

**North Pacific Research Board  
Science Panel Meeting  
NPRB Conference Room  
Anchorage, Alaska  
August 22-23, 2005**

The Science Panel met on August 22-23, 2005 to determine research priorities for the 2006 RFP. The meeting was chaired by Rich Marasco and the following other members were in attendance: Dick Beamish, Jim Berner, Don Bowen, Michael Dagg, Dan Goodman, Anne Hollowed, John Piatt, Tom Royer, David Witherell and Doug Woodby. The meeting was staffed by Clarence Pautzke and Francis Wiese.

**1. Call to Order and Approve Agenda**

**a. Introduction of new members**

Two of four new Science Panel members, Mike Dagg and John Piatt, attended the meeting and were welcomed by the Panel. Dan Goodman and Don Bowen both indicated that this will be their last meeting. It was decided that a marine mammal expert replacement will be needed by the time proposal review starts in January 2006.

**b. Election of officers**

Rich Marasco was re-elected as chairman and Doug Woodby was elected as new vice-chairman.

**2. Science and Implementation Plans**

**a. Status reports**

The Science Plan has been finalized and the staff is working with a professional graphics designer, with a target publication date of early October.

**b. Update of implementation plan – add 2009**

Clarence Pautzke gave an overview of the current 4-year implementation plan as a guide for the 2006 RFP, but deferred adding 2009 to the plan until the March 2006 meeting.

**3. Collaborations**

**a. OSRI**

The collaboration between the Board and the Oil Spill Recovery Institute (Prince William Sound Science Center), endorsed in March 2005, has been developed further by Carl Schoch, Francis Wiese and Clarence Pautzke. Three options for collaboration on issues of mutual interest were proposed to the Panel:

1. Long-term Ecological Research (LTER) in Prince William Sound (this would include an AOOS contribution and potential future contribution from NSF).
2. Role of forage fish in the Northern Gulf of Alaska and Prince William Sound.
3. Tracking and monitoring of marine organisms, specifically information on migration patterns and habitat use of fish, marine mammals and seabirds.

The Panel decided to integrate the need for tracking and monitoring studies in the general RFP, not to endorse the idea of an LTER given the current lack of interest by NSF, and instead suggested a collaborative RFP process with OSRI on the role of forage fish. This would involve a joint funding commitment of \$100,000 each by NPRB and OSRI for a period of 5 years.

**b. BSAI ecosystems research planning with NSF**

An interdisciplinary research team has been established to develop an initial integrated research program. It was formed in April 2005 and represents nine major organizations: AFSC, AOOS, NPRB, NSF, PMEL, UAF, UFWS, USARC, and USGS. The group has met three times thus far, has identified six priority research questions, and is working on how to parse out different elements of these questions among agencies. The Science Panel discussed these six priority questions and decided to adopt them in general terms, recognizing that an implementation plan for the Bering Sea integrated ecosystems research program needs to be more fully developed over the next 6-8 months. In the meantime, the Panel suggests sponsoring modeling and retrospective studies in the 2006 RFP that will support research for all six questions (see below for more details).

**c. Explore options for contributing to IPY 2007-2008**

International Polar Year was briefly discussed and it was decided that NPRB's Bering Sea Integrated Ecosystem Research Program, which will come into full action with the 2007 RFP will be a substantial contribution. In addition, the recently funded project on Arctic Ocean Synthesis (#503), as well as LTK pilot study (see below) will also contribute to this initiative.

**d. Update on AOOS**

Molly McCammon presented an update on AOOS and how it will move forward within current funding levels. She indicated that new funds are in current appropriations bills, but have not been approved yet. AOOS will focus this coming fiscal year on Cook Inlet and PWS, adding nitrate sensors to GAK 1, and establishing buoys in the Bering Strait and Amukta Pass. AOOS will not be able to support moorings M2, M4, M5 and M8 this year, but is hoping to in the future.

**e. LTK Committee recommendations**

The new LTK Committee met on June 27-28 and Henry Huntington, who is staffing it for NPRB, presented recommendations on an LTK section of the 2006 RFP (see LTK Committee report). The Science Panel adopted these recommendations and has included an LTK section in the RFP, at \$300,000 level, divided equally between a pilot project on community-based observing and general LTK studies linked to other research priorities in the RFP. The Board should consider sponsoring hypothesis generating workshops over the winter.

