

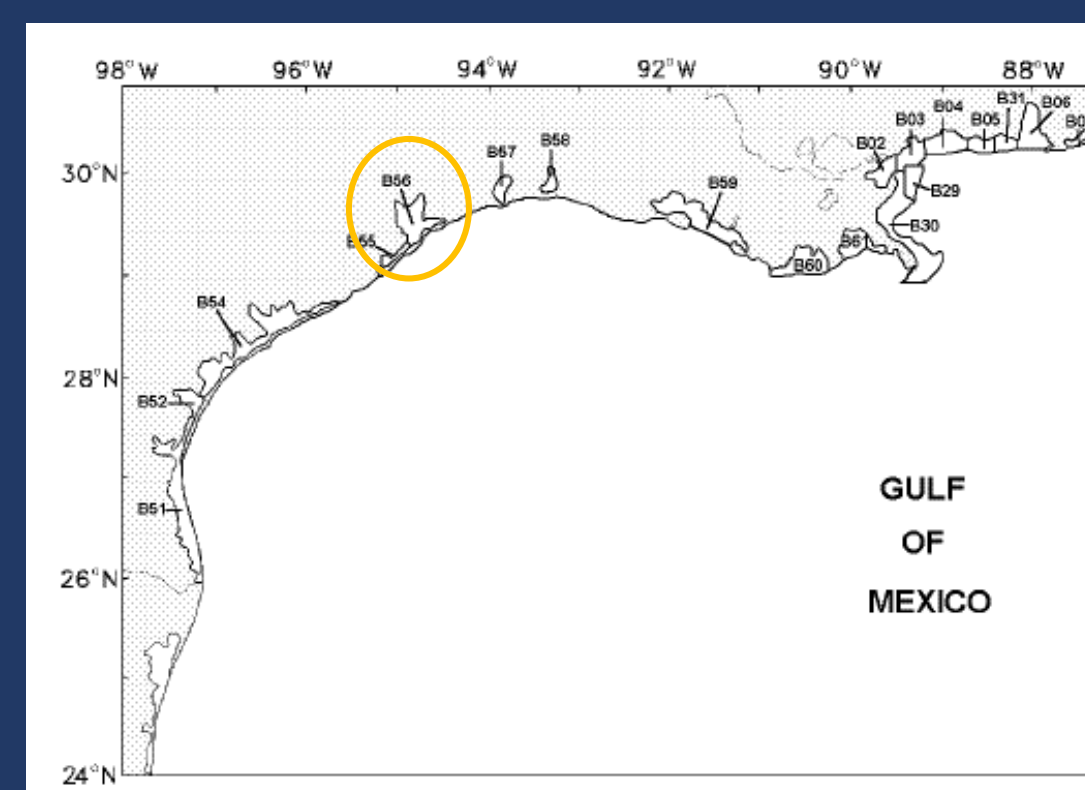
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Texas' Estuarine Bottlenose Dolphins: Addressing Knowledge Gaps in Galveston Bay

BACKGROUND

Critical data gaps exist for all Texas bay, sound and estuary bottlenose dolphin (*Tursiops truncatus*) stocks. The **Texas Bottlenose Dolphins Research Collaborative (TBDR)** aims to address these deficiencies.

