

# California Marine Life Protection Act Initiative

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**To: MLPA South Coast Regional Stakeholder Group and Other Interested Parties**  
**From: MLPA Initiative Staff**  
**Subject: Use of Substrate Data in the MLPA Initiative Process**  
**Date: April 23, 2009**

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Members of the public as well as members of the Marine Life Protection Act (MLPA) South Coast Regional Stakeholder Group (SCRSG) have raised a number of questions with regard to the use of substrate data within the MLPA Initiative. This memorandum describes various data used within the MLPA process, how they are utilized by the MLPA Master Plan Science Advisory Team (SAT) for evaluating MPA proposals, and how members of the public and SCRSG may contribute further information that may be useful to the process.

## Substrate Data Used in the MLPA Initiative

For the MLPA Initiative, hard and soft substrates refer to broad categorizations for ocean bottom habitats. "Hard bottom" habitats refer to rocky bottoms, boulder fields, and other habitats that are generally high relief and support distinct ecological communities. "Soft bottom" habitats include sand, mud, gravel, and generally lower relief habitats that have different ecological assemblages from hard bottom habitats. Information regarding locations of kelp growth is included in a separate dataset from the hard and soft habitats.

Spatially-linked information that the MLPA Initiative has assembled in a geographic information system (GIS) database showing locations of hard and soft bottom habitats can be divided into two data types: coarse scale (gross estimations of habitat areas) and fine scale (very detailed estimations of habitat areas). Coarse scale data are derived from a dataset compiled from many sources, including the National Oceanic and Atmospheric Administration (NOAA) Biogeographic Assessment of the Channel Islands National Marine Sanctuary and data compiled by Dr. Gary Greene from Moss Landing Marine Lab. These coarse scale data give a general sense of where hard and soft bottom habitats occur and completely cover the MLPA South Coast Study Region, but tend to underestimate hard bottom habitats in some locations, and overestimate them in other locations.

To provide a more accurate picture of where hard and soft bottom habitats occur, the MLPA Initiative has assembled finer scale information for use within the south coast process. Some of these data were collected by Fugro Pelagos during the summer of 2008 as part of a statewide mapping effort funded by the California State Coastal Conservancy. Additional data were collected by Dr. Rikk Kvitek and the Seafloor Mapping Lab at California State University, Monterey Bay. Data from the United States Geological Survey (USGS), Ocean Imaging, and the San Diego Association of Governments (SANDAG) were also incorporated into the fine-scale dataset.

Most datasets included in the fine scale substrate data are derived from multibeam sonar; this data collection technique uses a device that emits multiple sound waves that bounce off the

seafloor and provide information about ocean depth. Multibeam sonar data differ from single-beam sonar data in that multiple soundings are produced simultaneously to cover a swath of seafloor instead of a single position, providing large amounts of three dimensional information that can be used to model vast areas of seafloor texture. To gather multibeam sonar data, a ship must drive very slowly along a transect at a consistent speed and, for this reason, multibeam data require a large amount of time to collect. In addition, multibeam data are difficult to gather in areas close to shore due to navigational hazards and inefficiencies of gathering data in shallow waters (the width of the swath of data collected is reduced as water depth decreases). Additionally, the presence of kelp interferes with the ability to gather multibeam data, as it can become entangled in instruments and impairs sonar transmission, so areas of dense kelp growth cannot be mapped using this technique.

### **Fine-Scale Data Coverage**

The MLPA calls for use of the "best readily available scientific information.". For substrate data, MLPA Initiative staff and the SAT have implemented this requirement by using fine-scale data where readily accessible and by utilizing coarse scale data or substrate data proxies where fine-scale data are not available. In the MLPA Central Coast Study Region, approximately 20% of the area was mapped using fine-scale data sources. For the remaining 80% of the study region, coarse scale data were used and, in some cases, were supplemented with additional substrate proxy information based on fisheries data. In the MLPA North Central Coast Study Region, fine scale data coverage encompassed approximately 75% of the area. While the availability of these fine-scale data in the north central coast represented a significant improvement over the central coast, gaps in the fine scale data existed in the vicinity of the offshore Farallon Islands as well as along the mainland nearshore area, shallower than approximately 20 meters. The gap in nearshore data was a result of the particular methodology used for gathering fine-scale data, described above.

In the MLPA South Coast Study Region, fine-scale substrate data exist for approximately 63% of the study region, with similar gaps to the north central coast. At offshore islands, including San Nicolas and San Clemente islands, fine scale data have not been gathered for a large portion of state waters. In nearshore waters along the mainland, generally shallower than 10 to 20 meters, fine-scale data are not available due to the limited ability to gather multibeam sonar data in shallow waters close to shore.

