



**NOAA
FISHERIES**

**Northwest
Fisheries
Science Center**



Spatial concerns in the use of social data to assess fishing communities for the California Current marine ecosystem

Karma Norman, Connor Lewis-Smith
(and many others)

June 6, 2024 MSEAS



Space...*the final frontier*



Community Social Vulnerability Indicators Tool

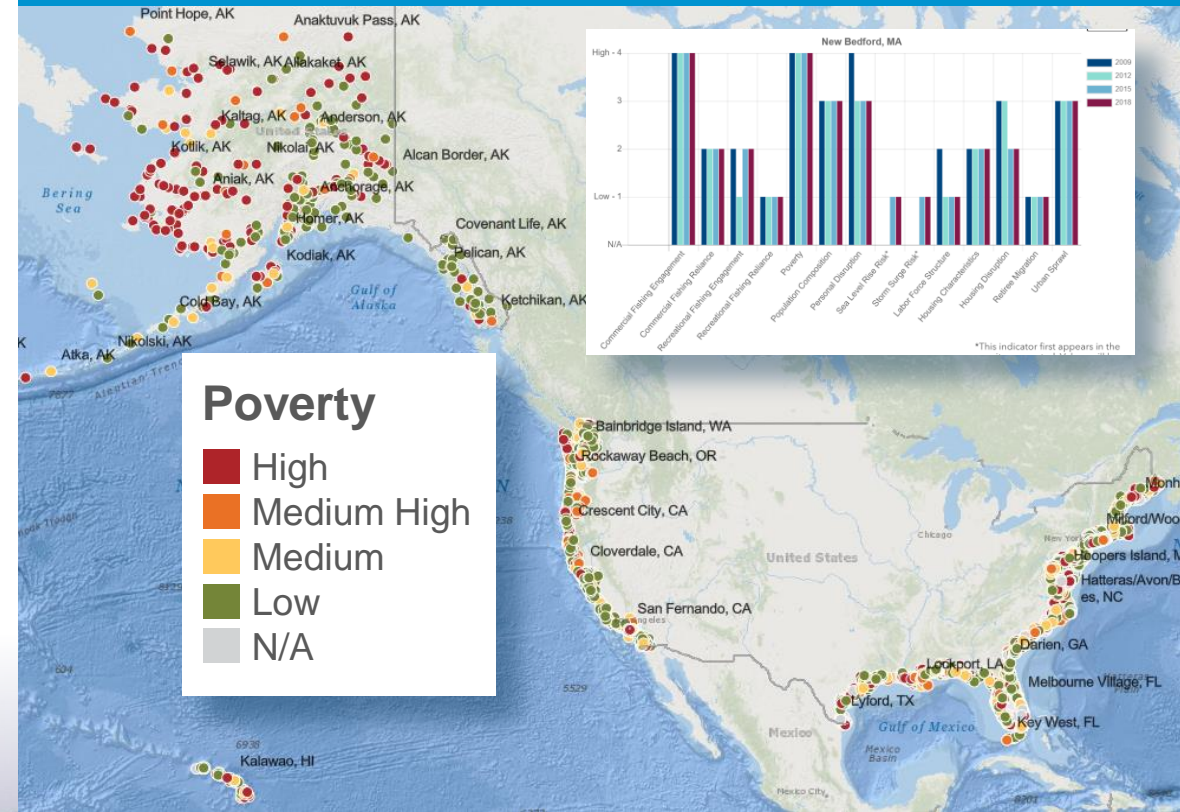
14 indicators | 24 states | 4,600 communities

Approach

- Feasible with available resources
- Utilize best available secondary data
- Statistically robust

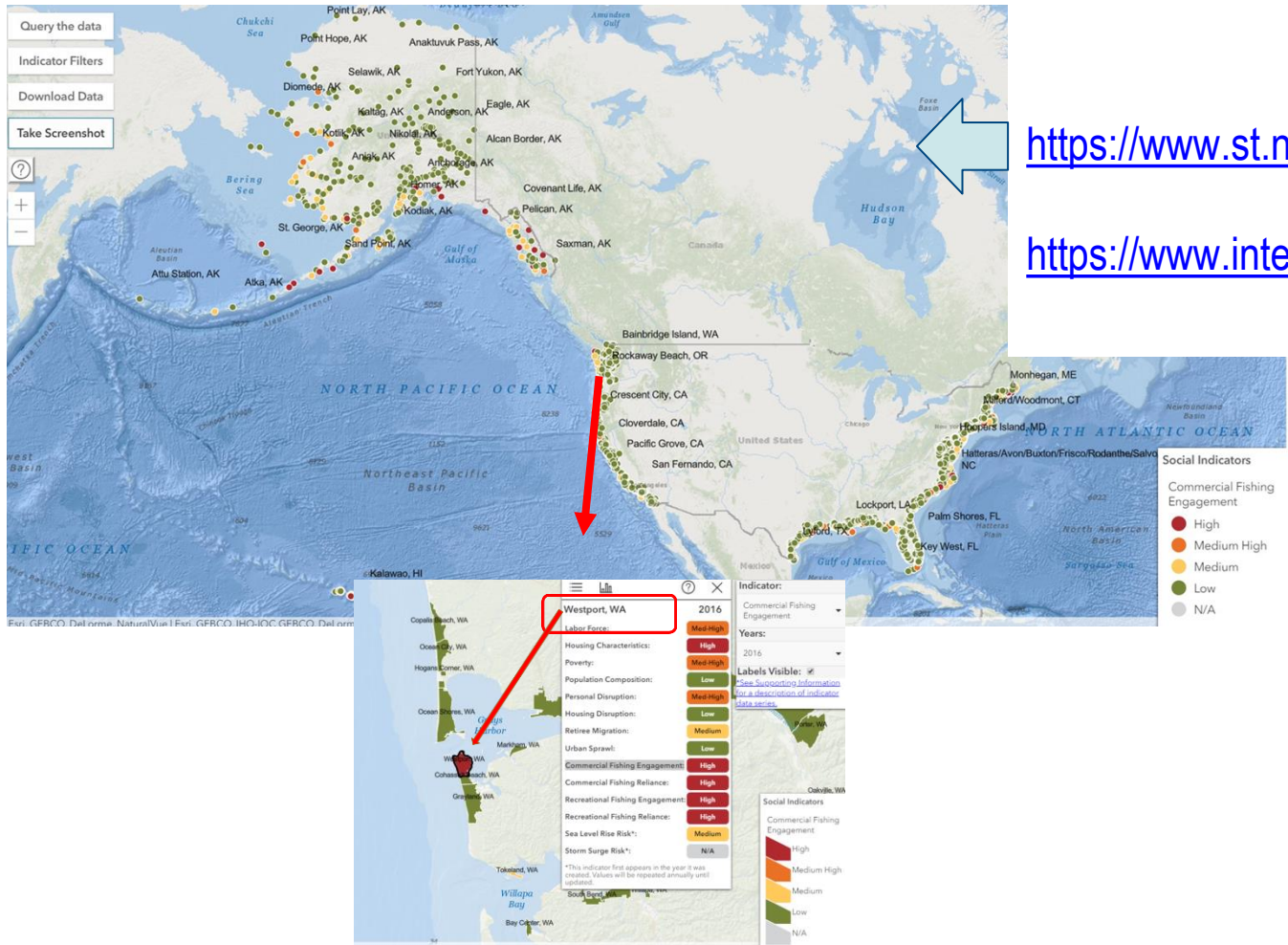
Methods

- Created *indices* with U.S. Census and NOAA Fisheries data
- Categorized from low to high based on standard deviation
- Groundtruthed in fishing communities