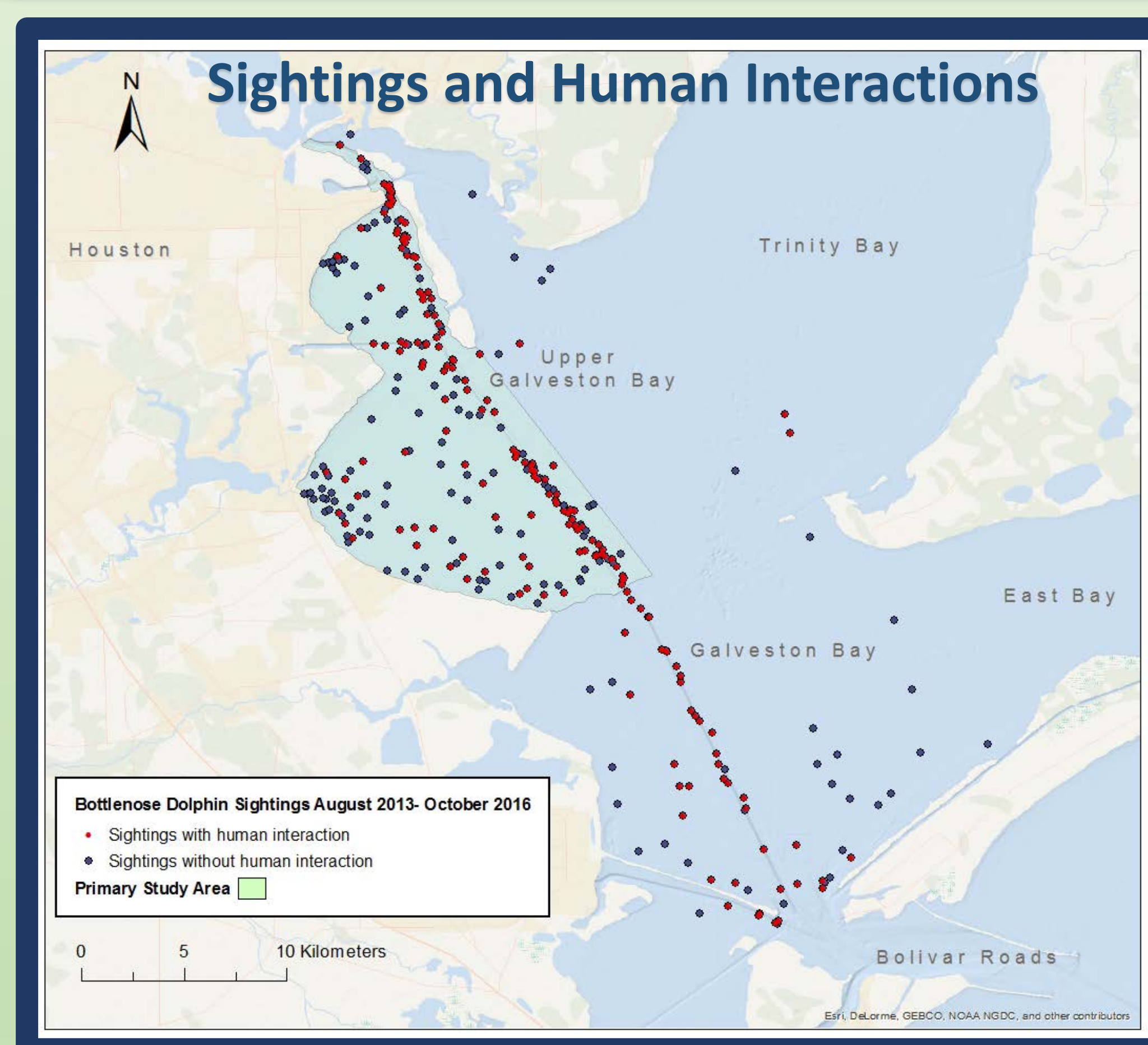
The **Galveston Bay Dolphin Research and Conservation Program (GDRCP)**, a partnership between the Environmental Institute of Houston—UHCL and the Galveston Bay Foundation, is part of the TBDR and addresses gaps in Galveston Bay, TX.



