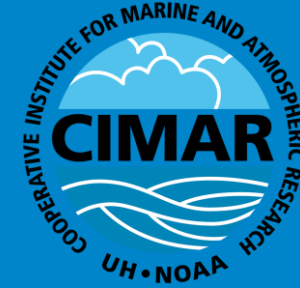




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Incorporating spatially explicit sociocultural values in marine management for West Hawai'i

Kirsten M. Leong, 'Alohi Nakachi, and Kirsten L.L. Oleson
Marine Socio-Ecological Systems Symposium
Yokohama, Japan June 6, 2024

NOAA Fisheries Mission

NOAA Fisheries is responsible for the stewardship of the nation's ocean resources and their habitat. We provide vital services for the nation, all backed by sound science and an ecosystem-based approach to management:

- Productive and sustainable fisheries
- Safe sources of seafood
- Recovery and conservation of protected resources
- Healthy ecosystems



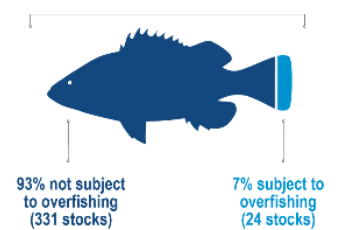
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NOAA Priorities Based on Annual Reporting

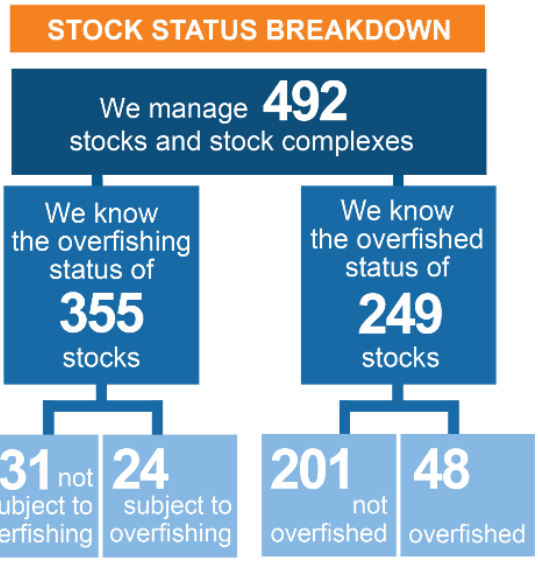
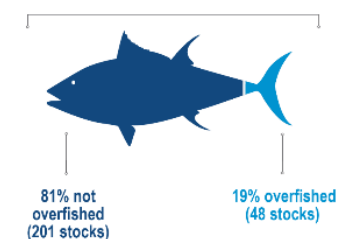
Annual Status of US Marine Fisheries

- Status of the stocks
- Fisheries of the United States
- Fisheries Economics of the United States

355 Stocks with Known Overfishing Status



249 Stocks with Known Overfished Status



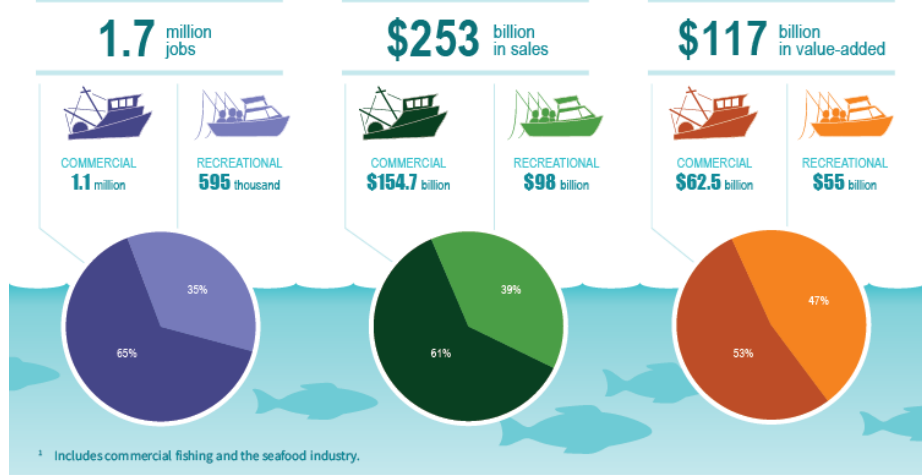
U.S. Commercial Fisheries and the Seafood Industry

Landings and Values, 2020
National Totals



U.S. COMMERCIAL AND RECREATIONAL FISHERIES

Economic Impacts, 2020



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National Standards and Social Outcomes

NS 1 - Optimum Yield

...the amount of fish that will ***provide the greatest overall benefit to the Nation***, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems...

NS 8 - Communities

Conservation and management measures shall...***take into account the importance of fishery resources to fishing communities by utilizing economic and social data***...to:

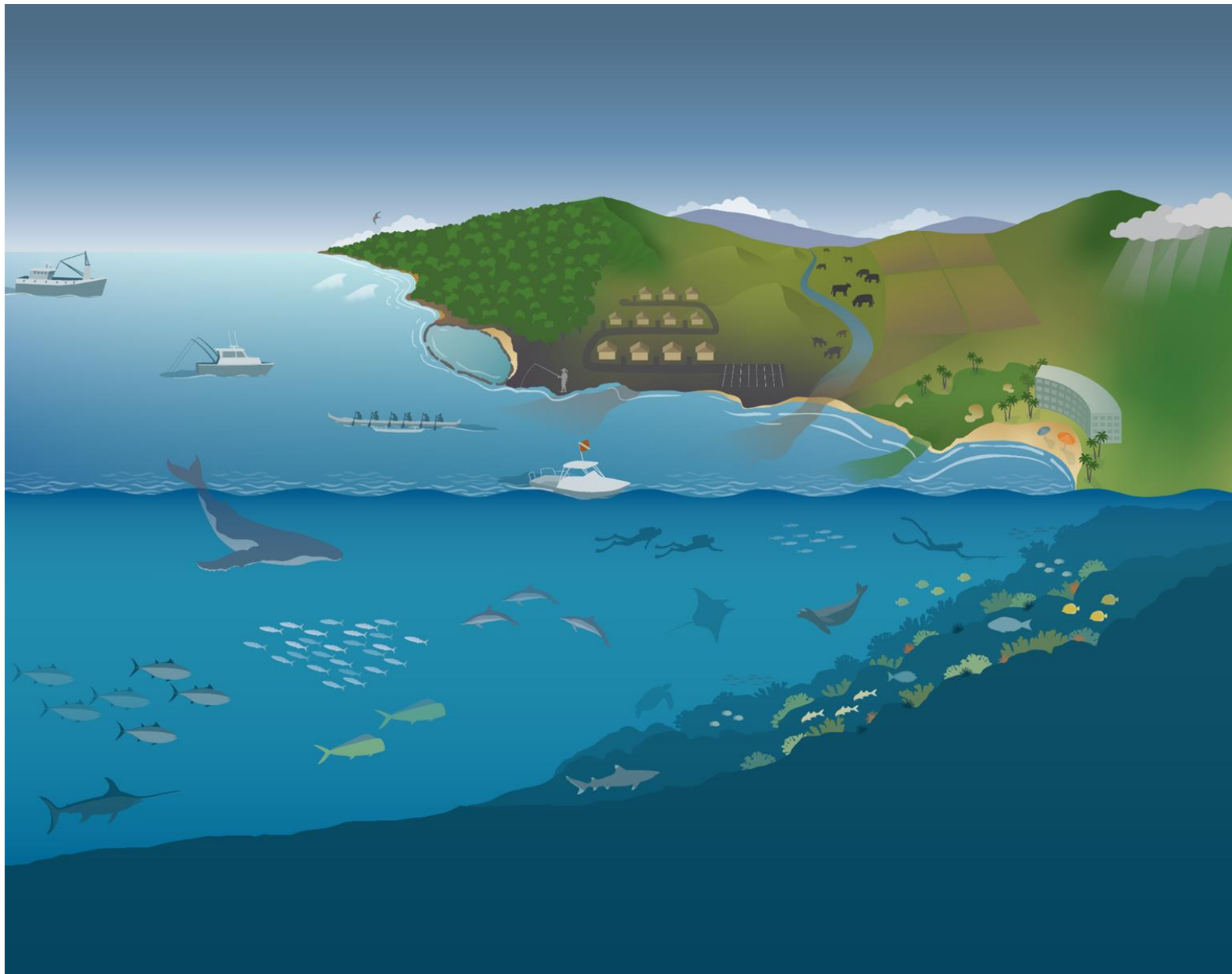
- 1) Provide for the sustained participation of such communities; and
- 2) To the extent practicable, minimize adverse economic impacts on such communities

