



**Title/Name of the area: Alijos Islands**

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**Abstract** (*in less than 150 words*)

Alijos Islands, located in 24° 57' 03" latitude N and 115° 44' 55" longitude W, are a group of small volcanic islands in columnar form rising from depths between 2400 to 4500m, its flanks are escarpments part of the rest of an underwater volcano elevated from the surface of the ocean floor, distant of the continental margin. The exposed part rising from the sea surface has a total area of 1,000 m<sup>2</sup>. This island group has been known since the colonial times in Mexico and represented in maps since 1598. Alijos Islands belong to the Pacific Coastal Biome and are located in the southern section of the California Current Province (CALC) northwest of the convergence front which lies southwest off the tip of Baja California. Fronts are less well defined in this region although the presence of upwelling fronts and fronts associated with meanders of the coastal jet and their associated cyclonic eddies occur. Upwelling generate a highly productive area that supports large densities of fish and other vertebrates. The islands Alijos are characterized by major aggregations of birds. The rocky outcrops are major nesting sites of marine birds feeding on the highly productive waters providing a major ecotourism interest, marine birds, marine mammals and the large fish densities are of relevance, the islands have been considered among the Mexico's Marine Priority Areas. The remoteness of this island group and the small dimensions exposed has limited its current knowledge and available biological, environmental and oceanographic studies but has preserved its naturalness.

**Introduction**

*(To include: feature type(s) presented, geographic description, depth range, oceanography, general information data reported, availability of models)*

Alijos Islands are a group of small volcanic islands in columnar form, its flanks are escarpments part of the rest of an underwater volcano elevated from the surface of the ocean floor, distant of the continental margin. The exposed part rising from the sea surface has a total area of 1,000 m<sup>2</sup>. 3 main larger rock mounds and numerous smaller rocks characterize the island complex. Roca Sur is the largest of the Group, its height 34 m, its diameter 14 m located in 24° 57' 03" latitude N and 115° 44' 55" longitude W rising from depths between 2400 to 4500m. This island group has been known since the

To: CBD National Focal Points, SBSTTA Focal Points; FAO; regional seas conventions and action plans and RFMOs in the North Pacific and South-Eastern Atlantic regions; Abidjan Convention Secretariat, IOC–UNESCO, IOC–WESTPAC, NOWPAP, PICES, OBIS, ISA, UNEP-WCMC, GOBI, other competent organizations and regional initiatives, and ILCs



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colonial times in Mexico and represented in maps since 1598. The rocky outcrops are major nesting sites of marine birds. The remoteness of this island group and the small dimensions exposed has limited its current knowledge and available biological, environmental and oceanographic studies. The most updated knowledge dates from the early 1990s and has been reported by Schmieder (1996).

Alijos Islands seem to have derived from a dome rise of molten rock from the mantle as a consequence of an extension of a fracture zone or a transform fault. It belongs to the chain of seamounts along the continental margin of California that have transitional and alkaline lavas formed from a mantle plume with short geological duration.

The geological surveys and studies carried out in the surrounding of the Islands Cayos Alijos Islands are limited to the SE and S to the island group. One is the expedition prior to the DSDP (*Deep Sea Drilling Program*) International drilling of site 472 the second the exploratory survey carried out by the R/V Maurice Ewing for the definition of sites in the coring activities of Leg 206 of ODP (*Ocean Drilling Program*) to characterize the sediment and rock properties that constitute the ocean cortex down to the lithological discontinuity of the cortex and upper mantle known as the Mohorovicic discontinuity. This site was selected by its high paleo-latitude, that would allow recognizing the magnetic polarity of the deeper cores that easily lose its azimuthal orientation and its low ocean dispersion rate of 120 to 130 mm/y that would prevent lesser thicknesses to reach the upper ocean mantle.

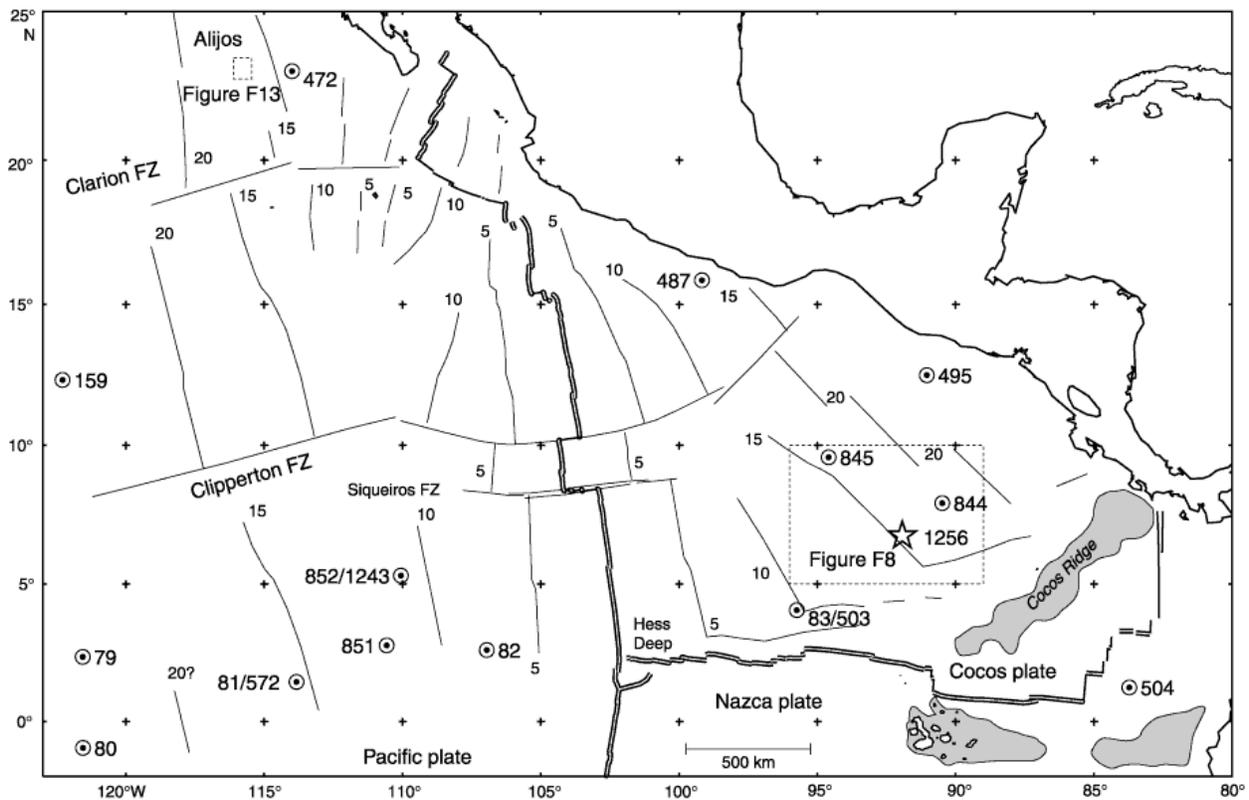


Fig 1. Map of the ocean floor ages in the Pacific and Cocos Plates. The isochrones are defined by lines at 5 my intervals. Locations in circles with numbers are DSDP and ODP coring efforts on the ocean floor. Numbers next to the lines are ages of the cortex. FZ= Fracture Zones.

The Exploratory surveys provide multichannel seismic reflection and reflection profiles recorded with seafloor hydrophones with 6km seismic cable that guarantee reaching the Mohorovicic discontinuity. The seafloor originated from the dispersion along the peripheral circum-Pacific ridges. The observed pattern displays NNW alignments of hills and basins that follow the magnetic alignment of the ocean floor. A thin layer of sediment varying between 50 to 100 m width covers the seafloor lying nearby to the Alijos Islands. The escarpments between basins and Hills rise to 100 to 400 m. All geological features en the region are formed by tectonic processes related to the volcanism and parallel fracture of centers of ocean dispersion.

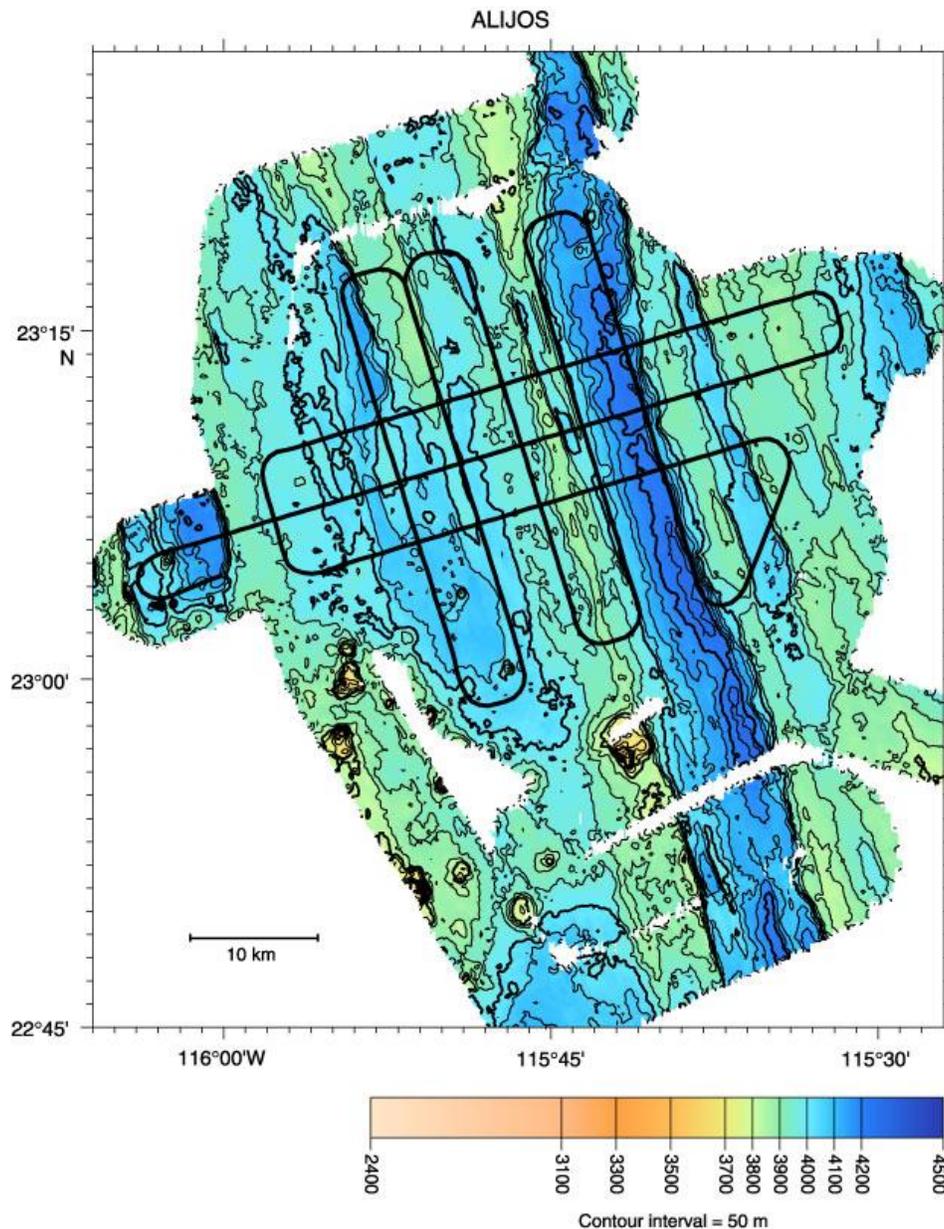


Fig 2. Seafloor bathymetry in the ODP area to the east of the Alijos Islands.

Geologically the composition of the lava in the seamounts in the section of origin to the East of the Peninsula resembles the composition of primitive composition of basalts formed in the MORB ridges as is the case of the EPR lava. The seamounts with lava

similar to MORB composition could have been formed in or near the crest of the dorsal (Davis et al., 1995). Alkaline composition in the seamount lavas indicate that these are more variable in the enrichment of the sources in the upper mantle than those near the ridge.

The volcanic rocks in the upper portions of the Alijos Islands are highly differentiated trachytes and andesitic trachytes with ages 270 ky and do not seem to belong to the same type of those found in Guadalupe and Socorro islands. Alijos Islands were formed by a *leaky transform fault* as based by the pattern of magnetic anomalies and the bathymetry of the region.

#### References

Alicé S. Davis, Susan H. Gunn, Wendy A. Bohrson, Leda-Beth Gray and James R. Hein (1995), *Chemically diverse, sporadic volcanism at seamounts offshore southern and Baja California*, *Geological Society of America Bulletin* 1995;107, no. 5;554-570, doi: 10.1130/0016-7606.

Schmieder R W. 1996, *Rocas Alijos: Scientific Results from the Cordell Expeditions*, Published by Kluwer Academic Publishers, 516 pp, ISBN 0-7923-4056-6.

#### **Location**

*(Indicate the geographic location of the area/feature. This should include a location map. It should state if the area is within or outside national jurisdiction, or straddling both. It should also state if the area is wholly or partly in an area that is subject to a submission to the Commission on the Limits of the Continental Shelf)*

The Alijos Islands are located in the Eastern Pacific Ocean at 24° 57.5' latitude N, and 115° 45.0' longitude W 300 km to the west of the Baja California Peninsula. These islands are located within the Ecoregion of the South Californian Pacific. The Geological and physiographic features are those of the Pacific Tectonic plate (Ulloa et al 2006), the topography is composed of igneous rocks (Ulloa et al 2006) and a narrow continental shelf (Schmieder 1996).

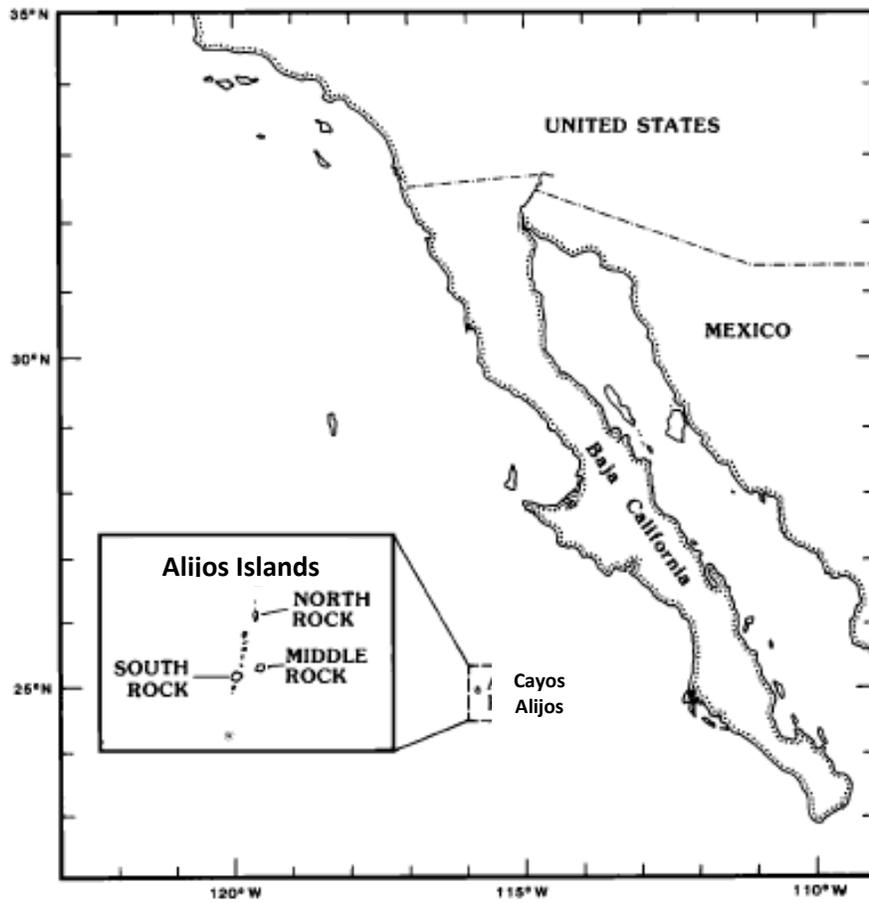


Fig 3. Location of the Alijos Islands.

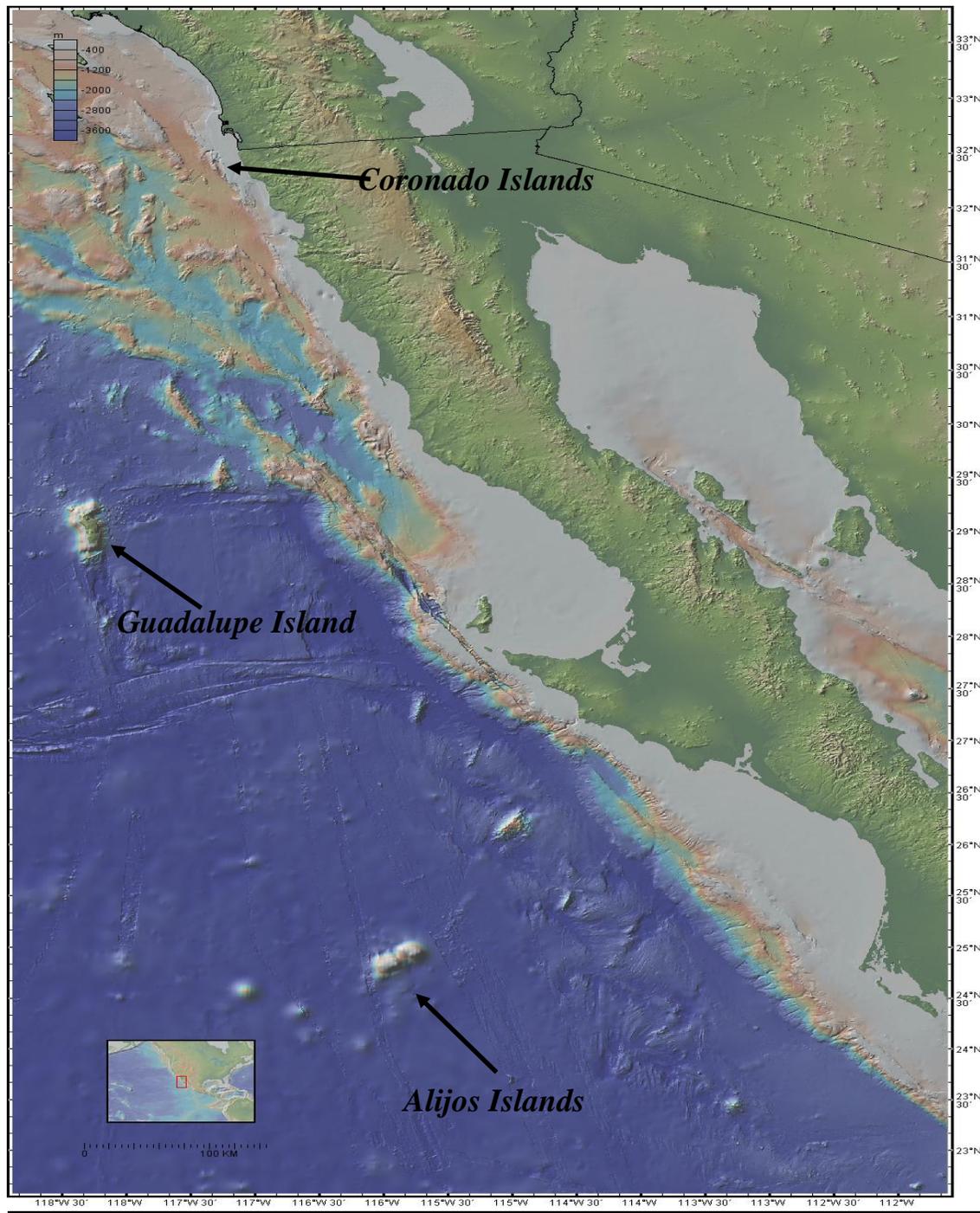


Fig 4. Location of Alijos Islands off the western Baja California peninsula and the bathymetry of the seafloor.