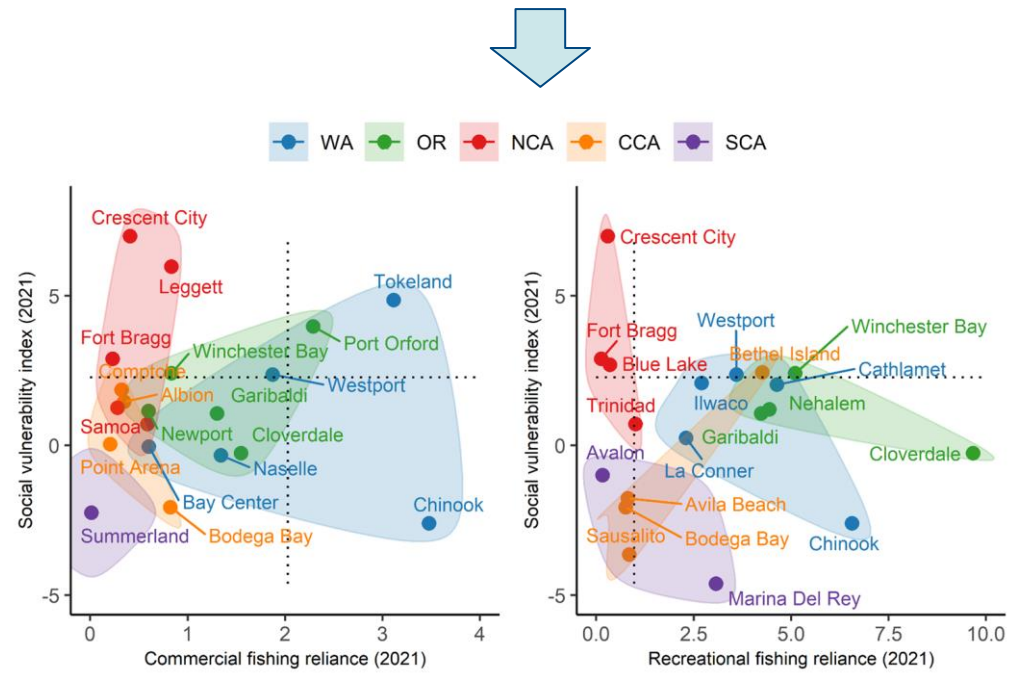
Indicator Categories

- Fishing Dependence
- Environmental Justice
- Climate Change
- Gentrification Pressure
- Economic




<https://www.st.nmfs.noaa.gov/data-and-tools/social-indicators/>


<https://www.integratedecosystemassessment.noaa.gov/regions/california-current>



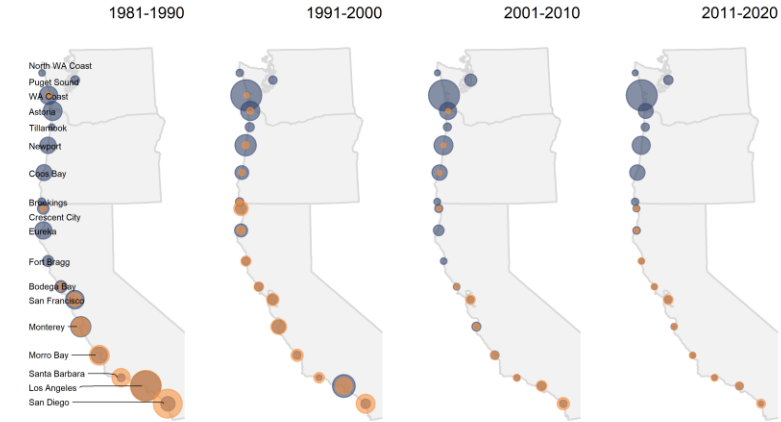
K. Norman, D. Holland, J. Abbott, A. Phillips (2022) Community-level fishery measures and individual fishers: Comparing primary and secondary data for the U.S. West Coast, Ocean & Coastal Management 224 <https://doi.org/10.1016/j.ocecoaman.2022.106191>.



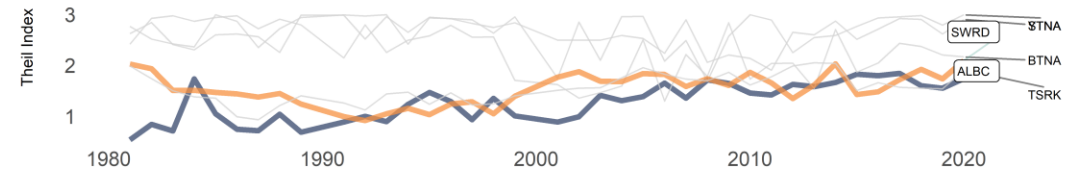
Lewis-Smith, C., and K. Norman. *In press*. Developing U.S. West Coast Recreational Fishing Community Measures: Applying an Index Approach in the Context of COVID-19 and Social Vulnerability, Ocean & Coastal Management.



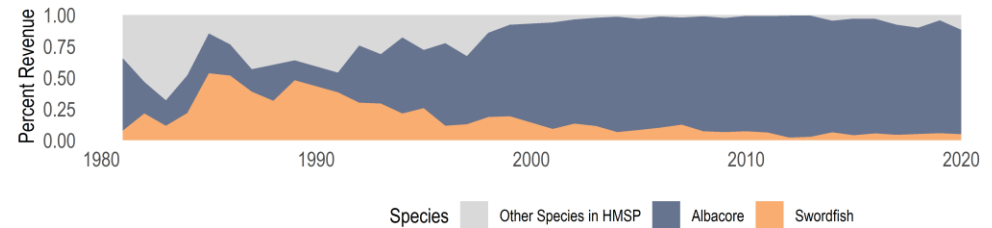
Theil index: measuring spatial concentration



