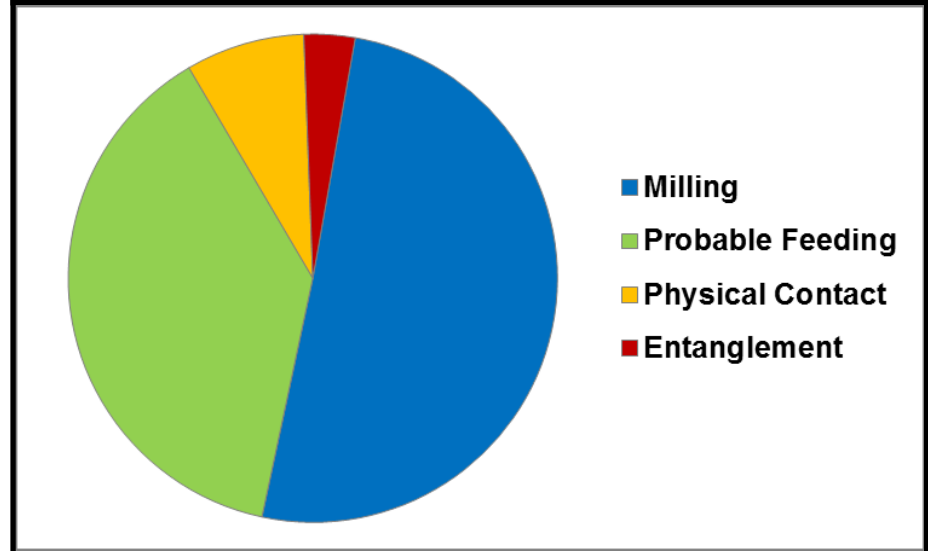
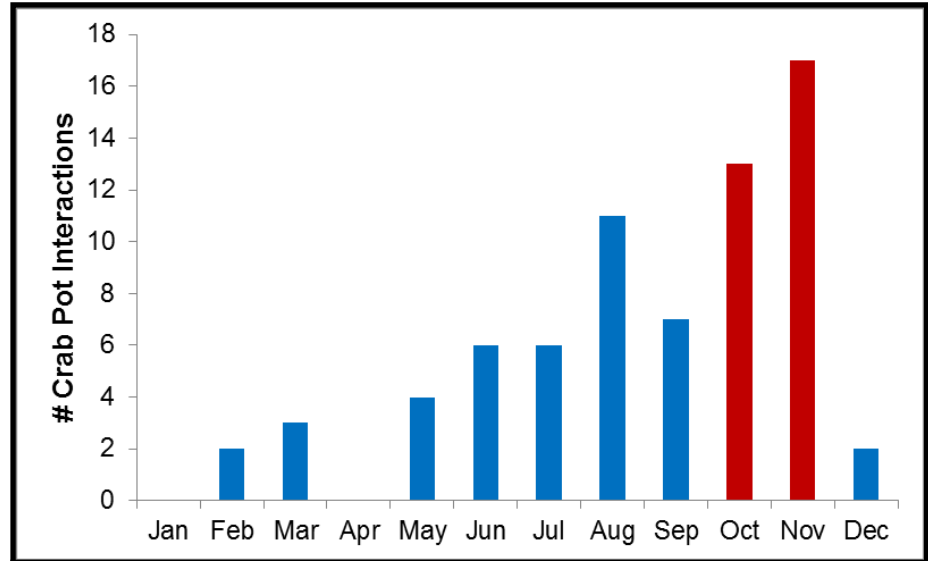
# Trap/pot interactions in Sarasota



