

Southern California Offshore Banks

National Marine Sanctuary Proposal

August 2016



Section I – Basics

Nomination Title: Southern California Offshore Banks National Marine Sanctuary Proposal

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Section II – Introduction

Narrative Description

Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow, offshore habitats that are under threat and would greatly benefit from increased coordination of management efforts as well as protection from potential oil and gas extraction. During the last glacial maximum, the largest of these habitats, Tanner and Cortes Banks, were islands and were likely visited by Native Americans, as such there may be unknown archaeological sites on these banks. The region including these banks is uniquely located at the confluence of the California Current and Southern California Counter Current in an extremely productive environment whose habitats are likely linked to the overall biological production of the Southern California Bight (SCB). Thus, these offshore banks are preferred feeding areas for protected marine mammals, birds and support unique populations of corals. They also maintain the largest known remaining populations of the federally endangered white abalone (*Haliotis sorenseni*). Two former fisheries species that are now listed as protected species of concern, Cowcod (*Sebastes levis*) and Bocaccio (*Sebastes paucispinis*), also utilize these areas. In addition, the high productivity at Tanner and Cortes Banks generates significant economic value, as these banks support a large percentage of the commercial and recreational fisheries in the SCB. This region also is used by the military, especially the U.S. Navy, for offshore security activities. Importantly, this proposal does not recommend the curtailment of these either military or fisheries activities but emphasizes the need to coordinate these offshore activities with national security concerns while prohibiting oil and gas extraction, mining, and other industrial uses.

Goals Description

1. Protect and manage critical offshore resources including endangered and protected species.
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies, universities and industries in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating), commercial fishing and recreational fishing.
5. Protect potential archaeological resources for future study.

Location Description

The current proposal delineates an area of 6,639 km². Cortes and Tanner Banks comprise 1359.6 and 63.2 hectares of shallow (<30 m) subtidal habitat. The tops of these banks are most

similar to island habitats without the emergent land masses (Emery 1960). Together, they contain ~4.7% of the shallow subtidal island habitat in the bight (Pondella et al. 2015a). The three other prominent relatively shallow features are Cherry Bank (28 m), Garrett Ridge (39 m) and Northeast Bank (108 m) (Emery 1960). Surrounding these ridges and banks are basins and canyons (San Nicolas, East Cortes, West Cortes and Tanner). These basins have sill depths from 1100-1400 m and basin depths to 1979 m (Table A).

Table A. Surrounding basin and associated depths (From Emery 1960).

Basin	Sill Depth (m)	Basin depth (m)
San Nicolas	1106	1832
East Cortes	1415	1979
West Cortes	1362	1796
Tanner	1165	1551

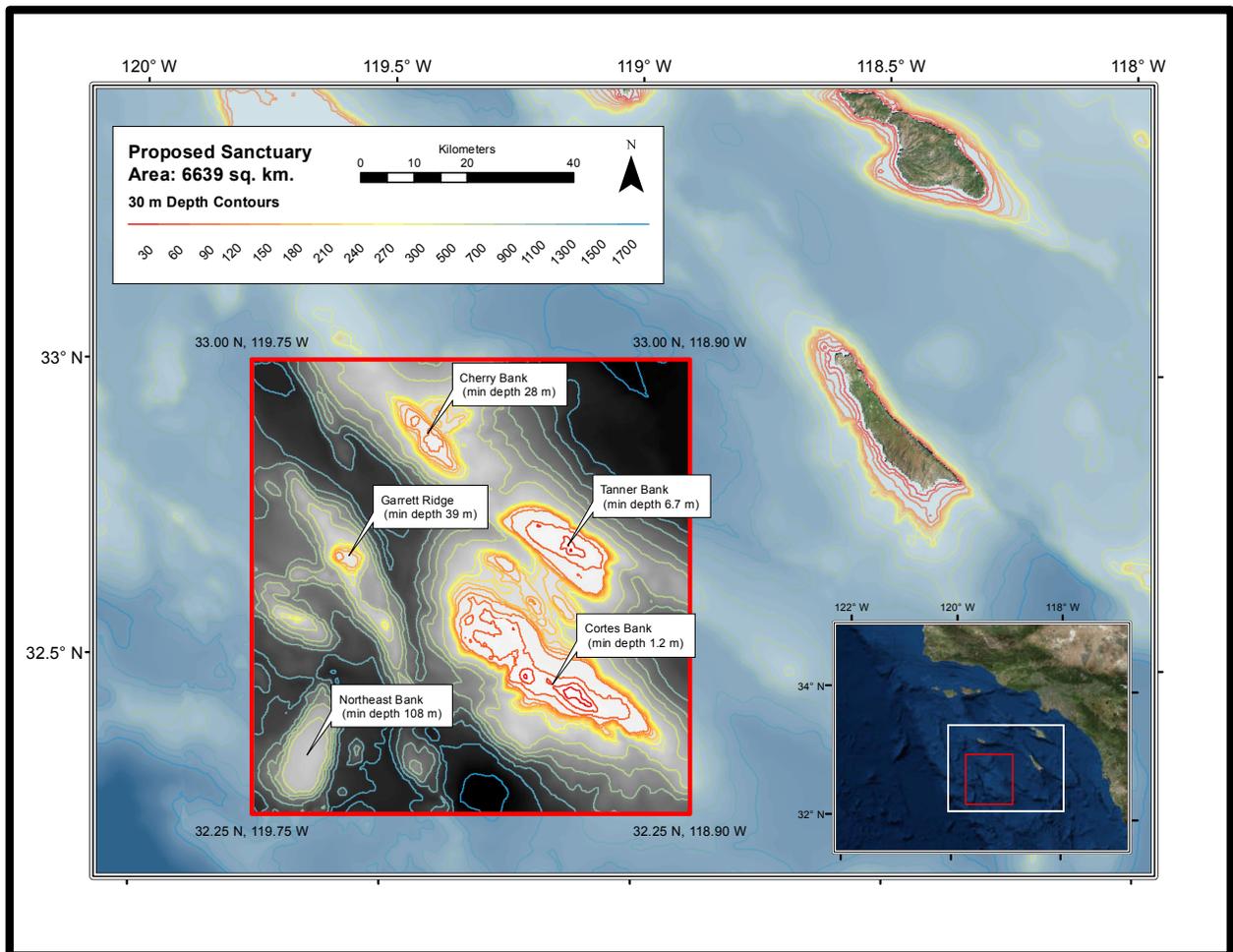


Figure A. Map of the proposed sanctuary area showing the five major banks within the proposed sanctuary boundary (red box), the five major banks within the proposed sanctuary (Garrett Ridge, Cherry, Tanner, Cortes, and Northeast Banks), and the surrounding islands of San Clemente to the East and Santa Catalina to the northeast. Inset depicts the proposed sanctuary location (red box) within the SCB.

Section III – Criteria Information

Criteria 1-The area's natural resources and ecological qualities are of special significance and contribute to: biological productivity or diversity; maintenance or enhancement of ecosystem structure and function; maintenance of ecologically or commercially important species or species assemblages; maintenance or enhancement of critical habitat, representative biogeographic assemblages, or both; or maintenance or enhancement of connectivity to other ecologically significant resources.

Summary

The Southern California offshore banks are unique among the shallow reef communities of California in that they occur far from land and are surrounded by deep ocean (Figure A). This unique geography has allowed the development of biological communities with a composition unlike those found elsewhere in the SCB. Furthermore, the considerable distance from the mainland and inhabited islands has provided these Banks with a partial refuge from the intense commercial and recreational harvest of marine organisms that occurs at shallow water reefs throughout the mainland and the Channel Islands. The largest remaining extant wild population of the critically endangered white abalone (*Haliotis sorenseni*) is found at Tanner Bank (Butler et al. 2006) and populations of the rare purple hydrocoral (*Stylaster californicus*) occur on both Cortes and Tanner Banks (Lewbel et al. 1981).

Based upon the geological and oceanographic intricacies of this region, the SCB represents a transitional zone between the warm temperate San Diegan fauna and the cool temperate Oregonian fauna dramatically increasing the overall diversity of the region (Horn and Allen 1978, Pondella et al. 2005). These biogeographic regions are generally described in two dimensional space throughout the SCB. However, these offshore banks, due to the range in depth and location with respect to the California Current, support warm water taxa in their extensive shallow reaches and cool water taxa at depth. Layering on the pelagic faunal components creates a vibrant, diverse and productive ecosystem, which is not replicated anywhere else in the region, the state, or the Pacific Northwest.

Geology

The SCB is floored by a ~300 km wide region of extensively faulted and extended continental crust comprising Mesozoic metamorphic and intrusive igneous rock as well as Neogene sedimentary and volcanic units (Crouch and Suppe 1993). This region of submerged continental crust (Figure B) is referred to in the geological literature as the California Continental Borderlands (CCB). It differs markedly from the continental shelf north of Point Conception, the northern border of the SCB, which is typically less than 100 km wide. The northern end of the CCB is formed by the E-W oriented Transverse Ranges, a large fault-bounded crustal block that underwent 90° of CW rotation between 15 Ma and 5 Ma (Luyendyk 1991). Rotation of the Transverse Range block and the submergence of extended continental crust in its wake created the SCB from a preexisting coastline that had relatively straight, NW-SE trend. The extension of the CCB occurred over approximately the same interval and is likely related to the rotation of the transverse range block (Crouch and Suppe 1993; Bohannon and Geist 1998). Seismic evidence (Lekic et al. 2011) shows that the entire thickness of the Pacific Plate (i.e., the continental crust plus the uppermost mantle) has been extended and thinned. Differential subsidence along the many faults that cut the CCB has produced the distinctive topography of islands and outer banks separated by ~1 km deep basins.

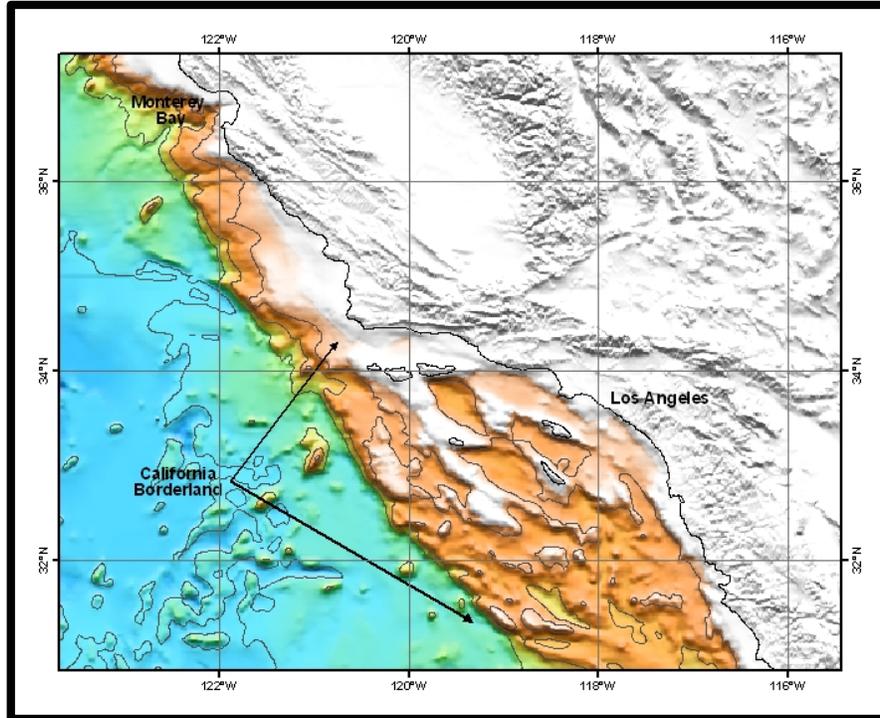


Figure B. The continental shelf off Southern and Central California.