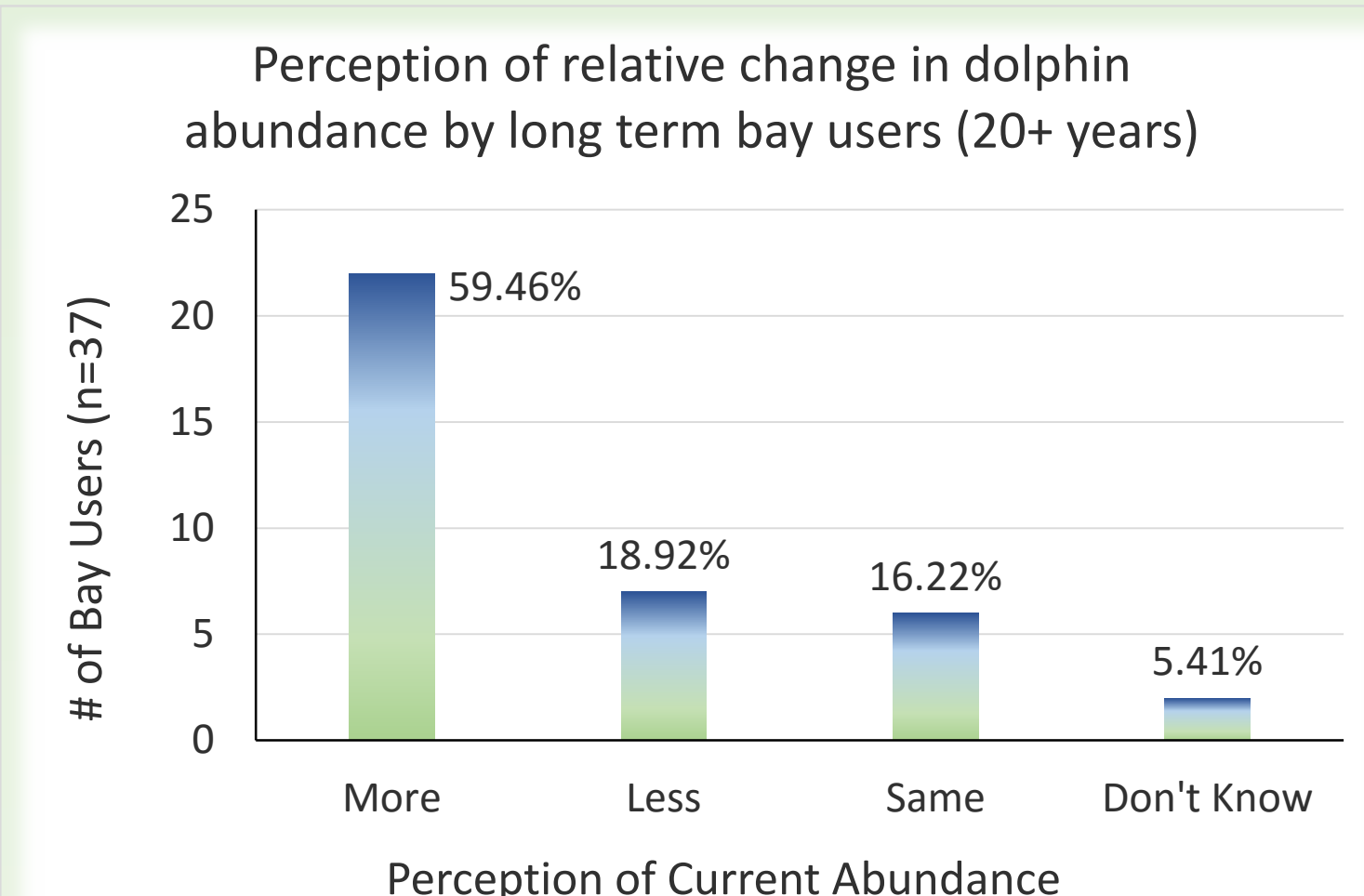
From the 1980's to early 2000's, studies of bottlenose dolphins in Galveston Bay (GB) (largely conducted by Texas A&M University MMBL) found:

- High concentrations of dolphins near the entrance to GB and lower concentrations in GB and East Bay
- A decrease in abundance moving north into the bay and little or no activity in upper GB and Trinity Bay regions^{1,2,3}

Recent surveys suggest an increase in dolphin activity in upper GB.

