Appendix E

Historical Data Sets from Long-Term Nearshore Biological Sampling: Site Descriptions

Channel Islands National Park Service

Island	Site	Latitude	Longitude
San Miguel	Wyckoff_Ledge	34.022367	-120.387467
San Miguel	Hare_Rock	34.064383	-120.356600
Santa Rosa	Johnsons_Lee_North	33.901467	-120.102967
Santa Rosa	Johnsons_Lee_South	33.897533	-120.100750
Santa Rosa	Rodes_Reef	34.032617	-120.107000
Santa Cruz	Gull_Island_South	33.949667	-119.827583
Santa Cruz	Frys_Harbor	34.056350	-119.755150
Santa Cruz	Pelican_Bay	34.034883	-119.703083
Santa Cruz	Scorpion_Anchorage	34.047983	-119.551400
Santa Cruz	Yellow_Banks	33.989833	-119.563067
Anacapa	Admirals_Reef	34.007750	-119.434383
Anacapa	Cathedral_Cove	34.015867	-119.371733
Anacapa	Landing_Cove	34.017033	-119.361133
Santa Barbara	SE_Sea_Lion_Rookery	33.466117	-119.027783
Santa Barbara	Arch_Point	33.487533	-119.027583
Santa Barbara	Cat_Canyon	33.464417	-119.039167

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Admiral's Reef
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Ventura

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 13-15 meters and consists of bedrock and large piles of large boulders (mostly 1-2 meters in diameter). Relief at this site may be up to 3 meters in some areas. The low lying areas are either sand and/or cobble. The transect runs along the base of a slope so that the inshore side of the transect can be considerably shallower than the offshore side. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 82.1%
Cobble 8.9%
Sand 9.0%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

This site was a Macrocystis pyrifera forest until the mid 1990's when it became dominated by echinoderms. The most prevalent echinoderms have been Ophiothrix spiculata and Strongylocentrotus purpuratus. Ophiothrix spiculata has been the most prevalent the past two years.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htmm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Cathedral Cove
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Ventura

Substrata and relief

Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 6-11 meters and consists of individual boulders, large pile of boulders and bedrock. Most of the boulders are 1-2 meters in diameter, but larger boulders are present. Relief at this site is often up to 2 meters. The inshore side of the transect slopes up considerably and sand is abundant on the offshore side where the reef ends. The transect runs along the base of the slope. There is typically little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 61.7%
Cobble 22.0%
Sand 16.3%.

Invertebrate and algal assemblages

Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Overall, this site has remained a Macrocystis pyrifera forest since it was established in 1981. The most prominent grazers are very large Strongylocentrotus franciscanus. Compared to the other KFM sites, this site and Landing Cove have experienced little changed over the past 23 years.

However, annual changes do occur especially with understory algae. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htmm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Landing Cove
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Ventura

Substrata and relief

Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 5-12 meters and consists mostly of bedrock and a few areas of large boulders. Most of the boulders are 1-2 meters in diameter. This site has dramtic relief. The first 35 meters of transect are on top of a small reef that has a depth of about 5 meters and drops down on all sides to a depth of about 10-12 meters. Along the inshore side of the remainder of the transect is a wall that goes to the surface about 5 meters away from the transect. The offshore side is relatively level. There is typically little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 70.2%
Cobble 19.5%
Sand 9.9%.

Invertebrate and algal assemblages

Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Overall, this site has remained a Macrocystis pyrifera forest since it was established in 1981. The most prominent grazers are very large Strongylocentrotus franciscanus. Compared to the other KFM sites, this site and Landing Cove have experienced little changed over the past 23 years.

However, annual changes do occur especially with understory algae. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Arch Point
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 7-8 meters and consists of bedrock and large boulders (up to approximately 2 meters in diameter). The transect is near the base of a slope. On the offshore side the reef extends approximately 5-10 meters and then ends and becomes sand. There is a moderate amount of relief up to about two meters in some areas. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 82.8%
Cobbl 13.2%
Sand 4.0%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Though this site was a Macrocystis pyrifera forest when it was established, it has mostly been dominated by Strongylocentrotus purpuratus over the past 23 years. High densities of S. franciscanus are also common.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Cat Canyon
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1986
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 7-9 meters and consists of bedrock and large boulders (up to approximately 2 meters in diameter). There is not much overal slope to this site as it is several hundred meters offshore. Sand is common in the low lying areas around the transect and there is little cobble. There is a moderate amount of relief up to about two meters in some areas. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 86.4%
Cobbl 2.6%
Sand 10.9%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Though this site was a Macrocystis pyrifera forest when it was established, it has mostly been dominated by Strongylocentrotus purpuratus and S. franciscanus over the past 19 years. Similar to the other sites though, urchin densities have crashed in some years and kelp forest have returned, but only to revert back to an urchin dominated area shortly after.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Southeast Sea Lion
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 12-14 meters and consists of mostly bedrock with an occasional boulder or small pile of boulders. The boulders are typically less than 1 meter in diameter. Relief at this site is relatively low and typically less than one meter. Sand is present in the low lying areas. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 81.8%
Cobble 6.0%
Sand 11.6%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Though this site was a Macrocystis pyrifera forest when it was established, it has mostly been dominated by Strongylocentrotus purpuratus over the past 23 years. Most recently, Ophiothrix spiculata has been more prevalent and one of the dominating biological features at this site.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Fry's Harbor
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 12-13 meters and is mostly large boulders (1-2 meters in diameter) with an occasional giant boulder (maybe up to 15 meters in diameter) and high relief where these giant boulders occur. In addition the site has a steeply sloping offshore gradient. When Band Transects are conducted the observer on the inshore side of the transect may be as shallow as 6 meters and the observer on the offshore side may be as deep as 20 meters. There has been little change in substrate since monitoring began.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 82.0%
Cobble 13.5%
Sand 4.4%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Similar to the other KFM sites, this site was established when a Macrocystis pyrifera forest was present, but by the late 1980's the site became mostly dominated by the aggregated red sea cucumber, Pachythyone rubra, and in some years moderate densities of Strongylocentrotus purpuratus. The cup coral Astrangia lajollaensis also has a high percent cover here.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Gull Island
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 13-16 meters and is mostly bedrock with an occasional large boulder. There is dramatic relief over most of the site. Within in a few meters of the transect there can be up to approximately 7 m of relief. Small cobble/sand is present in the low lying areas. The substrate remains stable and experiences little annual change.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 94.2%
Cobble 2.4%
Sand 3.4%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

