

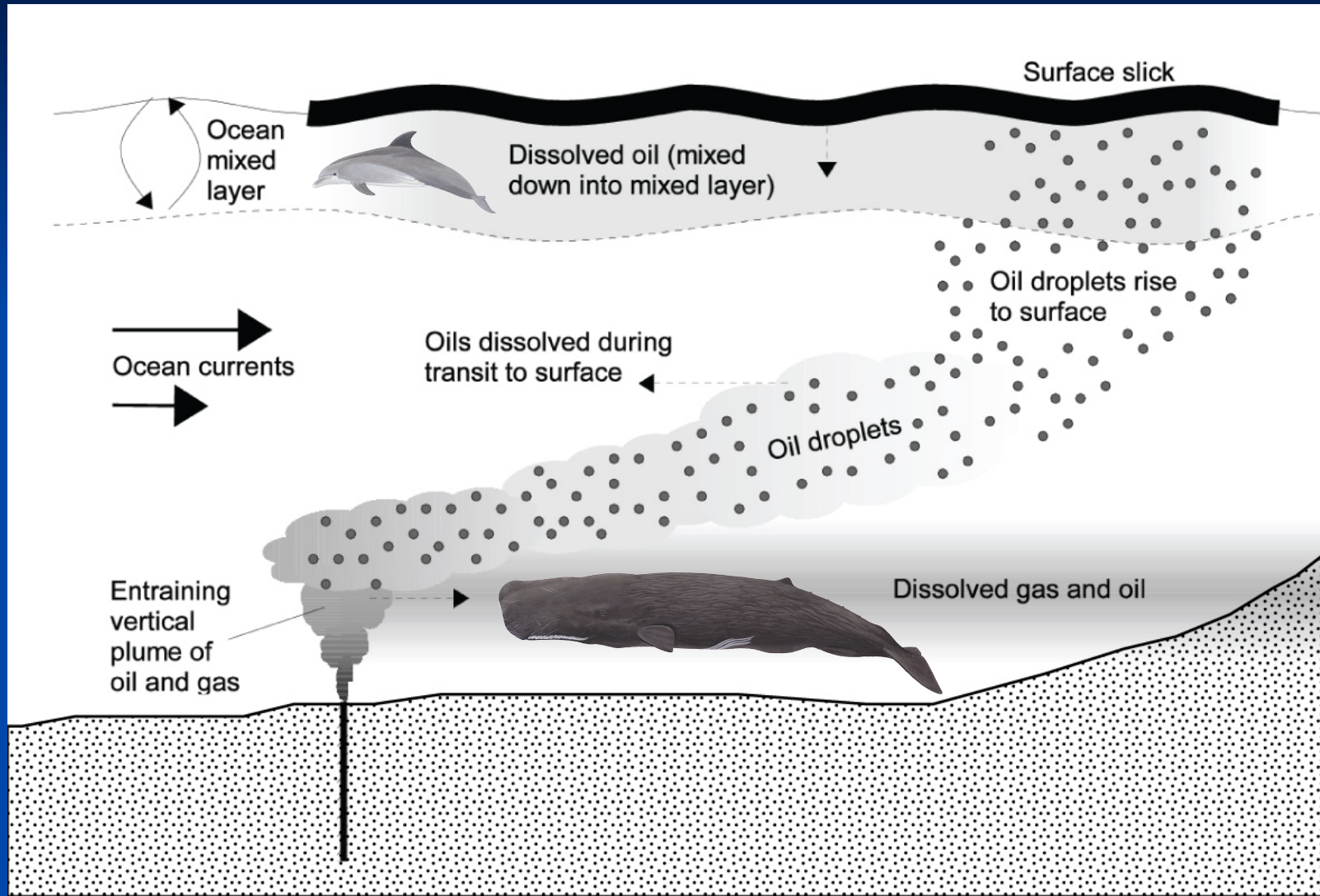
Lessons Learned from the Gulf of Mexico Oil Spill: Marine Mammals

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Alaska Marine Science Symposium

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Schematic of a Deep Oil Leak



