PICES/MAFF PROJECT ON "*MARINE ECOSYSTEM HEALTH AND HUMAN WELL-BEING*"
FIRST MEETING OF THE PROJECT SCIENCE TEAM
October 11, 2012
Hiroshima, Japan

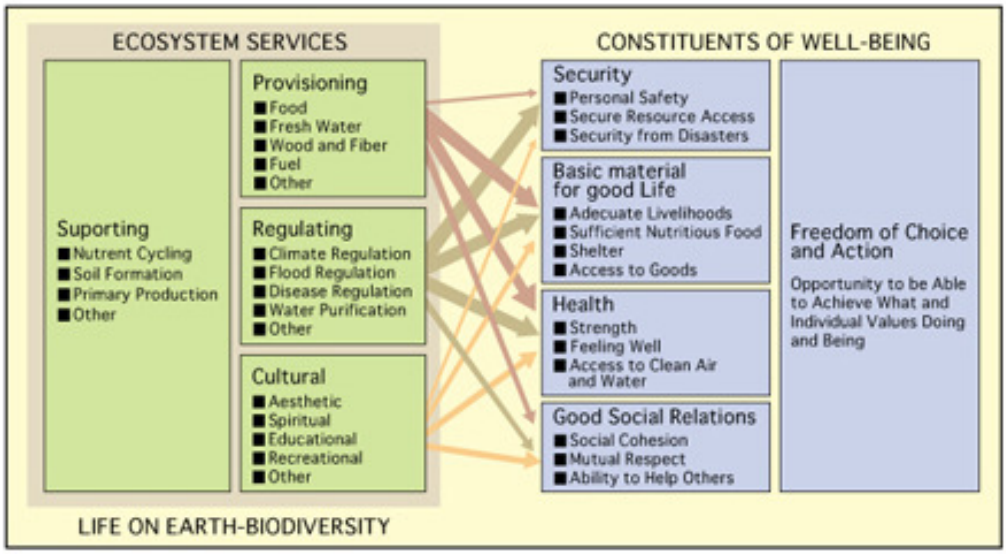
The first meeting of the Project Science Team (PST) for the PICES project on "*Marine Ecosystem Health and Human Well-Being*", funded by the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan, through the Fisheries Agency of Japan (JFA), was held October 11, 2012, in conjunction with the PICES Annual Meeting in Hiroshima, Japan. The meeting was co-chaired by Drs. Mitsutaku Makino (Japan) and Ian Perry (Canada).

The PST members and meeting participants are identified in *Appendix 1*, and the meeting agenda is presented in *Appendix 2*.

BACKGROUND OF THE PROJECT

- Progress is being made internationally on an ecosystem approach to the management of marine systems.
- Very recently, the concept of human well-being within marine social-ecological systems has become recognized as an important step forward.
- Well-being shifts the perspective from objective measures of sustainable livelihoods (comprised of the physical, social, human, natural, and financial resources available to a community or country) to include the subjective or perceived well-being of individuals and communities. This represents a shift from people as exploiters of the ocean to people as integral components of resource sustainability and ecosystem health (Coulthard *et al*. 2011; Charles 2012).
- The Japanese "Sato-umi" (village-sea) concept is an example of this humans-in-nature approach, in which a healthy ecosystem is seen to nourish human well-being, and human activities are seen as necessary for sustaining ecosystem health. Therefore, this project is proposed and funded by the Japanese government.

Ecosystem services and human well-being was recognized in the UN Millennium Ecosystem Assessment (2005), although it was noted in discussion that the connecting arrows should go both directions (see the chart below):



The project goal is to identify the relationships between sustainable human communities and productive marine ecosystems in the North Pacific, under the concept of fishery social-ecological systems. Considering that global changes are affecting both climate and human social and economic conditions, the project is expected to determine: (a) how marine ecosystems support human well-being, and (b) how human communities support sustainable and productive marine ecosystems. The MAFF contribution is from the ODA (Official Development Assistance) Fund and, therefore, involvement of developing Pacific Rim countries in activities is required under this project.

The project lifetime is 5 years: it began in April 2012, with the ending date set as March 31, 2017. The budget allocated for Year 1 (FY 2012: April 1, 2012 – March 31, 2013) was $149,880, and the initial budget breakdown is shown in the following table:

Travel and meetings	Contracts	Equipment	Miscellaneous	Overhead	Total
60,000	49,000	19,600	1,796	19,484	149,880

It was noted that the proposed goals of the project are very general and need to be made much more specific. Aspects of capacity building and the provision of analytical tools should be included and stated explicitly. Both of these (capacity building and tools) should continue to be useful after the project has been completed. When organizing capacity building workshops/courses, the objectives should include the needs and goals of a developing country and its partnering institutions.

