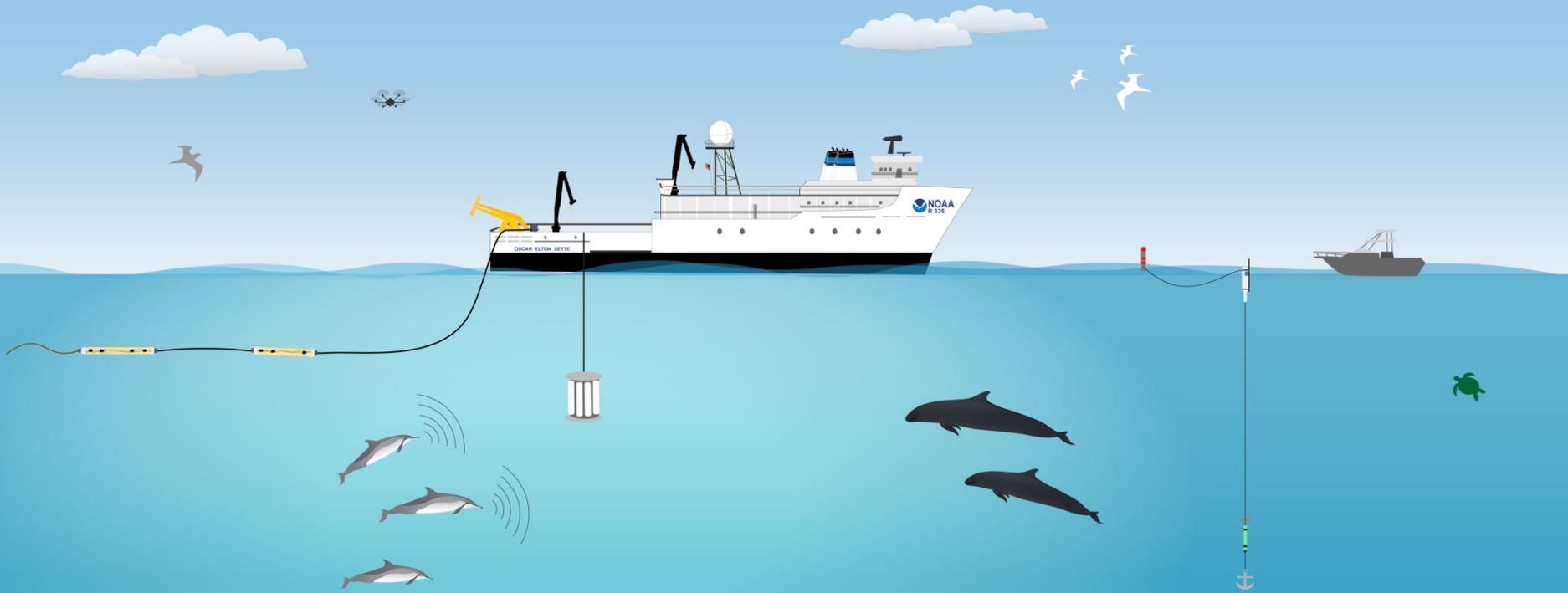


# Hawaiian Islands Cetacean & Ecosystem Assessment Survey 2017



<http://pifsc.noaa.gov/hiceas>

#HICEAS2017

**Erin Oleson**

**Pacific Islands Fisheries Science Center**

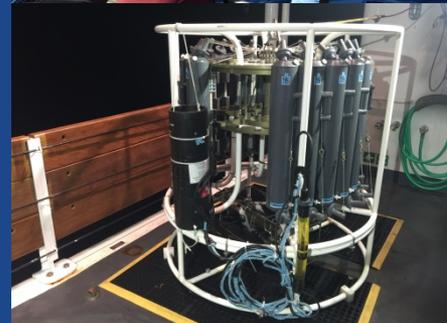
*15 March 2018, RAC, Honolulu, HI*

# HICEAS 2017

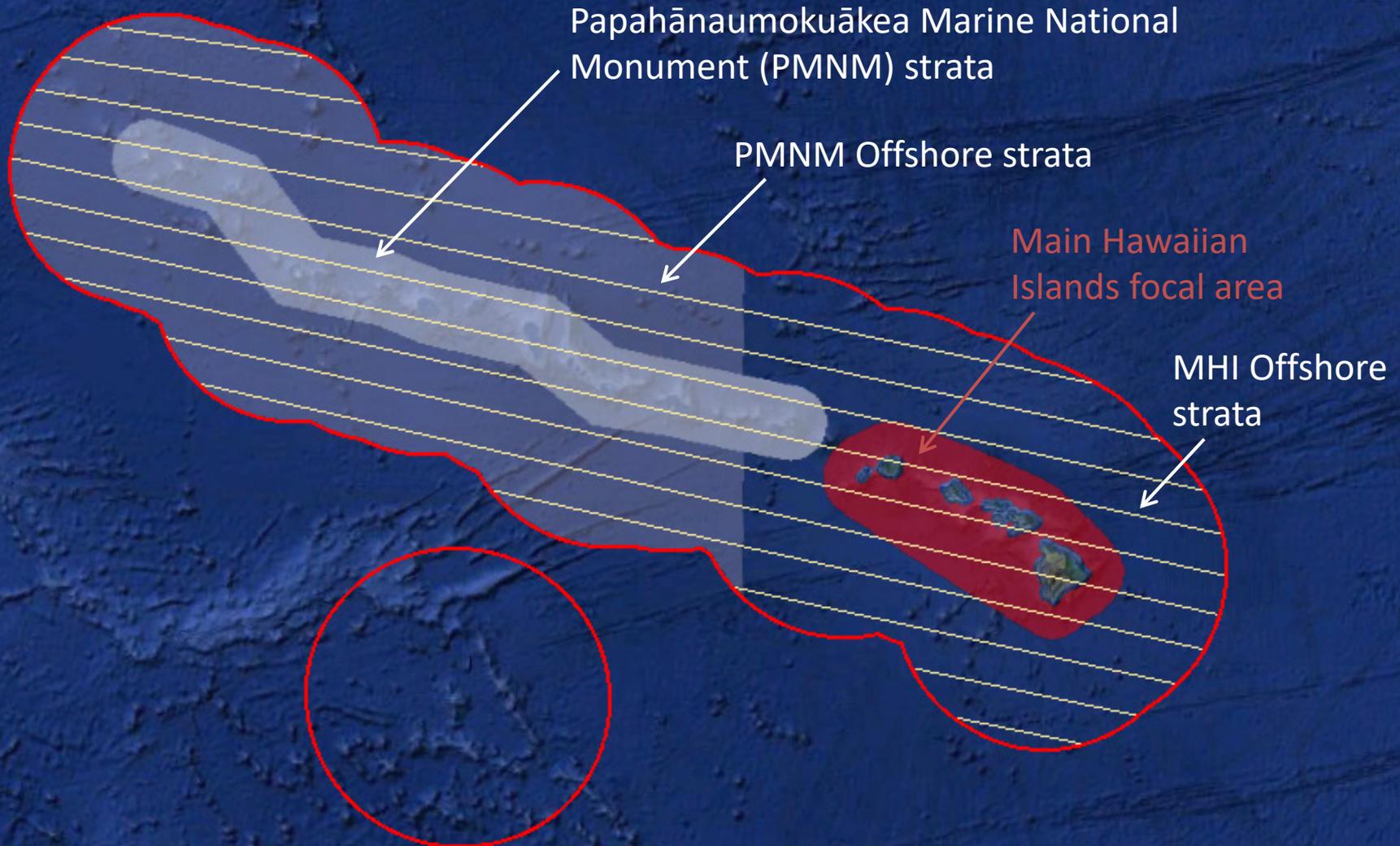
HICEAS 2017 is complete after 7 legs spanning 179 days at sea aboard the *Sette & Lasker* from July 6 – December 1, 2017