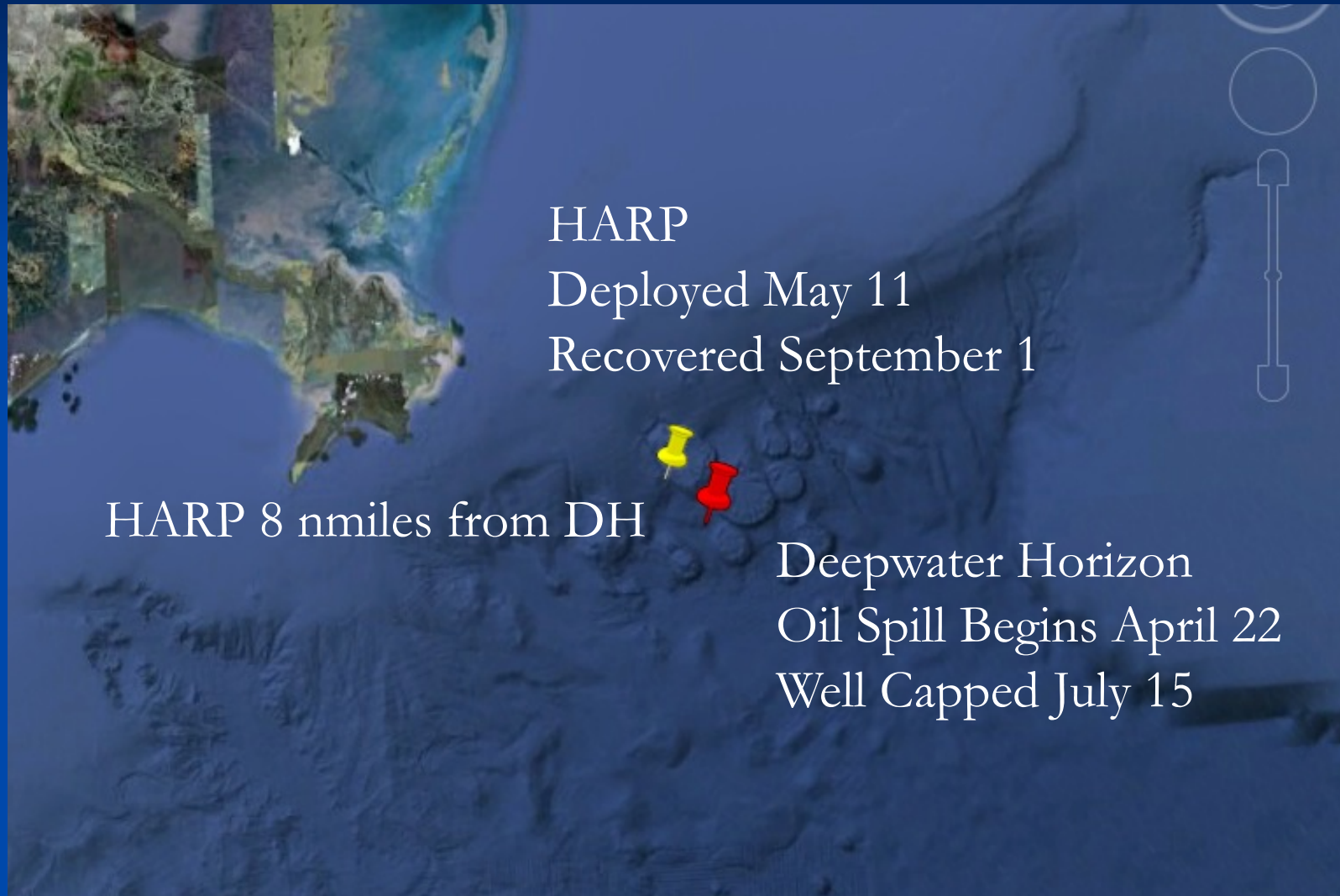
after Adcroft et al. 2010

Marine Mammals of the Gulf of Mexico

~ 30 Species

- Sperm Whales – Endangered species
- Brydes Whales – Mysticete
- Beaked Whales - Cuviers, Gervais, Blainvilles,
Sowerbys know from strandings
- Dwarf and Pygmy Sperm Whales
- Dolphin ~ 9 species
- Killer, False Killer, Pygmy Killer Whale
- Pilot Whale, Melon Headed Whale