**4. Request for Proposals for 2006**

**a. Staff report on connection of 2006 RFP with components of science plan and why particular issues should be of greatest concern and higher priority than others.**

The staff, as requested by the Panel in September 2004, provided draft research priorities for consideration. The draft was presented by Francis Wiese explaining the presence or absence of research components, as well as the link to the science and implementation plans. The Panel proceeded to use this as a basis for developing its recommendations for the 2006 RFP.

**b. Research priorities identified by North Pacific Fishery Management Council and how to be more responsive to SAFE documents and ecosystems consideration chapters.**

Clarence Pautzke presented the NPFMC research priorities provided by Chris Oliver. The Panel considered the priorities and covered most of them in its recommendations for the 2006 RFP.

**c. Results of GOA synthesis**

A workshop report from Ginny Eckert's project (#406) on Southeast Alaska Synthesis of Marine Biology and Oceanography was provided for consideration of research priorities for the GOA. As a next step toward the development of a GOA IERP, the Panel recommended following a

similar approach to that taken for the Bering Sea IERP. That is, rather than asking for proposals to develop such a program, to bring together a team of researchers that, based and expanding upon Eckert's synthesis work, will build an implementation plan between now and June 2006, that will then help guide a focused and strategic GOA IERP as part of the 2007 RFP. The Panel recommended identifying \$100,000 for stipends and travel to develop such a plan. The work groups will need to recommend whether to split the Gulf up into three areas for purposes of an IERP or treat it as one large IERP region. Important issue areas include changes in stock distributions in Southeast, what makes the shelf so productive, salmon redistribution and survival, climate change impacts, and the sudden increase in Atka mackerel.

**d. Budget review**

Clarence Pautzke provided a budget overview indicating that potential appropriations of \$2 million in the Senate budget remain undecided. However, he indicated that the planning horizon for the Panel, based on the implementation plan, should be \$6.4 million.

**e. Consider revisions to RFP and its boilerplate:**

- i. Criteria for evaluating applicants: *It was decided that nothing had to be added to the RFP language and that this assessment could be dealt with as part of the normal proposal review process.*
- ii. Initial screening of proposals: *The Panel recommended tighter language in the RFP to prevent receiving large quantities of unresponsive proposals and to avoid proposals that exceeded funding targets. The Panel also agreed that the process used last year by the Executive Director of dismissing some proposals without further review (those that were very clearly unresponsive to the RFP), in conjunction with an ad hoc committee of available Panel members, was appropriate and saves time and effort that otherwise could be spent on meritorious proposals. Criteria could include exceeding the funding limit, incomplete proposal, outside scope of RFP, and timeliness of submission.*
- iii. Qualitative scoring of proposals: *The Panel decided it would a good idea to examine NSF procedures as a model for scoring proposals by external reviewers. They also pointed to the fact that qualitative scoring should have a 5-tier evaluation approach (poor, fair, good, very good and excellent), recognizing that poor and fair proposals will have little chance of being funded, good and very good may be funded or placed in the second tier, and excellent proposals would most likely be recommended for funding.*
- iv. Special place in RFP for meritorious proposals seeking additional years of funding: *The Panel recognized that projects, initially proposed for several years but only funded for the first year, need a special category in the RFP. However, no current projects are in this situation and thus such a category does not need to be included in the 2006 RFP.*
- v. Require that geographic justification and power analysis as part of proposals: *This issue was not discussed but will be brought up again at the time of proposal reviews. Alternatively the Board could include this in the RFP to ensure completeness of proposals.*
- vi. Should we include a technical evaluation form as an example in the RFP? Inclusion may improve quality and responsiveness of proposals: *As above, this issue was not addressed by the Panel due to the lack of time. However, inclusion of this form may improve quality of proposals and thus the effectiveness of future research funded by NPRB.*

**5. Schedule Next Meeting**

Clarence Pautzke alerted Panel members about the annual marine science symposium scheduled for January 22-25, 2006. Travel costs for Panel members would be covered if they attend. Given the

ongoing efforts with the Bering Sea and the Gulf of Alaska integrated ecosystems research programs, the Panel decided that following the March proposal review meeting, another IERP planning meeting may be required in June/July 2006. This would allow more time to discuss the details of the proposed IERP implementation programs and thus ensure a strong foundation for the next 5-10 years.