EBFM Road Map: ***Maintain resilient ecosystems***, evaluate ***community well-being***

How can these ideas be represented spatially?



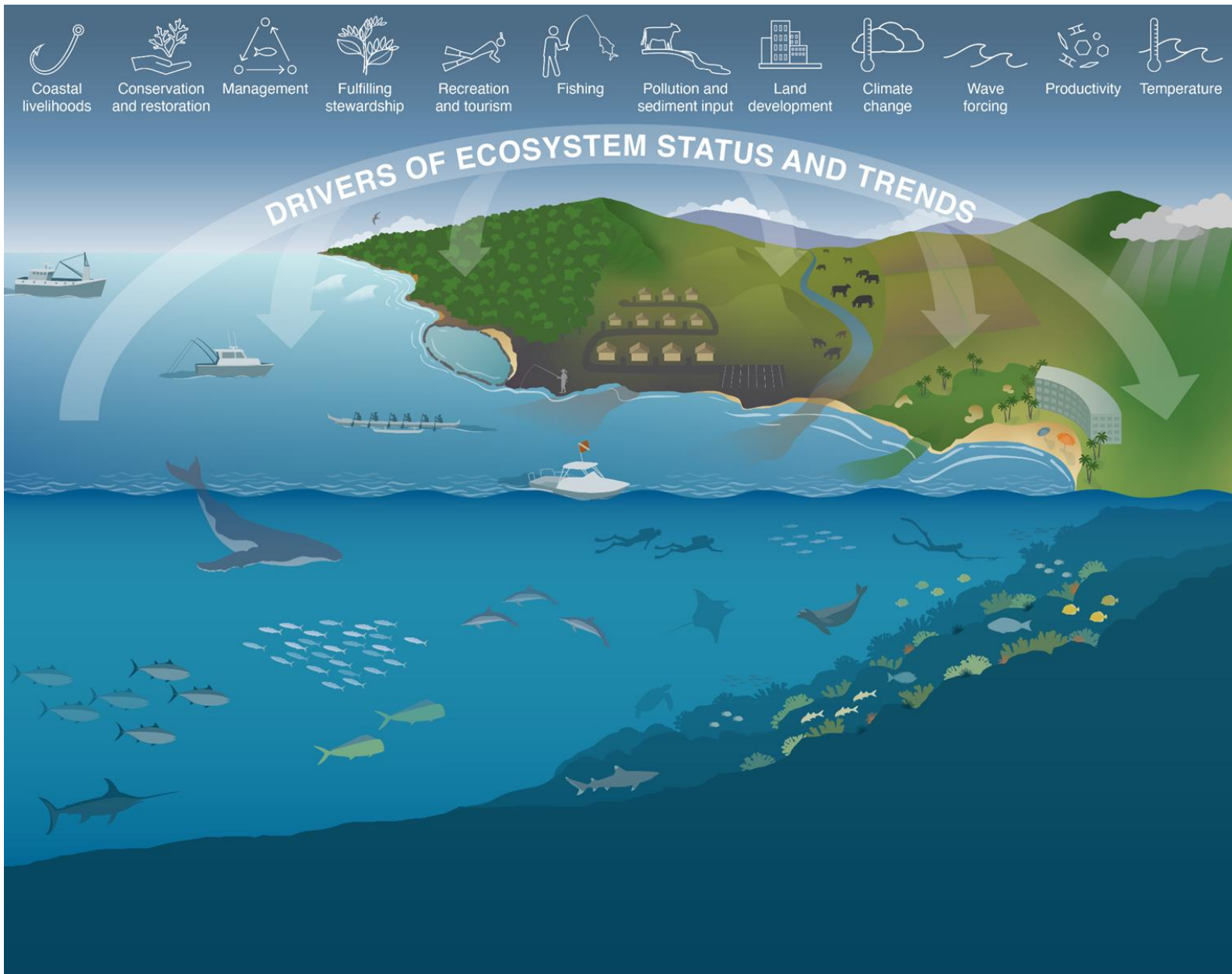
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Conceptualizing social-ecological systems

Often focuses on:

- Tangible ecosystem elements
- Human activities



Conceptualizing social-ecological systems

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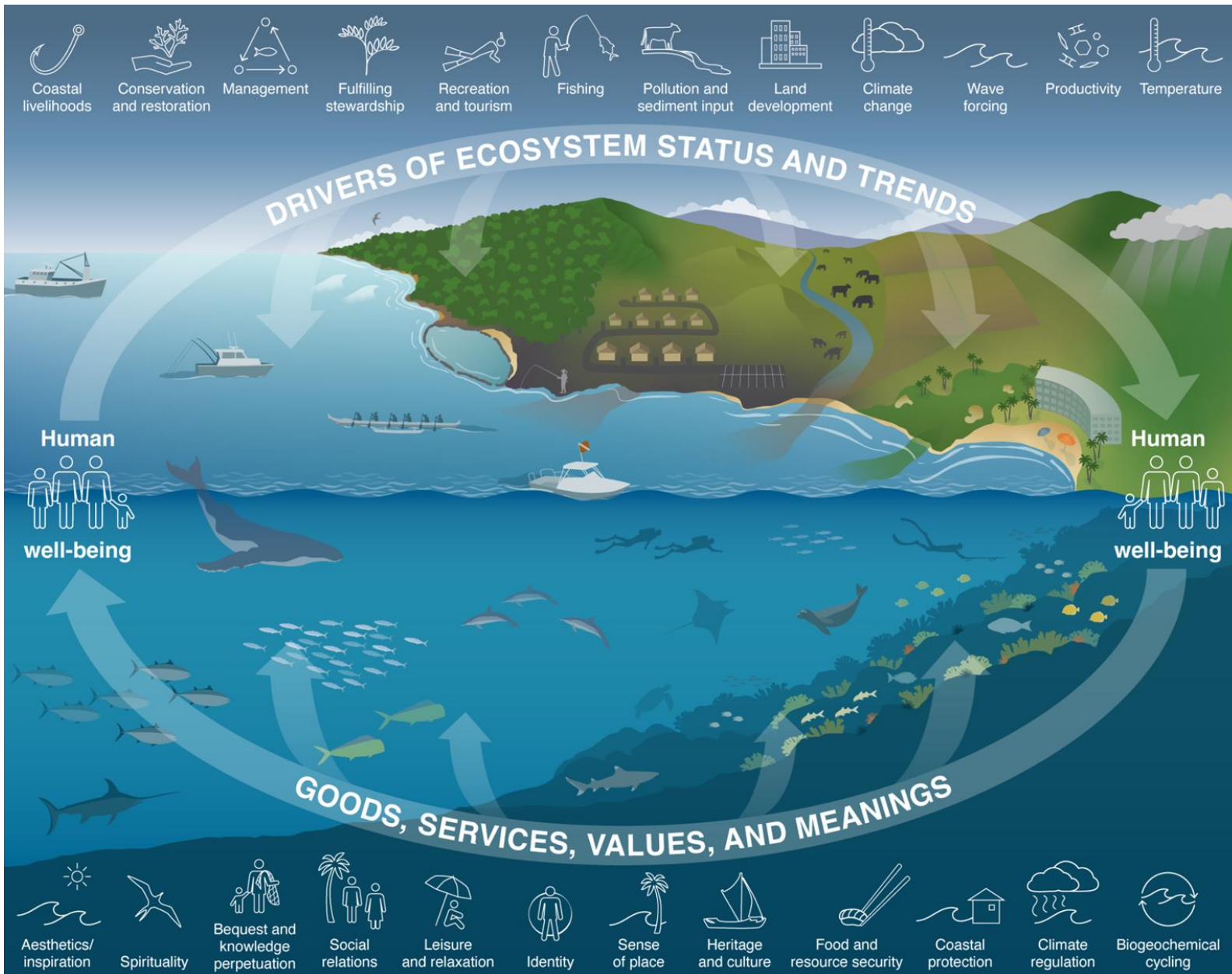


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Human dimensions and spatial planning

- Mapping areas of different types of use
- Focus on intensity and compatibility of uses
- Sensitivity of sacred spaces, proprietary fishing spots, etc.





Conceptualizing social-ecological systems

Often focuses on:

- Tangible ecosystem elements
- Human activities

Goods, services, values, and meanings (cultural ecosystem services) are underrepresented



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Cultural ecosystem services (CES)

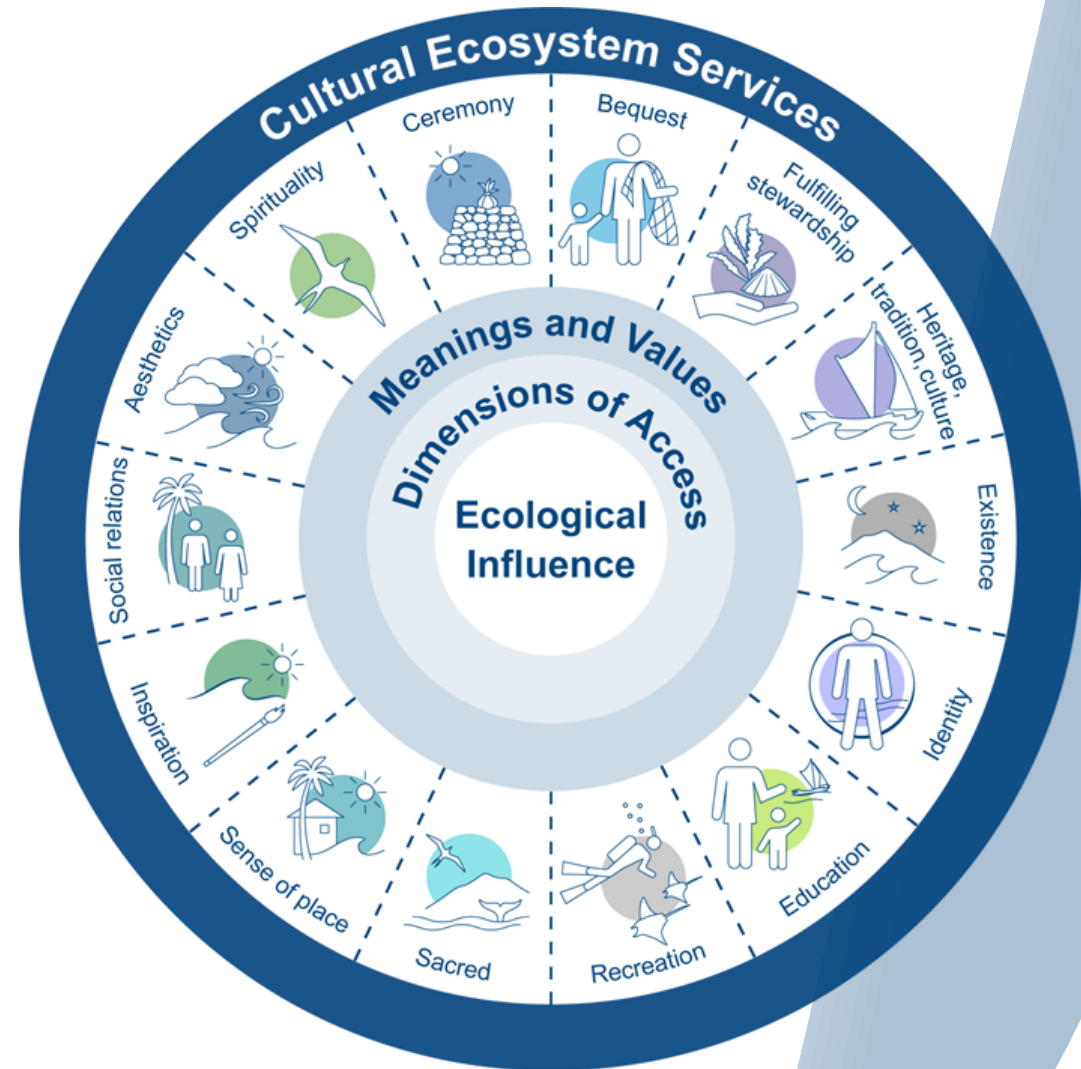
- Millennium Ecosystem Assessment category for ecosystem services
- “Nonmaterial benefits of nature”, often equated to unmeasurable
- Concerns they will be left off of maps used for spatial planning