This site if often a mature kelp forest but has gone through periods of being dominated by Strongylocentrotus purpuratus. This is the only KFM site that has a population of Stylaster californica.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Pelican Bay
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 6-8 meters and consists of a mix of bedrock, large boulders (1-5 meters in diameter) and some bedrock. The low lying areas have sand and there is one area towards the south end of the transect that is mostly cobble. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 59.5%
Cobble 15.5%
Sand 25.0%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Similar to all of the KFM sites, this site was established when a Macrocystis pyrifera forest was present. Similar to many of the other sites, M. pyrifera was gone by the mid 1980's and Strongylocentrotus purpuratus has mostly dominated this site since then.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htmm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Scorpion's Anchorage
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 4-5 meters and consists mostly of large boulders (1-3 meters in diameter) and bedrock. In the low lying areas fine sand is present. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 83.0%
Cobble 5.6%
Sand 11.3%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Similar to all of the KFM sites, this site was established when a Macrocystis pyrifera forest was present. Similar to many of the other sites, M. pyrifera was gone by the mid 1980's and Strongylocentrotus purpuratus has dominated the sites in most years since then.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Yellow Banks
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1986
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 15-16 meters and consists mostly of bedrock and small boulders (less than 1 meter in diameter). The transect runs along a ridge that drops off gradually along the inshore sided of the line and on the offshore side more abrubtly creating a small overhang in some areas before leveling off. Relief is low and rarely more than one meter. Sand with small cobble is common in the low lying areas. There is little change in substrate at this site.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 74.1%
Cobble 14.5%
Sand 11.4%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

This site has alternated between Macrocystis pyrifera forest and being dominated by Strongylocentrotus purpuratus twice since we began monitoring it in 1986.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Hare Rock
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 5-7 meters and is mostly bedrock with with high relief of up to 4 meters. The substrate remains relatively stable and has little change. The low lying areas often contain cobble.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 78.2%
Cobble 15.6%
Sand 6.2%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

Though this site was establish in a kelp forest, for much of the lifespan of this site it has been dominated by Strongylocentrotus franciscanus. Pisaster giganteus and Asterina miniata are abundant here.

Similar to the other KFM sites, this site has changed dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Wycoff Ledge
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 12-15 meters and is mostly bedrock with an occasional large boulder or piles of boulders. there is moderate relief of up to about 2 meters in some areas. Substrate remains relatively stable but there is some sand shifting in the low lying areas of the transect.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 73.7%
Cobble 4.4%
Sand 21.8%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

For most years since monitoring began at this site, the site has been described as a mature kelp forest (Macrocystis pyrifera) with a moderate to dense understory of algae. Understory algae changes significantly from year to year, but often consists of Pterygophora californica, red algae and on occasion the bottom is dominated by Desmarestia sp. Haliotis rufescens and Strongylocentrotus franciscanus are moderately abundant at this site.

More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Johnson's Lee North
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 9-11 meters and is mostly bedrock with with relief of about 2 meters. The transect line runs along the top of a shelf/ridge that gradually declines on the offshore side and rapidly on the onshore side creating a overhang in some locations. The substrate remains relatively stable and has little change.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 92.8%
Cobble 2.8%
Sand 4.3%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

This site if often a mature kelp forest or developing kelp forest with high density of M. pyrifera plants. Several times over the past 23 years, the site has switched to become dominated by Strongylocentrotus purpuratus, but typically for only a year or two before a kelp forest returns.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Johnson's Lee South
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1981
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transect ranges in depth from 13-16 meters and is mostly bedrock with an occasional large boulder with relief of about 2 meters. Sand is common in the low lying areas. The substrate remains relatively stable and has relatively little change directly along the transect.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 78.7%
Cobble 2.3%
Sand 19.0%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

This site if often a mature kelp forest or developing kelp forest with high density of M. pyrifera plants. Algae is diverse and changes annually with the bottom often nearly completely covered with red algae in some areas of the transect. Several times over the past 23 years, the site has some moderate increases of Strongylocentrotus spp., but typically for only a year or two before their density declines.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Channel Islands National Park (CINP)
SITE:	Rodes Reef
SURVEY_TYPE:	Quadrats, Band Transects, Fish Transects, Size Frequencies
YEAR_EST:	1983
YEAR_END:	Ongoing
COUNTY:	Santa Barbara

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

This transext ranges in depth from 13-14 meters and is mostly bedrock with an occasional large boulder. For most of the transect there is low relief of about 1 meter. Small cobble is common in the low lying areas. The eastern half of the transect is very flat with little relief and the western half has more relief. The substrate remains relatively stable and has relatively little change directly along the transect.

Percent cover of Rock, Cobble and Sand has been collected since this site was established using the KFMP Random Point Contact protocol. Below is the cover for these categories averaged since monitoring began at this site.
Rock 80.6%
Cobble 12.0%
Sand 7.2%.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

This site if often a mature kelp forest but has gone long periods of time being a “open” area with an abundance of understory red algae. As with most of the KFM sites, there are often large changes from year to year and it is difficult to generalize the site. Strongylocentrotus franciscanus are typically moderately abundant. Strongylocentrotus purpuratus have had moderate increases several times over the past 22 years, but their densities are low overall.

Similar to the other KFM sites, this site can change dramatically from year to year. More detailed biological information can be found described annualy in the Kelp Forest Monitoring Annual Reports. The reports that are available can be found at:
http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm

CRANE Historical Data
Program Summary Narrative

Enter information in shaded boxes below.

Program identification (Refer to Site Summary Table in Historical Data Format.)

CONTRACTOR: Tenera Environmental

SITE(S): DIABLO_CANYON

SURVEY_TYPE(S): Fish, macroinvertebrates, algae

Description of sampling program (If program goals differ by site, please identify.)

Discuss the motivation for the sampling program. Include program goals and objectives, and years in existence. If program structure or focus has changed significantly during the period discussed, please indicate how it changed and when.

This subtidal sampling program at Diablo Canyon Power Plant was established in 1976, 8 years prior to power plant start-up, to monitor changes in shallow water marine communities before and during thermal discharges from DCPP. The study was designed to fulfill the requirements of Clean Water Act Section 316(a). The Regional Water Quality Control Board reviews the results of the studies annually. Initially there were over 20 subtidal invertebrate/algae stations and 14 fish stations ranging in depth from -10 ft to -55 ft MLLW sampled on a bi-monthly basis. After several years of post start-up surveys, the monitoring was reduced in the early 1990s to 8 invertebrate/algae stations and 12 fish stations within 4 sites. These core stations will continue to be sampled in 2005.

Site selection
Provide an overview of site selection criteria, site size and seasonality of field work. If selection criteria changed significantly during the period discussed, please indicate how it changed and when.