## **6. Science Panel Recommendations for the 2006 Request for Proposals (\$6.4 million)**

Considering the above discussions and conclusions, and based on the draft recommendations provided by the staff, the Science Panel offers the following recommendations for the 2006 RFP:

### **Continuing Programs**

The Science Panel believes that certain activities in 2005 should be carried forward into 2006 outside the RFP. They fall into three main categories: ocean monitoring, IERP development, and other activities. The Panel recommends earmarking \$1.4 million combined for these categories, as follows:

#### Ocean Monitoring (\$700,000)

The Panel discussed the necessity to ensure support for long-term monitoring programs without which determining ecosystem change would be extremely difficult. The merit of these programs to date was also discussed and the report by AOOS was taken into account. Rather than putting these programs through the entire RFP process every year, the Panel recommends earmarking \$100,000 for the continuation of the Continuous Plankton Recorder Project (#302) by Sonia Batten, \$200,000 for biophysical monitoring through moorings M2 – M8 (#203, 315, 410, 517) by Phyllis Stabeno (the Board decided on this item temporarily in March 2005), and \$400,000 for continuation of the GAK line off Seward (#520) by Russell Hopcroft. The Panel recommends that these researchers be informed of these earmarks and that NPRB request and review statements of work for these amounts. Future years of continued funding for these monitoring programs should be predicated on how they relate to regional integrated ecosystem research programs.

#### IERP Development (\$400,000)

In order to ensure focused and successful integrated ecosystems research programs for the different LMEs, it is essential that collaborative and inter-disciplinary teams be assembled to develop research priorities and implementations plans. To ensure such a process, the Panel recommends earmarking \$100,000 for each of the GOA and Bering Sea planning areas. Due to the time commitment necessary for this development, and that these two regions were further along than the Arctic, it was decided to postpone planning on the Arctic until after the Arctic Synthesis Project is completed in 2006. In addition, it was noted that unless the Board is willing to focus significant fiscal resources on the Arctic, there may not be sufficient support for an integrated program. It was also pointed out by James Berner that there is an Interagency Arctic Panel that meets once a month and that it would be worthwhile for the staff to become part of this process.

The Panel also discussed the need for ecosystem models. Most models remain restricted to single species or ecosystem components, yet new models to generate more helpful indices of fisheries and ecosystem status, and those that realistically link climate and physical processes to recruitment, abundance and distribution, and ultimately to economic models (including subsistence use), are needed. In order to support the development of IERPs, the Panel recommends earmarking \$200,000 for a model oversight group that will develop the conceptual models and linkages between models that will be needed to integrate data generated through the IERPs, determine data gaps, help direct or re-direct research efforts

and make useful predictions. The group would also develop standards for validating model outputs and ensuring their robustness and predictive capabilities.

Science Panel members indicated interest in participating with work groups that may be established to develop implementation plans for the three LMEs. Jim Berner is interested in the Arctic. John Piatt and Tom Royer would help with the Gulf of Alaska. Doug Woodby, Anne Hollowed, and Mike Dagg would help with the Bering Sea.

#### Other Activities (\$300,000)

Four other activities are included in the implementation plan that should receive continued funding. Education and outreach has two parts: \$100,000 for continuation of Alaska SeaLife Center activities for the Board, and \$50,000 for additional materials for education and outreach. The Panel also recommends support for coordination in the form of meetings and synthesis for \$50,000, community involvement for \$50,000 and \$50,000 for help with data management as we continue to develop our project, proposal, metadata and data systems.

#### **General Research Priorities for 2006 RFP**

The continuing programs described above total \$1.4 million, leaving \$5 million for the 2006 RFP. The Panel recommends apportioning the \$5 million into four categories:

- Bering Sea Integrated Ecosystem Research Program (\$1.2 million)
- General Research Priorities (\$3.4 million)
- Collaboration with OSRI on forage fish issues (\$100,000)
- Local and Traditional Knowledge projects (\$300,000)

#### **Bering Sea IERP (\$1.2 million)**

Although the BSIERP will become more fully developed over the next 6-8 months, the Panel recommends moving ahead with some studies under this program that will be beneficial regardless of the details of the Implementation Plan. The Interagency Bering Sea Interagency Working Group, mentioned above, developed six research priorities during their July 2005 meeting and the Panel slightly revised the six questions as follows:

- a. *Are the distributions (range, spawning and breeding locations) and abundances of species in the Bering Sea ecosystem changing in response to climate change? If so, how?*
- b. *Are the physical and chemical attributes of the ecosystem changing in response to climate change? If so, how?*
- c. *Is lower trophic level production (quantity and form) changing in response to climate change? If so, how?*
- d. *What are the principal processes controlling energy pathways in the Bering Sea? What is the role of climate change in these processes?*
- e. *What are the linkages between climate change and vital rates of living marine resources in the Bering Sea?*
- f. *What are the economic and sociological impacts of a changing ecosystem on the coastal communities and resource users of the Bering Sea?*

The Panel recommends \$1.2 million for this section of the 2006 RFP, focusing on 1-2 year retrospective and modeling studies that address one or more of the above themes, with a particular emphasis on how

sea ice cover, where present, may mediate these climate-related changes. Retrospective studies should examine the effects of climate and regime shifts on ecosystem processes, whereas modeling studies, based on existing data, should focus on the ability to predict process change within the Bering Sea ecosystem as a result of climate change and point to data gaps.

### **General (\$3.4 million)**

After some discussion on the value of creating a general and specific research need section as in the 2005 RFP, it was decided to just create a General Research category, but identify specific topics under each subheading if appropriate. Given that the IERPs have already been addressed, it was felt appropriate that this section of the RFP focus around the different ecosystem components. The amounts assigned to each component are a reflection of what was assigned in the implementation plan for 2006, combined with portions taken up by earmarks, the IERP, as well as research priorities identified by the Panel. Given some of the proposals submitted last year, based on a sometimes vague wording, the Panel decided to focus the text, as well as the funding amounts as much as possible for this RFP.

- **Ocean Monitoring (\$400,000):** Three continuing projects for ocean monitoring were already identified in the earmarks. The Panel recommends allotting the remaining funding to ocean monitoring in the broadest sense, i.e. any marine observations to monitor changes in ocean characteristics, including sea ice, and marine life, particularly upper trophic level, within one or all of the three Alaska large marine ecosystems. The Panel felt that, given current projects and priorities outlined in the Science Plan, no additional specific needs had to be identified in this category.
- **Lower Trophic Level Productivity (\$400,000):** In the 2005 RFP, there was a call to “Evaluate Plankton Monitoring Methods” in the hope that results from such an evaluation would help guide the 2006 RFP on this topic. Unfortunately no proposals were received. The Panel thus recommends only one specific research need and a general category to address lower trophic level research priorities as identified in the Science Plan:
  - *General (\$300,000):* The Panel recommends focusing the general research needs for lower trophic level productivity on processes that will improve our understanding of ecosystem dynamics and the ability to forecast how climate change might impact the transfer of energy through the lower trophic levels; i.e. supporting research that examines the physical (air-sea interactions, transport, upwelling, processes at fronts, etc.), chemical (micronutrient limitations, re-mineralization by benthic processes, etc.) and biological processes that drive primary and secondary production at the base of the food web.
  - *Plankton as contaminant monitors (\$100,000):* Dr. Berner discussed the critical need to advance our understanding of how contaminants are distributed over larger regions by currents and bioaccumulate in the upper food web. This is a particular issue in the Arctic, and because plankton makes up the lowest, easy-to-sample component of the marine food web for many subsistence and commercial species of fish, marine mammals, and birds, they are a perfect candidate for such a monitoring study.
- **Fish habitat (\$550,000):** The Panel discussed the continued natural and anthropogenic impacts on fish habitat. It identified a continued lack of knowledge in the location of essential fish habitat, how to best map such habitat in a meaningful and effective manner, and how different habitats respond to extrinsic modifying factors. As a result, two special topics and one general category for fish habitat research are recommended:
  - *Recovery and resilience of fish habitat (\$250,000):* Assessing and mitigating impacts of fishing on habitat continue to be a challenge. The Panel recommends focusing on the quantification of recovery and resilience of habitat from and to natural processes and anthropogenic activities.

