

UAS-based deployments of suction cup attached biologging tags



MARINE MAMMAL COMMISSION
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Ocean Alliance Drone Tagging Numbers

A photograph of a whale breaching the ocean surface at sunset. The whale's head and a spray of water are visible in the center. The sky is filled with vibrant orange and pink clouds, and dark mountains are silhouetted in the background. The water in the foreground shows ripples and reflects the warm colors of the sunset.

406 tagging attempts

235 successful tag deployments

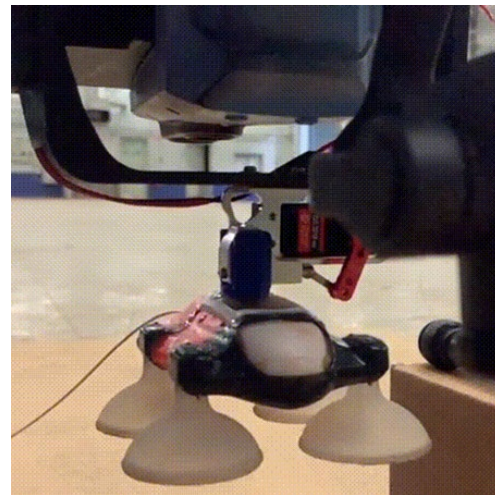
57% overall success rate

7 different baleen whale species

3 types of tags (DTAG, CATS, Acousonde)

2021 Development

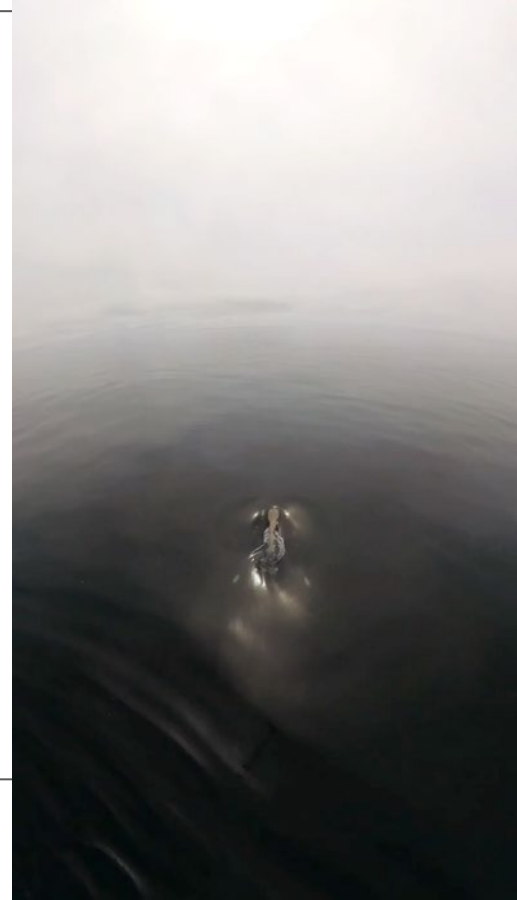
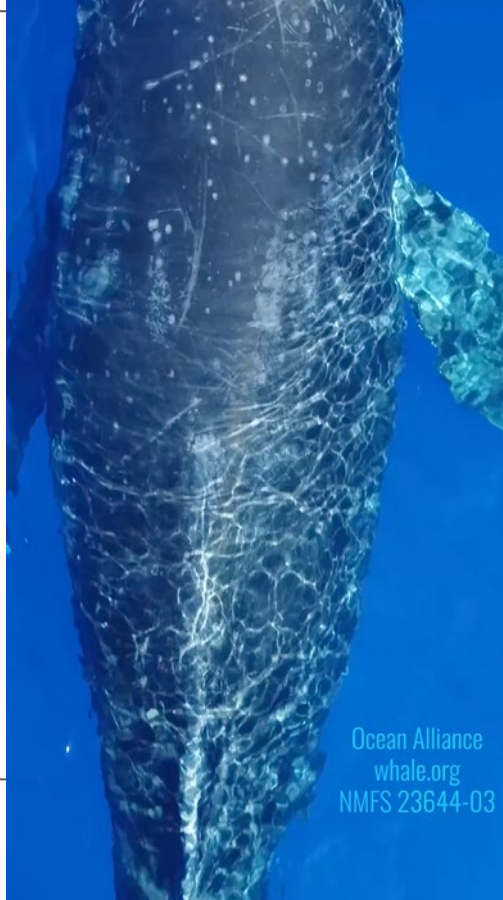
- Replicable & affordable
- Drone, tag, & species agnostic
- 3D printed add-ons for **off the shelf** drones (DJI Inspire 2 & DJI M210)
- **Single operator** for piloting and dropping



