Mosquito Fleet Thinking: A Community-Linked Network for Detection of Change in Coastal Waters

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Abstract

The coastline surrounding northern North America extends almost 200,000 km and forms a social-ecological continuum that connects the North Pacific, Arctic and North Atlantic oceans. Coastal communities along this vast coastline, most of which are aboriginal and rely to some degree on subsistence harvesting and fishing from the sea, exist within a complex adaptive system forced at several nested temporal and spatial scales. Such systems, currently under stress from climate change and other anthropological forcings are subject to sudden flips into new functioning arrangements; once such tipping points are passed, transformation is the general rule. We argue first that focused monitoring is the only means to confirm change and detect surprise; we then argue that Panarchy theory offers a framework to monitor this immense, non-linear and multi-scale challenge and apply new knowledge and tools to the real-world problems facing coastal communities worldwide. Our central hypothesis is that increased local understanding of impacts of global scale forcing on local conditions will transform a community’s ability to self-govern their resources and operate as a conservation economy. Our core objective is to establish a sustained, community-linked marine observational network measuring key water properties in which communities operate independently at local scales (watershed, estuary, continental shelf) and collectively at regional scales (west coast of Canada and the Arctic). This network of data collection then becomes the basis for two-way exchange of information and cross-scale analysis. Examples of data and traditional knowledge – as well as problems and pitfalls – are presented from three distinct but related pilot projects: one on the West Coast of Canada, one along the coastline of Alaska, and one in the Canadian Arctic Archipelago.

Keywords: coastal, marine, panarchy, community