- *Marine habitat mapping technology conference (\$150,000)*: Identified in the implementation plan for 2006, the Panel recommends holding a conference on this topic to synthesize available marine habitat mapping technologies to determine what methods best serve different research needs, so that, given the large investments required for this type of work, mapping can be carried out in the most effective and cost efficient manner.
- *Other Fish Habitat Research (\$150,000)*. Other topics identified in the Science Plan regarding fish habitat include general topics related to other human-related impacts, fishing effects on habitat, or on ecosystem functions of habitat. The Panel recommends an additional \$150,000 for this category.
- **Fish and Invertebrates (\$850,000)**: The Panel discussed research priorities in this category focusing on the critical role of forage fish and the lack of basic abundance and distribution parameters, the fact that many ecosystem models rely on these often spotty estimates, as well as on very seasonally limited diet information for many of the main commercial species. In addition, it was pointed out that we lack a clear understanding on the movement and spatial connectivity within fish stocks. Given spatial scales and heterogeneity at which these stocks are managed, the Panel believes that such information is critical to ensure sustainable management. Based on these discussions and the identified overall funding amount, the Panel recommends three special research topics and one general category:
  - *Migration patterns and spatial connectivity of fish and invertebrate stocks, especially in winter (up to \$300,000)*: Habitat needs, population dynamics and diet often differ spatially within species, but are poorly understood. Studies should be encouraged that describe migration patterns and spatial connectivity of fish stocks, especially during winter.
  - *Seasonal diets of exploited fish stocks (up to \$300,000)*: Fish food habits information is an ongoing, high-priority activity necessary to provide an up-to-date state of the North Pacific marine ecosystems. To ensure continued collection of such data and thus the production of the most reliable ecosystem models possible, support of this special category is recommended.
  - *Abundance and distribution of forage fish (up to \$300,000)*: Relatively few forage fish species (e.g. squid, capelin) form the basis of the marine food web in Alaska's marine ecosystems, and these are thus directly linked to important commercial fish and invertebrate species. Despite the importance of these species in ecosystem and stock assessment models, little is known about the spatial and temporal abundance and distribution of these forage fish.
  - *Other fish and invertebrate general research priorities (\$150,000)*: The Panel recommends additional research on other fish and invertebrate research priorities as identified in the Science Plan, such as stock assessment research and development, alternative harvest strategies, socio-economic considerations, reducing catch of unwanted species, causes of perturbations of major species, and implications of ecosystem change on fishery management.

The Panel did not recommend funding any new salmon research until the salmon funding analysis is complete, as well as several other studies the Board has funded already in Bristol Bay and with NPAFC. The AYKSSI also is putting out a request for proposals for over \$3 million this fall. Salmon again would be funded in the 2007 RFP.

- **Marine Mammals (\$600,000)**: The Panel discussed a variety of research needs regarding marine mammals, such as migration routes, the importance of changing sea ice conditions, and the need for demographic, abundance and distribution information. However, the Panel felt that there are currently no special issues that are more pressing than others, or that are not already being addressed in current projects. As a result, it recommends a general call for proposals open to any of the research

priorities identified in the Science Plan, such as human-related impacts, fisheries interactions, marine habitat use, foraging success, population dynamics, and long-term climate change.

