Strategic Plan – 1998

Executive Summary

Preamble: The strategic plan for the Monterey Bay Aquarium Research Institute (MBARI) attempts to capture the ideas and aspirations of the members of the institute and the Board of Directors in a form that can provide policy guidance for the next decade or so. It will be supplemented with an implementation plan that will be updated annually.

As with all strategic plans, the planning process has been at least as useful as the plan. This current version of the plan builds upon material compiled by the MBARI staff under the direction of Peter Brewer and by Ross Heath

> *"The mission of MBARI is to achieve and maintain a position as a world center for advanced research and education in ocean science and technology, and to do so through the development of better instruments, systems and methods for scientific research in the deep waters of the ocean. MBARI emphasizes the peer relationship between engineers and scientists as a basic principle of its operation … All of the activities of MBARI must be characterized by Excellence, Innovation, and Vision."*
>
> ***David Packard, November 27, 1995***

This mission will be accomplished by:

• Concentrating our effort in important areas of marine science where research progress to date has been limited by inadequacies of existing technology.

• Complementing, rather than duplicating, the research performed by the federally funded institutions.

• Performing innovative and high quality research that utilizes and demonstrates by example the worth of technology and operational procedures developed at MBARI.

• Insisting on teaming rather than hierarchical arrangements for research projects.

• Promoting effective communication throughout the institute via dissemination of the strategic plan, frequent project and divisional meetings, and Director's Dialogues so that all staff members will be equally well informed as to the institute's priorities and plans.

• Ensuring the best use of the investment in facilities and technology developed at MBARI by establishing a critical mass of in-house scientific expertise and by providing access to our resources for select outside users.

• Obtaining external input to assess the quality of MBARI's programs through individual project reviews and MBARI-wide visiting committees.

• Expanding external relationships to increase the flow of good ideas into the institute and augment the impact of MBARI's research.

• Transferring MBARI's results, technology, and operational techniques to the broader marine research community.

• Communicate to the public and our peers the importance of ocean conservation, the value of scientific research, and the unique role of MBARI within the broader ocean research community.

MBARI's success both at the project and institutional levels will be assessed by standard quantitative metrics as well as by periodic external reviews which will evaluate the innovativeness, importance, and productivity of its activities.

Strategic Plan—1998

MISSION

The Monterey Bay Aquarium Research Institute (MBARI) was created, under the sponsorship of David Packard, in 1987 to link the talents of scientists and engineers to advance our understanding of the deep ocean. As Mr. Packard stated on November 27, 1995 (only four months before his death in March, 1996):

> *"The mission of MBARI is to achieve and maintain a position as a world center for advanced research and education in ocean science and technology, and to do so through the development of better instruments, systems and methods for scientific research in the deep waters of the ocean. MBARI emphasizes the peer relationship between engineers and scientists as a basic principle of its operation…All of the activities of MBARI must be characterized by Excellence, Innovation, and Vision."*

MBARI was founded on the principle that we can make a unique contribution to advanced ocean research by building an organization that combines the talents of scientists and engineers as co-equal partners in the planning, development, and execution of research programs enabled by innovative technology. The fact that the great majority of the funding for research at MBARI is provided by an annual grant from the Packard Foundation has allowed MBARI to maintain this unique focus on innovation and expand its horizons during a time of stress and retrenchment within the federally-funded oceanographic community. MBARI remains distinct from most oceanographic research organizations built on the academic model, where disciplinary compartmentalization and funding structures discourage team building between engineering and science.

MBARI's unique sponsorship and mission poses an added challenge in strategic planning, as there are no peer institutions upon which to base MBARI's direction. Therefore, this strategic plan begins with an honest assessment of our internal strengths and weaknesses and of the external opportunities and threats from which we can extract some principles which should guide our planning.

MBARI AND THE LARGER OCEAN RESEARCH COMMUNITY

Our strategic plan should seek to build upon our strengths, mitigate our weaknesses, take advantage of outside opportunities, and avoid external threats.

Strengths

People: MBARI's greatest strength is its staff of creative, talented, and motivated people dedicated to

achieving Mr. Packard's vision for the institute.

Uniqueness: The fact that MBARI provides an institutional environment where scientists, engineers, and operations people are encouraged to work together allows us to translate good ideas into deployable instruments and scientific breakthroughs.