Theil Index for Highly Migratory (Hmsp) Fishery

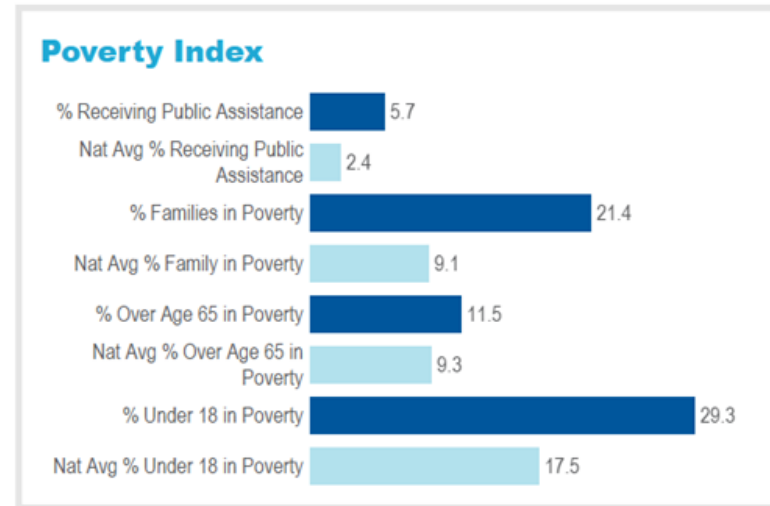
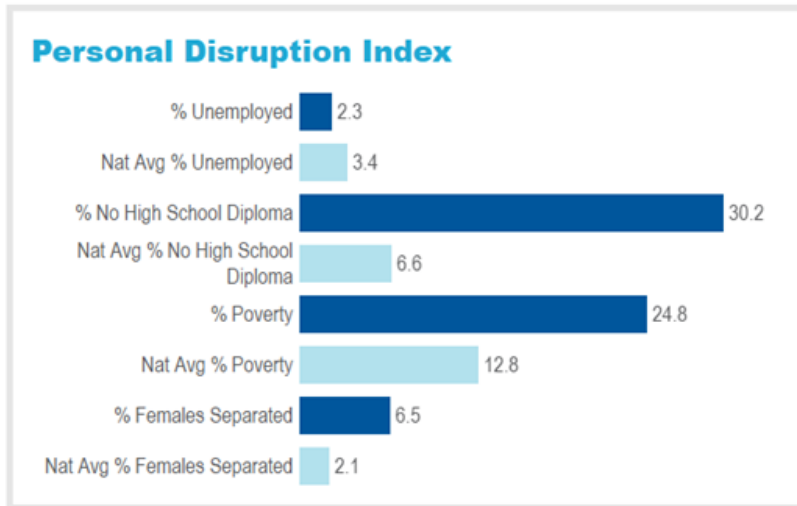
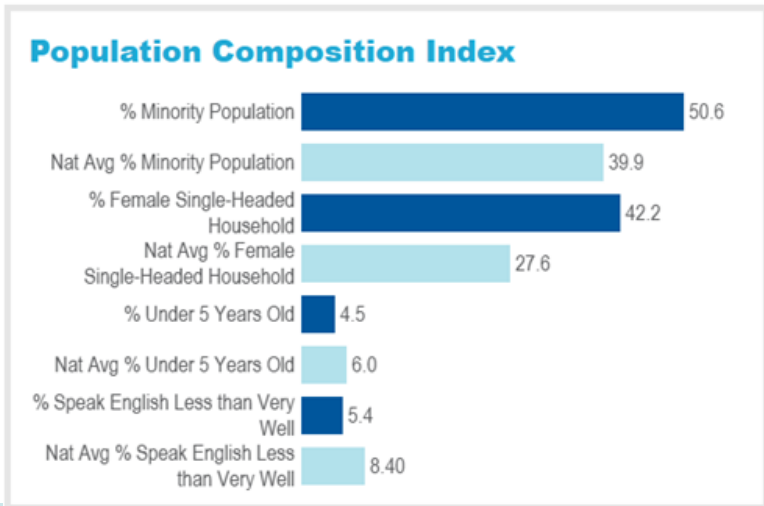
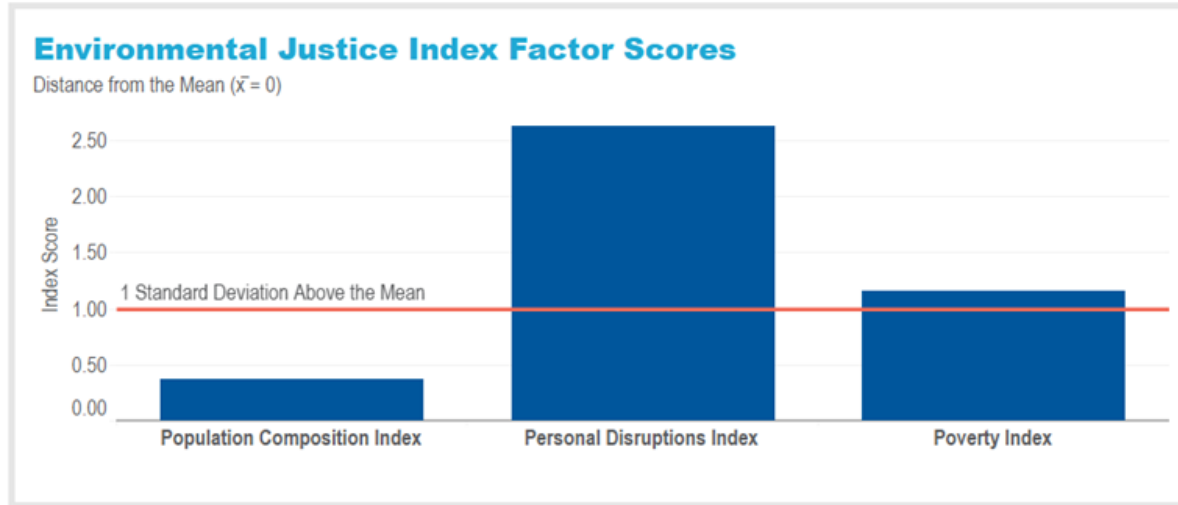
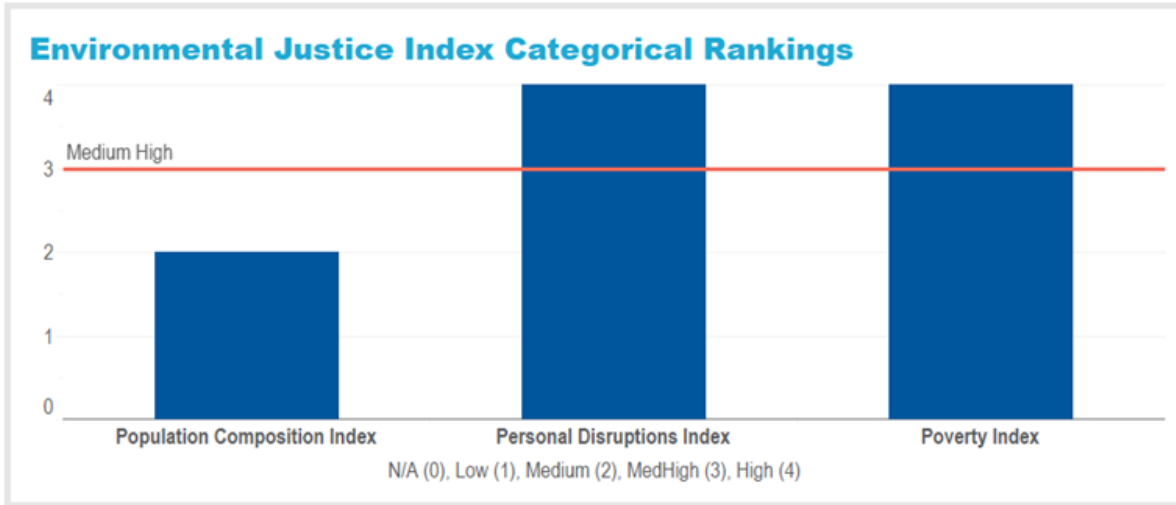