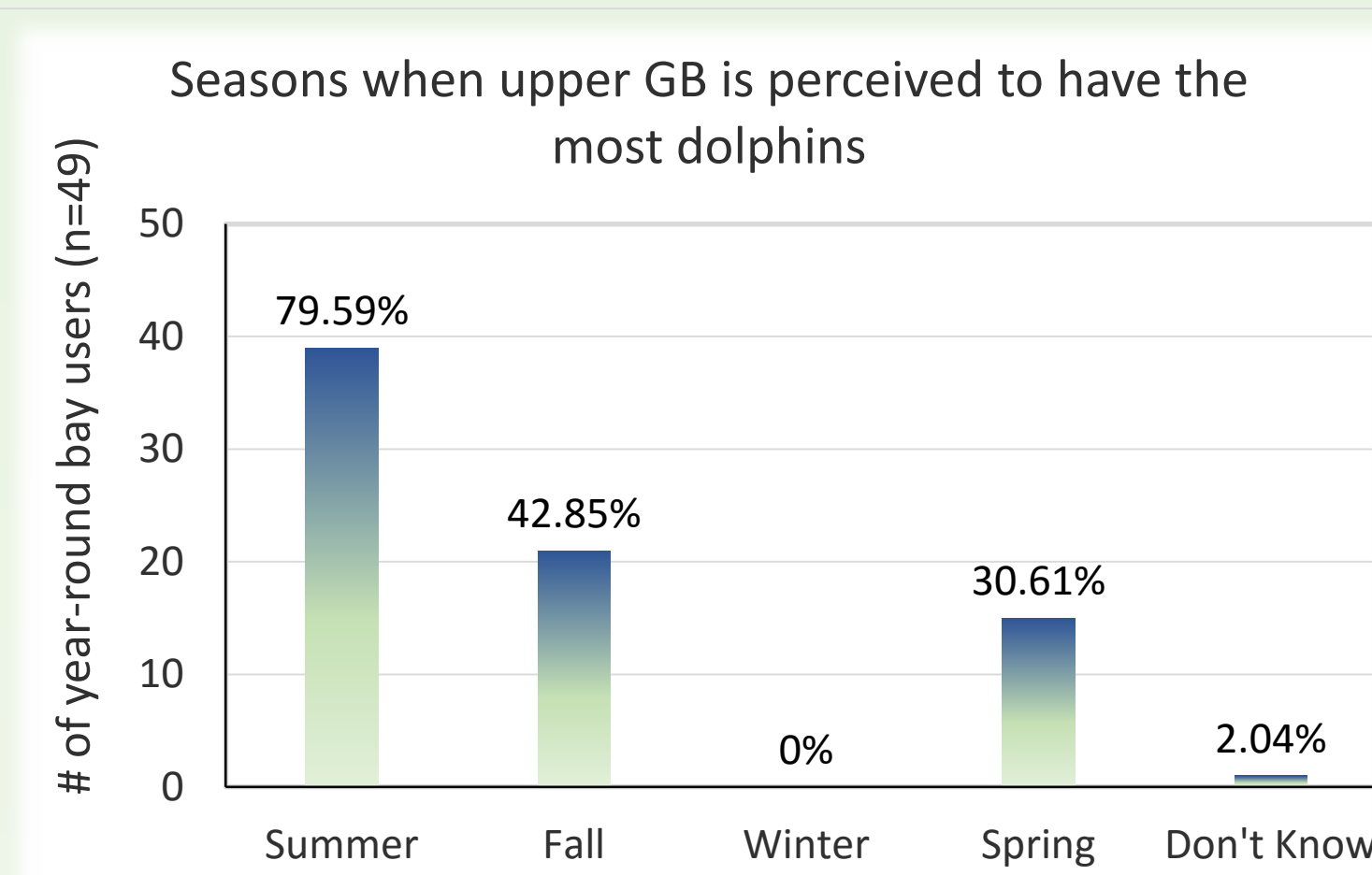


How do long-term bay-users perceive dolphin activity in upper GB?



95 bay users completed a 34-question online survey.

59% (n=13) of long-term users that indicated that there are now more dolphins in upper GB, explained that the improved health of Galveston Bay (i.e., better water quality, less pollution) and/or increase in food sources explains the increase.



65.33% (n=49) of year-round current users of upper GB indicated that dolphin abundance changes with time of year.