## Data Collection Goals:

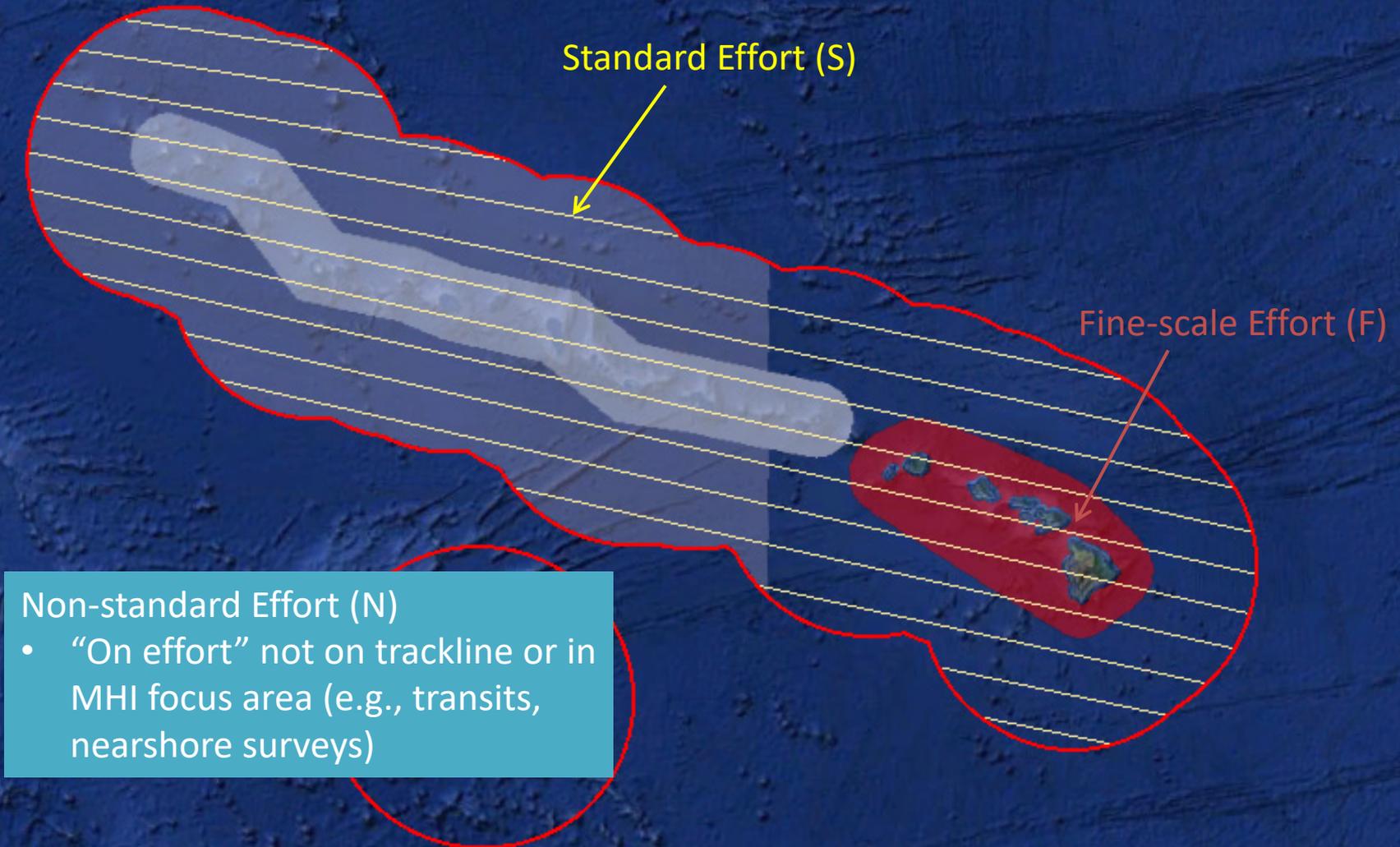
1. **Density & abundance** – EEZ-wide systematic line-transect visual & acoustic survey for cetaceans, strip transect for seabirds
2. **Population structure & range** – collection of photos & tissue samples, deployment of satellite tags
3. **Ecosystem observations** – oceanographic sampling
4. **Ancillary projects** – cetacean health assessment, noise monitoring, testing new technologies, eDNA species-identification