### **Evaluation Methods for Substrate Data**

In the MLPA North Central Coast Study Region, the SAT developed evaluation methods designed to account for the nearshore gap in substrate data; the SAT convened for the south coast has utilized a similar approach. This evaluation methodology involves developing a "nearshore substrate linear proxy," which can be referenced in several analyses, including evaluations of habitat representation, habitat replication, and spacing between MPAs. This linear proxy is made by creating a linear feature in GIS that roughly parallels the shoreline, and passes through nearshore areas where fine-scale data do exist. Sections of the line are divided into either "hard" or "soft" categories based on the fine-scale data and informed by additional datasets (described below).

It is important to recognize that the nearshore proxy represents a generalized representation of the dominant habitat type within the entire area from 0-30 meters depth, as opposed to simply the habitat type present where the line is drawn. Additional datasets are referenced where possible in creating the nearshore proxy. For instance, locations of kelp growth are used to identify areas of hard bottom habitat. Kelp data are derived from overflight surveys of the south coast study region conducted by the California Department of Fish and Game in 1989, 1999 and annually since 2002, as well as data provided by the Region 9 Kelp Consortium. In using kelp to identify hard bottom habitat, the SAT uses the maximum extent of kelp growth over all years of data. That is, any place where kelp has been surveyed is treated as hard substrate. Other data referenced for determining the nearshore proxy include shoreline habitat types and Bight 08 reef characterizations developed by Dr. Dan Pondella and other scientists.

In offshore waters surrounding the Channel Islands, gaps in fine scale data are reconciled in two different ways. At San Nicolas Island, gaps in fine-scale data coverage are filled in using coarse scale data. At San Clemente Island, the SAT has determined that readily available coarse scale data are not of adequate quality to be effectively used in evaluations. Thus, the SAT has developed an approach where offshore habitats are evaluated with regard to the depth range of protected habitats, as opposed to the hard or soft bottom nature of those offshore habitats.

Data used by the MLPA Initiative are available for viewing via the online decision support tool MarineMap, which can be accessed at <http://www.marinemap.org/marinemap/>. Both fine-scale data and nearshore proxy data described above are displayed as separate datasets. In this way, specific habitat data may be reviewed so that stakeholders can understand where habitats are included in the SAT analyses, and better design their MPA proposals.

### **Public Input Regarding Substrate Data**

Members of the public, as well as representatives on the SCRSG, have generously offered to provide additional information regarding the location of hard and soft bottom habitats in the MLPA South Coast Study Region. MLPA Initiative staff greatly appreciates these offers of assistance and recognizes that additional sources of information potentially can be useful to the MLPA Initiative process. It is important to recognize that additional information can be used in a variety of ways, some of which are outlined below.

Substrate information used for evaluation purposes and displayed online in MarineMap, the decision support tool, have been vetted by members of the SAT and have a high standard for resolution, data integrity and spatial coverage. As described, these data have broad geographic coverage and utilize advanced remote sensing techniques, including multibeam sonar, to create geographically-referenced, fine-scale datasets for display and analysis of where hard and soft bottom habitats occur. Data incorporated directly into maps and SAT evaluations need to meet similar standards for resolution, integrity and spatial coverage. Specifically, point locations of where hard or soft bottom habitats occur, or small datasets that lack significant spatial coverage, cannot be directly incorporated into fine-scale datasets.

One way in which additional datasets may be utilized is as a comparison to datasets compiled by the MLPA Initiative. For instance, a variety of datasets are utilized when creating the

"nearshore substrate linear proxy." In some cases, additional data may aid in verifying the extent to which this nearshore proxy accurately approximates the dominant habitat type in a particular area. While data used in this way are not directly integrated into fine-scale habitat maps, they may serve to better inform SAT evaluations of MPAs with regard to nearshore habitats.

In previous MLPA study regions, the most widely used method of integrating additional data into the MLPA Initiative was through the regional stakeholder group. The SCRSG is assembled specifically to serve as a forum in which stakeholders have the ability to share local, specialized knowledge, such as where hard and soft bottom habitats occur. MLPA Initiative staff encourages SCRSG members and members of the public to continue to share information within the SCRSG as MPA proposals are developed.

For any method of sharing additional information, it is important to recognize that some forms of information may be more readily useable than others, and that different datasets may serve different purposes. For instance, geographically referenced GIS files derived from remotely sensed data may serve as a good reference for verifying the accuracy of data products utilized by the SAT. Alternatively, hand-drawn maps based on anecdotal experience provide a different kind of information that may be more appropriate for consideration and discussion within the SCRSG.

### **Submitting Data to the MLPA Initiative**

Datasets may be submitted to the MLPA SAT for review using the external data vetting process adopted by the SAT at its February 24, 2009 meeting. Members of the public and SCRSG desiring to provide additional data should review the "Protocol for Evaluating Incoming Data from Sources External to the Master Plan Science Advisory Team" and complete the "California MLPA Master Plan Science Advisory Team Form for Submission of External Data" (both attached). In addition, interested parties should review the attached "South Coast Study Region Basic Data Criteria" distributed during the June 18, 2008 MLPA South Coast Study Region data outreach meeting, where MLPA Initiative staff met with a number of parties interested in providing additional datasets.

Data submitted to the MLPA Initiative will be reviewed using the protocol developed by the SAT. Completed data submission forms should be submitted to the Principal Planner for the MLPA Initiative, Evan Fox (evanwfox@gmail.com), so that they may be reviewed and then conveyed to the SAT. It is important to note that data should be submitted via the process outlined above and not directly to individual SAT members.

MLPA Initiative staff and members of the SAT will attempt to use additional information to the greatest extent possible. However, staff will focus on the use of data that are readily available and meet approved data quality standards. In some cases, stakeholders may wish to share information that does not meet the data standards outlined above; in these cases, MLPA Initiative staff invites members of the public and SCRSG to submit information via the MLPA Initiative public comments ([MLPAComments@resources.ca.gov](mailto:MLPAComments@resources.ca.gov)) or share this information directly with members of the SCRSG.

**California MLPA Master Plan Science Advisory Team**  
**Draft Protocol for Evaluating Incoming Data from**  
**Sources External to the Master Plan Science Advisory Team**  
*Revised February 18, 2009*

## **Background**

Based on experiences in prior MLPA study regions, the MLPA Master Plan Science Advisory Team (SAT) anticipates that external groups will come forward with data intended to enhance SAT analyses and evaluations. However, data submissions may be numerous, and may come from a variety of sources, in a variety of conditions, covering a wide range of topic areas. A protocol for dealing with incoming data from external sources is needed so the SAT can efficiently and effectively determine whether or not such data is beneficial to incorporate as the SAT conducts scientific evaluations in support of the MLPA process.

## **Draft Protocol**

1. External data should be initially submitted along with a completed data submission form to a designated MLPA staff person. The appropriate data submission form is titled: "California MLPA Master Plan Science Advisory Team Draft Form for the Submission of External Data". Once the draft form has been approved by the SAT, it will be posted to the MLPA website where external groups will be able to access the form. If needed, MLPA staff can be available to assist those who provide external data in obtaining and completing the form.
2. MLPA staff person will perform a preliminary assessment of the data against the as many of the below criteria as possible. Much of this information will be captured on the data submission form.
  - a. Will the data help the SAT answer a question or inform a scientific issue for the MLPA planning or design process?
  - b. Does the SAT already have data of a similar type, or data that addresses the same question? If so, then the staffer will evaluate whether the data sets are complimentary (with the potential that both sets may be considered) or if the datasets overlap. This may require the MLPA staff to consult with SAT member(s) and/or other MLPA staff to determine what data is already in-house.
  - c. What is the spatial resolution of the data?
  - d. What is the source of the data?
  - e. Do methods and/or analyses appear appropriate and/or acceptable?
  - f. What is the level of peer review?
  - g. Which components of the MLPA will benefit from the data (MLPA Blue Ribbon Task Force, South Coast Regional Stakeholder Group, SAT, GIS Team, regional profile or MarineMap)

\*As the MLPA staff person performs the preliminary assessment, he/she will check the completed data submission form, noting fields that need to be corrected or clarified. MLPA staff will also make a recommendation for how and where the data should be used in the MLPA process.

\*MLPA staff may determine that input from SAT members is necessary for proper evaluation against some of the above criteria, in which case he/she may bring it to the attention of SAT members in step 3 below.

3. MLPA staff will contact SAT member(s) with the relevant expertise, and consult/review with them details on the information resulting from the preliminary assessment of step 2.
4. If SAT member(s) in step 3 determine that data would add value to the MLPA process, then SAT member(s) will present the data to the full SAT for discussion. The full SAT would subsequently make the final recommendation for how and where the data should be used in the MLPA process.
5. If the MLPA staff member determines that another component of the MLPA process would benefit from the information or data then the information will be passed on to that MLPA component.

