April 25, 2005

By email, facsimile, and Federal Express

Mr. Stephen L. Jenkins, Project Officer
California State Lands Commission
100 Howe Street, Suite 100-South
Sacramento, CA 95825-8202

Ms. Deidre Hall, Permit Coordinator
Monterey Bay National Marine Sanctuary
299 Foam Street
Monterey, CA 93940

RE: Draft Environmental Impact Report/Environmental Impact Statement; Monterey Accelerated Research System (MARS) Cabled Observatory; SCH No. 200401511388; CSLC EIR No. 731; CSLC File #'s: W25980; W30156

Dear Mr. Jenkins and Ms. Hall:

On behalf of the Alliance of Communities for Sustainable Fisheries (the "Alliance" or "ACSF"), we are providing the following comments on the Draft Environmental Impact Report/Environmental Impact Statement ("DEIS") regarding the proposal to issue the necessary state and federal permits to the Monterey Bay Aquarium Research Institute ("MBARI")[1] to lay and operate a cable in Monterey Bay. We have been advised by Michelle Brown of the State Lands Commission, that the date for filing these comments has been clarified as the close of business, Tuesday, April 26, 2005, because of the mistake in the closing date set forth in the DEIS/EIR.

The goal of the Alliance is to support the fishing communities of the Central California Coast. Our comments are submitted on behalf of interested fishing groups whose members traditionally and regularly harvest fishery resources in Monterey Bay, including in the area that

[1] We understand that MBARI, a private research entity, is serving either as a contractor or grantee of the Federal government for purposes of this project. Also involved are the University of Washington, the Jet Propulsion Laboratory, and the Woods Hole Oceanographic Foundation. MBARI is affiliated with the Monterey Aquarium, a private institution that provides entertainment to the general public for an entrance fee, sells commercial products, and promotes certain environmental policies that are particular to that organization and that may not be consistent with policies set forth in State and Federal law and policy.

would be impacted by the proposed laying of an underwater cable as part of the MARS project. In fact, MBARI is a very recent addition to Monterey Bay, compared to the long history of utilizing the resources of this region by those who have depended on the sea for their way of life.

ACSF's interests are not simply limited to harvesting resources. The organization and its constituents have an abiding interest in preserving and protecting the Monterey Bay marine environment generally. A healthy marine environment supports strong fish stocks. Consequently, ACSF is vitally interested in making sure that the entire ecosystem remains healthy, including essential fish habitat, endangered and threatened species, marine mammal populations, water quality, and the water column and seafloor. Ecosystem management requires protection of all the unique environmental features of the Bay.

Project Description

The MARS project is publicly funded, by the National Science Foundation, as part of the Federal budget. What is proposed is the construction and operation of a lengthy (31.7 mile) submarine cable network that would impact the water and seabed on lands owned by the State of California and United States in an area designated by Congress and the National Oceanic and Atmospheric Administration ("NOAA") as so unique as to merit being named a marine sanctuary under the National Marine Sanctuaries Act, 16 U.S.C. § 1431 et seq. The project will consist of a set of underwater cables and "docking" stations, carrying power and high-speed data links in support of various oceanographic devices, which will include remote sensors, each of which could stretch as far as an additional 2.5 miles from the end of the cable. The power that will run the system is estimated at 10 kilowatts, or enough to "supply a small neighborhood."

It appears that the actual installation of the cable will be done not by an American company but by a French company, Alcatel, using a foreign-flag vessel, the M/V *Ile de Re*.[2] It appears that a sizeable trench, a least one foot wide (or probably more) and three feet deep, will be dug for an undisclosed distance. Based on the description in the DEIS (p. ES-4), it is not clear just how much of the cable will actually be buried but it is stated that about 5.6 miles, located on the seafloor edge of Bay that begins a steep vertical drop, will not be buried (DEIS; Figures 4.4-6 and 4.4-7). In addition, another portion inland of the unburied portion, of unknown length, would be "partially" buried. The cable would connect to a pipe located about .89 miles from shore, which ties it to the shoreside facilities on MBARI property. That portion of the system would be constructed using the same directional drilling techniques used by the offshore oil and gas industry.