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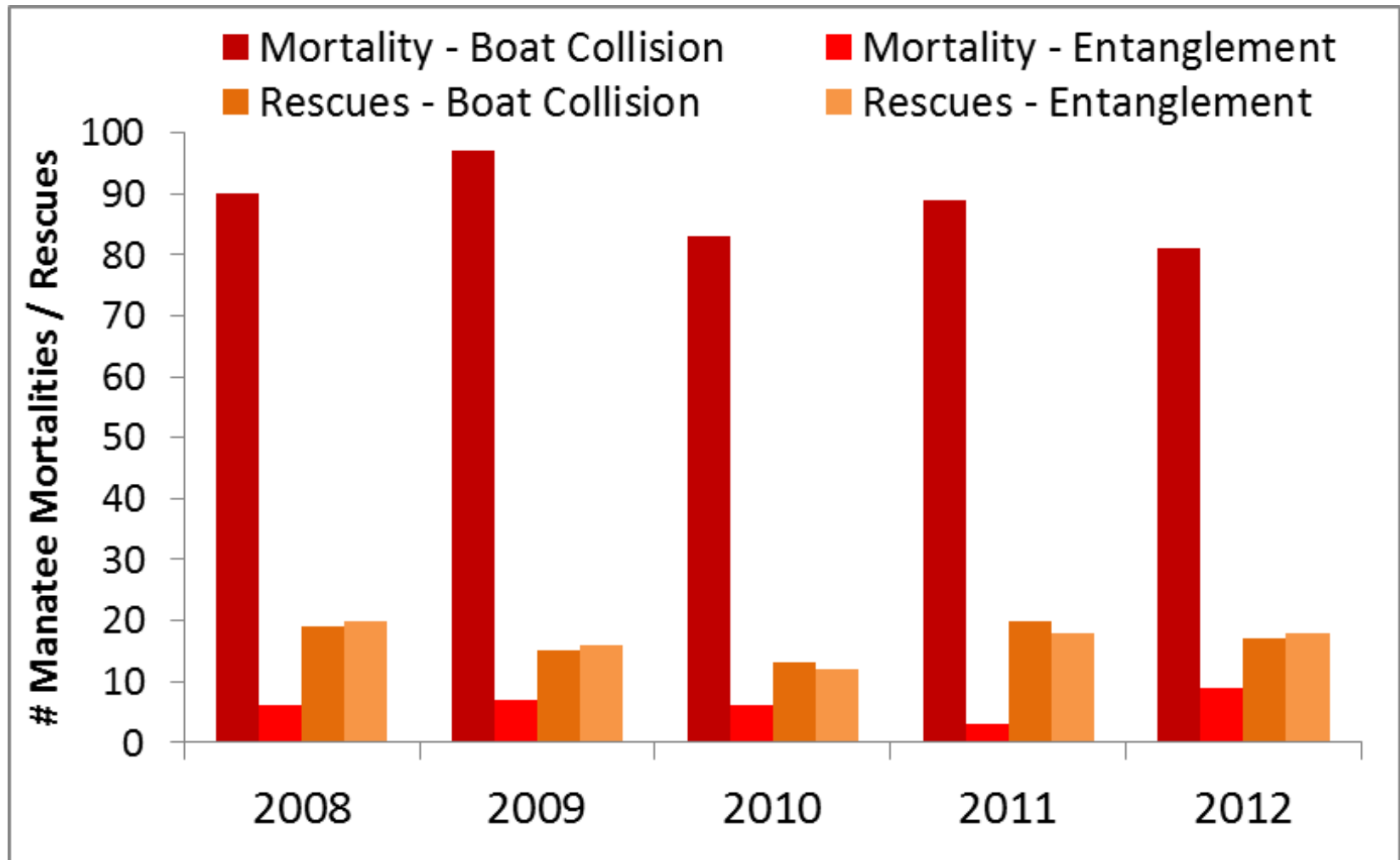