The study design included stations with varying exposures to the DCPP thermal discharge in order to compare changes in the biological communities resulting from exposure to elevated temperatures. The discharge is located along an open coastal shoreline comprised of small coves, offshore rocks, and headlands with mainly rock substrates. The main subtidal control site is located approximately 2 km south of DCPP and the data from this site (DIABLO_CANYON) have been compiled for the present project. All stations are in permanent locations and were established in relatively shallow water because the main effects of the thermal plume occurred in depths shallower than -15 ft MLLW. Sampling has been done on a quarterly basis. Invertebrate and algae counts at the site are done in two 28 square meter circular stations, one at a -10 ft depth and the other at a -20 ft depth. Fish transects are also permanent and consist of benthic and midwater counts along three 50 m x 4 m transects in -10 ft to -30 ft depths. Total area of the site is approximately 1.5 hectares.

Sample design- statistical
Provide an overview of the sample design, including statistical approach used to address program objectives. If sample design changed significantly during the period discussed, please indicate how it changed and when.

The larger sample design is a BACI (Before-After/Control-Impact) design that statistically compares mean differences in taxa abundances between impact and control stations before and after power plant start-up. The data are analyzed using a mixed-model ANOVA that includes random and fixed factors. Correspondence analysis, a multivariate ordination method, is also used to provide representations of

community structure and dynamics that can be examined for spatial and temporal responses to disturbances or ecological interactions. Other summary statistics such as H' diversity, species richness and evenness are compared over time to identify seasonal and interannual changes in the community.

Sample design- logistical
Discuss, in general terms, the parameters and variables measured. Include target species or survey types completed, but NOT reported in the accompanying Historical Data Summaries. Summarize methods (e.g., transect size; planned replicate transects). **Please discuss any changes in methodology or target species over time.**

All surveys were targeted to occur quarterly, but rough sea conditions, particularly in winter months, sometimes prevented sampling. For fish data, visual counts are done along three paired benthic and midwater transects within the site. A station was delineated by deploying 50 m measuring tape, beginning at a permanent marker buoy and extending along a pre-determined compass course away from the buoy. The benthic sampling area was two meters to either side of the line (4 m width) and 1 m above the bottom. The midwater transect sampling area was a cylinder 4 m in diameter, centered 3 m above the benthic transect. A survey team consisted of two divers, each counting fish along the benthic and midwater portions of a transect independently, but in opposite directions. This sampling technique allowed a more thorough inspection of possible fish habitats from all angles of view than would have been possible by a single diver progressing along a transect in only one direction. Fish were identified to species if possible, but juveniles of some species with similar appearance were combined into broader categories. The resulting survey data was the combined species counts of both divers, divided by two. This yielded an average count for each taxa per 50 m benthic or midwater transect. During each survey, the stations were sampled a second time within one to two weeks of the initial sampling effort. This provided two replicate fish counts within a particular survey for each station. Fish length was not recorded, but juveniles, particularly YOY rockfishes and surfperches, are noted as separate taxa codes from adults and subadults.

Macro-invertebrate data were collected within permanent 28 square meter circular stations. The invertebrate taxa included a short list of common species that were counted regardless of size, and all taxa greater than 2.5 cm in largest dimension. A few common species that typically occurred in numbers too high to accurately count over the entire station area were sampled only in the first one-third of each arc (2.33 m2) with the data extrpolated to the entire station.The observer started sampling by positioning two 3.5 m moveable reference lines to divide the arc (one-quarter of the station) into thirds. The moveable lines and fixed station lines were all marked to clearly delineate the sampling area boundaries. Organisms were counted within the 7 m2 arc according to the preceding criteria, and the observer then proceeded in a counter-clockwise direction around the station, eventually sampling all four arcs. Although rocks were not overturned during the search effort, the search effort did include rock crevices and underhangs.

All methods have remained unchanged over the duration of the sampling program (1976-2004). Almost all sampling has included at least one team member who has more than 10 years of subtidal sampling experience at DCPP, therefore ensuring consistency among surveys.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	Tenera Environmental
SITE:	DIABLO_CANYON Lat/Long 35.205141 -120.849737
SURVEY_TYPE:	fish, invertebtates
YEAR_EST:	1976
YEAR_END:	ongoing
COUNTY:	San Luis Obispo

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

The three historical 50x4 meter fish transects in Patton Cove (refered to by the site name DIABLO_CANYON) range in depth from approximately 3-10 m. The substrate composition is moderate to high relief bedrock (60%) interspersed with boulder (20%), cobble (10%) and sand/shell debris (10%). Sand scour is insignificant but the site is impacted by winter storm swells, with boulders as large as 1 meter in diameter having been overturned in some instances. The site is approximately 2 km southeast of the Diablo Canyon Power plant cooling water discharge, but receives no influence from the discharge.

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

The main canopy-forming kelps include Nereocystis and Cystoseira (summer-fall seasonal peak) and a subcanopy of Pterygophora and Laminaria. Crustose corallines, erect corallines, and a variety of fleshy red algae (Cryptopleura, Chondrocanthus, Callophyllis) comprise the benthic algal community. Numerically dominant macroinvertebrates include Tegula brunnea, Asterina, Tonicella, Pagurus and Serpulorbis. Dominant sessile species include Balanophyllia, Phragmatopoma, Corynactis, Dendropoma and bryozoans. The overall assemblage of invertebrates and algae at two 28-m2 stations have not changed substantially over the course of the study in terms of species composition, although the relative abundances among some invertebrate species have shifted. The early surveys included several years during the end of the cool-water PDO period. As average temperatures increased slightly in the 1980s and 1990s there were increases in Phragmatopoma, Homolpoma, and Serpulorbis. There were also long-term decreases in Asterina, Tonicella, and Dendropoma. Red abalone and red urchins were abundant in the 1960s before the arrival of sea otters in the early 1970s, but declined tremendously because of predation. Although not documented in the historical data set, the shift from an urchin-dominated community to an algal-dominated community was a very significant change.

Annual monitoring reports and summarized information can be obtained by contacting Tenera Environmental or the Central Coast Regional Water Quality Control Board in San Luis Obispo.

UC Santa Barbara – Anacapa Island

Contact Donna Schroeder

Island	Site	Latitude	Longitude
Anacapa	NE_PASS	34.013333	-119.379167
Anacapa	PORT_ROCK	34.015000	-119.423533

UC Santa Barbara – PISCO

Island or County	Site	Latitude	Longitude
Anacapa_Island	East_Isle	34.017667	-119.363683
Anacapa_Island	Middle_Isle	34.009317	-119.388767
Santa_Barbara	Cojo	34.445083	-120.415833
Santa_Barbara	Jalama	34.482800	-120.490783
Santa_Barbara	Naples	34.422183	-119.951867
Santa_Barbara	Purisima	34.730367	-120.623333
Santa_Barbara	Sal	34.871867	-120.629667
Santa_Cruz_Island	Forney	34.053033	-119.906933
Santa_Cruz_Island	Hazards	34.056583	-119.821167
Santa_Cruz_Island	Pelican	34.030650	-119.696650
Santa_Cruz_Island	Yellowbanks	33.990367	-119.554500

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary
UCSB

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	ANACAPA-EAST ISLE
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (45.0%), boulder (29.8%), sand (6.4%), and cobble (19.9%). These amounts have remained similar through the sampled years.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 55.8%). These amounts have remained similar through the sampled years.