Funding structure: Our stable funding from the Packard Foundation allows us to undertake long-term development efforts that are difficult to complete under the peer-review system, and provides us with a level of operations and engineering support that is without parallel.

Location: Monterey Bay provides easy and immediate access to the ocean for instrument development and testing and for scientific research on a geologically active ocean margin with high biological productivity. It also provides an attractive living and professional environment which aids in recruiting the best talent in the nation.

Facilities: Our buildings, ships, ROVs, and other science and engineering assets give us the best support available to address questions of primary scientific importance with new and innovative technology.

Internal structure: Our organization into functional (as opposed to disciplinary) divisions allows us to share resources (e.g., technical expertise, marine capabilities, etc.) and easily move them as institutional priorities change and evolve.

Weaknesses

Small scientific staff: By any standards, we are understaffed scientifically, and any reasonable growth models for the institute would not put us in the position of having the scientific breadth and depth of the larger institutions such as Scripps and Woods Hole.

Difficulty in building teams: The scientific culture rewards individual achievement, and thus discourages team efforts. Operations and engineering personnel are more accustomed to working as teams, but can disagree over the merits of an elegant versus an expedient solution to an engineering problem.

Funding structure: Steady funding from the Packard Foundation in the form of a block grant to the institute leaves us in the difficult situation of having little external measure of the quality of our research. Our internal funding structure leads to competition between groups within the institution, rather than with the national marine community as a whole, and thus can lead to breakdowns in collegiality within MBARI.

Data inundation: Our capacity to make observations has outstripped our ability to reduce, interpret, understand, and publish the data.

Conflicts between management and staff: Unlike the university system, at MBARI funding decisions are made by the same institution that employs the researcher. This situation can lead to excessive conflict if management decisions are not seen as impartial and in the best interests of the institution. Changes in direction for the institute imposed by management may force staff members to move into new areas of research to remain relevant.

Internal structure: Our organization into functional divisions can prevent the technical and support staff from understanding how to measure whether our efforts are successful, and thus take ownership of the result. The divisional organization tends to concentrate, rather than dilute, the different cultures of the MBARI staff members, and can lead to complete dysfunction if the divisions do not cooperate effectively with each other and understand their different roles in each research endeavor. The staff does not always know how each project makes a difference, to themselves, to science, and to MBARI's mission.

Opportunities

Observationally-limited field: Although new technologies, observational and computational, are providing significant increases in understanding of larger scale ocean phenomena, this understanding is limited by our technology to observe and understand the fundamental smaller scale processes underlying the larger phenomena. Major discoveries will still come from building new tools to make new or better measurements and then using them to make more accurate interpretations or predictions of the ocean.

Cuts in DOD budget: The end of the Cold War has led to significant decreases in R&D efforts in the Navy, much of which led to development of prototypes of oceanographic sensors, instrument packages, and vehicles that ultimately benefited the oceanographic community. MBARI is ideally suited to fill in at least part of the technology gap.

Excessive competition for federal funds: The rate of increase in the number of oceanography researchers has outstripped the increase in federal funding to support their research programs, making positions at MBARI extremely attractive to potential new staff members.

Connectivity to regional and national institutions: MBARI is surrounded by research institutions such as UC Santa Cruz, the Naval Postgraduate School, Moss Landing Marine Labs, the Naval Research Laboratory, and Stanford University with strong and growing programs in the ocean sciences. By building the right collaborations, MBARI can strengthen its own research program, encourage the transfer of its technology, and participate in the training of the next generation of ocean scientists and engineers.

Changing national priorities: Interest in the oceanographic community has shifted from reconnaissance exploration of the deep ocean to more targeted experiments on the continental margins and midocean ridges, requiring rigorously determined sampling and observational strategies. MBARI's existing marine assets can make us a leader in efforts to install observatories and conduct experiments in these environments; they are well within the depth limit of *Tiburon* and well represented within the likely operating areas of the *Western Flyer*.

Threats

Lack of understanding: The vast majority of external researchers do not understand MBARI's unique mission or the difficulty in achieving it despite our internal funding source. This situation can lead to off-target advice when we seek guidance on our programs and misplaced jealousy when others are asked to evaluate our proposals or achievements.

Public mistrust: MBARI finds itself in an uneasy middle ground between commercial interests that wish to exploit ocean resources and environmentalists who wish to preserve the ocean habitats. Either and both may object to an expanding presence of MBARI at Moss Landing and enhanced

experimentation and instrumentation of the Bay. On the other hand, knowledge that our activities are being scrutinized by these external groups is also beneficial, in that it keeps us mindful of our responsibility to the local community and the environment, not just our research peers.

