TESTIMONY OF John F. Bruno, PhD, Professor, Department of Biology, The University of North Carolina at Chapel Hill, before the Committee on Natural Resources on the Reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act, September 11, 2013.

Chairman Hastings and Ranking Member DeFazio,

My name is John Bruno and I am a marine community ecologist and Professor of Biology at The University of North Carolina at Chapel Hill.

I appreciate the invitation to talk with you today about fishing and how it affects and is affected by the heath of our oceans and I thought I'd offer a somewhat broader perspective.

As you have heard in other hearings and from other panelists and probably read in the recent report from the National Research Council, the Magnuson-Stevens Act is working and is helping to rebuild our highly depleted fish stocks. It is an exaggeration to declare that overfishing has ended in America, but we are moving in the right direction. Yet the changes ahead of us present an even bigger challenge. Let's not squander the sacrifices that got us here by ignoring these growing problems.

First, the loss of coastal habitats including salt marshes, seagrass beds, and mangroves is profoundly affecting fisheries. Many fish depend on these habitats as nurseries and as adult feeding grounds yet they are disappearing faster than rain forests. In North Carolina we've lost over 90% of our oyster reefs and much of our coastal marshland. This has greatly impacted our fish like our flounder and red drum.

Second, we've learned that ocean warming due to greenhouse gas emissions is having a huge impact on fisheries. Ocean warming is depressing fish populations by killing their living habitats like coral reefs. It is also causing fishes to shift their geographic ranges to higher latitudes by nearly 200 miles per decade[1]. Fisheries productivity hot spots are also moving and fish composition is changing. We'll be catching different fish off Gloucester in 50 years than we are catching today. Ocean acidification will also challenge or outright destroy many fisheries, such as some of our most productive shellfish.

Third, the dependence of most fisheries management on the theoretical concept of Maximum Sustainable Yield is the underlying cause of overfishing, not the solution to it. Estimates of MSY are usually based on oceanographic conditions that don't even exist anymore. Restoring fish populations to MSY does not restore ecological function or maximize profits and is a highly risky strategy in a changing world[2]. MSY also ignores critical interactions among species, which is a fundamental reason it has caused so many unanticipated problems.

To secure our hard-won gains, we need to invest in strategies that will stabilize fish populations for the long-term. Critically, we need to ensure that we conserve very large females - the ones who produce the most and healthiest offspring. Fully restoring fish populations, and natural population structure, would maximize profit and greatly reduce the effort and risk that goes into commercial fishing, it would improve opportunities for recreational fisherman - they'd be catching more and much larger fish – and it would buy us insurance against warming and acidifying oceans.

In short maintaining fish populations at roughly one third their natural density – which is what MSY prescribes and is also the current threshold for "overfished" – undercuts the social, ecological, and economic value of fish. Our fisheries would be more profitable, more sustainable, and more resilient at higher biomass levels.

I think the MSA has done enormous good and should be reauthorized. But it is time to move beyond MSY and start managing fish based on their real value and in a whole ecosystem context. Climate change, habitat loss, and other factors that influence fish populations need to be considered explicitly in the Magnuson-Stevens Act. **And fisheries management must recognize that the oceans are changing: we should be mitigating this change and also building the resilience of our coastal communities and marine ecosystems to it.**

Thank you,

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[1] Burrows, M. T. et al. 2011. The pace of shifting climate in marine and terrestrial ecosystems. Science 334:652–655. Poloczanska, E.S. et al. 2013. Global imprint of climate change on marine life. Nature Climate Change doi:10.1038/nclimate1958. Download PDFs here. The mean rate of expansion of the leading range edges for all marine species for which data is available is 72 km / decade (±14 SEM). For bony fishes this value was 278 km / decade (±77 SEM).