Oceanography

The SCB occurs within the broader context of the California Current (CC), which is a major equatorward, alongshore current flowing along the eastern boundary of the North Pacific Ocean. The circulation is driven by basin-scale forcing, and is amplified along the coast by the formation of an equatorward jet due to coastal upwelling as described in Auad et al. (2011). This coastal upwelling of deep, cold, nutrient-rich water subsidizes the primary productivity in the form of phytoplankton and benthic macrophytes, thus allowing rich biological communities to flourish both offshore and directly along the coastline of the US West coast and along the West coast of Mexico's Baja California.

The geographic configuration of the SCB results in the formation of a large counter-clockwise eddy landward of the main equatorward flow (Hickey 1992, Figure C), generally described as a poleward surface Inshore Countercurrent along the coast and a poleward undercurrent (California Undercurrent) that flows toward the North at a depth of approximately 200m along the continental slope (Dong et al. 2009, Figure D). Temporal and mesoscale spatial variability due to seasonal changes and local wind forcing results in the weakening and even reversal of the Inshore Countercurrent during spring upwelling season, yet strengthening poleward flow during summer and into fall (Bray et al. 1999). This circulation pattern, coupled with its complex bathymetry of the SCB, results in strong abiotic gradients within the SCB.

The shallow offshore banks in the southwest portion of the SCB (including Cortes, Tanner, Northeast, and Cherry Banks among others) are situated such that they are exposed to the main offshore portion of the equatorward-flowing California Current as well as the poleward-flowing California Undercurrent, depending on depth. When currents interact with the steep and complex bathymetry of seamounts and banks, increased vertical mixing results in turbulent upwelling that brings nutrient-rich deep water near the surface where it boosts both pelagic and benthic productivity (Genin and Boehlert 1985).

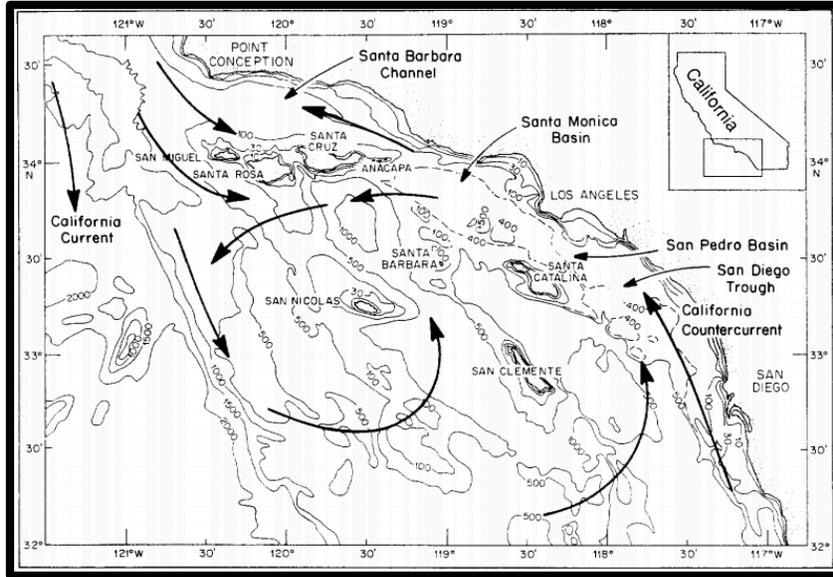


Figure C. Bottom topography and schematic mean circulation pattern in the SCB. Depth contours are in fathoms. (From Hickey 1992).

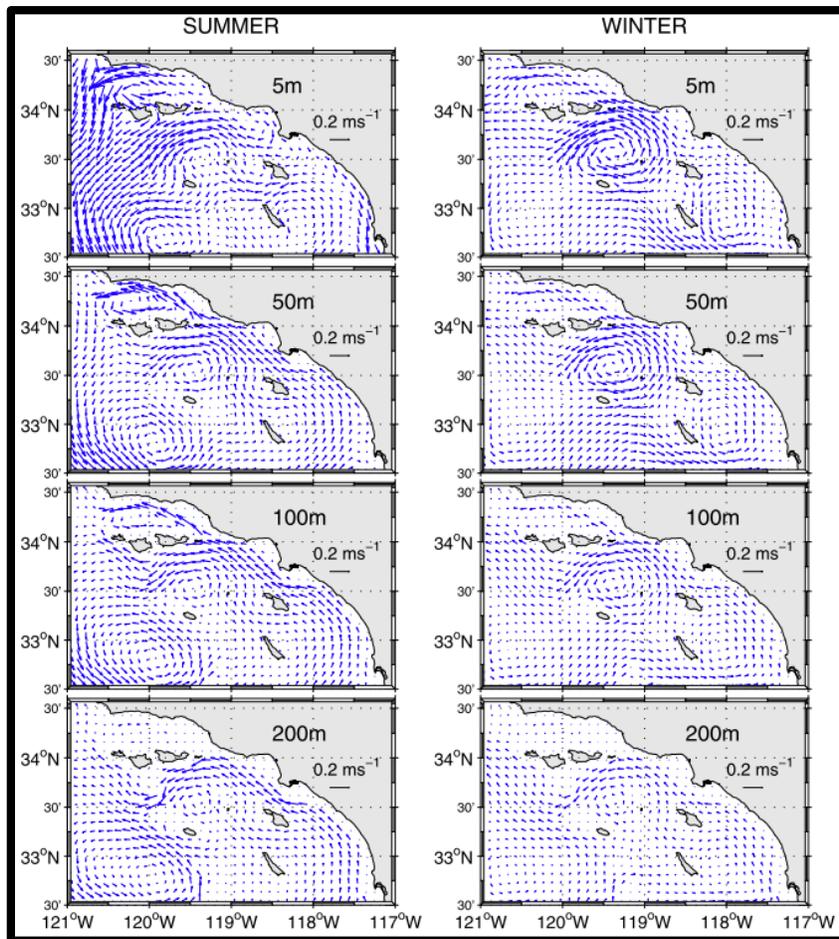


Figure D. Mean-seasonal currents in the SCB derived from ROMS model output at water depths of 5 m (top), 50 m (next to top), 100 m (next to bottom), and 200 m (bottom) during summer (left) and winter (right). (From Dong et al. 2009).

Deep Reef Surveys

Fish surveys have been conducted at Tanner and Cortes Banks using the manned research submersible Delta between 1997 and 2002 to examine rockfish populations (Figure E). Yoklavich et al. (2007) found that Tanner and Cortes Banks were the hot spot, in terms of total abundance and biomass of Cowcod (*Sebastes levis*), among the major offshore rock banks they surveyed. Cowcod were previously declared by NOAA NMFS as overfished and estimated to be at 7% of its unfished biomass (Butler et al. 2003). Therefore, Tanner and Cortes Banks represent important habitat in the Southern California Bight for this and other commercial important rockfish species. More detail of these submersible survey methods and results can be found in Yoklavich et al. (2007) and Love et al. (2009).

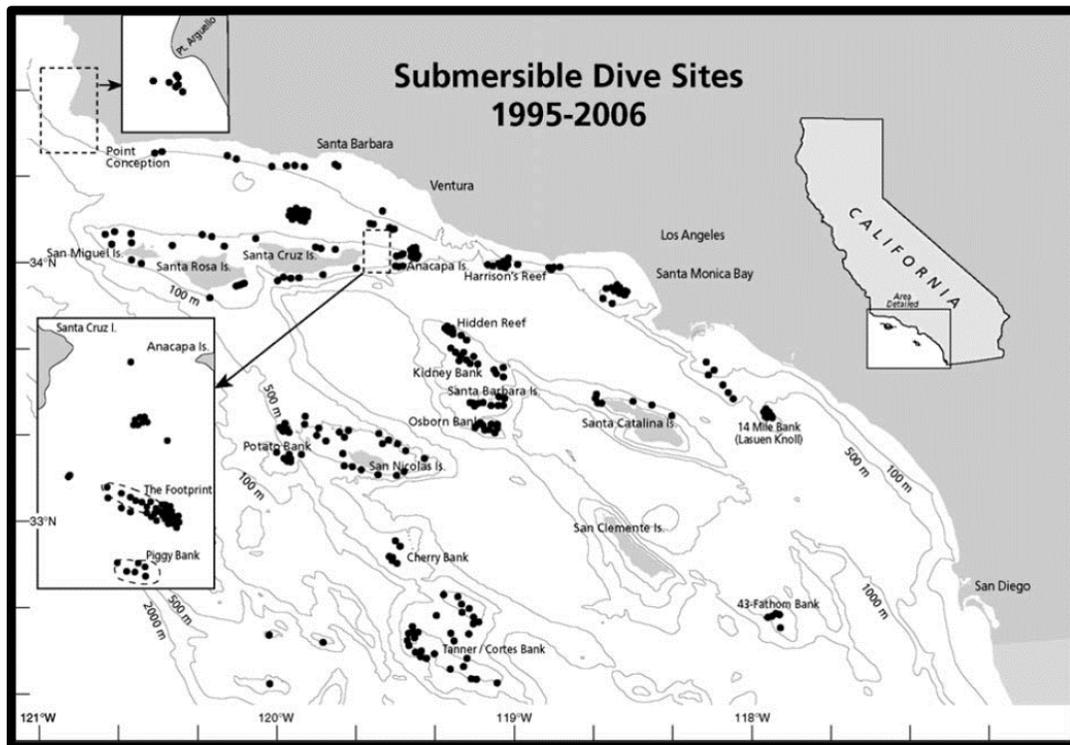


Figure E. Locations of the dive surveys conducted in southern California by Milton Love and collaborators between 1995 and 2006 using the research submersible Delta. Note that some dots represent more than one dive made in the same general area. (From Love et al. 2009)

Endangered and Critical Species

Abalone

White abalone (*Haliotis sorenseni*) were surveyed at Tanner Bank in July 2002 and September 2004, at Cortes Bank in July 2003, and at San Clemente Island in August 2004 by Butler et al. (2006) using small ROVs. Habitat was mapped using a combination of side-scan and multibeam sonar techniques and ROV video and was characterized by depth, an index of rugosity (from multibeam data), and algal type and cover (from ROV video). Based on observed density and available habitat, this study calculated the total white abalone population to be between 5,883 (2004 data) and 12,818 (2002 data) at Tanner Bank, 7,366 at Cortes Bank, and 1938 at San Clemente Island. Nearly all surveys were conducted between 30 m and 60 m depth.

More details about the surveys, abalone size distributions, densities, and habitat associations can be found in Butler et al. (2006).