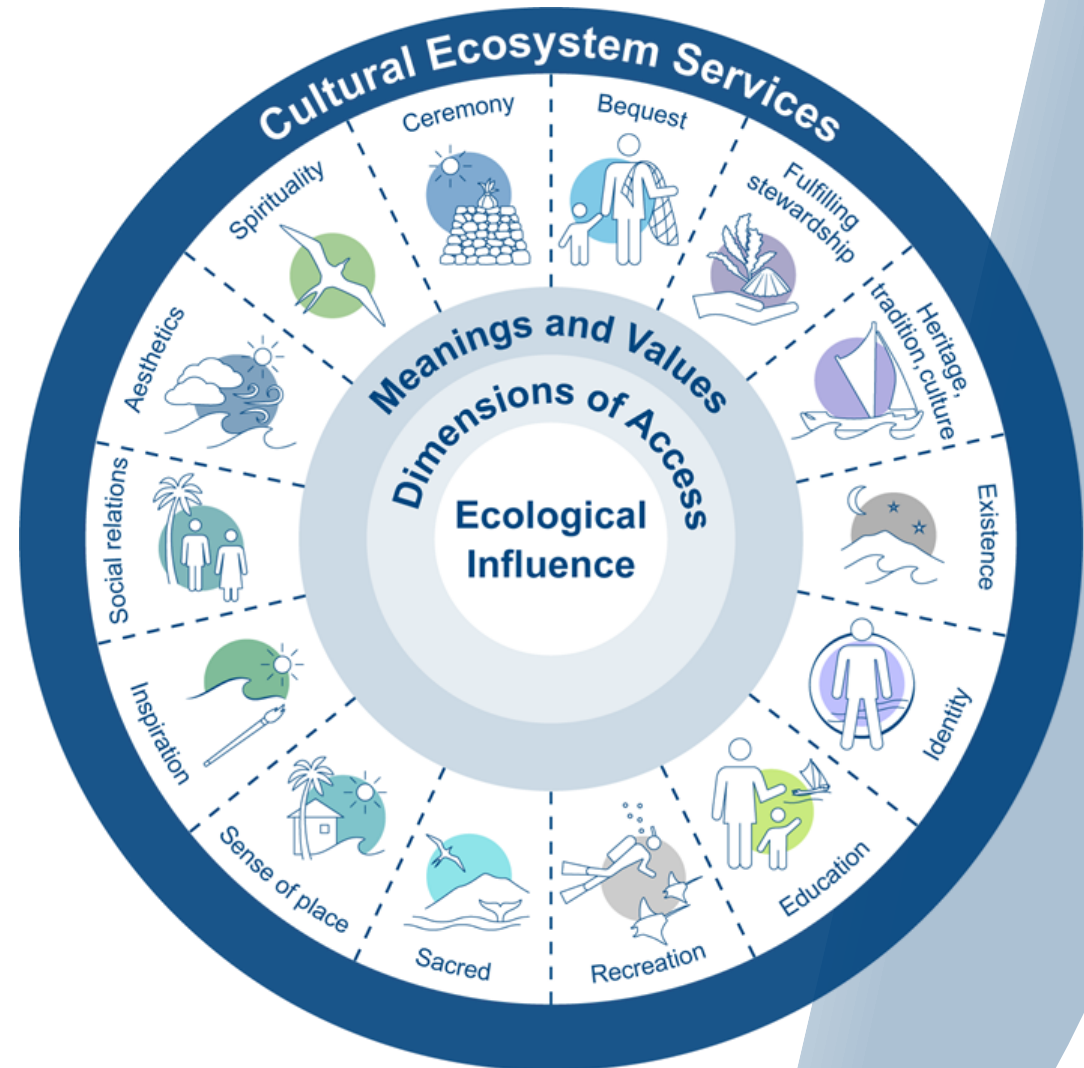
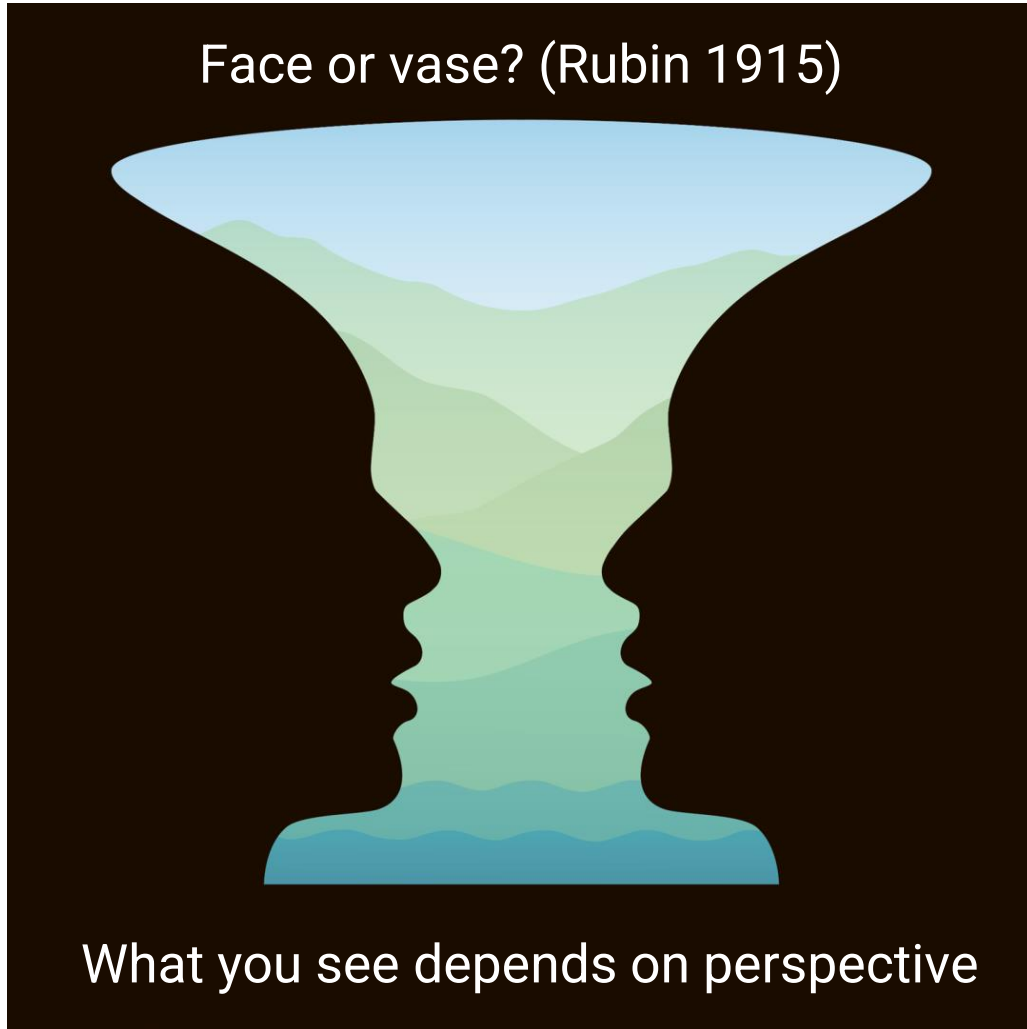
CES and multiple worldviews

