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Building resilience of coastal fishing communities to harmful algal blooms

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Moore, Kathleen M.; Moore, Stephanie; Dreyer, Stacia; Allison, Edward; Jardine, Sunny; Klinger, Terrie; Ekstrom, Julia; Varney, Anna; and Norman, Karma C., "Building resilience of coastal fishing communities to harmful algal blooms" (2018). *Salish Sea Ecosystem Conference*. 178.

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Speaker

Kathleen M. Moore, Stephanie Moore, Stacia Dreyer, Edward Allison, Sunny Jardine, Terrie Klinger, Julia Ekstrom, Anna Varney, and Karma C. Norman

Building socioeconomic resilience to harmful algal blooms in coastal communities

Kathleen Moore*, Eddie Allison, Stacia Dreyer, Julie Ekstrom, Sunny Jardine, Terrie Klinger, Stephanie Moore, Karma Norma

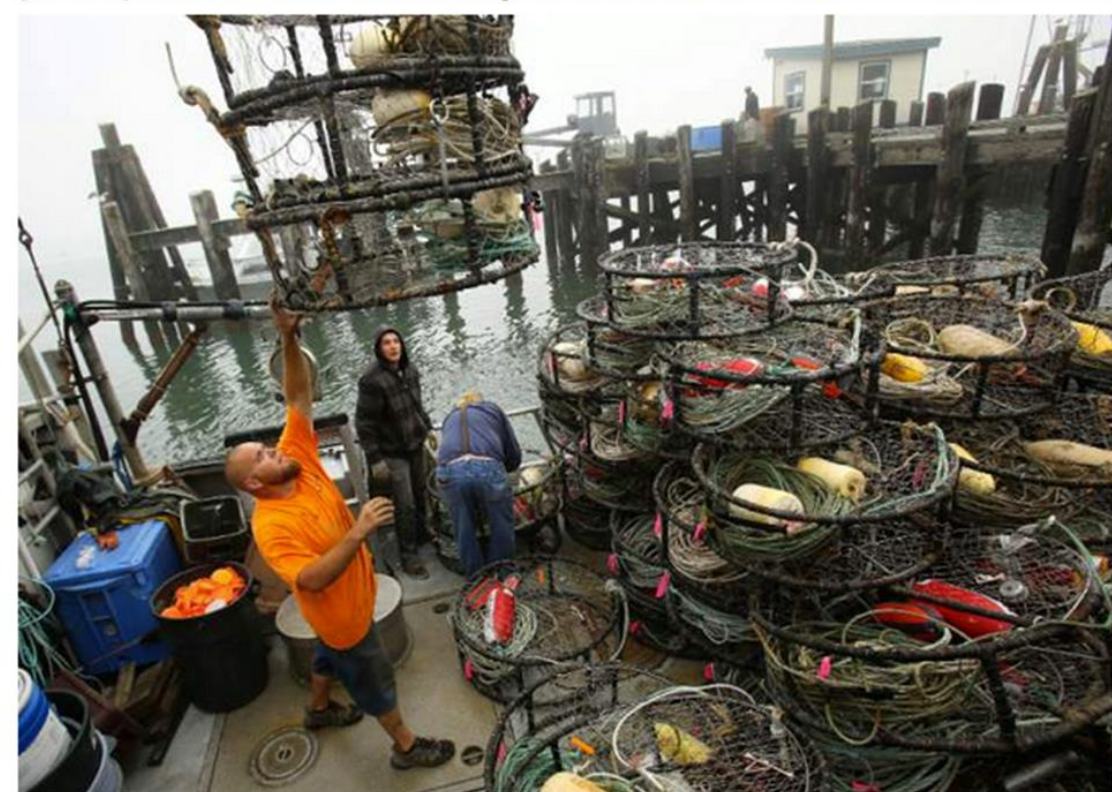


Research Motivation

Biggest-ever toxic algal bloom hits West Coast, shutting down shellfish industries -The Oregonian, June 16, 2015