# Trap/pot interactions in Sarasota





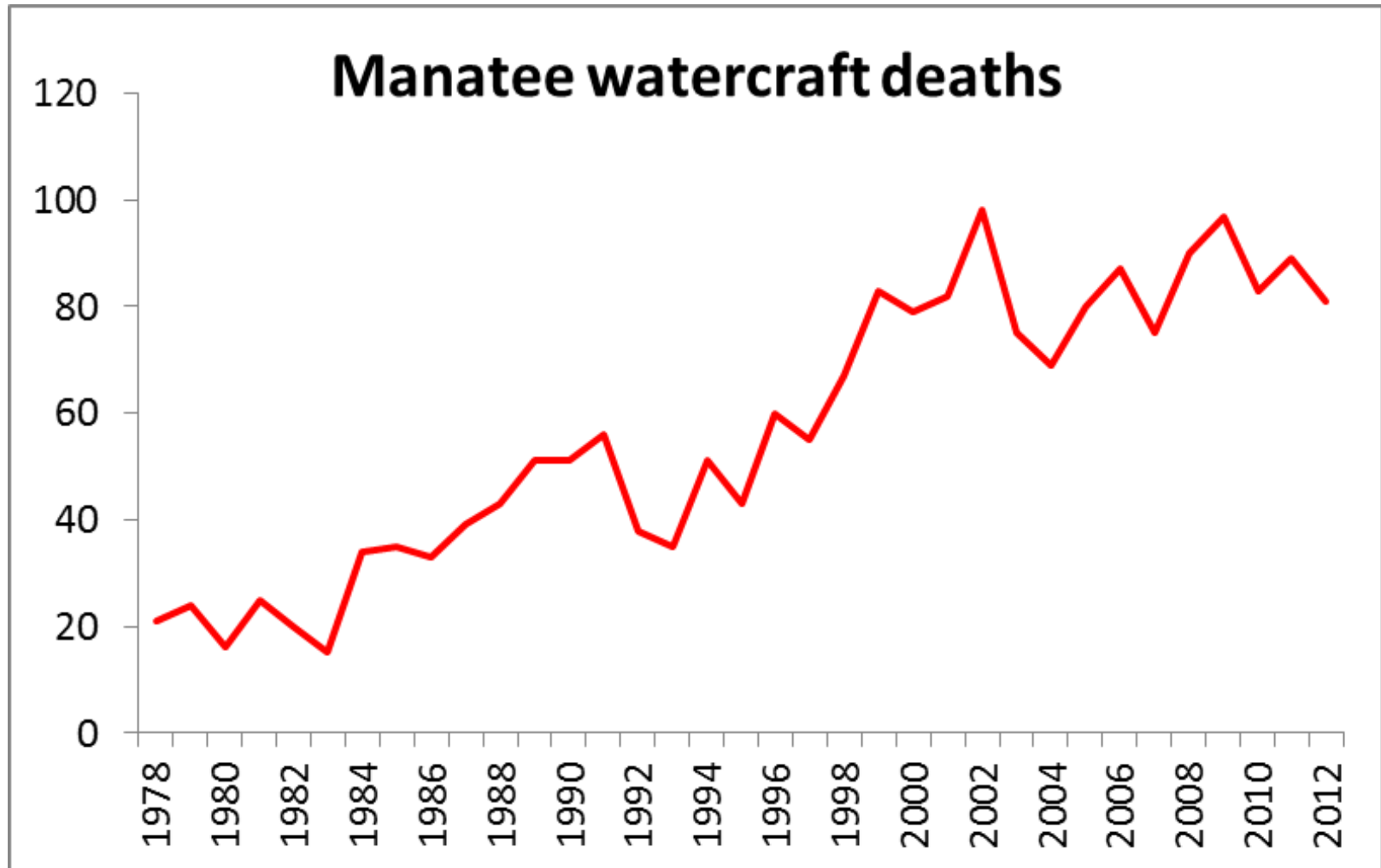
# Manatee serious injuries & mortality



**Mortalities:** 89-114 HI deaths/yr (average 25% watercraft, 2% entanglement of total)

**Rescues:** 25-39 HI interventions/yr (average 38% of total)

# Long-term mortality trends



Generally increasing over time, but rate of increase has significantly slowed with protection efforts even as # registered boats increased dramatically.

# Mitigating boat collisions: speed zones & encouraging reporting

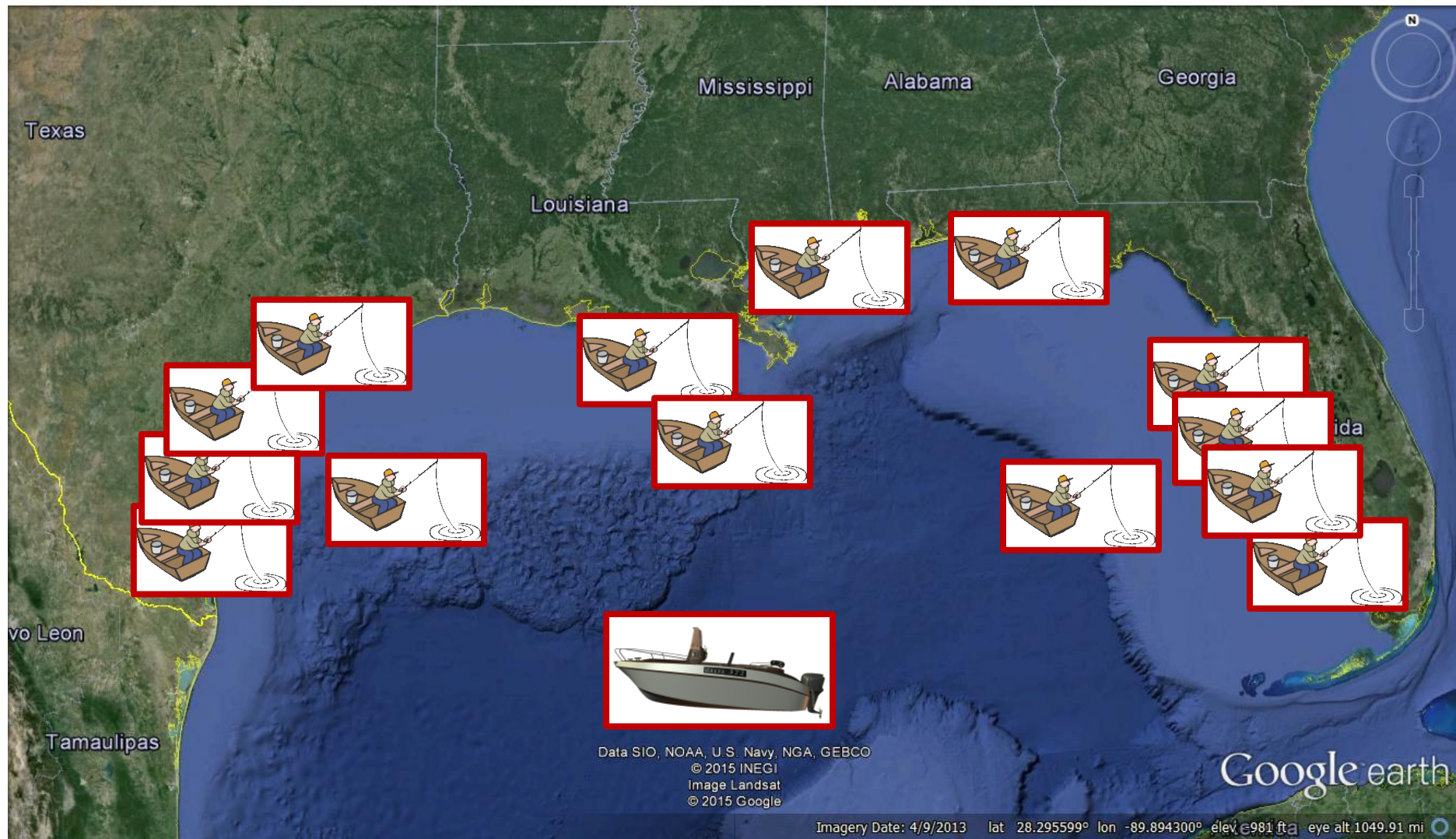


- Slower speeds reduce risks, but only partial compliance (on average 50-75%).
- Improves with enforcement presence, but not educational signage or outreach programs
- Marketing research to increase collision reporting for better understanding & injury response