# Study Area, Strata, & Transects

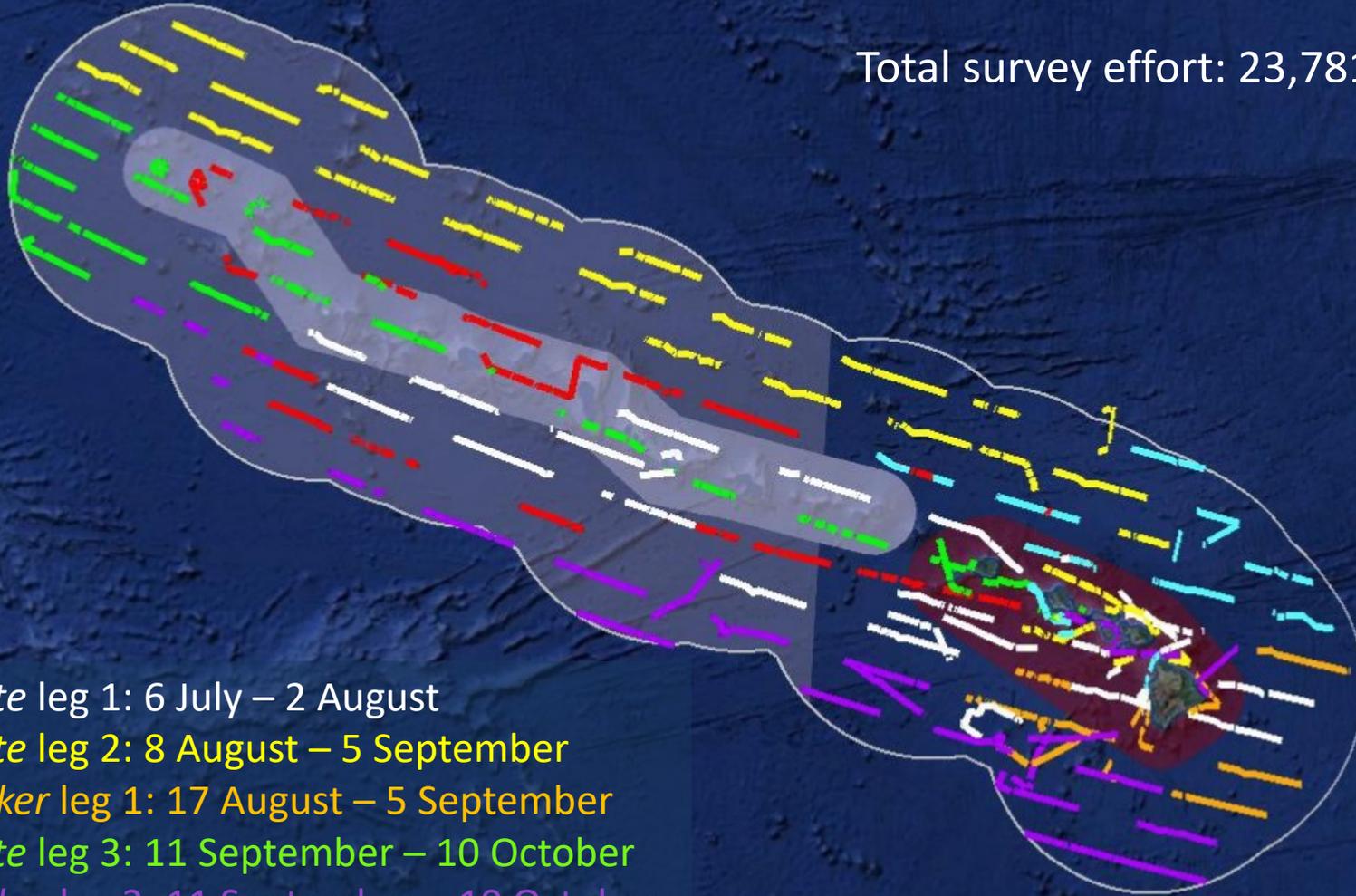


# Types of Survey Effort



# Survey Effort by Leg

Total survey effort: 23,781 km



*Sette* leg 1: 6 July – 2 August

*Sette* leg 2: 8 August – 5 September

*Lasker* leg 1: 17 August – 5 September

*Sette* leg 3: 11 September – 10 October

*Lasker* leg 2: 11 September – 10 October

*Lasker* leg 3: 16 October – 10 November

*Lasker* leg 4: 16 November – 1 December

# Cetacean Survey Effort Type by Beaufort Sea State

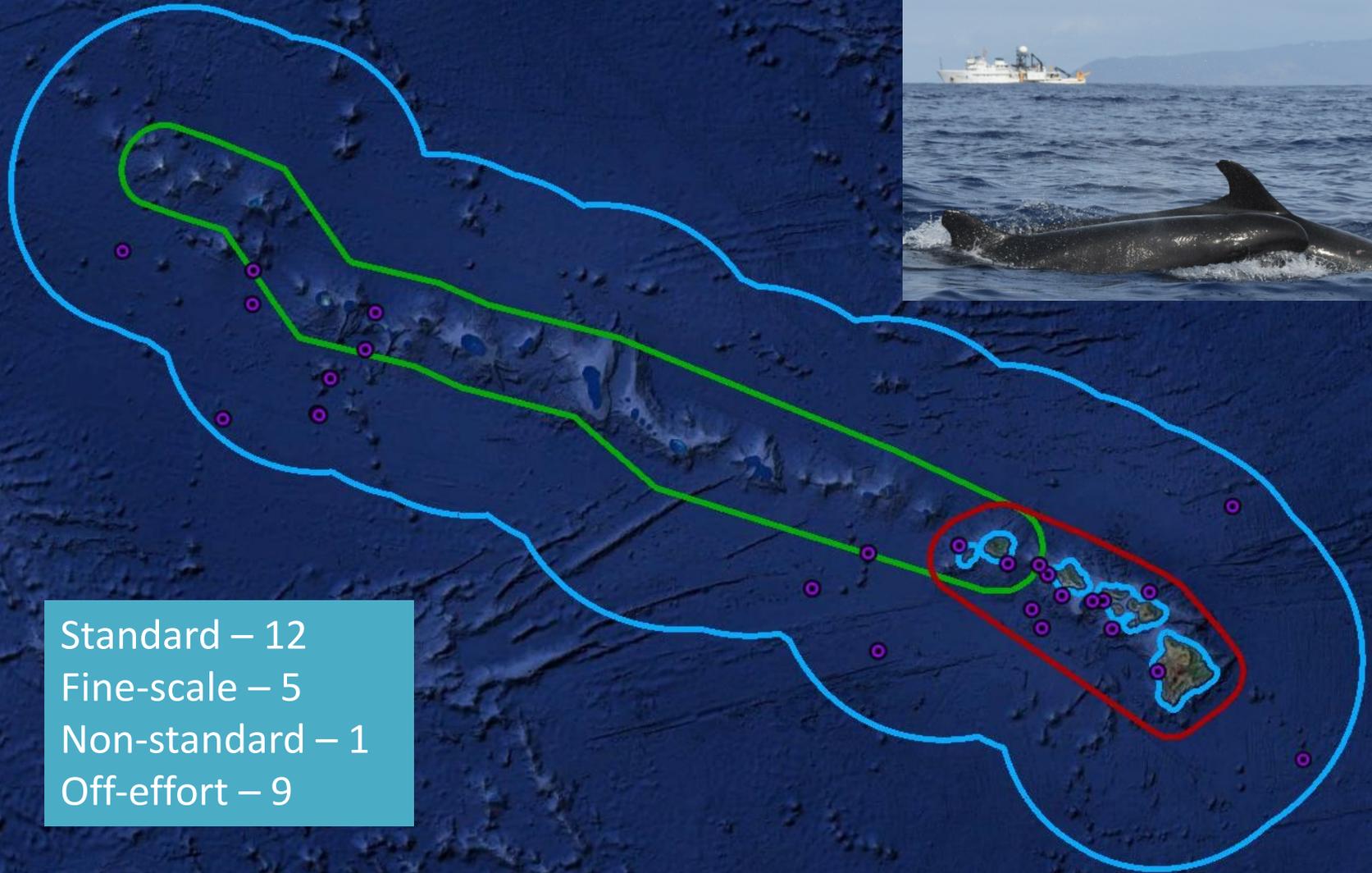
Beaufort Sea State	Effort (km)			
	Standard	Fine-scale	Non-standard	TOTAL (%)
0	13	0	0	13 (0%)
1	153	56	43	252 (1%)
2	689	73	333	1,094 (5%)
3	2,003	314	736	3,053 (13%)
4	5,208	629	2,102	7,938 (33%)
5	5,696	284	1,560	7,540 (32%)
6	2,795	342	751	3,889 (16%)
ALL	16,557	1,698	5,525	23,781

# Cetacean Sightings by Effort Type

- Sightings made during Standard & Fine-scale effort may be used for density/abundance estimation
- Not shown: 121 Non-standard & off-effort sightings
