Distributional Limits of San Francisco Bay Rockweed Populations are Influenced by Substratum Slope and Tidal Height

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Ecology and Management Knowledge Gaps

Rockweed (*Fucus distichus*) forms extensive intertidal beds on naturally rocky as well as armored shores in San Francisco Bay (SFB). The ecological function of fucoid algae are well documented for many estuarine ecosystems worldwide, especially in the Atlantic however, *Fucus distichus* beds in California estuaries have not been well-studied. This creates a challenge for managers trying to develop appropriate ecological goals for nature-based climate adaptation and restoration projects for rocky shores and cobble beaches in SFB.

Research Questions

- Are there differences in rockweed abundances between shores dominated by intertidal rocky benches, cobble beach, rip rap, and seawalls?
- How do habitat slope, orientation, and tidal height affect rockweed abundance ?

1. The intertidal rockweed, *Fucus distichus,* is less abundant on steeply sloped shores and surfaces.
2. The rockweed zone is wider on naturally rocky benches and cobble beaches than on armored shores.
3. Intertidal seawalls limit the spatial extend of rockweed beds much more than rip rap.

Methods Summary

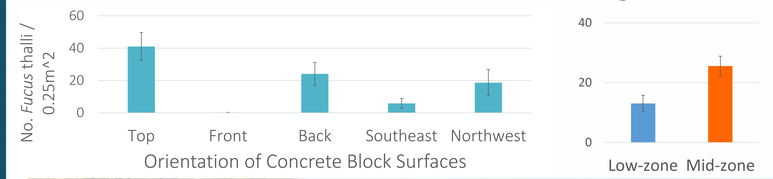
Surveyed rockweed at 20 sites Central SF Bay
- natural and armored rocky shores
- intertidal distribution
- slope of habitat

Focused study of rockweed at one armored site
- large concrete rip rap blocks (1.25 x 1.25 x 0.7 m)
- two shore-parallel rows different tidal heights
- abundance on each side
- surface slope, orientation and tidal height
- temperature and light level of each surface

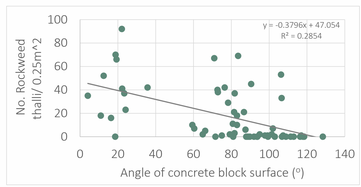
Results

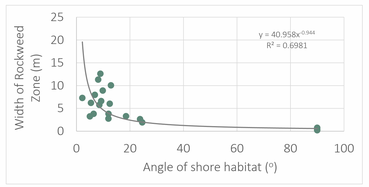
Rockweed abundance varied with habitat orientation
- Most abundant on upward facing surfaces
- Least abundant on vertical surfaces exposed to wave action
- More abundant on northwest than southeast facing surfaces

Rockweed abundance declined with tidal height

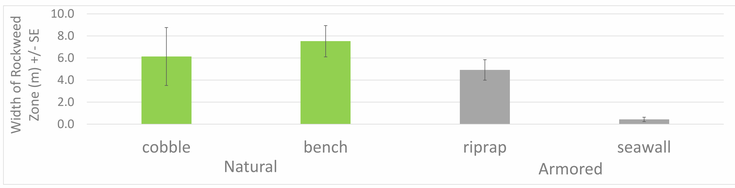


Rockweed abundance varies with steepness of habitat
- Density of thalli declined on steeper concrete block surfaces
- Habitat width was smaller on steeper rocky and armored shores





Rockweed abundance varied by shore type
- More abundant overall on natural rocky shores
- Riprap shores had greater abundance than seawalls



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