Over 80% (n=78) of participants indicated that they believe dolphins are an important animal in GB. 41.03% (n=32) stated that dolphins play an important role in the ecosystem and 30.77% (n=24) believe dolphins are good indicators of the health of the bay.

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Where and when are dolphins found in upper GB?

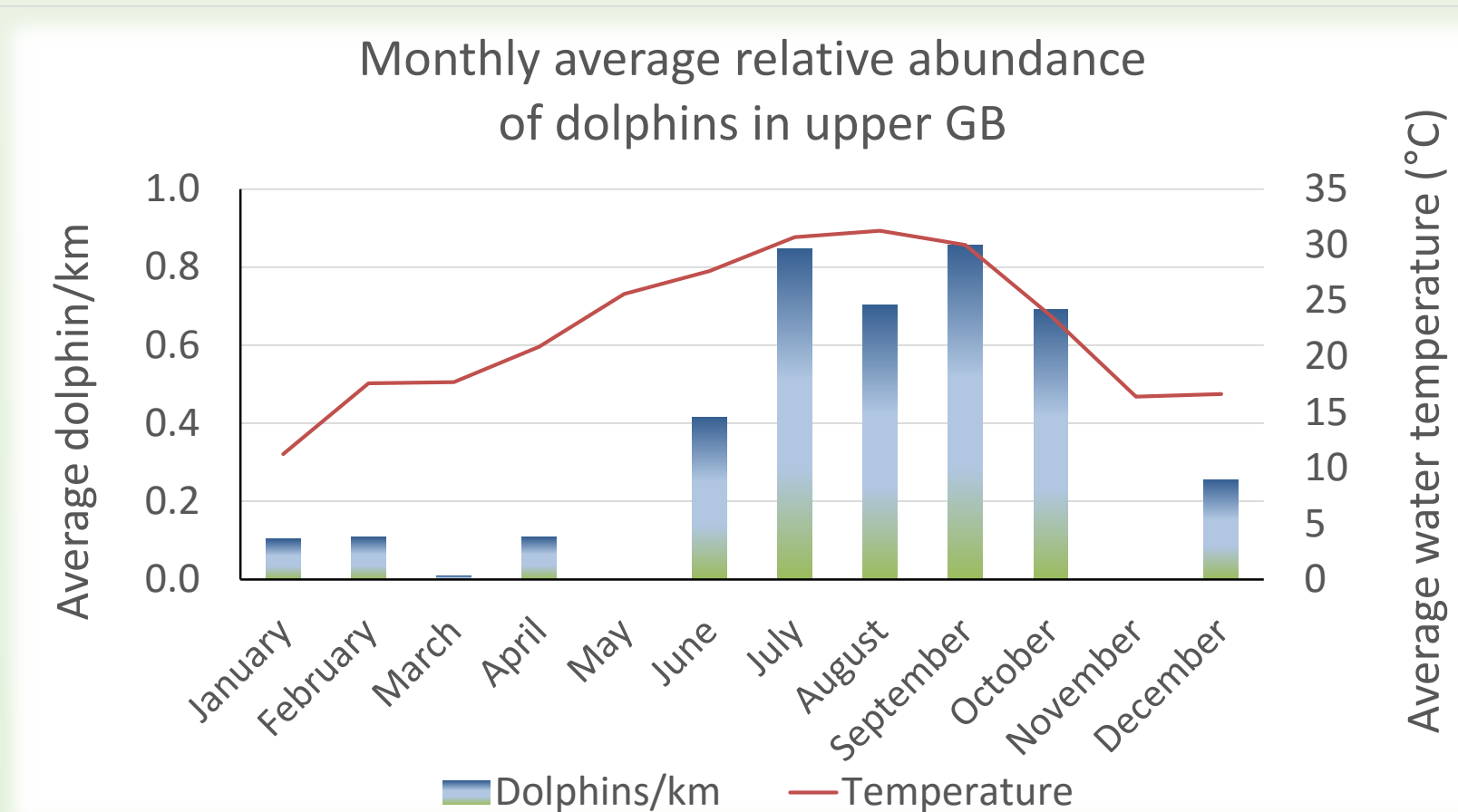
We conducted 55 photo-identification surveys focused on upper GB from August 2013 to October 2016 (213 group sightings, 1676 dolphins), plus an additional 37 biopsy collection and exploratory surveys. A total of 425 distinct individuals were identified (total catalog marked proportion = 0.786): 69% sighted more than once and 33% sighted 4 or more times.