# Recreational Interactions – USA

## *Injuries & Mortality*



# Research & Monitoring Activities

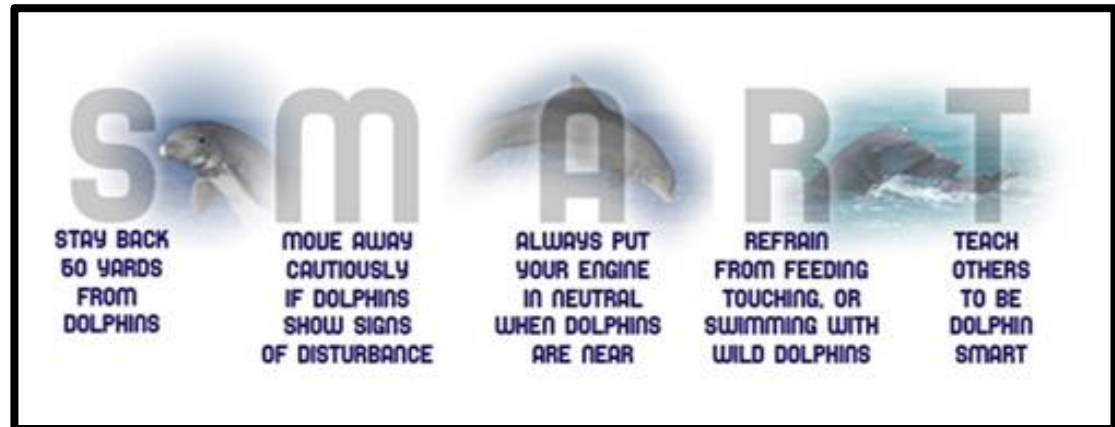
## *Observed adverse interactions*





# Current Research & Monitoring Cases

- Selected 'hotspots' and findings:
  - **Key West, FL** – dolphin tourism impacts, voluntary compliance effectiveness





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  - **Key West, FL** – dolphin tourism impacts, voluntary compliance effectiveness
  - **Panama City, FL** – pervasive feeding & swim with dolphin tourism, directed mitigation projects, human dimensions work
  - **Destin, FL & Orange Beach, AL** - characterizing and addressing recreational fishing interactions



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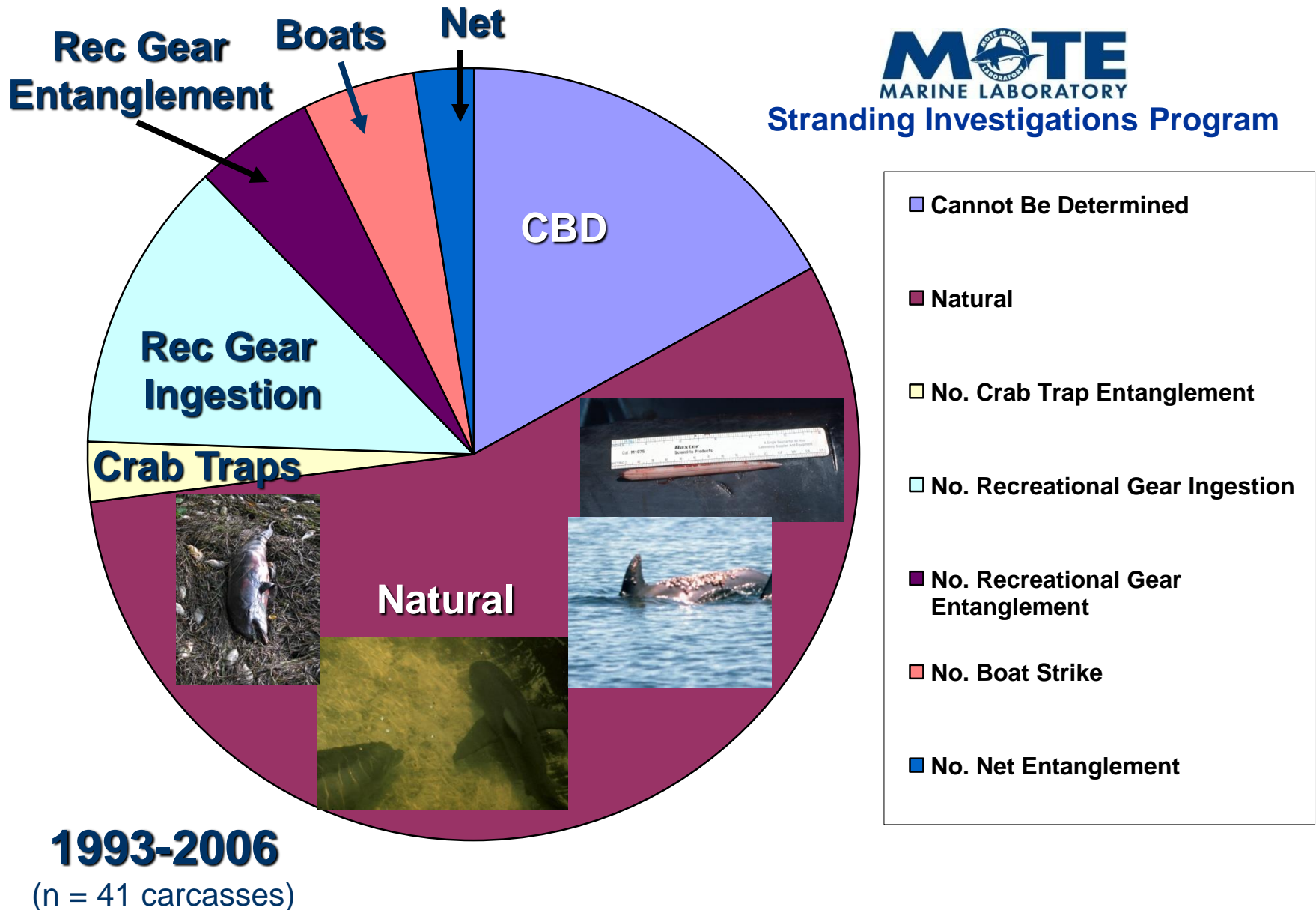
– **Crystal River, FL** – manatee tourism impacts



