Changes in ocean temperature affect fisheries & fishing communities

Issue:
- Warming of the world’s oceans is causing species ranges to expand or contract to avoid temperature stress.
  - The Gulf of Maine is particularly vulnerable to warming (Fig. 1).
  - Many species in the Northwest Atlantic are shifting northward.

Impacts:
- Ecological: changes in community structure, food web dynamics, and overall productivity of ecosystems (Fig. 2).
- Socioeconomic: shifting fish stocks impact industry stakeholders and fishing communities.

Potential Solutions:
- Consider distribution shifts in reauthorization of the Magnuson Stevens Fishery Conservation and Management Act.
- Identify potential ecological and socioeconomic impacts of shifting species before they happen.
- Consider alternate methods for collecting data (e.g., partner with fishermen to monitor shifting species), especially for data poor stocks.
- Consider alternate management methods (e.g., dynamic management)
- Provide education/training to fishermen interested in harvesting new species.
- Consider strategies to generate interest in new species and ultimately market demand that will secure profitable transition from targeting historically abundant species to newly abundant species.

Fig. 1. Global sea surface temperature trends, 2004-2013. The Gulf of Maine is outlined in black. (Pershing et al. Science 2013)

Fig. 2. Black sea bass are commonly caught as bycatch in lobster traps as far north as Cutler, Maine. Preliminary data suggests that the presence of sea bass causes lobsters to move/forage less and consume less. There is also evidence that sea bass eat juvenile lobsters (McMahan unpublished data).

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