**Social-ecological networks in marine fisheries**

**Problem statement**: There is broad consensus that ecosystem-based fisheries management, which aims to account for the coupling of social and human systems and their complex interactions, is critical to the long-term sustainability of ocean and marine systems. Yet translating theory to practice continues to be challenging due to institutional path-dependencies, technical barriers, and information blind spots. While important progress is being made in fisheries towards closing (or at least diminishing) these knowledge gaps and facilitating the operationalization of EBM, there is a relative dearth of empirically grounded scholarship that explicitly deals with the interplay between the human and biological components of these systems. Instead, research has largely focused on either social or ecological connectivity. This apparent compartmentalization is problematic given that the two parts of the system are inextricably linked.

**Description**: In this paper we aim to move beyond this artificial bifurcation by presenting three social-ecological networks in different marine systems (Maine, West Coast, Baltic) that depict natural and human interconnectivity that exists. We then demonstrate the usefulness of coupling these systems by using a social-ecological motif-based approach to evaluate the resilience of each system from a vulnerability perspective. Here, we describe the similarities and differences across systems and reflect on how each system emerged.

**Methods**:

a) Construct affiliation networks in each system

b) Link social networks to ecological system by way of diet matrices

c) Calculate three types of motifs: (i) disconnected (ii) positive feedback (iii) negative feedback (see: Bodin and Crona)

d) Calculate a tbd measure of centrality and look at distribution of human and fish nodes separately and together. Calculate % of path social/ecological for shortest paths.

**Results**:

Given the socio-political and ecological differences across our three case studies, we anticipate that three systems will exhibit different network structures and be dominated by different social-ecological motifs.

Discuss the distribution of centrality, anticipate that some nodes will be central in the network. Previous work suggests that this will include forage fish, (with a high % of shortest involving ecological nodes), but that new species may be highlighted as central because of human connectivity (i.e. Dungeness crab pots on the west coast).

**Discussion & Conclusion**:

We will briefly summarize each of the three systems, compare the similarities and differences and posit why they appear similar and/or different. Discuss the importance of measures of network centrality for management, and what central human nodes might represent.