

Using normative agents to model policy change scenarios for Icelandic fisheries

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Abstract

Fisheries scientists don't often include the human aspects of fisheries into their models. This is due, in part, to the limitations of mathematical models, which need to be kept at a tractable level of complexity. Agent based models can easily handle much more complexity and non-linearity than mathematical models, and have begun to be applied to fisheries, but even in their case human behavior is often modeled by reducing it to perfect rationality or simple heuristics. While these can act as useful simplifications of real life complexity, they fall short when human behavior is the central focus of a model, for instance when modeling policy meant to modulate said behavior in ways the policymakers deem desirable. In order to move beyond these limitations, we use a normative approach to agent modelling in fisheries with deliberative agents driven by values, goals and norms. We apply this approach to Icelandic fisheries in order to study the effects of fishing policy changes on the Icelandic coastal communities as measured by employment (inside and outside the fishing industry) and demographics. We present a number of scenarios designed for various community structures (population, infrastructure, industries, fishing activity, access to resources, and connectedness to the rest of the country's infrastructure), policy variations, and assumptions about the distribution of values and norms within the population. Model communities and environment are designed based on available empirical and statistical data. The models and simulations themselves are designed with the participation of fisheries experts.

Keywords: fisheries, fishing policy, agent based models, normative agents

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