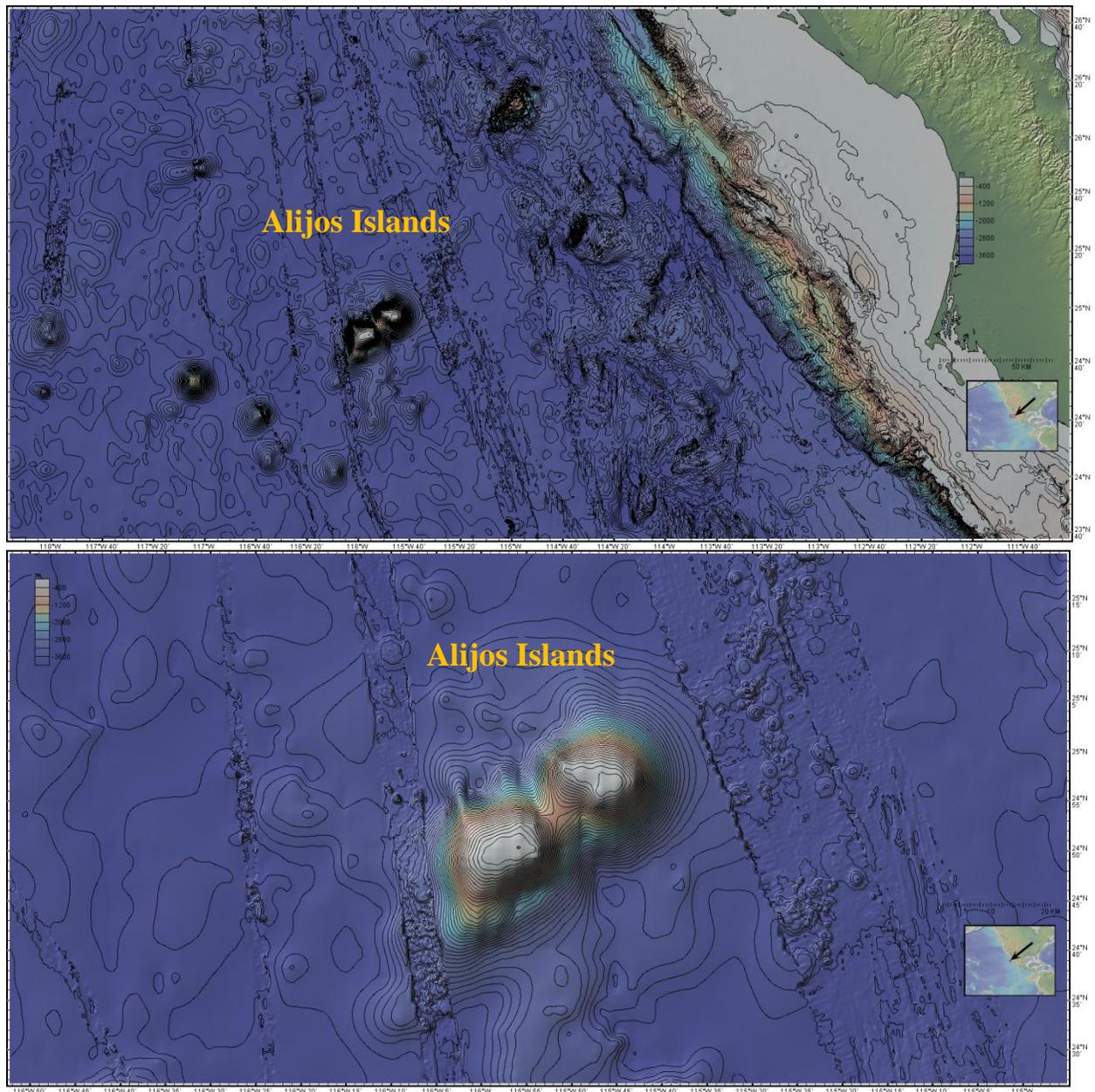


Fig 5. Bathymetry in the area near Alijos Islands. Upper panel regional bathymetry to the west of Bahía de Magdalena in the western margin of the Baja California Peninsula. Lower Panel: Local bathymetry surrounding the Alijos Islands. The softness of the relief of the flanks is product f the limited bathymetric records in this location.

### Oceanographic features

Alijos Islands belong to the Pacific Coastal Biome as described by Longhurst (1998), and are located in the southern section of the California Current Province (CALC) northwest of the convergence front which lies southwest off the tip of Baja California. The front is less well defined in this region although the presence of upwelling fronts and fronts associated with meanders of the coastal jet and their associated cyclonic eddies occur.

### References

Arriaga Cabrera, L., E. Vázquez Domínguez, J. González Cano, R. Jiménez Rosenberg, E. Muñoz López & V. Aguilar Sierra (coordinadores). 1998. Regiones marinas prioritarias de México. Comisión Nacional para el Conocimiento y uso de la Biodiversidad. México.  
(<http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/rmp062.html>)

Actualización de la Carta Nacional Pesquera. Diario Oficial de la Federación, Segunda sección Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación. 15 de marzo de 2004. México.

INEGI. 2005. Cartografía del Territorio Insular de México. Continuo Nacional, primera edición, escala 1:250,000. Instituto Nacional de Geografía y Estadística, Aguascalientes, Ags, Mexico

Longhurst, A. 1998. Ecological Geography of the Sea. Academic Press, USA 398pp

*Schmieder R W. 1996. Rocas Alijos: Scientific Results from the Cordell Expeditions, Published by Kluwer Academic Publishers, 516 pp, ISBN 0-7923-4056-6.*

Ulloa, R., J. Torre, L. Bourillón, A. Gondor & N. Alcantar. 2006. Planeación ecorregional para la conservación marina: Golfo de California y costa occidental de Baja California Sur. Informe final a The Nature Conservancy. Guaymas (México): Comunidad y Biodiversidad, A.C., 153 pp.

### **Feature description of the proposed area**

*(This should include information about the characteristics of the feature to be proposed, e.g. in terms of physical description (water column feature, benthic feature, or both), biological communities, role in ecosystem function, and then refer to the data/information that is available to support the proposal and whether models are available in the absence of data. This needs to be supported where possible with maps, models, reference to analysis, or the level of research in the area)*

The coastal wind regime is weaker at this latitude in comparison to the northern portion of the California current but has been recognized to be favorable for upwelling year round , through some seasonality in upwelling is evident in the chlorophyll field. Upwelling cells south of prominent capes are persistent: Cape Colonet, Punta Baja, Cape San Quintín, Punta Eugenia, Punta Abreojos and Cape Falso all may generate such cells from late summer (August) through early winter (November) and that south of Cape San Lazaro even coastal upwelling ceases in autumn and winter (September-January).

According to Longhurst (1998) because of the large number of published studies of the California Current, in reviewing this province it is easier to concentrate on the individual process rather than to see the whole. For instance, it is easy to lose sight of the fact that there is a seasonal cycle in the depth of the pycnocline that obtains over the whole area of the province (summer, 20-25m; winter approx 75m). At all seasons if one ignores the effects of mesoscale features, the thermocline slopes downwards to the west, offshore, as it must in upwelling cells, the density profile may be relatively featureless but wherever a significant mixed layer exists, a DCM occurs on the density gradient, usually with the depth of primary production a few meters shoaler. The offshore region has a seasonal cycle typical of subtropical oceans: Primary production rate and chlorophyll accumulation begin as soon as the mixed layer begins to deepen in the autumn. As noted previously in the offshore areas chlorophyll values peak in midwinter and PP rate slows again with the shoaling of the thermocline in spring. Analysis of chlorophyll fields, integrated for the

whole province, shows that this process-not summer upwelling at the coast- dominates the seasonal cycle. This observation recalls earlier suggestions that between year variability in biological properties was forced primarily by changes in the advection of nutrients from the source of the California Current rather by variation in the nutrients brought to the surface by coastal upwelling (Chelton, 1982).

#### References

Chelton, DB, PA Bernal, JA McGowan 1982. Large-scale interannual physical and biological interaction in the California Current. *Journal of Marine Research* 40:44, 1095-1125

Longhurst, A. 1998. *Ecological Geography of the Sea*. Academic Press, USA 398pp.

#### **Feature condition and future outlook of the proposed area**

*(Description of the current condition of the area – is this static, declining, improving, what are the particular vulnerabilities? Any planned research/programmes/investigations?)*

**Currently** considered Marine Priority Area by CONABIO (<http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/marinas.html>). Ongoing conservation programs and activities carried out by UNAM, UABC, CICESE.

**Future outlook.-** The establishment of a MPA in this area extending its protection in 10 miles off the islands shore. All the islands in this province are highly important in this region for the understanding of the vertebrate and invertebrate fauna connectivity and their relation to the local oceanography and productivity. We look forward to have the islands included as an EBSA.

## Assessment of the area against CBD EBSA Criteria

(Discuss the area in relation to each of the CBD criteria and relate the best available science. Note that a candidate EBSA may qualify on the basis of one or more of the criteria, and that the boundaries of the EBSA need not be defined with exact precision. And modeling may be used to estimate the presence of EBSA attributes. Please note where there are significant information gaps)

CBD EBSA Criteria (Annex I to decision IX/20)	Description (Annex I to decision IX/20)	Ranking of criterion relevance (please mark one column with an X)			
		Don't Know	Low	Some	High
<b>Uniqueness or rarity</b>	Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.				
<i>Explanation for ranking</i>					
<b>Special importance for life-history stages of species</b>	Areas that are required for a population to survive and thrive.				
<i>Explanation for ranking</i>					
<b>Importance for threatened, endangered or declining species and/or habitats</b>	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.				
<i>Explanation for ranking</i>					
<b>Vulnerability, fragility, sensitivity, or slow recovery</b>	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.			X	
<i>Explanation for ranking</i> Some of the current activities that could be considered of high impact to the island fauna include the yellowfin tuna fishery, <i>Thunnus albacares</i> . However in general the area can be considered of ecological					

importance and integrity with some degradation produced by human activities that if they continue will lead to the loss of the functional characteristics (Arriaga et al, 2000). Ciguatoxins were recorded in 1993 the area with 7 people dying (UNESCO, 2011).

#### References

2Arriaga Cabrera, L., E. Vázquez Domínguez, J. González Cano, R. Jiménez Rosenberg, E. Muñoz López & V. Aguilar Sierra (coordinadores). 1998. Regiones marinas prioritarias de México. Comisión Nacional para el Conocimiento y uso de la Biodiversidad. México.  
<http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/rmp062.html>

UNESCO 2011. Report of the First Meeting of the IOC Working Group on Harmful Algae in the Caribbean and Adjacent Region (IOCARIBE-ANCA), 29 June – 1 July 1998, Havana, Cuba, 67 pp. 1998 (IOC Workshop Report No 150, UNESCO 1998). 65 pp

<b>Biological productivity</b>	Area containing species, populations or communities with comparatively higher natural biological productivity.			<b>x</b>
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#### Explanation for ranking

Coastal upwelling is nevertheless, a special case which merits special attention. The upwelling cells generate diatom-copepod assemblages of remarkably low diversity: In repeated net tows in one assemblage such as a few kilometers off Baja California (25°N), I could find no more than 29 species of zooplankton (and no more than 20 in any one haul), or about one-quarter the number taken 25km farther offshore and examined with equivalent attention. Large, filter-feeding, copepod, especially *C. pacificus* at 115 ind m<sup>-3</sup> comprised 77% of zooplankton dry weight at the coast. The seasonal ontogenetic migration of this species cause the deep basin on the continental shelf to trap large concentrations of overwintering stage 5 copepodites; early in the winter these aggregate near the bottom, but the layers progressively shoal as oxygen concentration in the bottom water progressively declines, eventually forcing them over the sill depth as have been recorded in Santa Barbara Basin by Osgood and Checkly (1997a, b). Compare this situation with that of *C. finmarchicus* in the deep basin of the Scotia Shelf in the Northwest Atlantic Shelves Province.

A few large species of diatoms (*Coscinodiscus*, *Nitzschia* and *Tripodonesis*) formed 81% of algal cell volume. However, these rich diatom crops are also utilized by a very unusual organism- a bright red swimming galatheid crab *Pleuroncodes planipes*. The pelagic phase crowd into the surface layer off Baja California where they tail-flip up to the surface and then parachute down again filtering actively with their maxillipeds, this is remarkable sigh against the rich olive-green upwelled water. These crabs (at one per 3 m<sup>3</sup>, each capable of clearing diatoms from 3 or 4 L<sup>-1</sup>hr<sup>-1</sup> may comprise 90% of the total zooplankton/nekton biomass in upwelling cells and contribute 85% of all zooplankton/nekton grazing pressure. *Pleuroncodes* is directly preyed on, and preferred food of yellowfin tuna in the same region, so this is a remarkably direct link from diatoms to resource.

The islands aggregate fish and offshore fishery is one of the most important ecosystem services that these islands. It is an important feeding ground for birds, is slopes are refuge to invertebrates and juvenile larval stages, the islands provide nesting ground for the development and growth of birds that feed on the large fish abundance. Marine mammals feed on the high abundance of resources (Arriana-Cabrera et al., 1998).

#### Reference

Arriaga Cabrera, L., E. Vázquez Domínguez, J. González Cano, R. Jiménez Rosenberg, E. Muñoz López & V. Aguilar Sierra (coordinadores). 1998. Regiones marinas prioritarias de México. Comisión Nacional para el Conocimiento y uso de la Biodiversidad. México.  
<http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/rmp062.html>

Longhurst, A. 1998. Ecological Geography of the Sea. Academic Press, USA 398pp

Osgood KE, Checkley DM 1997a Observations of a deep aggregation of Calanus pacificus in the Santa Barbara Basin. Limnol Oceanogr 42:997–1001

Osgood KE, Checkley DM Jr 1997b Seasonal variations in a deep aggregation of Calanus pacificus in the Santa Barbara Basin. Mar Ecol Prog Ser 148:59–69

<b>Biological diversity</b>	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.				<b>x</b>
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*Explanation for ranking*

The Islands host a large Diversity of diverse taxa including Molluscs, Polychaetes, Echinoderms, Crustacea, Fish, Turtles, Marine Birds and Marine Mammals (Arriaga-Cabrera et al, 1998). The key species for supporting its conservation are the marine birds that nest in these islands, these enrich the processes of the marine islands in a unique manner through their activities. Loosing these will imply structural changes in the ecosystem with a subsequent loss of local diversity. The high aggregation of marine birds are considered as well flag species and charismatic for the islands that are highly attractive to ecotourism promoting conservation. Nationwide these islands have been considered due to their large aggregation special sites species.

Reference

Arriaga Cabrera, L., E. Vázquez Domínguez, J. González Cano, R. Jiménez Rosenberg, E. Muñoz López & V. Aguilar Sierra (coordinadores). 1998. Regiones marinas prioritarias de México. Comisión Nacional para el Conocimiento y uso de la Biodiversidad. México. (<http://www.conabio.gob.mx/conocimiento/regionalizacion/doctos/rmp062.html>)

<b>Naturalness</b>	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.				<b>x</b>
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*Explanation for ranking*

The Area is localized in the transition of two biological provinces in a latitude influenced by the Pacific current moving to the west and forming the Pacific Transocean current . In spite of its evident biogeographical importance, there number of scientific studies is limited due to its isolation and remoteness that allows these islands a high degree of naturalness and reduced human impact condition. Much still remains to be recorded on its biota, endemicy and oceanographic variability (Schmieder, 1996).

To date 500 species have been recorded many of which are unite to its genus (60 species in 57 genera) and many others undescribed.

