



RECORD OF DECISION

Monterey Accelerated Research System Cabled Observatory Project

National Science Foundation

21 November 2005

I. DECISION TO BE MADE

Pursuant to its mission to “promote the progress of science” the National Science Foundation (NSF) has reviewed and decided to authorize the expenditure of grant funds by the Monterey Bay Aquarium Research Institute (MBARI) to undertake the Monterey Accelerated Research System (MARS) Cabled Observatory project (“the project”) within the Monterey Bay National Marine Sanctuary (MBNMS or sanctuary). In this activity NSF is a cooperating agency with the National Oceanic and Atmospheric Administration (NOAA) who has decided to issue a permit to MBARI enabling the installation of this cabled observatory system. These decisions are based upon an assessment that funding the project is consistent with the National Science Foundation Act, 42 U.S.C. 1861, et seq., specifically with the mission of NSF’s Division of Ocean Sciences, which supports basic research and education to further understanding of all aspects of the global oceans and their interactions with the earth and the atmosphere, that the project is consistent with the purposes and policies of the National Marine Sanctuaries Act (NMSA; 16 U.S.C. 1431 et seq.), an assessment that the project will not violate National Marine Sanctuary Program (NMSP) regulations (15 C.F.R Part 922), and the outcome of analyses required by the National Environmental Policy Act (NEPA), included within the Draft Environmental Impact Report/Statement issued March 11, 2005 (Draft EIR/EIS) and Final Environmental Impact Report/Statement for the Monterey Accelerated Research System Cabled Observatory issued July 29, 2005 (Final EIR/EIS). This document comprises the Record of Decision (ROD) for this action. It includes a description of the proposed action, a statement of the decision made, synopses of other alternatives considered, the basis for the decision, a description of the environmentally preferable alternative, a summary of measures to minimize environmental harm, and an overview of legal requirements fulfilled.

This ROD is issued pursuant to NEPA, the Council on Environmental Quality (CEQ) NEPA regulations at 45 CFR Part 640 (“CEQ regulations”).

II. BACKGROUND INFORMATION

A. *Description of the Proposed Action*

In February 2004, MBARI applied to NOAA for a research permit to conduct the MARS project within the Monterey Bay Marine Sanctuary. As proposed by the applicant and funded by NSF, the project will include the installation of a 31.7 mile long (51 km) submerged cable, extending from the shore at Moss Landing in Monterey Bay to the northwest, north of the submarine Monterey Canyon, and along the continental margin to the southeastern part of a shelf slope formation known locally as "Smooth Ridge." The cable will be buried, using a hydraulic plow, for 24.1 miles to a depth of 3.3 feet (1 meter). The remaining 7.6 miles will either be surface laid or will be partially buried, where feasible. A total of at least 5.7 miles will be unburied due to the presence of hard bottom features or steep slopes.

The cable will be brought onshore to the proposed shore facility utilizing horizontal directional drilling technology (HDD). HDD is a highly specialized boring technique that will be used to drill an arc that will travel under Monterey Bay from the landing site to the location of the buried undersea cable. Shore facilities will consist of equipment housed in a 20-foot (6-m)-long portable structure.

The project also includes installation of one science node, to be located at the end of the submarine cable on Smooth Ridge, at a water depth of approximately 2,923 feet. The site on Smooth Ridge was chosen to best enable important science experiments and science observations to be undertaken. The science node, which is a piece of equipment that measures approximately 15 feet long by 12 feet wide and 4 feet high, will contain eight science data ports, each capable of providing electrical power and data transfer capabilities. This design will allow for extension cables to be plugged into any science port to provide power and communications up to 2.5 miles (4 km) away from the node. Scientific and test equipment will be installed by MBARI using the most cost-effective deployment vehicle, including MBARI's remotely operated vehicles (ROVs) and day boats. The node will support a variety of scientific research equipment and be utilized to test technologies, ROV operations, and operational management systems. The project systems will make use of the tools, techniques, and products developed over the last several decades for high reliability submarine telecommunication and military systems to ensure that this system can operate over a 25-year lifetime with minimum life-cycle cost.