The "must do" things under the project include to:
1. select 3 study sites: Southeast Asia, Pacific oceanic islands and Central America;
2. conduct research on ecosystem health and human well-being;
3. organize 2–3 workshops/courses at each site;
4. construct a 'database';
5. submit annual reports to MAFF/JFA within 120 days after the close of each project year ending March 31.

It was suggested that the 'database' could be a bibliography, for example, of interactions within human-natural systems and related references that would be useful for research and capacity building activities. It would be desirable for this database to support the work of the PICES FUTURE science program, and to link with the work of PICES Working Group on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors* (WG 28) on indicators of ecosystem responses to multiple stressors regarding human activities (and their related indicators) that affect the ocean.

It would also be desirable for the project to build on and learn from existing efforts, *e.g.*, NOAA's international activities to teach Integrated Ecosystem Analysis approaches in the South Pacific.

Action: Dr. Vera Trainer to provide contact information for these NOAA activities.

The work of this project should be integrated with other PICES activities and expert groups, such as:
- FUTURE Research Theme 3 on "*How do human activities affect coastal ecosystems and how are societies affected by changes in these ecosystems*";
- Section on *Human Dimensions of Marine Systems* (S-HD);
- Section on *Ecology of Harmful Algal Blooms in the North Pacific* (S-HAB);
- Section on *Climate Change Effects on Marine Ecosystems* (S-CCME);
- WG 28 on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors*;
- WG 21 on *Non-indigenous Aquatic Species*;
- WG 29 on *Regional Climate Modeling*.

REVIEW OF WORK RELATED TO THE PROJECT

Dr. Vera Trainer described the HAB (harmful algal bloom) component of the previous MAFF-funded project (2007–2012) on teaching country-specific training courses most required to ensure seafood safety in the Pacific Rim developing countries outside the PICES region (Philippines, Indonesia, and Guatemala). It had the following features:
- a survey sent through the Intergovernmental Oceanographic Committee of UNESCO (IOC) to appropriate national representatives regarding their perception of needs for HAB monitoring in their country (see *Appendix 3* for a sample survey form);
- a follow-up scoping meeting with representatives of agencies in each country selected for training courses and workshops, to refine their needs and goals for training;
- a regional workshop/course organized and conducted in collaboration with local partners;
- a follow-up meeting with the national representatives, to assess the outcomes from the training courses and workshops.

Dr. Trainer expressed her view that teaching the 'philosophy of how to do the work' approach was better than teaching a specific issue, so that the participants can have the tools to apply to issues as they emerge rather than fix on a set of specific problems. In addition, it is important that the trainees include those people who are actually doing the work.

Dr. Thomas Therriault commented that the PICES WG 21 on *Non-indigenous Aquatic Species* took a different approach to their 2007–2012 MAFF-funded project. They decided that the issues to be addressed regarding invasive species were already well-defined and focused their work on developing a database of where invasive species have been observed.

Dr. Keith Criddle noted that the Food and Agriculture Organization of the United Nations (FAO) has developed a training course on ecosystem-based management for fisheries and suggested it could be important to identify the spatial scale and scope of their project.

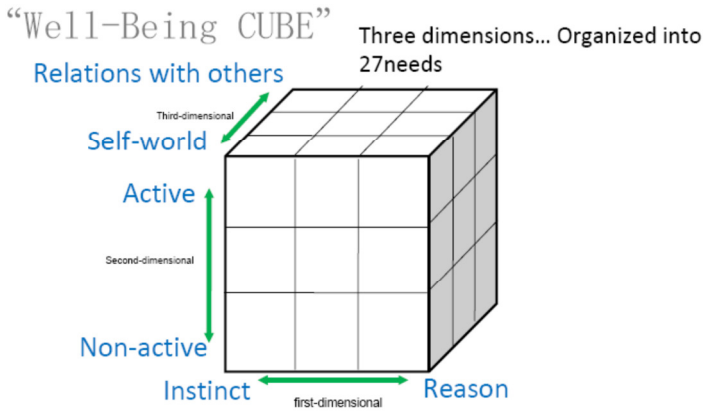
Action: Dr. Criddle to follow-up and circulate details on this FAO training course.

As human well-being is not always understood the same way by all parties, it was agreed that a process of getting to the 'shared objectives' is necessary for the present PICES/MAFF project. The following was suggested as a possible approach:

1) The PST selects the countries, and then develops a process and questionnaire for circulating to selected contacts in each country in order to identify the specific issue to be addressed, within the context of marine ecosystem health and human well-being (*i.e.*, specific issues within this topic may differ among countries).
2) The project adopts a 'responsible template' approach, in which the national representatives define their critical issues, and the PST members help with those issues for which the team has expertise.
3) It was recommended to start with broad objectives within the context of marine ecosystem health and human well-being, then let the national participants define/identify their critical issues within these broad objectives, on which subsequent training courses and workshops would focus.