Previous work illustrated multiple factors that together comprise CES:

- ecological components
- access or interactions
- meanings and values



CES and multiple worldviews



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Innovations needed to improve spatial representation of social values

1. elicitation of the underlying meanings of cultural ecosystem services,
2. reframing the research question to focus on spatial representation of reciprocal values, and
3. recognizing the limitations of scaling analyses between place-based values and practices to large marine ecosystem dynamics.



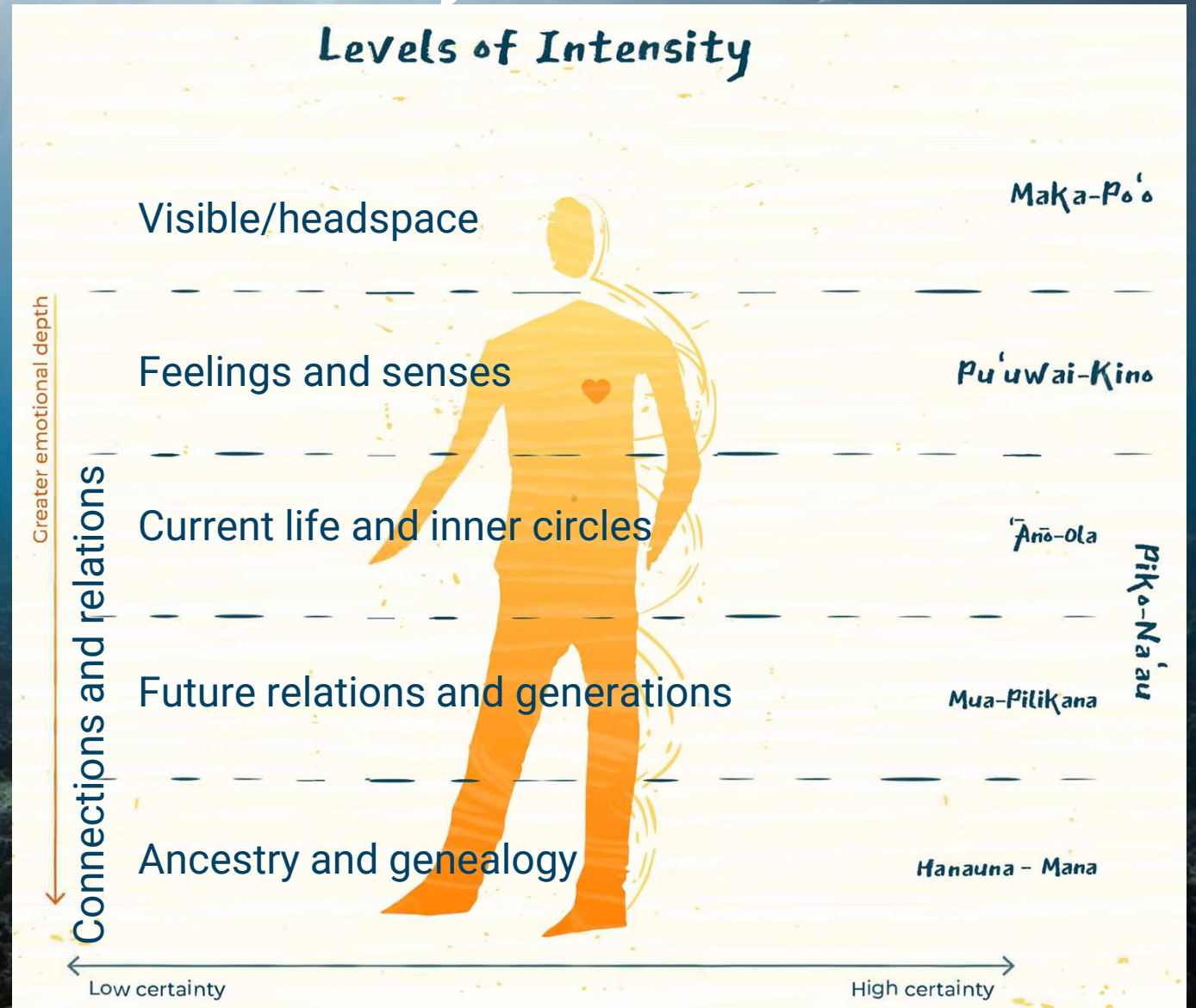
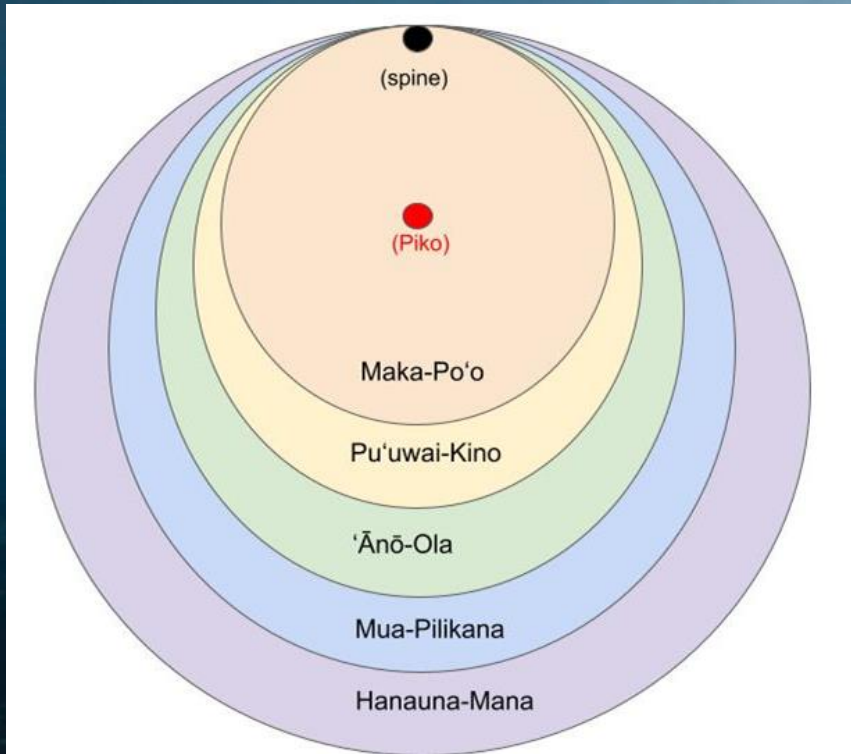
Methods: two-eyed seeing approach