High cost of living: Housing, gasoline, and utilities are very expensive in the Monterey Bay area. This negatively impacts our ability to attract new staff members to the institute.

ACCOMPLISHING OUR MISSION

With an accounting of these strengths, weaknesses, opportunities, and threats in mind, the following strategies will be used to accomplish MBARI's mission.

Focus on technology-limited marine-science research.

Because the declining federal support for basic research is leading to greater risk aversion, MBARI has a special opportunity, and even responsibility, to undertake high risk/high payoff studies, especially those requiring the development of new technology. MBARI also is well positioned to undertake long duration development efforts that are difficult to accomplish during the normal 1 to 3 year award period of peer-reviewed research grants from agencies such as NSF. By concentrating our efforts in this area, we take advantage of our unique mission (an internal strength) and capitalize on an external opportunity brought about by the decrease in DOD support for ocean research.

MBARI's strengths in the areas of ROV design/operation, mooring systems, *in situ* biogeochemical observatories, mid-water/benthic ecology, and geology lead naturally to prioritization of scientific research and development efforts that build upon these capabilities. Specific examples of development efforts include designing and building autonomous underwater vehicles (AUVs) that can expand the spatial and temporal coverage of the moorings and ROVs at low cost; *in situ* samplers that can be deployed from moorings, ROVs, and AUVs; modular tools for observing and manipulating the environment that can be adapted to a suite of MBARI or other platforms; and improved systems for powering and downloading data from ocean instrument packages. Such tools would allow real time and long-term repeated and continuous observations of deep-sea phenomena (such as the behavioral ecology of fragile midwater faunas, cold seep and hot vent animal communities, the evolution of hydrothermal vents, crustal strain, the impact of seasonal variations in organic carbon flux to the sea floor on the benthos, and biogeochemistry of the benthic boundary layer), the observation and sampling of unique but remote deep-sea environments (such as sub-ice areas, Red Sea, Western Pacific subduction zones, ultra-fast-spreading mid-ocean ridges), and the dynamics of the upper-ocean food-chain.

Although MBARI has a special opportunity in the area of high risk projects, it should also capitalize on opportunities to use its resources for low risk, high payoff projects. MBARI's programs should resemble a balanced stock portfolio with a reasonable mix of projects of varying risk and duration. In comparison to the "portfolios" of other oceanographic institutions, MBARI's will be riskier, but just as high quality.

Complement, rather than duplicate.

MBARI is and will remain a relatively small institution, and as such cannot expect to have a large impact if we attempt to do only the same sorts of scientific projects as the larger, federally funded institutions. We would be wasting the opportunity provided by our unique mission and funding structure if we were to focus on projects that fail to utilize the special resources developed at MBARI. Therefore, a reasonable policy for MBARI management is to use internal funds for innovative science and engineering projects relying on our unique resources and capabilities. So that externally funded projects do not detract from our ability to

accomplish our own mission, no researcher should commit more than 40% time to external projects, and the overall external contribution to MBARI's annual budget should not exceed 20%.

It is anticipated that MBARI will be an integral part of the larger community and participate, as appropriate, in national and international programs. MBARI collaboration in these programs should revolve around a unique contribution in terms of technology, operational capabilities, and experimental approaches pioneered by MBARI researchers.

MBARI is not an external funding sponsor. The greatest leverage for MBARI investment can be attained by simply incorporating existing pieces of technology into successful operational oceanographic systems and then demonstrating the worth of such systems for solving scientific problems. Useful technology developed at extremely high cost elsewhere is often not adapted to the ocean environment since oceanographic applications are such a small market. MBARI can make an extraordinary contribution by filling in this development gap. MBARI scientists can set the science requirements for ocean-going systems and apply the results to real problems, our engineers can adapt technology to fill those requirements, and our operations staff can oversee ease of deployment and maintenance of the instrumentation. Other oceanographic research organizations which are more geared to exploiting existing technology cannot compete with us in filling this gap, and this mode of operation provides ideal use for our exceptional personnel, facilities, and other marine assets.

Demonstrate the worth of our efforts.

