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Managing Marine Biodiversity: an Emerging Consensus

Marine ecosystems, upon which large parts of society depend, are evermore threatened by a multitude of direct and indirect human factors. Managing these interactions is complicated by expanding demand for provisioning services such as fresh water, fisheries, and aquaculture, as well as other service functions such as supporting marine transportation, military preparedness and utilizing traditional and alternative energy sources. Recent events in the Gulf of Mexico associated with the Deepwater Horizon oil spill remind us that human uses of the ocean can have far reaching and consequential impacts on marine biota, economies, the even social fabric of communities and human health.

There is an emerging consensus in much of the world that the management paradigms we have employed heretofore are insufficient both because of their failures to adequately protect marine biodiversity, and because risks and tradeoffs have not been adequately considered when making decisions about marine activities. In the USA and elsewhere, ecosystem-based coastal and marine spatial planning is gaining momentum as nations and regions more fully understand the benefits of more integrated, deliberative, science-based, and participatory management decision-making. New ocean policies, such as the Executive Order recently signed by President Obama, set into motion regional planning bodies charged with helping to manage the totality of ecosystem service functions with explicit consideration of the supporting, cultural and regulating functions provided by marine ecosystems, as well as the goods they generate. As these concepts pass into more common use in regulating human activities, it places serious demands on scientists to provide the types of decision-support tools, monitoring, research and the insightful advice that these institutions will require.

Supporting ecosystem-based management requires that we take more holistic approaches, for example, understanding the important links among climate, human use, and patterns of biodiversity (productivity, species richness, and stability). The scientific community has responded with better methods to monitor the ocean and its uses, ways to value market and non-market based ecosystem services, and new forecasting tools. Our challenges will be to implement these tools through governance systems that can adapt to changing base conditions, fairly evaluate new and existing demands for ecosystem services, and that can successfully implement policies based on fundamental principles such as reversing the burden of proof,

precautionary management in the face of uncertainty. This is an exciting and in fact pivotal moment in the history of the management of the oceans.