This process requires a clear sense of who the target participants are for what type of training. For example, an important difference between the present project and the 2007–2012 PICES/MAFF project is that the previous one had a very specific training topic related to human and environmental health. The participants at the training workshops were identified as those people who conduct the marine monitoring activities, in particular the laboratory personnel. In contrast, the present project is concerned more with conceptual issues of marine ecosystem health and human well-being. The target participants in such a topic may include representatives of local, regional and/or national government agencies responsible for marine management and representatives of local community groups in marine-dependent communities.

Ms. Juri Hori and Dr. Makino presented definitions for human well-being from psychological research: "*Well-being is a state of being with others and the natural environment which arises where human needs are met, where individuals and groups can act meaningfully to pursue their goals, and where they are satisfied with their way of life*" (Gough *et al*. 2007). They described the concept of the "well-being cube", in which a person (or community, region, or country) can be located in one or more of 27 cells defined by three axes each with three categories:



The survey discussed above could be used to complete this "cube" analysis for each country, thereby serving as a standard method to compare countries with respect to their needs for marine ecosystem health and human well-being. In addition, this method might be used to compare the responses of the workshop participants to the responses of the broader population from which the participants are drawn, and also, how does the region or community compare with country as a whole. In discussion, it was noted that multiple tools may then be needed to link human well-being analyzed by this method with the necessary ecosystem services.

Action: Ms. Hori and Dr. Makino to prepare a model example to illustrate how this approach might work, and the types of questions that might be developed. This example could include illustrations of how the "well-being cube" analysis links with ecosystem services.

SITE SELECTION

Three countries were discussed for potential training:

- Indonesia: large population, aquaculture-intensive;
- Palau: finfish capture fishery focus, existing networks of community-based fisheries;
- Guatemala: upwelling system, finfish and aquaculture.

Possible training workshop/course time schedule for these countries:

Year 1: Indonesia
Year 2: Indonesia and Guatemala
Year 3: Guatemala and Palau
Year 4: Palau and Indonesia
Year 5: final synthesis workshop

In addition, the selection of an appropriate site within each country has to be considered, in consultation with the national representatives. Is more than one site per country needed?

Dr. Harold Batchelder indicated that he has a student working on modeling of Meso-American reef systems, and so he keeps track of some issues on those systems. There is a website (http://www.healthyreefs.org/images/pdf/conceptual_framework.pdf) that shows a conceptual framework for those systems, which includes "social well-being", which seems synonymous with "human well-being" as described by Hori and Makino. The website has several reports that summarize the condition of Meso-American reef systems, and it might be worth exploring these and other similar sites. There is also prior work on "*Coastal systems and human well-being*", and the PST should learn from these efforts.

The reasons for selecting tropical countries as case studies need to be presented and proved to PICES member countries. For example, ENSO processes connect the tropics with PICES member countries at higher latitudes, as does food supply (shrimp and tuna from tropical countries are major imports to PICES member nations).

Action: Dr. Suam Kim to provide Dr. Makino with information on Dr. Sung Yun Hong as a possible contact in Indonesia, and Dr. Trainer to consider leading the program in Guatemala.

WHAT TOOLS CAN PICES PROVIDE?

Within the contexts of sustainable human communities and productive marine ecosystems:

- What are the general concepts leading to sustainable human communities and productive marine ecosystems?
- Where do countries 'want' to be within these concepts and where are they now?
- What are the major stresses (for example climate change) and how might these affect the current state and the transitions to the desired state?
- How does human well-being relate to ecosystem services in these countries?

The PST agreed to consider if a reduction of all potential activities to one, for example aquaculture, or a few activities may help to focus the discussions and training. The initial survey approach and first scoping meeting could be used to identify the larger suite of activities of interest, and if they can be reduced to a smaller number of key activities.

Key outcome: Provide an approach and tools to doing these types of 'integrated social-ecological assessments'.

NEXT STEPS

By February 2013:

- select specific objectives and approach for this project;
- refine "well-being cube" example;
- set-up a project website for PST members;
- prepare a draft questionnaire for Indonesia, including identification of potential target participants;
- identify contacts and conduct the first scoping meeting with appropriate representatives in Indonesia.