Even the most valuable technology developed at MBARI will fail to have an impact if the outside community is not convinced of its worth. Therefore, the institute must support the efforts of its own scientists and engineers to solve first-order science and technology problems and to publish the results. For this reason, producing peer-reviewed publications, maintaining a high citation count, and receiving national/international recognition, awards, and patents will remain important, but not sole, criteria for promotion at MBARI. By supporting the efforts of our scientists and engineers to develop and to use MBARI technology, we facilitate technology transfer and add to the reputation and luster of the institute through its scientific and technical contributions.

Insist on teamwork.

While MBARI's divisional structure (R&D, Marine Operations, Technical Services, and Information and Technology Dissemination) facilitates the sharing of resources, it has the unfortunate consequence of disconnecting the technical and support personnel from the goals and achievements of individual projects. Proposal procedures that encourage the leadership of a single Principal Investigator (usually a scientist or an engineer) with sole authority for success or failure of the project lead to the situation where the PI is making decisions about matters in which she or he has little expertise. In worst case scenarios, lack of strong teaming arrangements can lead to engineers building tools with functions scientists don't need or scientists prescribing sub-optimal engineering solutions to their problems.

MBARI will encourage projects developed by teams. Teams will typically consist of a lead scientist (who sets the science requirements, decides the parameters for the field program, oversees data collection, and ensures that the scientific interpretation is published), a lead engineer (who determines the engineering solution to the problem, oversees the development effort, makes "make versus buy" decisions, ensures intellectual property rights, prepares engineering publications, etc.), an operations liaison (often a pilot or other operations person who ensures that the engineering development leads to an easily deployed, robust, and easily serviced package and who takes part in the field experiment), and an ITD partner (who documents the instrumentation, aids in technology transfer and promotes educational opportunities). Other team members, such as technical support personnel, will be assigned either full or part time to projects as they are approved.

While all team members will retain their divisional affiliations, they will be temporarily associated either full or part time with the team project, allowing a sense of ownership in the outcome. As each project ends, those personnel are free to establish or be assigned to other teaming arrangements.

Decisions as to which proposals will be supported will be determined by how relevant the project is to the strategic plan, the scientific merit and approach, the likelihood of accomplishing the objective in the time frame proposed, and the strength of the teaming arrangement. This process can aid in setting staffing priorities by identifying positions within the institute that should be eliminated because the skills are not needed to accomplish high priority aspects of the strategic plan, and by replacing those slots with personnel needed to properly staff high priority projects.

Promote effective communication, cooperation, and COLLABORATION.

The negative consequences of internal competition for internal research support and management control of both funding and promotions can be mitigated by increased communication in and across the divisions. The priorities for projects and the rationale behind those priorities should be not a mystery or surprise to any MBARI staff members. We want to promote an environment in which each employee can easily assess how he or she can use his or her skills to the maximum benefit of the institution. Scientists and engineers can see if their research interests are not a high priority for the institute, and therefore either find employment elsewhere or shift their own focus.

In addition to promoting effective communication between management and staff, we must continually work on maintaining collegial relationships between the divisions. Division directors will be required to make cooperation, collaboration, communication, and accommodation across division boundaries the highest priority, and to set by their example the behavior expected of all members of the division. Each and every employee must do his or her part to enhance harmonious working relations.

Ensure optimum scientific use of our assets and capabilities.

MBARI has already spent a good deal of time and effort in building a large operations, technical, financial, and facilities infrastructure. Our ability to collect data has outstripped our capability to understand it. The research output of the institution could be nearly doubled by a modest increase in the scientific users of MBARI equipment, without needing to increase the support structure for those scientists. We propose to accomplish this objective both by additions to MBARI's permanent staff and by increasing the number of outside users of MBARI assets.

The best way to ensure a long-term commitment of scientists to the development and exploitation of new technology is to appoint them to positions on staff here. In order to maximize scientific interactions, we would choose to search for expertise that fills in gaps between existing programs and adds technical expertise to complement ongoing programs, rather than striking out in completely new directions. MBARI should insist on only the highest quality staff. We would propose to add one to two new Scientist positions in 1998 and in each of the next three years. National searches will be conducted for all positions, using scientifically and technically targeted but broadly written position descriptions and often searching in several areas at a time even if only one position is to be filled in order to ensure the highest caliber of appointments. Qualities we would look for in successful candidates are a commitment to technology development in the pursuit of important scientific questions, ability to work as a member of a team, and willingness to interface with the community outside of MBARI.