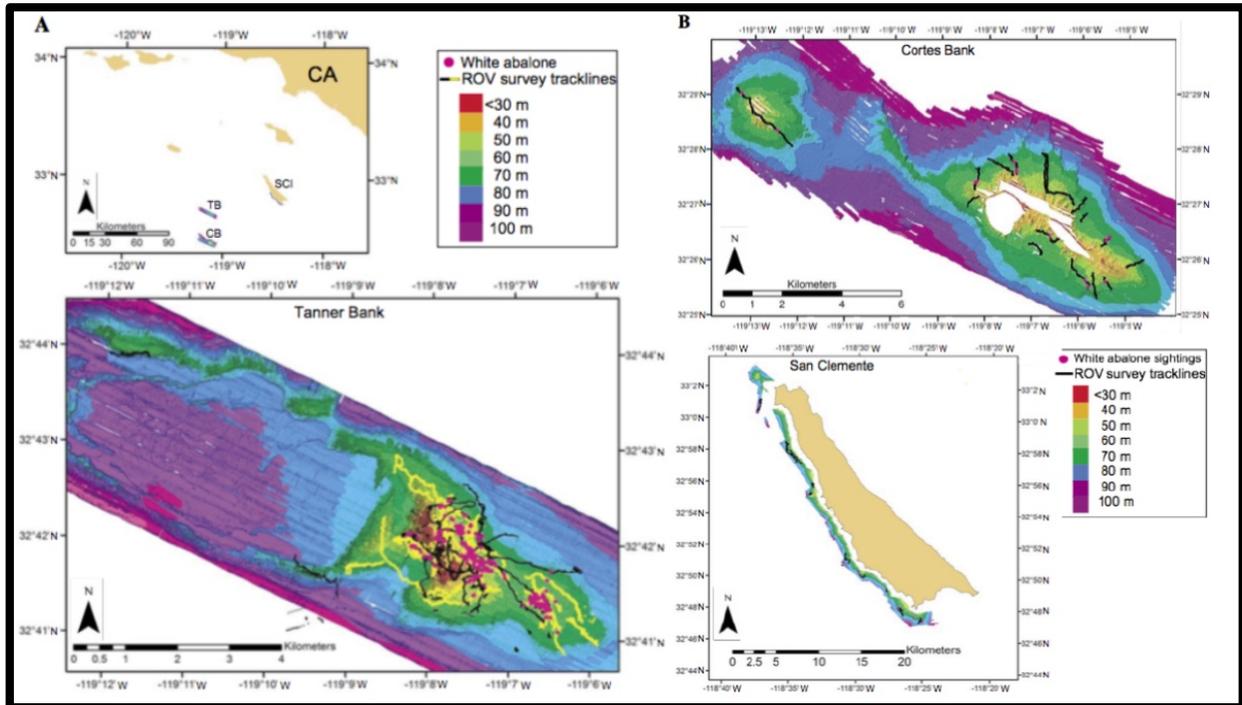


Figure F. High-resolution bathymetry and ROV survey track lines from Tanner Bank in 2002 (A, bottom, black lines) and 2004 (A, bottom, yellow lines) as well as from Cortes Bank in 2003 (B, top, black lines) and San Clemente Island in 2004 (B, bottom left). Pink dots represent sightings of white abalone (*Haliotis sorenseni*). (From Butler et al. 2006)

Earlier surveys done in the late 1970s by scuba (Lewbel et al. 1981) and by manned submersible (Interstate Electronics Corporation 1979) reported a complete absence of *Macrocystis pyrifera* from both Tanner and Cortes Banks; however, this giant kelp species definitely occurs at these sites now (Figure G). Both surveys made only sparse mentions of abalone (*Haliotis* spp.) but neither survey was designed to sample these taxa. Both surveys include fairly detailed descriptions of the biological communities at various locations on Cortes and Tanner Banks as well as thorough species lists.



Figure G. Kelp forest community at Cortes Bank September 1, 2013, notice the Giant Kelp (*Macrocystis pyrifera*) in the background. Photo credit D. Witting.

Marine Mammals

The SCB is a known feeding area for many species of cetaceans and pinnipeds, and according to CalCOFI surveys (Douglas et al., 2014), the proposed sanctuary area is utilized by the endangered humpback whale (*Megaptera novaeangliae*), blue whale (*Balaenoptera musculus*), and fin whale (*Balaenoptera physalus*) as well as the short-beaked common dolphin (*Delphinus delphis*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), Risso's dolphin (*Grampus griseus*), and northern right whale dolphin (*Lissodelphis borealis*). The endangered Sei whale (*Balaenoptera borealis*) has also been reported in the area over Tanner and Cortes Banks (USBLM 1978). Pinnipeds observed in the area include benthic foraging on Cortes Bank by the northern elephant seal (*Mirounga angustirostris*, Maxwell et al. 2012) and aggregations of the California sea lion (*Zalophus californicus*) at some of the shallower portions of Cortes and Tanner Banks (UCSC 1978). Other marine mammals observed in the proposed sanctuary include the Dall's porpoise (*Phocoenoides dalli*), northern fur seal (*Callorhinus ursinus*), and minke whale (*Balaenoptera acutorostrata*) (UCSC 1978, USBLM 1978).

Highly productive waters near the shallow offshore banks result in high densities of prey for mammals including krill, squid, and rockfish. The Cortes and Tanner Banks area appears to be an important feeding area for many species of mammal because of its wide diversity of habitat types. Shallow foraging species such as the California sea lion utilize kelp forest habitat on the crests of Cortes and Tanner Banks, while the deeper-foraging northern elephant seal takes advantage of the crest as well as the steep slopes of the banks (Maxwell et al. 2012, Figure H).

Baleen whales such as blue and fin whales target aggregations of krill (euphausiids; Oleson et al. 2007) that occur with seasonal regularity in areas with highly dynamic bathymetry such as those found within the proposed sanctuary area.

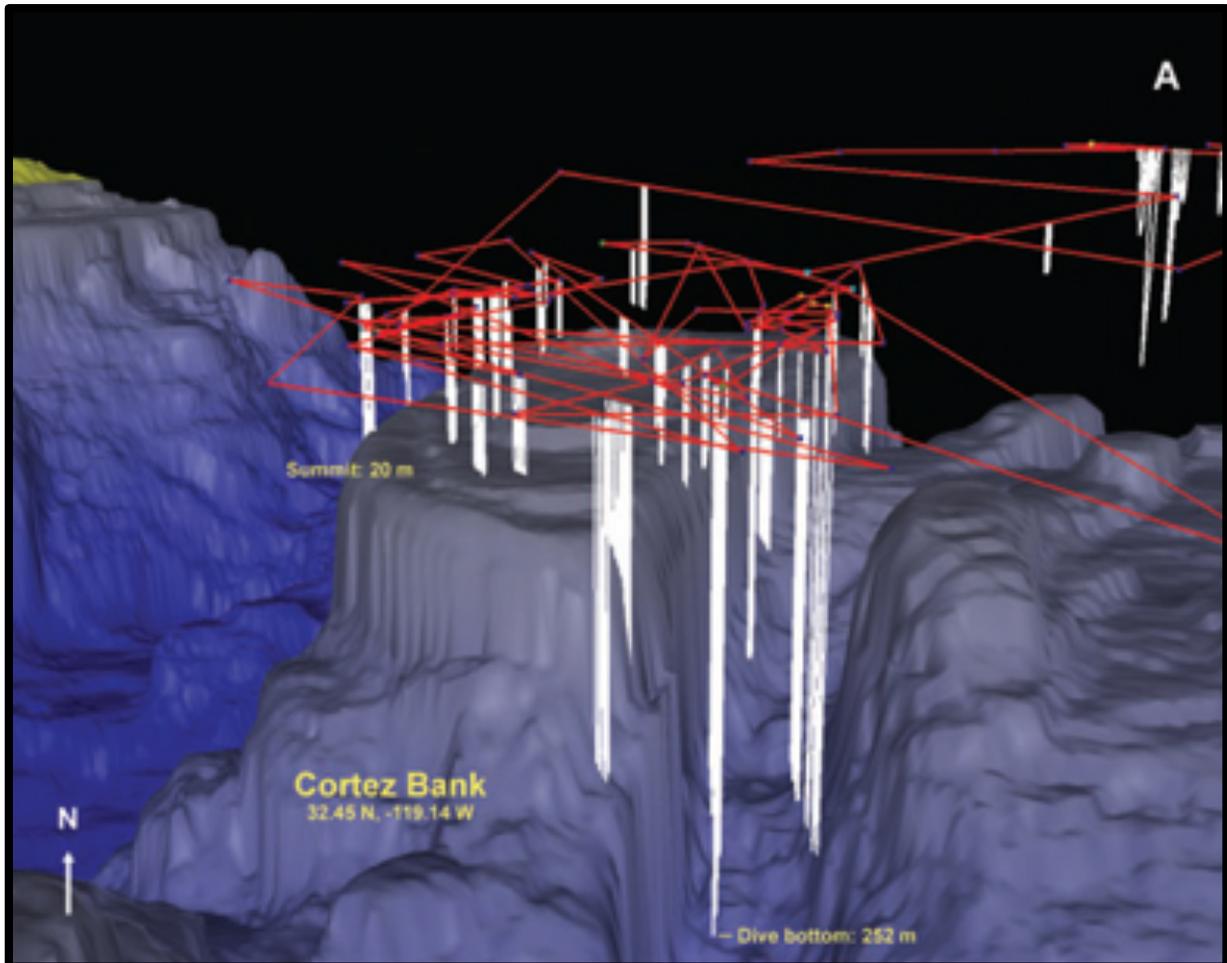


Figure H. Telemetry track (red) and dives (white) of a male elephant seal foraging on Cortez Bank (From Maxwell et al. 2011)

Recent studies have shown that blue whales are sensitive to anthropogenic generated sound sources such as the mid-frequency active sonar, explosions, and ship noise (Melcón et al. 2012). The patch of ocean to the West of San Clemente Island, including most of the proposed sanctuary area, is a very active naval testing and training area, and is subject to a high degree of anthropogenic noise during these activities. Impacts on cetaceans in the area are unclear and this is an area of active research. The Navy is actively studying, tracking and monitoring marine mammals in the region ([US Navy Marine Species Monitoring](#)). Sanctuary designation may facilitate this type of research.

Seabirds

Many species of birds have been reported in the proposed sanctuary area including the Scripps's murrelet (*Synthliboramphus scrippsi*; formerly Xantus's murrelet), which is listed as a threatened species by the State of California as well as the Brown pelican (*Pelicanus*

occidentalis), which was removed from the federal list of endangered species in 2009. A list of birds that have been observed in the area can be found in Table B.

Table B. Birds reported to frequent the Tanner and Cortes Banks area (reproduced from USBLM 1978).

Common Name:	Scientific Name:
Northern Fulmar	<i>Fulmaris glacialis</i>
Sooty Shearwater	<i>Puffinus griseus</i>
Pink-footed Shearwater	<i>Puffinus creatopus</i>
Black Storm-petrel	<i>Oceanodroma melania</i>
Leach's Storm-petrel	<i>Oceanodroma leucorhoa</i>
Scripps's Murrelet	<i>Synthliboramphus scrippsi</i>
Cassin's Auklet	<i>Ptychorampus aleuticus</i>
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>
Black-legged Kittiwake	<i>Rissa tridactyla</i>
Western Gull	<i>Larus occidentalis</i>
California Gull	<i>Larus californicus</i>
Brandt's Cormorant	<i>Phalacrocorax penicillatus</i>
Brown Pelican	<i>Pelecanus occidentalis</i>
Pacific Loon	<i>Gavia pacifica</i>
Black-footed Albatross	<i>Phoebastria nigripes</i>
Red-billed Tropicbird	<i>Phaethon aethereus</i>
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
South Polar Skua	<i>Stercorarius maccormicki</i>

Corals

The purple hydrocoral (*Stylaster californicus*) is a poorly-studied species that prefers very clear, cold, and high-current water and is usually found along high-relief submarine ridges such as those at Tanner and Cortes Banks (Figure I). The highest densities of hydrocoral are usually found between approximately 30 and 60 m depth, with some individuals found to depths of nearly 100 m at Tanner and Cortes Banks (Lissner and Dorsey 1986). These banks, along with Farnsworth Bank near Santa Catalina Island (Love et al. 2010) hold large populations of hydrocoral that have survived periods of commercial harvest in California due to their remote location and dynamic seas.

The life history of hydrocoral makes them particularly susceptible to overharvest and localized extinction. A very short larval duration prevents recolonization of cleared areas even a few hundred meters away from a source population, and slow growth rates delay regrowth of partially-removed or damaged colonies.