Deepwater Horizon – HARP



HARP

Deployed May 11

Recovered September 1

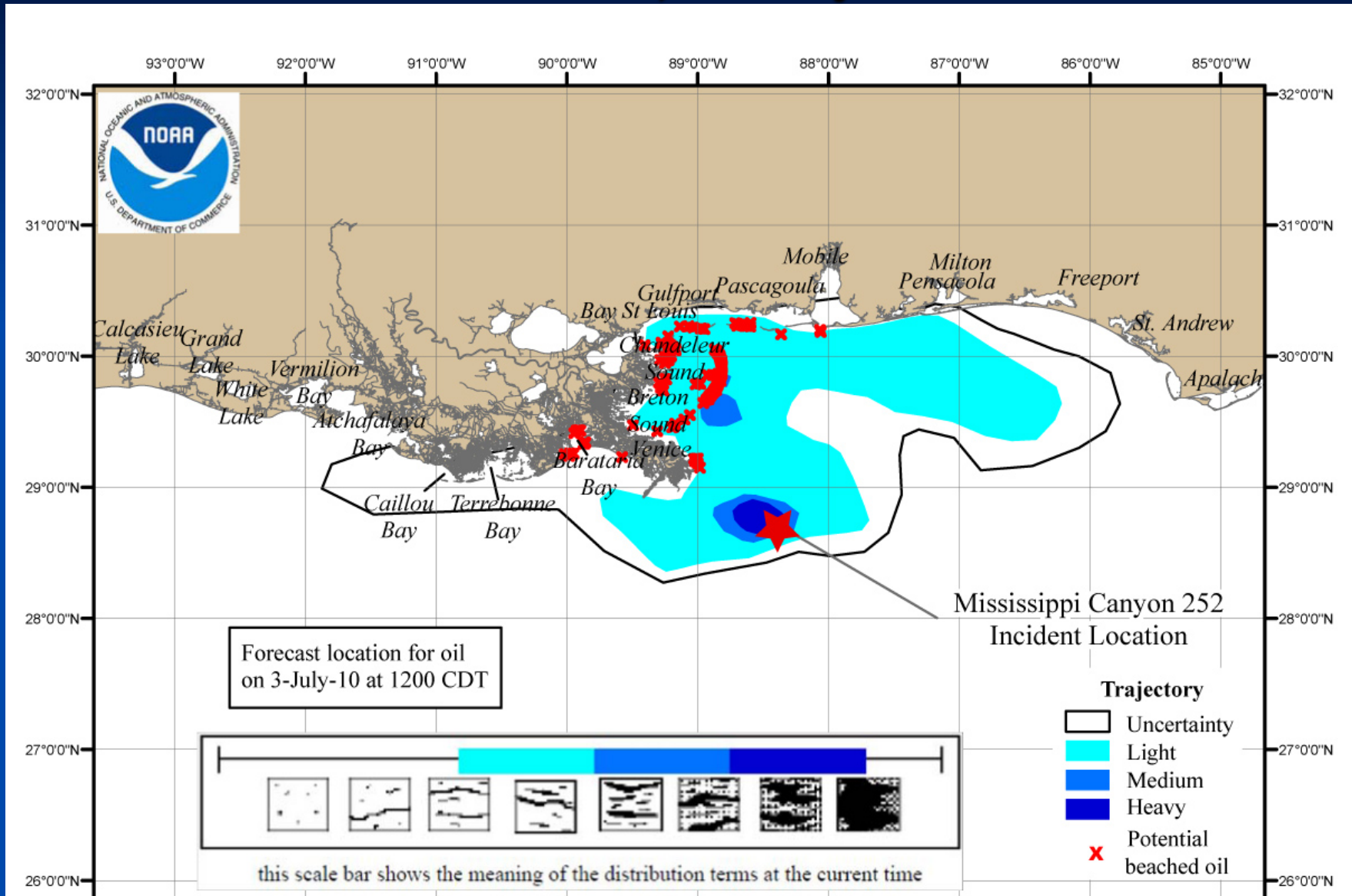
HARP 8 nmiles from DH

Deepwater Horizon

Oil Spill Begins April 22

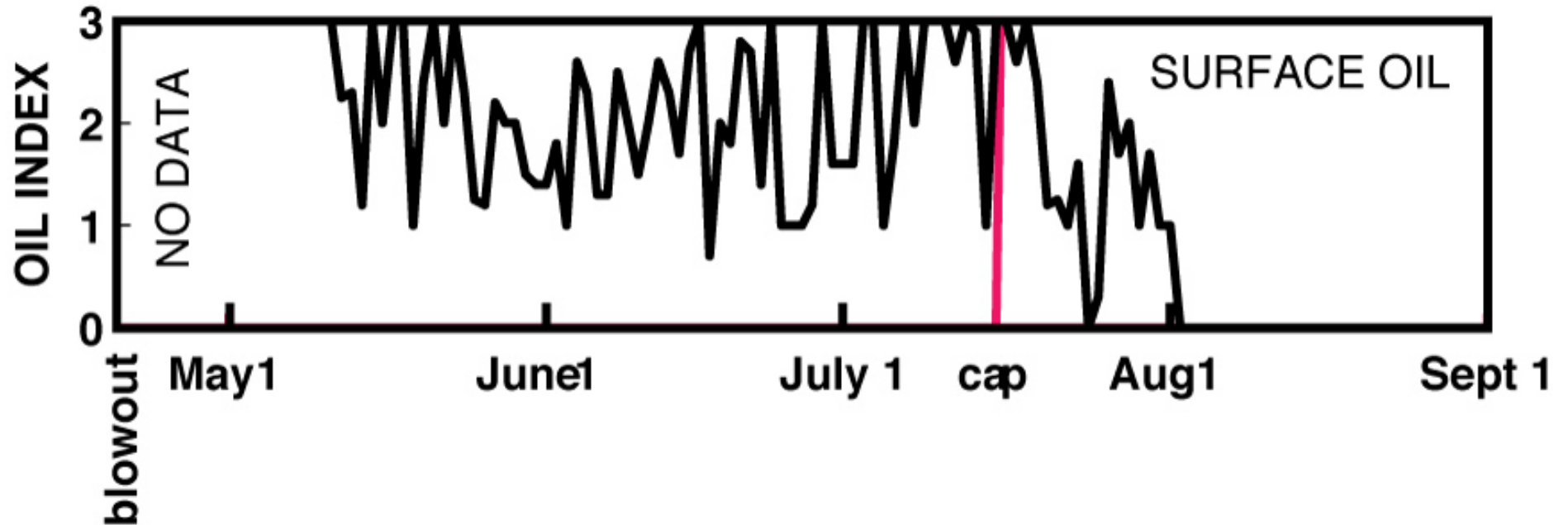
Well Capped July 15

NOAA Oil Trajectory Forecast



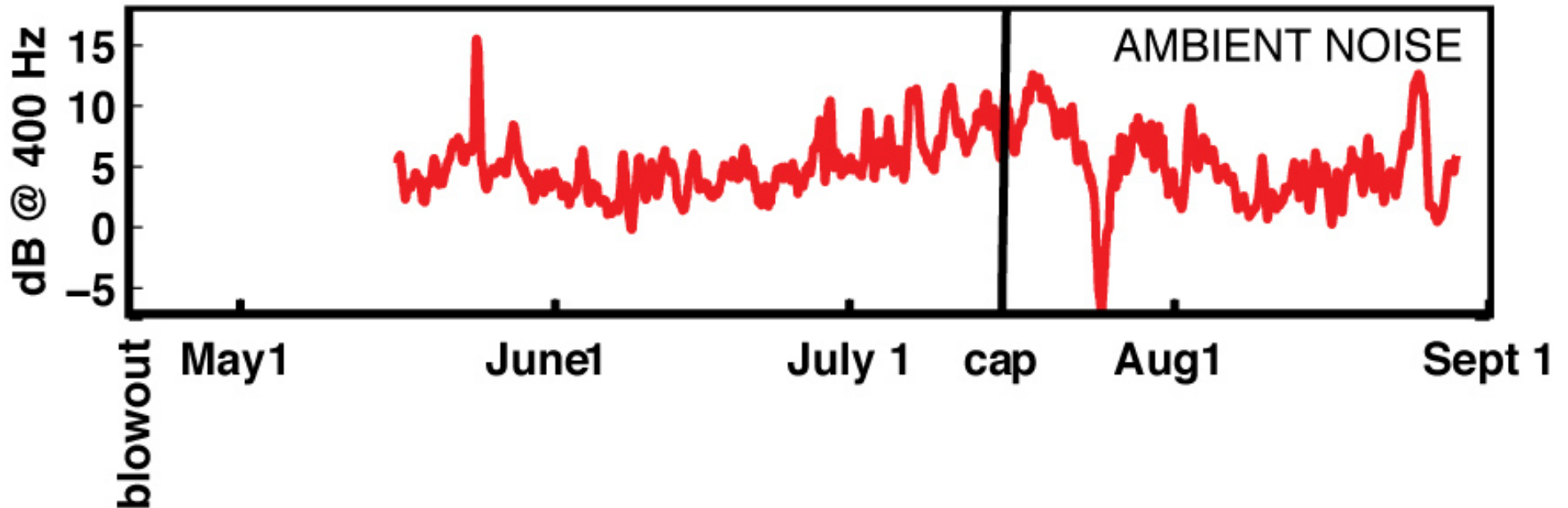
Extracted from <http://response.restoration.noaa.gov/>

Oil Index for HARP Site