Individual dolphins are identified using naturally occurring nicks and notches on their dorsal fins

Dolphins were sighted year round in GB but there was a significant difference in relative abundance (# dolphins sighted/km surveyed) in upper GB between seasons (Warm = May-October; Cool = November – April).

Higher concentrations sighted in warmer months (Md= 0.584) compared to the cool months (Md = 0.023) (Mann-Whitney U = 83, nW=30, nC=17, P<<.001, one-tailed)



How are dolphins interacting with humans in GB?

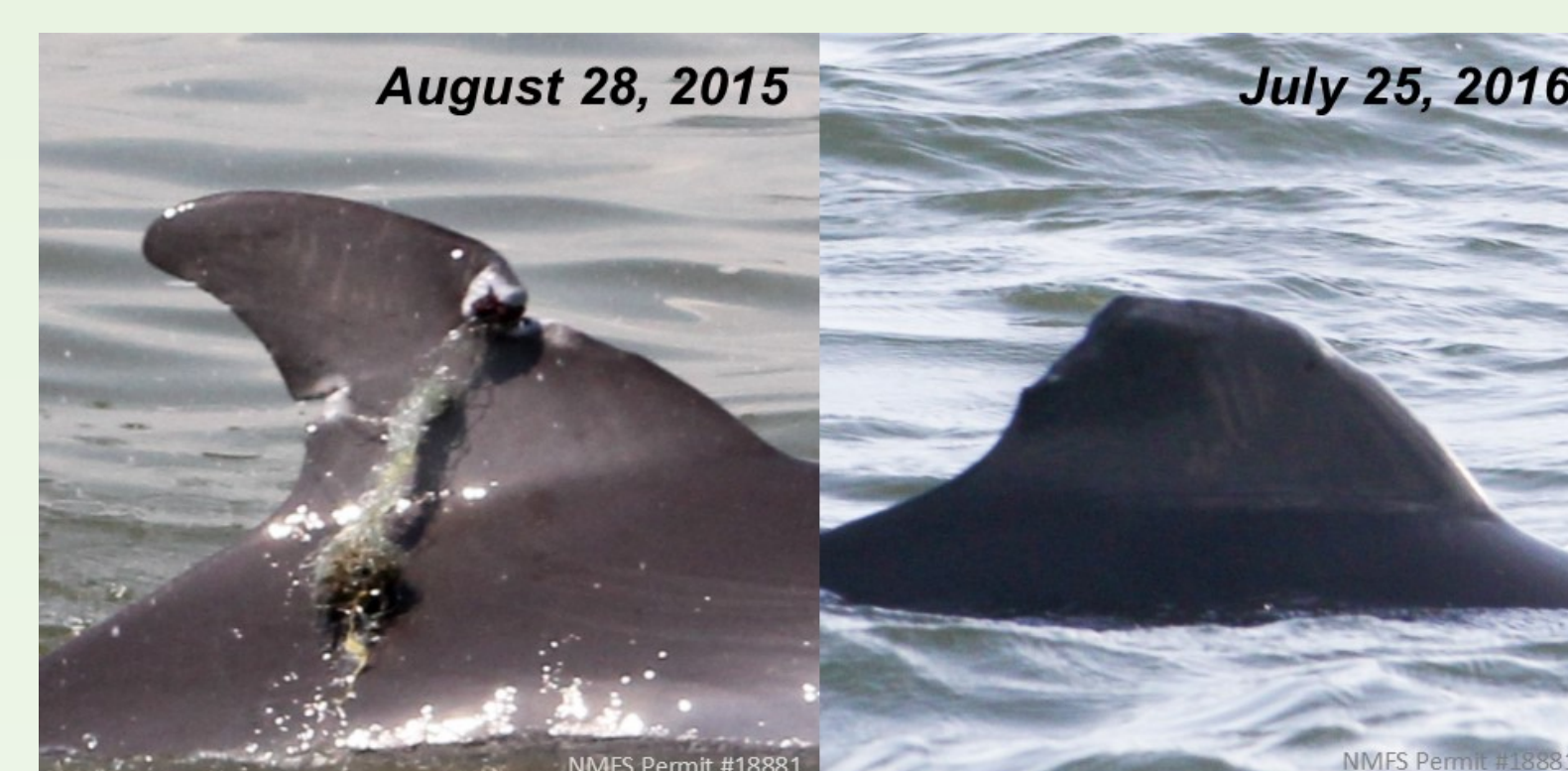
Association with a vessel was observed in over 50% of sightings.