Indigenous
Native
Hawaiian
Worldview

CES Frameworks
Economic Valuation
Environmental
Psychology
Relational Values

Results: the levels of intensity elicitation tool



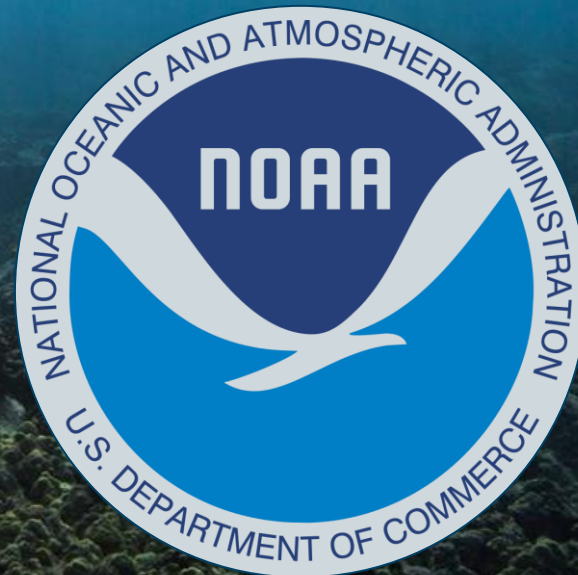
Methods: Deliberative workshops

9 deliberative workshops
workshops between January
June 2021

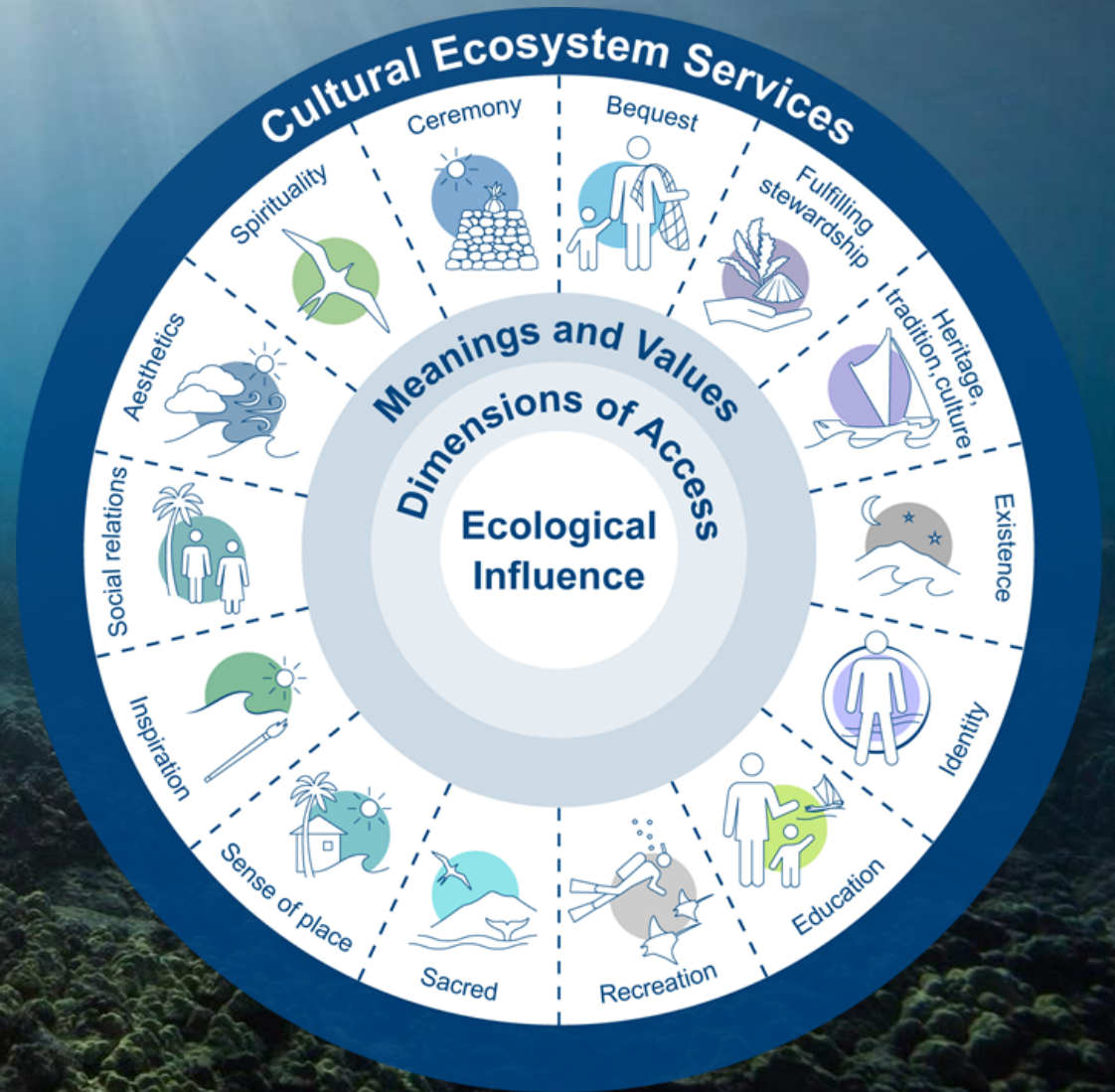
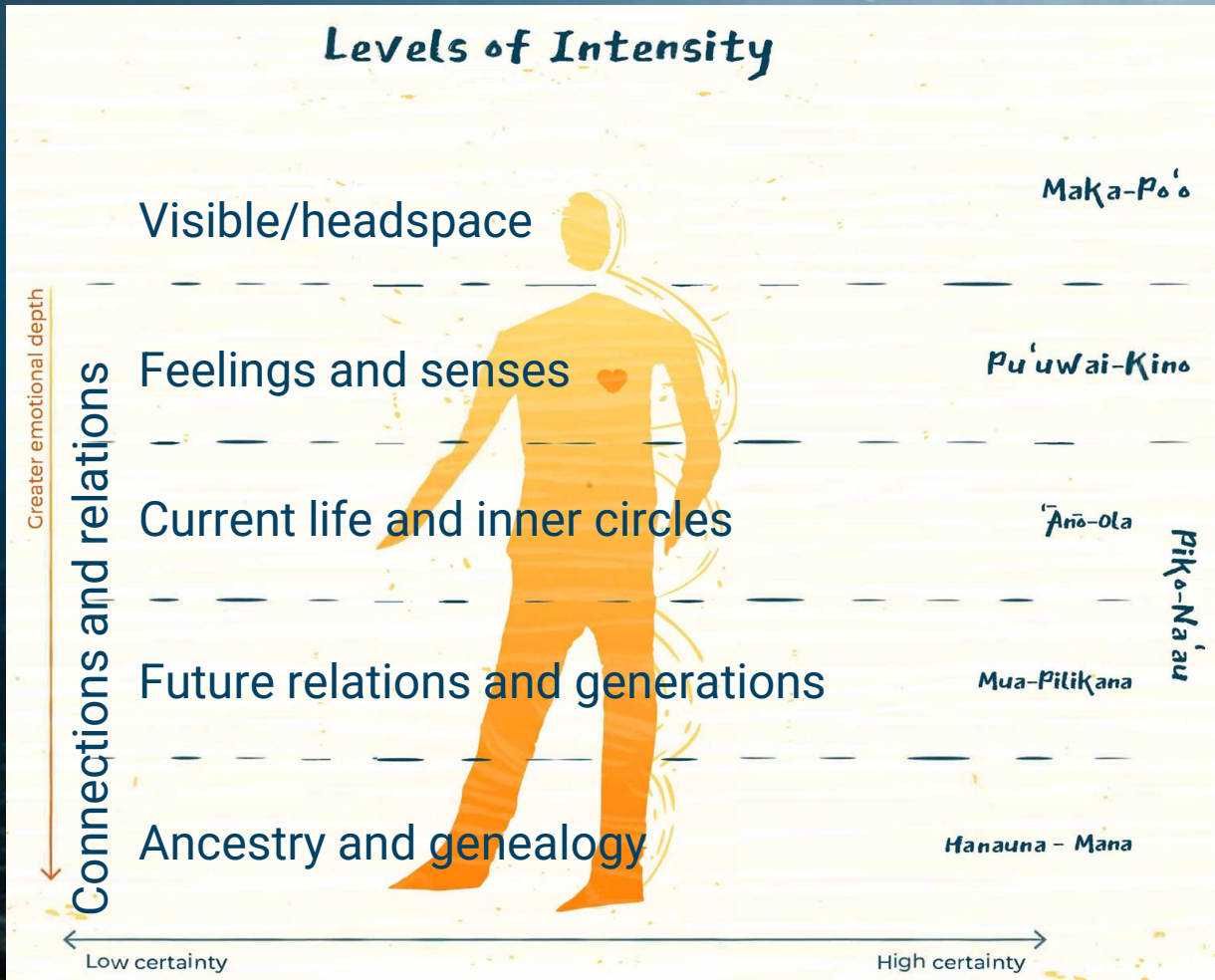