Daily estimate of oil within 3 km radius of HARP

Noise Index for HARP Site



Hourly estimate of ambient noise at HARP
400 Hz used as proxy for nearby ships

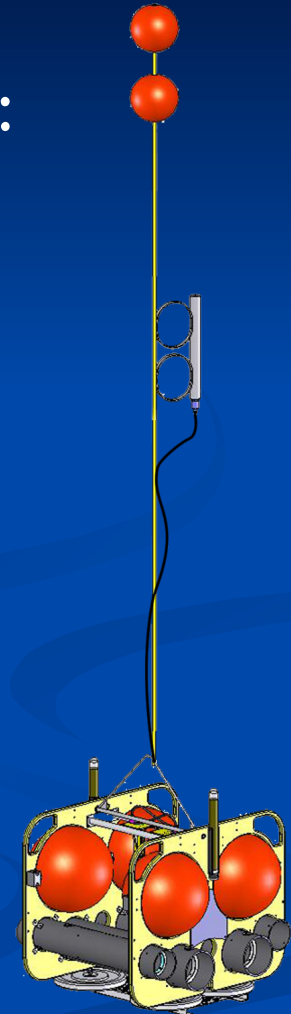
Whale Acoustic Assessment

Advantages of Acoustic Monitoring:

- Monitor continuously for long periods
- Acoustics are low cost
 - little ship time, reduced personnel
- Ability to assess species ID

