

Spatial use of pantropical spotted dolphins in relation to stock boundaries and environmental features in Hawai'i



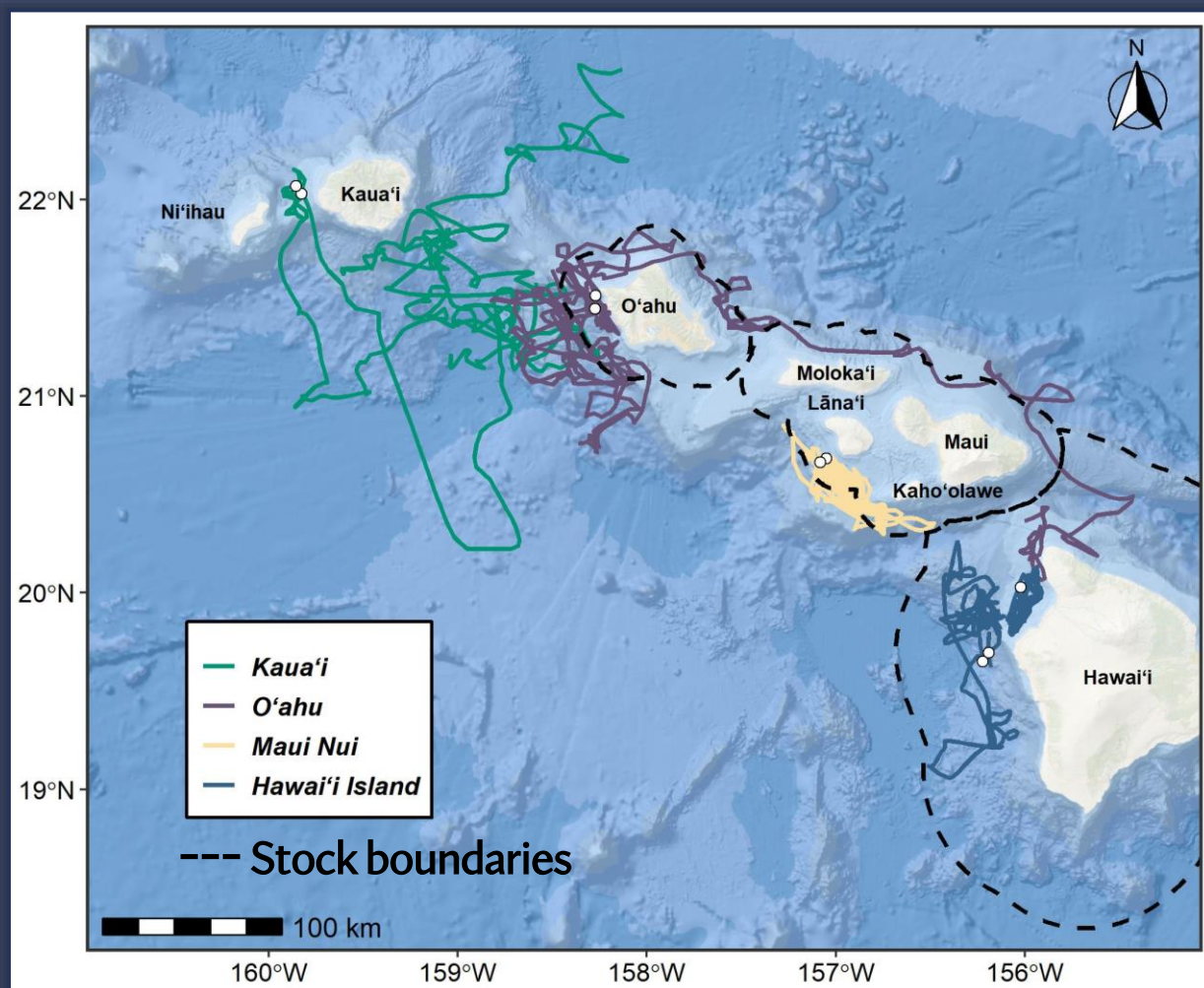
Michaela A. Kratofil^{1,2,3*}, Robin W. Baird¹, & Daniel L. Webster¹
¹Cascadia Research Collective, Olympia, WA, USA
²Department of Fisheries, Wildlife, and Conservation Sciences, Oregon State University, Corvallis, OR, USA
³Marine Mammal Institute, Oregon State University, Newport, OR, USA
 *Presenting author michaela.kratofil@oregonstate.edu



