

OCEAN USES IN THE MONTEREY BAY NATIONAL MARINE SANCTUARY

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This brochure applies human use data to place-based management through a proof of concept analysis of California Ocean Uses Atlas data within the context of the Monterey Bay National Marine Sanctuary (MBNMS). This analysis was performed by NOAA's National Marine Protected Areas Center (MPA Center) with input from MBNMS staff. More information can be found at http://www.mpa.gov/dataanalysis/atlas_cal and <http://montereybay.noaa.gov/>.

WHY LOOK AT USES WITHIN THE SANCTUARY?

- The oceans are getting crowded with the expansion of both emerging and traditional uses. The coexistence of these multiple uses in the same space can create complex management challenges.
- The California Ocean Uses Atlas provides critical information -- where uses are occurring in space.
- This MBNMS case study shows how ocean use data can be used to illustrate patterns of a single use, identify areas of heavy use from multiple activities, and explore potential conflicts or compatibilities among uses. This type of analysis is essential for implementing ecosystem-based management (EBM) by offering a comprehensive examination across sectors to better manage for ecosystem health.

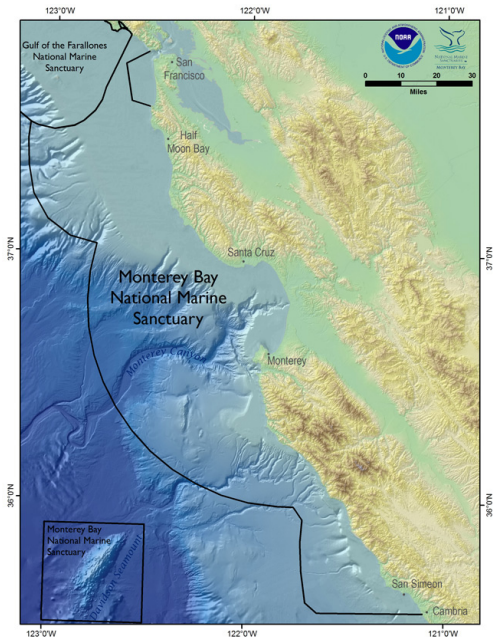
PROJECT BACKGROUND

California Ocean Uses Atlas

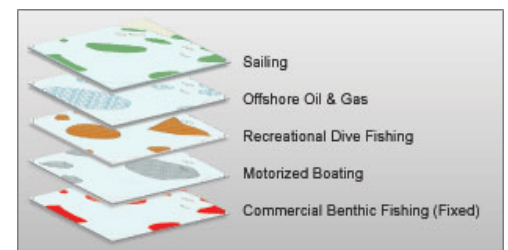
The California Ocean Uses Atlas is an innovative public-private partnership between the MPA Center and the Marine Conservation Institute. Funded by grants from the Gordon and Betty Moore Foundation and the Resources Legacy Fund Foundation, the Atlas fills a critical information gap in ocean management by mapping, for the first time, the full range of significant human uses of the ocean in state and federal waters off the coast of California. Spatial data for nearly 30 ocean uses were gathered through a series of participatory mapping workshops convened with regional ocean use experts throughout the state. The resulting data provide baseline information regarding the location and extent to which the ocean environment is used for non-consumptive, fishing, industrial, and military activities.

Monterey Bay National Marine Sanctuary EBM Initiative

The MBNMS has undertaken an EBM initiative whose goal is to "enhance ecosystem-based management and inform coastal and marine spatial planning in MBNMS by applying the best available science and integrating and coordinating with partner agencies." The Sanctuary aims to reach this goal by accomplishing the following objectives: maintain/restore marine ecosystem health and function; ensure protection of unique and rare features of the sanctuary; facilitate research to differentiate between natural variation and human impacts; and facilitate ecologically and economically sustainable uses, including fisheries. The recommendations developed will maintain healthy and resilient coastal and marine resources while allowing for multiple sustainable uses for the benefit of present and future generations (from <http://montereybay.noaa.gov/resourcepro/ebmi/welcome.html>).