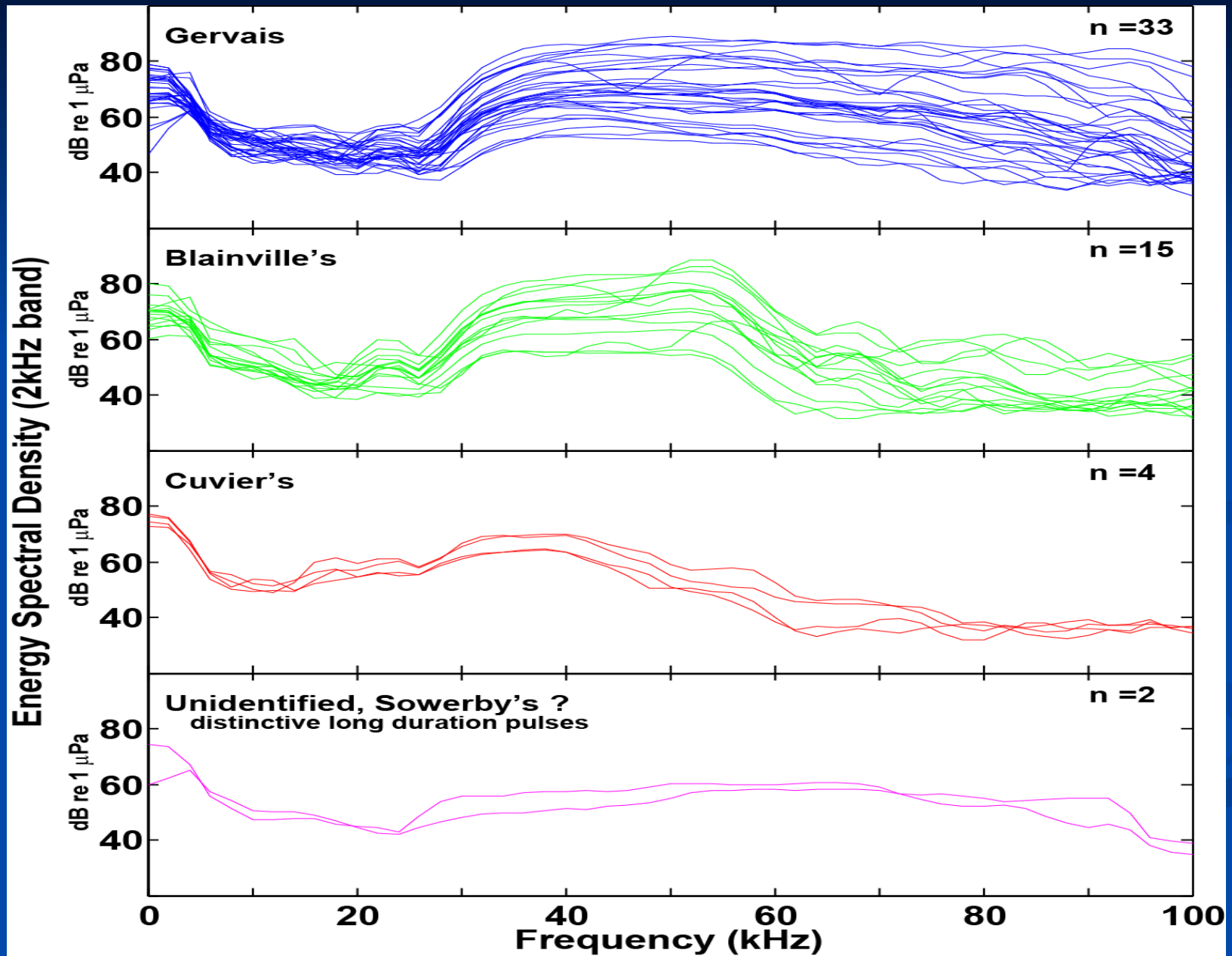
Analysis of Acoustic Data:

- Detect calls by scanning spectra
- Classify calls by species
- Estimate daily calling

