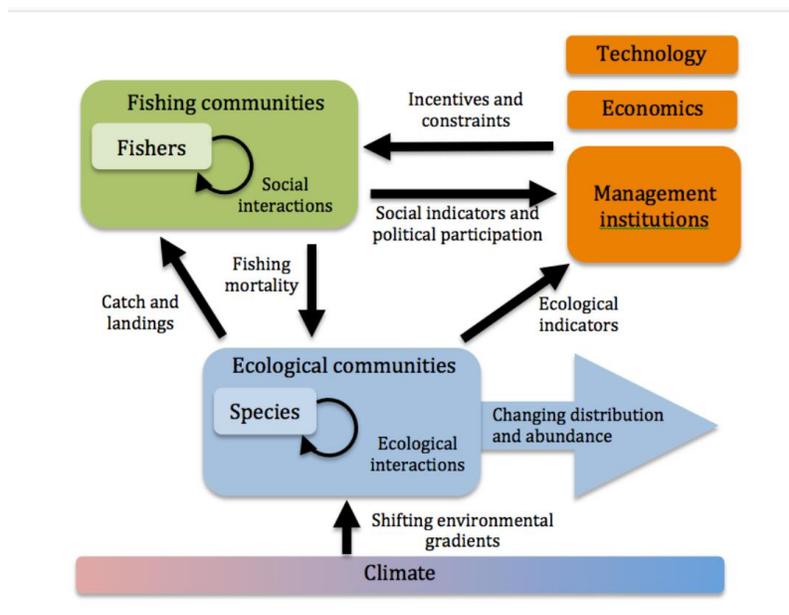


Part 3

Now that Joe understands why he may be seeing changes in his catch, his mind is racing through the impacts that these changes may have on his fishery. “Do I find a new species to fish? Do I find a new line of work? If I do, what about the welfare of those working for me?” After grappling with all the what-ifs, he took a deep breath and began thinking about ways to move forward. The next speaker sparked his interest.

Sam Sharkman from the National Oceanographic Administration was the final speaker of the day, and he suggested an action plan for the fisheries of the East Coast. “With your assistance, we need to find ways to ensure our fisheries are maintained into the future. It must not only consider our multi-million-dollar industry and the jobs it provides, but it must also consider the science. We know fish are leaving certain regions, but they are doing so at different rates and other species are moving in. We also know our current quota system for many species is based on data from the late 1980’s and early 1990’s, and it has not been updated to account for these shifts. Whatever management plan we adopt must be flexible enough to account for shifting fish populations now and into the future, and for the range in sizes of our fishing companies from small boats to large boats and fleets. Our regulations have been successful in rebuilding our fish stocks after years of overfishing. We’ve got to maintain this positive momentum.”

Sam showed one slide on the screen (*see Figure 5*), and split the audience into diverse teams with stakeholders representing various entities involved in the fishing industry (big boat and small boat fishers), science, local fishing communities, etc. The teams were tasked to develop a fisheries management plan reflecting the shifts in marine species.



*Figure 5: Conceptual diagram of the fisheries coupled human-environment system: climate and fishing impact species, while feedbacks through fishing link human communities and species. Management institutions respond to social and ecological information. Regulations, economics, and technology constrain or incentivize fishing behaviors.*



Questions

1. How might the interactions of fishing and climate velocity affect the abundance and distribution of marine fish?
2. How do fishers and fishing communities adapt to shifts in species ranges and abundances?
3. Fishing regulations place limits on the quantity and size of fish obtained in sectors of the ocean. Why is it so difficult to establish fishery regulations which ensure fish populations are sustainable?
4. Revise the model you created in Part 1 to account for the complexity of the issue presented in this case study. Be sure to identify any feedbacks that add to the complexity of developing a sustainable fisheries management plan. Refer to the model presented in Figure 5 to ensure all the components of the system are considered in your plan.