ACSF is deeply concerned because the area where the cable will not be buried, or only partially buried, cuts across one of the most important fishing areas within and on the shelf of the Bay, an area critical to fishing and where bottom-trawling equipment is essential to success (DEIS; Figures 4.2-1 and 4.2-2). For this and other reasons, it would appear, the DEIS states that the only area of controversy the Applicant sees is the conflicts with local fishing activity that

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[2] We presume that the use of this vessel will not violate U.S. cabotage laws with respect to coastwise trade, but do not know for sure. It is unfortunate, however, that this Federal project will not be using an American company and an American vessel for the work on the cable.

may catch and injure the cable. DEIS; p. ES-7. Contrary to the poorly documented statements in the DEIS, there is a significant risk that trawl doors from a working vessel will snag on the exposed cable, perhaps even on the area above the buried cable if the surface is not smooth. There is also a risk that deeper working trawl gear will snag on the terminal "nodes," notwithstanding that this part of the cable will be covered by a supposedly trawl-resistant cover. Other types of gear may be affected by the unburied and exposed part of the cable and its terminal "nodes."

The Applicant has been in discussions with local fishermen's organizations in an attempt to put a Fisherman's Agreement in place that would specify the terms, procedures, and rules for providing compensation to any fishermen whose gear is damaged or lost if snagged on the MARS cable or science nodes. At the time of the filing of these comments on the Draft EIR/EIS, an acceptable Fisherman's Agreement has not yet been negotiated between the Applicant and the fishermen's organizations.

As of the writing of these comments, ACSFcan confirm that no such agreement is in place, although a proposed agreement was presented to us by attorneys for the Applicant MBARI at approximately 3:30 p.m. on Thursday, April 21, 2005. This was the first time that MBARI put any kind of proposal in any real detail in writing.[3] ACSF remains hopeful that a satisfactory agreement can be reached so that the conflict created by the proposed cable with traditional fishing activity will be addressed and resolved, to the extent possible. However, as of the filing of these comments, analysis and approval by our constituent groups is still ongoing. We are not confident that an arrangement can be worked out, given what we believe is a conflict of interest on the part of MBARI, as will be explained below.

Legal Status of the Submerged Cable

It is our understanding that MBARI is engaged in a project funded by the Federal government. While the purpose of the cable is explained (DEIS, at ES-1), the DEIS does not discuss at all the legal status of the cable. For example, is the cable owned by the Federal government or by the private institution MBARI? If it is owned by the Federal government, is any conflict with other legitimate uses of this part of the marine environment governed by laws applicable to activities of the Federal government, including sovereign immunity? A related question is whether MBARI would have any legal standing to seek damages should a fishing vessel inadvertently injure the cable.[4] Could the fishing vessel seek damages against MBARI if the cable is either not properly buried or improperly marked? Will the cable be shown on navigation charts or made the subject of notices to mariners issued by the United States Coast Guard? Unfortunately, none of these issues are addressed in any meaningful manner in the DEIS, notwithstanding the concession that conflicts with fishermen are very possible. Quite

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[3] MBARI's attorneys have made the content of their letter subject to the protections of California law with respect to settlement negotiations, so ACSF will not disclose the terms of MBARI's proposal.

[4] *See American Telephone & Telegraph Company v. M/V CAPE FEAR*, 967 F.2d 864 (3rd Cir. 1992) (Submarine Cable Act does not give private right of action to cable owners to recover for negligence against a fishing vessel).

clearly, MBARI is seeking to create an obstruction in areas known to be subject to fishing activity.

In general, it does not appear that construction and operation of submarine cables, as a matter of State and Federal policy, are favored activities in this particular coastal area. In fact, the regulations in force for the Monterey Bay National Marine Sanctuary bar such activities because they constitute "[d]rilling into, dredging or otherwise altering the seabed of the Sanctuary," except pursuant to certain exceptions, none of which are relevant here. It does not matter if the cable is being installed for research or commercial purposes; submarine cables in Monterey Bay are barred by Federal regulation.[5] 15 U.S.C. § 922.132(a)(4). Moreover, other far less intrusive remote sensing techniques are available to conduct the research contemplated here. However, use of such alternative non-intrusive research techniques, and avoidance of all the environmental impact, is not discussed to any meaningful degree in the DEIS.

One environmental group has said that "[m]any of the activities inherent to submarine cable installation, operation, repair, and removal are generally incompatible with the National Marine Sanctuary Program's statutory objective of resource protection." Correspondence from Kaitilin Gaffney, Ecosystem Program, Center for Marine Conservation (now called the Ocean Conservancy), to Matt Brookhart, National Marine Sanctuary Program, NOAA (March 21, 2001). ACSF agrees with that statement.

It is ACSF's position that the MARS cable cannot be allowed under the National Marine Sanctuary Act without the issuance of a "special use permit." 16 U.S.C. § 1441. No such permit can be issued for more than five years, unless renewed. In addition, it is mandatory that the permitee purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit and to hold the United States harmless against such claims, among other requirements. 6 U.S.C. § 1441 (c)(4). Without such a permit, the MARS project will violate Federal law. Fees may also be required, although a waiver of fees may be available for research activities.[6] However, all "research" is not the same. Some methods of gathering scientific data are far less intrusive than others. For example, using explosives to gather geophysical data is more intrusive than other means. Here, the laying of the MARS cable, using oil and gas drilling methods and commercial cable laying equipment, is very intrusive, no different in kind from any other submarine cable. Congress intended that such activity apply for and obtain a special use permit.

Legal and Policy Status of Fishing in Monterey Bay

It is important to keep in mind that fishing activity, pursuant to applicable Federal and State law and policy, is a favored activity in Monterey Bay, and per se compatible with the

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[5] The only likely exception might be for national security purposes. However, the MARS cable appears to have no national security use.

[6] *See* 65 Fed.Reg. 51,264 (Aug. 23, 2000) (Installing and Maintaining Commercial Submarine Cables in National Marine Sanctuaries); 66 Fed.Reg. 43,135 (Aug. 17, 2001) (Fair Market Value Analysis for a Submarine Cable Permit in National Marine Sanctuaries).

purposes of the National Marine Sanctuary established in the area.[7] 16 U.S.C. §§ 1433(b)(1)(C) and 1434(a)(5). Fishing activities do not require the issuance of a special use permit to be conducted in the Sanctuary. Moreover, the California Coastal Act (Pub.Res.C. §§ 3001.5 and 30001.5) states that the basic goals of the State for the coastal zone include, among other things, maintaining access in the coastal zone and assuring a priority for coastal-dependent and coastal-related development over other development on the coast. See also, Pub. Res. C. § 30230 (maintenance of marine resources) and § 30234.5 (the economic, commercial, and recreational importance of fishing activities shall be recognized and protected).

For ACSF, supporting the fishing communities of the Central California coast while preserving and managing our fishery and other marine resources are our primary goals. These goals are established elements of Federal and California State coastal law, as well. A recent ruling by Third District California Court of Appeal confirmed, again, that the public' interest in fishing is firmly protected by the public trust doctrine in California. *California Earth Corps v. Calif. State Lands Commission*, 5 C.D.O.S. 3404 (April 25, 2005). The State holds the tidelands and submerged lands within state boundaries (including Monterey Bay) "in trust for public purposes, which have traditionally been delineated in terms of navigation, commerce, and fisheries." *City of Long Beach v. Mansell* (1970) 3 Cal.3d 462, 482.

NOAA's National Marine Sanctuary Program has also issued policy statements with regard to possible conflicts between submarine cables and the fishing industry that are instructive here. In discussing the issues raised by submarine cables, NOAA made the following observation in a 2000 Notice in the Federal Register:

> Recognize the fishing industry's role as a distinct, critical and interested party in submarine cable issues. [NOAA would accomplish this by strongly encouraging the cable industry to initiate negotiations and develop agreements with marine and coastal resource user groups before their applications for permits and licenses are deemed complete for public review...][8]

These observations apply with equal force to any submarine cable project because each one, whether for research or "commercial" purposes, creates the same kind of environmental impacts and possible conflicts with the fishing industry.

Commercial fishing is one of the most highly regulated activities in the United States. On the West Coast, the regulations adopted pursuant to the Magnuson-Stevens Fishery Conservation and Management Act strictly control fishing in the federal waters of the Sanctuary,[9] as do comparable regulations issued and enforced by the State. Regulations for Pacific groundfish are

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[7] In contrast, Federal regulations for the Sanctuary currently prohibit the laying of any submarine cable system. 15 C.F.R. § 922.132(a)(4).

[8] In this case, no such agreement was in place with the fishing industry before issuing the MARS proposal for public comment.

[9] Fishery management regulations issued by NOAA-Fisheries govern fishing in the Sanctuary. Congress has stated that "special use permits" are not required to engage in fishing in a Marine Sanctuary. 16 U.S.C. § 1441(g).

particularly strict and have severely limited harvest opportunities coast-wide. The fishing that is now allowed has been fully authorized by current fishery management regulations. Over time, it is expected that stocks will increase and, with that increase, fishing will also increase. Thus, it is reasonable to expect that fishing conflicts will increase over the life of the MARS Project, e.g. 26 years.

Inevitable Conflicts

Conflicts between submarine cables and the fishing industry are well documented. In fact, Tracey Lynne Holman, a Master of Marine Studies student at the University of Washington, wrote a thesis on the subject in 2000. The paper has been published on the World Wide Web with a cover that stated: Contribution to the NEPUNE PROJECT; www.neptune.washington.edu. Ms. Holman studied the conflicts between the submarine cable and fishing industries in Oregon and suggested an approach for resolving them. The clear implication is that the NEPTUNE Project, of which the MARS Project is a prototype apparently, can learn from these experiences in implementing its planned submarine cable program and use them in addressing similar conflicts in the MARS and NEPTUNE projects. However, this paper was not even referenced in the DEIS and, to date, MBARI has not addressed the fishing conflict issue in an appropriate and successful manner.

The DEIS at various points (e.g., Section 4.2) confirms that these conflicts in fact exist, but the analysis of the magnitude and scope of this conflict is shallow and rudimentary, and ignores easily available sources of contrary information.[10] Moreover, nothing concrete is suggested in mitigation to avoid or deal with these conflicts. It is also clear from the discussion in the DEIS that the authors did not directly contact those fishermen who would be directly affected by the impacts. Indeed, as if working from a distance using only general tables and charts developed by regulatory agencies, the DEIS tries to paint a picture of de minimus impact. The text at page 4.2-15 suggests that a snag from bottom fishing gear might occur once in 26 years, giving the impression that any such snag in this setting is extremely unlikely. But the Holmon thesis quotes an AT&T source that "[a]t least twice a month, somewhere in the world a fisherman snags a cable with fishing gear." Holman Thesis at 6.

But the most glaring omission in the DEIS is the failure to mention MBARI's own research on marine cables and fishing impacts: Irene Kogan, et al., Environmental Impact of a Submarine Cable: Case Study of the ATOC/Pioneer Seamount Cable, Monterey Bay Aquarium Research Institute and Monterey Bay National Marine Sanctuary, November 2003. A summary write up of this research project can be found at www.mbari.org/education/earth/2004/ATOC. This research report was to examine the environmental impacts of the ATOC/Pioneer Seamount cable located in the Sanctuary off Half Moon Bay, California. This cable was installed in 1995, about 10 years ago, for performing acoustic tomography. Contrary to the rosy observations in the DEIS, the following statement is found in the research write up:

> Fishing activity is the main cause of submarine cable breaks worldwide as

[10] This part of the DEIS reads as an advocacy piece, written to put the Applicant's proposal in an overly positive light.

> unburied cable is vulnerable to being snagged by fishing vessels. Several kinks in the ATOC cable were found in an area subjected to intense trawling activity. The first break in this cable's history was attributed to trawling, and seafloor tracks similar to trawl marks were observed in that area during the survey. The cable was broken a second time and has not transmitted data since September 2002. The exact location of the break and its cause were not found during the survey.

This research report is not listed in the References section of the DEIS. A copy of the write up is attached (Exhibit 1). Instead, the DEIS makes summary reference to an assessment prepared for an entity called Global West Network, using a so-called cable fault model. That model is then said to be the basis for concluding that the risk of a fishing snag is "exceedingly low" in this case. DEIS at 4.2-12. However, MBARI's own research indicates that at least two snags, and possibly one break, caused by trawling has affected the ATOC cable in only 7 years. No analysis of the adequacy of the Global West Network model, particularly in light of the ATOC factual information, is provided. The reader is only given a summary conclusion. Such simplistic analysis is not likely to survive a court challenge, under either State or Federal law, and should never have been accepted as part of this DEIS. For certain, State and Federal agencies should not rely on it for their decision-making.

The issue of the snagging of the exposed cable by fishing gear has significant environmental impacts. Snagged gear may also pose entanglement problems for marine mammals that frequent the area. The need to regularly engage in intrusive industrial activity to repair the cable every few years (every two years if the ATOC experience in very similar circumstances within the Sanctuary has meaning) will cause new environmental disruption each time. Yet the DEIS contains no specific information about how many vessels use the area where the cable will be located, what types of vessels are active or what gear they use, the projected fishing activity over the life of the cable, and other obviously relevant data and information.

Given the general experience of trawling impacts on submarine cables, as reflected in a multitude of reference materials for all kinds of cables (commercial, military, research), and the particular experience with the ATOC cable, it would be arbitrary and capricious for any State or Federal agency to rely upon MBARI's assessment of the risk of such adverse events as set forth in the DEIS. In fact, the risk of a trawl vessel snagging on the MARS cable, given its preferred route, is significant.[11] If the ATOC cable experienced one break, and several kinks, in less than 7 years due to trawling, then it is quite likely that the proposed MARS cable, which was routed through known fishing grounds rather than away from them, will be snagged and perhaps broken every year or so. As a consequence, further environmental disturbance will be required to repair the cable and liability disputes will surely result.

The DEIS also fails to apply the precautionary principle to the various ecological uncertainties obvious here. This principle should be well known to MBARI but gets no treatment at all in the DEIS. Therefore, the failure to analyze the risk associated with fishing gear conflicts undercuts all the conclusions in the DEIS as to the degree of risk and the

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[11] ACSF prefers Alternative 3, which was rejected prior to issuance of the DEIS, as the best route for the cable, if one were built.

significance of the related environmental impact. That a research institution of MBARI's purported prominence would fail to prepare an adequate assessment of a project for which MBARI is responsible for obtaining permits is quite troubling.

MBARI Has a Conflict of Interest

ACSF believes that MBARI has a conflict of interest with respect to analysis of the impacts of fishing in this case and in seeking to enter into what is referred to as a Fisherman's Agreement, as it is called in the DEIS (page ES-7). Although the views of ACSF have been known for some time, MBARI never made a proposal in writing that could be considered by fishing industry representatives until just last week. The essential issues in any such agreement can be easily identified and the need for such an agreement has been well recognized by the organizers of NEPTUNE, as evidenced by the Holman Paper. But, as of this date, nothing has been agreed to. Moreover, the DEIS does not include information gathered from the fishermen themselves. Overall, communications between MBARI, which has the affirmative duty of working with the fishermen in leading the effort for state and federal permits, and ACSF have not been very successful.

The source of the problems is clear. MBARI is affiliated with the Monterey Aquarium. The director of MBARI is Dr. Marcia McNutt, who also sits on the Board of Directors of the Aquarium. In fact, several individuals are members of both entities' boards of directors. Thus, the policies pursued by each are essentially the same. Each is funded by the David and Lucille Packard Foundation, a private trust with its own self-directed policies and goals. None of these institutions are considered to be public, although it appears that federal funds are provided to conduct some of the programs of MBARI. Because it is a private institution, MBARI does not function with the same concerns and policy directives that apply to, say, the Monterey Bay National Marine Sanctuary or a scientific laboratory at the University of California.

The conflict arises because the Monterey Aquarium has been leading a major campaign for a consumer boycott of the very fishing activity that would be the subject of a Fisherman's Agreement for the MARS Project. The Aquarium has a Seafood Watch Program which is carried out, in part, by a consumer brochure distributed by the Aquarium and available on its website that tells the consumer what seafood should be purchased and what seafood to be avoided. This Seafood Guide currently recommends against any purchase of Pacific (trawl-caught) rockfish. The label for this type of fish is red and means "Avoid." Yet all trawl fishing for rockfish on the West Coast must be conducted in accordance with strict State and Federal fishery management regulations. These regulations include no-fishing zones, gear restrictions, quotas, and seasonal closures.

Fishermen do not make the regulations; duly authorized government authorities do. Fishermen can only comply, under threat of monetary and criminal penalties, and gear and vessel forfeiture. Any Pacific rockfish that would be caught, therefore, would be considered legal and any fisherman would be authorized to sell the fish. The Aquarium's Seafood Watch Guide campaign, nonetheless, calls upon the public to boycott legally caught Pacific rockfish, the result of which is to undercut any law-abiding fisherman who seeks only to make a living for his or her family.