California's commercial Dungeness crab season postponed indefinitely over toxin risk



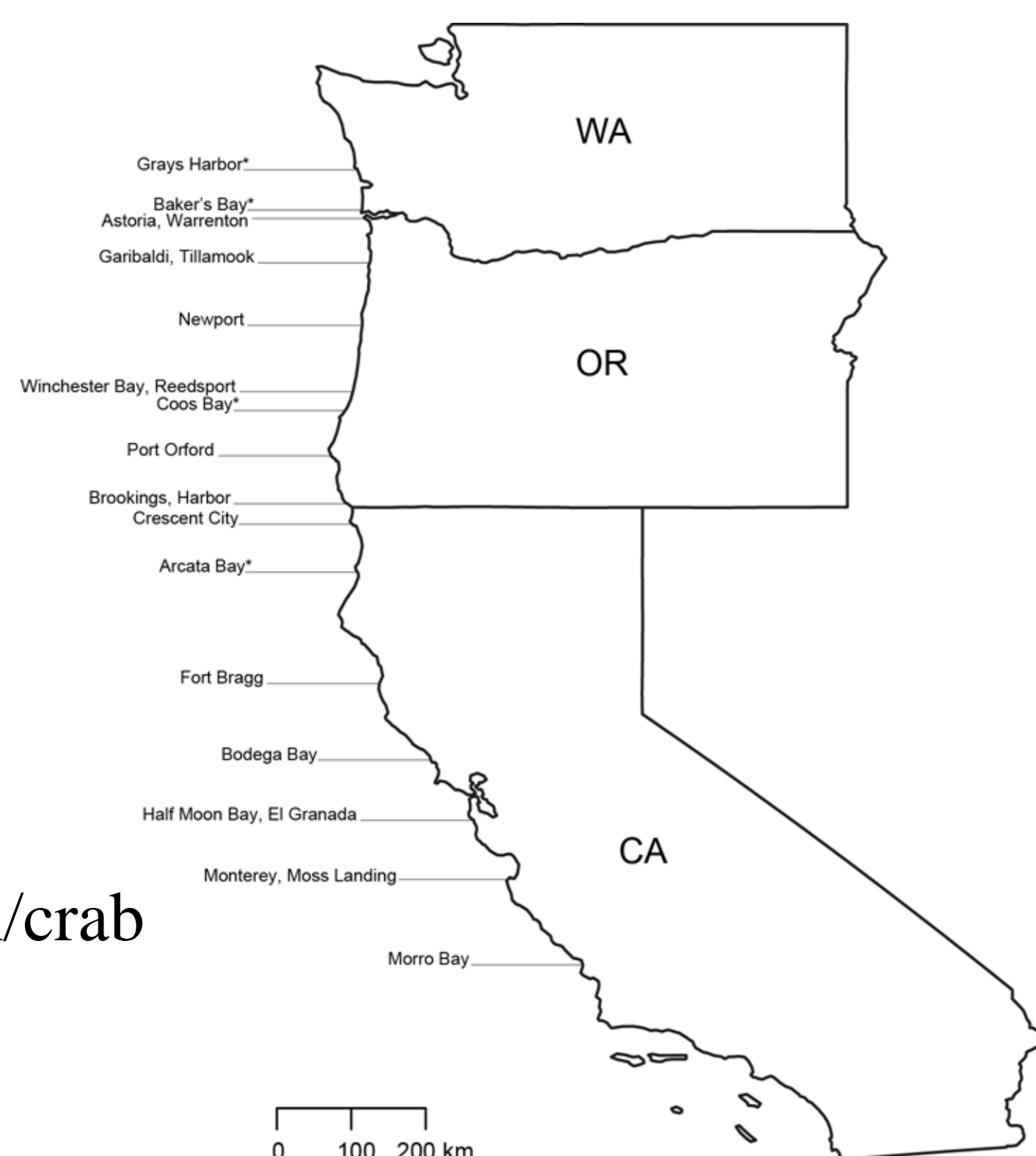
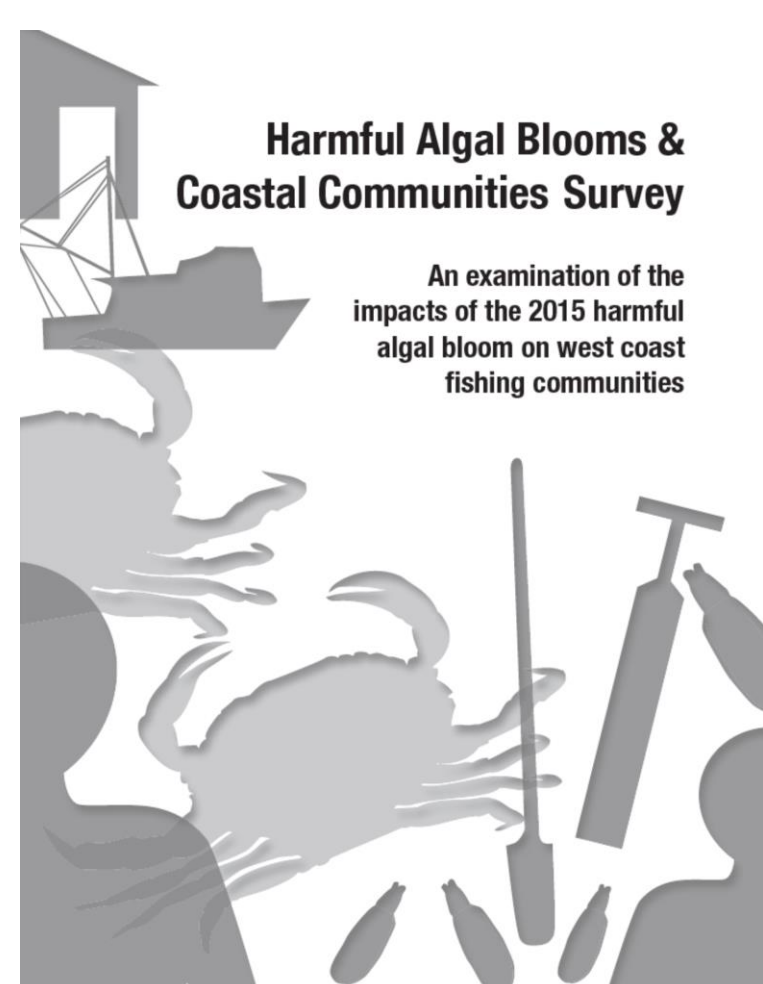
- The 2015 HAB event was linked to anomalously warm ocean conditions (McCabe et al., 2016), which may worsen in the future.