By May 2013:

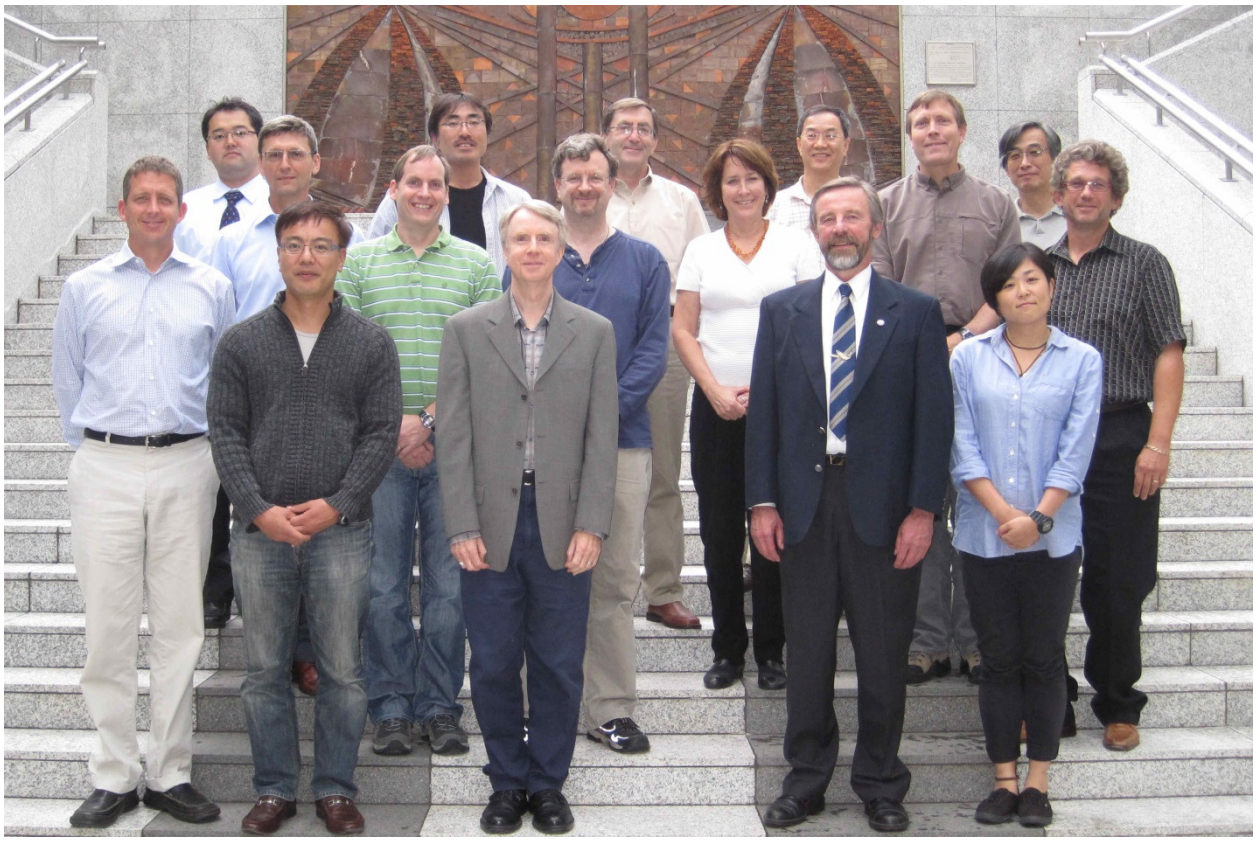
- discuss details of a workshop in Indonesia at a PST meeting to be held, possibly, in conjunction with the PICES inter-sessional Science Board meeting (Kaliningrad or St. Petersburg, Russia, week of May 20, 2013), or independently of this inter-sessional meeting, for example, in Hawaii in May 2013.

Appendix 1

Project Science Team members and meeting participants

According to the organizational principles, agreed upon by MAFF/JFA and PICES, the project is directed by a Project Science Team (PST), co-chaired by Drs. Mitsutaku Makino (Fisheries Research Agency, Japan, mmakino@affrc.go.jp) and Ian Perry (Department of Fisheries and Oceans, Canada, Ian.Perry@dfo-mpo.gc.ca). The PST Co-Chairmen are responsible for the scientific implementation of the project and annual reporting to MAFF/JFA and PICES Science Board. The current PST members are listed in the table below (Drs. Mark Wells and Thomas Therriault were invited to join the PST at the meeting, and both accepted). All participants of the meeting are shown on the group photo.