The leadership of MBARI has, presumably, adopted and supports the boycott policy and is aggressively pursuing it. Notwithstanding the fact that government agencies are also aggressively regulating the Pacific rockfish fishery, the Aquarium's boycott policies remain in place. In effect, the Aquarium is encouraging the public to have no faith in government fishery management policies and programs and to punish law-abiding fishermen. The Aquarium is seeking to undercut the business of lawfully trawling for Pacific rockfish, which will result in harm to individuals and businesses that rely on fishing for a living. It seems the Aquarium is run by individuals who long ago forget what it takes to put food on the table for a family.

Therefore, it is not terribly surprising that there is no Fisherman's Agreement and that the DEIS is inadequate. But it is surprising that the other academic institutions in the NEPTUNE Project, and the National Science Foundation, have allowed MBARI to take the lead on a well-known and important problem of conflict between the establishment of a new submarine cable network and traditional fishing activity. Perhaps only through the intervention of these other agencies and institutions will something fair be developed for dealing with this conflict. Whatever is negotiated here will set the precedent for locating the NEPTUNE cables in other areas.

What ACSF Believes Is Necessary

ACSF is prepared to support the MARS Project if their concerns are addressed in a fair and balanced manner, through a legally enforceable written agreement or pursuant to lease and permit conditions required by State and/or Federal agencies. In order to resolve the conflict that is created by authorizing the otherwise illegal activity of placing a submarine cable in the Monterey Bay Sanctuary, the following issues should be addressed:

1. The conflict of interest posed by MBARI's involvement and the anti-fishing policies of the Aquarium needs to resolved. MBARI cannot use the MARS Project to force fishing out of Monterey Bay.

2. It should be confirmed that no area where the cable is located is to be off-limits to fishing, but that fishing should be conducted pursuant to lawfully issued State and Federal fishery management regulations.

3. A far more thorough and intellectually honest assessment of the risk of snagging the cable must be prepared. This should include more detail about the fishing activity now active there, the types of vessels and gear used (and the relative risk of snagging of each), and a projection of fishing activity over the life of the project, applying the precautionary principle. At present, the discussion and analysis in the DEIS is incomplete, conclusory and biased.

4. A system of regular dialogue should be established to substitute for the unsatisfactory communications between the Applicant and the fishing industry. Other entities responsible for the MARS Project may want to intervene to assure that MBARI is not using the Project to further the Monterey Aquarium's anti-fishing boycotts.

5. Mechanisms should be put in place to provide up-to-date information about the location of the cable and steps to be taken if fishing gear appears to be snagged. More definitive measures should be implemented during the cable-laying operation to prevent conflict.

6. Fishermen should be compensated for gear lost and lost fishing times, at reasonable amounts, without inordinate delay. Fishermen, or their organizations, should be provided financial assistance and incentive to work continuously on assuring the least risk of harm to the cable.

7. If fishermen follow appropriate procedures, they should not be liable for damage to the MARS project cable and equipment. In addition, the legal status of the ownership of the cable must be clarified. There should also be a fair mechanism to resolve claims so that any claims can be resolved expeditiously.

8. Improved discussion of the impact of the cable-laying activities on endangered and threatened species in the Bay is needed, including, but not limited to, whales and salmon. The DEIS should include the same discussion as would be included in a biological assessment or biological opinion under Section 7 of the Endangered Species Act, 16 U.S.C. § 1536. The current discussion is inadequate.

If these items cannot be negotiated between ACSF and MBARI, they should be included in any lease issued by the State or any permit issued by NOAA or other Federal agency, if approval of the project in its current form is contemplated.

We appreciate the opportunity to present our views to you.

Sincerely,

Kathy Fosmark

Monterey, CA 93940

cc: Governor Arnold Swartznegger
Senator Diane Feinstein
Senator Barbara Boxer
Congressman Sam Farr
National Science Foundation
National Oceanic and Atmospheric Administration
Congressman Richard Pombo, Chairman, House Resources Committee
Senator Ted Stevens, Chairman, Senate Commerce Committee
California Coastal Commission

Environmental Impact of a Submarine Cable: Case Study of the ATOC/ Pioneer Seamount Cable

By

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In recent years there has been a significant upsurge of activity and interest in installing offshore cables for both commercial (e.g. telecommunications) and scientific purposes. Cables that are only one-to-two inches in diameter are able to transmit power and large amounts of data over long distances. The telecommunications industry is in the process of building an extensive undersea global network to connect large urban centers on different continents. Scientists also want to utilize the power and data transmission capability of underwater cables but for the purpose of studying coastal and marine environments. Whereas the traditional mode of marine data collection consists of sporadic shipboard surveys, cables allow scientists to set up instruments and experiments that collect and transmit data continuously. Constant monitoring promises to improve our understanding of the ocean and could lead to major new discoveries regarding marine systems.