- 23 species seen on-effort, **21 within Hawaii EEZ**
- Not seen on-effort in Hawaii EEZ: dwarf sperm, blue, sei, & North Pacific right whales

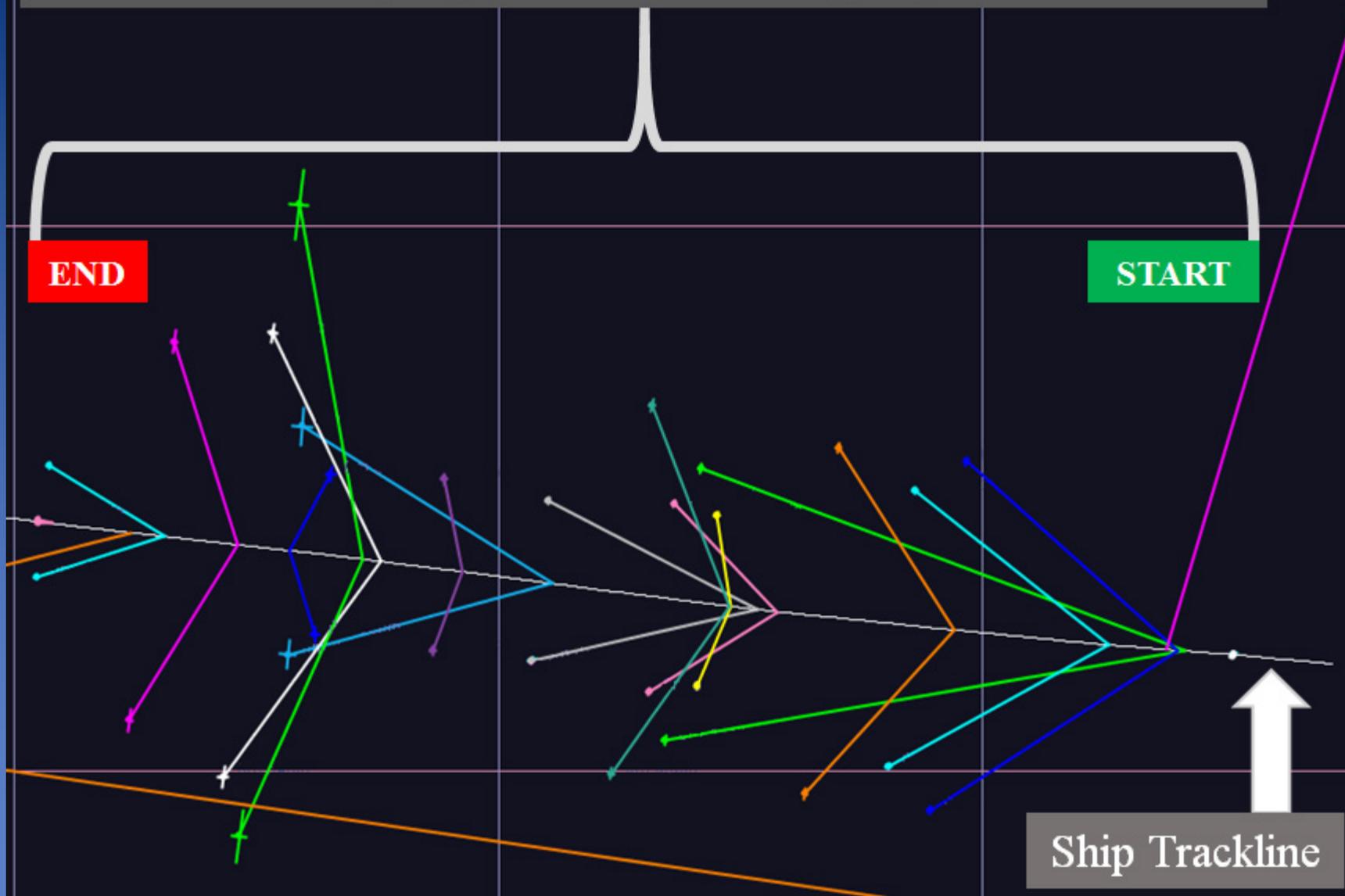
Species	Standard	Fine-Scale	TOTAL
Striped Dolphin	19	0	27
Sperm Whale	15	2	24
Pantropical Spotted Dolphin	14	0	25
False Killer Whale	12	5	27
Rough-toothed Dolphin	11	4	25
Risso's Dolphin	9	0	12
Cuvier's Beaked Whale	6	0	11
Short-finned Pilot Whale	6	12	35
Humpback Whale	5	0	6
Melon-headed Whale	4	0	7
Longman's Beaked Whale	4	0	7
Pygmy Sperm Whale	3	0	3
Bryde's Whale	2	0	2
Fraser's Dolphin	2	0	3
Pygmy Killer Whale	2	1	3
Killer Whale	1	0	1
Common Minke Whale	1	0	1
Fin Whale	1	0	2
Spinner Dolphin	1	0	3
Bottlenose Dolphin	1	1	4
Blainville's Beaked Whale	0	2	8
Blue Whale	0	0	2
Short-beaked Common Dolphin	0	0	1
Unidentified Dolphin	27	2	46
Unidentified Whale	14	1	25
Unidentified Beaked Whale	9	2	24
<i>Mesoplodon</i> Beaked Whale	5	0	7
Pygmy/Dwarf Sperm Whale	3	0	5
Unidentified Cetacean	2	0	5
Sei/Bryde's Whale	1	0	5
<b>TOTAL</b>	<b>180</b>	<b>32</b>	<b>356</b>

