7. EXISTING SEAFLOOR SUBSTRATE DATA CATALOG (NEDP-TASK 2)

7.1. INTRODUCTION

The purpose of this portion of the project was to contribute to the completion of Task 2: Data Catalog, for the California Department of Fish and Game (DFG) Nearshore Ecosystem Database Project (NEDP). The Department's objective for this task was to conduct an assessment of currently available data not presently held by DFG on marine bathymetry and substrates, and to assess the adequacy of those data to meet their needs for defining and mapping nearshore habitats. The results from the assessments were to be entered as metadata into the CERES database Metadata Management System as part of the DFG Marine Region GIS Catalogue. Key issues were to include:

- From whom and where can the data be obtain?
- How old are the data?
- What is the resolution of the data?
- What is the accuracy of the data?
- How large are the data sets (what are the storage requirements)?
- How much do the data cost?
- What additional data are needed?

Data sets on depth and substrate were selected by the DFG because they are two of the most important physical habitat variables effecting the distribution and abundance of benthic and nearshore species (see sections 2 and 3). Because DFG took on the task of identifying and catalogue existing depth data (bathymetry) for California waters, we were instructed to restrict our search to identifying data sets relating to seafloor substrate, and to concentrate our efforts primarily on data within the 0-30m depth zone).

Our goal has been to create a Spatial Metadata Database for Seafloor Habitat Data containing all existing seafloor substrate data relevant to habitat mapping on the California continental shelf. Once combined with the CDF&G bathymetry data catalogue, this database will enable the Department to identify gaps in the existing data needed for mapping California's nearshore benthic habitats.

Our general approach was to contact all institutions, agencies and private companies likely to have data holdings related to seafloor substrate and request the relevant metadata. The majority of these types of data sets have been acquired using acoustic techniques (sidescan sonar, multibeam bathymetry with backscatter, or some type of acoustic ground discrimination sonar such as RoxAnn). Although newer electromagnetic technologies show great promise for increased data resolutions and efficiencies (see section 4), very few habitat mapping results have been obtain from these techniques along the California coast to date. For this reason, we focused our efforts on collecting metadata primarily on acoustic remote sensing survey results. DFG requested that we archive and append these metadata to the DFG Marine Regions GIS Catalogue within the CERES Metadata Management System using their existing Microsoft Access template for CERES Spatial Metadata entry (Fig. 7.1). The CERES database conforms to the Federal Geographic Data Committee Standard.

7.2. METHODS

A variety of methods were used to locate appropriate data sets. The data search began using the Internet. Two different search engines (HotBot and AltaVista) were used on the following keywords: seafloor mapping, habitat mapping, sidescan sonar, bathymetry, and marine survey and habitat classification. The results of these searches were thoroughly checked and all leads followed for at least the first 200 matches.

The next step was to contact agencies and groups involved with hydrographic surveying activities along the California coast. This list included the United States Geological Survey(USGS), California Dept. of Mines and Geology(CDMG), Monterey Bay Aquarium Research Institute(MBARI), Army Corp Of Engineers, Mineral Management Services, Office of Naval Research(ONR), National Marine Fisheries-NOAA, National Geophysical Data Center(NGDC), Scientific Applications International Corporation(SAIC), Racal, Seafloor Surveys Inc., California State University Geology Chairs, UC Santa Barbara, UC Santa Cruz and UC San Diego. All of these agencies were contacted by phone and/or e-mail, and questioned as to their knowledge of existing data sets. If the contacts had data and were willing to share it then a metadata questionnaire was sent out to get the specific information we were looking for (see questionnaire below). Upon return these data were entered into the DFG Marine Region GIS Metadata Catalogue using the CERES Spatial Metadata Record template with Microsoft Access software (Fig. 7.1).

Questionnaire for Seafloor Substrate Metadata

- Data set name
- Data type
- Source
- Collector
- Date of Collection
- Date of Publication/completion
- Equipment used including age and/or version:
- Vessel-
- Hardware-
- Software-
- Collection method-
- What are the data resolution and accuracy?
- Is Product in raw data form, partially processed or is it a finished product, i.e., does it exist only as pretty pictures?
- If it is a finished product are the raw and/or intermediate files available for processing and interpretation?
- If data are unprocessed, is there a planned date for further processing?
- What QA/QC measures were followed during collection & processing of data?
- How was final product groundtruthed?
- Data file format and size-
- Spatial Extents and scale-
- Depth range-
- Contact-

- Availability/Access limits
- Cost
- AdditionalComment

a) Metadata database Main Menu. b) Path to catalogue records. c) Data record entry fields.

Figure 7.1 CERES Metadata Entry Template. The hierarchical sequence for entering metadata for each record into the DFG Marine Region GIS Spatial Metadata Database catalogue within CERES using the Microsoft Access template. While conforming to FGDC Standards, the predefined record fields in the Spatial Metadata Database were not always suitable for hydrographic data, there by constraining the utility of the database for marine habitat mapping.

7.3. RESULTS

A total of 85 data sets have been catalogue to date after contacting 86 sources. Most of the catalogued data sets came from a relatively small number of sources (Table 7.1), and results from many of the contacted sources are still pending and will be added once received (Table 7.2). The majority of the institutions and individuals contacted did not have access to relevant data that could be contributed (Table 7.3). The metadata provided by these contacts are summarized in Table 7.4, and a complete listing of all information catalogued is accessible via the Ceres Spatial Metadata Records Database on the accompanying CD. Below we present an overview description of the major data resources on seafloor substrate available to DFG.

California Dept. of Conservation- Division of Mines and Geology/Moss Landing Marine Labs

In 1986 Gary Greene of the USGS and Michael Kennedy of the CDMG compiled all existing data available at that time for the state of California into a series of 1: 250,000 scale hardcopy maps entitled Geology of the California Continental Margin. Although the relatively course scale of this data set limits its usefulness for classifying habitats in the nearshore environment, these maps do provide a useful baseline to determine how much progress has been made in the intervening years in the field of habitat classification. The metadata for these geology maps are included in the database. An initial search of

Gary Green's holdings has been conducted to identify all potentially useful data, but it's possible that more relevant data exists there that were not found during this search.

US Geological Survey

The Pacific Mapping Group at Menlo Park headed by James Gardner responded with metadata information on four different surveys they ran using multibeam with backscatter. The four sites are the Santa Monica Bay area, the Eel River Delta, the mouth of San Francisco Bay, and an area off of San Diego. Through other contacts at USGS we also obtained metadata on a side scan survey done in the Gulf of the Farallones, and the GLORIA side scan project which has mapped the deep water areas of the entire coast. We are awaiting metadata on surveys done in the Monterey Bay, Big Sur, Ano Nuevo, Channel Islands and Santa Barbara areas by the USGS. Results from these later surveys have not yet been released for general distribution, but will undoubtedly be of value for coastal habitat mapping.

National Geodetic Data Center

The NGDC stores digital multibeam bathymetry data and analog sidescan sonar data collected by NOAA, UC San Diego, University of Rhode Island, Wood's Hole, Lamont-Doherty Earth Observatory, University of New Hampshire and the University of Hawaii. Unfortunately the multibeam data does not contain backscatter information and the side scan data set is stored on 35mm micro film with no easy way of transferring to digital format. Furthermore, the side scan data has questionable positioning and there is no indication that data for California exists. Thus the usefulness of the NGDC data included in the database will be limited.

Monterey Bay Aquarium Research Institute

MBARI sent us a CD with bathymetric data and shaded relief imagery of seafloor morphology of the Monterey Canyon and surrounding areas. They have indicated that there will be more data forthcoming, but we have yet to receive it. An overview with examples of their data resources is also available on their web site. Although MBARI has undertaken an ambitious program of high resolution (1-2 m) multibeam and backscatter mapping along the California coast, the majority of their survey work and data have been restricted to depths below the continental shelf break (130 m water depth).

California State University Monterey Bay

California State University Monterey Bay has produced three data sets aimed specifically at habitat mapping which include sidescan with habitat interpretation, bathymetric contours and RoxAnn data. These data were collected at the Punta Gorda Ecological Refuge, the Big Creek Ecological Refuge and the Point Lobos Reserve as part of work done for DFG.

Ecoscan Resource Data

Over two decades worth of DFG aerial photographic transparencies covering California's central coast kelp forests are currently being archived by Bob VanWagenen of Ecoscan Resource Data. These 35 and 70 mm slides owned by DFG, have not been catalogued or converted to digital format. They could provide valuable information on the distribution and historic changes in kelp forest habitats once digitized, georeferenced and brought into GIS for analysis. Combining these time series photos with

substrate maps could provide new insights into how the seasonal distribution of kelp forests varies with physical habitat type.

Proprietary Data

It has become apparent that there are proprietary data that exist for the coast of California. Four of the survey companies, Williamson & Assoc., David Evans & Assoc., Fugro West and Racal/Pelagos, responded that while significant portions of the coast have been surveyed, the data are proprietary and thus must be tracked down from the client side to determine the coverage, type, value and availability of these data sets. Although we have not received responses from all the survey companies contacted, it is likely that their answers will also be tangled in issues of propriety. Those consulting companies we have contacted are not able to reveal their client list, but we have reason to believe that the largest customer groups are the communications (offshore cable routes) and petroleum industries. At this time we have not made any positive contacts with these industries, but continued effort in this direction may be warranted.

Office of Naval Research

We believe that the Office of Naval Research facility at the Stennis Space Center in Mississippi has vast holdings of seafloor mapping data that could be potentially useful. The person who has been responsible for these archives for many years has recently retired, and the replacement personnel have not been available since we tracked down this facility. An incomplete entry has been made in the database for this location so that this potential source can be pursued in the future. Information from other sources we have contacted suggest that while the Navy may have vast holdings of excellent high resolution side scan sonar data, the majority of these records are hardcopy sonographs with questionable positioning data. Thus, while the images may be very good, a great deal of processing and difficult georeferencing will be required to turn them into usable digital habitat data suitable for GIS applications. Nevertheless, an excellent peace time use of military personnel and resources might be to "mine" and process these archives for habitat mapping products.

Limitations of the CERES Spatial Metadat Record Template

The ability to accurately characterize and represent the results from seafloor mapping surveys was limited by the data entry fields currently available within the CERES Spatial Metadata Record template. As a result, a separate table called 'dataset_2' was created within the database. We linked the dataset_2 table to the original table containing the data entered into the CERES template. The fields in dataset_2 are: ApproxArea, GeoRegion, oid, Min Depth(m), Max Depth(m), Min Resolution, Max Resolution, Data Type and Hardware. None of these fields are visible in the front end of the database but they can be queried and used in reports. We believe that these fields contain some of the most vital information in terms of evaluating potential habitat data. Because these fields are not visible in the CERES template the relevant information from these fields has been recorded in the "Supplemental" field of the database. Also, because the CERES database limits entry of the survey area extents to the northern, southern, western and easternmost points of the data set, the area covered by the actual data may be exaggerated. For example, a long and narrow survey (e.g. 5 km x 0.5 km) running from NW to SE, which is typical for many nearshore coastal surveys, will be calculated to have a 5 km x 5 km

footprint. This error will result in an estimated survey area 10 times larger (25 km^2) than the area actually covered (2.5 km^2).

Primary sources & pending data

Most of the organizations contacted referred us to either the US Geological Survey, Gary Greene at Moss Landing Marine Labs or MBARI as the primary sources for seafloor data along the California continental shelf. We also encountered a fair amount of data that was judged by the contacts to be simply too old or having unreliable positioning information to be useful. These data sets were therefore not included in the database.

Throughout the course of this project we have made positive contacts that have yet to yield results in terms of metadata. Several scientists at USGS confirmed they had relevant data for which we are still waiting. The one survey company that didn't automatically decline to participate for reasons of client proprietary ownership was SAIC. While not being specific, this company did claim to have relevant data, but we have yet to receive the metadata they agreed to send. There are also at least two data sets collected by other CSU schools for which we are still awaiting the metadata. It is also likely that there are very recent datasets which will not be available for some time. We believe this is true for USGS at the very least.

7.4. CONCLUSIONS

A surprisingly small amount of habitat data has been collected for the nearshore California continental shelf since the 1986 Marine Geology of California maps were produced by Greene and Kennedy. Much of the data that we did find is questionable in its usefulness. High resolution, accurately georeferenced substrate data suitable for habitat mapping within the 0-30 m depth zone is extremely rare. Data scarcity within this zone is probably due to several factors:

1) shallow water and high relief make these waters inaccessible to the larger survey vessels typically used for seafloor mapping
2) sensor motion due to the high wave height to water depth ratio in these areas on most days of the year along the open coast results in highly distorted data from towed or hull mounted sensors aboard the smaller survey vessels required for nearshore work
3) sensor entanglement in kelp canopy has previously made nearshore acoustic surveys in many rocky areas virtually impossible
4) surf conditions often preclude safe survey operations within this depth zone
5) irregular shorelines and high bottom relief often prevent the use of more efficient long, straight survey track lines resulting in much higher survey times and costs

7.5. RECOMMENDATIONS

Greene and Kennedy developed the most comprehensive representation of seafloor substrate data in their 1986 1:250,000 scale maps of the entire California continental shelf. These maps were based on all the acoustic, observational and direct sampling information available at the time. Indeed, our search results show that little non-proprietary work appears to have been done in shallow waters since. These

maps were first developed at 1:50,000 scales, and then combined to yield a set of seven maps covering the shelf at a scale of 1:250,000. Developed as geology maps, these paper products represent the ideal starting point for classifying and mapping benthic habitats along the California coast. Our recommendations for producing habitat maps at sufficient resolution for managing the California nearshore environment are to:

1) convert the 1986 geology maps to GIS products
2) follow up on the Office of Naval Research archives and proprietary data sets identified in this report to see if any of these can be made available and are of use to this effort
3) augment the resulting GIS products with any of the newer, higher resolution substrate data identified in the metadata database that meet the standards for inclusion
4) use GIS to merge the resulting composite substrate coverages with the most accurate bathymetric data being compiled by DFG as part of the NEDP
5) apply a habitat classification system for converting the geologic descriptors to habitat types using GIS
6) verify the resulting habitat maps with modern remote sensing methods according to DFG site selection priorities
7) begin acquiring higher resolution habitat data (<1:50,000) based on DFG priorities for filling data gaps

The USGS is the most active group currently involved in mapping the California coast and they have indicated intentions of continued small-scale projects that may turn out to be useful for habitat mapping on the shelf. However, most of their past as well as planned survey work will be confined to depths beyond the 50m contour. As a result, following the completion of updating the small scale 1:250,000 geology maps produced by Greene and Kennedy in 1986, there is a clear the need for a dedicated project to take on the task of mapping California's nearshore (0-30 m) environment at a much larger scale (<1:20,000). Finding ways to complete such a vast mapping effort will undoubtedly require the use of newer and more cost effective technologies for mapping large shallow subtidal areas at high resolution.

Table 7.1. **Existing Seafloor Data Metadata Contacts.** Organizations contacted that have existing seafloor data for which metadata has been received and catalogued in the CERES Spatial Metadata Database for Seafloor Habitat Data according to the Federal Geographic Data Committee (FGDC) Standard (http://fgdc.er.usgs.gov/). Data types catalogued include: multibeam bathymetry with backscatter data (mb/b), singlebeam bathymetry (b), sidescan sonar (sss), geologic interpretation of merged data sets (geologic interp.), Roxanne seafloor classification (rox), and photographic transparencies (35mm & 70mm slides). Each data record is referenced in the metadata catalogue with a unique three digit identifier number (Oid).

Organizations with Data	Contact Person	Contact Information	Data Type	Oids

California Dept. of Conservation-Division of Mines and Geology/Moss Landing Marine Labs	Michael Kennedy Gary Greene	(213)620-3560 (831) 633-7264	geologic interp.	560, 563, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 669, 671, 672
Ecoscan Resource Data (ECI) for California Deptmartment of Fish and Game	Bob VanWagenen (ECI)	Vanwagenen@aol.com	35mm & 70mm slides	613
CSU Long Beach	Robert Francis	(562)985-4929	Sss	685

Table 7.1. Existing Seafloor Data Metadata Contacts. (Continued.)

CSU Monterey Bay	Rikk Kvitek	(831)582-3529	sss, rox	555, 557
US Army Corp of Engineers	Art Shak	(213)452-3675	LIDAR	681
Office of Naval Research	Bruce Layborn	(228)688-4075		680
Monterey Bay Research Institute	Gerry Hatcher and Norm Maher	gerry@mbari.org nmaher@mbari.org	bathy	444
ABA Consultants	James Oakden	(831)633-7252	Sss,rox	674, 676
National Geodetic Data Center	Robin Warnken	(303)497-6338	bathy	558
US Navy- CSC/SPAWAR	Marissa Caballero	(619)-553-5334		679
US Geological Survey	Pat S. Chavez Jr.	(520)556-7221	sss	443
US Geological Survey	James Gardner	(650)329-5469	mb/b	441, 442, 447, 448
US Geological Survey	Christine Gutmacher	(650)329-5309	sss	446, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599
US Geological Survey	Roberto Anyma	(650)329-5212	Mb/b	683
US Geological Survey	Guy Cochrane	(650)329-5076	Sss	682
US Geological Survey	Steve Eittreim	(650)329-5272	Sss,mb, rox	678,684

US Geological Survey	http://walrus.wr.usgs.gov/docs/infobank/bear/programs/html/years2idshtml/years.html	bathy	451, 453, 455, 457, 459, 461, 463, 465, 467, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 544, 546, 548, 550, 552, 554

Table 7.2 Pending Seafloor Data Metadata Contacts. Sources with existing seafloor data holdings for which the metadata have not yet been received by the authors as of this writing.

Organizations with Data	Contact person	Contact Information
ABS Marine Consultants	Kit Kuittinen	(707) 987-9567
Atlantic Marine		+44 1273-248800
C & C Technologies	Mike Dupuis	(318) 261-0660
Canadian Seabed Research	Rob Myers	(902) 827-4200
Clydeside Surveys Limited		+44-1475-520394
Coastal Geoscience Research		(250) 380-6866
CSU Hayward	Calvin Lee	(510) 885-3088
CSU Long Beach	Dan Francis	(562) 985-4929
CSU Northridge	Peter Fischer	(818) 677-3574
EMC, Inc		(601) 453-0325
Geoprobe	Paul Kronfield	(713) 974-3205
Hawaii Mapping Research Group	Bruce Appelgate	(808) 956-9720
Kenneth Balk & Associates		(314) 576-2021
McKim & Creed	Tim Cawood	(901)343-1048
Meridian	Jonathan Snow	(410)562-8931
Mineral Management Services	James Lima	(805)389-7847
NOAA	Coastal Services Center	csc@csc.noaa.gov
Office of Coast Survey		(301) 713-2770
SAIC	Steve Miller	(401)847-4210
Science Applications International Corp	Rod Evans	(401) 847-4783
Scientific Marine Services Inc		(760) 737-3505
Seabed Explorations	Martin Morrison	(902)422-3688
Seavisual Consulting Inc.	Terry Sulivan	(503) 663-2894
Smedvig Technologies		(713) 339-2626
UC Berkely	William Dietrich	(510)642-2633
UC Santa Barbara	Milton Love	(805)893-2935
Scripps Institute of Oceanography	Michael Buckingham	(619)534-7977
US Geological Survey	Roberto Anima	(650)329-5212
US Geological Survey	Guy Cochrane	(650)329-5076
US Geological Survey	Steve Eittreim	(650)329-5272
Office of Naval Research	Bruce Layborn	(228)688-4075
Army Corp of Engineers	Art Shak	(213)452-3675
Western Subsea Technology Ltd.	Mike Muirhead	(250) 380-2830

Table 7.3 Contacted sources without seafloor habitat data. Potential sources contacted who did not have access to additional seafloor habitat data holdings for coastal California.

Organizations without Data	Contacts	Contact Information
Army Corp of Engineers	Frank Rezac	(415)977-8272
Army Corp of Engineers	Wayne Stroup	800-522-6937x2404
Army Corp of Engineers	Jack Kilgore	(601)634-3397
Ca Dept. Conservation- Mines & Geology	Dave Wagner	(916)445-1825
California Coastal Commision	J. Van Coutts	(408)427-4863
California State Lands Commision	Eric Coffman	(916)574-1879
California State Lands Commision	Arthur Mitsche	(805)966-7107
Caulfield Engineering	Dave Caulfield	(250)548-3244
Channel Islands National Marine Sanctuary	Ben Waltzenberger	(805)966-7107x461
CSU Bakersfield	Rob Negrini	(805) 664-2185
CSU Channel Islands	J Handel Evans	(805)383-8400
CSU Chico	Vic Fisher	(916) 898-5262
CSU Dominguez Hills	David Sigurdson	(310)243-3316
CSU Fresno	Stephen Lewis	(209) 278-6956
CSU Fullerton	John Foster	(714) 278-7096
CSU Humbolt	Jeff Borgeld	(707)826-3328
CSU Los Angeles	Ivan Colburn	(323) 343-2413
CSU Monterey Bay	John Stamm	(831) 582-3743
CSU Pomona	John Klasik	(909) 869-3454
CSU Sacramento	Diane Carlson	(916) 278-6382
CSU San Bernadino	Sally McGill	(909) 880-5347
CSU San Diego	Clive Dorman	(619) 594-5707
CSU San Francisco	Karen Grove	(415) 338-2061
CSU San Jose	Don Reed	(408)924-5036
CSU San Luis Obispo	Mark Moline	(805)756-2948
CSU San Marcos	Dick Bray	(760)750-4175
CSU Sonoma	Thomas Anderson	(707) 664-2176
CSU Stanislaus	Mario Giaramita	(209) 667-3090
David Evans & Associates	Jon Dasler	(503)223-6663
Fleet Numerical Meteorologic and Oceanographic Center	Carl Thormeyer	(831)656-4584
Fleet Numerical Meteorologic and Oceanographic Center	Mike Clancy	(831)656-4414
Fugro West	Sean Johnson	(805)658-0455
Gulf of Farallones National Marine Sanctuary	Dan Hallard	(415)561-6622
Menlo Scientific Acoustics	Neil Shaw	(310)455-2221
Monterey Bay Aquarium Research Inst.	David Clague	(831)775-1781
National Geodetic Data Center	Bill Virden	(303)497-7278

National Marine Fisheries Service	Bob Hoffman	(562)980-4043
National Marine Fisheries Service	Rich Cosgrove	(619)546-7057

Table 7.3 Contacted sources without seafloor habitat data. (Continued.)

National Marine Fisheries Service	Frank Schwing	(831)648-9034
Naval Postgraduate School	Bill Garwood	(831)656-2673
Newfoundland Ocean Ind. Assoc.		noia@nfld.com
NOAA	Ken Long	ken.long@noaa.gov
NOAA	Richard Wright	(619)594-5466
Office of Naval Research	Ellen Livingston	(703)696-4203
Racal Pelagos	Jerry Wilson	(713) 784-4482
Scripps Institute of Oceanography	Christian Demoustier	(619)534-6322
Seafloor Surveys Inc.	Frizbie Campbell	(206)441-9305
Southern California Coastal Water Research Project	Larry Cooper	(714)894-2222
Southern California Marine Institute	Rick Piper	(310)519-3172
UC Davis	Jim McClain	(530)752-7093
UC Irvine	Ellen Druffel	(949)824-2166
UC Merced	Joe Castro	(209)241-7120
UC Riverside	Carole Carpenter	(909)787-3435
UC Santa Barbara	Phil Sharfstein	pjs@magic.geol.ucsb.edu
UC Santa Cruz	Gary Griggs	(831)459-5006
UC Santa Cruz	Casey Moore	(831)459-2574
UCLA	Frank Kyte	(310)825-2015
University of Texas	John A. Goff	goff@utig.ig.utexas.edu
US Environmental Protection Agency	Bob Hall	(415)744-1936
US Fish and Wildlife Service	Jennifer Greiner	(703)358-2201
US Fish and Wildlife Service	Tony McKenzie	(916)979-2710
US Geological Survey	Peter Dartnell	(650)329-5460
US Geological Survey	Randy Hanson	(619)637-6839
US Geological Survey	Michael Carr	
Williamson & Associates		(206)285-8273

Table 7.4 Seafloor Substrate Metadata Search Summary. Summary of each record entered into the CERES DFG Marine Region GIS Metadata Catalogue as part of this project, and identified by its unique oid record number. *The ArcView script for calculating the entries for the Approximate Area covered by each data set is being completed, and these results will be added to the final table.* The extents of the data set are given as decimal degrees longitude and latitude. The Description of Data provided here is from the Supplement field in the database.

oid	Source	Data Type	Approx. Area	GeoRegion	Extents (N,S,E,W)	Description of Data
441	US Geological Survey	multibeam backscatter	Pending	Santa Monica Bay	37.55 37.15 -114.2 -115.23	Collector-- Dr. James V. Gardner Dataset name CS-1-96 & A-2-98 individual subareas vary in spatial resolution from 4m (bathy)/2 m (backscatter) to 16 m/8 m. Overview at 16 m/8 m. Bathymetry accuracy is function of water depth, but is at least as good as 0.04% water depth. Backscatter is calibrated albedo, referenced to 1 m from transducers. QA/QC by Patch test was conducted prior to survey; CTDs and XBT collected throughout survey to assure proper water velocity corrections; TSS/POS/MV motion sensor; dual DGPS with SkyFix reference for navigation. All data tide-corrected. Coordinate system, Datum, Projection-latitude/longitude; WGS84; Mercator. Depth range- 20 to 800 m Vessel- Coastal Surveyor & Ocean Alert
442	US Geological Survey	multibeam backscatter	Pending	San Diego	36.42 36.3 -113.5 -114.1	Collector-- Dr. James V. Gardner Dataset name A-2-98 Vessel- Ocean Alert Hardware- Kongsberg Simrad EM-300 Software- Swathed (OMG.UNB) Collection method- digital, spatial resolution from 4m (bathy)/2 m (backscatter) to 16 m/8 m. Bathymetry accuracy is function of water depth, but is at least as good as 0.04% water depth. Backscatter is calibrated albedo, referenced to 1 m from transducers.QA/QC Patch test was conducted prior to survey; CTDs and XBT collected throughout survey to assure proper water velocity corrections; TSS/POS/MV motion sensor; dual DGPS with SkyFix reference for navigation. All data tide-corrected Coordinate system, Datum, Projection-latitude/longitude; WGS84; Mercator. Depth range- 20 to 800 m

443	US Geological Survey	sidescan	Pending	Gulf of Farallones	37.8 37.1 -122.48 -123.6	Digital sidescan-sonar images collected by a high-resolution (one- to two-meter pixels) system were used as input for barrel detection analysis. The data were collected by the SeaMarc 1A sidescan sonar imaging system and cover an area approximately 50 km by 75 km.

444	Monterey Bay Aquarium Research Institute	bathymetry	Pending	Monterey Bay	45 33 -117.249 -124.599	CD-ROM Contains files under the headings of: Features, Grids, Images, ASCII and Miscellaneous.These files are: Features- 100mcont.shp - gridded contours -10m_cont.shp - gridded contours -200mcont.shp - gridded contours -dnc_appr.shp - coastline w/1:50,000 scale and +/- 100m accuracy -dnc_harb.shp - harbor coastline w/1:10,000 scale and +/- 50m accuracy -faults.shp landmask.shp - 1:50,000 and +/- 100m in Bay moorings.shp Grids bathy20 - 20m grid bathy200 - 200m grid bathy20f - filtered 20m grid hshd_dem - shaded DEM w/ 1:100,000 scale hshd20 - shaded 20m grid hshd200 - shaded 200m grid hshd20f - shaded and filtered 20m grid mont_dem - lattice DEM Images c18685.tif - NOAA Chart w/ 1:210,668 scale and +/- 15m accuracy dem_sea.tif - Merged bathy and topo, +/- 100m accuracy geology.tif - 1: 250,000 scale and +/- 300m accuracy gryshade.tif - Bathy 20f w/ accuracy of +/- 100m mb50sat.tif - Merged bathy and LandSat w/ accuracy +/- 500m mb50slar.tif - Merged bathy and SLAR w/ accuracy of +/- 500m landsat.tif - accuracy of +/- 50m topo_map.tif - accuracy of +/- 250m sidescan.tif - San Gregario fault zone sseast.tif - Monterey Canyon w/ 7m/pixel resolution

445	National Oceanic and Atmospheric Administration	sidescan	24.6km^2	Big Creek	36.13 36 -121.57 -121.68	Side scan sonar in depths from 30-200m
446	US Geological Survey	sidescan	Pending	California	42 32.53 -117.2 -126	GLORIA
447	Ocean Mapping Group, Univ. of New Brunswick	multibeam backscatter	Pending	Eel River Delta	41.083 40.65 -124.1 -124.57	Collector-Dr. Larry A. Mayer Dataset name PH-1-96 spatial resolution from 4m (bathy)/2 m (backscatter) to 16 m/8 m. Bathymetry accuracy is function of water depth, but is at least as good as 0.04% water depth. Backscatter is calibrated albedo, referenced to 1 m from transducers.QA/QC Patch test was conducted prior to survey; CTDs and XBT collected throughout survey to assure proper water velocity corrections; TSS/POS/MV motion sensor; dual DGPS with SkyFix reference for navigation. All data tide-corrected. Groundtruthing by Box, gravity, and piston coring. Depth range- 20 to 600 m. Vessel- Pacific Hunter Hardware- Kongsberg Simrad EM-1000 Software- Swathed (OMG.UNB) Collection method- digital Coordinate system, Datum, Projection- latitude/longitude; WGS84; Mercator

448	US Geological Survey	multibeam backscatter Pending	SF Bay	37.9 37.8 -122.39 -122.49	Collector-Dr. James V. Gardner Dataset name CS-1-97 Vessel-Coastal Surveyor Hardware- Kongsberg Simrad EM-1000 Software- Swathed (OMG.UNB) Collection method- digital, spatial resolution from 4m (bathy)/2 m (backscatter) to 16 m/8 m. Bathymetry accuracy is function of water depth, but is at least as good as 0.04% water depth. Backscatter is calibrated albedo, referenced to 1 m from transducers, QA/QC Patch test was conducted prior to survey; CTDs and XBT collected throughout survey to assure proper water velocity corrections; TSS/POS/MV motion sensor; dual DGPS with SkyFix reference for navigation. All data tide-corrected.Coordinate system, Datum, Projection-latitude/longitude; WGS84; Mercator. Depth range- 4 to 120 m
451	US Geological Survey	bathymetry Pending	Humbolt Bay	40.7711 40.7528 -124.2172 -124.2456	Survey conducted in 1984 Chief Scientist(John Dingler)
453	US Geological Survey	bathymetry Pending	Monterey Bay	37.0981 36.8041 -121.8943 -122.3805	Survey conducted in 1995,Chief Scientist (Roberto Anima, Andy Stevenson, Steve Eittreim) MONTEREY BAY MARINE SANCTUARY
455	US Geological Survey	bathymetry Pending	Monterey Bay	37.1115 36.9184 -121.8671 -122.3648	Survey conducted in 1995,Chief Scientist (Roberto Anima, Andy Stevenson, Steve Eittreim) MONTEREY BAY NATIONAL MARINE SANCTUARY PROJECT
457	US Geological Survey	bathymetry Pending	North Coast	42.7348 37.7072 -122.9749 -125.9102	Survey conducted in 1977 Chief Scientist(John Dingler)Bathymetry instrumentation 12 KHZ DIGITIZED BATHY 3.5 KHZ,Additional forms of bathymetric data Yes,General rate of bathymetry in file (unspecified)
459	US Geological Survey	bathymetry Pending	North Coast	37.8097 36.6068 -121.7967 -123.5573	Survey conducted in 1978 Chief Scientist(Gary Greene),Bathymetry instrumentation BATHYMETRY 12 KHZ BATHYMETRY 3.5KHZ

461	US Geological Survey	bathymetry	Pending	North Coast	39.5261 34.2581 -119.1586 -124.6121	Survey conducted in 1979 Chief Scientist(Gary Greene)
463	US Geological Survey	bathymetry	Pending	SF Area	37.8477 37.1844 -122.2016 -123.5431	Survey conducted in 1979 Chief Scientist(Steve Eittreim), Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified) General rate of bathymetry in file 1.1 minutes
465	US Geological Survey	bathymetry	Pending	SF Area	39.5697 34.8838 -121.889 -126.2568	Survey conducted in 1984 Chief Scientist(BILL NORMARK),Bathymetry instrumentation(unspecified) Additional forms of bathymetric data (unspecified) General rate of bathymetry in file 2.4 minutes
467	US Geological Survey	bathymetry	Pending	SF Area	38.4646 37.1539 -122.3008 -123.4518	Survey conducted in 1979 Chief Scientist(DAVE CACCHIONE, DAVE DRAKE) Bathymetry instrumentation (unspecified)
471	US Geological Survey	bathymetry	Pending	Monterey Bay	36.7032 36.6074 -121.8121 -121.8863	Survey conducted in 1980 Chief Scientist(John Dingler),Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified) General rate of bathymetry in file 1.0 minutes
473	US Geological Survey	bathymetry	Pending	North Coast	44.8911 40.7209 -124.1286 -125.3529	Survey conducted in 1981 Chief Scientist(Sam Clarke, Mike Field, Parke Snavely) Bathymetry instrumentation 12KHZ NARROW 1SEC,3.5KHZ WIDE
475	US Geological Survey	bathymetry	Pending	Monterey Bay	36.8365 36.4971 -121.7884 -121.9948	Survey conducted in 1981 Chief Scientist(John Dingler)

477	US Geological Survey	bathymetry Pending	San Mateo Coast	37.8191 34.0857 -119.2096 -122.6471	Survey conducted in 1981 Chief Scientist(Dave McCulloch) Bathymetry instrumentation 12KHZ NARROW 1 SEC, 3.5KHZ WIDE Additional forms of bathymetric data RECORDER ROLLS General rate of bathymetry in file (unspecified)
479	US Geological Survey	bathymetry Pending	SF Area	37.8336 37.1029 -122.1862 -123.0338	Survey conducted in 1981 Chief Scientist(Dave McCulloch) Bathymetry instrumentation 12KHZ NARROW 1 SEC, 3.5 KHZ WIDE Additional forms of bathymetric data RECORDER ROLLS General rate of bathymetry in file (unspecified)
481	US Geological Survey	bathymetry Pending	North Coast	41.7398 37.5118 -122.1882 -124.6569	Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified) General rate of bathymetry in file 1.0 minutes General collection rate of bathymetry (unspecified) Assumed sound velocity 1463.0 m/sec
483	US Geological Survey	bathymetry Pending	SF Area	37.8351 37.4433 -122.1978 -123.6276	Survey conducted in 1982 Chief Scientist(TERRY KELLEY), Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified) General rate of bathymetry in file 0.9 minutes
485	US Geological Survey	bathymetry Pending	SF Area	37.8387 34.0152 -122.1948 -123.49	Survey conducted in 1982 Chief Scientist(Don Tompkins),Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified) General rate of bathymetry in file 0.8 minutes
487	US Geological Survey	bathymetry Pending	SF Area	37.8352 36.5244 -122.2276 -123.0654	Survey conducted in 1982 Chief Scientist(Dave McCulloch), Bathymetry instrumentation (unspecified),Additional forms of bathymetric data (unspecified),General rate of bathymetry in file 0.8 minutes

489	US Geological Survey	bathymetry	Pending	North Coast	41.7567 41.7306 -124.1871 -124.211	Survey conducted in 1983 Chief Scientist(John Dingler)
491	US Geological Survey	bathymetry	Pending	Big Sur	38.9693 33.6742 -118.21 -127.868	Survey conducted in 1984 Chief Scientist(JIM GARDNER, DAVE MCCULLOCH) Bathymetry instrumentation 3.5 KHZ Additional forms of bathymetric data (unspecified)
493	US Geological Survey	bathymetry	Pending	North Coast	43.0418 38.2203 -123.5092 -129.3419	Survey conducted in 1984 Chief Scientist(DAVE CACCHIONE, DAVE DRAKE) Bathymetry instrumentation 3.5 KHZ
495	US Geological Survey	bathymetry	Pending	North Coast	44.6513 37.8644 -122.7374 -124.8141	Survey conducted in 1985 Chief Scientist(MIKE FIELD, DAVE CACCHIONE) Bathymetry instrumentation (unspecified)
497	US Geological Survey	bathymetry	Pending	SF Area	37.8345 37.471 -122.1912 -123.0471	Survey conducted in 1985 Chief Scientist(BOB HALL, MIKE TORRESAN) Bathymetry instrumentation (unspecified)
499	US Geological Survey	bathymetry	Pending	SF Area	37.8666 37.1673 -122.1917 -123.5588	Survey conducted in 1985 Chief Scientist(BILL NORMARK, JAN MORTON) Bathymetry instrumentation (unspecified)
501	US Geological Survey	bathymetry	Pending	North Coast	46.6212 37.7603 -122.3597 -126.6053	Survey conducted in 1986 Chief Scientist(DAVE DRAKE, DAVE CACCHIONE)
503	US Geological Survey	bathymetry	Pending	N Coast Offshore	42.9149 40.7465 -124.1863 -127.8136	Survey conducted in 1986 Chief Scientist(DAVE CLAGUE, PETER RONA) Bathymetry instrumentation (unspecified)

505	US Geological Survey	bathymetry	Pending	N Coast Offshore	41.0738 37.5881 -122.2269 -127.7148	Survey conducted in 1986 Chief Scientist(JAN MORTON) Bathymetry instrumentation Bathy 12 kHz Bathy 3.5 kHz
507	US Geological Survey	bathymetry	Pending	Pt. Reyes	38.0029 37.5071 -122.1934 -123.3872	Survey conducted in 1989 Chief Scientist(John Chin, Herman Karl, Bill Schwab)
509	US Geological Survey	bathymetry	Pending	SF Area	37.8345 37.1091 -122.1932 -123.6317	Survey conducted in 1990 Chief Scientist(HERMAN KARL, DAVE DRAKE)
511	US Geological Survey	bathymetry	Pending	SF Area	38.0707 37.1622 -122.2008 -123.5319	Survey conducted in 1990 Chief Scientist(HERMAN KARL, DAVE DRAKE)
513	US Geological Survey	bathymetry	Pending	North Coast	41.7676 37.763 -122.3808 -125.8284	Survey conducted in 1994 Chief Scientist(Ann Meltzer, Sam Clarke)
515	US Geological Survey	bathymetry	Pending	SF Area	37.8242 37.0537 -122.1929 -123.3102	Survey conducted in 1994 Chief Scientist(Herman Karl)
517	US Geological Survey	bathymetry	Pending	Big Sur	37.7153 32.4051 -117.3873 -123.6525	Survey conducted in 1972 Chief Scientist(Gary Greene, Eli Silver) Bathymetry instrumentation (unspecified)
519	US Geological Survey	bathymetry	Pending	South Coast	34.8004 32.49 -117.1478 -121.3818	Survey conducted in 1978 Chief Scientist(GARY GREENE) Bathymetry instrumentation 12 KHZ BATHY 3.5 KHZ BATHMETRY

521	US Geological Survey	bathymetry	Pending	Los Angeles	33.9168 33.5298 -117.9149 -119.0659	Survey conducted in 1978 Chief Scientist(DAVE CACCHIONE, DAVE DRAKE) Bathymetry instrumentation 12 KHZ BATHYMETRY 3.5 KHZ BATHYMETRY
523	US Geological Survey	bathymetry	Pending	S Coast Offshore	36.4325 32.1815 -117.6097 -124.621	Survey conducted in 1978 Chief Scientist(BILL NORMARK)
525	US Geological Survey	bathymetry	Pending	Pt. Conception	36.3606 34.1341 -119.2357 -122.0314	Survey conducted in 1978 Chief Scientist(DAVE MCCULLOCH) Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified)
527	US Geological Survey	bathymetry	Pending	South Coast	34.4063 33.2003 -118.3828 -120.5252	Survey conducted in 1981 Chief Scientist(BRIAN EDWARDS) Bathymetry instrumentation (unspecified) Additional forms of bathymetric data (unspecified)
529	US Geological Survey	bathymetry	Pending	South Coast	34.864 30.7953 -117.1378 -125.3672	Survey conducted in 1984 Chief Scientist(MIKE FIELD, BRIAN EDWARDS) Bathymetry instrumentation 3.5 KHZ BATHY
544	US Geological Survey	bathymetry	Pending	South Coast	34.6017 34.0822 -124.0107 -124.4843	Survey conducted in 1987 Chief Scientist(MIKE FIELD, JIM GARDNER) Bathymetry instrumentation 10 kHz bathy 12 kHz bathy 3.5
546	US Geological Survey	bathymetry	Pending	South Coast	36.2842 34.0178 -123.0124 -124.7272	Survey conducted in 1989 Chief Scientist(MIKE FIELD, JIM GARDNER)
548	US Geological Survey	bathymetry	Pending	South Coast	36.6499 31.188 -117.3812 -122.0151	Survey conducted in 1990 Chief Scientist(BOB BOHANNON, STEVE EITTREIM)

550	US Geological Survey	bathymetry	Pending	Big Sur Offshore	37.832 33.728 -122.0106 -125.0181	Survey conducted in 1990 Chief Scientist(JIM GARDNER, DOUG MASSON)
552	US Geological Survey	bathymetry	Pending	Palos Verdes	37.5024 33.517 -118.2169 -122.6505	Survey conducted in 1992 Chief Scientist(HERMAN KARL, MONTY HAMPTON)
554	US Geological Survey	bathymetry	Pending	South Coast	37.5101 33.277 -112.8973 -123.9548	Survey conducted in 1998 Chief Scientist(Bill Normark)
555	California State University Monterey Bay	sidescan, roxann	Pending	Punta Gorda	40.2744 40.2386 -124.3527 -124.389	Projection -Albers Conical Equal Area Datum- NAD27, Navigation equipment used - Trimble 4000RL GPS receiver with PRO BEACON differential corrections applied for +/- 2m accuracy. Survey equipment - Innerspace analog bathymetric recorder and 208 kHz transducer. EG&G Model 260TH side-scan sonar recorder with model 272TD towfish. Marine Micro Systems RoxAnn bottom classification hardware. Hypack for Windows hydrographic survey software used to coordinate all systems and record bathymetric, RoxAnn and navigation data. The analog side-scan data was hand mosaiced, digitally scanned and incorporated into the GIS database. Survey vessel - DF&G Melanops The bathymetry is available as:raw data in ASCII format, in grids, and as contour files. Grid spacing - 20m. The final product consists of depth contour lines and polygons.

557	California State University Monterey Bay	sidescan, roxann	Pending	Big Creek	36.0924 36.0578 -121.5931 -121.6292	Projection -Lat/Long, Navigation equipment used - Trimble 4000RL GPS receiver with PRO BEACON differential corrections applied for +/- 2m accuracy. Survey equipment - Innerspace analog bathymetric recorder and 208 kHz transducer. EG&G Model 260TH side-scan sonar recorder with model 272TD towfish. Marine Micro Systems RoxAnn bottom classification hardware. Hypack for Windows hydrographic survey software used to coordinate all systems and record bathymetric, RoxAnn and navigation data. The analog side-scan data was hand mosaiced, digitally scanned and incorporated into the GIS database. Survey vessel - DF&G Melanops The bathymetry is available as: raw data in ASCII format, in grids, and as contour files. Grid spacing - 12m. The final product consists of depth contour lines and polygons
558	National Geodetic Data Center - NOAA	bathymetry	Pending	California	42 32 -117 -126	The National Ocean Service (NOS) Survey Data provides the most extensive digital bathymetric data available for the coastal waters of the continental United States, Alaska, Hawaii and Puerto Rico/Virgin Islands. Because the database contains depth values obtained during surveys, more detailed bathymetric information is available than can normally be found on published nautical charts. The dense inshore and shallow-water data are well suited for computer generation of grids to be used in hydrodynamic models of estuaries and other coastal systems. Both inshore data and the less dense offshore and deep-water data are valuable input to: bathymetric basemaps, Geographic Information Systems (GIS), geophysical exploration, coastal engineering studies, and other research purposes. This two disc CD-ROM set includes Header- and Data- Records (see below) stored in a compacted binary format. Also included on the CD-ROMs is custom menu-driven, GEODAS (GEOphysical DAta System) software developed by NGDC specifically for managing geophysical and hydrographic data.
560	USGS, California Dept. of Conservation-Mines and Geology	subbottom	Pending	California	42 32 -117 -126	The series of maps representing the California Coastal Margin are broken up into 7 distinct geographic regions. These regions are classified as: Inner Southern, Mid-Southern, Outer-Southern, South-Central, Central, North-Central and Northen. All data is in hardcopy format

563	USGS, California Dept. of Conservation-Mines and Geology	subbottom	Pending	North Coast	42 40 -124 -126	This series of maps represents Area 7, the northenmost section of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications
565	US Geological Survey	sidescan	Pending	Far North	42 40 -127 -129	Quad 22 is one of the northern most quads and and at that latitude is the farthest west. GLORIA data for California. There is close to full coverage within the given extents
567	US Geological Survey	sidescan	Pending	Far North	42 40 -125 -127	Quad 21 is one of the northern most quads and is longitudinally centered between the other datasets at this latitude. GLORIA data for California. There is full coverage within the given extents
569	US Geological Survey	sidescan	Pending	Far North	42 40 -124.55 -125	Quad 20 is one of the northern most quads and and at that latitude is the nearest to shore. GLORIA data for California. There is close to full coverage within the given extents however this is a very SMALL QUAD relative to the others.
571	US Geological Survey	sidescan	Pending	Mendicino	40 38 -127 -129	Quad 19 is one of the northern quads and and at that latitude is the farthest west. GLORIA data for California. There is approximately 75% data coverage extending from the north-east corner within the given extents
573	US Geological Survey	sidescan	Pending	Mendicino	40 38 -125 -127	Quad 18 is one of the northern quads and and at that latitude it is centered between the other datasets. GLORIA data for California. There is full coverage within the given extents
575	US Geological Survey	sidescan	Pending	Mendicino	40 38 -123 -125	Quad 17 is one of the northern quads and and at that latitude it is nearest to shore. GLORIA data for California. There is approximately 50% coverage extending from the western boundary within the given extents
577	US Geological Survey	sidescan	Pending	Central Coast	38 36 -127 -129	Quad 16 is located in the central part of the state off of San Francisco. It is the western most quad at this latitude. There is less than 50% coverage extending from the north_east corner within the given extents

579	US Geological Survey	sidescan	Pending	Central Coast	38 36 -125 -127	Quad 15 is located in the central part of the state off of San Francisco. It is next to the western most quad at this latitude. There is close to full coverage within the given extents
581	US Geological Survey	sidescan	Pending	Central Coast	38 36 -123 -125	Quad 14 is located in the central part of the state off of San Francisco. It is next to the nearest shore quad at this latitude. There is close to full coverage within the given extents
583	US Geological Survey	sidescan	Pending	Central Coast	38 36 -121 -123	Quad 13 is located in the central part of the state off of San Francisco. It is the nearest shore quad at this latitude. There is less than 50% coverage extending from the south-west corner within the given extents
585	US Geological Survey	sidescan	Pending	Southern Cal	36 34 -125 -127	Quad 12 is located in the south central part of the state off of Pt. Conception. It is the western most quad at this latitude. There is less than 50% coverage extending from the north-east corner within the given extents
587	US Geological Survey	sidescan	Pending	Southern Cal	36 34 -123 -125	Quad 11 is located in the south central part of the state off of Pt. Conception. It is next to the western most quad at this latitude. There is close to full coverage within the given extents
589	US Geological Survey	sidescan	Pending	Southern Cal	36 34 -121 -123	Quad 10 is located in the south central part of the state off of Pt. Conception. It is next to the nearest shore quad at this latitude. There is close to full coverage within the given extents
591	US Geological Survey	sidescan	Pending	Southern Cal	36 34 -119 -121	Quad 9 is located in the south central part of the state off of Pt. Conception. It is the nearest shore quad at this latitude. There is less than 25% coverage extending from the south-west corner within the given extents
593	US Geological Survey	sidescan	Pending	Far South	34 32 -123 -125	Quad 8 is located in the far southern section of the state. It is the farthest west quad at this latitude. There is approximately 50% coverage extending from the north-east corner within the given extents

595	US Geological Survey	sidescan	Pending	Far South	34 32 -121 -123	Quad 7 is located in the far southern section of the state. It is next to the farthest west quad at this latitude. There is full coverage within the given extents
597	US Geological Survey	sidescan	Pending	Far South	34 32 -119 -121	Quad 6 is located in the far southern section of the state. It is next to the nearest shore quad at this latitude. There is approximately 80% coverage within the given extents
599	US Geological Survey	sidescan	Pending	Far South	34 32 -117 -119	Quad 5 is located in the far southern section of the state. It is the nearest shore quad at this latitude. There is approximately 50% coverage from the west boundary within the given extents
602	USGS, California Dept. of Conservation-Mines and Geology	subbottom, bathymetry	Pending	Mendicino Coast	40 38.01 -122.85 -124.86	This series of maps represents Area 6, the Mendicino coast section of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications
604	USGS, California Dept. of Conservation-Mines and Geology	subbottom, bathymetry	Pending	Central Coast	38.01 36.01 -121.53 -123.53	This series of maps represents Area 5, the central coast section of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications
606	USGS, California Dept. of Conservation-Mines and Geology	subbottom, bathymetry	Pending	Big Sur Coast	36.01 33.99 -119.93 -121.94	This series of maps represents Area 4, the Big Sur coast section of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications

608	USGS, California Dept. of Conservation-Mines and Geology	subbottom, bathymetry	Pending	Channel Islands	33.99 32 -120 -121.94	This series of maps represents Area 3, the offshore, Channel Islands section of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications
610	USGS, California Dept. of Conservation-Mines and Geology	subbottom, bathymetry	Pending	Los Angeles	34.5 32 118 120	This series of maps represents Area 2, the Los Angeles area of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications.
612	USGS, California Dept. of Conservation-Mines and Geology	subbottom, bathymetry	Pending	San Diego	33.99 32 -115.91 -118	This series of maps represents Area 1, the southeastern most section of the California coast. There are 4 maps representing the geology, selected faults and earthquake epicenters, gravity and magnetic anomaly, and well, trackline and data source classifications
613	California Dept. of Fish and Game	35mm slides	Pending	Central Coast	36.75 36.2 -121.8 -122	CA DFG: 1967 (at least a few), 70 (at least a few), 73, 74,75,76,77, 78, 79,and 89; These 35 mm slides cover at least the area of the MTY peninsula and multiple flights were made in numerous years (the extent of the 89 survey was the entire CA coast). VanWagenen: 1980, 81, 82, 83, 84 (might be DFG's), 87, 88, 91, 92, 94, 97; Again, these 35 mm slides covered at least the MTY peninsula (and probably more). The 94 and 97 surveys are in 70 mm slide format. Monterey Bay Aquarium: 1985 - 1991, taken approx. monthly from Marina to Big Sur (excellent dataset!)
614	USGS- H. Gary Greene	unknown	Pending	Monterey Bay	37 36.5 -122 -123	A geologic interpretation. This map is on vellum. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
616	USGS- H. Gary	unknown	Pending	Monterey Bay	37	A geologic interpretation. This map is on vellum. This map was used in the

	Greene				36.5 -122 -123	construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
618	USGS- H. Gary Greene	unknown	Pending	Upper Sur Slope	36.5 36 -121.92 -122.42	Preliminary geology and geomorphology. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
620	USGS- H. Gary Greene	unknown	Pending	Lower Sur Slope	36.5 36 -122.42 -122.66	Preliminary geology and geomorphology. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
622	USGS- H. Gary Greene	unknown	Pending	Monterey Bay	36.5 36 -122.75 -123	Preliminary geology and geomorphology. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
624	USGS- H. Gary Greene	unknown	Pending	Monterey Bay	36.42 36.08 -122.75 -123	Preliminary geology. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
626	USGS- H. Gary Greene	unknown	Pending	Central Coast	37 36.5 -121.83 -123	Preliminary geology and geomorphology. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
628	USGS- H. Gary Greene	unknown	Pending	Central Coast	37 36.5 -121.83 -123	Geology and geomorphology. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
630	USGS- H. Gary Greene	unknown	Pending	Monterey Bay	36.5 36 -122.75 -123	A geologic interpretation. This copy is on vellum. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.

632	USGS- H. Gary Green	unknown	Pending	Monterey Bay	36.5 36 -122.75 -123	A geologic interpretation. This copy is on vellum. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
634	USGS- H. Gary Greene	unknown	Pending	Big Sur	36.5 36 -122 -122.33	A geologic interpretation. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
636	USGS- H. Gary Greene	unknown	Pending	Southern California	33.66 33.5 -117.66 -117.83	A geologic interpretation. This map is on vellum. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
638	USGS- H. Gary Greene	unknown	Pending	Southern California	33.66 33.5 -118 -118.33	A geologic interpretation. This map is on vellum. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
640	USGS- H. Gary Greene	unknown	Pending	Southern California	33.66 33.5 -118 -118.33	Geologic structures. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
641	USGS- H. Gary Greene	Magnetic Intensity	Pending	Ventura/Oxnard	34.33 33.92 -119 -119.5	Contour intervals of 25 gammas. This map is available as a negative. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this
643	USGS- H. Gary Greene	unknown	Pending	Ventura/Oxnard	34.33 33.92 -119 -119.5	Earthquake epicenters. This map is available as a negative. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
647	USGS- H. Gary Greene	bottom grabs	Pending	Ventura/Oxnard	33.6 33 -119.5 -120	Sample sites. This map is available as a negative. Sample types are: dart cores, gravity cores, Van Veen, box cores and chain dredges. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California

649	USGS- H. Gary Greene	unknown	Pending	Santa Rosa Ridge	34 33.5 -119.5 -120.5	Survey tracklines. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
651	USGS- H. Gary Greene	unknown	Pending	Mugu/Santa Monica	34 33.5 -118.33 -119.17	Geologic Interpretation. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
653	USGS- H. Gary Greene	unknown	Pending	Tanner-Cortes Bank	32.83 32.25 -118.83 -119.5	Preliminary geology. This map is available as a negative. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
655	USGS- H. Gary Greene	Seismic Reflection	Pending	San Pedro	33.58 33.42 -117.83 -118.17	High resolution seismic reflection. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
657	USGS- H. Gary Greene	unknown	Pending	San Pedro	33.58 33.42 -117.83 -118.17	Geologic Interpretation. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
659	USGS- H. Gary Greene	Seismic Reflection	Pending	Santa Cruz	37.2 36.8 -122.2 -123	High resolution seismic reflection. The geolocation of this map is approximated. This map is available as a negative. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time pe
661	USGS- H. Gary Greene	unknown	Pending	Mugu/Santa Monica	34.17 33.5 -118.42 -119.08	Geologic Interpretation. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
663	USGS- H. Gary Greene	multibeam	Pending	Monterey Bay	36.5 36 -122.42	Slumps from Seabeam data. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is

					-122.66	approximate.
665	USGS- H. Gary Greene	unknown	Pending	Monterey Bay	37.25 36.25 -121.25 -122.5	Geologic interpretation. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology.
669	USGS- H. Gary Greene	bottom grabs	Pending	San Pedro	33 32.5 -117.25 -117.5	Sample sites. This map is available as a negative. Sample types are: dart cores, gravity cores, Van Veen, box cores and chain dredges. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California
671	USGS- H. Gary Greene	unknown	Pending	San Pedro	33.1 32.75 -117.25 -117.75	Survey tracklines. This map is available as a negative. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology. The time period for this study is approximate.
672	USGS- H. Gary Greene	unknown	Pending	Santa Barbara	34.5 34 -120 -120.5	Seismotectonics. This map contains information on faults and folds. This map was used in the construction of the 'Geology of California Continental Margin' series produced by USGS and the California Dept. of Mines and Geology.
674	ABA Consultants	sidescan, roxann	Pending	Big Sur	36.164 36.1585 -121.674 -121.681	Navigation equipment used - Trimble 4000RL GPS receiver with PRO BEACON differential corrections applied for +/- 2m accuracy used for the 1997 and 1998 surveys. For the earlier surveys a 4000RL GPS receiver was used as a base station transmitter in con
676	ABA Consultants	sidescan, roxann	Pending	Marin Coast	37.881 37.854 -122.582 -122.646	Navigation equipment used - Trimble 4000RL GPS receiver used in conjunction with a 2nd 4000RL transmitting base station position information for +/- 2m accuracy. Survey equipment - Innerspace analog bathymetric recorder and 208 kHz transd
678	USGS- Steve Eittreim	sidescan,multibeam, roxann	Pending	Ft. Ord	36.775 36.6 -121.83 -122	Navigation equipment used - Trimble 4000RL GPS receiver used in conjunction with a 2nd 4000RL transmitting base station position information for +/- 2m accuracy. Survey equipment -Simrad EM-1000 multibeam system, Innerspace analog bathyme
679	U. S. Navy	unknown	Pending	San Diego Bay	32.74 32.61	The geolocation of this dataset is taken from a subset of 5,000 points and is therefore an approximation to the coverage of the entire dataset. The data

					-117.1 -117.24	can be downloaded directly from the website location following these instructions:
680	Office of Naval Research	unknown	Pending	California	42 32 -117 -126	So far we have been unable to contact the ONR at Stennis Space Center but we do have contact information. The spatial extents are estimated and the time period is unknown.
681	U.S. Army Corp of Engineers	LIDAR	Pending	Santa Monica	34 33.5 -118.33 -119.17	The metadata for this dataset has not yet been received. The spatial extents are estimated as is the time period.
682	U.S. Geologic Society	sidescan	Pending	Channel Islands	34.2 33.8 -119.7 -120.3	Metadata for the Channel Islands surveys has not yet been received. The spatial extents and time period are estimates.
683	U.S. Geologic Society	sidescan	Pending	Monterey Bay	37.17 36.83 -121.83 -123	Metadata for this project has not yet been received. The spatial extents are extimated.
684	U.S. Geologic Society	multibeam backscatter	Pending	Big Sur	36.25 36 -122 -122.5	The metadata for this survey has not yet been received. The spatial extents and time period are estimates.
685	CSU Long Beach	sidescan	Pending	Los Angeles Harbor	33.4 33.39 -117.69 -117.75	The metadata for this project has not yet been received. The spatial extents and time period are estimates.