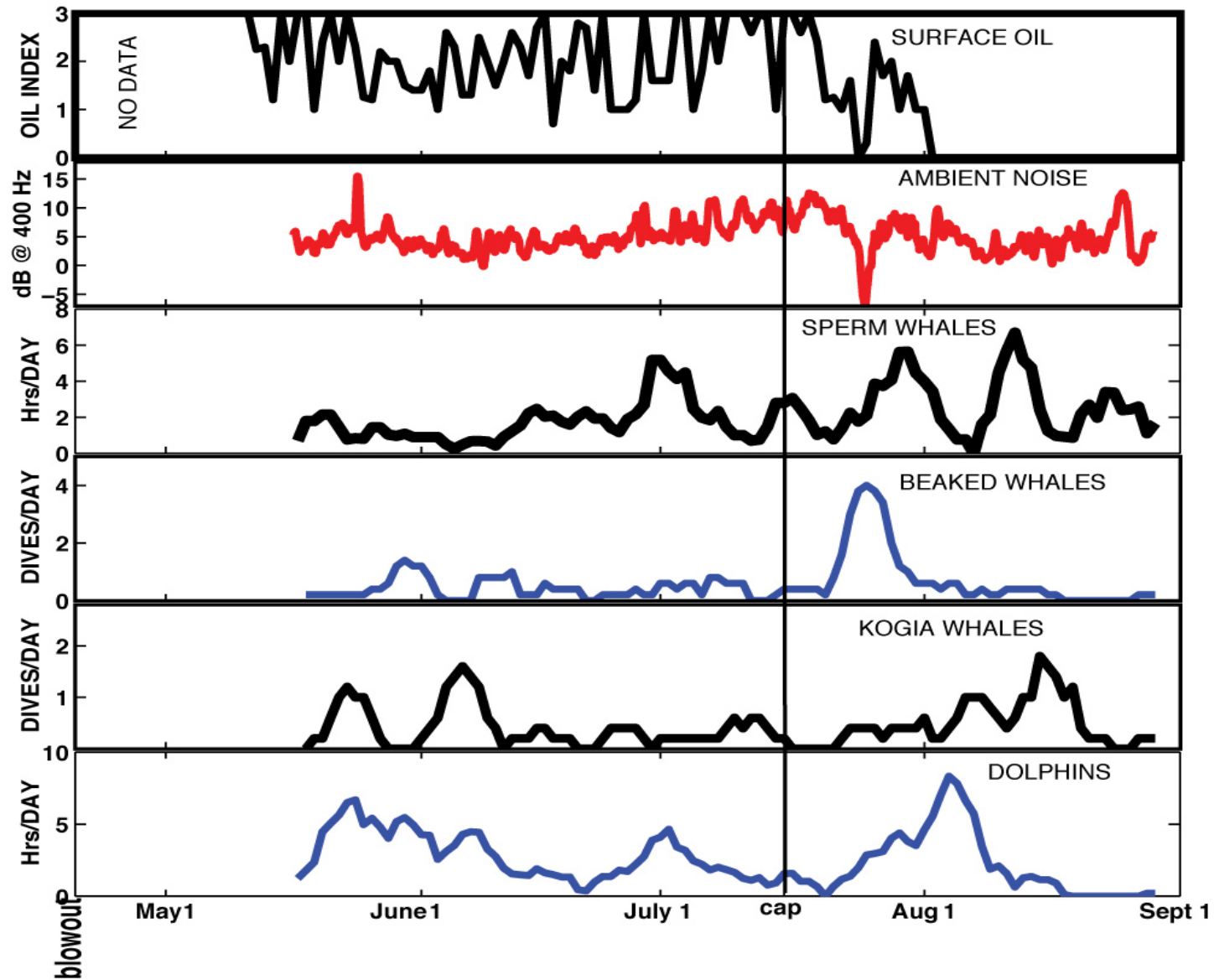


HARP

Beaked Whale Acoustic ID



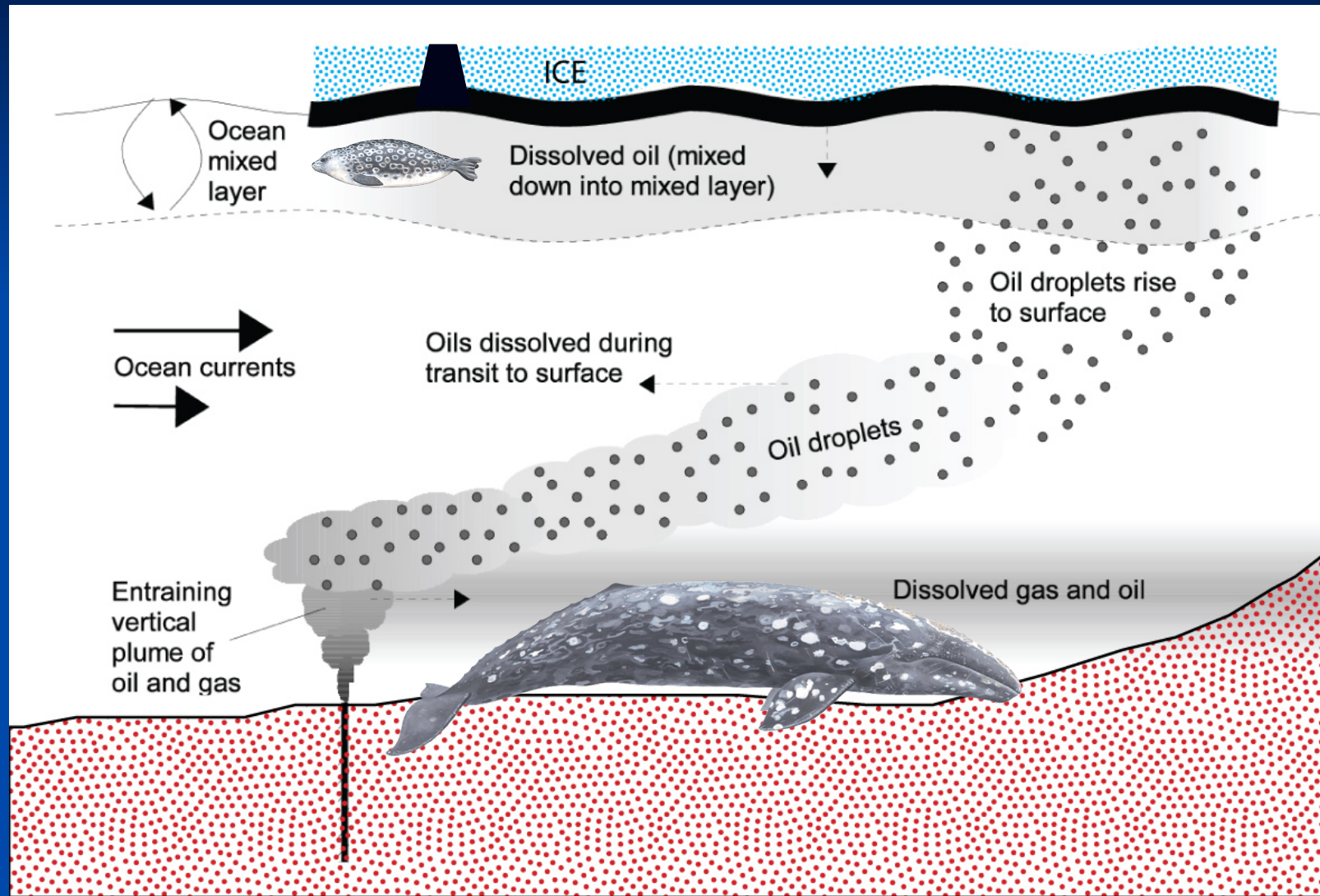
Whale Acoustics at HARP Site



Lessons from Gulf of Mexico