Revenue Share of Albacore and Swordfish in the Highly Migratory (Hmsp) Fishery




<https://www.integratedecosystemassessment.noaa.gov/regions/california-current>

Environmental Justice Drivers - Crescent City



Environmental Justice and fishers

WEST COAST FISHERIES PARTICIPATION SURVEY



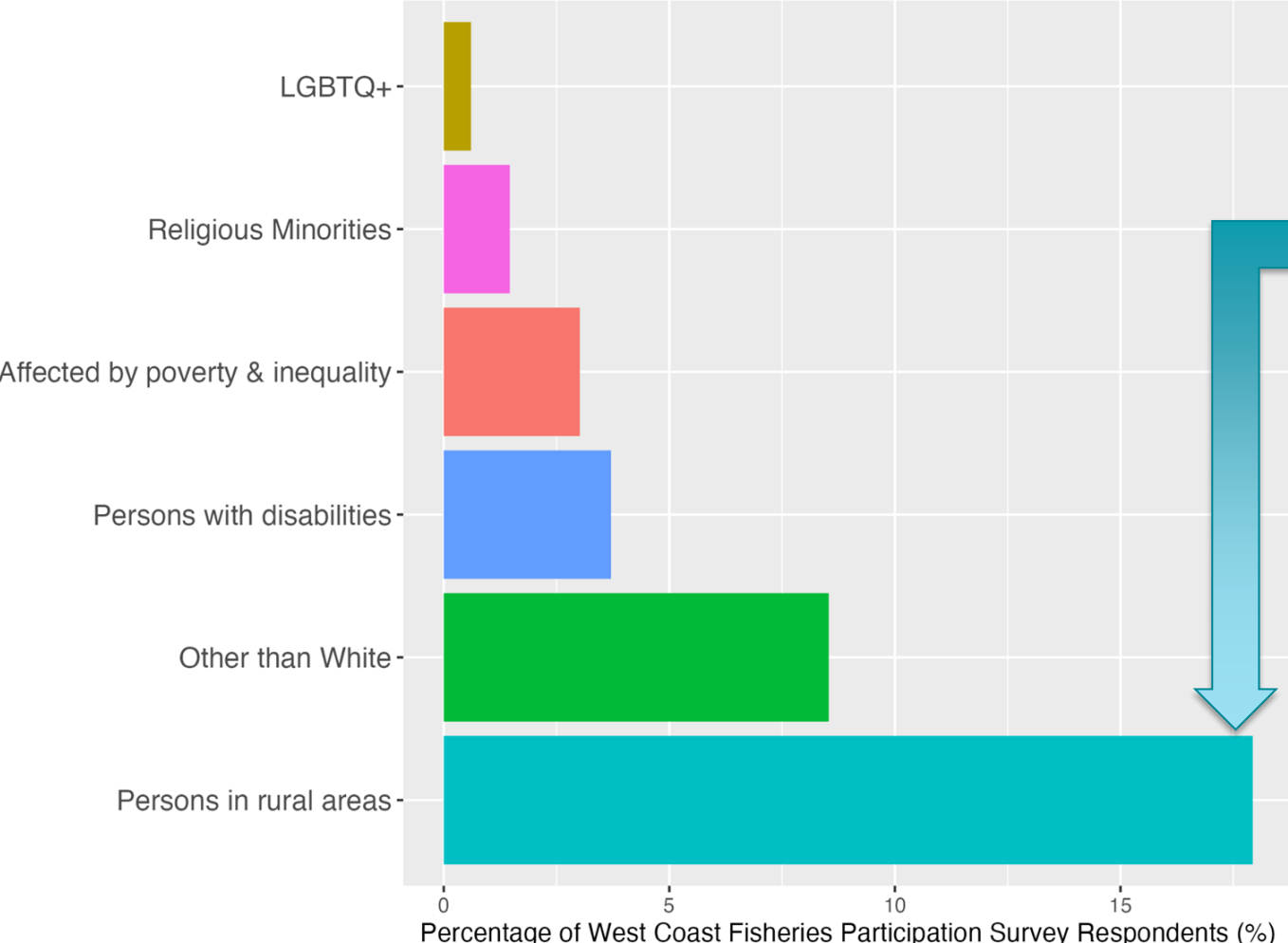
Purpose of West Coast Fishery Participation Survey: This survey collects information about why you fish and the benefits you get from participating in fisheries, including non-monetary benefits. This will enable fish to better understand how individuals and communities are affected when opportunities and profitability in fisheries change. Be assured your personal information is kept confidential. As a small token of our appreciation we have enclosed \$5.

Researchers: Dan Holland (NOAA), Karma Norman (NOAA)
 Contact: karma.norman@noaa.gov

If you would prefer to complete this survey online, please go to www.surveymonkey.com/r/NOAA
 Participant code: XXX00000

33. Do you identify with any of the following groups that the federal government has identified as underserved? Check all that apply.

- Black, Latino and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color
- Members of religious minorities
- Lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons
- Persons with disabilities
- Persons who live in rural areas
- Persons otherwise adversely affected by persistent poverty and inequality
- No, I do not identify with any of these groups

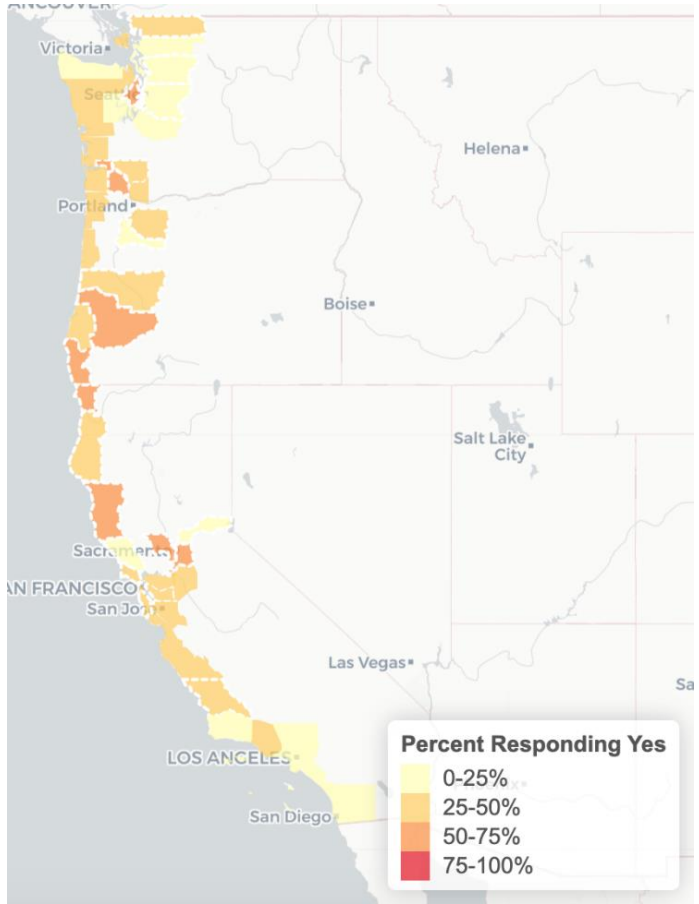
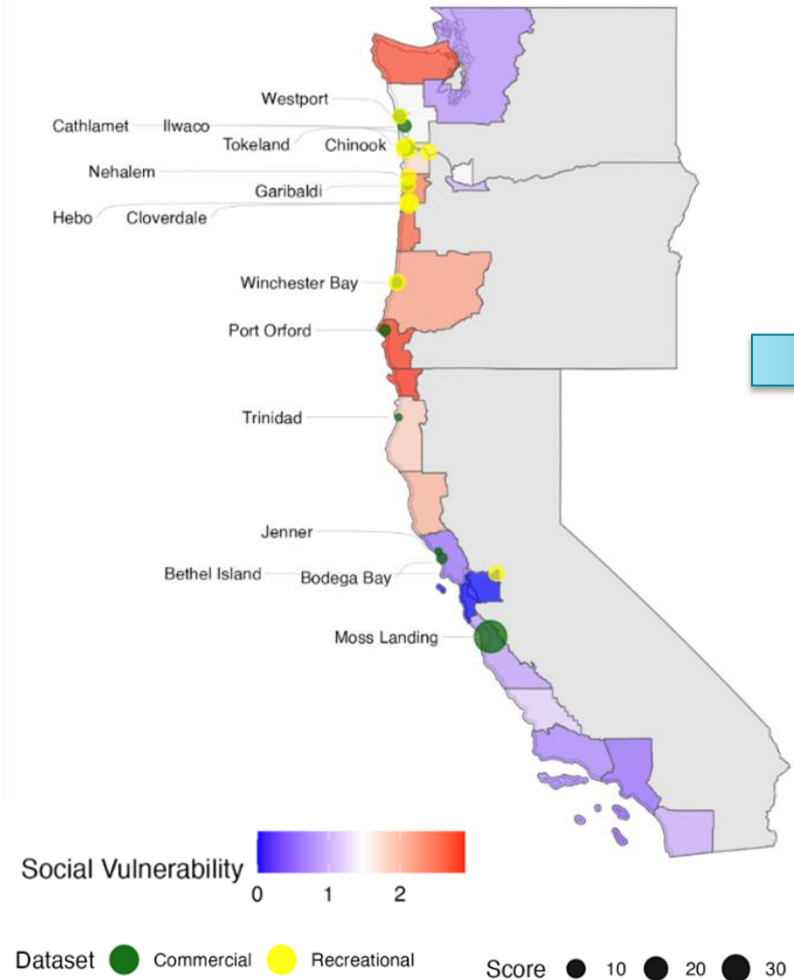


EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations):

“[t]o the greatest extent practicable and permitted by law... identify and address, as appropriate, the disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.”

