



Baseline Environmental Assessment of Chumash Heritage National Marine Sanctuary

Student Proposers:

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<u>Client:</u> Chumash Heritage National Marine Sanctuary

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Objectives:

This project aims to develop a baseline environmental understanding of the recently designated Chumash Heritage National Marine Sanctuary's (CHNMS) region by assessing habitats and the status and trends of key species within its boundaries. This foundational assessment will identify regional trends and monitoring gaps. These findings will inform the sanctuary's first <u>Condition Report</u> and <u>Climate</u> <u>Vulnerability Assessment</u>, guiding future management and conservation strategies. Objectives for the initial baseline environmental assessment of the sanctuary are listed below:

1. **Characterize the sanctuary environment**: Conduct literature review to provide a qualitative description (~2 pages) of sanctuary habitats, seafloor features, physical and biologic

oceanographic conditions, and seasonal variations. This characterization will guide the following objective.

- 2. Assess status and trends of sanctuary resources from the past 5-10 years: Analyze historical data to evaluate keystone and foundation species, other focal species, non-indigenous species, biodiversity, and migratory species of seabirds and marine mammals. Assess anthropogenic pressures on these resources, supporting focus for targeted management responses.
- 3. **Prioritize and communicate trends for living resources:** Synthesize findings to identify essential species, critical habitats and ecological components, and develop visualizations that highlight key trends within the sanctuary.

Significance:

Spanning 4,543 square miles of coastal and ocean waters, the recently designated Chumash Heritage National Marine Sanctuary (CHNMS) represents a transformative approach in how we understand and protect vital marine ecosystems (see Figure 1) [1]. Situated off California's Central Coast, it joins four other national marine sanctuaries in the state, collectively protecting habitats that support a remarkable diversity of life—kelp forests, benthic communities, upwelling zones, and deep-sea environments teeming with marine mammals, seabirds, fishes, and invertebrates [1]. CHNMS is the first Tribal-focused national marine sanctuary, setting a powerful precedent for weaving Indigenous knowledge and ecosystem stewardship, honoring the profound cultural significance this region holds for the Indigenous Peoples who have thrived here for millennia [2].

Existing data collected by research institutions, government agencies, nonprofit organizations, and community groups are dispersed and require a comprehensive review and analysis within the boundaries of CHNMS. This project aims to consolidate and synthesize these diverse datasets to establish an ecological baseline essential to the Sanctuary's long-term understanding of critical habitats, biodiversity patterns, and ecosystem shifts driven by climate change and other stressors.

This assessment will directly support CHNMS's Research and Monitoring Action Plan, strategies 2-4, a core element of its management framework, ensuring that policy recommendations and protective measures are grounded in robust, place-based knowledge [1]. It will lay the groundwork for the sanctuary's first Condition Report and inform subsequent management phases, shaping resource allocation and balancing cultural, ecological, and economic interests. The benefits of this undertaking extend well beyond sanctuary staff. Local communities, Indigenous partners, fisheries stakeholders, neighboring sanctuaries such as Monterey Bay National Marine Sanctuary (MBNMS) and Channel Islands National Marine Sanctuary (CINMS), regional policymakers, and research partners will all benefit from cohesive, consolidated information regarding this unique marine environment.

Equity:

Chumash Heritage National Marine Sanctuary's (CHNMS) creation emerged from Tribal-led organizing and collective action, making it the first national marine sanctuary to be nominated and shaped by Indigenous leadership [2]. This historic accomplishment sets a precedent for advancing environmental stewardship that acknowledges and centers Indigenous sovereignty, values, and perspectives [3].

Our project aligns with Strategy RM-3 (Research and Monitoring) of CHNMS Final Management Plan, which calls for characterizing the sanctuary's biological and physical features. Additionally, our

deliverables will provide foundational support for Strategy RM-4, which focuses on interpreting and applying scientific information and Indigenous knowledge to address sanctuary needs [3].