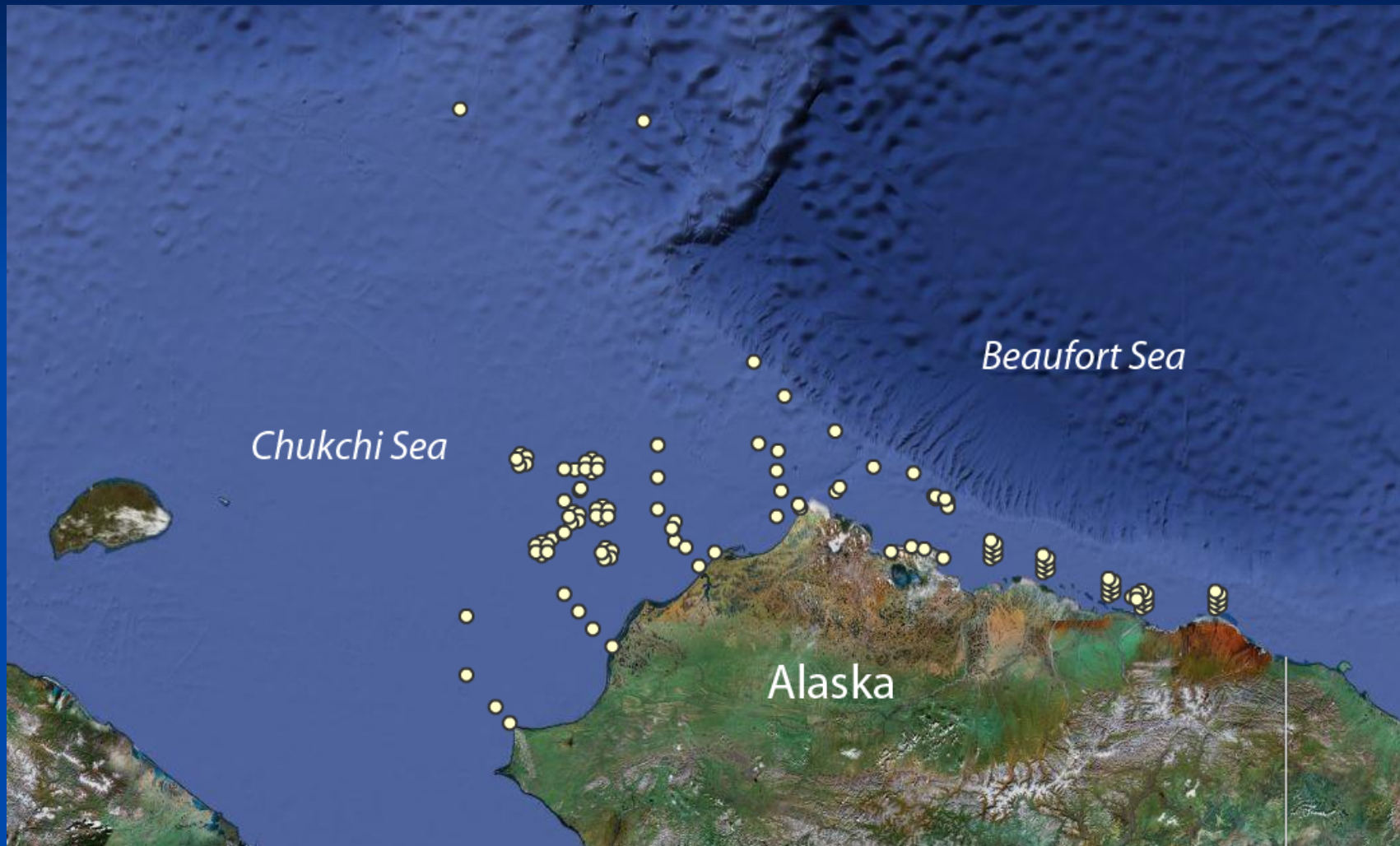
- Helpful to have Assets On Call
- Marine Mammals present in the Oil
- Baseline for Ecosystem ?
- Need Continued Monitoring