Lewis-Smith, et al. in prep

Improving fisher specification in spatial distributions of environmental justice measures

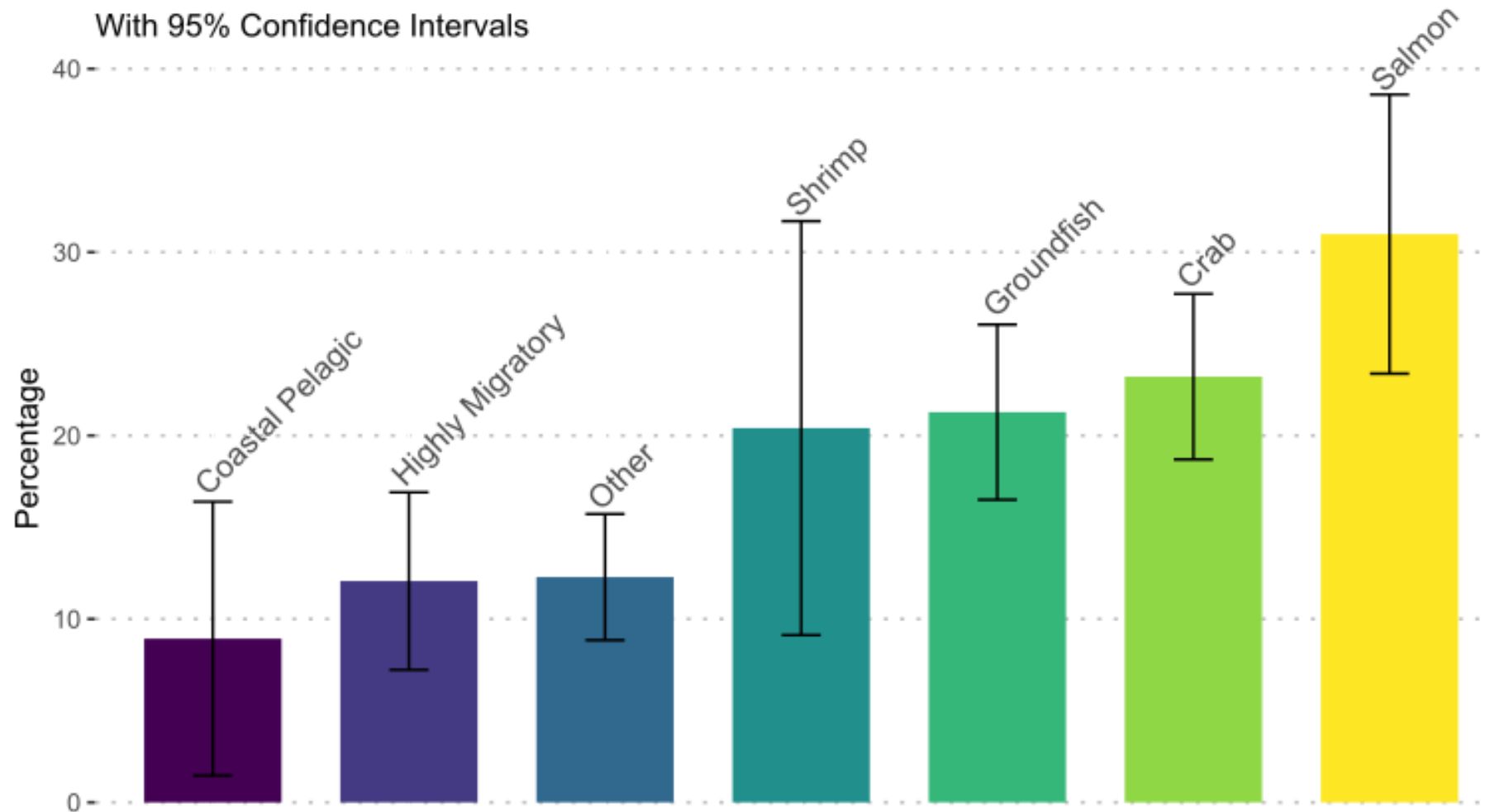


Lewis-Smith, et al. in prep



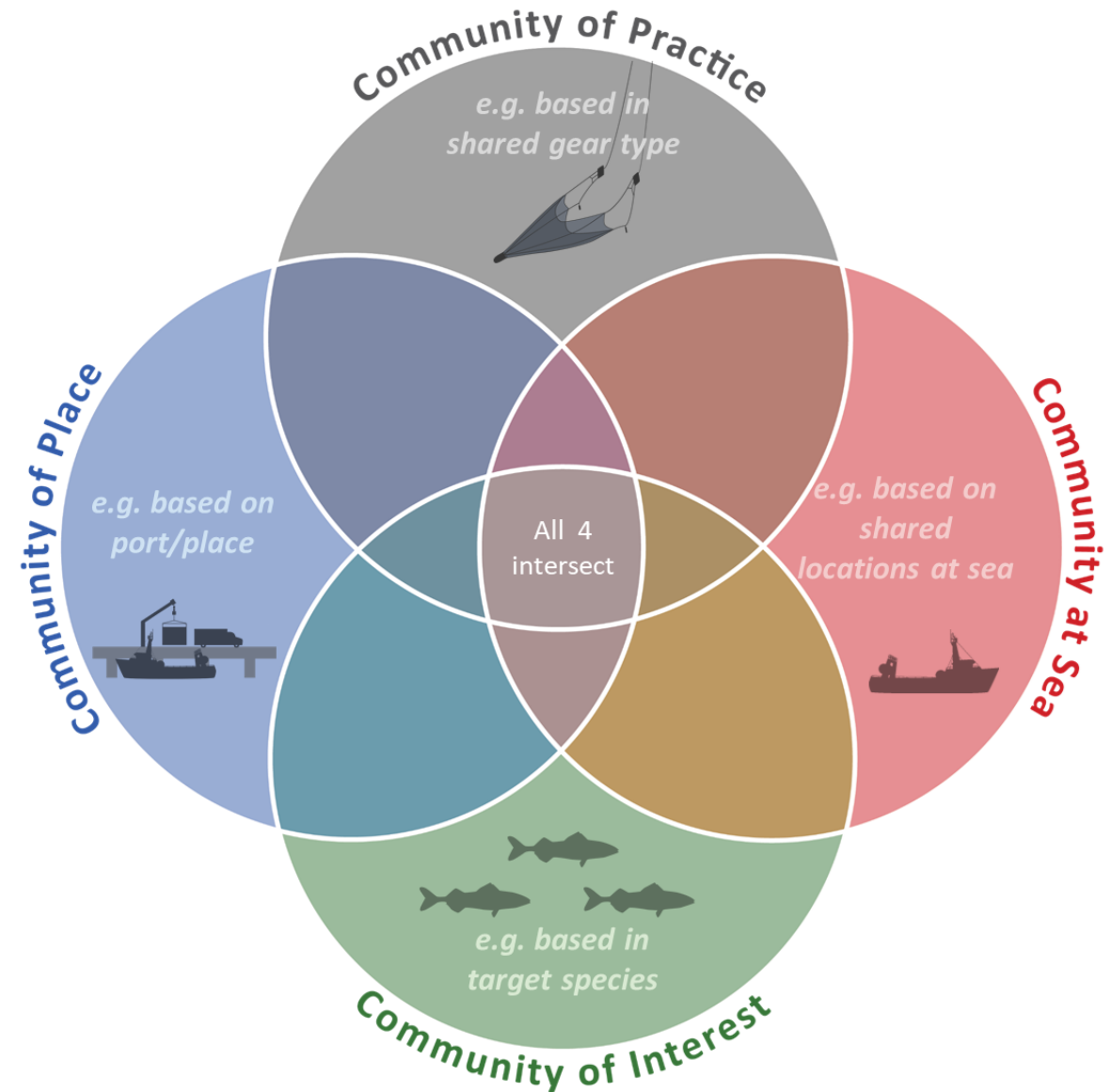
Percentage of Rural Respondents by Management Group