# Long-term studies in Sarasota Bay

- Documenting recreational injuries and mortality, effects of boat disturbance
- Investigating long-term human interaction trends and contributing factors
- Conducting mitigation experiments
- Serving as case study for population consequences of disturbance, cumulative impacts work

# Causes of death: ~25% human related



# ***Boat disturbance and collisions are a real danger***

- Both to resident dolphins and other marine wildlife
  1. >44,000 registered boats in Sarasota Bay area
  2. 5% of dolphins bear collision scars, as many as 5 observed injuries/yr
  3. Documented disturbance to group cohesion, behavior, dive and whistle patterns as boats approach
- Exploring habitat use and risk of co-occurrence for resident dolphins



**In Sarasota Bay, boats pass within 100 meters of a dolphin once every 6 minutes**

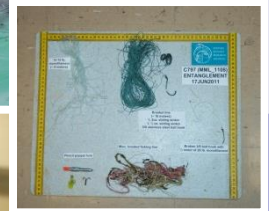


# Recreational Fishing Gear Entanglement and Ingestion

Biggest threat to local dolphins, lost 2% of Sarasota population in 2006,  
11% of population has entanglement scars



2011: Yearling C797 - died

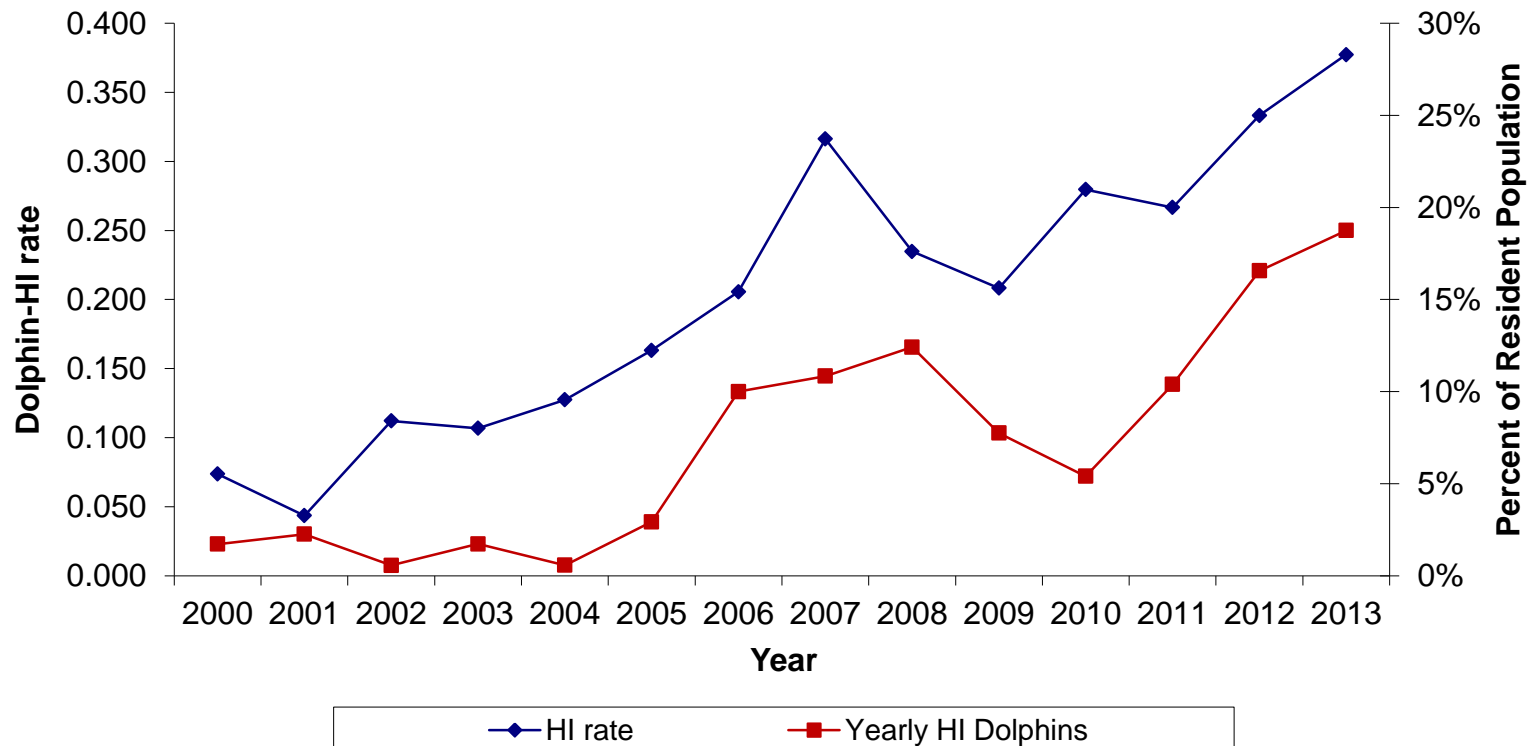


2012: 6-mo-old calf lost, too

# Long-term human interaction trends in Sarasota Bay

*Increasing rate of interaction and # of individuals involved*

Yearly standardized HI rate and Yearly HI dolphins 2000-2013



# ***Archive Development: Human Interactions***

## ***Now fully archived in FinBase***

Systematic HI observations began in 2009, with angler interactions documented starting in 2006, and begging by habituated individuals recorded prior to this. Opportunistic records of unnatural foraging & other human interactions of concern now archived back to 1970.