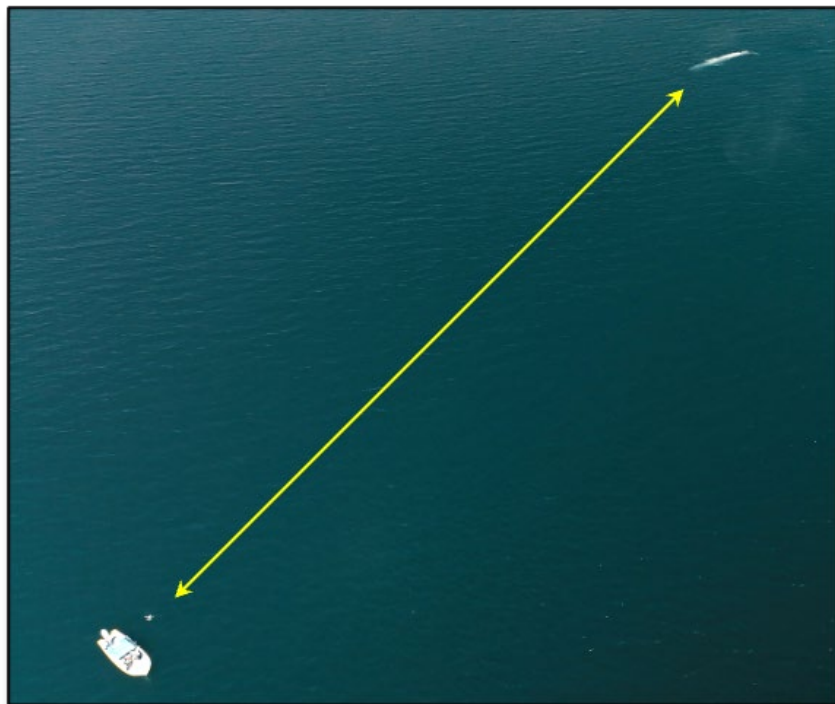




2024 Gyro Development



2022 First Field Test – benefits of UAS



value	Distance From Launch at Drop (m)	Time from Launch to Drop (mm:ss)
Mean	490.1	02:45
SD	235.8	02:15
Range	90.1 - 1048.8	00:43 - 12:20

Gulf of California Tagging 2022

21 tags deployed, blue and fin whales

Wiley et al., 2023 - <https://doi.org/10.1098/rsos.221376>

Best Use Cases of Drone Tagging

- **Hard to approach** species
- **Endangered** species
- Projects requiring **reduced vessel noise**/impact