Additional information about the project including timing and methodology can be found in the Draft and Final EIR/EIS.

B. *Purpose and need for the proposed action*

The purpose of the proposed action is to support oceanographic research in Monterey Bay by installing an advanced cabled observatory that will utilize new power and communication technologies to provide a remote, continuous, high-power, large-bandwidth infrastructure for multidisciplinary, in situ exploration, observation, and experimentation in the deep sea. The project will provide a continuous monitoring presence in the MBNMS, and will serve as the test

bed for a state-of-the-art regional ocean observatory, currently one component of the NSF's Ocean Observatories Initiative (OOI; refer to www.orionprogram.org for more information).

Two general classes of research will take advantage of the proposed project. The first class consists of research projects directed at oceanographic features that are particularly well represented in Monterey Bay. Such features include the large and active submarine canyon, well-developed coastal upwelling and associated biological productivity, cold seeps and associated benthic faunas, and tectonic features associated with the eastern edge of the Pacific lithospheric plate. The second class consists of more generic research such as benthic ecology, mixing processes in the interior of the ocean, and food web dynamics in the midwater. The project will allow researchers in such areas to develop the tools and methods to take advantage of the sea floor power supply and real-time data return and experiment control. Currently, information can be gathered only during ship cruises or using temporary devices that must eventually be retrieved when their batteries are depleted.

Additional information about the purpose and need for the proposed action, including details on the reasons for locating the project in Monterey Bay and the scientific objectives for the project can be read in the Draft and Final EIR/EIS.

C. Regulatory authority to require a permit

Pursuant to MBNMS Regulations, 15CFR 922.132(a)(2) and (4), "Discharging or depositing, from within the boundary of the Sanctuary, any material or other matter..." and "Drilling into, dredging or otherwise altering the seabed of the Sanctuary; or constructing, placing or abandoning any structure, material or other matter on the seabed of the Sanctuary..." are prohibited except in specific circumstances and when conducted under a valid NMSP permit.

D. Other agency involvement

As outlined in the Draft and Final EIR/EIS, NSF and NOAA were cooperating agencies in the analysis of this action under the National Environmental Policy Act. The lead state agency for purposes of ensuring compliance with the California Environmental Quality Act (CEQA) is the California State Lands Commission (SLC). A Draft EIR/EIS was released for a 45-day public comment period on March 11, 2005 and a Final EIR/EIS was published July 29, 2005. The SLC certified the Final EIR/EIS as being "adequate" (CEQA's threshold determination term) under CEQA and approved a State Lease for the portions of the proposed action under State jurisdiction on August 8, 2005.

III. DESCRIPTION OF PROJECT ALTERNATIVES

The following is a summary of the alternatives considered by NSF in the Draft and Final EIR/EIS. In addition to the proposed action (described above in Section II), three alternatives were considered in the EIR/EIS: No Action, and two alternative cable landing areas. Alternatives involving different technologies and different routes for the proposed cable were initially considered, but were both rejected as not meeting the project's purpose and need.

A. *No Action Alternative*

Under the No Action Alternative, NSF would not approve use of Federal funds for this major action thus preventing the installation of the MARS cable. The scientific and technical advances that will result from this project would be lost in this alternative. In addition, the critical need for the MARS system as a cabled observatory testbed for the larger and more complex Regional Cabled Observatory that is part of NSF's OOI would not be met.

B. *Alternative Landing Area 1 - Duke Pipeline to MBARI Property:*

This alternative is similar to the proposed Project, except that the shore landing would occur through an existing fuel oil pipeline owned by Duke Energy, in addition to a HDD installed conduit, which would bring the cable to the landing site in Moss Landing. The cable would run inside the pipeline from the ocean side entrance to a location on Jetty Road. A conduit would be installed by HDD from this location, extending south under the entry channel to Moss Landing Harbor. The cable would continue from the Duke Energy pipeline through this new conduit to the landing site. As opposed to the proposed Project where the HDD will terminate offshore, the exit pit for the HDD under this alternative would be onshore.