Name	Country	Group
Dr. Grant Murray	Canada	S-HD
Dr. Ian Perry, Co-Chairman	Canada	WG 28
Dr. Thomas Therriault	Canada	WG21, ACE-AP, MEQ, SB
Dr. Masahito Hirota	Japan	S-HD
Ms. Juri Hori	Japan	S-HD
Dr. Mitsutaku Makino, Co-Chairman	Japan	S-HD
Dr. Dohoon Kim	Korea	S-HD
Dr. Suam Kim	Korea	S-CCME
Dr. Harold Batchelder	USA	AP-SOFE
Dr. Keith Criddle	USA	S-HD
Dr. Vera Trainer	USA	S-HAB
Dr. Mark Wells	USA	S-HAB
Dr. Skip McKinnell	PICES Secretariat	PICES Secretariat



Participants of the first Project Science Team meeting for the PICES/MAFF project on "Marine ecosystem health and human well-being". Front row: Grant Murray (Canada), Mitsutaku Makino (Japan), Ian Perry (Canada), Skip McKinnell (PICES Deputy Executive Secretary) and Juri Hori (Japan); middle row: Igor Trofimov (Russia), Thomas Therriault (Canada), Harold Batchelder (USA), Vera Trainer (USA), Keith Criddle (USA) and Mark Wells (USA); Back row: Takaomi Kaneko (Japan), Masahito Hirota (Japan), Alexander Bychkov (PICES Executive Secretary), Suam Kim (Korea) and Sinjae Yoo (PICES Science Board Chairman).

Appendix 2

First Project Science Team meeting agenda

1. Member self-introductions
2. Background of the project (Co-Chairs)
3. Review of work related to the project
   - Previous PICES-MAFF Project, 2007–2012 (Vera Trainer, Mark Wells and Thomas Therriault)
   - IMBER WG on *Human Dimensions* and Current Opinion in Environmental Sustainability (COSUST) Special Issues (Ian Perry)
   - "Sato-umi"-related initiatives in CBD, UNU, *etc*. (Mitsutaku Makino)
   - Others
4. Proposal of research topics by PST members
   - Proposal of candidate sites (Co-Chairs)
   - Potential intersects/synergies with WG-28, S-HD, and other groups and activities within PICES (All)
5. Discussions on the workplan and budget
6. Others

Appendix 3

Questionnaire to assess Pacific member state needs in relation to HAB monitoring and management and strengthened seafood safety

1. Do you see a need for assistance to strengthen capabilities for harmful algae and biotoxin monitoring and management capabilities in your country?
2. Do you see a need for assistance to strengthen capabilities for harmful algae and biotoxin research capabilities in your country?
3. Which authority is responsible for monitoring of harmful algae and biotoxin monitoring in relation to public heath/seafood safety, aquaculture and fisheries in your country?
   a. Institution name & address
   b. Contact person, e-mail
4. Which institution/laboratory is in charge of implementation of monitoring of harmful algae and their biotoxins in relation to public heath/seafood safety, aquaculture and fisheries in your country?
   a. Institution name & address
   b. Contact person, e-mail
5. Is there any working relationship between the above institutions and research institutions, for example, when there is a mortality/illness event, which scientists/groups assist regulators in researching the cause of the event?
   a. Research institution name & address
   b. Contact person, e-mail
   c. Please specify nature of this working relationship
6. At which institution/agency is national data on harmful algal events stored?
   a. Institution name & address
   b. Contact person, e-mail
7. Is there an interest by regulators to assure seafood safety of non-exported products?
8. Would there be an interest in your country in sharing knowledge on different approaches and methods in HAB management?
   a. In relation to export markets
   b. In relation to local non-exported fisheries and aquaculture
9. How would you assess the needs for short term technical training (you may indicate more than one, indicate priority with 1 as high, 5 as low priority)
   Regulatory labs and institutions:__ Research labs and institutions:__
   a. Regulatory monitoring and management laboratories:
      __Species identification __Toxicity testing __HAB data management __Introduction to new methodologies __other (please specify)
   b. Research institutions:
      __Species identification __Toxicity testing __HAB data management __Introduction to new methodologies __other (please specify)
10. Are there shortages among the authorities or institutions responsible for HAB monitoring and their laboratories technology (IT, microscopes, analytical facilities etc) that impede effective monitoring and management of HAB? Please specify.
11. Would there be interest in initiating or strengthening network activities (e.g. learning visits to sister labs in the region with a goal to compare methods in species identification or toxicity measurements etc)?
12. What would you identify as most needed network activities in your country in relation to harmful algae and management of their effects?
13. What would you identify as most needed network activities in your country in relation to harmful algae research?
14. What other needs or comments pertaining to protection of seafood safety from harmful algae events in your country are not covered above?

The answers to this questionnaire were submitted by:
Name: Institution: Address: E-mail: