

Catch and Release: Large whale entanglements and response to mitigate the threat

National Marine Sanctuaries
Webinar Series
July 10, 2019



Ed Lyman

Hawaiian Islands Humpback Whale National
Marine Sanctuary

NOAA Fisheries' Marine Mammal Health and
Stranding Response Program

Moore/ NOAA MMHSRP (permit # 18786-

Hawaiian Islands Humpback Whale

NATIONAL MARINE SANCTUARY



- Five separate protected areas
- From shoreline to depth of 100 fathoms (600 feet)
- 1,370 square miles of federal and state waters



Sanctuary Boundary

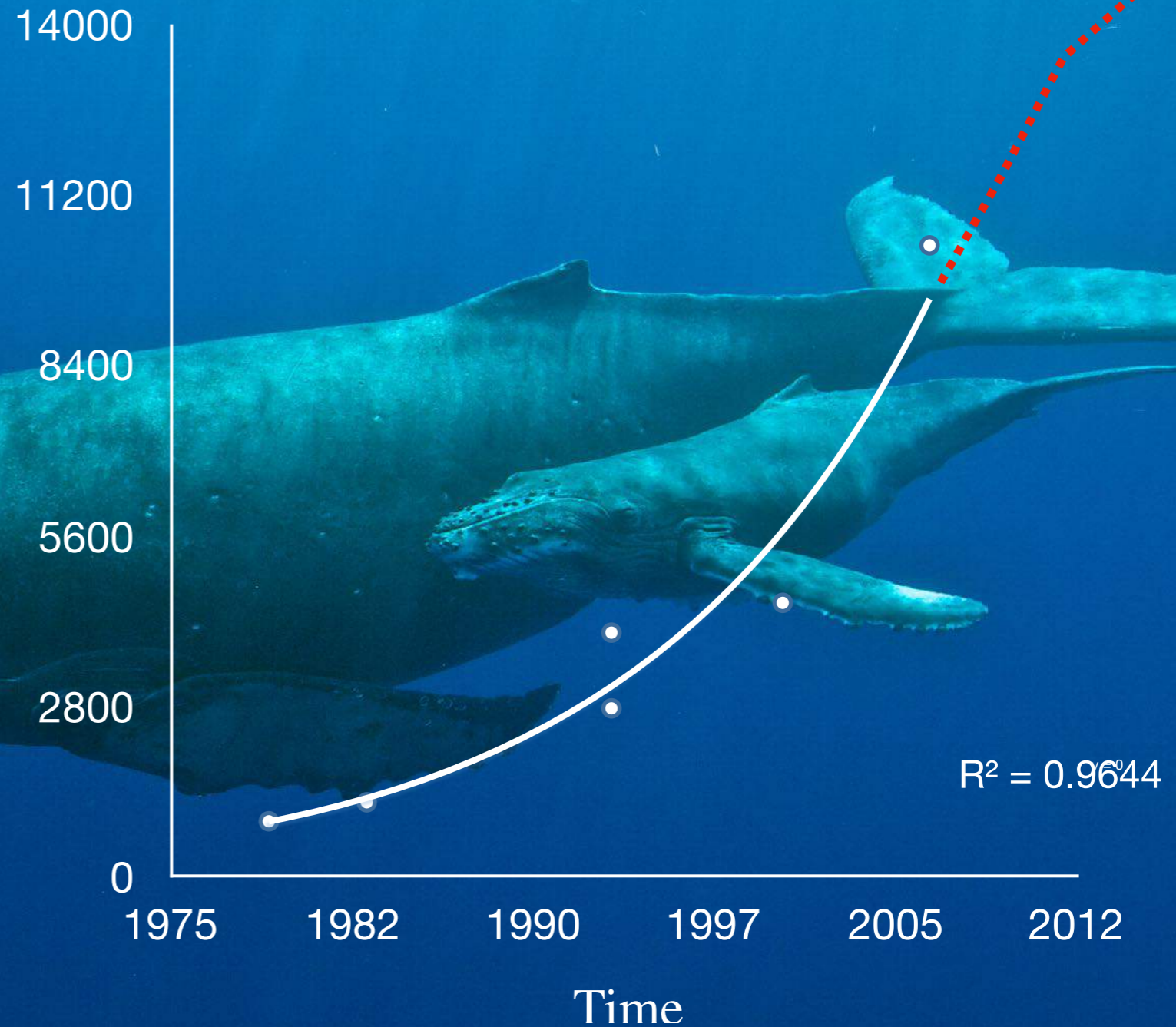
0 50 100 Kilometers

0 50 100 Miles



Special Place: Primary breeding/ calving ground for the North Pacific humpback whales

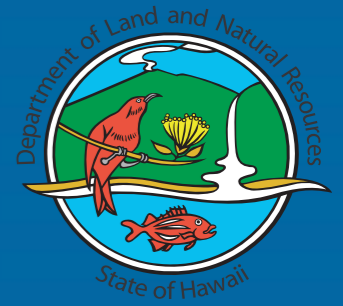
- > 50% of humpback whales in North Pacific use Hawaii
- Population has generally increased and in 2016 taken off Endangered Species List (i.e. delisted)
- Entanglement remains a risk for these and other humpback whales, as well as, many other species



NOAA Permit #15240



What we want to cover



- **Background on threat**
- **Goals/ objectives**
- **How to cut a 40-ton, free-swimming whale free (catch and release)**
- **Review case histories as examples of technology used and information gained**
- **Our accomplishments and some examples of mitigating measures**
- **Summary**

With a focus on Hawaii and humpback whales



Entanglement Threat



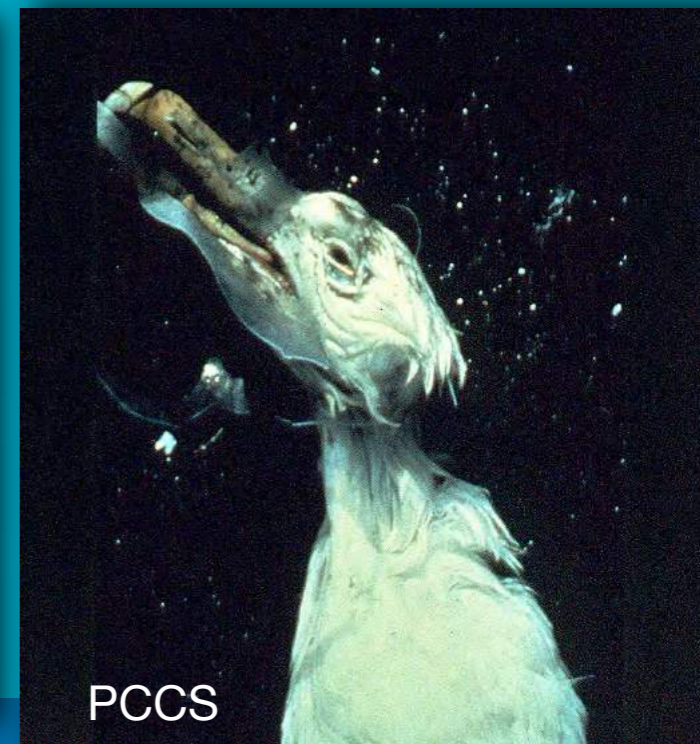
- Global issue
- Many species impacted
- Involves a variety of gear/
not just fishing gear
- Tend to know more about
impact for smaller species



PCCS



G. Freitag



PCCS



Impacts for large whales: Individual level



- Physical trauma
- Deterioration of health
- Chronic/ systemic infections
- Associated factors (ship-strike)
- Starvation
- Drowning





Impacts: Population level



- Estimated world-wide mortality for cetaceans at 308,000/yr (Read *et al*, 2006)
- Considered one of largest “anthropogenic” threats
- Humpback whales represent 66.0% of large whale entanglement cases reported in US over the last decade (HIHWNMS and NMFS data)



North Atlantic Right Whales



- For some species may be having a significant impact on population
- Population estimated at ~ 400 animals
- Scar rates upwards of 87%
- Overlap of animals with gear - urban whale..
- Three reports this last week of entangled right whales

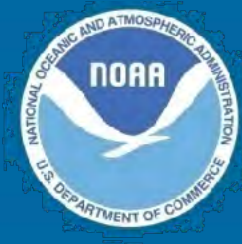


Courtesy of PCCS

**Impact typically not immediate
Threat remains, but have some time
and as a result**

Buys us time to free them





Can be difficult and dangerous

They very likely do not realize you are there to help them



Photo: Mark Ferrari, CWS/ NOAA MMHSRP (#932-1489)



National Large Whale Entanglement Response Program



- Responsibility of NOAA Fisheries Office of Protected Resources
- Authorized via ESA/MMMPA permit issued to the Marine Mammal Health and Stranding Response Program (Permit # 18786-03)
- Based on a set of criteria involving experience, training, availability, resources and conditions



Flip Nicklin



Why respond?

Value of entanglement response



Manage risk under NOAA Fisheries' Office of Protected Resources Marine Mammal Health and Stranding Response Program

- **Increase awareness**
- **Public safety**
- **Release some large whales from life threatening entanglements**
- **Gather information towards reducing threat**



Challenges in gaining information



- Small sample size
 - Big needles in a big haystack
 - Opportunistic reporting
 - Challenges of identifying gear and source
 - Cases likely removed in time and space
- Risk
 - Big ocean
 - Big animals
 - Mobile



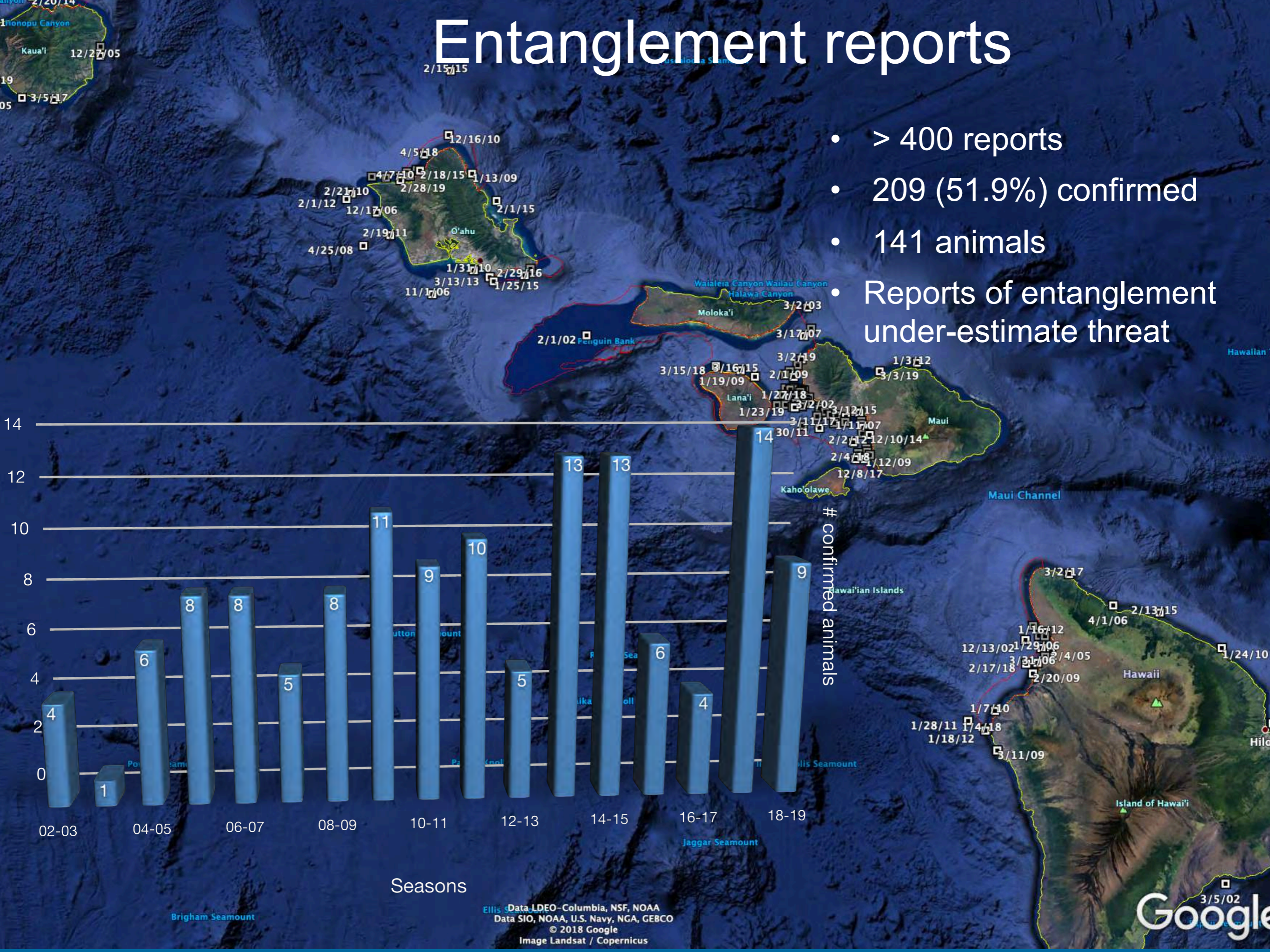
Advantages of Hawaii's clear, warm, protected waters, and aloha spirit towards large whale entanglement response

- Increases scope of effort (unique/ more comprehensive)
- May act as a filter (temporal/ spatial filter)
- Increases operational safety (clear, warm, calm seas)
- Increases assessment (animal, entanglement, behavior)
- Aloha spirit (increases assistance and support)

February 7, 2007, Humpback whale off Upolu Pt.

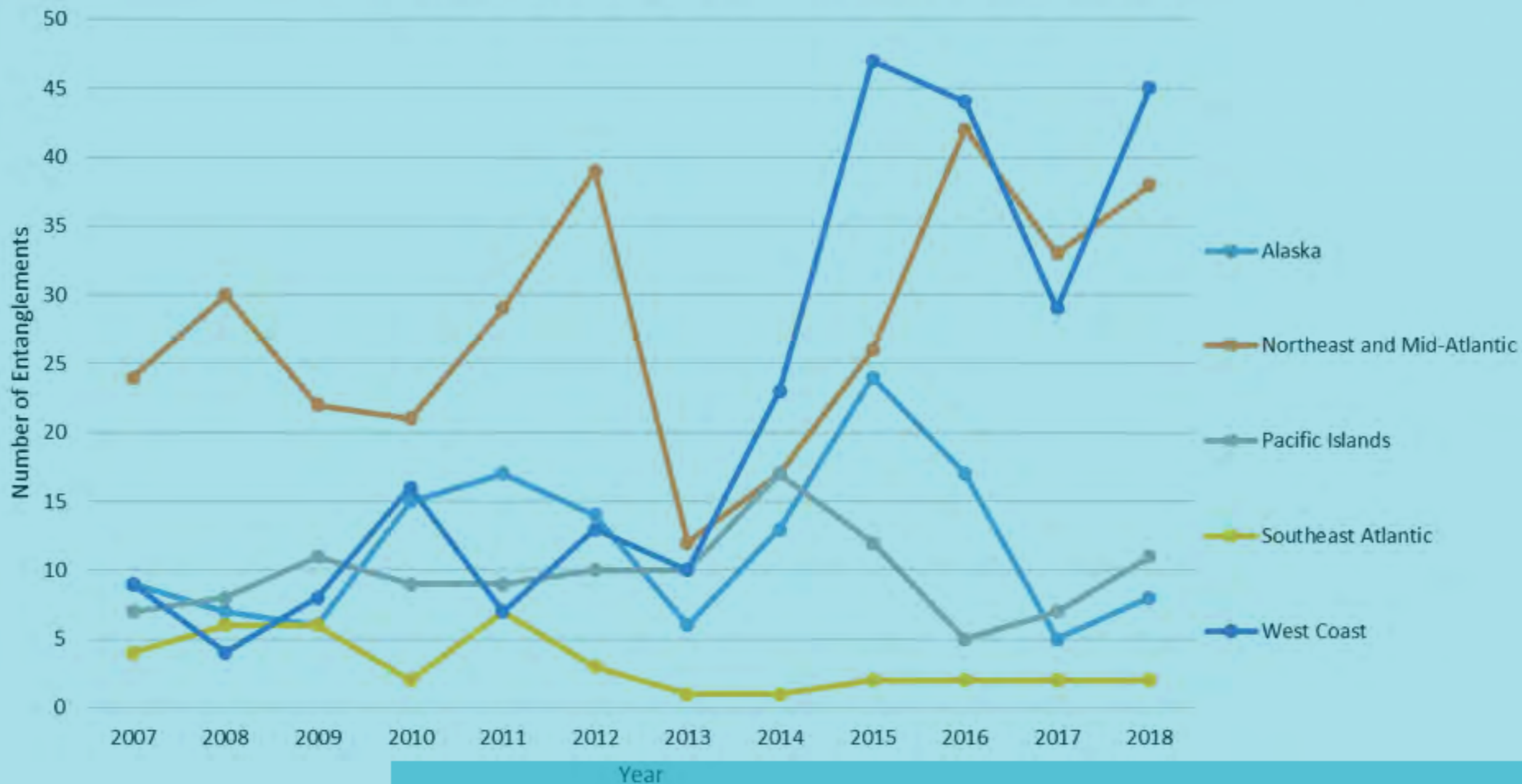
Entanglement reports

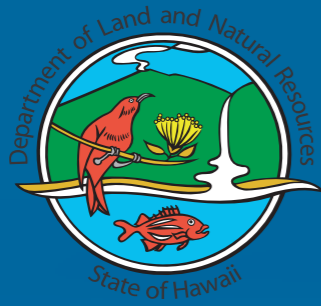
- > 400 reports
- 209 (51.9%) confirmed
- 141 animals
- Reports of entanglement under-estimate threat





Confirmed Large Whale Entanglements Nationwide (2007 - 2018)





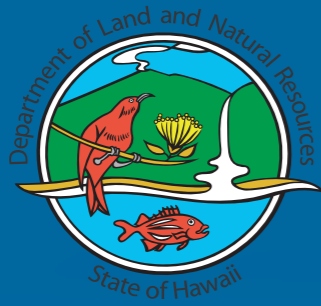
Scar analysis

Hawaii: 2013 - 2019



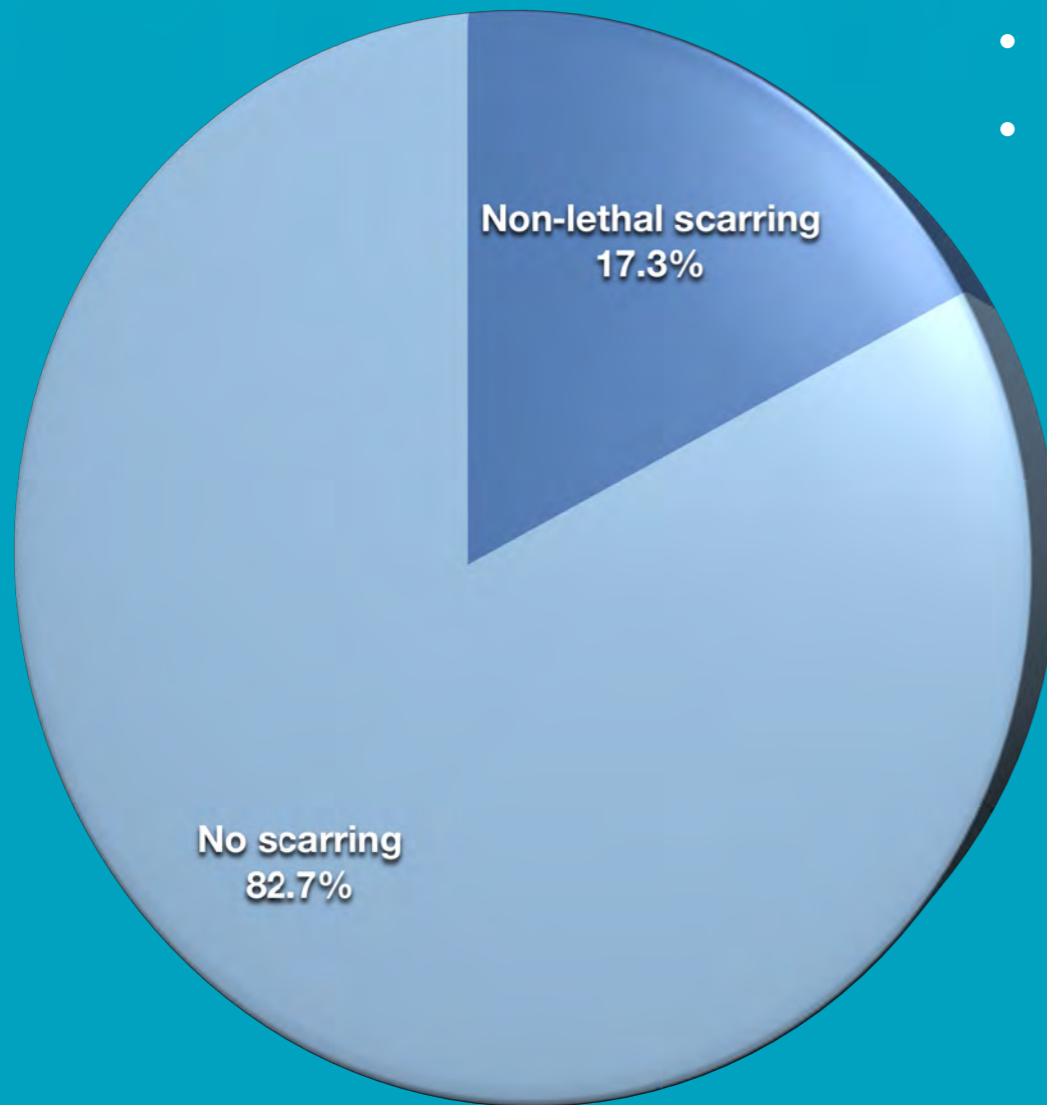
- Entanglement threat pervasive
- Percentage scarred generally between 30 to 70%
- Many more animals entangled than sightings would suggest. In Gulf of Maine fewer than 10% reported
- Many animals throw gear on their own given time





Scar analysis

Hawaii: 2013 - 2019



- Hawaii scar rates range from 16.3% - 33.8%
- This season's average scar rate is 17.3%

**But how do you free a 40-ton,
45-foot, likely free-swimming
whale that likely doesn't realize
you are there to help it ?**



Kegging: Modification of a historic whaling technique (Gone Fishing)

- Use grapple or skiff hook to attach to whale (via gear) instead of a harpoon
- Add polyball buoys instead of barrels to slow whale down and keep it near the surface
- Use hooked knives on long poles to free whales instead of the lance blade to kill them



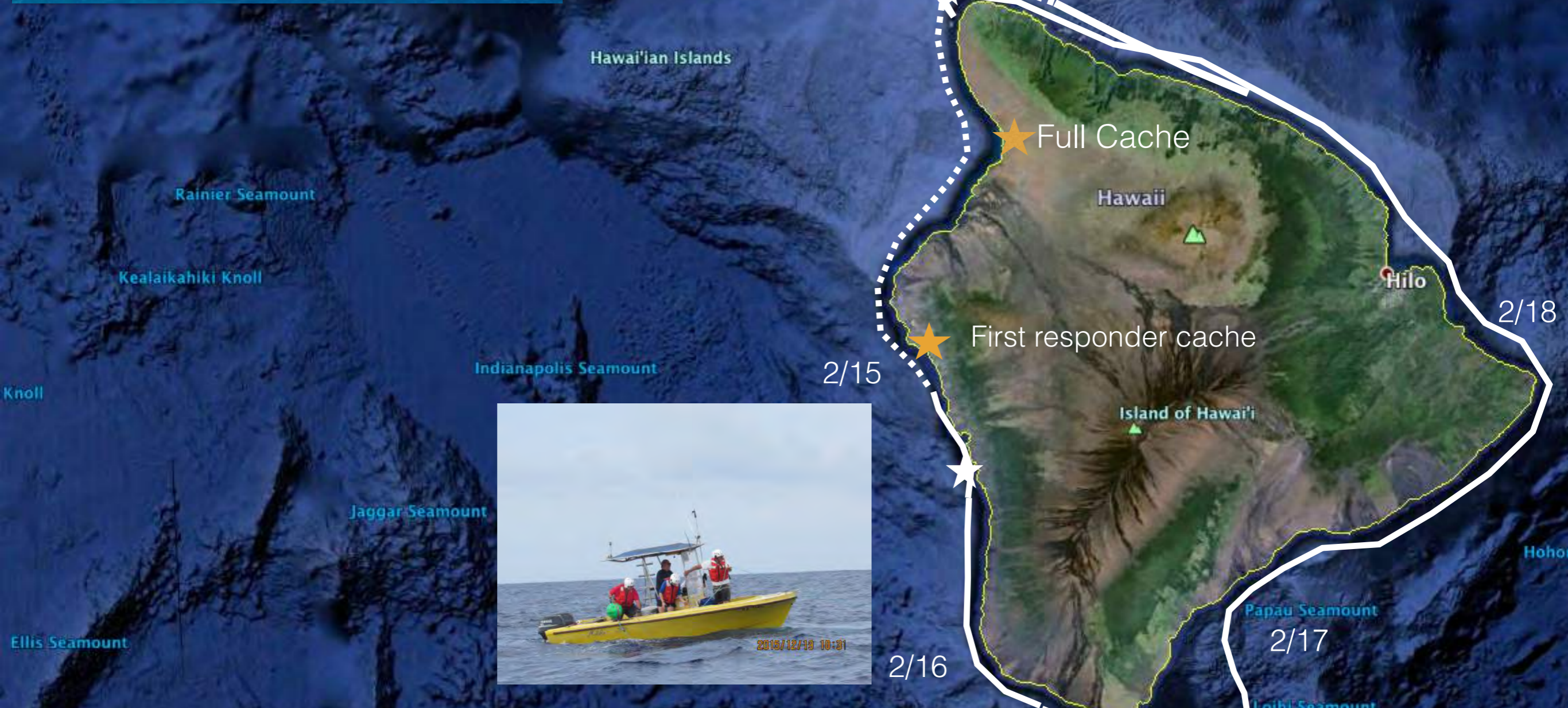
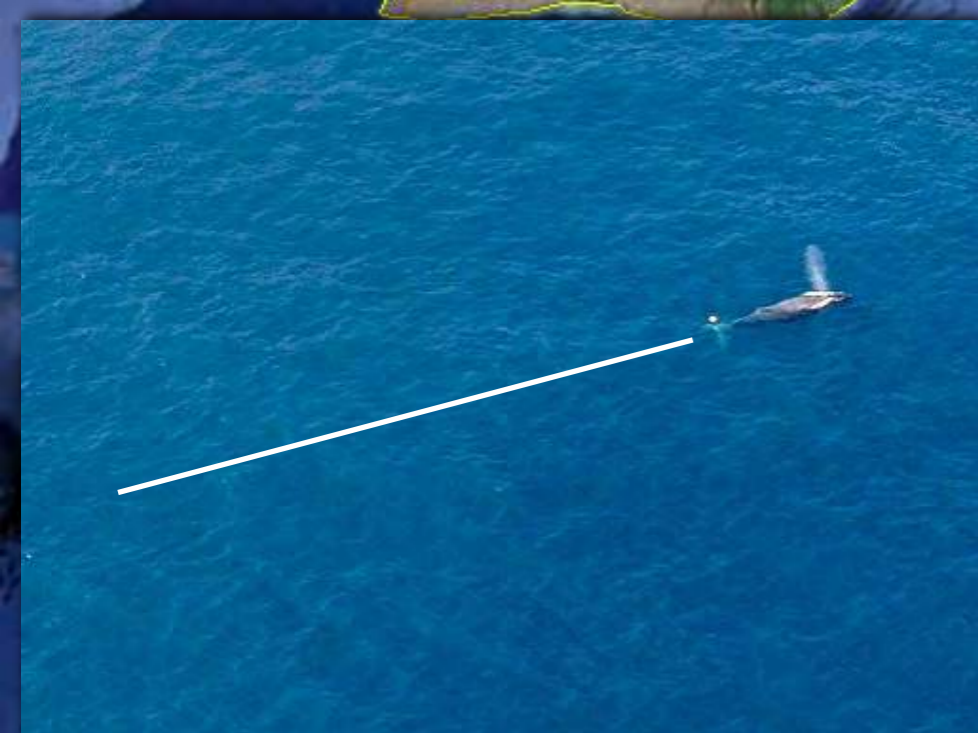




NOAA HIHWNMS/ MMHSRP #932-1905

2/13/2015: Adult humpback whale reported entangled off the island of Hawaii





Data LDEO-Columbia, NSF, NOAA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO





Entangled Humpback Whale off Maui
1/11/2018







Pantukhoff/ NOAA MMHSRP (permit # 18787-02)

February 17 - 18: Entangled subadult humpback whale off Maui



Pribilof Isl, AK

Wrangell, AK

Unimak Pass, AK

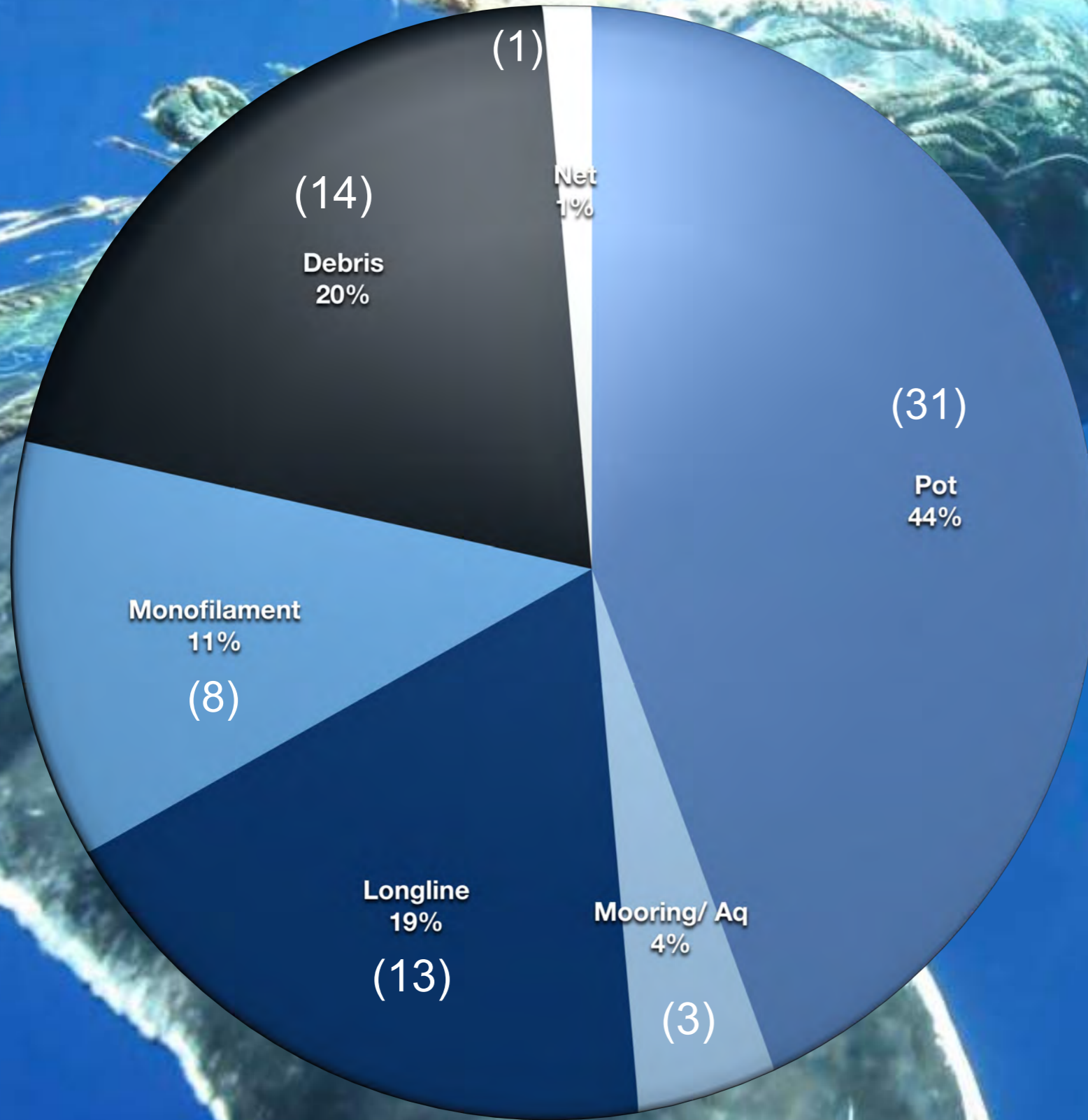
Hecate St, BC



Gear from Alaska and British Columbia

Gear Types

Hawai'i (2002 - present)



- **51.5%** of gear identified to gear type
- **68.6%** fixed gear (of IDed gear)
- **41.5%** (n=31) pot (trap) gear
 - 11 local
 - 20 from Alaska / BC

Changes in gear types?

- **Cables - communications**
- **Mooring/ anchor gear**
- **FADs (fish aggregating device)(aquaculture)**

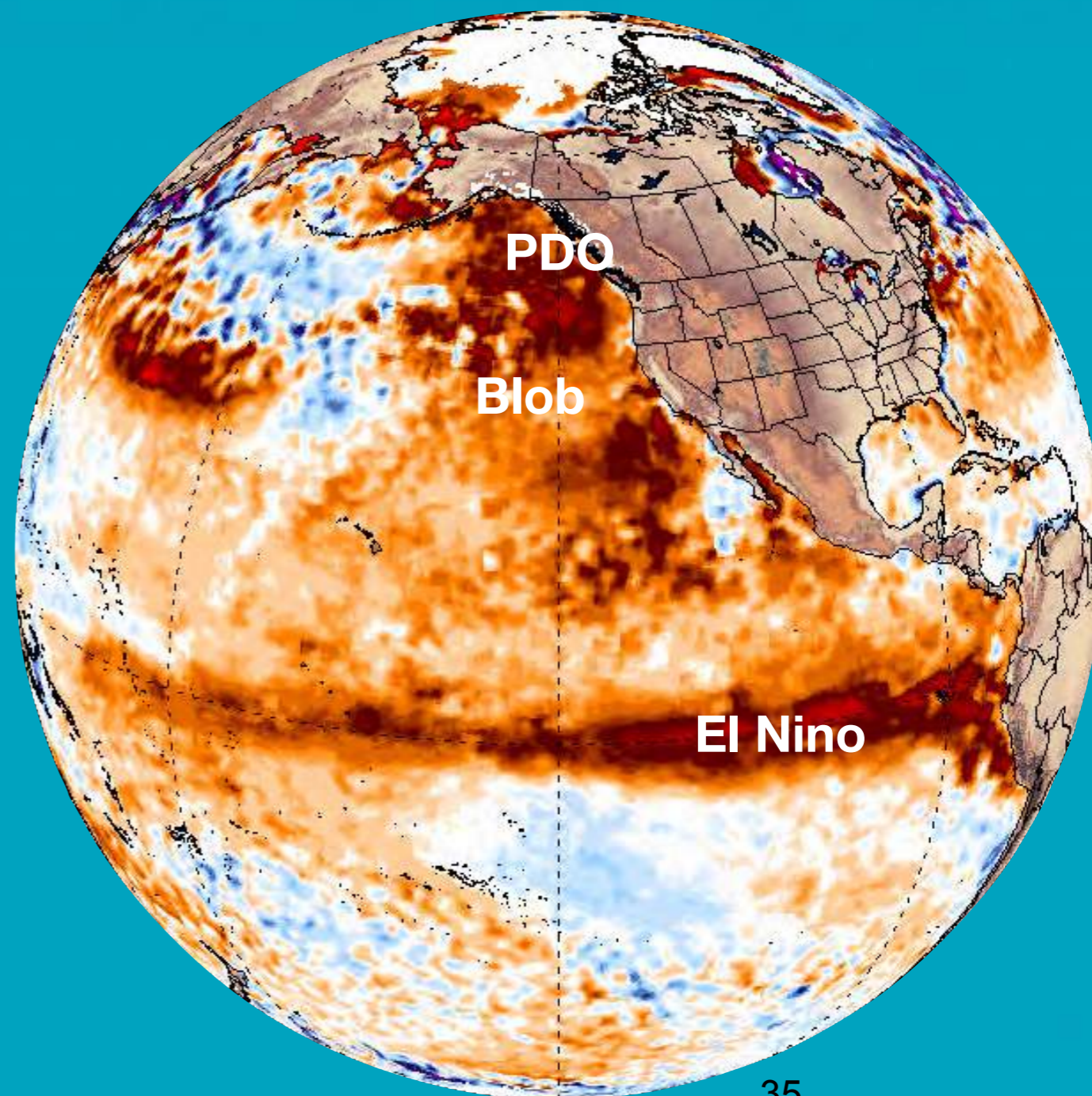




Environmental changes



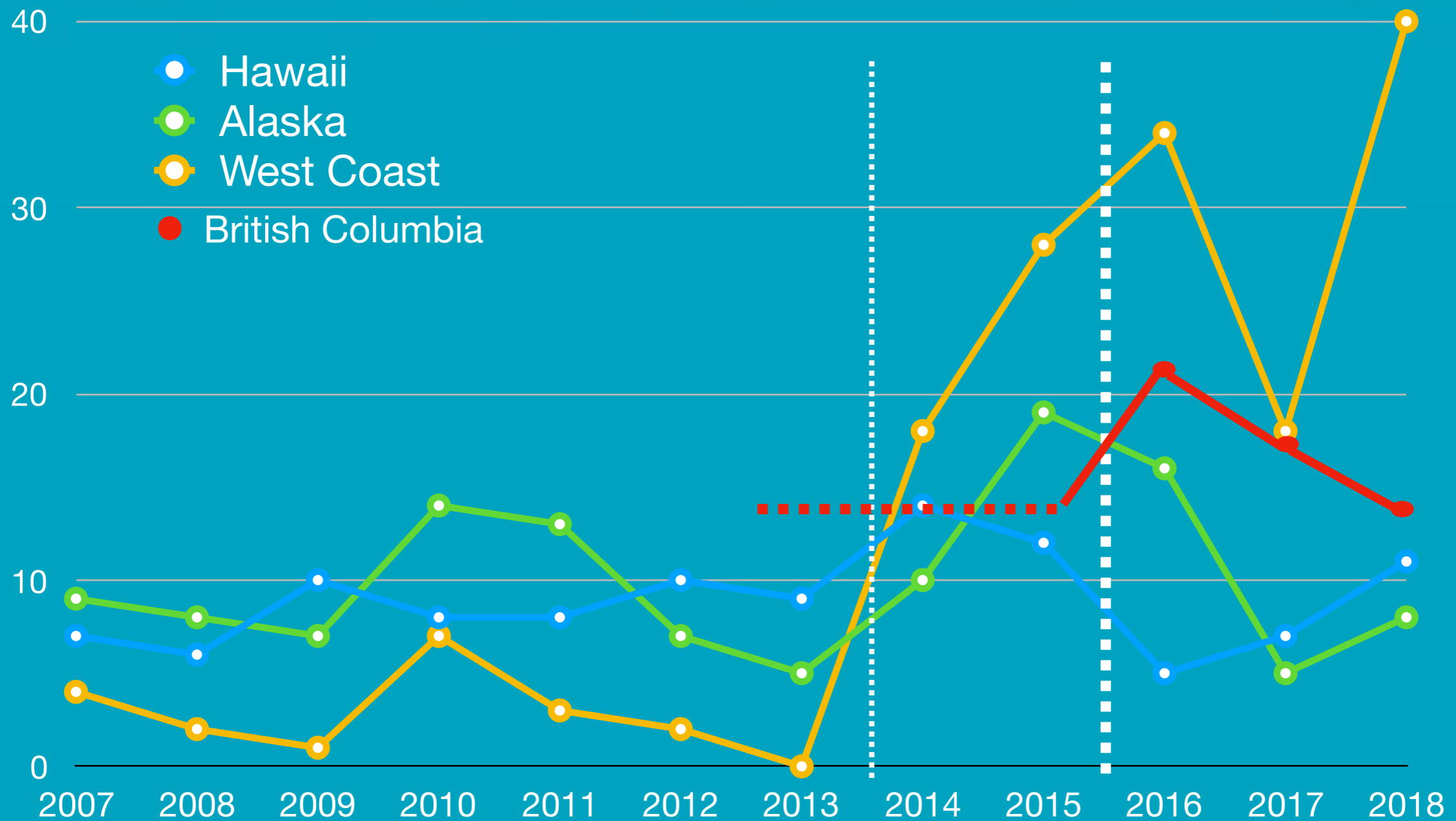
- **Blob**: Region of warmer than average temperature water off West Coast to Gulf of AK
- **Pacific Decadal Oscillation (PDO)**: Long-lived El Niño-like pattern of Pacific climate variability above 20° lat.
- **El Niño**: Warm phase associated with a band of warm ocean water that develops in the central and east-central equatorial Pacific