56 participants

Management agencies and
management engaged groups



Methods: Deliberative workshops



Method: Key Informant Interviews

Key informants: Native Hawaiian
Knowledge holders

Perceptions and relationships of
kuleana

Voluntary participatory mapping

15 interviews with 24 participants

kuleana / kule.ana /

nv., [Right](#), [privilege](#), [concern](#), [responsibility](#), [title](#), [business](#), [property](#), [estate](#), [portion](#), [jurisdiction](#), [authority](#), [liability](#), [interest](#), [claim](#), [ownership](#), [tenure](#), [affair](#), [province](#); [reason](#), [cause](#), [function](#), [justification](#); small piece of property, as within an ahupua'a; blood relative through whom a relationship to less close relatives is traced, as to in-laws.

> Examples:

- > Make wale nō lākou me ka hewa 'ole, a me ke kuleana 'ole no ka make (Kep. 147), they were killed without having done wrong, and without justification for death.
- > 'O Hina kō mākou kuleana, 'a'ole 'o ke kāne, we are related through Hina, not through the husband.
- > 'Elua lo'i 'ai, ua kuleana 'ia e a'u, two taro patches claimed as kuleana by me [will].

> Related:

- > Kuleana lako, supplies, equipment.
- > Kuleana pule, necessary prayers, prayer responsibilities.
- > Ke kuleana o ke kanaka, man's rights and privileges, [human rights](#).
- > Kuleana wai, water rights.
- > Ka ho'olimalima kuleana kū'ai, rental with the right to buy.
- > Kō ha'i kuleana, other persons' affairs or business.
- > Kuleana ala hele e hiki aku ai, right of way of access.
- > Kuleana hapakolu o ka wahine kāne make, dower right of widow to a third of an estate.
- > Kuleana o ke kāne male, estate by courtesy, of a husband's right in the estate of his wife.
- > **ho'okuleana** *Caus/sim.*; To entitle, give right to possess; to give a responsibility.
 - > Palapala ho'okuleana, patent, copyright.