*\*Need for complete individual HI histories required archiving all possible HI observations to document dates of 'onset' for unnatural behaviors (first confirmed record is in 1975) and facilitate ongoing analyses of drivers of HI persistence & spread*

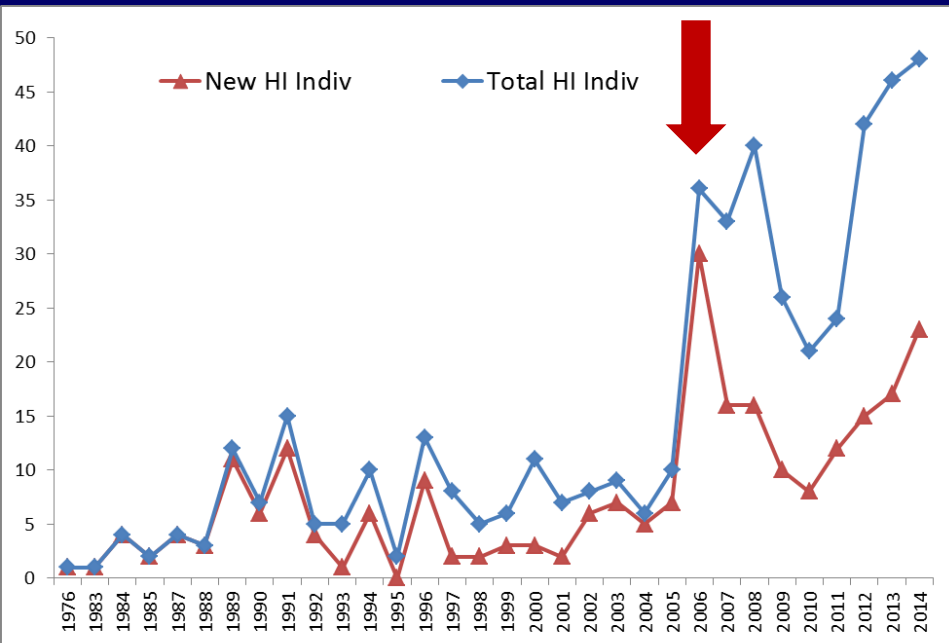
This HI archive now contains:

- Over 1,680 sightings with adverse human interactions observed
- 248 individuals with confirmed unnatural behavior (48 begin <1993)
- Complete observations, including entanglement, fixed gear interactions, and vessel harassment
- Observations tied to geographic location for hotspot/risk analyses

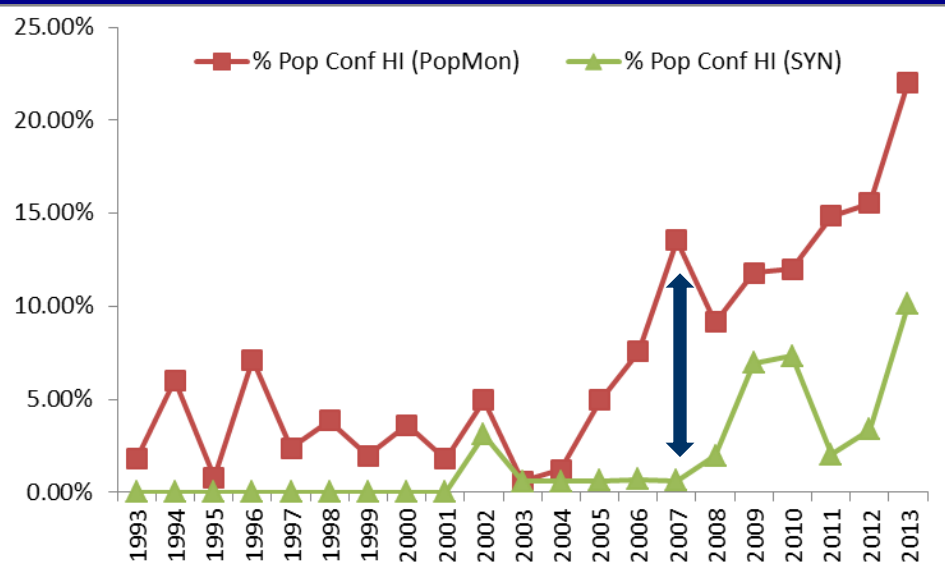
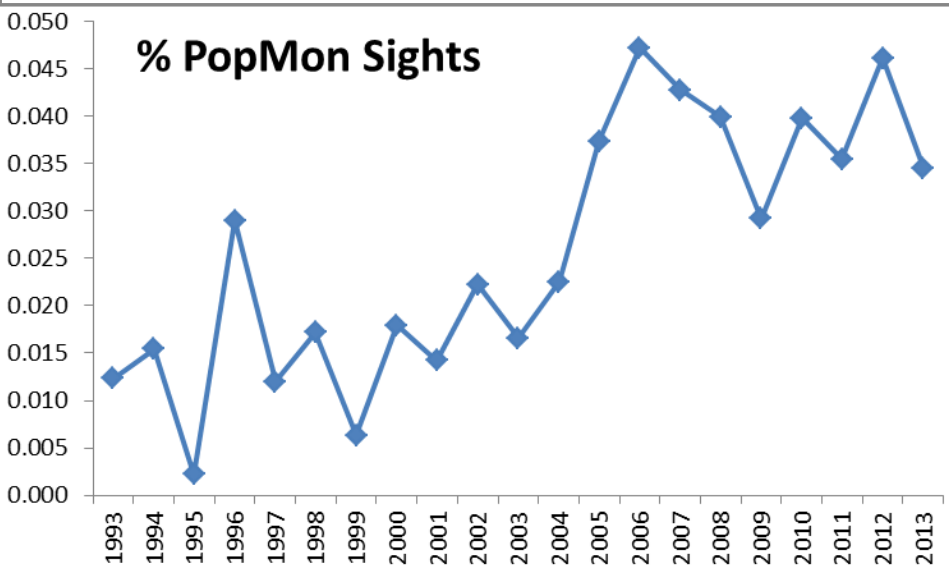