WHY IT'S IMPORTANT & WHAT WE DID

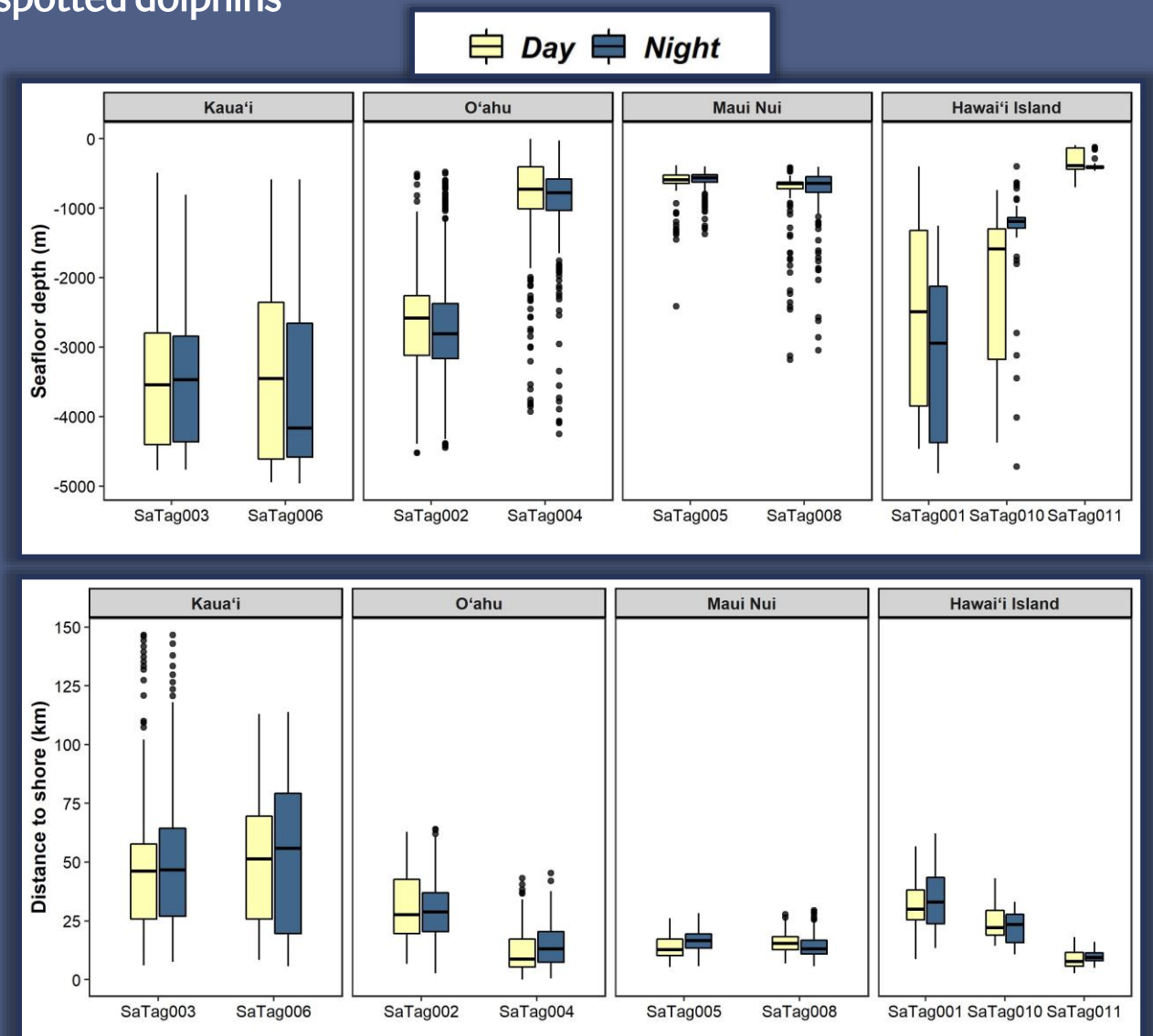
- There are 4 stocks of pantropical spotted dolphins: O'ahu, Maui Nui, and Hawai'i Island insular and 1 broadly-ranging pelagic stock^{1,2}
- Information on short-term movements and spatial use is limited, but important for: (1) **Informing stock structure and management** and (2) Understanding how their movements may relate to **risk of harmful interactions with fisheries**³
- We used state-space model-fitted location data (*crawl*⁴, 1hr time-step) from 9 satellite-tagged spotted dolphins from 2015-2022 to **examine spatial use and movement behavior** over periods ranging from 6-21 days (median = 14 days).

VARIATION IN MOVEMENT PATTERNS AND SPATIAL USE



- Pelagic (Kaua'i) and 1 O'ahu spotted dolphin moved over wide ranges (194-321 km displacement from deployment)
- Remaining insular spotted dolphins remained near their tagging location (25-81 km displacement)
- Movement behavior was generally similar among individuals (low persistence in speed and direction), although pelagic dolphins exhibited periods of higher directional persistence more frequently

- Insular dolphins used nearshore waters associated with islands slopes although exhibited some offshore movements, whereas pelagic dolphins used waters farther offshore
- Pelagic, 2 Hawai'i Island, and 1 O'ahu dolphin used deeper waters compared to Maui Nui and the other O'ahu and Hawai'i Island spotted dolphins



KEY FINDINGS & NEXT STEPS

- Current **stock boundaries are inadequate** for O'ahu and Maui Nui stocks
- Movement patterns of insular spotted dolphins support fidelity to island areas and nearshore waters, with one inter-island traveler, and variability in spatial use among and even within stocks
- Further analyses needed to examine **diel variation in spotted dolphin spatial use** (e.g., incorporating movement behavior), which has been evidenced by previous studies on dive and acoustic activity^{5,6}

REFERENCES [linked]

- 1-Caretta et al. 2021 NOAA Tech. Memo.
- 2-Courbis et al. 2014 J. Hered.
- 3-Baird and Webster, 2020 Fish. Res.
- 4-Johnson et al. 2008 Ecology
- 5-Baird et al. 2001 Can. J. Zool.
- 6-Howe and Lammers, 2021 Pac. Sci.

FUNDING & PERMITS

Funding for MAK student research was supported by NFS GRFP Award #1840998; This presentation was supported by the Oregon Gray Whale License Plate royalties to Oregon State University's Marine Mammal Institute; Data collection and satellite tag deployments were conducted under NMFS Permits #20605 and #15330 issued to RWB, and funded by Dolphin Quest, NOAA Pacific Islands Fisheries Science Center, and Navy Pacific Fleet. Photo: © Colin J. Cornforth/Cascadia Research Collective (NMFS Permit # 20605)

Presented virtually at the 24th Biennial Conference on the Biology of Marine Mammals, August 2022

Learn more about our work at <https://cascadiaresearch.org/hawaii-species/pantropical-spotted-dolphins-hawaii/>