Invertebrate and algal assemblages

The cover is dominated by Crustose Coralline Algae (18.8%), Erect Coralline Algae (15.3%) and Bryozoan (8.0%). These amounts have remained similar through the sampled years.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	ANACAPA-MIDDLE ISLE
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (58.7%), boulder (23.7%), sand (12.1%), and cobble (5.4%).

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 82.7%). These amounts have remained similar through the sampled years.

Cover of invertebrate and algal assemblages

The cover is dominated by Crustose Coralline Algae (37.2%), Bare Rock (18.4%) and Bare Sand (15.1%).

Differences in years: In 2000 and 2001, there was a higher percentage of Bare Sand (cover) and Sand (Substrate) compared with 2002-2004. As the sand decreased, the cover of crustose coralline algae increased.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	COJO
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (65.6%), boulder (1.1%), sand (20.3%), and cobble (13.2%). These amounts have remained similar through the sampled years despite changes in the location of the transects from 1999 to 2000 and from 2000 to 2001.

Relief: Overall, mostly Flat Relief (0 - 10 cm, 79.1%) but there was a slight increase in relief after 2002 (avg. 11% flat relief to 40% slight relief).

Invertebrate and algal assemblages

The cover is dominated by Bare Rock (25.2%), Bare Sand (11.5%) and Diopatra ornata and Chaetopterus worms (13.5%). These amounts have remained similar through the sampled years despite changes in the location of the transects from 1999 to 2000 and from 2000 to 2001.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	JALAMA
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (67.1%), boulder (5.9%), sand (21.8%), and cobble (8.6%). In 2001 and 2002, the distribution of sand, cobble and bedrock was more even than in the other sampling years, in which the substrate was dominated by bedrock.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 57.6%). In 2001 and 2002, the percentage of flat relief increased relative to slight relief, corresponding to the substrate changes noted above.

Invertebrate and algal assemblages

The cover is dominated by Bare Sand (18.1%), Branching red algae (14.3%) and Bare Rock (11.6%). These amounts have remained similar through the sampled years.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	NAPLES
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2002 (for benthic), 2004 (for fish)
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (82.4%), boulder (2.4%), sand (4.2%), and cobble (12.0%). These amounts have remained similar through the sampled years.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 63.1%). These amounts have remained similar through the sampled years.

Invertebrate and algal assemblages

The cover is dominated by Crustose Coralline Algae (18.4%), Bare Rock (14.2%) and *Corynactis californica* (13.3%). Between 1999 and 2002 there has been a slight trend towards decreasing areas of bare rock and increasing areas of crustose coralline algae and *Corynactis californica*.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	PURISIMA
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (88.8%), boulder (1.6%), sand (8.5%), and cobble (2.5%). Bedrock has remained uniformly dominant. Sand was only present in 1999 while we were searching for areas in which to set up transects.

Differences in years:

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 63.0%) and Flat relief (0-10 cm., 34%).

Invertebrate and algal assemblages

The cover is dominated by Branching red algae (26.4%), Crustose Coralline Algae (12.2%) and Bare Rock (12.2%). These amounts have remained similar through the sampled years.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	SAL
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (73.6%), boulder (3.8%), sand (22.1%), and cobble (1.2%). The amount of sand varied from 8% to 30%, dependent on the exact location of the transects within the reef. The reef at Sal is very discontinous and contains areas of rock surrounded by sand.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 65.6%).

Invertebrate and algal assemblages

The cover is dominated by Branching red algae (27.3%), Bare Sand (24.1%) and Leafy red algae (6.4%). These amounts have remained similar through the sampled years.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	SCI-FORNEY
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	2001
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (55.3%), boulder (8.7%), sand (28.8%), and cobble (7.2%). These amounts have remained remarkably similar through the sampled years.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 54.7%) and Flat Relief (0-10cm., 41.8%).

Invertebrate and algal assemblages

The cover is dominated by Crustose Coralline Algae (23.7%), Bare Sand (23.1%) and Brown "scummy" Unid. algae (6.7%). Crustose corallines were dominant in 2001-2, and sand became dominant in 2003-4.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	SCI-HAZARDS
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	2000
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (67.4%), boulder (20.0%), sand (8.8%), and cobble (3.8%).

Differences in years:

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 57.2%) but one of the few sites with relatively high amounts of Moderate relief (1-2m, 17.3%) and High relief (>2m., 16.2%).

Invertebrate and algal assemblages

The cover is dominated by Crustose Coralline Algae (19.9%), *Pachythone rubra* (12.5%) and Cup corals (9.7%). Note, *P. rubra* was only noted in 2000 and 2001 as part of the UPC cover technique. *P. rubra* are now considered as a “superlayer’ on UPC.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	SCI-PELICAN
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	2000
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (56.5%), boulder (15.4%), sand (9.2%), and cobble (18.8%). These amounts have remained similar through the sampled years.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 55.0%). This amount has remained similar through the sampled years.

Invertebrate and algal assemblages

The cover is dominated by Crustose Coralline Algae (15.8%), Bare Rock (10.1%) and Bryozoan (10.0%). Although each has been the dominant in any given year, the averages are similar for all three.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB
SITE:	SCI-YELLOWBANKS
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC, QUAD
YEAR_EST:	2001
YEAR_END:	2004
COUNTY:	SANTA_BARBARA

Substrata and relief

Substrate: The substrate was composed of the following percentages: bedrock (43.9%), boulder (11.6%), sand (31.7%), and cobble (12.8%). Sand was higher in 2001-2 than in 2003-4 due to a slight shift in the locations of the sides and transects.

Relief: Overall, mostly Slight Relief (10 cm - 1 m, 60.9%).

Differences in years:

Invertebrate and algal assemblages

The cover is dominated by Bare Sand (37.2%), Crustose Coralline Algae (13.4%) and Bare Rock (9.6%). Bare sand was higher in 2001-2 than in 2003-4 due to a slight shift in the locations of the sides and transects. As Bare sand declined, Bare rock increased.

UC Santa Barbara – San Onofre

CRANE Historical Data
Program Summary Narrative

Enter information in shaded boxes below.

Program identification (Refer to Site Summary Table in Historical Data Format.)

CONTRACTOR: UCSB_3

SITE(S): SMK_1, SMK_2, SMK_14, SMK_16,
SOKU_3, SOKU_4, SOKU_20, SOKU_5, SOKU_9, SOKU_41
SOKD_11, SOKD_12,SOKD_15,SOKU_10, SOKD_60, SOKM_70
SOKD_90

SURVEY_TYPE(S): FISH

Description of sampling program (If program goals differ by site, please identify.)

Discuss the motivation for the sampling program. Include program goals and objectives, and years in existence. If program structure or focus has changed significantly during the period discussed, please indicate how it changed and when.

1979-1986. Sampling was designed to determine the effects of the once-through cooling system of San Onofre nuclear generating stations 2 and 3 on kelp bed fish populations in the San Onofre kelp forest. Sites in the San Mateo kelp forest functioned as controls in this design.

Site selection
Provide an overview of site selection criteria, site size and seasonality of field work. If selection criteria changed significantly during the period discussed, please indicate how it changed and when.

Sites were chosen in the San Onofre (SOK) and San Mateo (SMK) kelp beds to be at equivalent depths and to have a surface canopy of giant kelp. Sites were the same size (reference Site Summary Table).

Sample design- statistical
Provide an overview of the sample design, including statistical approach used to address program objectives. If sample design changed significantly during the period discussed, please indicate how it changed and when.

The BACIP design was used (see S.C. Schroeter, J.D. Dixon, J. Kastendiek, R.O. Smith, and J.R. Bence 1993. Detecting the ecological effects of environmental impacts: a case study of kelp forest invertebrates.

Sample design- logistical
Discuss, in general terms, the parameters and variables measured. Include target species or survey types completed, but NOT reported in the accompanying Historical Data Summaries. Summarize methods (e.g., transect size; planned replicate transects). **Please discuss any changes in methodology or target species over time.**

In general, all kelp forest fishes were counted and sizes estimated using cine-transect methods. Samples were taken on bottom, mid-depth and canopy transects. Bottom depths ranged from 13.4 to 16.5 meters.

Video 'Cine-Transects' were done at multiple transects in multiple directions from a station location. Each transect was a 3-minute swim for a distance of 75m. The swath was 1.5 m high by visibility function with the transects averaging about 800 to 1000 cubic meters for midwater and canopy swims. Bottom transects were 75m x 1.5m x 3m for a total volume of 337.5 m3. All midwater & canopy counts were translated into a density per 1000m3 before summaries were done for the tables.

Survey Levels at each station were:
C = Surface Canopy at 3.1m
M = Mid-Depth at 7.7m
ML= Mid-Lower Depth at 12.5m
B = Bottom at varying depths

Calculated values are formatted to 2 decimal places by formatting in Excel, which means the full value is present.

Geographic Coordinates are Latitude Longitude using NAD83 NW Quadrant

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSB_3
SITE:	SOK, SMK
SURVEY_TYPE:	Fish
YEAR_EST:	1979
YEAR_END:	1986
COUNTY:	San Diego (SOK) and Orange (SMK)

Substrata and relief
Describe the composition of substrata (sand, cobble, boulder, bedrock), and the vertical relief at the site throughout its depth range. If there was a significant change during the period discussed, please indicate how it changed and when. Please note if there are any significant physical factors (e.g. sand scour) affecting the site.

low relief, cobble and boulder reefs at both SOK & SMK. Average coverage of hard substrate at sampling sites approx. 60%

Invertebrate and algal assemblages
Discuss the dominant invertebrate and algal assemblages at the site. If there was a significant change in assemblage during the period discussed, please indicate how it changed and when.

n/a

UC Santa Cruz – PISCO

County	Site	Latitude	Longitude
Monterey	Andrew_Molera	36.278312	-121.870125
Monterey	Big_Creek	36.069117	-121.606558
Monterey	Bluefish	36.523688	-121.946135
San_Luis_Obispo	Cambria_Rock	35.569190	-121.125725
Monterey	Carmel	36.543258	-121.938450
San_Luis_Obispo	Cayucos	35.434633	-120.948612
Monterey	Duck_Pond	35.857747	-121.425622
Monterey	Esalen	36.126257	-121.648978
Monterey	Hopkins	36.621988	-121.902268
San_Luis_Obispo	La_Cruz	35.711720	-121.324728
Monterey	Lingcod	36.563667	-121.965667
Monterey	Lopez_Rock	36.025315	-121.581337
Monterey	Lucia	36.016105	-121.561492
Monterey	Macabee	36.617668	-121.896265
Monterey	McWay	36.167238	-121.685550
Monterey	Monastery	36.525325	-121.931897
Monterey	Partington	36.172750	-121.697133
Monterey	Pescadero	36.560288	-121.957062
Monterey	Plaskett_Rock	35.915847	-121.478678
Monterey	Point_Sur	36.295213	-121.895549
Monterey	Salmon_Creek	35.809150	-121.377617
Santa_Cruz	Sandhill	36.973567	-122.150542
San_Luis_Obispo	San_Simeon	35.630725	-121.192963
Monterey	Stillwater	36.560217	-121.945867
Santa_Cruz	Terrace	36.944892	-122.065283
Monterey	Weston	36.511485	-121.947273
San_Luis_Obispo	White_Rock	35.526372	-121.087255
Monterey	Wild_Cattle	35.976100	-121.493372

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	ANDREW_MOLERA
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (38%) with roughly equivalent amounts of boulder (25%), sand (20%), and cobble (17%). Differences in coverage of sand (31->9%) and bedrock (17->58%) were the result of moving the location of transects within this site between the two years it has been sampled.

Relief: Overall, mostly low relief (10cm-1m, 67%). Large drop in the amount of flat (0-10cm) relief from 2003 to 2004 (47->1%) and increase in low relief (40->94%) also as a result of relocating transects

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (21%), crustose (11%) and articulated coralline (4%) red algae. Dominant sessile invertebrates included colonial tunicates (1.7%), sponges (1.2%) and bryozoans (0.9%). The main differences that resulted from moving transects to rockier substrates were that coralline crusts increased (9->13%) and the cover of branched fleshy red algae increased (18->25%).

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	BIG_CREEK
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2001
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (68%) with lower coverage of boulder (18%), sand (12%), and very few cobbles (2%). These amounts have stayed relatively stable in each of the years sampled, except for slightly elevated cover of sand (21%) and reduced bedrock (54%) seen in the first year sampled, 2001.

Relief: Overall, mostly low relief (10cm-1m, 53%) with lower coverage of moderate and high (>1m) relief (24%). These amounts have remained similar through the sampled years.

Invertebrate and algal assemblages

Algae are dominated by crustose (15%) and articulated (15%) coralline reds. Dominant sessile invertebrates include colonial tunicates (6.5%), bryozoans (5.1%) and sponges (4.4%). In 2002 as the elevated sand cover seen in 2001 was removed slightly higher coverage of crustose coralline algae (23%) was recorded.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	BLUEFISH
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (79%) with lower coverage of boulder (13%), sand (6%), and few cobbles (2%). These amounts have stayed relatively stable in each of the years sampled, except that very little sand (0.1%) and boulder (1.5%) were seen in 2002 along with an increased cover of bedrock (97%).