In deeper waters (greater than 200 m) surrounding the crests of the banks, deep-sea corals provide structured habitat for unique assemblages of fish and invertebrate communities (Etnoyer and Morgan 2003). These deep coral beds are very poorly understood by science due to their rarity and extreme depths, and consist of members of at least 8 families of cnidarians worldwide (Etnoyer and Morgan 2003). The proposed sanctuary area contains a diverse set of benthic habitat with deep basins to over 1,500 m depth and banks rising to within just several meters of the surface. This diversity of habitats can provide the opportunity for the development of multiple types of deep-sea coral beds. Deep-sea corals, like purple hydrocoral, are vulnerable to anthropogenic disturbance due to their very slow growth rates and limited dispersal capabilities.

The study of these species and the communities they support is an active area of research that continues to produce new and exciting results including the recent description of new species of corals (e.g., the Christmas tree black coral, *Antipathes dendrochristos*; Yoklavich 2013). Sanctuary designation may facilitate coral conservation research.

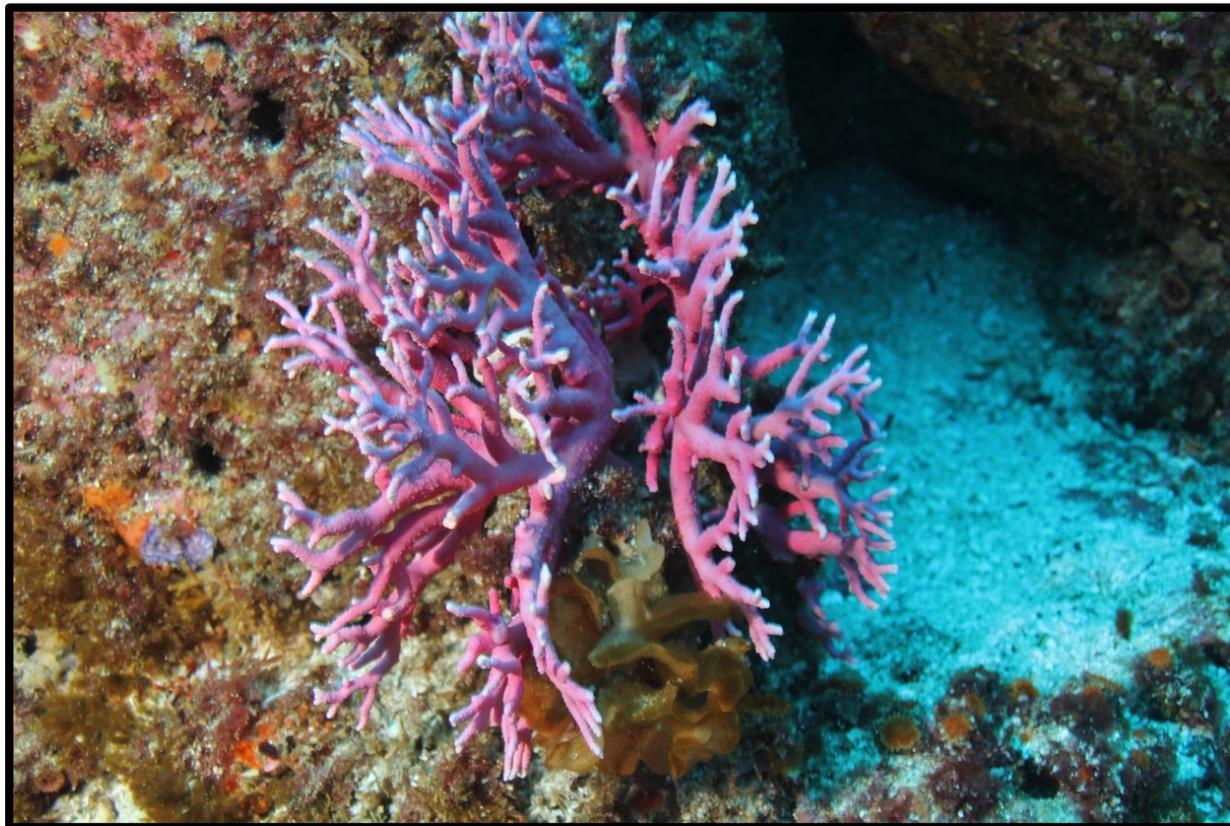


Figure I. *Stylaster californicus* at Cortes Bank, photo by D. Witting.

Criteria 2 - The area contains submerged maritime heritage resources of special historical, cultural, or archaeological significance, that: individually or collectively are consistent with the criteria of eligibility for listing on the National Register of Historic Places; have met or which would meet the criteria for designation as a National Historic Landmark; or have special or sacred meaning to the indigenous people of the region or nation.

At the end of the Pleistocene a glacial maximum occurred at approximately 18,500 BP and at this time sea level was approximately 117 m below present levels (Graham et al. 2003). Sea level gradually rose as the glaciers retreated until ~6,000 BP where it has stayed relatively stable until the present day. During the Holocene Epoch, Tanner and Cortes Banks formed three islands (Tanner, Cortes and North Cortes) during this recession from the last glacial maxima 10-12,000 BP (Figure J). At 12,000 CYBP the areas of the islands were 45 km² for Cortes, 4 km² for North Cortes and 28 km² for Tanner. By 10,000 CYBP Tanner and Cortes had an area of 2 and 11 km², respectively with North Cortes still submerged (Table C). These islands would have been observable from San Clemente Island where there were extensive indigenous settlements at this time (Schoenherr et al. 1999). Thus, it was extremely likely that

these islands were visited during this period. Whether or not there are any submerged archaeological resources at these locations is unknown.

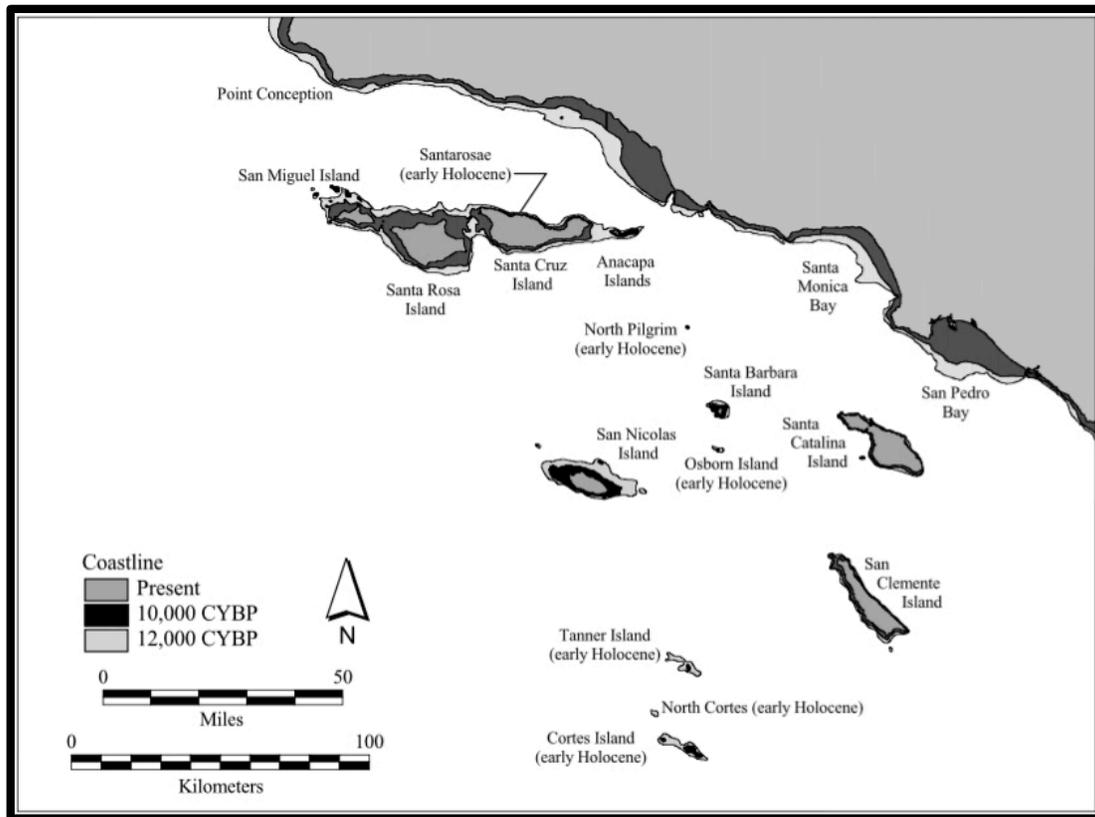


Figure J. The SCB during the early Holocene (Porcasi et al. 1999).

Table C. Past Areas (km²) of islands in Tanner-Cortes region (Porcasi et al. 1999).

Island	10,000 BP	12,000 BP
Cortes	11	45
North Cortes	0	4
Tanner	2	28

Shipwrecks

Despite the proposed Sanctuary’s large area there are relatively few records of shipwrecks, likely due to limited vessel traffic as a product of inaccessibility, limited areas for potential grounding, and the isolated nature of the region that limited knowledge of exactly if and where wrecks occurred in the past. There have been groundings at Bishop Rock that did not result in sinking, most notably the US Navy aircraft carrier *USS Enterprise* in 1985 (Roberts 1990) and the collision with its namesake, the clipper *Stillwell S. Bishop* in 1855 (Editors 1968, Theberge 2006). At least four vessels are believed to have sank within the boundaries of the proposed Sanctuary (Table D, Figure K) – the *SS Jalisco*, which was purposefully grounded in 1966 in an attempt to create a new constitutional monarchy called “Abalonia” (Keen 1966, Stewart 1966, Dixon 2011); *Falkland*, a four-masted bark that capsized near Tanner Bank in

1901 (CSLC 2011); *El Capitan*, an 80-ft purse seiner that sank after colliding with another fishing vessel in 1952 (Dixon 2011), and; *Santa Rosa*, a Spanish Manilla Galleon that was thought to have collided with Bishop Rock in 1717 and rumored to be carrying a fortune in gold and silver (USBLM 1978, CSLC 2011). Of these, only the *Jalisco* and *El Capitan* are distinguishable from surrounding reef and above the limits of recreational diving depth and/or useful for recreational fishing purposes.

Table D. Known shipwrecks and their coordinates in the proposed marine sanctuary.

