

Proposal for a workshop at the International Symposium on  
“Climate Change Effects on Fish and Fisheries: Forecasting impacts, Assessing Ecosystem  
Responses, and Evaluating Management Strategies”  
April 2010, Sendai, Japan

<b>1. Title</b>
Networking across global marine ‘hotspots’
<b>2. Convenors</b>
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<b>3. Description and Objectives</b>
<p>Regional global warming ‘hotspots’, typified by above average ocean temperature increases, provide the potential for early warning and evidence of the response by natural resources to climate change. In theory, regions at the ‘front-line’ of climate change should also be leading the field in terms of assessing impacts and evaluating adaptation options. Networking and synthesising outcomes from across hotspots can facilitate accelerated learning and also indicate sensible pathways for maximising adaptation and minimising impacts for other global regions.</p> <p>This workshop is designed to (1) highlight where global marine ‘hotspots’ occur now, and where they are projected to occur in the future; (2) summarize the information currently emerging on biological climate change impacts in these areas, and (3) discuss the potential for developing a global network of scientists, policy makers and managers working in marine hotspots.</p> <p>Ecological monitoring of hotspots provides us with one of the first opportunities to detect the nature and pace of climate change induced impacts on our marine ecosystems, and also the first prospect for validating species or ecosystem model projections against reality. Fisheries provide significant social and economic benefits globally, and early warning of changes in resource quality and/or availability is required to minimize social tensions (<i>e.g.</i>, increased poverty and changes in resource allocation) and societal costs (<i>e.g.</i>, income redistribution and government restructuring). Prior knowledge of how and when resources may alter will also facilitate the development, application and evaluation of adaptation options for fisheries.</p> <p>Traditionally, as ecologists and fishery biologists, we have looked to the past to generate hypotheses of future species, ecosystem and fishery behavior. However, as we move towards non-analogue futures, the nature and pace of climate change is actually eroding the value of historical information – we therefore need to develop ways of capitalizing, as efficiently and rapidly as possible, on emerging information. By nature, all marine ecosystems are unique, and the information derived from each location is context dependent to varying degrees. However, if we can develop a network of scientists and managers working in global marine hotspots, where information is integrated and synthesized, contrasted and compared across locations then this provides us, globally, with the best possible learning opportunity to address the challenges of climate change.</p> <p>Participants from the 17 areas identified in our analyses as ‘hotspots’ (areas warming faster than 90% of the ocean), as well as researchers from other areas that would like to contribute to the development of a global network, are encouraged to attend. Hotspots include: the Bering Sea, Gulf</p>

of Alaska, south California/Mexico, Galapagos, south Brazil/Uruguay, north east Canada (Hudson Bay and Flemish Cap), Greenland Sea (and Denmark Strait), Angola Basin, South Africa, Mozambique Channel, south Western Australia, south eastern Australia, northern Indian Ocean, Indo-China, Sea of Japan, Sea of Okhotsk, and the Antarctic Peninsula. Our preliminary analysis of Global Climate Models has indicated areas that are ‘hotspots’ from the perspective of *exposure* to greatest rates of temperature change, however, input from researchers working in areas or systems known to be highly *sensitive* to smaller changes would also be appropriate.

Participants providing or presenting a summary of impacts from any of the global hotspots will be asked to contribute to a large multi-authored publication. Identification of biological change in these hotspots is the main workshop challenge; however, participants are also requested to identify publications or unpublished data showing long-term change in oceanographic or physical characteristics of the area (*e.g.*, SST, currents). Several potential proposals and funding sources for a global network of marine hotspots will be discussed.

#### **4. Anticipated Outcomes/Products**

Production of a scientific paper in a high-ranking international journal – including an overview of where these ‘hotspots’ are currently and where they are likely to be in the future, and the scientific benefits of networking across marine hotspots from around globe.

By networking researchers from hotspots in both developing and developed countries we anticipate being able to provide the earliest information on impacts, the ability of models to capture climate change for prediction of resource futures, and to measure the success of adaptation measures, that would have relevance at a global scale. This would lead to greater knowledge for managers to make decisions and for increased community understanding of the need for these decisions, including increased confidence in the models and adaptation options being proposed.