Title: **Linking ecology, economics, and fleet dynamics to evaluate alternative management strategies for US West Coast trawl fisheries**

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Abstract: Increasingly fishery managers are expected to take an ecosystem approach to fisheries management that accounts for the interrelationships of target species as well as non-target species and habitat. Fishery managers would benefit from coupled ecological-economic models that includes both the human and ecological aspects of the fishery and incorporates them in the context of the wider ecosystem. We augment an ecological simulation model (Atlantis) of the US West Coast marine ecosystem with fleet dynamic models that are consistent with the economic incentives created by the current and prospective fishery management systems for the West Coast groundfish fishery. The Atlantis model is a spatially explicit, age structured food web simulation model that incorporates oceanography, climate, and fishery dynamics. The model extends from the US/Canada Border to Point Conception, California, and out to the 1200 meter isobath. We use the model to evaluate alternative policies for setting total allowable catch (TACs) under different management systems including cumulative catch limits (i.e., status quo strategy), cumulative catch limits with full retention and increased observer coverage, and individual transferable quotas. In addition to providing insights into how alternative fishery management policies might affect the profitability and sustainability of primary fisheries, the model illustrates the wider ecosystem impacts of fishery management policies. The linking of fishery ecology and economics within Atlantis serves as a filter to identify management policies and strategies that are both economically and ecologically robust in the long term and avoid those that are not.