Even with modest increases to our regular scientific staff, we expect to have excess operational capability. Therefore, we will augment the internal use of MBARI assets using external collaborations and temporary

visitors to the institute. Such collaborations should involve the most talented external researchers and should also maximize collegial interactions with MBARI staff. To facilitate and manage such collaborations, MBARI has created several categories of affiliation for individuals not part of the regular staff:

Adjunct Scientists/Engineers – These individuals have an enduring relationship with the institute that goes beyond the time frame of an individual project. They must be researchers who would qualify and we would be pleased to have on the permanent staff were resources available. They are nominated by MBARI staff members with appropriate documentation and appointed for terms of one to three years (renewable) by the President. Adjuncts may apply for access to MBARI ship time and other resources during the annual proposal process. MBARI will not pay salaries of Adjuncts, except in cases where they become in-house visitors to the institute for durations of a month or more and contribute to MBARI's overall program (e.g., seminars, publications, collaborative projects, etc.).

Visiting Staff – During their terms of appointment, these distinguished scientists and engineers enhance the breadth and depth of expertise at MBARI while taking advantage of the institute's unique facilities. Through advance planning and collaboration with MBARI staff, Visitors are given every opportunity to be highly productive during their time in residence. Although typically visitors would be expected to remain in residence for one year, stays of longer or shorter duration can be supported if circumstances warrant.

Postdoctoral Scientists/Engineers – Each year, the institute recruits recent Ph.D. graduates to work with MBARI scientists and engineers on institutional projects. Appointments are for two years but given satisfactory job performance and external support may be extended for a third. MBARI staff members are expected to serve as mentors for their postdoctoral collaborators to help prepare them for careers in industry, education or academia.

Research Assistants – These pre-doctoral appointments as temporary staff members give young scientists and engineers the opportunity to gain work experience in a research institution. In many cases, the Assistants are students of MBARI staff or Adjuncts from nearby universities and are able to incorporate the work they do at the institute into their MS or PhD theses.

Interns – These limited, temporary appointments allow high school and college undergraduate students an opportunity to experience life in a marine research institution and to learn something about marine science and technology in order to help them focus their career goals. Each Intern is paired with a staff mentor. During the organized summer internship program, the Interns also benefit from coordinated group activities, such as visits to the Monterey Bay Aquarium.

All categories of external collaborators sign written agreements that address intellectual property questions, the acknowledgment of MBARI affiliations on publications and scientific presentations, and the management of samples and data collected from MBARI platforms. All external investigators are required to spend significant time in residence at MBARI to develop and maintain close working relationships with internal investigators, to gain familiarity with MBARI's operational assets, and to contribute to the continued development of the institute's program and projects.

Seek external advice on the quality of our work.

By opening up MBARI to external reviews, we can assess the quality of our projects, obtain valuable guidance on how to improve them, increase outside awareness of MBARI programs, and provide a focus for pulling together accomplishments and scientific results. Reviews should be planned well in advance, involve only the most esteemed outside members, and be viewed as an important and positive management tool.

All completed or nearly completed projects will be presented to the Board. This will ensure the Board is cognizant of accomplishments and problems impacting MBARI. The following information should be provided in these accomplish-based reviews to the Board:

1. the original objectives;
2. the POA&M (Plan of Action and Milestones) to meet these objectives;
3. whether those milestones, including deliverable, were met;
4. what problems arose if any; and
5. the significant scientific and/or technical accomplishments that came out of the research.

For each task/project reviewed, MBARI researchers should present other information important for monitoring its technical execution. The Board anticipates that most of the presenter's time will be spent addressing the sections on deliverables and technical accomplishments.

In addition to the more formal reviews, MBARI should make every effort to encourage staff members to make informal visits to other institutions to assess the state of the art, and to arrange for visits by external researchers to view our projects and present seminars bringing us up to date on advances outside MBARI.

Expand our relationships with regional institutions.

The Monterey Bay area has become a center for oceanographic research in the U.S. MBARI will expand its collaborations with other Monterey Bay and California institutions to take full advantage of opportunities for joint projects (scientific and engineering), sharing of resources (libraries, analytical facilities, data sets, etc.), and educational opportunities (student research, summer interns, curriculum development, etc.). Examples of major research thrusts that any one institution is unlikely to mount alone include instrumenting and maintaining ocean observatories and research on the undersea portion of the active continental margin.