# False Killer Whale Sightings

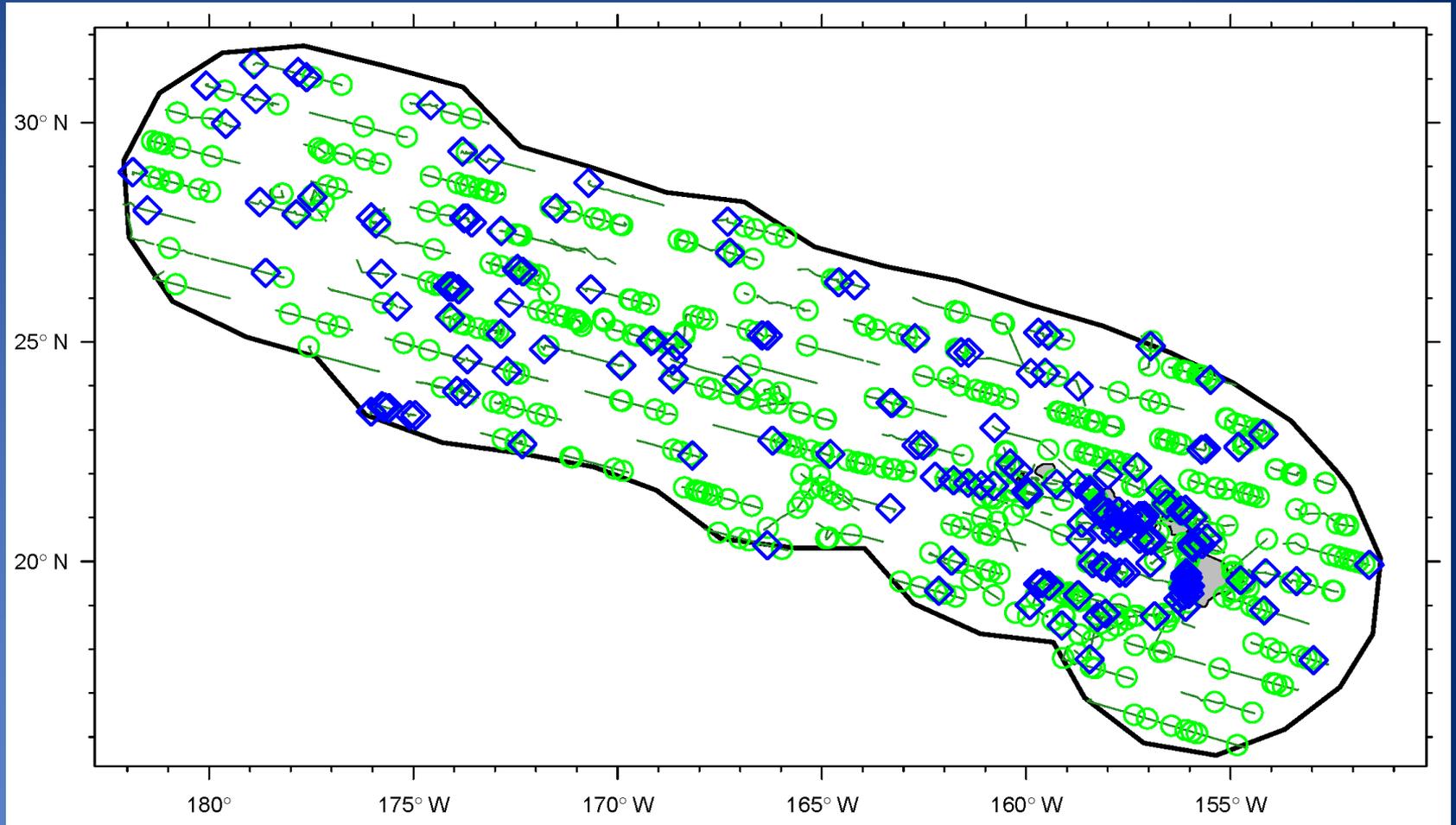


# PHASE 1:

Acoustics 19 subgroups & Visuals 18 subgroups over 19.3 nmi



# Passive Acoustic Cetacean Detections



# Seabird Observations

- At least 58 species of seabirds observed
- 10,009 sightings of 21,567 individual seabirds during strip-transect survey
- 559 feeding flocks observed
- Most commonly sighted species: Wedge-tailed and slender-billed shearwaters, sooty tern, bonin and black-winged petrels, red-footed booby, Bulwer's petrel, white tern, brown noddy, and great frigatebird

