PICES XIV W4-2520 Invited
Millennium Ecosystem Assessment: Lessons learned

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The Millennium Ecosystems Assessment (MA) was a global assessment of the world's major ecosystems. It is different from past global assessments such as United Nation's Environment Program GEO3 with its focus on the interaction of ecosystems and human well-being. The MA used a modified demand-pressure-state-response (DPSR) model to not only assess current trends and conditions, but also looked at possible futures and responses. The assessment also considered sub-global assessments at different scales from around the world. The marine and coastal aspects of the assessment were focused on two chapters: Marine Fisheries (Chapter 18) and Coastal (Chapter 19). Aspects such as biodiversity, aquaculture fisheries as a 'food' system and management of coasts were included in other chapters within the three volumes. Although considered one of the most comprehensive assessments of its kind, there were gaps and deficiencies in coastal and marine areas, specifically: trends in basic oceanographic features, climate change on ecosystems, biodiversity, pollution, human health, economic valuations and human use (non-fisheries) and good examples of linkage between marine ecosystems and human well being that were not focused on fisheries. In addition to the gaps in specific aspects of marine systems, there was also weak links between the global and sub-global assessments, especially with a lack of a high seas sub-global assessment and only two assessments with a coastal component. Future MAs will likely be small and more focused. For marine and coastal issues, the focus should be on filling the gaps identified in this first assessment.

PICES XIV W4-2362 Oral
Putting ecosystem science to work

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The dialogue between scientists and the makers of decisions about how the ecosystem affects human activities and is affected by human activities is a key justification for investment in and prioritization of research. Investigation of how scientific perspectives are being used to inform decisions is one means of assessing gaps in North Pacific ecosystem science and research. This study focuses on the Alaska region [BSAI, GOA] to examine the current use of ecosystem information in decision-making by selected federal and state institutions, compares this usage with the content of the PICES North Pacific Ecosystem Status Report, and identifies possible gaps in coverage that could be considered in prioritization of future research. This process research process also identifies barriers and bridges to the use of ecosystem science to inform decision-making.

PICES XIV W4-2595 Oral
Hypothesis-driven ecosystem monitoring in the Gulf of Alaska

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The Gulf of Alaska Ecosystem and Monitoring Program (GEM) has assembled and published the basic hypotheses regarding the regulation of biological production and the current understandings of the relevant physical, chemical and biological sciences for the northern Gulf of Alaska. An interdisciplinary narrative attributes the short and long term changes in biological production to the consequences of climatic variability on annual and decadal scales. Ocean circulation is strongly shaped by the topography of the region, both terrestrial and submarine, and topography influences and interacts with climate. Key indicators of changes in production are identified in the hypotheses presented. The hypotheses are followed by summaries and syntheses of the status of these indicators from physical, chemical and biological oceanography, as well as birds, fish and mammals. Human factors that produce change in the region are also seen as important indicators of ecosystem change. Modeling is presented as the ultimate means of understanding the many indicators and their complex

interactions that are necessary to explain change in ecosystems. A discussion of modeling approaches and a summary of available models concludes the work.

Mundy, Phillip R. (ed.) 2005. The Gulf of Alaska: Biology and Oceanography. Alaska Sea Grant College Program, University of Alaska Fairbanks.

PICES XIV W4-2424 Oral
PICES report on the marine ecosystems of the North Pacific: Why, how, and what's needed next

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The PICES Report on the Marine Ecosystems of the North Pacific was published in late 2004, after two years of active work by a large number of scientists. It arose out of recognition that many unusual events had occurred in these marine ecosystems during the past 10 years, but there had been no attempt to connect them across the larger region of the entire North Pacific Ocean. The report that was published in fact was one part of a larger proposal for PICES to support regional analysis centers to collect and analyze ecosystem data. The ecosystem report was led by a Working Group (mostly the members of PICES Science Board) who developed a template of required information, and the chapters were written by lead authors (and co-authors selected by them) familiar with each region or species group. The next version of the Report needs to consider several issues:

1) is the previous approach the most efficient and effective, considering that a core report now exists and that the MONITOR Task Team will take responsibility for the report;
2) what are the significant data gaps? Do they represent actual missing information or a lack of awareness of existing data;
3) are there significant themes that were poorly or not covered, *e.g.* contaminants, benthos, near-shore;
4) to what extent should PICES conduct its own analyses and develop its own ecosystem indicators rather than synthesising previously published material;
5) better definition of the clients for, and users of, this report and its information and the best formats to present the information.