Shipwreck	Latitude	Longitude
<i>SS Jalisco</i>	32.478	-119.215
<i>Santa Rosa</i>	32.42	-119.10
<i>Falkland</i>	32.62	-119.12
<i>El Capitan</i>	32.45	-119.12

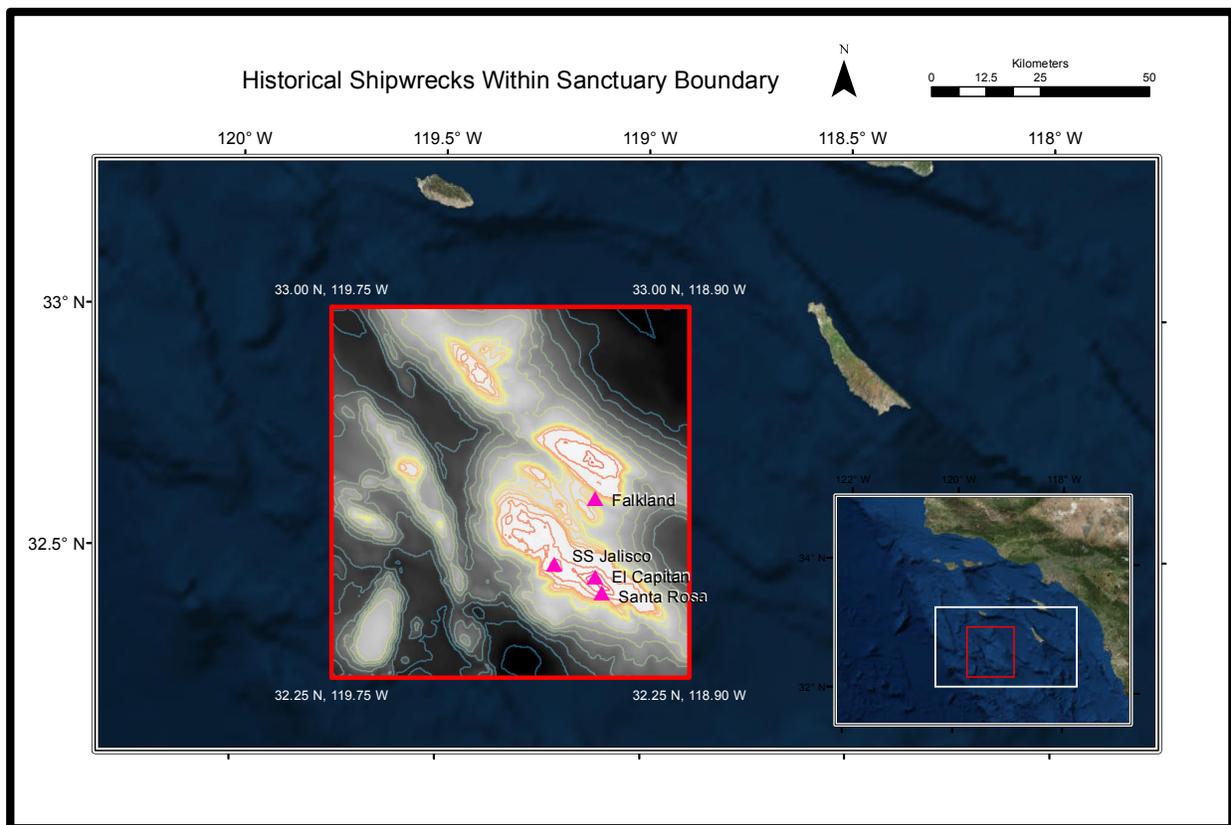


Figure K. Locations of known shipwrecks in the proposed marine sanctuary.

Criteria 3 - The area supports present and potential economic uses, such as: tourism; commercial and recreational fishing; subsistence and traditional uses; diving; and other recreational uses that depend on conservation and management of the area's resources.

These outer banks have long supported valuable economic interests due to their high productivity and access to various habitats. These banks form a potentially strong link between habitat conservation and health with productive and sustainable fisheries. California's Ocean Economy is the largest in the United States with a total gross state product of \$21.4 billion in 2000 (Kildow and Colgan 2005). While this economy is strong, there have

been marked declines in the fishing industry and nearly half of its landings by weight are from Southern California (Kildow and Colgan 2005). These outer banks are also extensively used by scuba charters, Commercial Passenger Fishing Vessels (CPFV), commercial fishers, recreational fishers and divers and most recently surf charters. Considering the curve of the southern California coastline, the distance to these banks from the various marinas and ports is fairly uniform creating numerous access points. Thus, high value charters for these types of activities can originate at any port in the SCB. Considering the distance offshore, charters (diving, surfing and fishing) are overnight premium excursions and the different types of activities will cost relatively the same amount (Pendleton and Rooke 2006). As an example of the economic importance of fishing in the region, total expenditures for charter and private boats alone in southern California have been estimated to average almost \$400 million US dollars annually (Gautam et al., 1996) and a significant amount of this effort is focused on these offshore banks.

Commercial Passenger Fishing Vessels and commercial fishers report their catch by fishing blocks (Perry et al. 2010). Due to the distance from port and accessibility issues associated with weather and ocean conditions, these reefs do not receive the same fishing pressure as the nearshore islands and mainland of the SCB. Recreational fishers target benthic and pelagic taxa on these banks and these taxa are reported as the number of individuals caught; the numbers reported for these fishing blocks from 1980-2009 are reported in Table E. The top three taxa reported for this region are fishes associated with the benthos. The rockfishes (*Sebastes* spp.) represent 56.5% of the reported catch. Two species of rockfish, the Cowcod and Bocaccio (*Sebastes levis* and *S. paucispinis*) were individually reported and are currently the basis of fishery closures. Rounding out the top three taxa are Ocean Whitefish (*Caulolatilus princeps*) and Albacore Tuna (*Thunnus alalunga*). Catches of 11,543 Kelp Bass (*Paralabrax clathratus*), a shallow reef species, were also reported. Pelagic taxa Pacific Bonito (*Sarda chiliensis*), California Sheephead (*Semicossyphus pulcher*), and Yellowtail (*Seriola lalandi*) represent 12.6% of the reported catch (ranks 4-6). Other important pelagic species are California Scorpionfish (*Scorpaena guttata*), Yellowfin Tuna (*Thunnus abacares*), Pacific Mackerel (*Scomber japonicus*), Bluefin Tuna (*Thunnus thynnus*), California Barracuda (*Sphyraena argentea*), and Skipjack (*Katsuwonus pelamis*). Of the remaining taxa, California spiny lobster (*Panulirus interruptus*; N = 15,882) and rock scallops (*Crassadoma gigantea*; N = 683) were undoubtedly taken by scuba divers. Thus, the recreational fishers were targeting pelagic taxa (tunas and tuna-like fishes), deep reef taxa (e.g. rockfishes, Lingcod, Ocean Whitefish) and shallow reef taxa (e.g. California Sheephead, Kelp Bass, California spiny lobster, etc.).

Commercial fishers report their landings using the same fishing blocks, however they report their catches by weight. Of identified taxa, 27,765 tons representing 129 taxa were reported taken from these banks during this period. This greater diversity is due to the multiple types of gear employed (purse seines, hook and line, traps, trawls, longlines, gill nets etc.). The top 98.4% of the catch comprising 26 taxonomic categories are reported in Table Y. Commercial fishers targeted silversides such as Jack Mackerel (*Trachurus symmetricus*), Chub Mackerel (*Scomber japonicus*), Northern Anchovy (*Engraulis mordax*), Pacific Sardine (*Sardinops sagax*) and market squid (*Loligo opalescens*), reporting 6,295 tons caught. The tunas targeted by the recreational fleet were also important for commercial fishers; Bigeye Tuna (*Thunnus obesus*) were routinely caught in this region (11.5 tons). Other important pelagic species were Swordfish (*Xiphias gladius*), Common Thresher (*Alopias vulpinus*), White Seabass (*Atractoscion nobilis*), Opah (*Lampris guttatus*) and Shortfin Mako (*Isurus oxyrinchus*). The top benthic taxon was red urchin, which ranked second in landed weight at 2,918 tons. Rockfishes (*Sebastes* spp.) were also taken in large quantities with both Cowcod and Bocaccio constituting important components of this fishery. The closed and endangered abalones (*Haliotis* spp.) were also reported in catch records prior to these fisheries being closed.

Table E. Top 22 taxa representing 99% of reported recreational fishes and invertebrates by fishing block from 1980-2009 (excluding 1985). Numbers represent the total individuals reported.

Taxa	Fishing Block																		Total	
	852	853	854	855	856	857	870	871	872	873	874	875	888	889	890	891	892	893		897
<i>Sebastes spp.</i>	1438	1675	10411	37918	5076	495	3444	58338	37733	0	240	156	4295	20541	17111	341	857	1830	95405	297304
<i>Thunnus alalunga</i>	2613	406	1678	664	112	0	4263	1457	62	355	780	208	4057	1713	688	1159	1424	61	14336	36036
<i>Caulolatilus princeps</i>	60	51	14	126	21	54	1420	5240	1513	0	5	0	1973	1484	1413	0	0	75	22024	35473
<i>Seriola lalandi</i>	202	67	10	16	5	118	518	4497	575	138	14	0	598	668	768	297	287	147	16425	25350
<i>Semicossyphus pulcher</i>	31	1	1	0	221	50	511	2453	591	0	5	3	707	729	445	0	40	73	15545	21406
<i>Sarda chiliensis</i>	100	16	0	1	17	83	1110	3106	808	0	1	7	926	647	442	180	175	29	11965	19613
<i>Panulirus interruptus</i>	0	0	379	0	0	440	610	0	0	0	0	0	128	0	41	0	0	0	14284	15882
<i>Paralabrax clathratus</i>	79	220	15	585	492	1118	1134	2788	968	84	18	57	17	1252	1170	88	164	0	1294	11543
<i>Scorpaena guttata</i>	20	10	0	1	13	33	458	875	142	0	112	75	394	718	713	4	17	29	7591	11205
<i>Thunnus albacares</i>	52	0	18	31	0	44	6	2289	46	0	0	0	34	98	627	3	873	72	6865	11058
<i>Thunnus thynnus</i>	204	24	73	22	0	1	543	1794	223	9	59	25	780	249	148	63	8	12	4552	8789
<i>Scomber japonicus</i>	64	481	0	0	452	0	145	1232	245	34	25	86	0	450	20	294	41	0	1756	5325
<i>Sphyræna argentea</i>	0	10	0	0	44	129	340	773	53	1	0	44	21	2215	72	35	112	0	106	3955
<i>Katsuwonus pelamis</i>	9	0	27	122	0	1	221	1166	48	0	12	0	104	164	93	0	49	8	1746	3770
<i>Sebastes levis</i>	13	18	242	1155	252	33	0	362	388	0	0	0	0	149	292	3	0	0	436	3343
<i>Paralabrax nebulifer</i>	105	201	0	0	636	0	595	260	47	0	18	639	0	172	13	45	109	7	79	2926
<i>Sebastes paucispinis</i>	16	0	0	0	0	0	131	283	2	0	0	0	327	26	0	0	0	37	1932	2754
<i>Prionace glauca</i>	0	0	1	2	0	0	0	1215	1020	0	0	0	0	0	0	0	0	15	0	2253
<i>Medialuna californiensis</i>	0	0	0	0	69	79	77	421	53	0	0	0	27	269	360	0	0	0	844	2199
<i>Ophiodon elongatus</i>	2	2	8	10	0	1	32	142	332	0	0	0	15	58	272	3	0	0	474	1351
<i>Coryphaena hippurus</i>	0	0	65	42	0	6	0	69	1	0	0	13	11	0	26	64	33	2	785	1117
<i>Crassadoma gigantea</i>	0	0	18	0	0	12	1	2	0	0	0	0	0	0	0	0	3	0	647	683
	5008	3182	12960	40695	7410	2697	15559	88762	44850	621	1289	1313	14414	31602	24714	2579	4192	2397	219091	

Table F. Top 26 taxa and 98.2% of reported tonnage of commercial fishes and invertebrates by fishing block from 1980-2009 (excluding 1985).