- **Seabirds (\$400,000):** The implementation plan called for a focus on the ecosystem role of seabirds. A study to determine the role of seabirds as ecosystem indicators (#516) was just initiated this year, and it was thus felt that focus should be on research supporting the assessment of ecosystem change through seabirds as well as on other pressing gaps while this project develops. Based on these discussions, the Panel recommends focusing seabird research on four special topics, with no proposal exceeding \$200,000:
  - *Distribution and abundance of seabirds at sea:* Most of our knowledge about seabirds is based on observations at colonies, but most interactions between seabirds and humans occur at sea. Unfortunately, our knowledge of the distribution of seabirds at sea is either outdated, localized, or remains otherwise poorly documented. The Panel recommends addressing this lack of important knowledge through the development of a coordinated observer program that takes advantage of other research efforts and ships of opportunity and stresses the need of collaboration with the North Pacific Pelagic Seabird Database.
  - *Determination of demographic parameters, especially survival rates:* Seabird populations can serve as ecosystem indicators, but in order to assess how and if activities such as fishing, contaminants, and changing ocean conditions will affect seabirds on a population level, basic demographic information is needed. Although monitoring programs routinely include population counts and estimates of breeding success, demographic data on many species and/or in many locations are missing. The Panel thus recommends filling this data gap for key species, especially in regards to adult survival rates, the main driver in seabird population dynamics.
  - *Development of survey and census methods for determining population size:* As mentioned, monitoring seabird populations is essential to detect fluctuations in population size and provide information to manage human activities that might influence those populations. Although census and/or monitoring methods are well established for a handful of species (e.g., murres, kittiwakes, tufted puffins), they are less so for others, including crevice-nesting, burrowing, and nocturnal species. The Panel thus recommends putting some effort into the development of census methods and/or finding new technologies that will allow us to detect population trends (on plots, or using indices of abundance), map the extent of colony boundaries, or assess whole colony populations.
  - *Effect of anthropogenic impacts during migration and at overwintering grounds:* Seabirds are exposed to many anthropogenic stressors, including subsistence harvest, by-catch in fishing gear, marine pollution, introduced predators, and degradation of breeding and/or marine habitats. Population regulation often occurs outside the breeding season, a time for which little is known about the ecology of most species, or their vulnerability to human activities. The Panel thus recommends a focus on determining migration patterns and/or the location of wintering grounds for seabirds in combination with efforts to assess the influence of human activities on seabird populations during this time.
- **Humans (\$200,000):** A lot of discussion on research priorities for this category took place. Panel members talked about the need for research on the impacts of management and policy change on stakeholders, economic and social impacts of a changing environment, and the importance of human health in relation to the use of marine resources. However, no special priorities beyond those made in the Science Plan were identified, and thus the Panel recommends just one general category in which proposals can address any of the five general research priorities identified: fishery management and policy, baseline assessment issues, human health and marine resources, human values and resource protection, and climate variability and change.



### **Collaboration with other Funding Entities (\$100,000)**

As mentioned above, the staff worked with Carl Schoch, Science Director of the Oil Spill Recovery Institute (OSRI), to develop opportunities for collaborative research. Based on these discussions, three topics of mutual interest were developed in detail and presented to the Science Panel:

- a. Role of Forage Fish and in the Northern Gulf of Alaska and PWS
- b. Tracking and Monitoring of Marine Organisms
- c. Long Term Ecological Research (LTER) in the Gulf of Alaska

The Panel discussed the relevance and feasibility of each topic. It was felt that option 'b' could easily be part of other sections in this RFP and thus did not need an additional special emphasis. In regards to option 'c' the Panel argued that LTER sites are official NSF designations with a long term commitment, and such collaboration, in addition to the additional support from AOOS for such a program, would be of interest. However, preliminary talks with NSF staff have indicated little interest for such a site in the GOA and collaboration at this time. Based on this and the already indicated importance of forage fish, the Panel recommends dedicating \$100,000 per year for five years towards the collaborative effort to study the role of forage fish in the northern GOA and PWS.

### **Local and Traditional Knowledge (\$300,000)**

Henry Huntington, staffing the LTK committee, presented the three main recommendations made at their June 27-28 meeting:

- o LTK research projects should be funded through the RFP process, as with other NPRB research.
- o The NPRB should sponsor activities that will help generate specific questions and hypotheses for future RFPs.
- o The NPRB should cooperate with other agencies to explore the potential for a system for recording observations, as part of the International Polar Year (2007-09).

The Panel considered the full report and recommends two categories under the LTK component of the 2006 RFP:

- o *Pilot Project for Community-based Observation System (\$150,000)*: Communities can play an important role in the gathering and reporting of biological data for the purpose of monitoring change in the environment and for tracking the frequency and scope of unusual events such as bird die-offs and changes in animal abundance. The Panel recommends supporting a pilot study that will initiate a community-based observation system that will ultimately lead to a monitoring network in Alaska.
- o *LTK Studies Related to Other RFP Priorities (\$150,000)*: LTK can contribute to the NPRB's mission with several approaches: generating research hypotheses, documenting existing LTK, recording observations, fostering collaborative analysis, collaborating on specific projects, and exploratory research. The Panel recommends adopting the committee's recommendation to include a general call for LTK proposals, with specific criteria for evaluation, in which LTK and its holders are explicitly engaged in projects that address one or more of the research priorities identified elsewhere in the 2006 RFP. This course of action would provide an opportunity for proposers to exercise initiative and creativity in developing project ideas that use LTK effectively to help achieve the overall mission of the NPRB using any of the approaches identified above.

### **Alaska Regional Research Vessel**

Tom Royer offered recommended text for a letter to OMB supporting the proposed Alaska Regional Research Vessel. The Science Panel urges the Board to send a letter of support.