Results: Types of Kuleana

Mo'olelo/wahi pana: storied places

'Ohana/mo'okū'auhau: family and genealogy

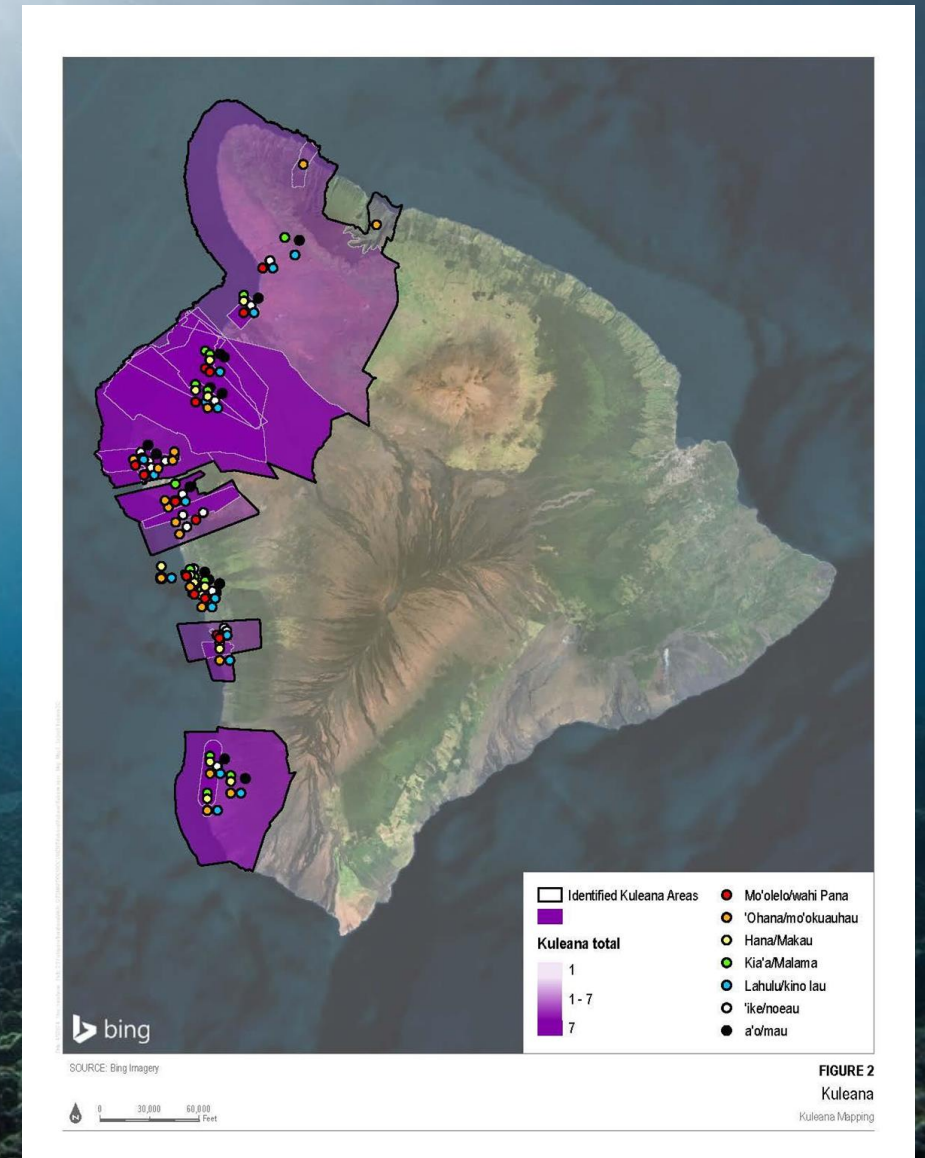
Hana/mākau: skills and callings

Kia'i/mālama: protecting and caring for

Lāhulu/kino lau: species, embodiments of gods

'Ike/no'eau: art and knowledge of cultural practices

A'o/mau: perpetuating knowledge



Results: Threats, impacts, and considerations to kuleana

Climate/ecological change

Land development

Economics and money

Management

Food security and land planning

Tourism/foreigners

Colonization

Perpetuation



Source: Caleb Jones



Source: Autumn Ness



Source: OHA



Source: Joe Hong

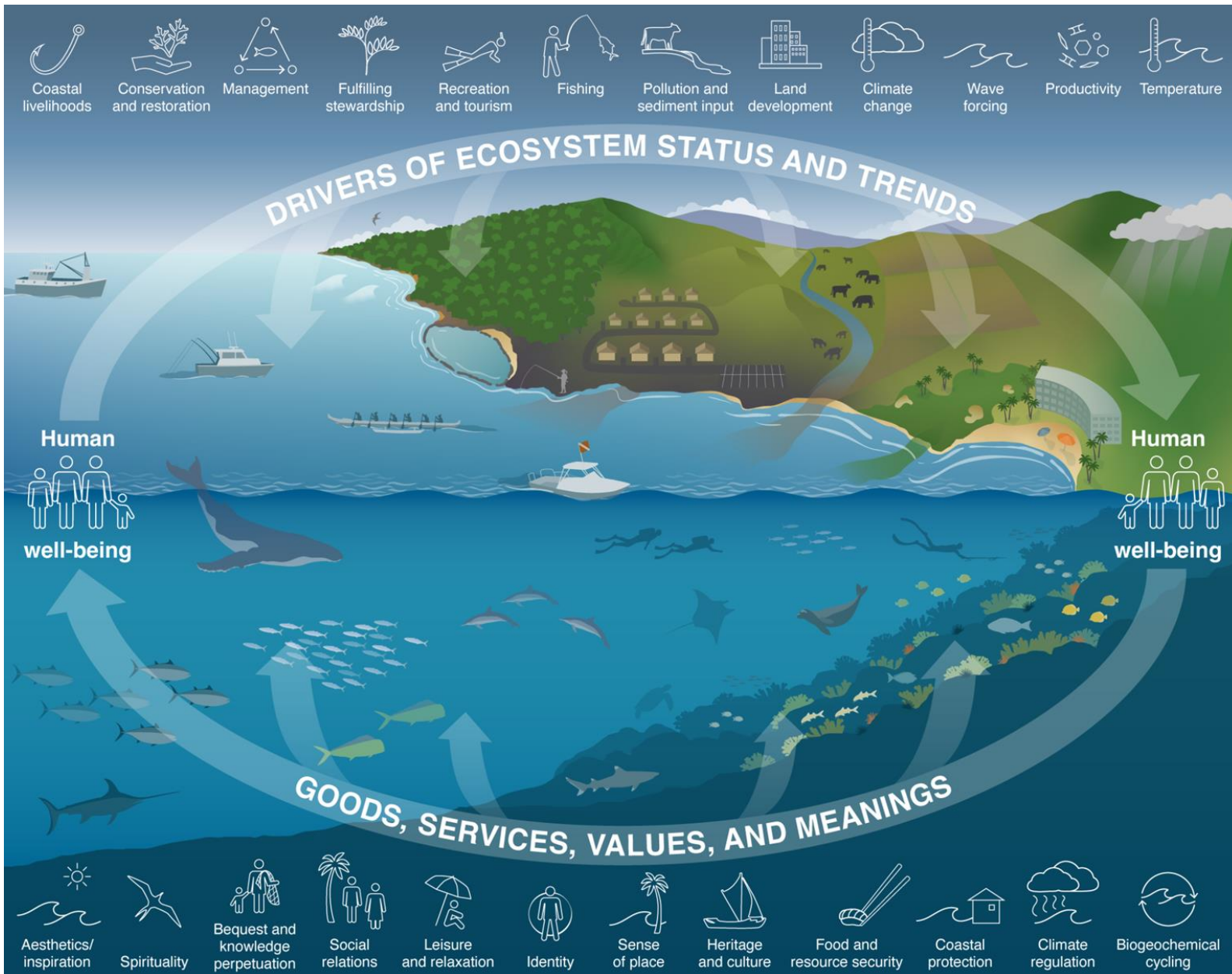
Scaling up

How can these insights be applied to broader geographies?

- Reviewed existing structured surveys and participatory mapping methods
- Synthesized into a “question bank” for pre-approval
- Developed draft survey questions for future testing

Why are the various interactions with or meanings of the surrounding environment [or X environment] important to you, your family, and/or your community?

- They are important to my sense of self and personal identity
- They are important to my familial, cultural, or community identity
- They are important to build or maintain my connections with other humans
- They are important to build or maintain my ancestral connections
- They are important to build or maintain my cultural or spiritual connections
- They are important to build or maintain my connection with places and/or elemental and natural forces
- They are important to build or maintain my connections with other more than human beings
- They are important to build or maintain specific practices and activities
- They are important to my mental and physical well-being
- They are important to elicit emotions, thoughts, and feelings
- They are important for future generations
- They are not important
- Other_____



Insights and questions

- Mapping connections is possible!
- Activities can have multiple meanings
- How to emphasize non-material meanings on maps?



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Questions?

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