Taxa	Fishing Block																			Total
	852	853	854	855	856	857	870	871	872	873	874	875	888	889	890	891	892	893	897	
<i>Thunnus thynnus</i>	133	8	35	25	0	8	273	186	58	4	0	0	398	492	562	49	0	0	1029	3259
<i>Trachurus symmetricus</i>	0	0	0	0	1	0	0	621	0	0	0	0	31	33	2430	16	0	0	17	3149
<i>Strongylocentrotus franciscanu</i>	15	7	4	1	13	37	20	20	2	42	6	2395	3	8	122	12	1	0	210	2918
<i>Scomber / Trachurus</i>	0	0	0	0	0	0	30	2502	22	0	0	33	0	0	178	0	0	0	0	2766
<i>Thunnus alalunga</i>	50	7	46	45	6	390	45	38	29	118	19	1	60	50	80	426	465	12	621	2506
<i>Scomber japonicus</i>	4	8	0	0	0	11	109	500	110	0	0	0	349	119	1128	104	0	0	7	2449
<i>Katsuwonus pelamis</i>	102	0	0	120	0	60	16	17	4	0	0	0	285	236	159	35	39	0	1029	2104
<i>Sarda chiliensis</i>	7	0	0	0	0	0	65	478	14	0	0	0	348	476	169	14	0	0	312	1884
<i>Sebastes spp.</i>	5	5	5	102	187	6	60	342	90	10	42	1	28	150	498	74	65	1	98	1768
<i>Thunnus albacares</i>	1	0	0	0	0	2	18	57	31	0	0	0	721	70	41	12	51	0	267	1272
<i>Xipias gladius</i>	13	13	12	11	16	53	24	47	15	9	17	6	149	33	12	48	48	1	163	689
<i>Alopias vulpinus</i>	4	29	23	8	2	23	17	40	4	1	10	4	121	25	6	48	6	0	82	452
<i>Engraulis mordax</i>	0	0	332	0	84	0	0	0	0	0	0	0	11	0	0	0	0	2	0	429
<i>Sebastes/group</i>	1	0	0	79	8	1	4	45	38	0	61	1	1	21	62	19	6	0	13	362
<i>Anoplopoma fimbria</i>	0	4	8	16	1	44	62	2	2	4	38	0	2	1	1	0	0	0	0	186
<i>Loligo opalescens</i>	0	16	0	0	0	2	52	0	41	0	0	0	62	0	0	0	0	0	2	175
<i>Sebastes melanostomus</i>	0	1	0	33	5	13	0	11	17	5	6	0	9	22	8	0	5	0	13	146
<i>Atractoscion nobilis</i>	1	0	2	0	0	1	1	11	3	0	0	1	1	9	20	0	0	0	93	144
<i>Sebastes paucispinis</i>	0	0	1	19	3	2	0	28	11	0	7	0	2	5	24	4	2	0	4	112
<i>Isurus oxyrinchus</i>	2	2	4	1	1	6	5	5	2	0	2	0	17	6	4	6	2	0	29	97
<i>Lampris guttatus</i>	1	2	1	2	1	6	4	3	1	1	1	0	25	3	2	6	4	0	33	95
<i>Sardinops sagax caeruleus</i>	0	0	0	0	0	19	31	1	0	0	0	0	0	4	38	0	0	0	0	93
<i>Panulirus interruptus</i>	1	0	1	1	1	2	2	1	1	2	0	1	0	3	23	0	0	0	45	82
<i>Semicossyphus pulcher</i>	0	0	0	1	0	0	0	4	1	0	0	3	0	1	18	0	1	0	43	72
<i>Sebastes levis</i>	0	3	0	5	7	1	2	8	5	0	5	0	1	6	14	4	4	0	4	70
<i>Seriola lalandi</i>	0	0	0	0	0	0	2	2	1	1	1	0	2	3	15	0	0	0	26	53
	339	103	473	471	335	687	845	4972	501	198	216	2446	2625	1774	5613	878	700	17	4140	

Criteria 4 - The publically-derived benefits of the area, such as aesthetic value, public recreation, and access to places depend on conservation and management of the area's resources.

The geographic makeup of the Southern California Offshore Banks and their uniquely isolated position within the SCB have resulted in a rich ecological community that has largely withstood the pressures of human extraction and intervention despite their relative proximity to the large population centers of Los Angeles and San Diego. These banks, even though they are considerably offshore, are regularly used for public recreation (scuba diving, fishing and surfing discussed in Criteria 3) highlighting the necessity and imperative for new research and monitoring projects. According the U.S. Census Bureau, the 2010 population estimates for the region were 19,208,583 (Table G). However, with an ever-increasing population and advancements in navigation technologies, the previously realized isolation of this area is decreasing rapidly. There are estimates of a 61.7% population increase by 2050 ([America 2050](#)), which would put the population of these counties at over 31,000,000. Undoubtedly there will be increased pressure and activities at these offshore banks due to the steady predicted increase in the population. As the banks become more widely understood and used, the potential impacts are profound. Conservationists and resource managers need to act to protect the Banks from bottom disturbance by oil and gas and mineral extraction, overfishing, unintended damage to fragile corals (e.g. from anchoring), and the spread of invasive species. This increase in the population and projecting corresponding pressure on resources may be the single most important reason to proactively begin to actively manage these resources for future generations.

Table G. 2010 U.S. Census Bureau data for Southern California by county.

<u>County</u>	<u>2010</u>
Santa Barbara	423,895
Ventura	823,318
Los Angeles	9,818,605
San Bernardino	2,035,210
Orange	3,010,232
San Diego	3,095,313
total:	19,208,583

Section IV- Consideration Information

Consideration 1- The area provides or enhances opportunities for research in marine science, including marine archaeology.

The SCB is an intensively studied ecosystem; its proximity to the most populated urban coastline in the country puts it in direct proximity to federal, state and local resource agencies as well as a variety of major colleges and universities. While there have been a few focused studies of these outer banks, the information obtained to date for this area is not comparable to the remainder of the SCB. For instance, the role played by these banks in this ecosystem is relatively unknown. Importantly, from ecological and economic perspectives, their role as a source or sink of fish and invertebrate larvae, considering their unique placement within the California Current and Southern California Countercurrent (Figures C

and D), is not understood. Similarly, the banks' deep water habitats have generally not been studied; however, we can assume that these are diverse and unique habitats similar in importance to analogous areas in California.

In addition to the paucity of biological information for the region, this area offers an opportunity to support a wide variety of technical innovations for research. Because its distance offshore is accessible for vessel based research cruises, the banks are optimal sites for developing technologies utilizing remote sensing, unmanned submersible vehicles, robotics, and drones because their topography presents a vibrant challenge to information-gathering capacity of these technologies.

As discussed in Section III, Criteria 2, there also are potential archaeological sites at Tanner and Cortes Banks, because these habitats were emergent islands during the last glacial maximum and likely visited by native Americans. Thus, there is the possibility of discovering currently unknown archaeological sites and developing research lines that explore the history of human occupancy in southern California similar to those now being investigated on the Channel Islands.

Consideration 2 - The area provides or enhances opportunities for education, including the understanding and appreciation of the marine and Great Lakes environments.

Santa Barbara, Ventura, Los Angeles, Orange and San Diego Counties include some of the most well-known marine studies programs in the world. Bracketing the SCB, the University of California's Scripps Institution of Oceanography and San Diego State University to the south and the University of California, Santa Barbara to the north are some of the top marine programs in the nation. In the middle of the region is the California State University's Ocean Studies Institute (OSI), a collaborative program of nine CSU southern California campuses. OSI is the primary partner in the Southern California Marine Institute (SCMI) based in the Port of Los Angeles. SCMI members also include USC, UCLA, Occidental College, Los Angeles Community College District (9 campuses) and the Bay Foundation. The quantity and quality of the potential educational resources that can be available to carry out projects in this proposed sanctuary are as great as or greater than any other region in the country.

These offshore banks also provide a plethora of novel educational opportunities. The special biological significance of seamounts could greatly interest and energize not only the educational community in region, but also would make for a great public outreach forum. Good examples could be the study of the big waves that form (and are occasionally surfed) at Cortes Bank, Native American studies and fisheries research. Understanding the unique characteristics of the banks and how these connect to the remainder of the SCB and positively affect both the ecology and economics of the region provided a very rich template for future research, education and outreach. The enormous population of the region indicates the need for proper messaging and public education. Fortunately, there are many excellent marine aquariums and associated institutes (Cabrillo, Long Beach, SeaLab, Santa Monica Pier, Birch, Ocean Institute, Roundhouse, Maritime Museum of San Diego, L.A. Maritime Museum, Santa Barbara Museum of Natural History etc.) that are perfect platforms for this type of outreach. We have a need, an audience and the resources for delivery of this messaging in place in Southern California.

Consideration 3 - Adverse impacts from current or future uses and activities threaten the area's significance, values, qualities, and resources.

Current and potential future activities and oceanographic may threaten these offshore banks. These threats may include climate change, deep sea mining, oil and gas extraction,

fishing and the potential of offshore alternative energy projects. While fishing is actively tracked and managed, new technologies may facilitate activities in this region with potential impacts. These include deep sea mining, offshore energy projects and oil and gas extraction.

The mining industry is seeing advancements in technology that can potentially extract resources from the ocean floor in an economically feasible fashion. The current focus of these new technologies is the extraction of cobalt crusts (CRC), polymetallic nodules, and deposits of seafloor massive sulphides (SMS). The potential impacts to benthic resources associated with these practices can be extremely problematic. Deep sea organisms generally are slow growing and long lived and therefore recovery from disturbance will take much longer than that associated with shallower habitats and faster growing organisms. The regions surrounding these outer banks is already known to contain manganese nodules that contain manganese and iron oxides as well as nickel, cobalt, copper and other trace metals including rare earth metals that are important for our tech industries ([Ocean Foundation](#); Baker and Beaudoin 2013). Rare monoplacophorans are associated with manganese nodules in this region (Wilson et al. 2009). Monoplacophorans are ancient molluscs that are studied to understand the phylogenetic evolution and diversification of this important group.

As California increases its renewable energy goals, improvements in technology may drive offshore energy projects to fruition. Current planning is associated with Morro Bay where the infrastructure associated with the electrical grid is proximate to ample wind and swell energy. As pressure for renewable energy increases coupled with advances in technology, this opens the possibility of these offshore banks being utilized for these resources. Proper spatial planning will be necessary in the future under this scenario. Having a marine sanctuary will facilitate this type of future management.

Tanner Bank is the location of eight plugged and abandoned oil and gas wells (Figure L). Because of this sanctuary proposal, all future oil and gas extraction would be prohibited. This type of prohibition has been successfully enacted with high public support at the nearby Channel Islands National Marine Sanctuary.

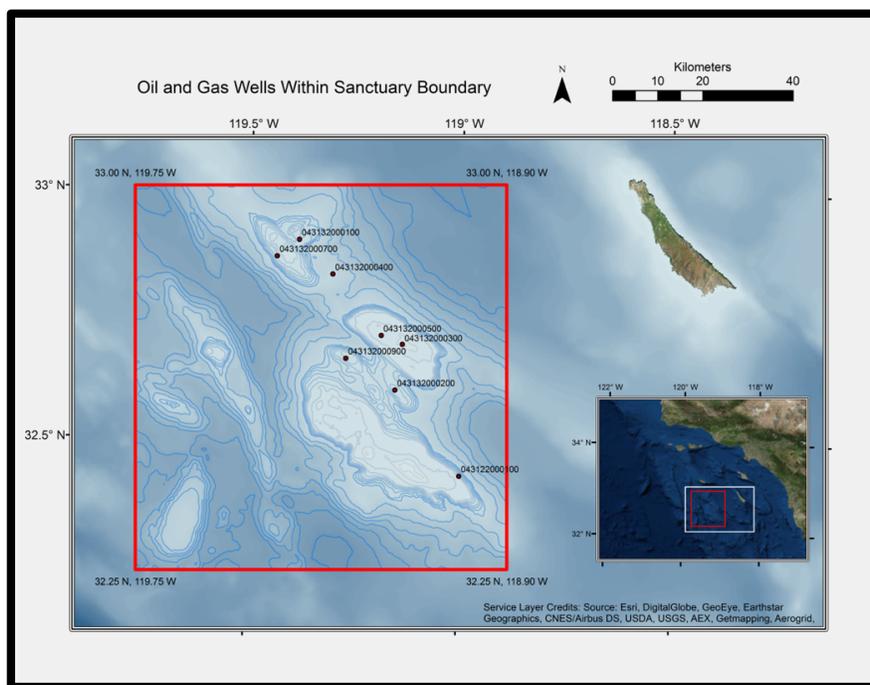


Figure L. Plugged and abandoned exploratory oil and gas wells at Tanner Banks and surrounding areas.