Relief: Overall, mostly low relief (10cm-1m, 44%) with lower coverage of moderate (>1m) and high (>2m) relief (25% and 21% respectively). These amounts have remained similar through the sampled years.

Invertebrate and algal assemblages

Algae are dominated by and articulated (29%) crustose (18%) coralline reds with 6.4% cover of branched fleshy reds. Dominant sessile invertebrates include *Dodecaceria fewkesii* (5.6%), colonial tunicates (5.5%) and sponges (2.6%). These coverage amounts have been relatively stable throughout the sample period.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	CAMBRIA_ROCK
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2002
YEAR_END:	2004
COUNTY:	SAN_LUIS_OBISPO

Substrata and relief

Substrate: On average, dominated by exposed bedrock (70%) with lower coverage of sand (17%), boulder (9%), and few cobbles (4%). These amounts have stayed relatively stable in each of the years sampled, except that in the first sample year, 2002, higher cover of sand (21%) and cobbles (10%) were covering areas of bedrock (57%).

Relief: Overall, mostly low relief (10cm-1m, 52%) with areas of flat relief (0-10cm, 23%), lower coverage of moderate (>1m) and high (>2m) relief (13% and 12% respectively). Recorded cover of moderate and high relief has fluctuated in some years (27% and 23%) suggesting that the site is somewhat heterogeneous.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (34%) and broad-leaved (7.4%) reds coralline reds with 6.4% cover articulated of. Dominant sessile invertebrates include *Diopatra ornata* (5.5%), cup corals (5.0%) and bryozoans (3.3%). Higher coverage of Diopatra (9.6%) along with areas of shell hash (8.9%) were seen in 2002.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	CARMEL
SURVEY_TYPE:	FISH
YEAR_EST:	2003
YEAR_END:	2003
COUNTY:	MONTEREY

Substrata and relief

No benthic data recorded at this site.

Invertebrate and algal assemblages

No benthic data recorded at this site.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	CAYUCOS
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	SAN_LUIS_OBISPO

Substrata and relief

Substrate: On average, dominated by exposed bedrock (43%) with lower coverage of boulder (27%), sand (15%), and cobbles (15%). These amounts were relatively similar between the two years sampled.

Relief: Overall, mostly low relief (10cm-1m, 74%) with areas of flat relief (0-10cm, 18%) and very little coverage of moderate (>1m) and high (>2m) relief (6.2% and 1.5% respectively). These amounts differed little between the two years sampled.

Invertebrate and algal assemblages

Algae are dominated by crustose coralline (28%) and branched fleshy (11%) reds, with 5% cover of crustose fleshy reds. Dominant sessile invertebrates include *Diopatra ornata* (8.4%), colonial tunicates (5.8%) and bryozoans (4.7%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	DUCK_POND
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (53%) with lower coverage of boulder (33%), sand (11%), and cobbles (2.6%). These amounts were relatively similar between the two years sampled.

Relief: Overall, mostly low relief (10cm-1m, 60%) with lower coverage of moderate (>1m) and high (>2m) relief (28% and 8.3% respectively). These amounts differed little between the two years sampled.

Invertebrate and algal assemblages

Algae are dominated by crustose coralline (18%) and branched fleshy (14%) reds, with 12% cover of articulated coralline reds and 4.5% cover of *Desmarestia*. Fewer sessile invertebrates were present and were dominated by colonial tunicates (3.7%) and bryozoans (3.0%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	ESALEN
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2001
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (66%) with lower coverage of boulder (19%), sand (10%), and cobbles (5%). These amounts were relatively similar between sample years.

Relief: Overall, mostly low relief (10cm-1m, 54%) with lower coverage of moderate relief (>1m, 25%). Some areas of flat (<10cm) and high (>2m) relief were present (10.5% and 10.2% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by crustose (22%) and articulated (21%) coralline reds, with 12% cover of branched fleshy reds. Fewer sessile invertebrates were present and were dominated by colonial tunicates (4.1%) and bryozoans (3.7%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	HOPKINS
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (74%) with lower coverage of sand (19%), boulder (6.6%), and very few cobbles (0.6%). These amounts were relatively similar between sample years except there was more sand (32%) and less bedrock (60%) in 2003.

Relief: Overall, mostly low relief (10cm-1m, 49%) with lower coverage of flat (<10cm) relief (25%). Some areas of moderate (>1m) and high (>2m) relief were present (18% and 7.4% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (16%), broad-leaved (15%), and articulated coralline (6.2%) reds. Relatively few sessile invertebrates were present and were characterized by colonial tunicates (4.6%) and Diopatra ornata (4.0%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	LA_CRUZ
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (65%) with lower coverage of boulder (13%), sand (12%), and cobble (11%). Cover of sand increased from 6.6% to 16% in 2004 along with a decrease (71% to 58%) in bedrock cover suggesting that sand burial/scour occurs at this site.

Relief: Overall, mostly low relief (10cm-1m, 63%) with lower coverage of flat (<10cm) relief (20%). Some areas of moderate (>1m) and very little high (>2m) relief were present (15% and 1.4% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (29%), crustose coralline (13%), and broad-leaved (12%) reds. Very few sessile invertebrates were present and were characterized by colonial tunicates (1.8%) and bryozoans (1.0%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	LINGCOD
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2001
YEAR_END:	2002
COUNTY:	MONTEREY

Substrata and relief

Substrate: Almost completely dominated by exposed bedrock (94%) with small areas of boulder (1.9%), sand (2.9%) and cobble (0.8%). These amounts did not change appreciably in the two years this site was sampled.

Relief: Overall, mostly low relief (10cm-1m, 54%) with lower coverage of moderate (>1m) and high (>2m) relief (28% and 11% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by a large percentage of articulated coralline reds (40%) with some rustose coralline (20%), branched fleshy (10%), and broad-leaved (8.6%) reds. Very few sessile invertebrates were present; among them were sponges (1.2%) and barnacles (1.0%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	LOPEZ_ROCK
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2001
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by exposed bedrock (53%) with lower coverage of boulder (29%), sand (14%), and cobbles (4%). The number of points assigned to either bedrock or boulder varied significantly between years. Potentially, when sand cover was reduced (e.g. 9.7% in 2003) more boulders (50%) were revealed as being separate from the bedrock substrate (35%).

Relief: Overall, mostly low relief (10cm-1m, 60%) with lower coverage of moderate relief (>1m, 22%). Some areas of flat (<10cm) and high (>2m) relief were present (11% and 7% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by articulated coralline reds branched fleshy (15%), crustose coralline (15%), and articulated coralline (12%) reds. Sessile invertebrates characterized by colonial tunicates (4.0%), sponges (3.1%) and barnacles (3.3%). No major differences were seen between the sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	LUCIA
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by boulders (52%) with lower coverage of cobble (18%), sand (16%), and bedrock (15%). In 2004 there was no sand recorded at this site and increased cover of cobbles was recorded (47%).