Research objectives

- Assess the social, cultural and economic impacts of the 2015 HAB event.
- Identify factors that contribute to an individual's ability to cope with HAB events.

Methods

- Mixed mode (mail and online) survey across 16 west coast fishing communities.



- Mail survey recruited participants in shellfish/crab related business using InfoUSA and PacFIN databases.
- Online survey advertised via state agency email lists with participants self-selecting.
- N=381 (47% mail, 53% online; 41% WA, 24% OR, 35% CA; 55% fisheries jobs, 45% hospitality/other jobs).
- Ordinal regression and multinomial logit models used to empirically test factors influencing an individual's vulnerability to HAB events.

Preliminary Findings

HAB Exposure Index

- Lost fishing opportunities were calculated as the proportion of days a fishery was closed due to HAB toxins relative to the normal season length (Moore et al., in prep).

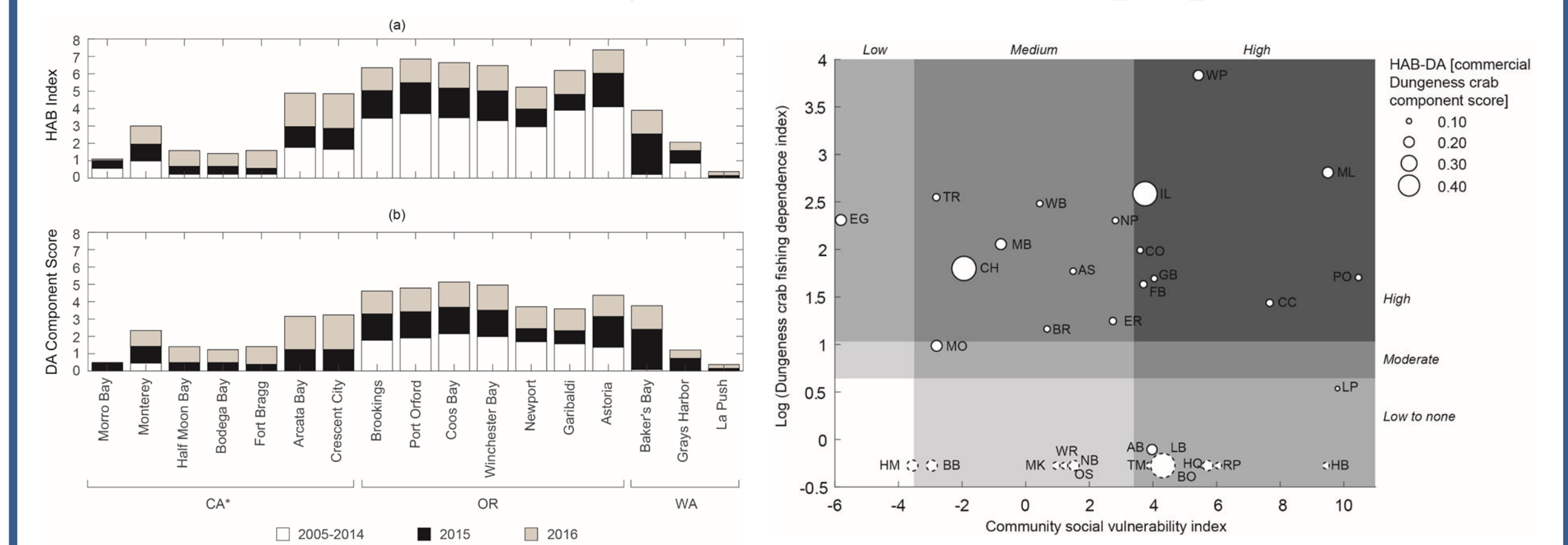
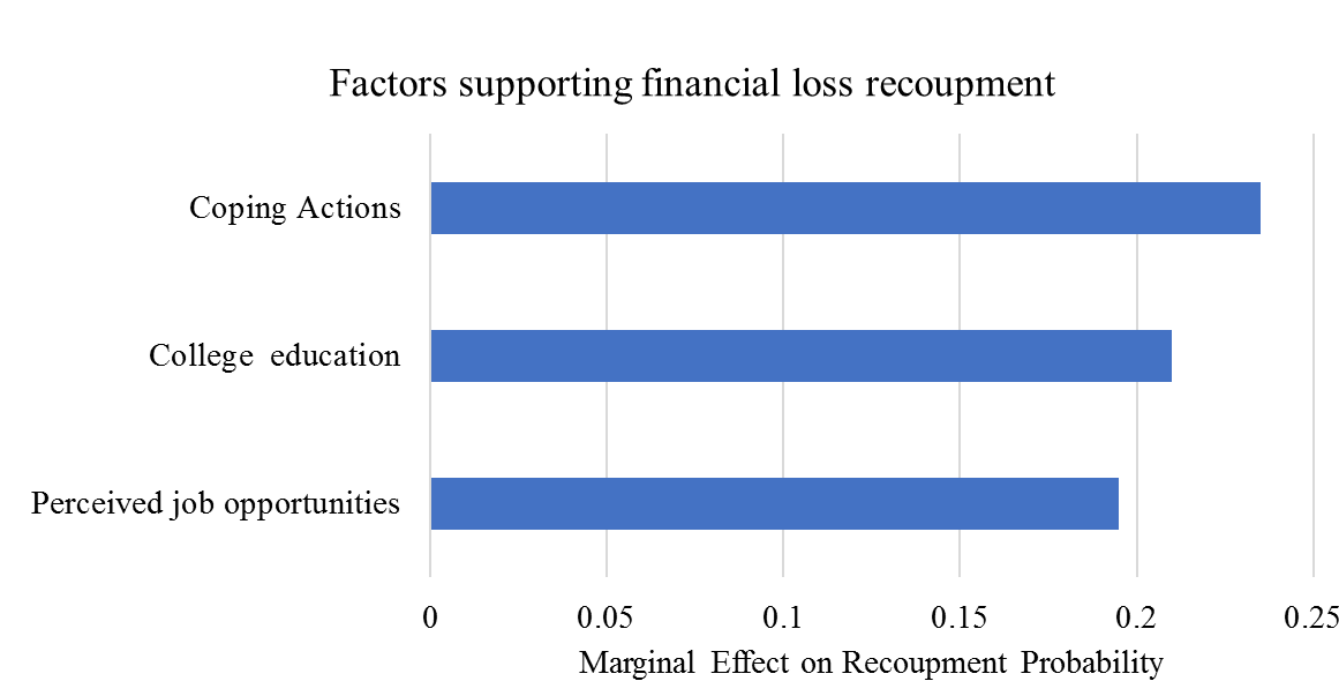
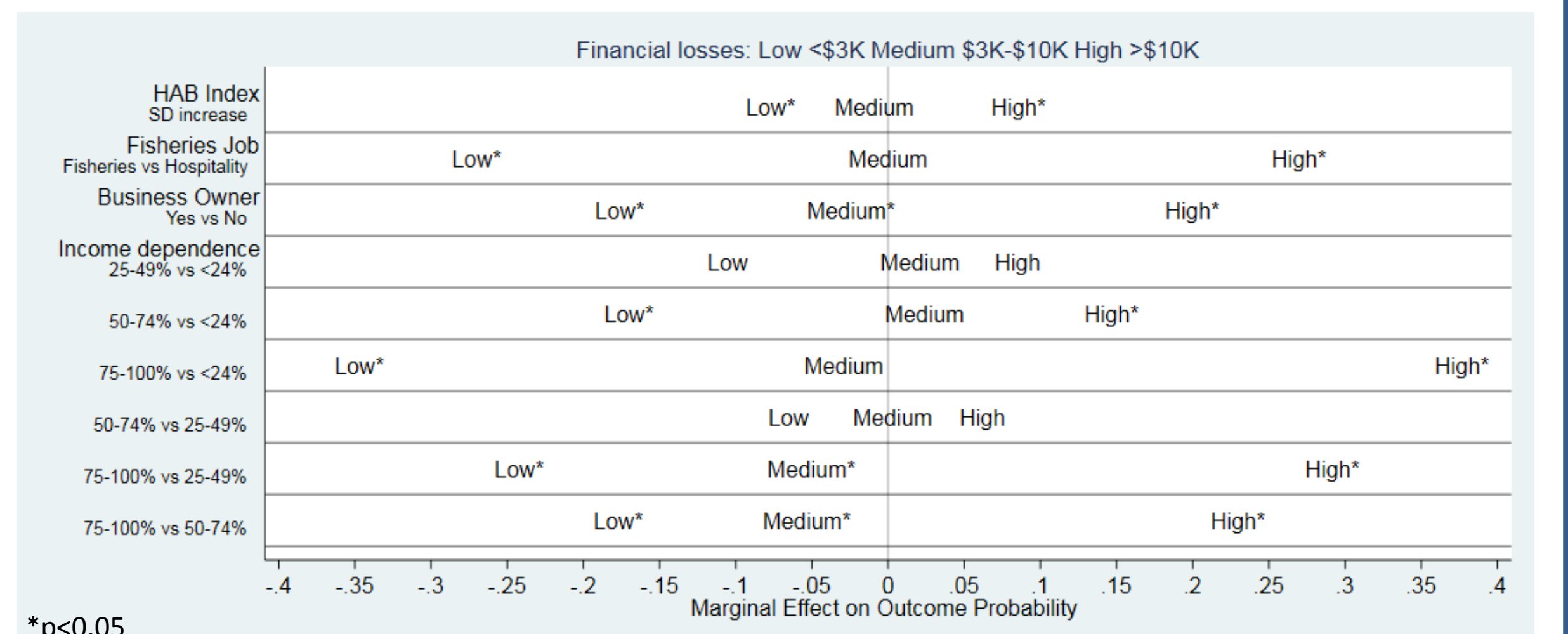
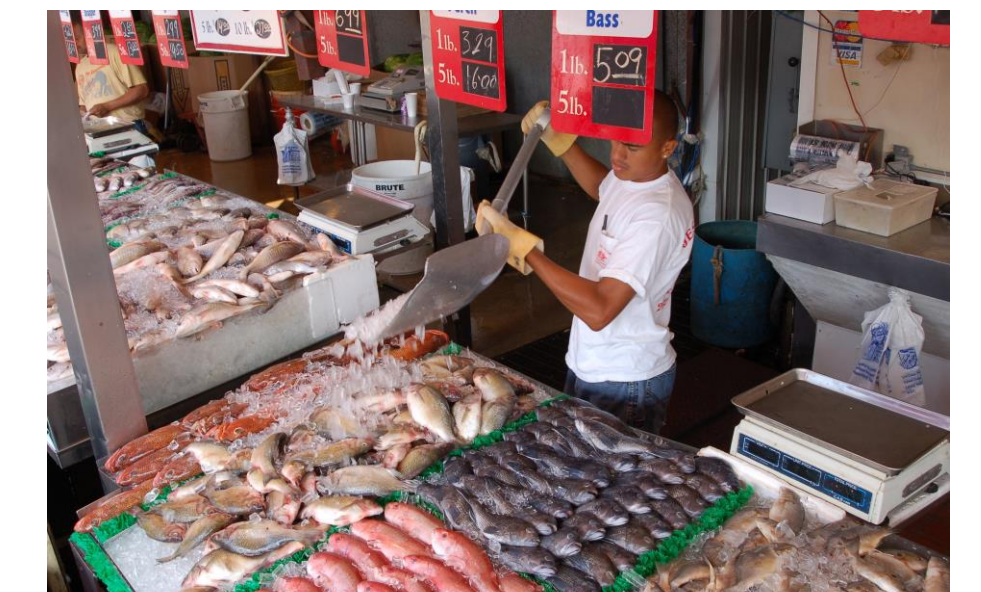