References

Schmieder R W. 1996, Rocas Alijos: Scientific Results from the Cordell Expeditions, Published by Kluwer Academic Publishers, 516 pp, ISBN 0-7923-4056-6.

## Sharing experiences and information applying other criteria (Optional)

Other Criteria	Description	Ranking of criterion relevance (please mark one column with an X)			
		Don't Know	Low	Some	High
<i>Add relevant criteria</i>					
<i>Explanation for ranking</i>					

## References

(e.g. relevant documents and publications, including URL where available; relevant data sets, including where these are located; information pertaining to relevant audio/visual material, video, models, etc.)

## Maps and Figures

## Annexes

### SPECIES IN A CATEGORY OF PROTECTION RECORDED FOR ALIJOS ISLANDS

Group	Family	Genus	Species	NOM-059-SEMARNAT-2001	IUCN Red List category
Marine Birds	Laridae	<i>Sterna</i>	<i>antillarum</i>	Sujeta a protección especial.	
Marine mammals	Delphinidae	<i>Lagenorhynchus</i>	<i>obliquidens</i>	Sujeta a protección especial	
	Otariidae	<i>Arctocephalus</i>	<i>townsendi</i>	En peligro de extinción. Endémica	VU D2 ver 2.3 (1994)
	Ziphiidae	<i>Berardius</i>	<i>bairdii</i>	Sujeta a protección especial	LR/cd ver 2.3 (1994)
	Ziphiidae	<i>Mesoplodon</i>	<i>densirostris</i>	Sujeta a protección especial	
	Ziphiidae	<i>Mesoplodon</i>	<i>europaeus</i>	Sujeta a protección especial	
	Ziphiidae	<i>Mesoplodon</i>	<i>ginkgodens</i>	Sujeta a protección especial	DD ver 2.3 (1994)
	Ziphiidae	<i>Mesoplodon</i>	<i>peruvianus</i>	Sujeta a protección especial	DD ver 2.3 (1994)

## List of species in the Mexican Fishery File

Group	Target species
Bivalves	<i>Anadara tuberculosa</i>
	<i>Argopecten irradians concentricus</i>
	<i>Atrina maura</i>
	<i>Atrina tuberculosa</i>
	<i>Chione californiensis</i>
	<i>Chione undatella</i>

	<i>Lyropecten subnodosus</i>
	<i>Megapitaria squalida</i>
	<i>Pecten vogdesi</i>
	<i>Pinna rugosa</i>
	<i>Spondylus calcifer</i>
	<i>Tivela stultorum</i>
Tuna fish	<i>Auxis thazard</i>
	<i>Katsuwonus pelamis</i>
	<i>Thunnus albacares</i>
	<i>Thunnus obesus</i>
	<i>Thunnus thynnus</i>
Bluecrabs	<i>Callinectes arcuatus</i>
	<i>Callinectes bellicosus</i>
	<i>Callinectes toxotes</i>
Lobsters	<i>Panulirus gracilis</i>
	<i>Panulirus inflatus</i>
	<i>Panulirus interruptus</i>
Fish	<i>Bodianus diplotaenia</i>
	<i>Brotula clarkae</i>
	<i>Caulolatilus affinis</i>
	<i>Caulolatilus princeps</i>
	<i>Hippoglossina stomata</i>
	<i>Hippoglossina tetrophthalmus</i>
	<i>Merluccius productus</i>
	<i>Paralabrax auroguttatus</i>
	<i>Paralabrax clathratus</i>
	<i>Paralabrax loro</i>
	<i>Paralabrax maculatofasciatus</i>
	<i>Paralabrax nebulifer</i>
	<i>Paralichthys aestuarius</i>
	<i>Paralichthys californicus</i>
	<i>Paralichthys woolmani</i>
	<i>Pleuronichthys guttulatus</i>
	<i>Scomberomorus concolor</i>
	<i>Scomberomorus sierra</i>
	<i>Scorpaena guttata</i>
	<i>Scorpaena plumieri</i>
	<i>Sebastes atrovirens</i>
	<i>Sebastes paucispinis</i>
	<i>Semicossyphus pulcher</i>
	<i>Xystreurus liolepis</i>
Smaller pelagics	<i>Cetengraulis mysticetus</i>
	<i>Engraulis mordax</i>
	<i>Etrumeus teres</i>
	<i>Oligoplites refulgens</i>
	<i>Opisthonema bulleri</i>
	<i>Opisthonema libertate</i>
	<i>Opisthonema medirastre</i>
	<i>Sarda chiliensis</i>
	<i>Sardinops sagax</i>

	<i>Scomber japonicus</i>
	<i>Trachurus symmetricus</i>
Sword fish	<i>Xiphias gladius</i>
Coastal sharks	<i>Carcharhinus falciformis</i>
	<i>Carcharhinus leucas</i>
	<i>Galeocerdo cuvier</i>
	<i>Ginglymostoma cirratum</i>
	<i>Isurus oxyrinchus</i>
	<i>Sphyrna corona</i>
	<i>Squatina californica</i>
	<i>Alopias pelagicus</i>
	<i>Alopias superciliosus</i>
	<i>Alopias vulpinus</i>

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