Demographically independent stocks of common bottlenose dolphins (*Tursiops truncatus*) in the Main Hawaiian Islands display differences in social structure

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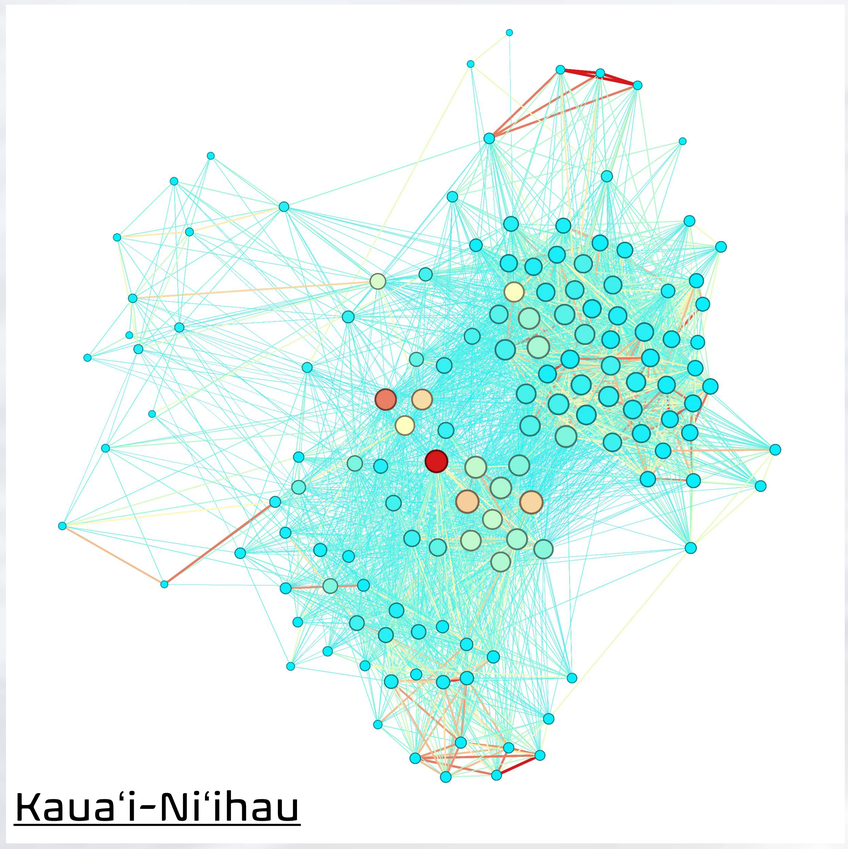
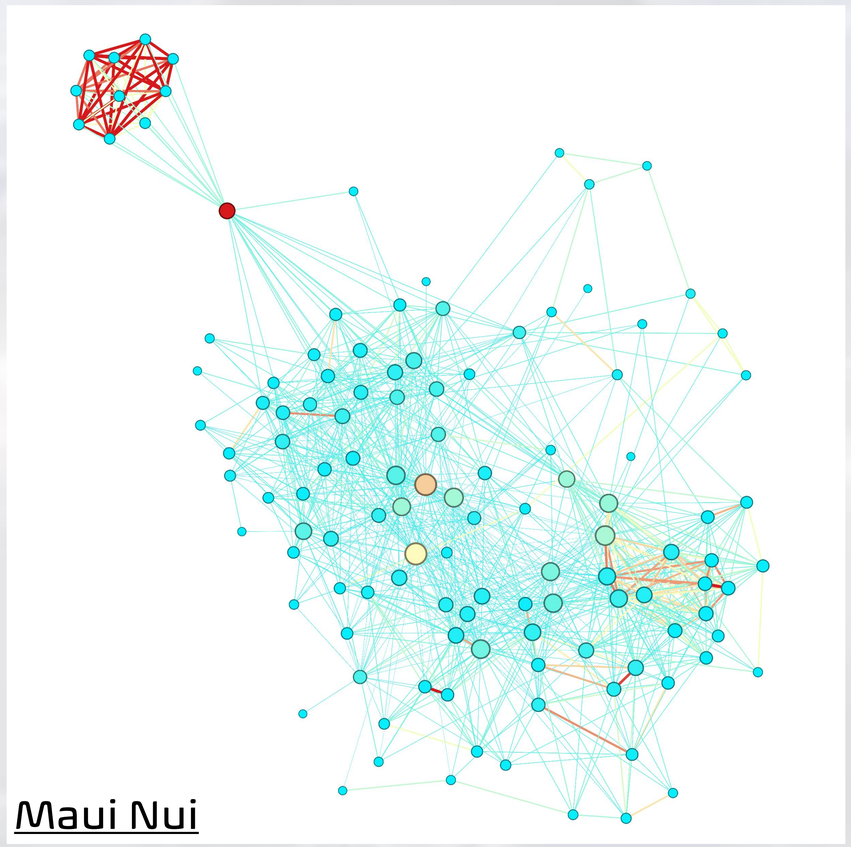


Kaua‘i-Ni‘ihau

Why is this important?

- Social structure, habitat use and movement ecology are deeply entwined in highly social species (Mann et al., 2000).
- There are four demographically independent stocks of common bottlenose dolphins (*Tursiops truncatus*) in the Main Hawaiian Islands, some of which appear to be declining (Carretta et al., 2020; Van Cise et al., 2021).
- The social structures of each stock are poorly understood.



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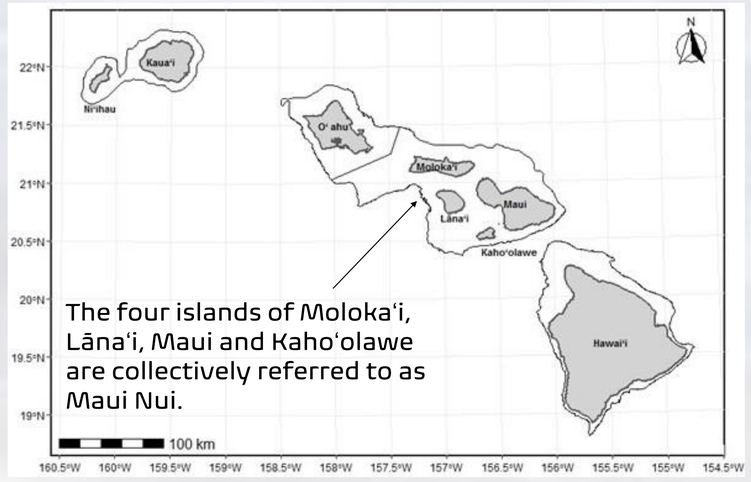
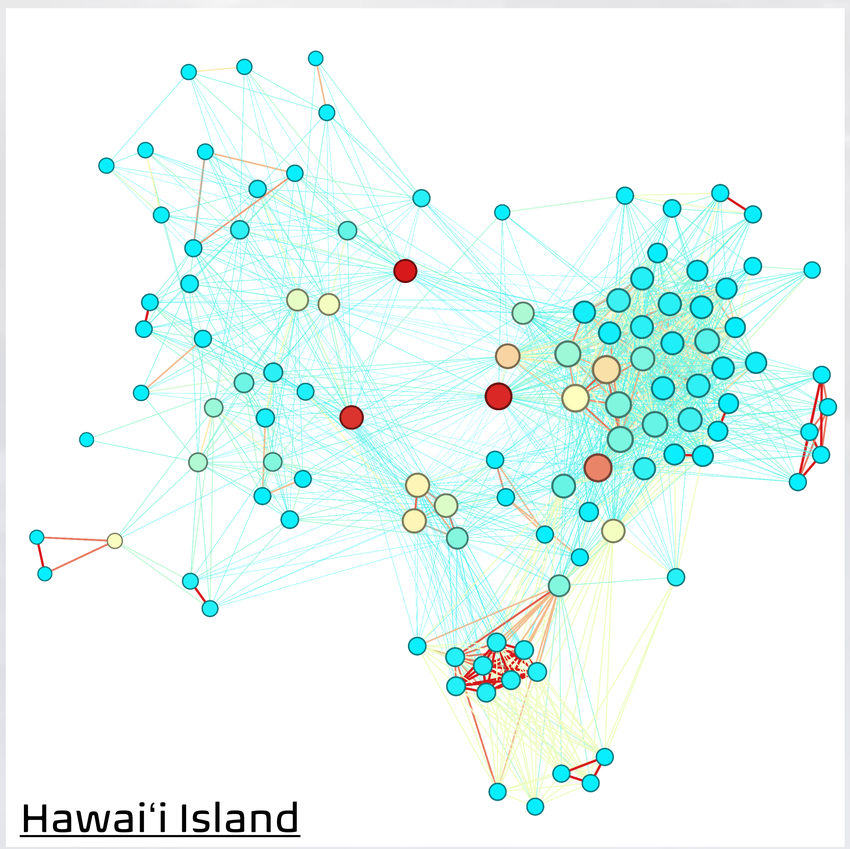


Figure 1: Common bottlenose dolphin stock boundaries in the Main Hawaiian Islands.



Hawai‘i Island

What did we do?

- We analyzed the social structure of three bottlenose dolphin stocks around the main Hawaiian Islands (the O‘ahu stock was excluded due to low sample size) (Figure 1).
- Sociograms of the three stocks were made using a Half-Weight Index of Association in SOCPROG 2.9 (Figure 2).
- Network metrics (density, modularity and degree and betweenness centralization) were used to assess network structure.
- Permutation tests were used to assess whether associations occurred at random or not.

Figure 2: Sociograms of the three stocks.

- Only animals seen at least twice are included.
- Node size increases with number of associates (degree).
- Node colour ranges from blue to red the more important the animal is to maintain network cohesion (betweenness centrality).
- Link colour ranges from blue to red the stronger the association between the two individuals.

What did we find?

- The Kaua‘i-Ni‘ihau network is denser, less fragmented and less centralized than the other two.
- Permutation tests found that associations are not random in all three stocks.

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Acknowledgements

Data collected under NMFS permits 926, 731-1509, 731-1774, 15330, and 20605 (issued to RWB) and 13427, 18101 and 21321 (issued to PWF). Field work was funded from a variety of sources including the US Navy (PACFLT, LMR, ONR), NMFS (PIFSC, SWFSC, BREP), and PWF supporters. We would like to thank many community scientists for photos, interns and volunteers who aided in photo-ID matching and data processing, and Sabre D. Mahaffy and Thibaut Bouveroux for their advice and aid in the analysis process.

Poster presented at the 24th Biennial Conference on the Biology of Marine Mammals, West Palm Beach, FL, USA, August 2022

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