Summer 2016



Comparison of regional reports of humpback whales over time

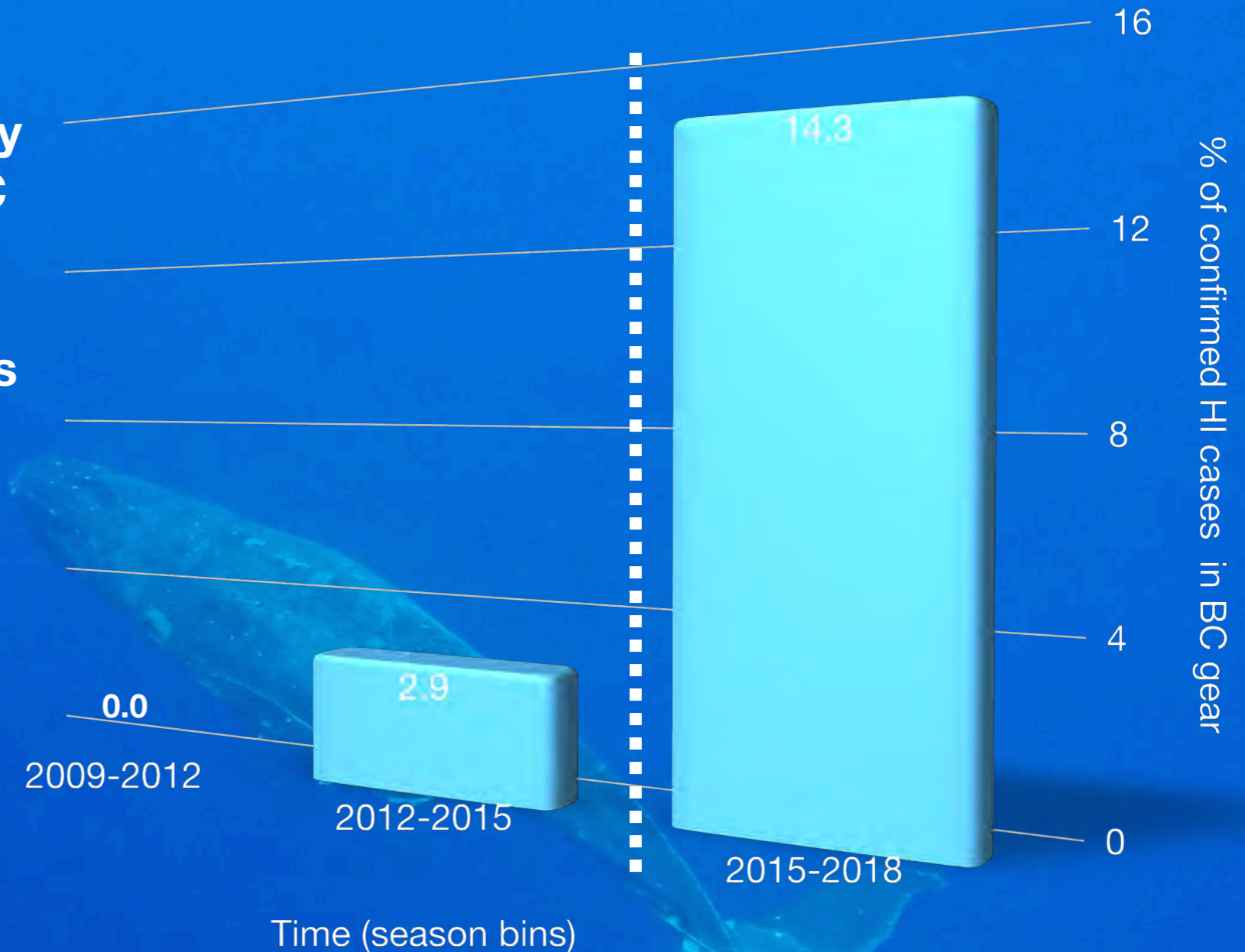




Gear from British Columbia

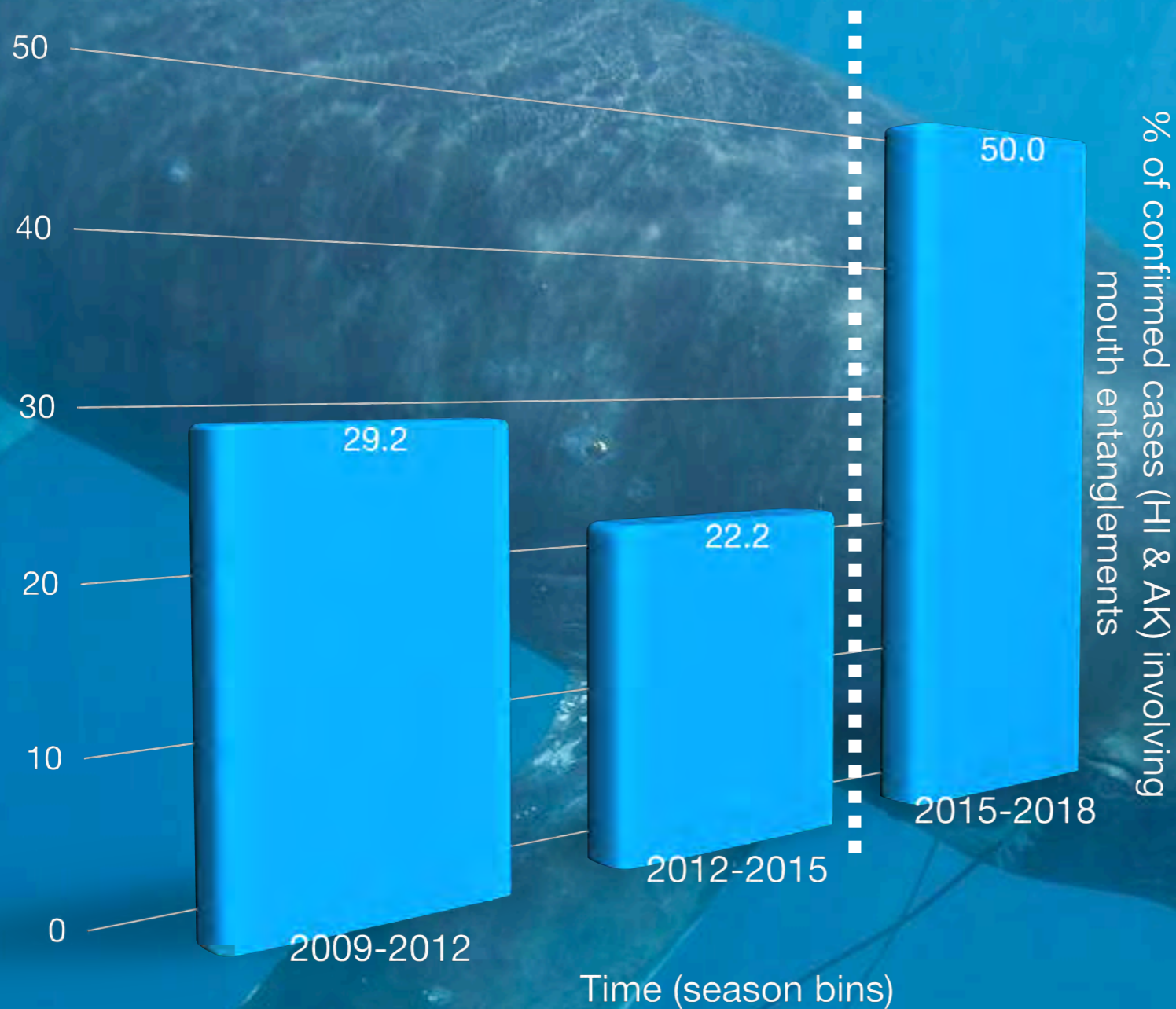


- Prior to 2015-16 season, only a few cases of gear from BC known
- Since 2015-16 season, cases involving BC gear have increased. However,
- Reminder, sample sizes are small