Figure. Stacked bar charts of the values of the (a) HAB index and (b) component scores for fisheries harvest closures due to domoic acid (DA) in 2015 (black), 2016 (gray) and all prior years (white).

Figure. HAB index component score for closures to the commercial Dungeness crab fishery in conjunction with NOAA indices of community social vulnerability and commercial Dungeness crab fishing dependence.

Socioeconomic Impacts



References:

McCabe, R.M., Hickey, B.M., Kudela, R.M., Lefebvre, K.A., Adams, N.G., Bill, B.D., Gulland, F.M.D., Thomson, R.E., Cochlan, W.P., Trainer, V.L., 2016. An unprecedented coastwide toxic algal bloom linked to anomalous ocean conditions. *Geophys Res Lett*, 10.1002/2016GL070023.

Moore, S.K., Dreyer, S.J., Allison, E.H., Ekstrom, J.A., Jardine, S.L., Klinger, T., in prep. Harmful algal blooms and coastal communities: Sociocultural and economic impacts, perceptions of health risk and fisheries management, and actions taken to cope with the 2015 U.S. West Coast domoic acid event. *Harmful Algae*.

Moore, S.K., Cline, M.R., Blair, K., Klinger, T., Varney, A., Norman, K., in prep. A novel index of fisheries harvest closures due to harmful algal blooms and a framework for identifying vulnerable fishing communities on the U.S. West Coast.