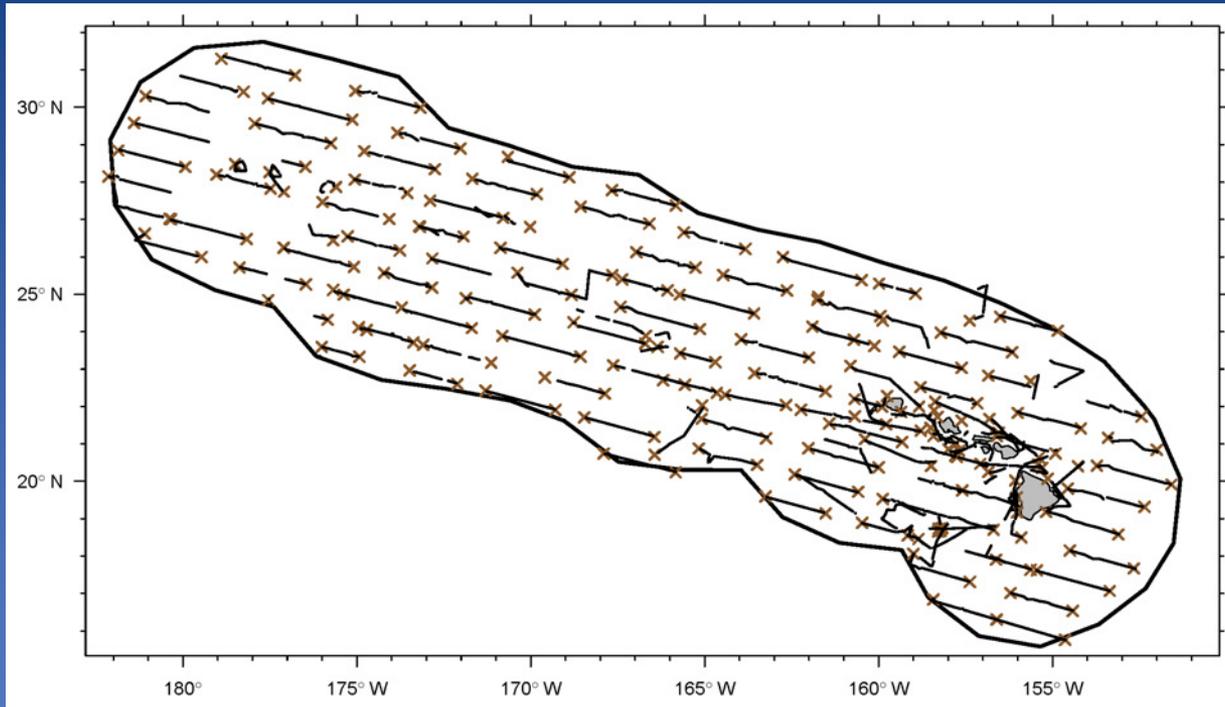


# Beyond Abundance

- Collected **ecosystem observations**: oceanographic sampling & seabird surveys
- Deployed **satellite telemetry tags** for movement studies
- Surveyed the main Hawaiian Islands using Drifting Acoustic Spar Buoy Recorders (**DASBRs**)
- Collected Unmanned Aerial System (**UAS** or **hexacopter**) imagery to assess body condition & group composition
- Collected water samples during beaked whale encounters to test ability of **eDNA** techniques for species ID
- Refurbished **Pacific Islands Passive Acoustic Network** stations at Kona, Kauai, & Pearl & Hermes Reef
- Refurbished a NOAA Ocean **Noise Reference Station**



