Divergent coral reef and hard bottom communities of a mesophotic shelf edge in the U.S. Virgin Islands

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The Study

- The southeastern Puerto Rican Shelf mesophotic coral habitat is 1.5x area of shallow habitat
- Mesophotic reef is broken into distinct bank habitats
- The primary bank appears as drowned barrier reef >25m depth, with distinct seaward and leeward slopes
  - Observation: seaward habitats are largely low hard coral hardbottoms, and leeward habitats are denser *Orbicella* reefs
- We asked: is this true and what processes might control benthic cover on reefs at depths below 25 m?
- Spatially stratified random diver surveys were conducted along 50km of shelf edge and stratified into leeward and seaward habitats

Results

- Low hard coral and high macroalgal cover was found on the seaward shelf edge; east leeward was low coral, and west was dense *Orbicella*
- Process must restrict coral development on seaward slope
  - Our hypotheses include eutrophication from upwelling (indicated by algae) and higher disturbance from storms.
  - Transplantation will indicate choronic or acute processes
- The leeward slope can have well-developed reef, but this only occurs in regions with dense reef (i.e., the Virgin Passage)
- This suggests that processes that favor reef development occur across horizontal space (e.g., deep currents, internal waves)

Comparison of major benthic cover categories across leeward/ seaward and east/west positions.