

WHOI-Duke Fellowship Project Summary
by
Alfred Lingxiao Yan
Duke University's Nicholas School of the Environment

I was honored to receive the WHOI-Duke fellowship to learn and work at the Marine Policy Center of the Woods Hole Oceanographic Institution in the summer of 2013. With the guidance of Dr. Di Jin, I conducted research on the ecological and economic tradeoffs between herring fisheries and whale watching in New England.

The research intends to investigate the benefits and costs associated with restrictions on trawling for herring in order to protect whale population in the New England area. This policy option is based on the idea that intense trawling for herring, a prey of whales, will cause the reduction of whale abundance. In the study, we compare the revenues of herring fisheries with those from whale watching under different herring harvest levels through an integrated economic-ecological analysis.

Using the marine ecosystem model (i.e., the EMAX food web model) developed by Link et al (2008), I calculated the ecological coefficients linking the two stocks. Unlike simple predator-prey models, our food web analysis takes into account the effects of other eutrophic groups. The socio-economical analysis focuses on the revenues from herring fisheries and whale watching operations. By comparing the benefits from two sides, we examine whether more of the herring stock should be left in the ocean as food for whales from a social economic standpoint. Figure 1 shows the framework of our research.

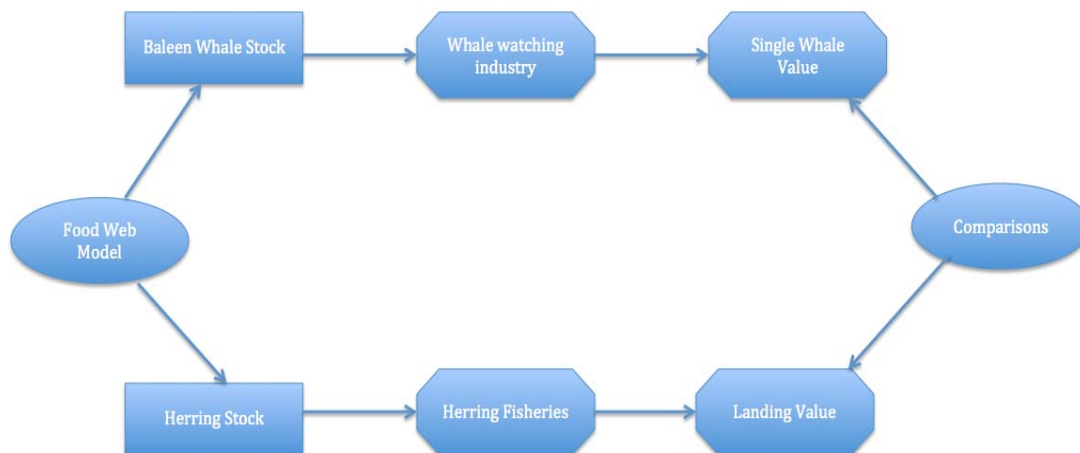


Figure 1: The analytic framework for the research

Our preliminary results suggest if we reduce the current catch level for herring, the associated benefits from the whale-watching industry (due to increased whale sightings) would be far lower than the losses from the herring fisheries. In other words, the current level of herring harvest does not have a significant impact the whale stock.

It should be pointed out that the result is preliminary and there is a lot of room to improve in our model. Specifically, we did not include the non-use value of whales, which may impact the result significantly. In addition, some regional and temporal mismatching in our data needs further investigation.