Sei Whales – Difficult to approach



NOAA NMFS #18786-06

Gray Whales – Tagging whales in a group



Large Offshore Vessels

- Additional use case for drone based methodology
- Remove need for small boat



North Atlantic Right Whales



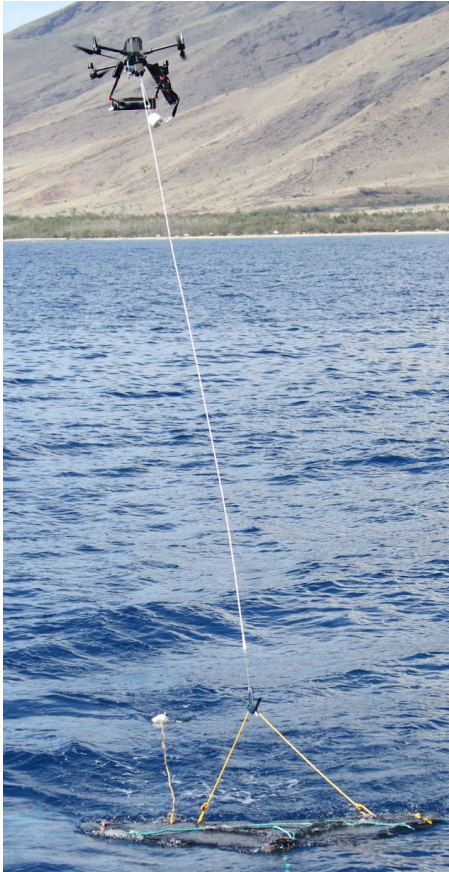
NMFS Permit 24359

Entanglements

- Minimally invasive approach to already stressed whale

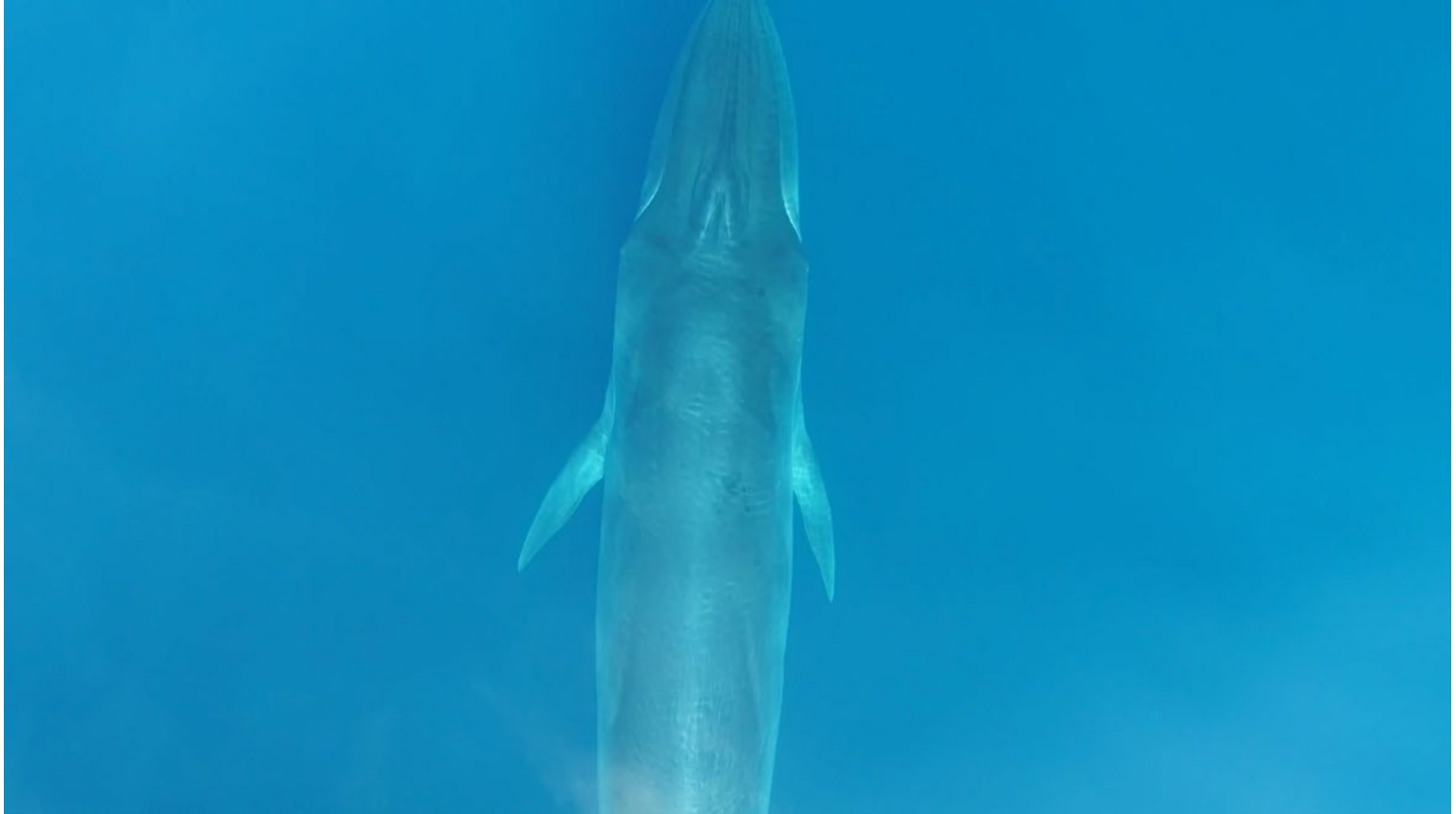


Entanglements



- Reducing number of close boat approaches
- Drone-based working lines, cutting grapples, telemetry buoys