Climate change is already causing significant issues and impacts. Changes in weather patterns, sea level, acidification of the oceans, changes in dissolved oxygen and warming are all issues that face Southern California. While the predicted sea level rise is unlikely to be a significant problem for these submerged geologic structures. Certainly, changes in sea level have dramatically changed the landscape of these outer banks in the past (Figure J). Weather patterns, particularly precipitation are also changing appreciably and are generally contextualized with regard to coastal processes (e.g. runoff, high surf and associated erosion, etc.). The SCB is a well described transitional zone between the warm San Diegan fauna from the south and the cold Oregonian fauna associated with central and northern California (Horn and Allen 1978, Pondella et al. 2005). It is therefore sensitive to macroscale changes in oceanographic processes such as El Niño/La Niña patterns and fluctuations in the Pacific Decadal Oscillation. During warm water periods, the shallow reaches of the SCB transition to a warm fauna with the opposite process during cold water phenomena. Thus, under warming scenarios, the SCB may be predicted to follow these patterns and will potentially warm over time. These offshore banks with significant amounts of deeper and cool water habitat (fueled by the California Current) may provide a reservoir or haven for cold water taxa during these periods. This potential buffer against a warming SCB will be critical to manage moving forward.

Consideration 4 - A national marine sanctuary would provide unique conservation and management value for this area or adjacent areas.

There are currently protected resources in this region (abalone, hydrocoral, Cowcod closures, etc.). Although any of these regulations can be changed, the proposed sanctuary would allow additional levels of oversight for resource management within its boundaries. However, none of these protections are comprehensive, permanent or are contextualized in a strategic marine spatial planning process. A marine sanctuary process will a nucleus and means to support the considerations with this proposal. Marine sanctuaries have advisory councils that can integrate information across various platforms to craft ecosystem based management plans and multi-agency partnerships. These types of resources and structure will enable better marine spatial planning and vision allowing long-term utilization of these resources in a practical manner.

Coordination in the management of this area has already begun. The Navy and NOAA Fisheries recently (July 6, 2016) signed an historic agreement for [White Abalone Recovery](#). This agreement enhances an already established informal partnership between the Navy and NMFS that began in 2012. Both agencies are committed to this effort, and firmly believe that the white abalone can be recovered at the Banks through measures that are wholly compatible with the DON's testing and training requirements at sea. This recovery effort does not depend on more formal mechanisms for marine habitat protection that have been considered for the Banks, and the MOA demonstrates the agencies' joint intent to continue protecting and recovering the resources at the Banks through such informal cooperation.

Consideration 5 - The existing regulatory and management authorities for the area could be supplemented or complemented to meet the conservation and management goals for the area.

Information and data from this region could greatly augment ongoing studies and data products that are being used for a variety of management goals in the SCB. Regional efforts

consist of assessments of subtidal habitats for the marine protected areas (MPAs) and military closures established January 1, 2012. The MPA Monitoring Enterprise of the Ocean Science Trust has recently completed the baseline assessment of this region (e.g. Pondella et al. 2015). Data products associated with similar habitats that are in the MPA and military closure network will be valuable for future assessments involving this banks' ecosystem. In addition, data on federally managed species in these locations may help further define Essential Fish Habitat.

Consideration 6 - There are commitments or possible commitments for partnerships opportunities such as cost sharing, office space, exhibit space, vessel time, or other collaborations to aid conservation or management programs for the area.

The Southern California Marine Institute ([SCMI](#)) is a unique West Coast consortium representing the two largest university systems in the world: the California State University System representing the [Ocean Studies Institute](#) (Channel Islands, Dominguez Hills, Fullerton, Long Beach, Los Angeles, Northridge, Pomona, San Bernardino and San Marcos) and the University of California (represented by UCLA), Los Angeles Community College District (Los Angeles City College, East LA College, LA Harbor College, LA Pierce College, LA Southwest College, LA Trade-Tech College, LA Valley College and West LA Colleg) the University of Southern California, Occidental College and the Bay Foundation. In addition to the 22 partners in this consortium, we are actively planning a new marine facility with [AltaSea](#) at the Port of Los Angeles. SCMI will be the anchor tenant of this cutting edge marine research and business park, which is being designed from the ground up to use cutting edge technologies and public and private partnerships for marine studies and exploration. AltaSea at the Port of Los Angeles accelerates scientific collaboration, facilitates job creation and inspires the next generation for a more sustainable ocean. Built on a historic pier with access to the deep ocean, AltaSea's 35-acre campus brings people together to expand science-based understanding of the ocean; incubate and sustain ocean-related business; and pioneer new ocean-related education programs.

SCMI's current location on Terminal Island in the Port of Los Angeles is a wharf based facility that is designed to facilitate any type of nearshore to offshore marine activity. It features a variety of research vessels, machine shops, warehouses, office space, seawater systems, dive locker, vessel support, dry and wet labs, classrooms etc. SCMI's current and potentially future home has the resources, institutional backing and scientists that make it an ideal location for basing a Marine Sanctuary office and associated operations. We currently are already supporting various NMFS and NOAA activities and NOAA's application to join SCMI is pending and will be approved at our next board of directors meeting.

Consideration 7 - There is community-based support for the nomination expressed by a broad range of interests, such as: individuals or locally-based groups (e.g., friends of group, chamber of commerce), local, tribal, state, or national elected officials; or topic-based stakeholder groups, at the local, regional or national level (e.g., a local chapter of an environmental organization, a regionally-based fishing group, a national-level recreation or tourism organization, academia or science-based group, or an industry association).

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UNIVERSITY
OF SOUTHERN
CALIFORNIA

January 4, 2017

Director
Office of National Marine Sanctuaries
1305 East-West Highway, 11th Floor
Silver Spring, MD 20910

College of Letters,
Arts and Sciences

Department of
Earth Sciences

Director,

This is a letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal, we do not suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this by:

1. Protect and manage critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Sincerely,

William M. Berelson
Chairman, Dept. of Earth Sciences
(phone contact: 213-740-6106, email: berelson@usc.edu)

University of
Southern California
Los Angeles,
California 90089-0740
Tel: 213 740 6106
Fax: 213 740 8801
e-mail:
earthsci@usc.edu
web page:
www.usc.edu/dept/
earth



November 30, 2016

Director John Armor
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Dear Director Armor,

I am writing this letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Realizing the complexity of the process, I wish to help outline here what a sanctuary designation provides the educational goals of the nine colleges in the L.A. Community College District and its 136,000 students to be part of the important research into coastal waters of the California Bight.

Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. As Sustainability Coordinator for the Los Angeles Community College District, I can only emphasize the importance of this resource in our overall educational goals as members of the SCMI.

The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal, we do not suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this in order to:

1. Protect and manage critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Sincerely,

A handwritten signature in black ink that reads "George S. Leddy".



OFFICE OF THE PRESIDENT

1600 Campus Road
Los Angeles, CA 90041-3314

P 323-259-2691
F 323-341-4946

oxy.edu

November 17, 2016

Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Dear Director:

This is a letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal we do not suggest restricting fishing or military activities. In fact, our hope is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will:

1. Protect and manage critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan Veitch".

Jonathan Veitch
President, Occidental College



CALIFORNIA STATE UNIVERSITY, FULLERTON

Office of the Dean

College of Natural Sciences and Mathematics

P.O. Box 6850, Fullerton, CA 92834-6850 / T 657-278-2638 / F 657-278-5390

Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Director:

This letter strongly supports the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal, we do not suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this by the following actions:

1. Protect and manage critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Sincerely,

Marie Johnson
Dean, College of Natural Sciences and Mathematics

THE CALIFORNIA STATE UNIVERSITY

December 16, 2016

Director
Office of National Marine Sanctuaries
1305 East-West Highway, 11th Floor
Silver Spring, MD 20910

To the Director of National Marine Sanctuaries:

We are writing in support of the application submitted by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management, ensuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal, we do not suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this by:

1. Protecting and managing critical offshore resources, including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Bocaccio and a variety of marine mammals and birds).
2. Protecting these marine resources from proposed industrial threats, including oil and gas extraction, mining, etc.
3. Promoting collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promoting the awareness of the socioeconomic benefits from tourism (e.g., surfing, diving, boating) and commercial and recreational fishing.
5. Protecting potential archaeological resources for future study

Thank you for your consideration of this important proposal.

Sincerely,



Dianne F. Harrison, Ph.D.
President



Yi Li, Ph.D.
Provost and Vice President
for Academic Affairs



Jerry Stinner, Ph.D.
Dean, College of Science
and Mathematics



OFFICE OF THE VICE CHANCELLOR FOR RESEARCH
BOX 951405
LOS ANGELES, CALIFORNIA 90095-1405

December 16, 2016

Director John Armor
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Director Armor,

This is a letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. For the University of California, Los Angeles, along with other academic institutions across the region, designating this area as a marine sanctuary will also provide Southern California with critical research and educational opportunities for students, researchers, and academics across multiple disciplines. It effectively will allow NOAA to direct resources to the region to safeguard these habitats as well as threatened species. The proposed sanctuary is an area of high productivity and serves as a feeding grounds for many species of cetaceans and pinnipeds. Economically, the proposed Southern California Offshore Banks National Marine Sanctuary is uniquely positioned in the most populous coastal zone on the west coast.

The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources. It is important for us to understand and conserve the cultural, biological and socioeconomic value of these offshore banks. This proposal does not restrict fishing or military activities. We want to highlight the importance of these activities for the economy while protecting these valuable resources for future generations. We will accomplish this by:

1. Protecting and managing critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protecting these critical marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promoting collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promoting the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.

5. Protecting potential archaeological resources for future study.

The designation of the Southern California Offshore Banks National Marine Sanctuary will be an important step forward for research, conservation and education.

Sincerely,

A handwritten signature in cursive script that reads "Mark Gold".

Mark Gold, D. Env.
Associate Vice Chancellor for Environment and Sustainability
University of California, Los Angeles



December 23, 2016

To: Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor Silver Spring, MD 20910

From: Tom Ford, Executive Director
The Bay Foundation

Re: Support for Southern California Offshore Banks National Marine Sanctuary Proposal

Dear Director:

I hope that your office will kindly consider and support the nomination of the Southern California Offshore Banks National Marine Sanctuary Proposal. The area proposed has a great wealth of natural resources and significant socioeconomic values. Support for this proposal would assist NOAA and a host of local interests to sustain and protect these resources and values for future generations.

With the nomination of this proposal NOAA would be better able to meet its responsibilities to the protection and preservation of federally managed, and co-managed species with the State of California. As conceived the proposal allows for existing uses to continue while protecting this area from the impacts of sea floor mining and fossil fuel exploration and extraction. I am confident that this proposal will be warmly accepted by the majority of ocean users in Southern California.

The mission of The Bay Foundation is to restore and enhance Santa Monica Bay and local coastal waters. Our goals include the restoration of kelp beds, rocky reefs, abalone, and sea grasses. We serve to promote and protect the human communities and economies that the aforementioned ecosystems support. The increased preservation, exploration, research and protection of the Southern California Offshore Banks will greatly enhance our ability to accomplish these goals for the benefit of the people of Southern California and of our nation at large.

Thank you for your time. If I can be of further assistance in your office's consideration of this proposal please do not hesitate to ask.

