May 4, 2016

Dear Dr. Vignieri

We’d like to gauge interest for a manuscript we are are preparing to be considered for publication as a Policy Forum in *Science*. We present a new way to quantify the adaptive capacity of coupled natural-human systems and our work, which focuses on coastal fishing communities on the US west coast, is directly aimed at advancing new policies for sustained economic growth based on the use of natural resources. This piece is a convergence of disciplines – ecology, economics, complex adaptive systems theory – and is the culmination of a NSF Coupled Natural-Human Systems project run out of Princeton University.

We believe this piece could change the way coupled natural-human systems are governed. By introducing a tractable method to quantify the complexity and adaptive capacity of these commercial fishery systems, our work will facilitate informed planning for, and responses to, environmental and economic shocks such as natural disasters, large-scale market setbacks, and climate change. While policy makers have made great steps to account for natural complexity, for example the ESA recognizes that critical habitat is essential to recovery planning, there is a gaping hole in our ability to do so for social-systems. We present a new method for quantifying the socio-economic structure of coupled natural-human systems. This is analogous to the first depiction of a food-web by Darwin centuries ago. Now, we depict the “tangled bank” of socio-economic interactions, that make clear the human connectivity in the food-webs from which we extract living resources. In this piece, we use our novel research as a spring-board to discuss new policies aimed at sustainable natural resource use, accounting for the connectivity of socio-economic systems.

This piece is particularly suited to *Science* for several reasons. (1) At this time, **national and international marine EBFM and EBM policy** are being implemented, specifically both the US and the EU are designing fishery ecosystem plans and our novel methodology and policy suggestions will directly engage these efforts toward explicitly linking and balancing human well-being and ecological integrity. (2) Our methods for quantifying the connectivity of socio-economic systems, while new in approach, uses existing data. Hence it can be **quickly adopted** by government agencies tasked with policy design. (3) The **novelty** of this piece lies in the operationalization of decades-worth of Complex Adaptive Systems theory applied to coupled natural-human systems, moving beyond theory to practice in clear and targeted ways, aimed at improving the governance of social and ecological systems in the face of human population growth, technological advances and global climate change.

We hope that this brief introduction to our work will give us the opportunity to submit a manuscript for review and we welcome any questions on this work.

Yours sincerely,

Emma Fuller1,

Jameal Samhouri2,

James Watson3,

and Simon Levin1

1Princeton University, USA

2NOAA, Northwest Fisheries Science Centre, USA

3Stockholm Resilience Centre, Sweden