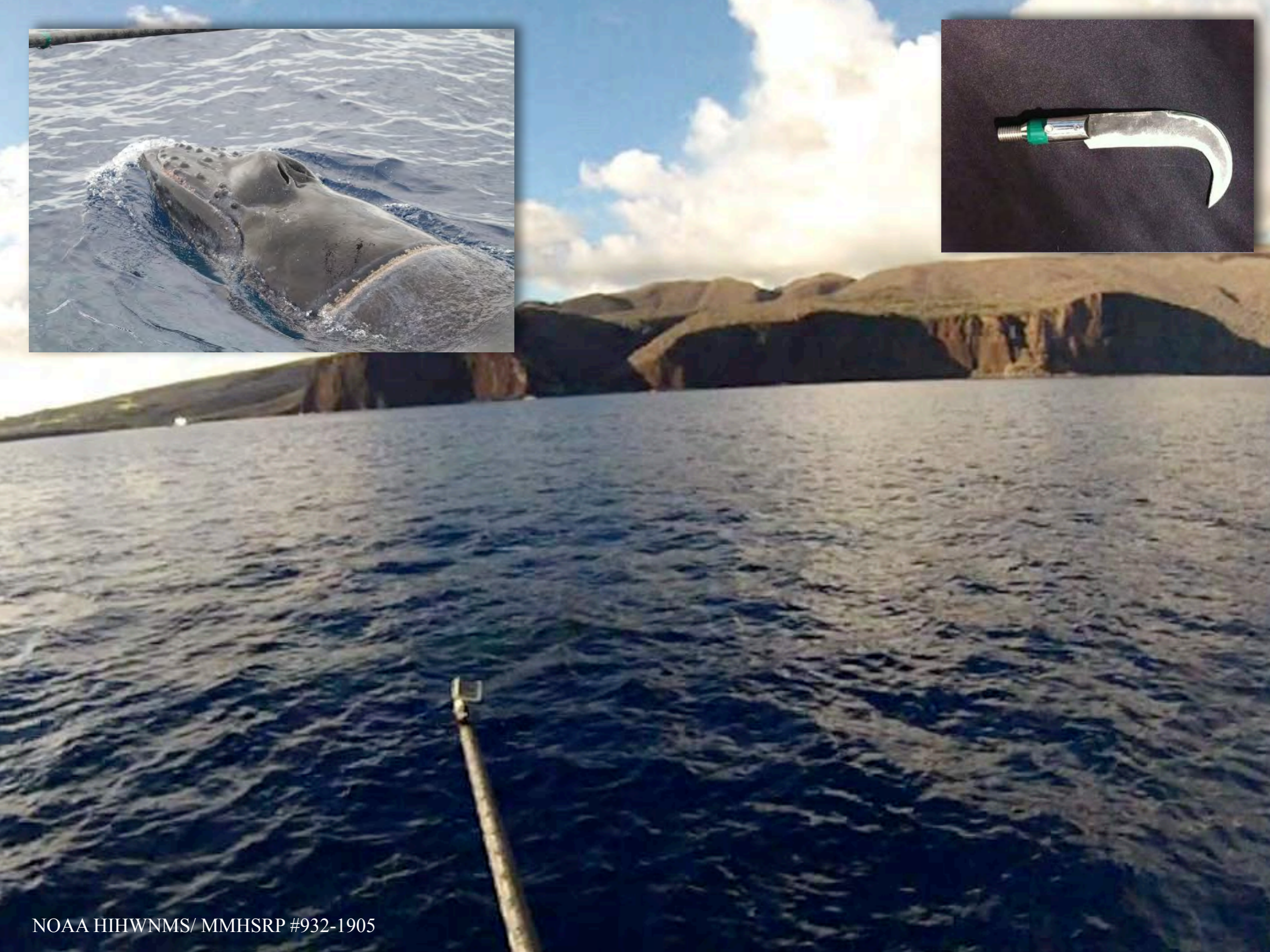
Mouth entanglements (Alaska and Hawaii reports)



- Prior to 2015-16 season, % of cases involving the mouth was around 25%
- Since 2015-16 season, value lies at 50%