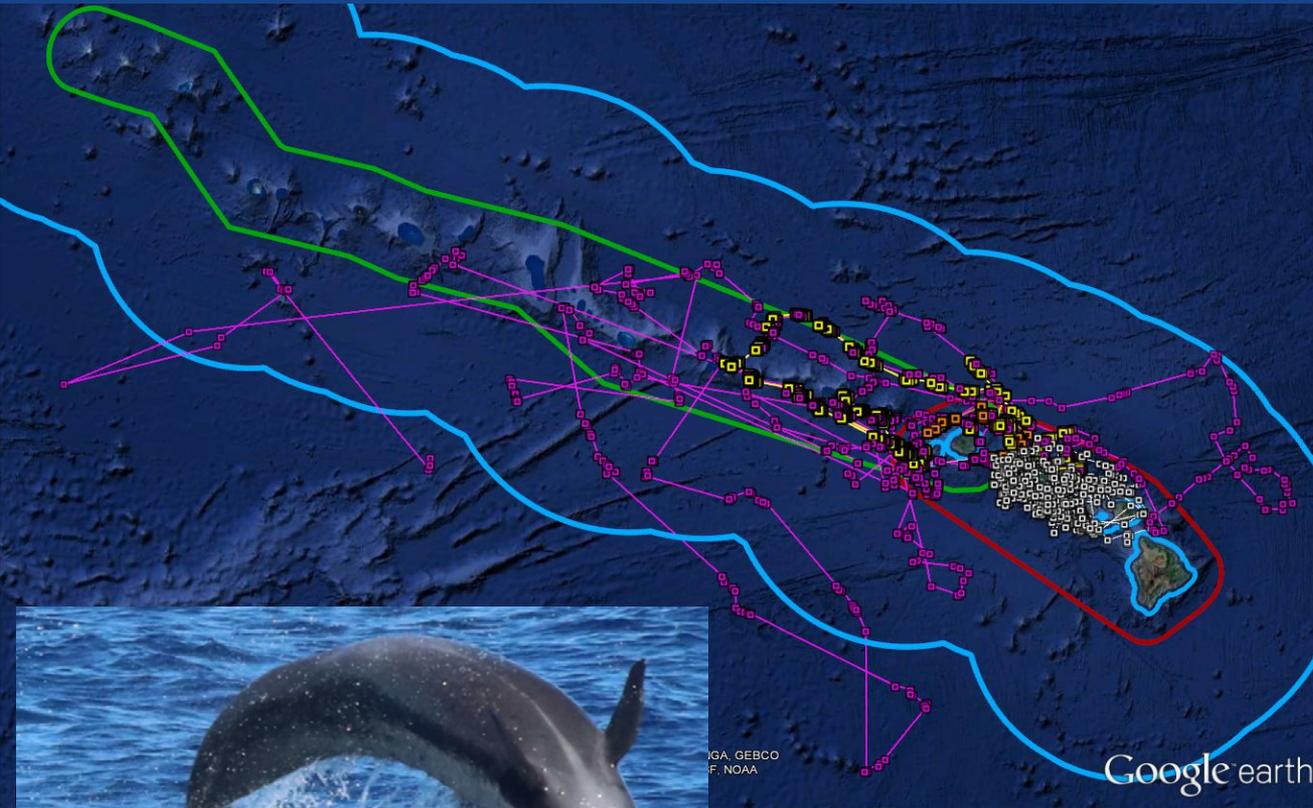
# Ecosystem Observations



- 243 CTD casts, active acoustic sampling while on-effort

# Satellite Tagging:

4 false killer whales & 3 short-finned pilot whales



IGA, GEBCO  
F, NOAA

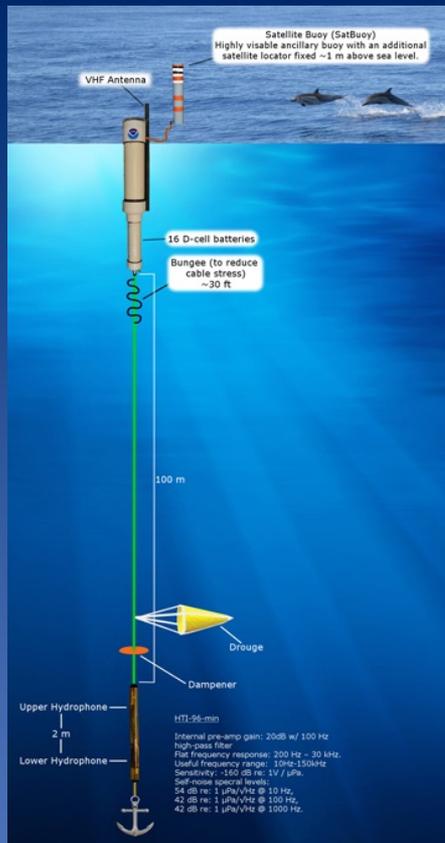


Data LDEO-Columbia, NSF, NOAA  
Data SIO, NOAA, U.S. Navy, IGA, GEBCO

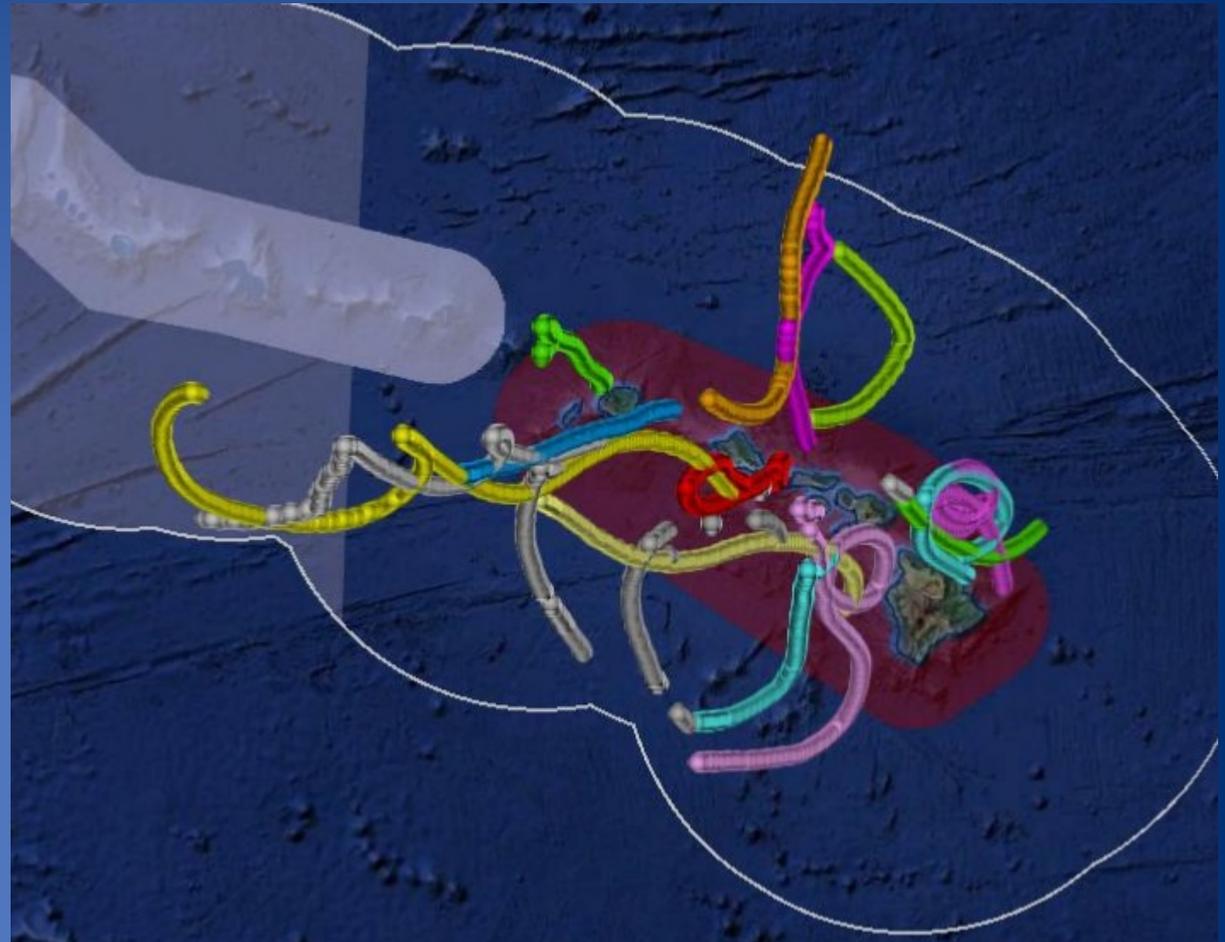
Google earth

# Surveying the MHI with DASBRs

Acoustic detection for density estimation



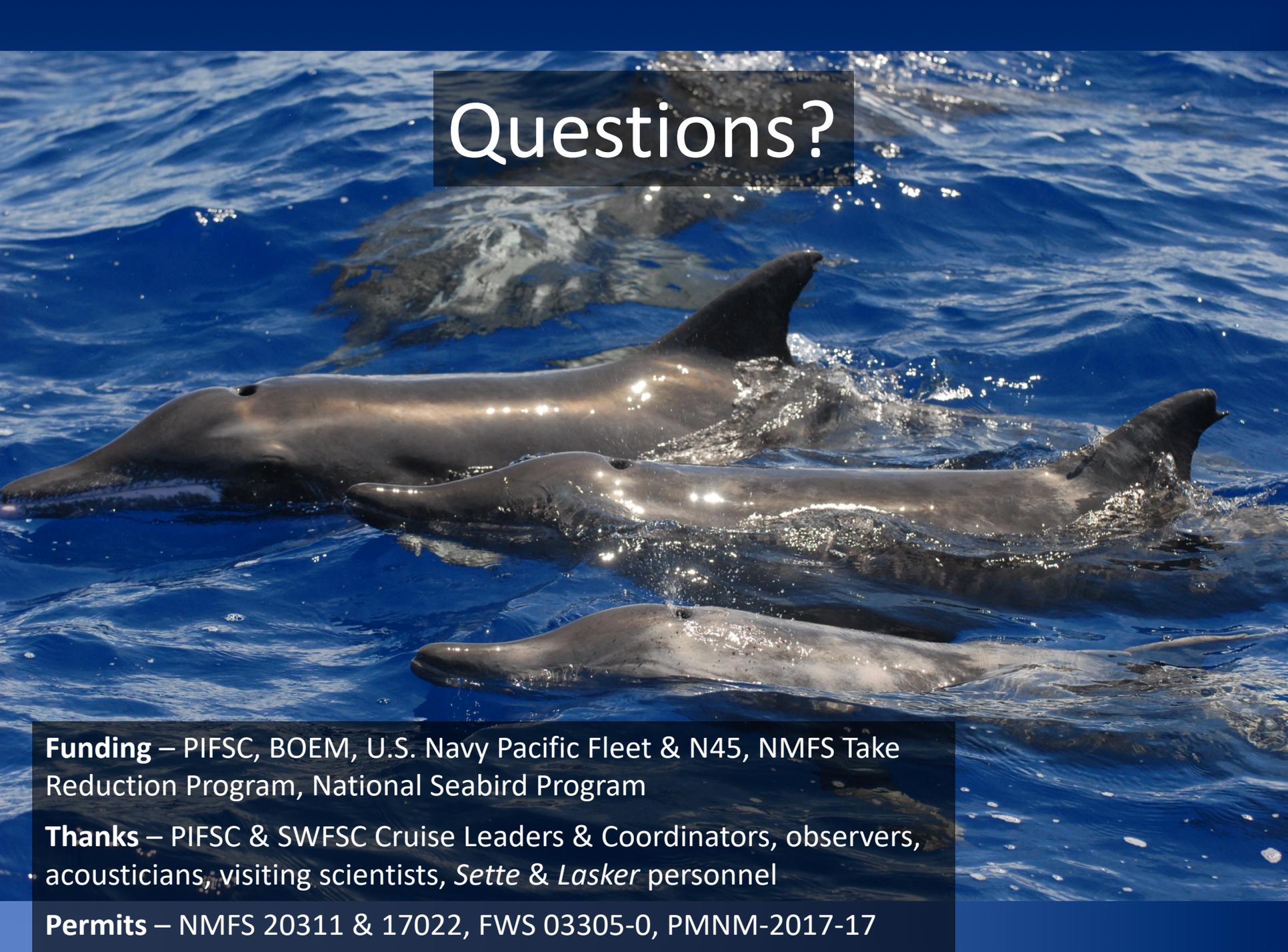
- 19 deployed, 13 recovered
- Recordings from 251 days & >6,354 km drifting trackline



# Analyses Underway

- Survey Summary Report in review
- Genetic data currently being processed at SWFSC (111 samples of 7 species)
- Photo-ID data for false killer whales being compared to CRC catalogs
- Uniform & habitat-based density models to be complete by April 2019
- Passive acoustic data being processed for species ID & false killer whale detections for trackline detection distance

# Questions?

A photograph of three dolphins swimming in the ocean. The dolphins are dark grey and sleek, with their dorsal fins visible above the water. The water is a deep blue with some white foam from the dolphins' movement. The dolphins are swimming from left to right across the frame.

**Funding** – PIFSC, BOEM, U.S. Navy Pacific Fleet & N45, NMFS Take Reduction Program, National Seabird Program

**Thanks** – PIFSC & SWFSC Cruise Leaders & Coordinators, observers, acousticians, visiting scientists, *Sette & Lasker* personnel

**Permits** – NMFS 20311 & 17022, FWS 03305-0, PMNM-2017-17