With 95% Confidence Intervals



Groundfish, Climate Change, and Communities in the California Current (GC5)

- We problematize fishing community
- We conceptualize fishing community categories with the groundfish fishery in mind
- We make use of community rubrics in thinking about climate scenarios
- Ultimately, “communities of place” conceptions insufficient in examining climate impacts



Norman, et al. in prep

Self-reported conceptions of community



WEST COAST FISHERIES PARTICIPATION SURVEY

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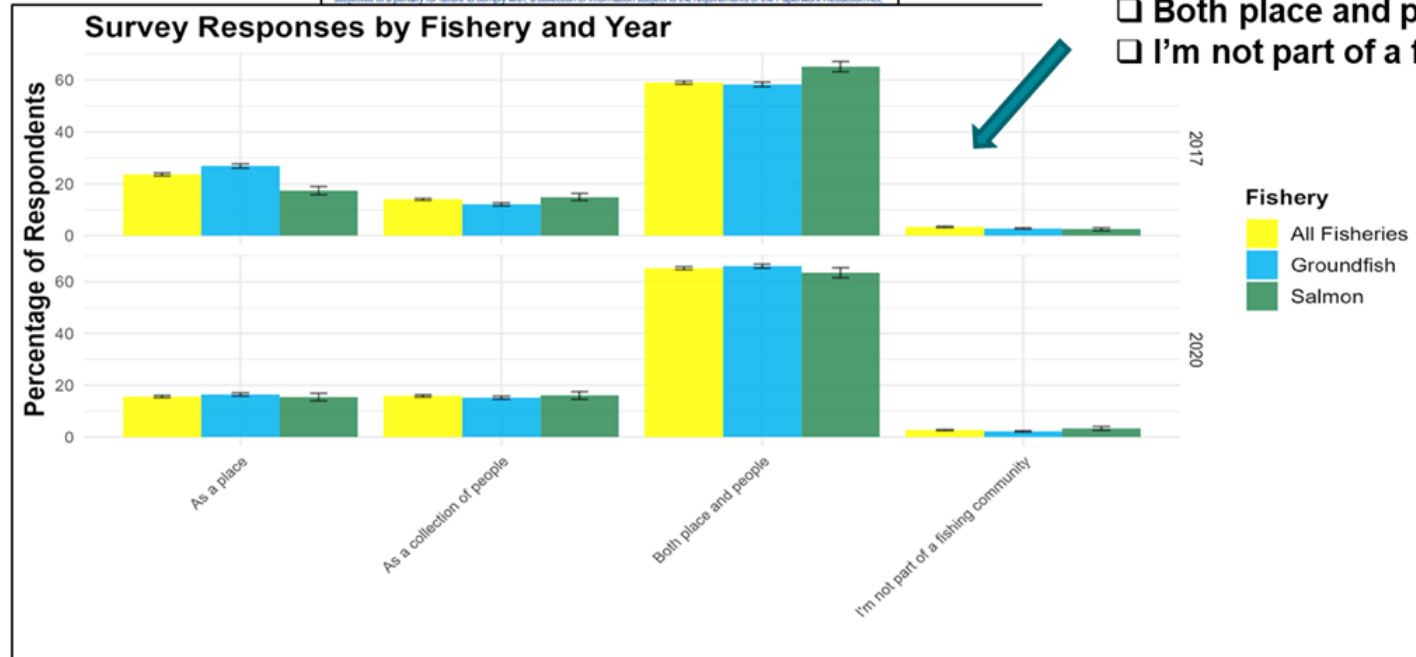
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Public reporting burden for this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Kama Norman, Northwest Fisheries Science Center, 2725 Montlake Blvd East, Seattle, WA 98112.

The data collected will be kept confidential as required by section 402(b) of the Magnuson-Stevens and NOAA Administrative Order 216-100, Confidentiality of Fisheries Statistics, and will not be released for public use except in aggregate statistical form without identification of sources. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subjected to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act.

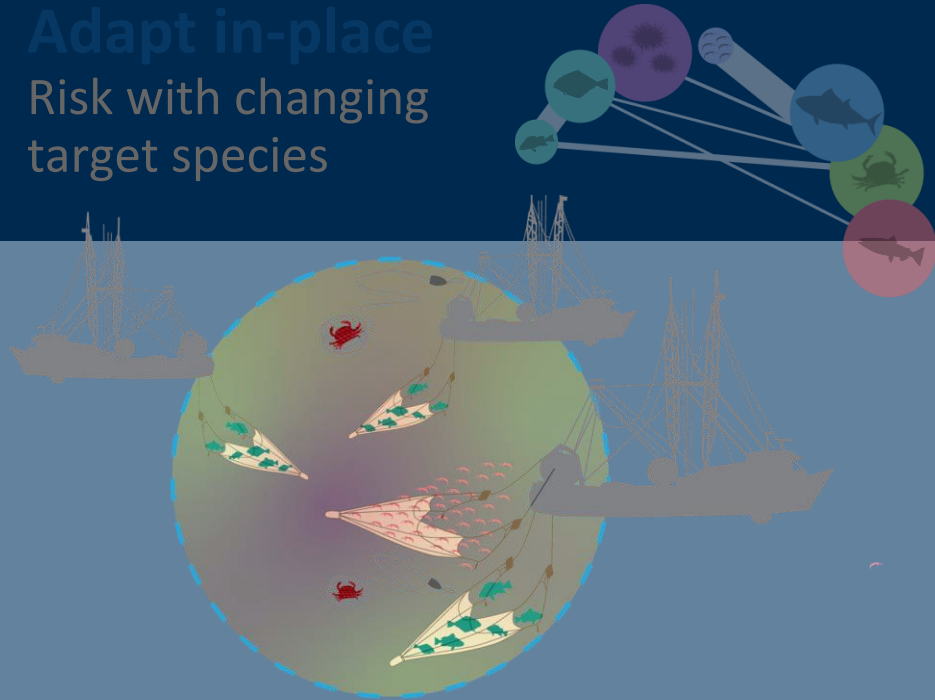
10. How would you define the fishing community you feel most a part of?

