

## Implementation of The Ecosystem Approach— What is the status of national science that supports policies implementing EA in the Arctic?

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The Ecosystem Approach promises multiple benefits for the multiple uses, pressures and concerns associated with the ocean. Yet the ecosystem approach suffers severely from linguistic uncertainty. Here we clarify the levels of ecosystem-based management, using a rubric developed in the US Marine Fisheries context, to better elucidate which approaches are appropriate under which conditions. Further, there are multiple policies and mandates that establish a broad array of management requirements, broadly known as ecological objectives, for marine resource management, including for example nearly 100 treaties, laws and orders in the US alone. Beyond the US there are comparable management requirements internationally and within national jurisdictions of Arctic Council member states. This dizzying array of management requirements begs for an ecosystem approach, primarily to more systematically and cumulatively coordinate among orthogonalities across these mandates. Here we provide an example, again for the US Marine Fisheries context, of the recently released Ecosystem-based Fisheries Management Policy that describes six guiding principles for implementing these major mandates. To do effective ecosystem approaches to management requires a solid science basis, yet negative perceptions and certainly objections remain as rationales for not enacting an ecosystem approach. Here we succinctly and quickly address the more common myths, noting that in fact an ecosystem approach is feasible. In the context of the Arctic, the perception of lacking clear objectives for an ecosystem approach is explored, noting that given the governance and policy contexts, there are indeed commonly-held ecological objectives. The commonality of ecological objectives is most apparent at higher levels of policy and overarching enabling legislation. As national and indigenous policies and laws are propagated downward toward management requirements for individual activity sectors, such as fishing, differences in ecological objectives necessarily emerge. Furthermore, we describe a suite of working examples from the US Marine Fisheries context from our draft Ecosystem-based Fisheries Management Road Map, noting how they could be applied in the Arctic for both the fishery and other sectors, such as shipping. Certainly we need to continue to develop capacity in the midst of uncertainty, yet we also need to maintain and actually foster a “can-do” attitude as is befitting of those working in polar regions. As the World Ocean continues to face rapid change, with the Arctic being ground zero for many such changes, we don’t really have a choice.