Rice's Whales



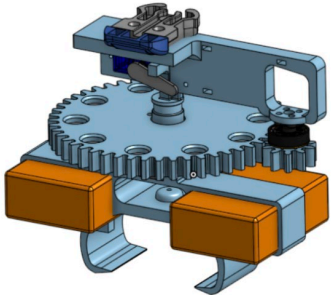
NMFS Permit 21938-04

Importance of Tag Data

- Field Metabolic Rates (FMR)
 - Measuring overall activity
 - Overall Dynamic Body Acceleration (ODBA)
 - Stroke rate
 - Breath frequency
- Noise exposure
 - Vessel disturbance
 - Behavior response to stimuli (sonars, construction, etc)
 - Auditory Brainstem Response (ABR)



Smaller Drones

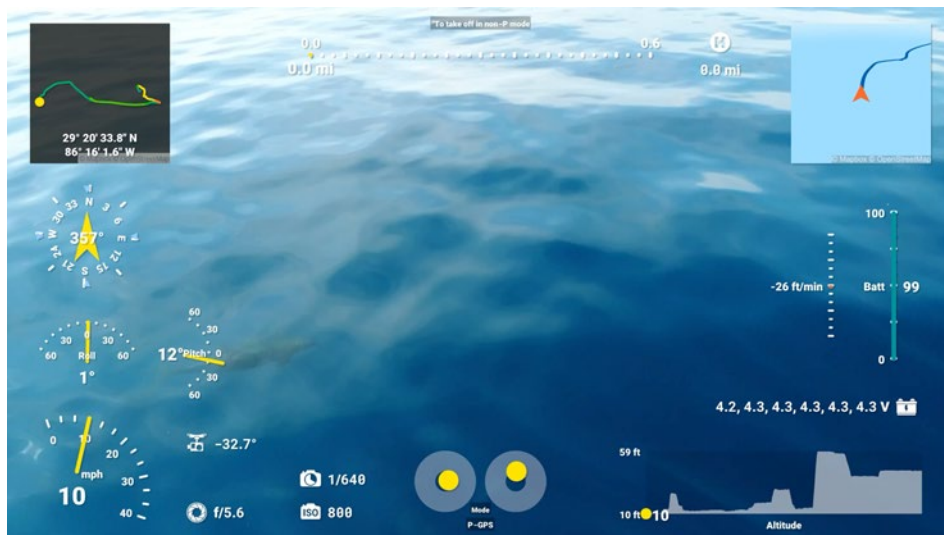


ABR



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Questions?

 @SnotBot