Entangled humpback calf off Lahaina
December 15 - 18, 2013



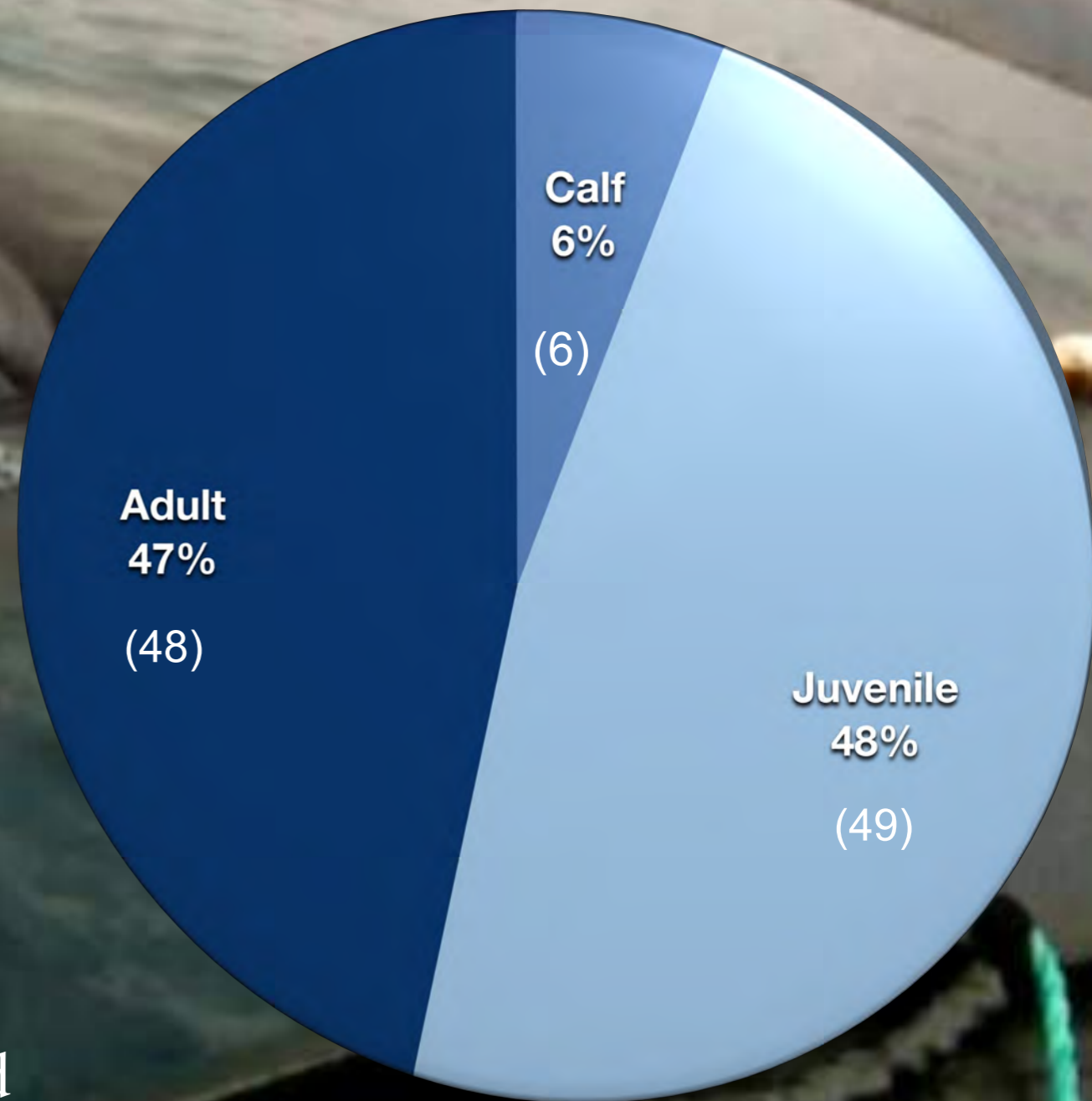


Who - Age Class

Hawai'i 2002 - To date*

- Age class known in 85.8 % (n=120) of cases

- Juveniles and calves represented the majority (53.4%, n=55) of known aged animals



(#) represent sample

* April 26, 2019

Hawai'i accomplishments

2002 - to date

Mounted more than 180 responses

- Gear removed from 32 whales
- 28 animals (27 humpback whales and 1 sei whale) freed of significant amount of gear
- Representing a ~43% success rate toward those cases warranted and able
- More than 12,000 feet of line removed
- More than 70 sets of gear removed or documented identified.





Mitigating measures: Reduce frequency/ occurrence



- Time and area closures
- Reduced scope, sinking line, no wet storage, ropeless gear
- Colored lines
- Acoustic alerts



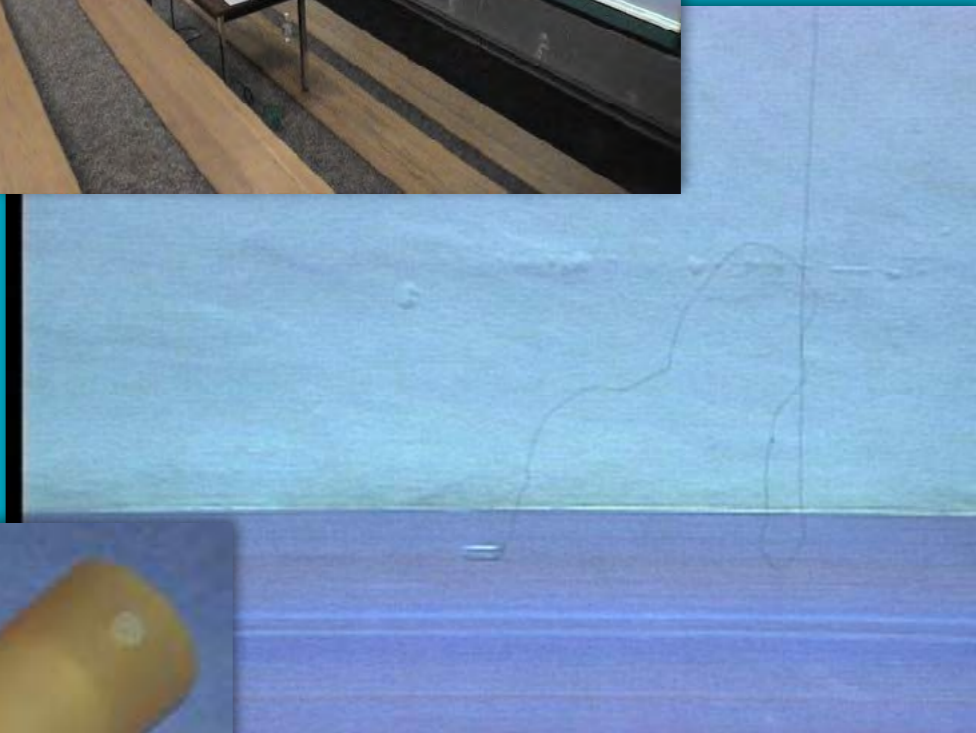
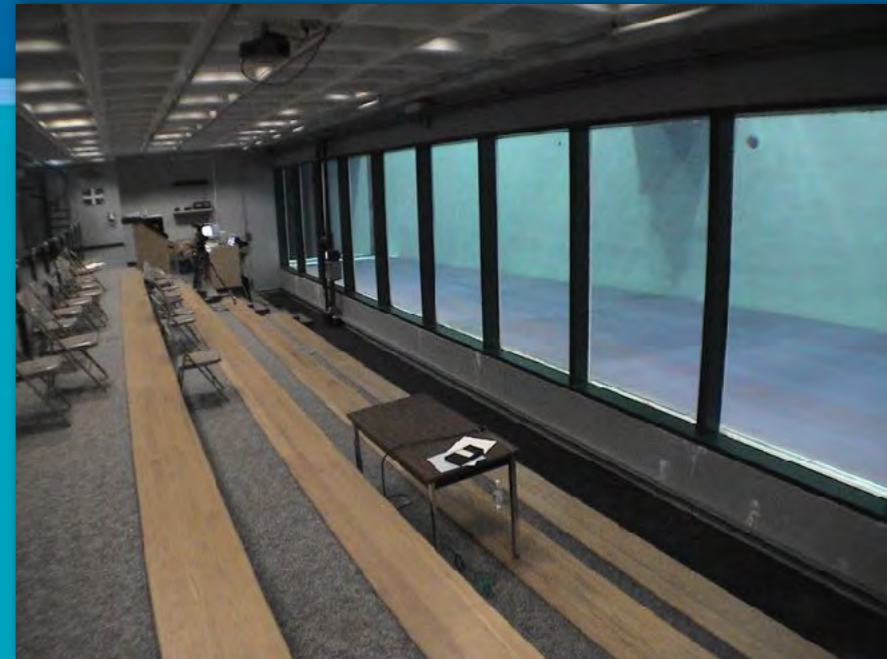
Courtesy of Bycatch.org



Mitigating measures: Reduce severity/ ease of self-release



- Weak lines and weak links
- Reduce scope/ tighter lines
- Stronger anchoring
- Tended fisheries





Disentanglement: What is a success?



- All potentially lethal gear off the animal
- Minimum injuries to the whale and none to rescuers
- Increase awareness
- Gain information towards reducing overall threat



Conclusions

- Response effort in Hawaii increased the scope of our effort towards understanding the impact and reducing risks
- Entanglement threat continues to be dynamic
- Changes in the animals' environment/ ecology, likely affect threat
- Full extent of threat/ impact is still unknown
- We are cutting some large whales free and making progress towards saving many others in the future



Acknowledgements



Courtesy of Jason Moore/ NOAA permit # 15240

- NOAA Office of Protected Resources
- NOAA Office of National Marine Sanctuaries
- NOAA Fisheries Protected Resources Div. - Pacific Islands and Alaska Regions
- NOAA Fisheries Pacific Islands Fisheries Science Center
- NOAA Office of Law Enforcement
- NOAA Corps
- Hawaiian Islands Humpback Whale National Marine Sanctuary
- Hawaii Department of Land and Natural Resources
- U.S. Coast Guard/ CG Aux. (D14/ D17)
- Kaho'olawe Island Reserve Commission
- National Marine Sanctuary Foundation
- Provincetown Center for Coastal Studies
- Canada's Division of Fisheries and Oceans
- Fishers (Commercial, sport, recreational)
- Whale researchers (NGOs)
- Commercial tour operators
- Watermen (other ocean -users)



Resources



- <https://hawaiihumpbackwhale.noaa.gov/res/entanglement.html>
- <https://www.fisheries.noaa.gov/national/marine-life-distress/marine-mammal-health-and-stranding-response-program>
- https://nmshawaiihumpbackwhale.blob.core.windows.net/hawaiihumpbackwhale-prod/media/archive/res/pdfs/disentanglement_one_page.pdf



Mahalo

Any questions?