- As a place (e.g., the town you tie up your vessel, land fish, and or the town where you and your family reside)
- As a collection of people (e.g., the fishermen who fish in the same area or in your “radio” group, belong to the same industry association as you, or an ethnic group)
- Both place and people
- I’m not part of a fishing community



GC5: Adapting to climate change risk

Adapt in-place
Risk with changing
target species



Exposure: Thermal change within fishing grounds

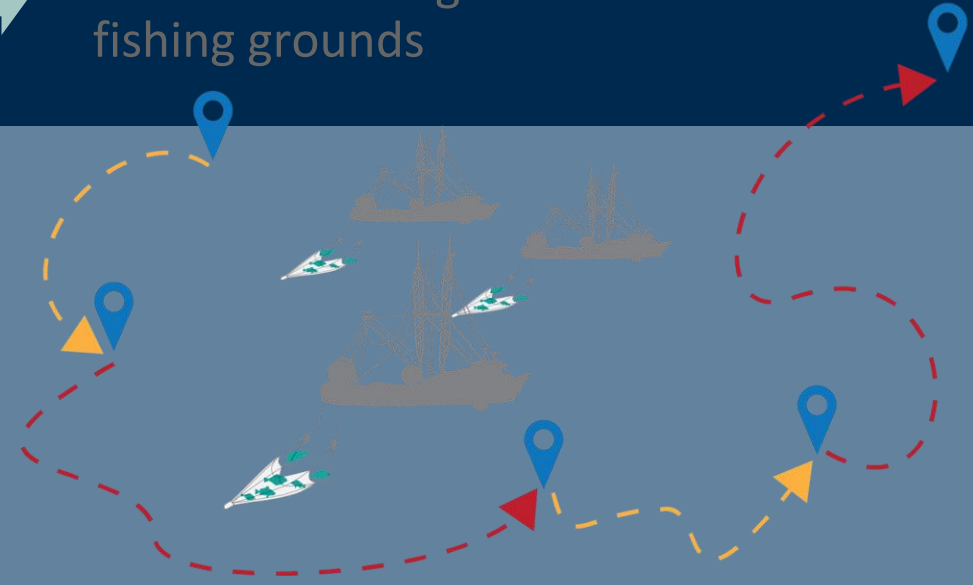


Vulnerability/Sensitivity: Economic dependence



Vulnerability/Adaptive capacity: Fisheries diversification

Adapt on-the-move
Risk with shifting
fishing grounds



Exposure: Thermal displacement of fishing grounds

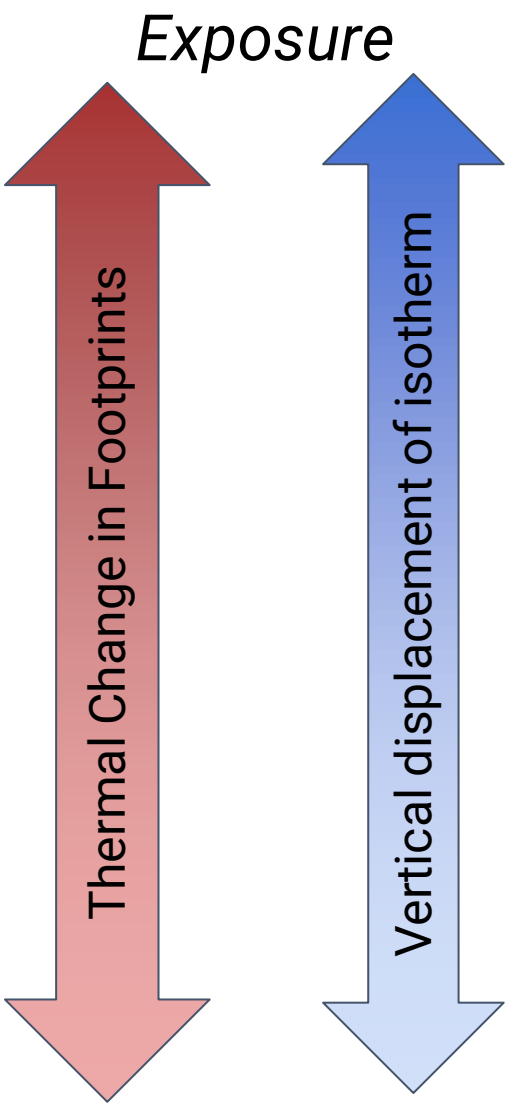
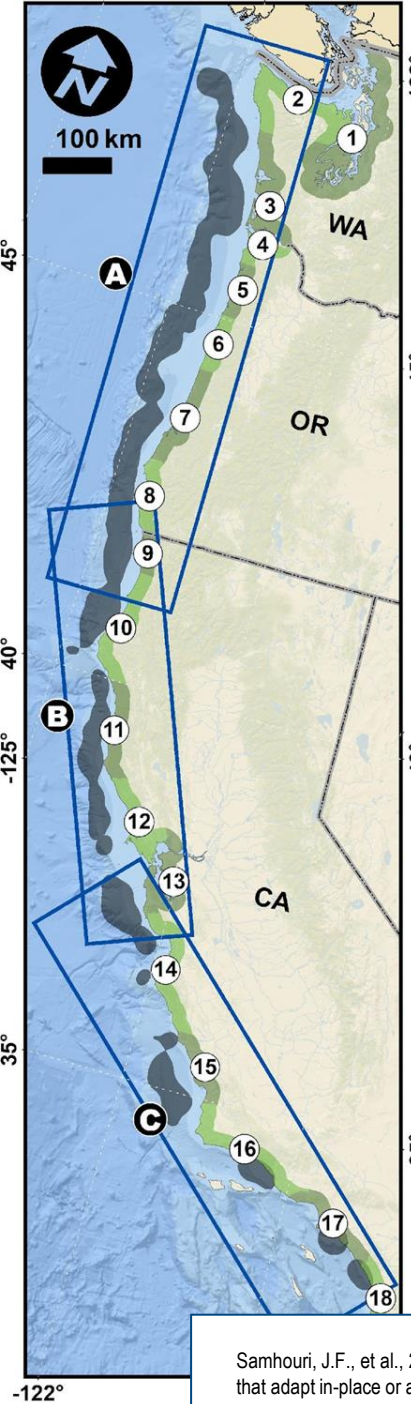


Vulnerability/Sensitivity: Economic dependence



Vulnerability/Adaptive capacity: Fleet mobility

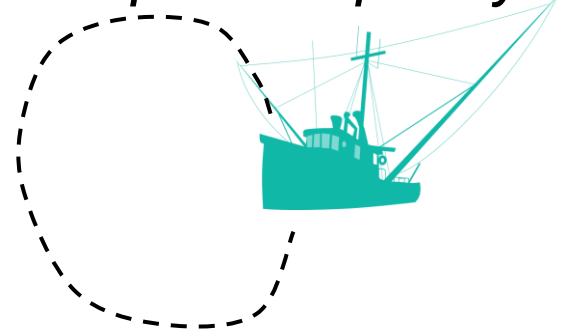
Exposure, sensitivity and adaptive capacity depend on latitude