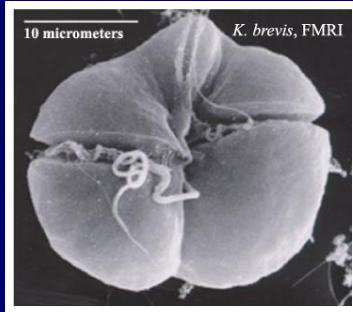
# Adverse Human Interactions Research: Long-term trends



1. Increasing problem – spike in 2006, but still new individuals involved every year
2. Substantial variability year to year
3. Incomplete picture without year-round effort and stranding program data
4. Much of resident community involved at some point

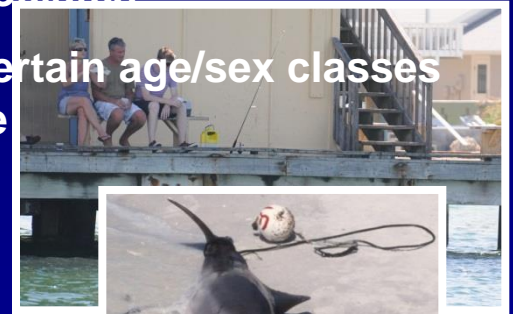
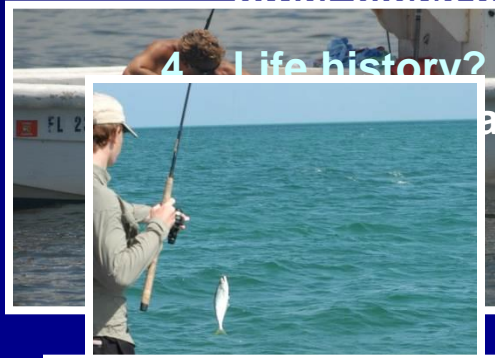


# Adverse Human Interactions Research: Drivers



1. **Need?** Natural prey availability, red tides, cold stun events
2. **Opportunity?** Human activities and sources of food
3. **Social factors?** Learn from mother or other close associates

4. **Life history?** Certain age/sex classes vulnerable



# Adverse Human Interactions Research: Social Learning





# ***Adverse Human Interactions: Consequences & Mitigation***



# ***Rescues have helped some individuals***

*But intervention not always successful, so prevention is key*

A few recent cases...plus a few more last year



Seymour

C797



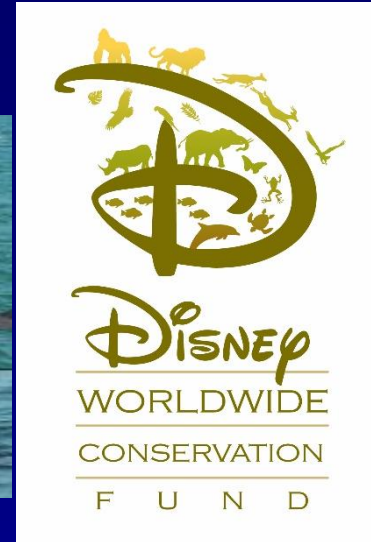
Lizzie





# Mitigation experiment

- Focused on HI hotspot near “Beggar”
  - Paired observations of dolphin and human activity under baseline and experimental conditions
- Standardized methods to control for variation
- Explored demographics of boating community
  - Likelihood of interaction and response to mitigation