**California MLPA Master Plan Science Advisory Team**  
**Form for the Submission of External Data**  
*Adopted February 24, 2009*

*- Please complete a separate form for each dataset -*

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Contact Information: \_\_\_\_\_

Issue or question data is intended to inform for the MLPA process:

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**Type of Data:**     Habitat/substrate                       Non-consumptive human use  
                          Water quality                               Consumptive human use  
                          Physical oceanography     Biological characteristics  
                          Other (please describe) \_\_\_\_\_

**Data Format:**     ESRI shapefile                       KML file  
                          GeoTIFF                                       Non-digital map  
                          Other (please describe) \_\_\_\_\_

**Extent of Data:**     Entire study region                      If data covers less than entire study  
                          Most of study region                      region, describe spatial extent here:  
                          Small portion of study region  
                          One specific location                      \_\_\_\_\_

**Spatial Coverage:**     Continuous                       Evenly-spaced grid                       Coastal points  
                          Other (please describe) \_\_\_\_\_

**Spatial Resolution:**     10-100 km                       1-10 km                       <1 km                       <1 m

**Temporal Frequency:**     One-time collection                       Periodic collection (describe) \_\_\_\_\_  
                          Other (please describe) \_\_\_\_\_

**Data Privacy:**     Public data set                       Confidential data set  
                          Specific privacy issues: \_\_\_\_\_

\_\_\_\_\_

**Peer Review:**       Published in journal       Not peer-reviewed       Government data  
 Reviewed by SAT or other scientists.  
Identify reviewer: \_\_\_\_\_

**Data Condition:**     Ready to incorporate into database     Data needs some conditioning

**Data collection date(s):** \_\_\_\_\_

**Metadata<sup>1</sup>:**           XML           FGDC           Simple description           Not included

***MLPA Initiative Staff Use Only (recommendation for how/where data should be used in the process):***

- MLPAL staff / regional profile       SAT / evaluations
- RSG / guidance information       RSG / designing alternatives
- BRTF / guidance information       Other (please describe):

***SAT Use Only (final recommendation for how/where data should be used in the process):***

- MLPAL staff / regional profile       SAT / evaluations
- RSG / guidance information       RSG / designing alternatives
- BRTF / guidance information       Other (please describe):

***Please provide any further details regarding this data:***

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<sup>1</sup> "Metadata" is information that describes who collected the data, how data collection was conducted, and other details regarding the background of a data set. The MLPA Initiative will not use data sources that do not include metadata.



**California Marine Life Protection Act (MLPA) Initiative**  
**South Coast Study Region Basic Data Criteria**  
*June 12, 2008*

The MLPA Initiative welcomes the submittal of data relevant to the MLPA South Coast Study Region (Point Conception in Santa Barbara County to the California border with Mexico) and will attempt to use these data to the greatest extent possible. Organizations interested in submitting data should note that some forms of data are more useful in the MLPA planning process than others. At a minimum, data should:

- Be relevant to marine protected area (MPA) planning
- Be spatially explicit
- Have "metadata" that explain the data characteristics (source, methods, etc.)
- Be readily available and require minimal/no processing.

The most useful data, which are more likely to be incorporated into the MLPA process, have the following attributes:

- Have a broad spatial extent, covering the entire study region, or at least a significant portion of the study region
- Have an appropriate spatial resolution for the given data type
- Include analytical products showing aggregate summary data, as opposed to raw data
- Are in a format compatible with our geographic information system (GIS) databases (e.g. ESRI shapefiles or geodatabases, Access or SQL databases, excel tables, etc.)
- Are peer reviewed and complimented with comprehensive metadata.

In our effort to compile MPA planning data within specific applicable subjects (i.e. base data, benthic substrate data, water quality data, etc.), the MLPA Initiative will attempt to use the best readily available data provided, including some that do not meet the above criteria. However, we can not guarantee that any specific dataset will be used within the process due to the limitations of certain data or the resources required to synthesize certain data. Some examples of data that are less easy to incorporate include:

- Tabulated data (e.g. excel spreadsheets) that do not link to specific geographic locations (e.g. latitude/longitude locations)
- Very large data sets that have not been incorporated into a summary map or document (e.g. a 50-year, monthly time series on sea surface temperature)
- Data that require significant additional conditioning for use in our spatial database (e.g. non-digital data or formats that require complex transformations).

Questions regarding data needs and uses should be directed to Evan Fox at [evanwfox@gmail.com](mailto:evanwfox@gmail.com).