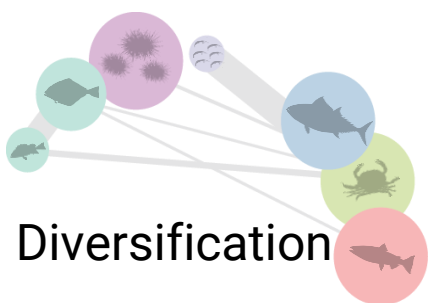
Exposure

Sensitivity

Adaptive Capacity



Economic Dependence on Groundfish

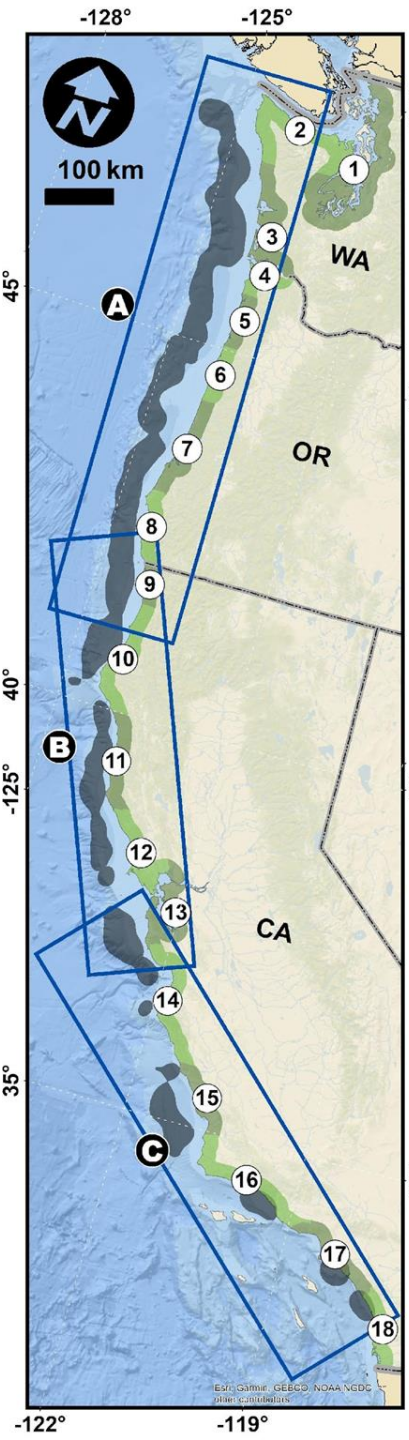


Diversification

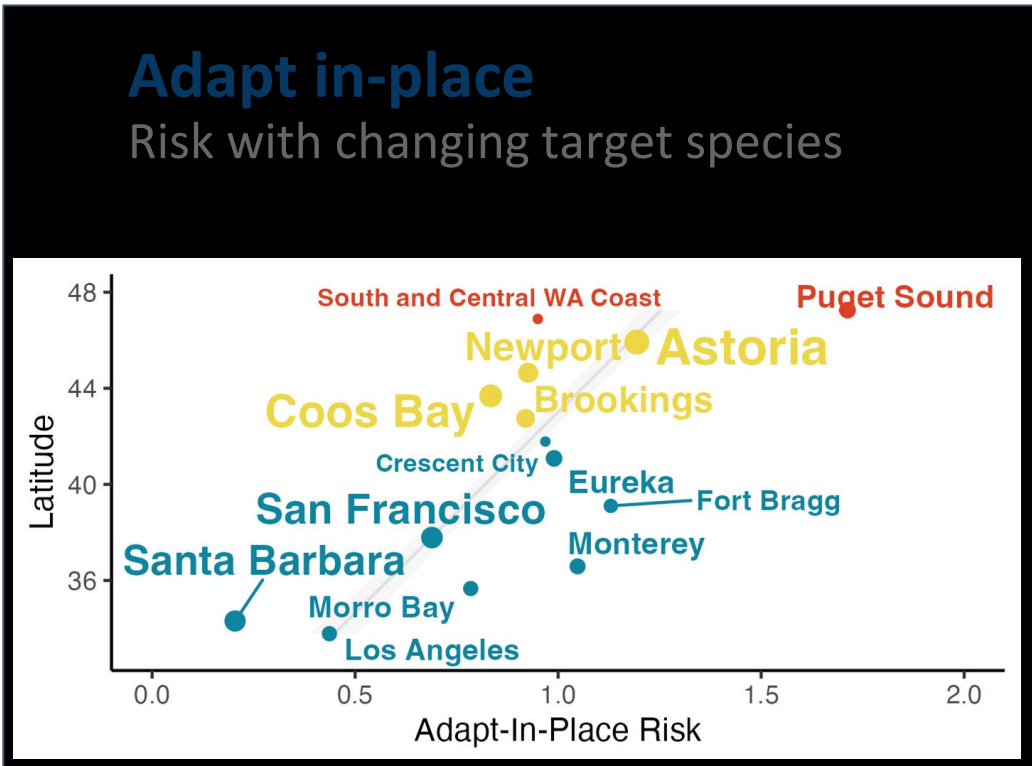
Mobility



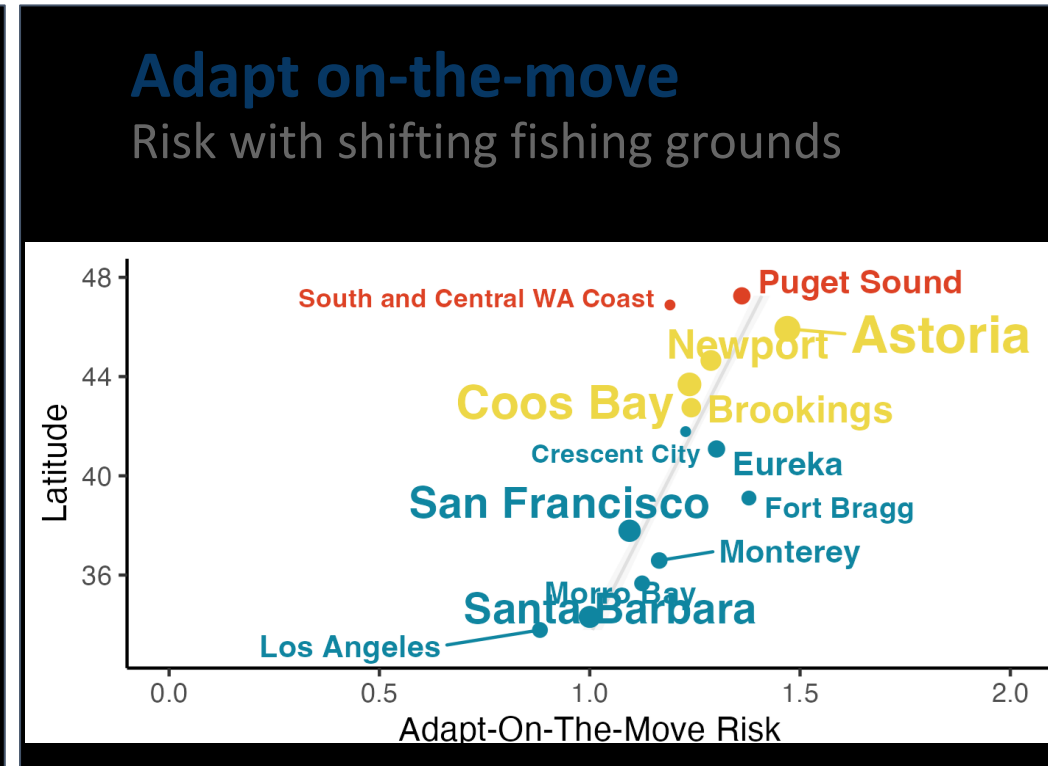
Samhuri, J.F., et al., 2024. Stay or go? Geographic variation in risks due to climate change for fishing fleets that adapt in-place or adapt on-the-move. PLOS Climate 3, e0000285



Social-ecological risk elevated for more northern fleets *but* depends on adaptation strategy



Similar levels of diversification across latitude results in risk **matching** latitudinal trends in exposure * sensitivity if adapting in place



Greater mobility of more northern fleets **dampens** risk if adapting on the move



Insights from the final frontier

- Spatial scales an important, challenging concern in the context of social data
- “Communities of place” conceptions are essential, but insufficient for addressing spatial concerns and integrating spatial approaches
- Linking people to marine spaces through fishing critical to linking social data to climate impacts in socio-ecological systems





More on the
West Coast Fisheries
Participation Survey!

Groundfish, Climate Change, and Communities in the California Current (GC5)- Collaborators

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Questions