Sincerely,

Tom Ford
tford@santamonicabay.org
310-216-9827

California State University
Northridge
Department of Biology

Director
Office of National Marine Sanctuaries
1305 East-West Highway, 11th Floor
Silver Spring, MD 20910

Director:

This is a letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal, we do not suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this by:

1. Protect and manage critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Sincerely



Larry G. Allen, Ph.D.
Chair and Professor of Biology



Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Director,

This is a letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal we do not suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this by:

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3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Sincerely,

Signed Electronically
Robert Espinoza
Professor of Biology & Special Assistant to the Dean
California State University, Northridge

Steve Murray, Ph.D.

Professor Emeritus
CSU Chancellor's Office Liason
California State University, Fullerton

Sean Anderson, Ph.D.
Professor, Environmental Science and Resource Management
California State University Channel Islands

Roberta Pollock, Ph.D.
Professor of Biology

Cheryl Okumura, Ph.D.
Assistant Professor of Biology

Joseph Schulz, Ph.D.
Associate Professor of Biology

Gary Schindelman, Ph.D.
Adjunct Professor of Biology

Renee Baran, Ph.D.
Associate Professor of Biology

Elizabeth Braker, Ph.D.
Professor of Biology

Gretchen North Ph.D.
Professor of Biology

John McCormack, Ph.D.
Assistant Professor of Biology
Director and Curator, Moore Laboratory of Zoology

Chris Lowe, Ph.D.
Professor of Biology
California State University, Long Beach

Kathryn Dickson, Ph.D.
Vice Chair and Professor of Biological Science
California State University Fullerton

Jeremy Claisse, Ph.D.
California Polytechnic University, Pomona



Oceanographic Teaching Stations A 501(c)(3) Non-Profit Corporation
Roundhouse Marine Studies Lab and Aquarium
P.O. Box 1, Manhattan Beach, CA 90267-0001 (310) 379-8117
Federal Tax ID # 95-3409019

November 13, 2016

Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Director,

As President of Oceanographic Teaching Stations, Inc (OTS), I am writing to support the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. OTS operates the Roundhouse Aquarium in Manhattan Beach. Our mission is to foster and promote the public study of, and interest in, the oceans, tidelands and beaches of Southern California, the marine life therein, and the impact of human populations on that environment.

Despite their unique geography and role in the overall biological production and biodiversity of the Southern California Bight, offshore banks and seamounts are not well known to the general public, and even to many in the scientific community. The overall goal of this application is to allow NOAA to direct resources to our region for spatial management to insure that these valuable resources can be maintained for future generations. This is an important consideration, given the projected population increases in the Los Angeles and San Diego regions and the corresponding pressures on resources.

An additional goal is to promote public awareness of the biological and socioeconomic impacts of offshore banks and seamounts on research, education, tourism (e.g. surfing, diving, boating) and commercial and recreational fishing. Of particular interest to OTS are the stated goals "...to understand and protect the biological and socioeconomic value of these offshore banks, and to "Promote collaborative research among the various marine agencies and universities in the region." Results of this research should be directly applicable to our educational programs.

Sincerely,

John W. Roberts
Emeritus Professor of Biology, CSU Dominguez Hills
President, OTS

Board of Directors: Charles Milam, Lynne Gross, Dick Fruin, Hillel Cohn, John Corrales, Janet Soliman-Suard,
John Roberts, Paul Konwiser, Matt Friedman, Lauren Muller
Roundhouse Aquarium Valerie Hill, Eric Martin, Dawn Eyre-Martin, Brittney Olaes



November 3, 2016

Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Dear Director:

I am pleased to show our support for the proposal to designate National Marine Sanctuary status for the outer banks of the Southern California Bight submitted by the Southern California Marine Institute and AltaSea at the Port of Los Angeles.

Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides Southern California with research, educational and business opportunities across multiple disciplines. Designating this area as a National Marine Sanctuary will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast, to support spatial management projects seeking to insure maintenance of these valuable resources for future generations.

Once designated a National Marine Sanctuary, the biological and socioeconomic value of these offshore banks would be preserved by:

1. Protecting and managing critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds)
2. Protecting these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promoting collaborative research among the various marine agencies and universities in the region and coordinating this research with our national security concerns
4. Promoting the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing
5. Protecting potential archaeological resources for future study

Every year Cabrillo Marine Aquarium (CMA) engages about 300,000 visitors (which includes over 150,000 schoolchildren) in learning about Southern California ocean life. We include the offshore banks in our exhibits and would welcome the opportunity to tell our visitors these special places are receiving the care and attention they need to remain valuable to future generations.

Sincerely,

Mike Schaadt
Director, Cabrillo Marine Aquarium



222 West 6th Street, Suite 1010
San Pedro, CA 90731
www.AltaSea.org

Director
Office of National Marine Sanctuaries
1305 East-West Highway 11th Floor
Silver Spring, MD 20910

Director,

I am writing in support of Southern California Marine Institute's application for the Southern California Offshore Banks to be designated as a marine sanctuary. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat and would greatly benefit from increased coordination of management. This area provides southern California with research, educational and business opportunities across multiple disciplines. It will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast.

The overall goal of this application is to allow NOAA to direct resources to our region for spatial management insuring that we can maintain these valuable resources for future generations. Our goal is to understand and protect the biological and socioeconomic value of these offshore banks. In this proposal we do suggest restricting fishing or military activities. In fact, our goal is to highlight the importance of these activities for the economy of our region and to protect these valuable resources for future generations. We will do this by:

1. Protect and manage critical offshore resources including endangered and protected species (i.e., endangered White Abalone, protected fisheries species such as Cowcod and Boccacio and a variety of marine mammals and birds).
2. Protect these marine resources from proposed industrial threats including oil and gas extraction, mining etc.
3. Promote collaborative research among the various marine agencies and universities in the region and coordinate this research with our national security concerns.
4. Promote the awareness of the socioeconomic benefits from tourism (e.g. surfing, diving, boating) and commercial and recreational fishing.
5. Protect potential archaeological resources for future study

Southern California Marine Institute is a valued partner of AltaSea and we strongly endorse their efforts to designate the Southern California Offshore Banks as a marine sanctuary.

Sincerely,


Jenny Krusoe
Executive Director



200 NIETO AVENUE
SUITE 207
LONG BEACH, CA 90803
(805) 895-3000 or
(714) 686-6548

August 15, 2016
John Armor, Director
Office of National Marine Sanctuaries
NOAA National Marine Sanctuaries Program
1305 East-West Hwy, 11th Floor
Silver Spring, MD 20910

Re: Support for Southern California Offshore Banks NMS

Dear Mr. Armor,

The Sportfishing Conservancy has strongly supported our nation's array of National Marine Sanctuaries. In concert with your office we have conducted the "Sanctuary Classic" fishing and photo contest within all of our NMS, giving out more than \$16,000 in scholarships to children fishing within our Sanctuaries. In addition to the Classic, The Sportfishing Conservancy has held a series of "best practices" workshops ranging from Stellwagen Bank through Gray's Reef, the Florida Keys, Channel Islands, Monterey Bay and the Humpback Whale Sanctuaries. These workshops provided a responsible outline for the fishing within the Sanctuaries. We have been happy to carry the message that over 90% of all Sanctuary waters are open to regulated fishing.

With that as background, I am writing in support of the proposed Southern California Offshore Banks National Marine Sanctuary. For environmental and fishing reasons the Tanner, Cortez and neighboring banks are important to all Californians, but to Southern California in particular. As you are aware California already has 4 National Marine Sanctuaries. Unfortunately all of the existing Sanctuaries are geographically and biologically linked to northern California. When I was part of the Channel Islands NMS Marine Reserve Working Group in the late 1990's, it was stressed that while the Channel Islands NMS was at the dividing line of the north to south transition zone, the Sanctuary fell more with the north. California is a diverse place, but the majority of its people live in Southern California. It is time that we in Southern California have a National Marine Sanctuary of our own. Please make this happen.

Best always,

Tom Raftican, President



Dr. Jennifer Caselle
MARINE SCIENCE INSTITUTE
PHONE: (805) 893-5144
FAX: (805) 893-8062
E-MAIL: jenn.caselle@ucsb.edu

SANTA BARBARA, CALIFORNIA 93106-9610

Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Dec. 30, 2016

Dear Director,

This is a letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary. I am a Research Biologist at the University of California Santa Barbara with more than 20 years of field experience in the region. I am very familiar with the offshore banks (as well as island and nearshore mainland reefs) in Southern California.

Globally, seamounts are of critical importance. Southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) are no exception and comprise a valuable set of relatively shallow to deep, unique, offshore habitats for the region. This area provides southern California with research, educational and business opportunities across multiple disciplines. Protection of these seamounts and banks will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. This region in particular is complex in terms of human uses, the habitats are threatened and would greatly benefit from increased coordination of management.

I have read the proposal and the detail is extraordinary. These precious systems need to be protected for future generations. The proposal for inclusion in the Marine Sanctuary program does not prohibit fishing- in fact, the proposal clearly points to various activities as important to the economy of our region.

The proposed area provides critical habitat for a number of endangered and threatened species from invertebrates to birds and mammals. It is truly a special and unique place and one that could be destroyed by oil and gas activities and deep sea mining, threats that are increasing in other areas of the US and the world.

Sincerely,

A handwritten signature in black ink that reads "Jenn Caselle".

Dr. Jennifer Caselle

Research Biologist and Lecturer
Marine Science Institute
University of CA Santa Barbara



Scripps Institution of Oceanography
9500 Gilman Drive
La Jolla, CA 92093
21 December 2016

Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

To Whom It May Concern:

This is a letter in support of the proposal to designate the Southern California Offshore Banks as a marine sanctuary as submitted by the Southern California Marine Institute. The southern California offshore banks and seamounts (Cortes, Tanner, Northeast, and Cherry Banks and Garrett Ridge) comprise a critical set of relatively shallow to deep, unique, offshore habitats that are under threat that would greatly benefit from increased management coordination. This area provides southern California with significant research, educational and business opportunities across multiple disciplines. Protecting it in this manner will allow NOAA to direct resources to Southern California, the most populous coastal zone on the west coast. The overall objective of the application is to promote wise spatial management insuring that we can maintain these valuable resources for future generations. The goal is to understand and protect the biological and socioeconomic value of these offshore banks, not to restrict fishing or military activities in the area. Protection of these resources will benefit not only the environment but also provide economic stability to those endeavors dependent upon them.

Sincerely,

A handwritten signature in blue ink that reads "Philip A. Hastings".

Philip A. Hastings
Professor & Curator of Marine Vertebrates



January 5, 2017

Director
Office of National Marine Sanctuaries
1305 East-West Highway
11th Floor
Silver Spring, MD 20910

Re: Letter of support for designation of California Offshore Banks as a marine sanctuary

Dear Director,

We are pleased to provide this letter of support for the application by the Southern California Marine Institute for the Southern California Offshore Banks to be designated as a marine sanctuary.

The California Ocean Science Trust is a 501(c)3 not-for-profit that was created by California statute to support the state's challenging ocean resource management and policy decisions with sound science provided by transparent processes. In this role we are committed to encouraging multi-agency coordinated approaches to ocean resource science. Ocean Science Trust works with a wide range of partners to seek funding for research projects and promoting salient and credible research projects that contribute useful science to policy and management decisions. Ocean Science Trust also serves as the Science Advisor to the California Ocean Protection Council.

This designation aligns with our collective priorities and strategies. We recognize the research, educational and business opportunities that are provided by Southern California offshore banks and seamounts, and the connections between these areas and the State-managed coastal oceans. Increased research and management funding and coordination enhances the potential to effectively protect the biological and socioeconomic value of these offshore banks.

We look forward to collaborating with many partners in the region to advance towards our shared goals.

Sincerely,

A handwritten signature in cursive script, appearing to read "Tom Maloney". The signature is written in dark ink and is positioned above the printed name and title.

Tom Maloney
Executive Director
Ocean Science Trust