Available data:

This project will use data provided by CHNMS and the public data sources below:

| Data Source | Support | Description | Distribution within CHNMS Boundaries |
|--|---|--|---|
| <u>CeNCOOS and SCCOOS</u> <u>California Ocean Observing</u> <u>Systems Data Portal</u> | <i>Objective 1: Characterize Sanctuary Environment</i> | Variables used will be sea- surface temperature, currents, and conductivity to characterize seasonal variations, and environmental drivers. | 12 deployed sensors (2022-2025) |
| NOAA Bathymetry | <i>Objective 1: Characterize Sanctuary Environment</i> | High-resolution seafloor mapping to identify benthic habitats, geologic features, informing qualitative offshore sanctuary topography. | 9 annual multibeam bathymetric survey tracklines (1995-2021) |
| PISCO (Partnership for Interdisciplinary Studies of Coastal Oceans) | <i>Objective 2: Assess status and trends of key resources and species</i> | Long-term datasets on rocky intertidal and kelp forest ecosystems, identifying fish and invertebrate species over the past 5-10 years. | ~7 survey sites monitored annually (1999-2023) |
| MARINe (Multi-Agency Rocky Intertidal Network) | <i>Objective 2: Assess status and trends of key resources and species</i> | Standardized intertidal monitoring data to detect distribution and abundance trends in critical shore habitats and intertidal species. | ~18 survey sites monitored quarterly/ annually (2007-2024) |

Supplemental Data Sources:

- <u>CalCOFI (California Cooperative Oceanic Fisheries Investigations)</u>: Oceanographic and marine ecosystem data (salinity, nutrients, larvae, eDNA net tows) for sustainable marine management.
- <u>ESI Maps</u>: ESI maps and GIS data of habitats. CHNMS related information is located under "Offshore Los Angeles / Long Beach California" with 2024 data.
- <u>MarineBIOS (CDFW's Biogeographic Information and Observation System)</u>: Spatial distributions of marine species and habitats, supporting identification of key species and biodiversity hotspots.

Possible Approaches:

• Review condition reports and methodologies from other California national marine sanctuaries (e.g., CINMS, MBNMS) [4][5], to identify successful habitat characterization and monitoring

techniques applicable to CHNMS. Develop standardized criteria for assessments to ensure comparability across sanctuaries.

- Examine 5–10 years of data on keystone and foundation species, migratory seabirds, marine mammals, and non-indigenous species. Use GIS to map critical habitats.
- Attend Sanctuary Advisory Council (SAC) meetings (e.g., CHNMS and CINMS), which are site-focused, community-based councils advising National Marine Sanctuary System leadership [6]. Review council meeting notes to understand Indigenous perspectives, community insights, and holistically inform our baseline assessment.

Deliverables:

- 1. **Executive summary addendum** for stakeholders and decision makers, outlining strategies and indicators for ongoing monitoring, suggestions for integrating new data sources, and adaptive management recommendations.
- 2. **Map products and interactive StoryMap** in collaboration with the CHNMS team to develop a comprehensive suite of GIS layers, incorporating data on habitats, species distributions, migratory corridors, and seafloor features. GIS data will be integrated into an interactive StoryMap that combines maps, images, and narrative text to highlight the cultural significance and baseline assessment of the sanctuary in a cohesive narrative.
- 3. **Public communication materials** (e.g., infographics, fact sheets, short summaries) for educators, and the general public. These materials will distill complex scientific and cultural information into accessible formats, facilitating broader awareness and support for CHNMS conservation efforts and significance.

Internship:

The client (CHNMS) is willing to host one intern to support this project over the summer. Internship funding is currently pending, but CHNMS is actively working to secure funding for a 10–12 week position.

Additionally, our project also offers an exciting opportunity to create multiple summer 2025 internships with the Bren School centered on reviewing and analyzing datasets collected for the baseline assessment. Leveraging campus program fellowships (e.g., Bren Environmental Leadership (BEL), Mantell, and Promise Scholars), graduate students could be paired with undergraduate mentees, fostering skill-building and collaboration. These internships would provide undergraduates with hands-on data analysis experience while offering graduate students valuable mentorship opportunities, contributing to the professional growth of both groups and advancing the project's objectives.

Budget and Justification:

This project should not need funding beyond the given \$1,000 from the Bren School. However, to support these summer 2025 internships we plan to collaborate with the Bren School's Development Team to secure funding through on-campus fellowship opportunities.

References:

- National Oceanic and Atmospheric Administration (NOAA). (n.d.). Chumash Heritage National Marine Sanctuary. Sanctuaries NOAA. Retrieved December 11, 2024, from https://sanctuaries.noaa.gov/chumash-heritage/
- 2. Chumash Heritage National Marine Sanctuary. (n.d.). About. Chumash Heritage National Marine Sanctuary. Retrieved December 10, 2024, from https://chumashsanctuary.org/about/
- 3. Office of National Marine Sanctuaries National Oceanic and Atmospheric Administration. (2024). "Chumash Heritage National Marine Sanctuary: Final Management Plan".
- 4. Office of National Marine Sanctuaries. 2009. Channel Islands National Marine Sanctuary Condition Report 2009. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 60pp.
- Office of National Marine Sanctuaries. 2019. Channel Islands National Marine Sanctuary 2016 Condition Report. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 482 pp.
- 6. NOAA Channel Islands National Marine Sanctuary. (n.d.). Sanctuary Advisory Council. NOAA. Retrieved January 6, 2025, from https://channelislands.noaa.gov/sac/

Appendix:



Figure 1. Map of Chumash Heritage National Marine Sanctuary boundaries. Image: NOAA. [1]

Glossary of Acronyms:

CBNMS: Cordell Bank National Marine Sanctuary

CeNCOOS: Central and Northern California Ocean Observing System CDFW: California Department of Fish and Wildlife CalCOFI: California Cooperative Oceanic Fisheries Investigations CHNMS: Chumash Heritage National Marine Sanctuary **CINMS**: Channel Islands National Marine Sanctuary eDNA: Environmental DNA ESI: Environmental Sensitivity Index **GFNMS**: Greater Farallones National Marine Sanctuary **GIS**: Geographic Information Systems **MBNMS**: Monterey Bay National Marine Sanctuary MARINe: Multi-Agency Rocky Intertidal Network NMS: National Marine Sanctuary NOAA: National Oceanic and Atmospheric Administration PISCO: Partnership for Interdisciplinary Studies of Coastal Oceans SAC: Sanctuary Advisory Council SCCOOS: Southern California Coastal Ocean Observing System



UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration NATIONAL OCEAN SERVICE Office of National Marine Sanctuaries | West Coast Region 99 Pacific Street, Bldg 100, Suite F Monterey, CA 93940

January 8, 2025

Group Project Committee Bren School of Environmental Science & Management 2400 Bren Hall UC Santa Barbara, CA 93106

Dear Group Project Committee:

I am writing to affirm support for the group project proposal, "Baseline Environmental Assessment of Chumash Heritage National Marine Sanctuary." The proposal was written in partnership with Chumash Heritage National Marine Sanctuary (CHNMS) of NOAA's Office of National Marine Sanctuaries (ONMS) West Coast Region, which is a government agency working to promote responsible, sustainable ocean uses that ensure the health of our most valued ocean places. Officially designated in November 2024, CHNMS is America's 17th national marine sanctuary, the sixth off the U.S. West Coast, and is one of the largest in the National Marine Sanctuary System. The sanctuary encompasses 4,543 square miles of Central California's coastal and ocean waters, providing protection to nationally significant natural, cultural, and historical resources while bringing new opportunities for research, community engagement, and education and outreach activities.

This project addresses establishing a baseline assessment of habitats and species within CHNMS. The assessment will lay a critical foundation to guide science efforts and long-term management plans for the new marine sanctuary. Furthermore, this assessment will provide an essential framework for future management documents such as our Condition Reports and Climate Vulnerability Assessments.

CHNMS staff and advisors are committed to providing the Bren student team with reliable, timely access to relevant datasets, along with professional guidance and expert feedback. We will facilitate connections and share insights on sanctuary management objectives. As the client for this project, we are committed to providing consultation and relevant data throughout the entire duration of the project. In addition, CHNMS is working on securing financial support to host a paid intern to advance this project during the summer of 2025. Further, we do not anticipate this project requiring more funding than the budget provided by the Bren School for each group. However, we understand that if additional financial needs arise, CHNMS will seek to provide the necessary support.

We are confident that the suite of deliverables—baseline reports, geospatial analyses, outreach materials, and interpretive frameworks—will equip CHNMS, neighboring sanctuaries, and the broader marine management community with the tools needed to understand changing conditions, identify key challenges, and collaboratively develop solutions. We look forward to working closely with the Bren School team on this project. If you have any questions or need additional details, please contact Monisha Sugla (monisha.sugla@noaa.gov, (908) 461-6446).

Sincerely,

Sarah Fangman Regional Director