Due to the high degree of interest in installing cables in marine environments, there is also a need to better understand the environmental impacts of cables on the seabed. For this purpose, NOAA- Oceanic and Atmospheric Research, NOAA- National Ocean Service, and the Monterey Bay Aquarium Research Institute (MBARI) partnered to study the environmental impacts of the ATOC (Acoustic Thermometry of Ocean Climate)/ Pioneer Seamount cable.

The 95 km ATOC/Pioneer Seamount cable lies mostly within the Monterey Bay National Marine Sanctuary off Half Moon Bay, CA. The cable was installed in 1995 by the ATOC research consortia and was initially used to connect an acoustic projector and hydrophone on Pioneer Seamount to shore for performing acoustic tomography in the North Pacific. The cable was laid directly on the seafloor, not buried. In 2001, OAR took over responsibility for the cable and used it to monitor ocean sounds near Pioneer Seamount. The permit issued by the National Marine Sanctuary Program required a survey of the cable before December 2003. In order to scientifically investigate the environmental impacts of the cable and address the National Marine Sanctuary Program permit requirements, MBARI and NOAA scientists collected data from selected sites during three research cruises in 2002 and 2003, using MBARI's vessels and remotely operated vehicles (ROVs). The survey objectives were to analyze the effect of the cable on the benthic organisms and habitat, as well as to document the state of the cable.

The survey team analyzed cable and control sites over 15 kilometers of seafloor. They concluded that the main biological difference was the greater number of organisms attached or adjacent to the cable relative to control sections of the seafloor. In soft sediment areas, the cable stands out as a hard surface. Organisms such as anemones, which are known to colonize hard substrates, were more abundant on the cable in transects at most soft sediment locations. Data extrapolation suggests that more than

50,000 anemones may live in the modified habitat created by the cable. Other organisms such as echinoderms and sponges were also seen living on the cable. Higher numbers of flatfish and rockfish were also found near the cable at some sites. More shell hash and drift kelp were also found near the cable at several sites, perhaps caused by cable-induced hydrodynamic perturbations that concentrate shell hash and minor amounts of drift kelp near the cable. Analysis of sediment cores taken adjacent to the cable and 100 meters away from it showed that the cable has had no apparent effect on organisms that live within the sediment. The team extrapolated that a total of approximately 500,000 organisms may be concentrated near or on the 95-kilometer cable.

Although the cable was installed on the seafloor unburied, the survey team estimates that approximately 50 percent of the cable has become buried over time. The buried sections lie within continental shelf sediments, in water depths less than 120 meters, whereas much of the cable remains exposed on the seafloor at deeper depths and on rocky terrain. The depth of burial is relatively shallow (less than 10 centimeters) and the cable is likely to become exposed in places due to shifting substrate. A notable discovery was that the cable was damaged in a rocky, nearshore, high-wave-energy area where frayed cable, unraveled cable armor, and vertical grooves in the rock apparently cut by the cable were found. The periodically intense wave energy in that region appears to be strong enough to shift the cable's position, abrading both the cable and the rocks. Neither the rocks nor the cable were damaged in the rocky environment on Pioneer Seamount.

Cable suspensions and loops are of concern due to potential entanglements, such as with fishing gear and marine mammals. No such entanglements were found although suspensions were seen throughout the survey in areas of irregular topography. Most of the suspensions were short (about 10 centimeters above the seafloor). However, longer suspensions (up to 40 meters long and 2 meters high) were seen in rocky regions. Multiple loops of slack cable, added during a cable repair operation, were found lying flat on the seafloor.

Fishing activity is the main cause of submarine cable breaks worldwide as unburied cable is vulnerable to being snagged by fishing trawls. Several sharp kinks in the ATOC cable were found in an area subjected to intense trawling activity. The first break in this cable's history was attributed to trawling, and seafloor tracks similar to trawl marks were observed in that area during this survey. The cable was broken a second time and has not transmitted data since September 2002. The exact location of the break and its cause were not found during this survey.

Results and observations from this survey will aid National Marine Sanctuary Program decision makers regarding the ATOC Pioneer Seamount cable's future and provide scientific data for shaping cable policy.

EXHIBIT 1