Relief: Overall, mostly low relief (10cm-1m, 68%) with lower coverage of flat (<10cm) relief (20%). Small areas of moderate (>1m) and high (>2m) relief were present (9.8% and 2.2% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (15%), crustose coralline (8.2%), and lacy (polysiphonious) (6.1%) reds. Sessile invertebrates characterized by colonial tunicates (5.3%), *Diopatra ornata* (4.9%) and sponges (4.8%). Cover of coralline crusts increased from 5% to 16% along with the removal of sand in 2004.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	MACABEE
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by bedrock (59%) with lower coverage of sand (23%), boulder (17%), and very few cobbles (0.9%). In years with lower sand cover (18-22%) there was relatively higher cover of boulders recorded (20-29%) suggesting that as sand was removed these substrates were revealed as being separate from the underlying bedrock.

Relief: Overall, mostly low relief (10cm-1m, 60%) with lower coverage of flat (<10cm) relief (26%). Small areas of moderate (>1m) and high (>2m) relief were present (12% and 1.4% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (19%), broad-leaved (15%), and crustose coralline (5.31%) reds. Sessile invertebrates characterized by bryozoans (3.1%), barnacles (2.2%) and colonial tunicates (1.9%). No major differences in these amounts between sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	MCWAY
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2003
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by bedrock (39%) with lower coverage of boulder (31%), sand (21%), and cobbles (8%). Only one year was sampled at this site.

Relief: Overall, mostly moderate relief (>1m, 39%) with similar coverage of low (10cm-1m) relief (38%). Smaller areas of flat (<10cm) and high (>2m) relief were present (17% and 6.4% respectively). Only one year was sampled at this site.

Invertebrate and algal assemblages

Algae are dominated by crustose coralline (15%), branched fleshy (10.5%), and articulated coralline (8.7%) reds. Sessile invertebrates characterized by *Diopatra ornata* (14%), colonial tunicates (7.4%) and bryozoans (5.9%). Only one year was sampled at this site.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	MONASTERY
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by bedrock (74%) with lower coverage of boulder (19%), sand (4.8%), and very few cobbles (2.3%). Cover of sand increased to a high of 9% in 2003 along with an increase in boulder to 24.9 and a decrease in bedrock to 63%.

Relief: Overall, mostly low relief (10cm-1m, 57%) with lower coverage of moderate (>1m) relief (29%). Small areas of high (>2m) and flat (<10cm) relief were present (11% and 3% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Relatively high algal cover characterized by articulated coralline (21%), crustose coralline (19%), and branched fleshy (11%) reds. Sessile invertebrates include sponges (2.1%), *Dodecaceria fewkesiii* (1.8%), bryozoans (1.7%) and cup corals (1.3%). Cover of fleshy red algae declined from a total of 34% in 2002 to 22% in 2003, otherwise cover of other biotic groups remained stable.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	PARTINGTON
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2003
COUNTY:	MONTEREY

Substrata and relief

Substrate: On average, dominated by bedrock (74%) with lower coverage of cobble (16%), sand (9.4%), and very few boulders (0.5%). Only one year was sampled at this site.

Relief: Overall, mostly low relief (10cm-1m, 66%) with lower coverage of moderate (>1m) relief (18%). Small areas of flat (<10cm) and high (>2m) relief were present (10.4% and 5.6% respectively). Only one year was sampled at this site.

Invertebrate and algal assemblages

Relatively low biotic cover including the algae *Desmarestia ligulata* (14%), branched fleshy (9.9%), and articulated coralline (8.8%) reds; and the sessile invertebrates characterized by sponges (7.1%), colonial tunicates (6.9%) and bryozoans (3.9%). Only one year was sampled at this site.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	PESCADERO
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (91%) with low coverage of boulder (5.5%), cobbles (2.8%), and very little sand (1.2%). These amounts did not differ greatly between the two years sampled.

Relief: Overall, mostly low relief (10cm-1m, 46%) with coverage of moderate (>1m) relief (25%) and smaller areas of high (>2m) and flat (<10cm) relief were present (16% and 13% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by crustose (21%) and articulated (18%) coralline, and branched fleshy (17%) reds. Low sessile invertebrates cover made up of sponges (2.9%), cup corals (2.0%) and bryozoans (1.9%). No major differences were seen between sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	PLASKETT_ROCK
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (78%) with low coverage of boulder (11%), sand (8.7%), and few cobbles (2.3%). These amounts did not differ greatly between the two years sampled.

Relief: Overall, mostly low relief (10cm-1m, 49%) with coverage of moderate (>1m) relief (29%) and smaller areas of high (>2m) and flat (<10cm) relief were present (14% and 8.7% respectively). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by articulated (22%) and crustose (13%)coralline, and branched fleshy (17%) reds. Low sessile invertebrate cover made up of bryozoans (2.6%), tunicates (2.5%) and *Diopatra ornata* (2.0%). No major differences were seen between sample years.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	PT_SUR
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	1999
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (65%) with lower coverage of boulder (18%), sand (11%), and few cobbles (5.4%). This site was only sampled in 1999 as a new site was established nearby at Andrew Molera.

Relief: Overall, mostly moderate (>1m) relief (47%) with coverage of low relief (10cm-1m, 39%) and smaller areas of high (>2m) and flat (<10cm) relief were present (6.7% and 7.6% respectively).

Invertebrate and algal assemblages

Algae are dominated by fleshy red (25%), crustose (16%) and articulated (14%) corallines. Sessile invertebrate cover made up of tunicates (7.9%), sponges (4.4%) and bryozoans (1.8%).

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	SALMON_CREEK
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (53%) with coverage of boulder (30%), sand (10%), and cobbles (6.5%). Sand movement may be an important factor at this site – as the cover of sand increased from 5 to15% the amount of hard substrate recorded as bedrock decreased (75>31%) and the amount recorded as boulder increased (14>47%).

Relief: Overall, mostly low relief (10cm-1m, 83%) with coverage of moderate (>1m) relief (11%) and smaller areas of flat (<10cm) relief (5.1%). Very little high (>2m) relief (0.8%) was present. These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (20%) articulated (12%) and crustose (14%) coralline reds. Low sessile invertebrate cover made up of *Diopatra ornata* (7.4%) barnacles (4.1%), and cup corals (2.6%). Cover of branched fleshy reds decreased (29>11%) between years along with the increase in sand cover.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	SAN_SIMEON
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	SAN_LUIS_OBISPO

Substrata and relief

Substrate: Composed primarily of bedrock (74%) with coverage of sand (10%), boulder (9.1%), and cobbles (6.9%). These amounts differed little between years sampled.

Relief: Overall, mostly low relief (10cm-1m, 76%) with coverage of moderate (>1m) relief (11%) and smaller areas of flat (<10cm) relief (7.9%). Very little high (>2m) relief (4.8%) was present. These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (23%), crustose (16%) and polysiphonious (lacy, 8.3%) reds. Low sessile invertebrate cover made up of barnacles (4.7%), *Diopatra ornata* (4.4%), and bryozoans (3.1%). These amounts differed little between years sampled.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	SANDHILL
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	SANTA_CRUZ

Substrata and relief

Substrate: Composed primarily of bedrock (91%) with low coverage of sand (6.7%), boulder (2.4%), and cobbles (1.1%). In the last two years sand cover was increased (12%) along with a corresponding decrease in exposed bedrock (84-88%).

Relief: Overall, mostly low relief (10cm-1m, 57%) with coverage of flat (<10cm) relief (38%), moderate (>1m) relief (3.4%) and very little high (>2m) relief (3.0%). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (32%), broad-leafed (6.6%) and polysiphonious (lacy, 6.0%) reds. Relatively high sessile invertebrate cover made up of tunicates (8.8%), *Diopatra ornata* (8.8%), and barnacles (6.8%). These amounts differed little between years sampled.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	STILLWATER
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	1999
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (82%) with low coverage of boulder (8.5%), sand (5.8%), and cobbles (3.9%). In 2002 sand cover was increased (12%) along with a corresponding decrease in exposed bedrock (71%).

Relief: Overall, mostly low relief (10cm-1m, 43%) with coverage of high (>2m) relief (22%), flat (<10cm) relief (20%), moderate (>1m) relief (17%). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by articulated (35%) and crustose (18%) corallines and broad-leaved (6.0%) reds. Low sessile invertebrate cover made up of barnacles (3.3%) and cup corals (2.5%). These amounts differed little between years sampled.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	TERRACE
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2000
YEAR_END:	2004
COUNTY:	SANTA_CRUZ

Substrata and relief

Substrate: Composed primarily of bedrock (64%) with low coverage of sand (35%), and very few boulders (0.9%), and cobbles (0.2%). In 2002 and 2004 sand cover was increased (53% and 43%) along with a corresponding decrease in exposed bedrock.

Relief: Overall, mostly flat (<10cm) relief (75%), with some low relief (10cm-1m, 24%) and almost no moderate (>1m) relief (1.5%) or high (>2m) relief (0.9%). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (12.3%), polysiphonious (lacy, 9.8%) and broad-leafed (5.6 %) reds. Relatively high sessile invertebrate cover made up of *Diopatra ornata* (12.5%), tunicates (6.0%), and barnacles (2.7%). These amounts differed little between years sampled.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	WESTON
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2001
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (86%) with low coverage of sand (7.5%), and very few boulders (5.5%), and cobbles (1.2%). These amounts differed little between years sampled.

Relief: Overall, mostly low relief (10cm-1m, 39%) with some moderate (>1m) relief (22%) flat (<10cm) relief (18%), and high (>2m) relief (20%). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by articulated (34%) and crustose (16%) corallines and branched fleshy (14%) reds. Low sessile invertebrate cover made up of tunicates (3.2%), barnacles (2.3%) and bryozoans (2.0%). These amounts differed little between years sampled.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	WHITE_ROCK
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2002
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (75%) with low coverage of sand (9.9%), and few boulders (7.5%), and cobbles (7.2%). These amounts differed little between years sampled.

Relief: Overall, mostly low relief (10cm-1m, 82%) with some moderate (>1m) relief (9.7%), flat (<10cm) relief (6.4%), and high (>2m) relief (2.3%). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (35%), and crustose (12%) and articulated (8.3%) coralline reds. Low sessile invertebrate cover made up of *Diopatra ornata* (2.8%), barnacles (2.2%) and bryozoans (2.0%). These amounts differed little between years sampled.

CRANE Historical Data
Benthic Assemblage Narrative- Site Summary

Enter information in shaded boxes below.

Site identification (Refer to Site Summary Table in Historical Data Format)

CONTRACTOR:	UCSC
SITE:	WILD_CATTLE
SURVEY_TYPE:	FISH, SWATH_DENSITY, UPC
YEAR_EST:	2003
YEAR_END:	2004
COUNTY:	MONTEREY

Substrata and relief

Substrate: Composed primarily of bedrock (60%) with lower coverage of sand (23%), boulders (16%), and cobbles (0.8%). These amounts differed little between years sampled.

Relief: Overall, mostly low relief (10cm-1m, 57%) with some flat (<10cm) relief (19%), moderate (>1m) relief (15%), , and high (>2m) relief (8.5%). These amounts differed little between years sampled.

Invertebrate and algal assemblages

Algae are dominated by branched fleshy (19%), polysiphonious (lacy, 6.8%) and crustose coralline (5.8%) reds. Low sessile invertebrate cover made up of tunicates (6.2%), *Diopatra ornata* (5.5%) and sponges (4.9%). These amounts differed little between years sampled.

UC San Diego SIO – Point Loma

County	Site	Latitude	Longitude
San Diego	PtLoma_12m_C	32.6994967	-117.2645528
San Diego	PtLoma_15m_C	32.6999098	-117.2685171
San Diego	PtLoma_18m_C	32.6991481	-117.2718001
San Diego	PtLoma_18m_N	32.7221400	-117.2698958
San Diego	PtLoma_18m_S	32.6597357	-117.2510505

CRANE Historical Data
Program Summary Narrative

Enter information in shaded boxes below.

Program identification (Refer to Site Summary Table in Historical Data Format.)

CONTRACTOR: SIO

SITE(S): Pt. Loma

SURVEY_TYPE(S): Invertebrates and Algae

Description of sampling program (If program goals differ by site, please identify.)

Discuss the motivation for the sampling program. Include program goals and objectives, and years in existence. If program structure or focus has changed significantly during the period discussed, please indicate how it changed and when.

Longterm monitoring. Inter and intra-specific competition. Physical oceanographic influence over biological processes. Program established in mid 70s.

Site selection
Provide an overview of site selection criteria, site size and seasonality of field work. If selection criteria changed significantly during the period discussed, please indicate how it changed and when.

All sites were chosen to be similar enough to each other across a depth gradient to be able to compare them (i.e. no major vertical relief, sandy areas, etc.).

Sample design- statistical
Provide an overview of the sample design, including statistical approach used to address program objectives. If sample design changed significantly during the period discussed, please indicate how it changed and when.

Sample design- logistical
Discuss, in general terms, the parameters and variables measured. Include target species or survey types completed, but NOT reported in the accompanying Historical Data Summaries. Summarize methods (e.g., transect size; planned replicate transects). **Please discuss any changes in methodology or target species over time.**

Algae and invertebrates surveyed along 4 replicate 25 meter transects, width=4m; Transect lines oriented crosshore

Vantuna Research Group – King Harbor and Palos Verdes Point