Schematic of an Oil Leak in Ice



Modified from Adcroft et al. 2010

Arctic Acoustic Monitoring



Darcy Dugan http://data.aos.org/maps/arctic_assets.php

Arctic Acoustics

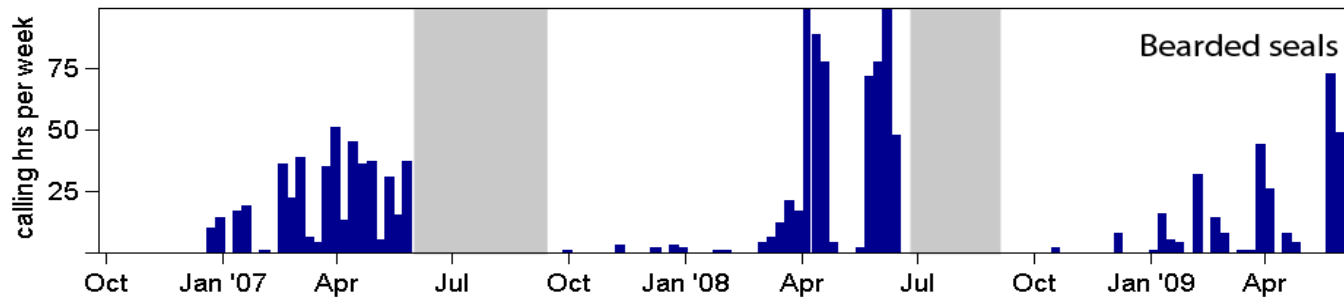
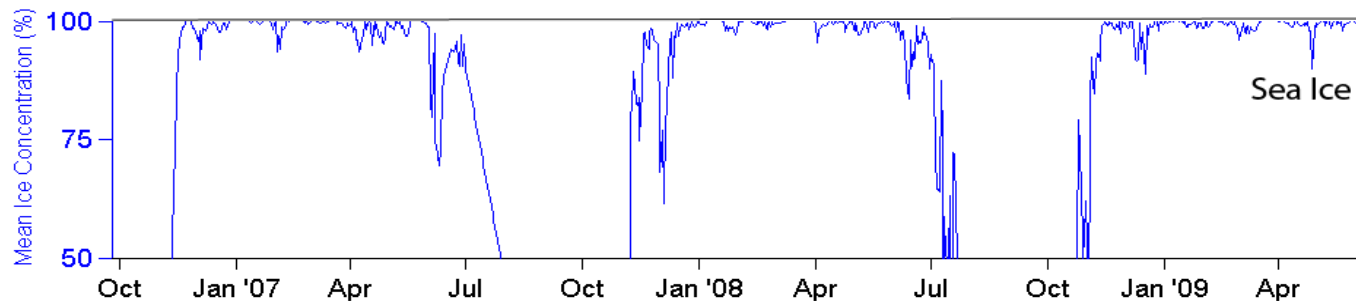


Photo: Mike Cameron, NOAA-NMFS

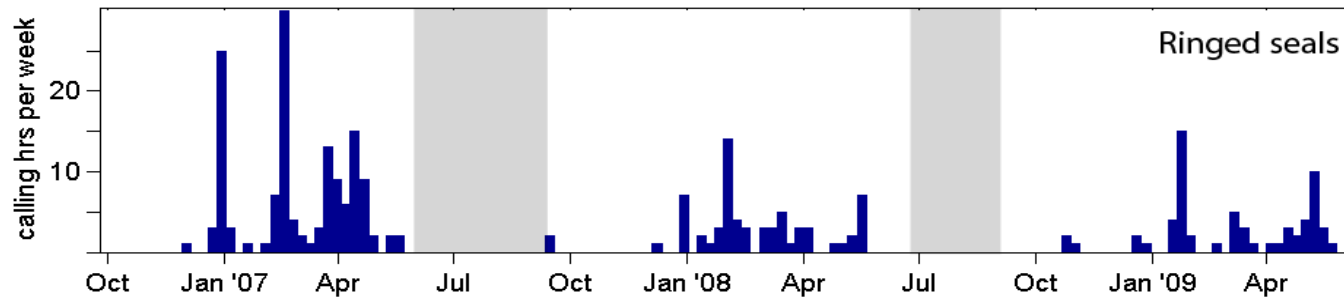


Photo: Brendan Kelly, NOAA-NMFS

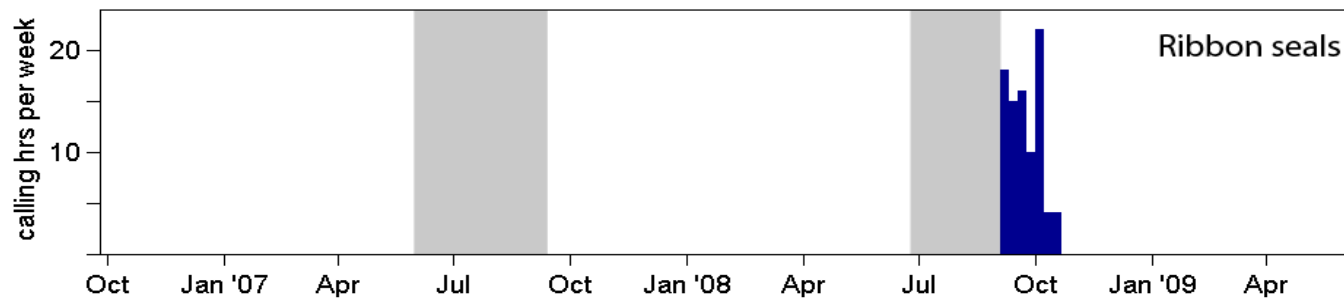


Photo: Mike Cameron, NOAA-NMFS

Lessons for Arctic

- Have Assets In Place
- Baseline for Ecosystem -
How much is enough?
- Oil Spill in Sea Ice – Threat to
Marine Mammals

Acknowledgments

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- US Marine Mammal Commission for Project Support
- LUMCON and Ocean Alliance for Shiptime
- US Arctic Commission for AMSS Travel Support