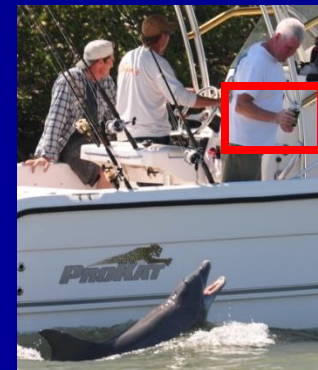




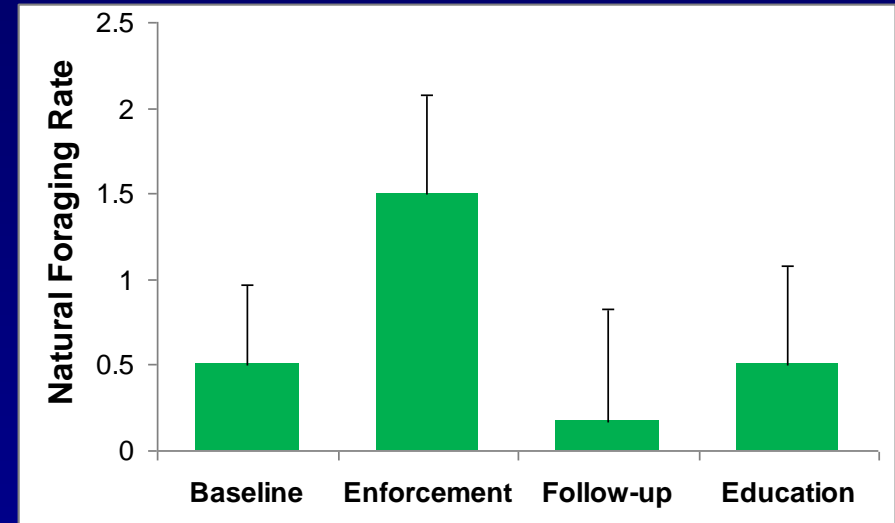
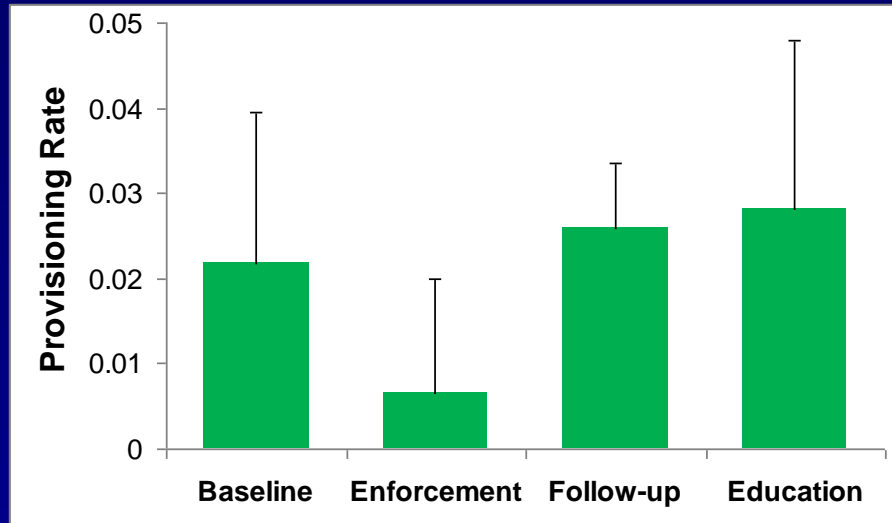
# General observations

- Busy area with frequent interactions
  - Up to 120 boats/hr
  - Up to 70 interactions/hr
  - Begging substantial portion of activity budget
- Provisioning and bites were serious issues
  - Up to 6 provisioning events/hr
  - Wide variety of items fed
  - Baseline: ~1 bite/day

<u>Interaction</u>	<u># events</u>
Begging	>1500
Attempt to attract	>1000
Provisioning	169
Attempt to touch	121
Confirmed bite	9



# *Opportunities for improvement*



- Human Behavior

- Support for effectiveness of enforcement
- Less clear benefits of educational campaign

- Dolphin Behavior

- Improvements when unnatural source of food removed from equation

# Mitigation strategies & options

- Enforcement (most effective)
- Education/Outreach
  - Many initiatives, need new approaches
- Voluntary programs encouraging 'best practices'
- Interventions to reduce mortality
  - Expensive, logistically complex, need improved reporting & capacity to respond
- Targeted regulation/management action
  - E.g. protected areas, speed zones, permits
- Technological solutions, gear modification





# Education & Outreach

- Mind your “Manatee Manners”
- Don’t Feed Wild Dolphins
- Stow it Don’t Throw It
- Dolphin SMART
- Cast with Care/DFF tips



To report feeding or harassment of wild dolphins, call the NOAA Fisheries Southeast Enforcement Division at: 1-800-853-1964.

To report an injured or entangled dolphin, or other wildlife, call the Florida Fish and Wildlife Conservation Commission at: 1-888-404-FWCC (3922).

For more information on fishing line recycling and bin locations, please visit: [www.fishinglinerecycling.org](http://www.fishinglinerecycling.org)

For more information on dolphins and interactions with anglers, please visit: [www.mote.org](http://www.mote.org) or [www.sarasotadolphin.org](http://www.sarasotadolphin.org)



# Priorities for future

- Characterizing true scope and nature of interactions as well as driving factors throughout Gulf
- Understanding long-term and cumulative impacts of repeated sub-lethal interactions
- Increasing interdisciplinary human dimensions work
- Supporting enforcement and interventions (*while evaluating effectiveness of current measures and developing improved mitigation options*)
- **Taking a collaborative approach!**

# Thanks!

A serene sunset scene over a calm body of water. The sun is low on the horizon, casting a warm, golden glow across the sky and reflecting on the water's surface. In the foreground, the silhouette of a boat with a raised platform and a motor is visible, positioned on the right side of the frame. The overall atmosphere is peaceful and contemplative.

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