Although this alternative was found by NSF to meet the project purposes, it was not selected because the impacts to other users of the MBNMS, particularly those entering and leaving Moss Landing Harbor, were found to be significant and unavoidable. Specifically, this alternative would require the cable-laying vessel (as well as other vessels used in repair and removal) to operate for extended periods of time in the entrance channel for Moss Landing Harbor, effectively blocking the entrance for several hours.

C. *Alternative Landing Area 2 - Moss Landing Marine Laboratories (MLML) Pier*

The only differences in this alternative from the proposed project is that HDD would not be used and the shore landing would occur at the future MLML pier, to be located approximately 0.6 miles (1 km) south of the entrance to the Moss Landing Harbor. The cable would cross the head of the Monterey Canyon along the seafloor near the entrance to the Moss Landing Harbor and would extend south to the MLML pier at a water depth of approximately 52.5 feet (16 m). A cable in this portion of the route would be placed along the seafloor, so no HDD would be required. From the pier, the cable would be placed in a conduit and follow the same path as an existing intake pipe that supplies seawater to MBARI. Building C located at MBARI would serve as the shore facility, and no additional structures would be constructed.

As with the previous alternative, this alternative was found by NSF to meet the project purposes. However, it too was not selected because the impacts to other users of the MBNMS, particularly those entering and leaving Moss Landing Harbor, were found to be significant and unavoidable. Specifically, this alternative would require the cable-laying vessel (as well as other vessels used in repair and removal) to operate for extended periods of time in the entrance channel for Moss Landing Harbor, effectively blocking the entrance for several hours.

D. Alternatives Considered but Rejected

Several alternatives were initially considered by NSF but eliminated from detailed evaluation based on infeasibility or failure to meet project objectives.

1. Alternative 3, Southern Route

This alternative would have placed the proposed cable in a different location. The Alternative 3 cable route extended from the shore into Monterey Bay along the south side of the Monterey Bay Canyon. The cable would head in a general southwesterly direction for approximately 31 miles (50 km) and would terminate at the science node, at the same location as the proposed action. NSF determined this alternative would not meet the purpose and need of the project, primarily because the cable would be placed across Monterey Canyon, thus potentially reducing its longevity. Placing the cable across Monterey Canyon would subject the cable to landslides and mass wasting events, which are likely to destroy the cable within a year of its installation.

2. Alternative 4, Duke Energy Landing

The Duke Energy Landing Alternative is the same as the proposed project, except that the shore landing would occur through an existing fuel oil pipeline owned by Duke Energy and the shore facility would be on Duke Energy property, rather than the proposed vacant parcel owned by MBARI. NSF eliminated this alternative as a result of potential security concerns raised by the United States Coast Guard. Activities in this area not directly related to the operation of the power plant are now prohibited.

3. Alternative 5, Moored Buoy

Alternative 5 would utilize a series of moored buoys that would provide a wireless data link to the shore. The buoys would contain scientific equipment and a compact battery power source and would be linked to the sea floor by a steel cable attached to an anchoring device. Power would also be obtained through a combination of solar cells and a wind-generated turbine. Science nodes connected to fiber optic and power lines would then be arrayed up to 6 miles (10km) from the base of the mooring line to areas of scientific interest. NSF eliminated this alternative because it would not meet the project purpose and need in that a buoyed system would not provide the power requirements or data transfer ability required nor would it provide the needed testbed capabilities for a cabled ocean observatory.

E. Environmentally Preferable Alternative

The environmentally-preferred alternative was determined to be the No Action Alternative, where all potential impacts from cable laying activities would be avoided, and potential disturbance to marine resources would remain similar to that under existing conditions.

IV. EVALUATION OF THE PROJECT

NSF's decision to allow the project to use Federal funds to complete the MARS cabled system was reached after a careful and rigorous evaluation of the proposed action in coordination with NOAA and in consultation with other regulatory agencies having jurisdiction over the proposed research location. NSF took the following steps relevant to the making the final decision:

- NSF considered the consistency of the proposed action with NSF's mission to promote the progress of science;
- NSF in coordination with NOAA conducted a technical evaluation of the proposed activity itself, including an identification of all reasonable alternatives to the proposed activity;
- NSF evaluated and compared the impacts of the proposed activity and the reasonable alternatives; and
- NSF considered other factors that may have affected the determination of whether to allow the use of Federal funds for the proposed activity.

These steps and NSF's related conclusions on the project are summarized below.

A. *Factors Related to the Agency Mission*

The proposed action is clearly consistent with NSF's mission to support and conduct basic research and technology development. Furthermore, NSF has determined the Federal funds for the proposed action will also assist NOAA in its mission of resource protection.

B. *Project review*

NSF conducted a technical evaluation of the proposed activity, including peer review of its scientific and technical merit and an identification of all reasonable alternatives.

1. Professional Qualifications and Financial Ability of the Applicant

MBARI is a highly qualified research organization with approximately 220 experienced professional, technical, and administrative staff. MBARI has conducted many research activities within MBNMS, has diligently complied with past research permits covering hundreds of research projects, and has demonstrated extreme care in protecting and preserving sanctuary resources and qualities.

As a private, non-profit research center, MBARI has a \$47 million annual budget (2005), 75% of which is funded by The David and Lucile Packard Foundation. MBARI is a financially secure organization, in operation for 18 years. Ongoing repair of any damaged cable, and its eventual removal, will be covered through the NSF or by MBARI and its partners. NOAA's permit will require MBARI to purchase and maintain a bond to cover all estimated costs associated with cable and scientific gear removal. The amount of the bond must be sufficient to cover all estimated costs under the cable removal plan.

2. Evaluation of methods

Inherent in considering and evaluating the project's methods, is an identification of and comparison of the proposed action to all reasonable alternatives. NSF has reviewed the methods proposed by MBARI to complete the project and has determined them to be reasonable when evaluated in the context of other reasonable alternatives. See section II for a description of all reasonable alternatives.

3. End value of the project

As demonstrated in the project objectives, the proposed action is intended to provide substantial research and engineering benefits for the marine science community. NSF has determined that the research, engineering, and educational benefits of the project will provide a positive "end value" of the project that outweighs any environmental impacts as noted in the Draft and Final EIR/EIS.

C. Evaluation of the impacts of the proposed activity

NSF conducted an evaluation and assessment of the impacts of the proposed activity and reasonable alternatives in coordination with NOAA. 15 CFR § 922.133(c) establishes the criteria for making permitting decisions for proposed activities within the MBNMS. Those criteria that relate to the assessment of impacts include a consideration of the following factors:

- the duration of the activity and its effects;
- the cumulative impacts;
- the extent to which the proposed activity may diminish or enhance MBNMS resources and qualities.

Following a consideration of these three factors, a determination is then made as to whether the impacts of the activity are greater than short term and negligible. Only activities with impacts found to be no greater than short term and negligible may be permitted under a research permit.

The Draft and Final EIR/EIS provide detailed analyses of all short-term and long-term adverse impacts. In the Draft and Final EIR/EIS, NSF and NOAA made a determination that no significant, unavoidable short or long-term impacts will occur as a result of the project. Furthermore, permit conditions and mitigation measures will ensure that impacts will be avoided or reduced to levels that are far below significance thresholds. This finding is based on detailed assessment of impacts on each resource area, using established impact significance criteria.

While there is no quantifiable standard for a negligible, short-term adverse effect, NSF and NOAA employed the professional expertise of the MBNMS Superintendent, NOAA scientists, and managers knowledgeable of MBNMS resources, qualities, and values to reach a determination of potential impact from the project. Additional insights into the impacts of the project were gained from NOAA scientists and resource managers knowledgeable about essential fish habitats and endangered species; as well as from its state partners, including the California Coastal Commission and State Lands Commission; and from local academic institutions.

There were a number of issue areas evaluated by NSF in the Draft and Final EIR/EIS, for which NSF concluded there will be no adverse effect. These issue areas included: environmental

justice, aesthetics, agriculture, land use, hydrology, population and housing, public services, recreation, transportation and utilities and service systems.

Most of the potential environmental impacts associated with the MARS project will occur during cable installation, which is expected to require 5 to 6 days. Weather conditions and other difficulties may increase the time needed for installation, thus a timeframe of 10 to 14 days is assumed, which NSF considers to be very short-term. During the duration of cable-installation operations, NSF anticipates the following effects:

- The presence of the cable installation vessel will preclude fishing within a limited area (within 1 mile of the vessel) for a temporary period -- a few hours to several days in any one location.
- Cable installation is not expected to impact any known archaeological resources.
- The cable installation will result in limited, short-term negligible disturbance of the seafloor, in soft sediment areas where the cable will be buried.
- Cable installation could cause localized, temporary, and negligible impacts on invertebrates and fishes in soft-bottom habitats along the cable corridor as a result of cable burial and placement.
- No sensitive plant habitats, such as kelp, eelgrass, or algae will be impacted.
- The cable has been routed to avoid any ecologically rare communities, such as the chemosynthetic communities (cold seeps).
- No fish or wildlife migration or passage routes will be impacted for more than a few hours, and cable installation or removal will not produce changes in substrate or environmental conditions that will restrict migration or passage.
- Special status invertebrate or fish species are not known to occur along the cable route, with the possible exception of bocaccio, but disturbance to fishes including these species, if any, will be localized and temporary (minutes to a few hours).
- Based on the definition of adverse effect, as provided in the NOAA Fisheries Guidance Document, no reduction in quality and/or quantity of Essential Fish Habitat is likely.
- No adverse impacts on fish communities managed under the three Pacific Fish Management Plans are expected.
- No sensitive nursery areas will be crossed by the cable, and no reduction in population yields are expected.
- Temporary noise disturbance impacts on seabirds from cable installation, repair, or removal activities will be very limited in duration and will not occur near known nesting colonies.
- The potential for impacts on marine mammals is very low and any potential impacts will be temporary and localized.
- Noise from HDD activities are not expected to be heard by sensitive marine mammals, fish, or organisms.
- Marine vessel transportation will not be affected, other than very temporary preclusion of traffic in the immediate vicinity of the cable-laying vessel.

Considering all relevant factors, NSF does not anticipate any long-term impacts on MBNMS resources or qualities to occur from the continued presence of the cable (i.e., after the cable is installed and outside of repair or removal activities). All affected benthic organisms are expected

to recolonize to the area through natural recruitment within a short period of time and would be unaffected by the presence of the cable.

Given the limited scope and duration of these impacts, NSF has concluded that any adverse effects on the environment will be negligible and short-term.

V. MITIGATION MEASURES ADOPTED

NSF has determined that all practical means to avoid, minimize, or compensate for environmental harm from the proposed action have been adopted. The Draft and Final EIR/EIS identify five mitigation measures for the proposed action, four of which apply to the protection of marine resources. These four measures have been incorporated into the Mitigation Monitoring Plan for the permit, and NSF Grant General Condition 39 requires compliance with NOAA's permit as a condition of NSF funding. In addition, MBARI has incorporated several other operational procedures into the project that NSF believes will minimize or prevent altogether impacts on MBNMS resources. NOAA has made all of the following mitigation measures enforceable conditions of the permit:

- Cable-laying vessel speed limits of generally less than 2 knots will be established and enforced.
- A 500-meter safety zone will be established around the cable-laying vessel.
- NOAA Fisheries-approved marine mammal monitors will be present during cable laying activities to increase the likelihood that all marine mammals entering the safety zone will be sighted. Monitors will have the authority to call for the curtailment of operations if any marine mammal enters the safety zone. If a marine mammal is sighted, operations will be delayed until the animal moves out of the area.
- Impacts on biological resources in the nearshore area will be avoided by conducting HDD and installing an underground conduit for the cable from shore to about 50 feet water depth offshore.
- Proposed advanced construction techniques, protective measures, emergency response plans, a very short construction time period, additional mitigation measures, and permit conditions ensure that any other potential impacts will be short term and will fall far below significance thresholds.
- The cable-laying vessel has an approved Spill Prevention Control and Countermeasure Plan that will be implemented in the event of a leak.
- After permit issuance, the MBNMS Superintendent will review this permit every 5 years to determine if it warrants modification, revocation, suspension, or amendment due to new information about injury, destruction, or loss to MBNMS resources, qualities or values resulting from the ongoing activities.
- Furthermore, in response to concerns about potential fishing conflicts, and in the interest of minimizing conflicts between fishing and research activities in the sanctuary, detailed permit conditions have been included to minimize impacts and financial losses to fishermen.
- Applicant meetings with designated fishing representatives and trawlers will be required, in order to coordinate cable installation activities, and subsequent meetings will be

required to exchange information and address administrative or other issues related to the cable.

- Provision of an “as-built cable plan” to fishermen.
- Maintenance of a fully-staffed 24-hour telephone hotline to be contacted in the event of a cable snag or other fishing incident on the cable.
- Retrieval of snagged or entangled gear by MBARI, to the extent reasonable and feasible.
- Compensation to fishermen for lost or damaged fishing gear and reimbursement for catch lost with the gear.
- Release of all claims against any fisherman legally authorized to trawl or otherwise fish in the project area who, while using reasonable care snags the cable, if the fisherman immediately notifies MBARI of the snag.
- Establishment of a mediation process for any disputes over reimbursement for lost or damaged gear or lost catch.
- Removal of the cable prior to expiration of the permit.
- Use of low emission fuel and contribution to an off-site emission reduction program to reduce air emissions from cable-laying and support vessels.
- Reviewing existing sub-bottom profiler data and avoidance of any potential submerged archaeologically sensitive areas.
- The fifth mitigation measure requires noise-reduction equipment for HDD activities and applies only to noise impacts on the onshore environment.

With implementation of these mitigation measures, all potential impacts on MBNMS resources, qualities, and values will be reduced to levels that are expected to be short-term and negligible.

VI. MONITORING AND ENFORCEMENT

To ensure the project is conducted in accordance with permit terms and conditions, the impacts of the project are not greater than expected, and to ensure mitigation measures are implemented, NOAA will require certain types of monitoring and reporting be conducted for the duration of the project. Monitoring and reporting will ensure the cable and associated equipment are installed properly and remain in compliance with permit terms and conditions (e.g., ensure the cable is and remains buried to permit requirements). Monitoring and reporting will also be designed to ensure impacts to MBNMS resources, qualities, and values are consistent with expectation discussed above. Like the mitigation measures, these will be made enforceable conditions of the permit. The terms and conditions of NSF’s award to MBARI’s require compliance with these enforceable conditions of the NOAA permit. Monitoring and reporting requirements of the permit will include:

- conducting periodic surveys of the cable and control areas by ROV;
- preparing post-installation and periodic cable survey reports;
- monitoring for marine mammals in the project area during cable installation, repair, maintenance, and removal;
- ensuring that proper construction notices are provided;
- verifying construction procedures and practices; and
- observing HDD activities to ensure proper techniques are employed.

The California SLC and NOAA may assign duties and responsibilities for monitoring to other environmental monitors or consultants as deemed necessary. The SLC, NOAA, or their designee(s), however, will ensure that each person assigned any duties or responsibilities is qualified to monitor compliance. MBARI is responsible for successfully implementing all the conditions of the permit, and is responsible for ensuring that these requirements are met by all of its construction contractors and field personnel.

VII. CONTACTS

Further information regarding this Record of Decision may be obtained by contacting:

Charisse Carney-Nunes (ccarney@nsf.gov)
Alexandra Isern (aisern@nsf.gov)
National Science Foundation
4201 Wilson Blvd.
Arlington VA 22230

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H. Lawrence Clark Date
Division Director
Division of Ocean Sciences
National Science Foundation