34% of groups sighted patrolling around shrimp boats



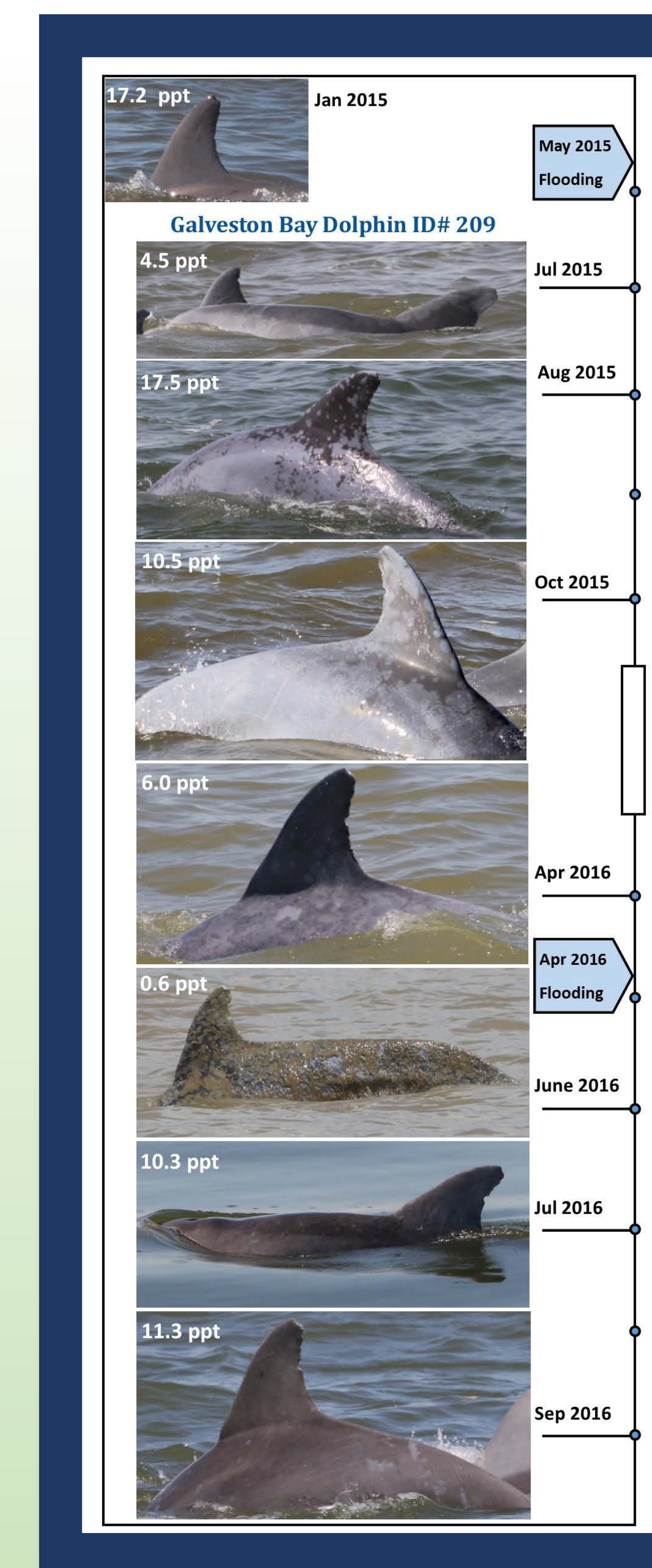
23% of groups sighted bow-riding on a vessel



Continuous observation of individuals facilitates the monitoring of the effects of human-dolphin interactions.

