

Does competition among ecosystem engineering species result in tradeoffs in the production of ecosystem services?

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Production of ecosystem services depends on the ecological community structure at a given location. Ecosystem engineering species (EES) can strongly determine community structure, but do they consequently determine the production of ecosystem services? We explore this question in the context of Pacific Northwest estuaries which harbor several EES that compete for space on extensive intertidal flats, including seagrasses, burrowing shrimps, and oysters. Using existing data, we assessed the relative effect that EES have on production of selected ecosystem services (i.e. food production, water purification, climate moderation, recreational wildlife viewing, biodiversity enhancement). We also evaluated how abiotic factors (e.g. salinity, elevation) moderate that production. Using maps of EES distribution within well-studied estuaries, we estimated whether production of ecosystem services would change if competition between EES changed their areal distribution. Results of this analysis reveal which EES most influence production of ecosystem services, and which services are most sensitive to changes in EES distribution. This information can inform estuarine habitat restoration strategies, management of non-native EES, and prioritization of new information needs.