This presentation will discuss how the Ecosystem Report came about, what worked and what did not work well, our view of the significant data gaps, and propose a plan for creation of the next Ecosystem report.

PICES XIV W4-2509 Oral
Progress on a range-wide inventory for Pacific salmon monitoring data

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Salmon (*Oncorhynchus* spp.) are assessed in the 2004 PICES North Pacific Ecosystem Status Report using times series of catch statistics by nation. Our program endeavors to provide a more rigorous assessment of salmon across the North Pacific based on fisheries-independent monitoring data. We have embarked on a range-wide data inventory for anadromous Pacific salmon to provide (1) a consistent framework to describe current monitoring efforts and (2) a source for data to conduct quantitative range-wide salmon status and trend assessments. We have begun systematically characterizing monitoring activities which track parameters related to salmon population viability – abundance, distribution, diversity and productivity. We intend to classify each data set into a monitoring tier (1-3) based on the underlying biological knowledge of the target stock or population to help standardize data. We expect to complete the North American inventory and initiate the Western Pacific inventory over the next eighteen months. Our first two analyses using data sets from the inventory will be (1) a comprehensive gap analysis of current monitoring effort and (2) a phased assessment of salmon status and trends at the coarsest spatial scale, reflecting regional species groupings (referred to as Tier 1). The gap analysis will provide the first range-wide assessment of the distribution of monitoring effort and the range of data quality used to assess North Pacific salmon status and trends. Our coarse-grained, Tier 1 status assessment will draw more robust inferences on the population status of species, representing an improvement on relying solely on aggregated catch statistics.

PICES XIV W4-2401 Invited
Broadening our understanding of the North Pacific nearshore ecosystem: Integrating PICES and NaGISA

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The costal zone cannot be ignored when assessing the oceans ecosystem. Easy to access, this zone, which acts as a nursery ground and primary food chain source, is exposed to the brunt of human incursion and environmental change. A global comprehensive assessment of the costal ecosystem has never been completed. Meaning that the few interregional ocean assessments prepared have either had to use fisheries catches as a measure of biodiversity, non-quantitative data or geographically patchy and incomparable data sources. The cost effective, standardized protocols for nearshore habitat assessment of biodiversity as promoted by NaGISA (a Census of Marine Life field project) are part of the effort to supply a baseline of information and create a network of researchers that will change this. The basic information NaGISA is gathering on coastal communities will allow a comprehensive assessment of global biodiversity. The continuation of the protocols, as they are incorporated into local and national monitoring schemes are envisioned as perpetually providing similarly detailed data. The next step is to incorporate this essential nearshore information into ocean wide assessments. The integration of PICES and NaGISA, as outlined in this presentation is intended to advance this idea and in doing so form a clearer picture of the North Pacific Region.

PICES XIV W4-2542 Oral
Filling the gaps: The case of the Yellow Sea

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To assess the status of an ecosystem in an appropriate manner, theoretically we have to know its past trajectory and the present state should be evaluated as a point in the continuous trajectory. When preparing the chapter on the Yellow Sea and the East China Sea in the NPESR, it was evident that far less knowledge and information were available than were required to do the state assessment of YS/ECS ecosystem. The picture was fragmentary in terms of geographical, temporal, taxonomical and thematic coverage. A basin-scale picture was lacking, in particular, on nutrient cycles, benthos, fish species biomass and population dynamics, pollutants and their ecological impacts. There were also problems in synthesizing data due to differences in sampling and analysis methods among nations. With such holes, it was even more difficult to single out the causes of ecosystem change. Some of the gaps can be filled in the near future with new international projects in the region. One example is YSLME (Yellow Sea Large Marine Ecosystem) project supported by GEF (Global Environment Facility). Of the five working groups established in the YSLME project, four working groups' activities are relevant to ecosystem status assessment; Fisheries, Ecosystem, Biodiversity, and Pollution. From proposed activities, historical data will be mined in a more methodical way. And basin-scale surveys are planned to collect up-to-date data of various variables. With better data coverage, a better theoretical development is desired.