Literature Cited

- Moreno, M.P.T., *Environmental Predictors of Bottlenose Dolphin Distribution and Core Feeding Densities in Galveston Bay, Texas*. 2005, Texas A&M University. Ph.D. Dissertation.
- Henningens, T. 1991. *The distribution and ecology of bottlenose dolphin (Tursiops truncatus) in Galveston, Texas*. Thesis from the Faculty of Mathematics and Natural Sciences of the University of Kiel, 79 pages
- Blaylock, R. A. and W. Hoggard (1994). "Preliminary estimates of bottlenose dolphin abundance in southern US Atlantic and Gulf of Mexico continental shelf waters." NOAA Tech. Memo. NMFS-SEFSC 356(10)



Skin lesions as a result of low salinity?

2015 and 2016 were particularly wet years in GB with major spring floods. After the May 2015 event, we began seeing skin lesions on many individuals.

The image to the left displays a timeline of the manifestation of skin lesions on dolphin #209. The surface salinity at the sighting location is displayed in the upper left-hand corner.

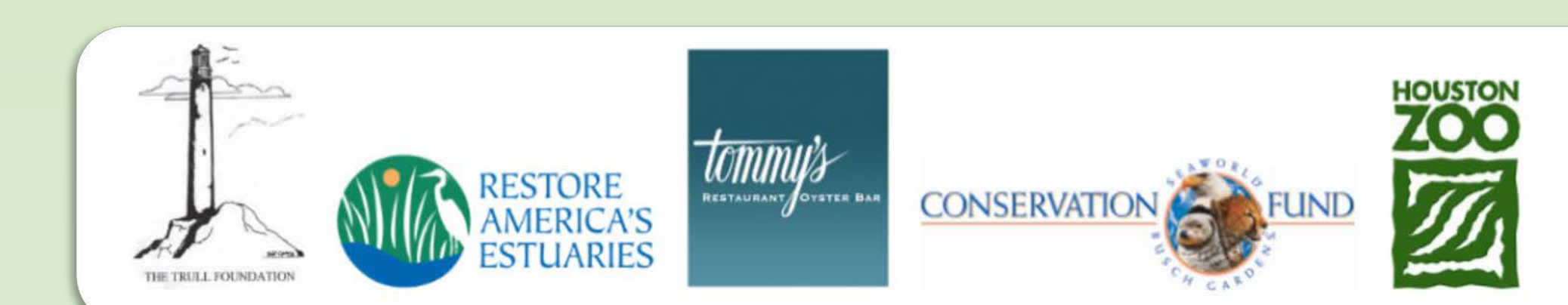
CONCLUSIONS

Dolphins utilize upper GB, a region previously thought to have little or no dolphin activity, with an apparent increase in abundance in this region over the last 20 years. There is an increase in relative abundance during warm months. Dolphins often associate with shrimp trawlers and vessels in the Houston Ship Channel. More investigation is needed due to the high risk environment. Bottlenose dolphins are a good candidate to be a flagship species for Galveston Bay.

FUTURE RESEARCH

- Quantify site fidelity and determine proportion of residents & transients
- Expand study area to regularly include other portions of GB
- Compare the GDRCP fin catalog to others along the coast to look at larger-scale movement patterns and habitat use
- Collaborate with other scientists along coast to evaluate prevalence and factors affecting skin lesions
- Continue current biopsy efforts to collect tissues for examination of persistent organic pollutants, stable isotopes, and genetic markers.

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Texas Bottlenose Dolphin Research Collaborative



Learn more about the Galveston Bay Dolphin Research and Conservation Program at www.galvbay.org/dolphin

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