

Tropical cyclones, fishing gear, and the future of benthic seascapes in South Florida

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Understanding how natural disturbances interact with human activities to alter spatial heterogeneity is of fundamental interest in landscape ecology. Scenario analysis can produce insights about how human activities may amplify or dampen effects of changing disturbance regimes. In the South Florida commercial spiny lobster fishery, trap loss is common but greatly exacerbated during tropical cyclones. Derelict traps may move hundreds of meters during high winds, resulting in damage or loss of critical benthic habitats. Given the large numbers of traps in the fishery, increased frequency/intensity of cyclones may amplify future loadings of derelict traps with implications for seascape structure and connectivity. I estimated trap loss under three scenarios of future tropical cyclone activity (*Business-as-Usual*, *Intensification*, *Katrina-like*) and four scenarios of fishery effort (*Existing*, *Expected*, *Optimal*, *Excessive*). At *Existing* effort, *Intensification* led to a 1.2-fold increase in lost traps over *Business-as-Usual*, but *Katrina-like* led to a 2.5-fold increase (> 4 million lost traps). Across all cyclone scenarios, *Excessive* effort led to a 92.3% increase in trap loss while *Optimal* effort led to a 57.3% reduction in trap loss when compared to *Existing* effort. Results suggest that cyclone-related trap losses could exceed 7-million if *Existing* fishery effort is maintained in the coming decades. Considering a trap footprint of 0.6 m², the area of directly affected seascape may exceed 4-million m², excluding impacts due to movement. Future policy should consider fishery effort and future cyclone regimes as a first step toward sustaining benthic seascapes given climate change.

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Oral – will ask for consideration in the Coastal Wetland symposium