Transfer our successes to the marine research community.

MBARI's mission statement, as well as the institute's status as a non-profit corporation, requires that it distribute its results, technology, and skills broadly so as to advance deep-ocean research. By broadly disseminating the results of our efforts, we enhance MBARI's reputation and name recognition, thus facilitating our goal of attracting the highest caliber staff to MBARI. Distribution will be accomplished by:

- Publication of scientific results in the peer-reviewed literature.
- Presentation of results and technology at professional meetings, conferences, and workshops.
- Patenting of new technology and its licensing to commercial manufacturers.
- Sharing of results, samples, and technology with peer researchers from outside institutions.
- Release of video footage to qualified scientific, educational, and entertainment users.
- Collaboration with researchers outside MBARI (see description of categories above).

Communicate with the public.

MBARI should take advantage of its close relationship to the Monterey Bay Aquarium (MBA) to help increase the level of public understanding of the ocean in general and Monterey Bay in particular. We should develop and implement mutually beneficial program goals, roles and responsibilities. We can provide information, content review, high-quality video, real-time environmental data sets, and access to cutting-edge technology to help the Aquarium present research and science-based conservation effectively to students and the public.

The primary responsibility for such activities rests with the ITD Division. In addition, however, all MBARI employees are expected to be aware of the educational potential of their ongoing activities and to serve as resource persons for the institute in its interactions with the outside world. These activities will help promote public awareness of the importance of science and of the unique contributions of MBARI to oceanography.

CRITERIA FOR SUCCESSFUL IMPLEMENTATION

The assessment of the performance of research institutions in meeting their strategic objectives is notoriously difficult and rarely is addressed in a systematic or convincing way. The decadal polls of the National Research Council provide a gross measure of the relative standing of marine institutions, but is weighted towards educational programs (as measured by the quality and professional success of graduate programs, for example). Thus, MBARI's standing or even appearance in the next poll is problematic, regardless of our progress in meeting our goals. In addition, commentators on the polls note that historical reputations can weigh as heavily as current performance in influencing the ratings.

Other measures, such as staff size, budget, number of successful dives, amount of data collected, are input rather than output oriented variables; their relation to the performance of an institution is confounded by correlated variables and has not been well established. The number or rate of production of peer-reviewed publications and the extent to which they are subsequently cited are widely used measures of research productivity. In addition, the number of invited talks, awards and honors are all useful metrics, but do not completely capture the quality or significance of the research or its relevance to an institution's goals. In addition, current citation indices are known to be incomplete, inaccurate, and field-specific in their norms. Nevertheless, peer-reviewed publications, awards, honors, invited talks and citations are widely accepted metrics for the success of scientific research programs and investigators, and thus will be tracked at MBARI.

Reservations notwithstanding, MBARI will make every effort to design and employ meaningful measures of its success. The initial measures we will use include:

1. The rate of publication and citation of MBARI research.
2. The number of invited talks, awards, and honors bestowed on MBARI staff.
3. The strength of collaborative arrangements with other institutions, as measured by co-authored publications between the institutions and budget savings through sharing of resources.
4. The ability to collect, publish, and disseminate increasing amounts of data at lower cost.
5. The completion of projects on schedule and on budget through realistic risk management.
6. Reports of the MBARI-wide visiting committees as to whether research programs are unique, high quality, well managed, and leading to important advances.
7. Opinions of both the MBARI Board and visiting committees on the quality of the MBARI staff and affiliates.
8. The quantity and quality of media coverage of MBARI activities.
9. Annual polls by the MBARI Staff Council and on-going feedback from employees on the effectiveness of inter-institutional communication and management.
10. External interest in MBARI technology, as indicated by licensing agreements and requests for use of MBARI instrumentation by external researchers.

PROCESS FOR REVISING AND UPDATING THIS PLAN

This strategic plan is intended to provide long-term guidance to the Institute, its staff, and other affiliates. At all times, it should set a course for the Institute without restricting MBARI's ability to move in promising directions. Therefore, it is reasonable to revisit the plan every three years. Any modifications made to the plan at three-year intervals should result in a slow evolution of the plan such that the content looks

significantly different on a ten-year time scale. The President of MBARI will initiate the revision process six months in advance of the date when the revised plan should be in place. Staff and Board input will be solicited during this period. The final revised plan will require Board review and approval.