MBNMS boundaries (map credit: MBNMS)

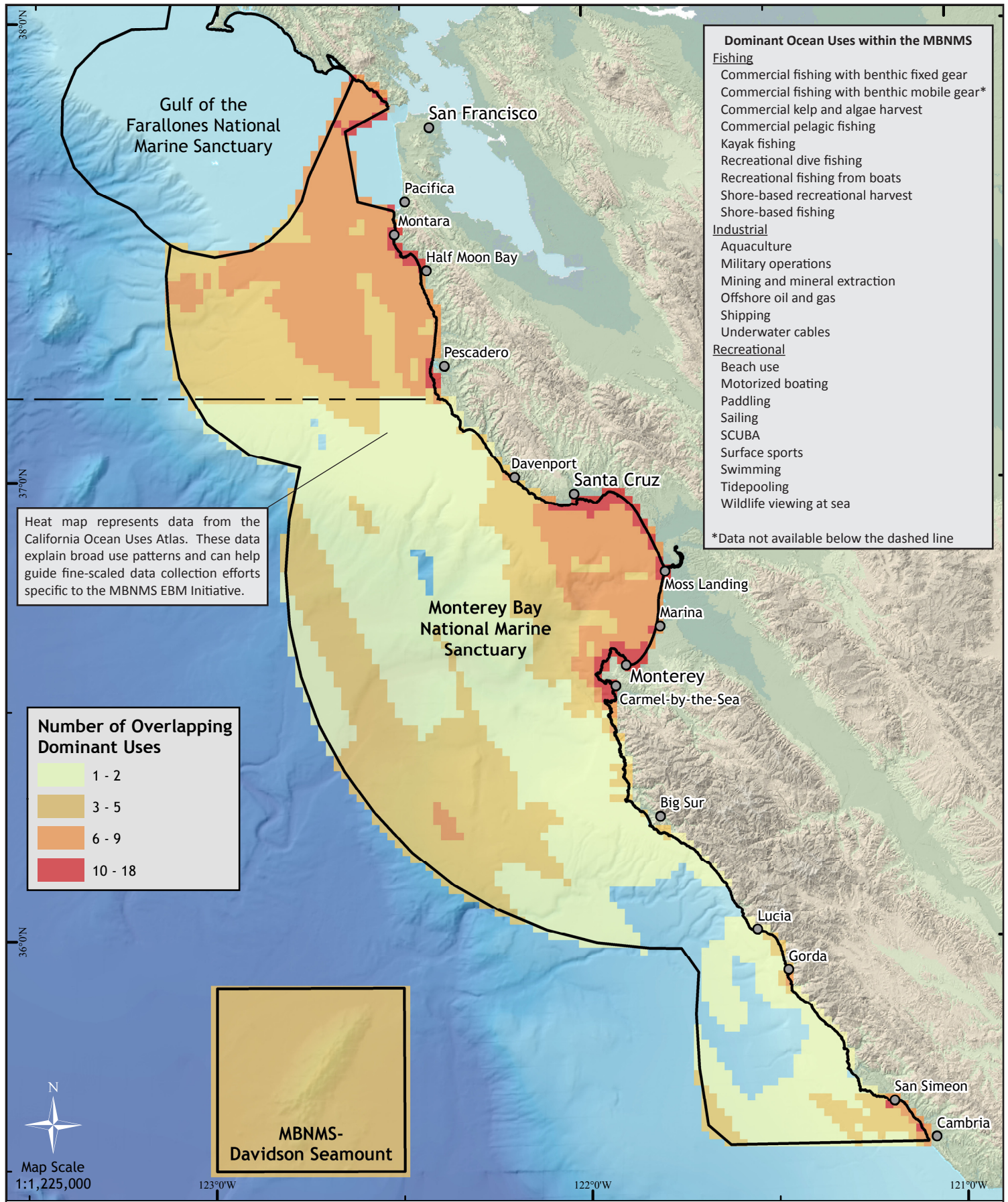


The California Ocean Uses Atlas was designed to capture spatial patterns of ocean use activities and can be used to analyze the overlap of human activities within the marine environment.

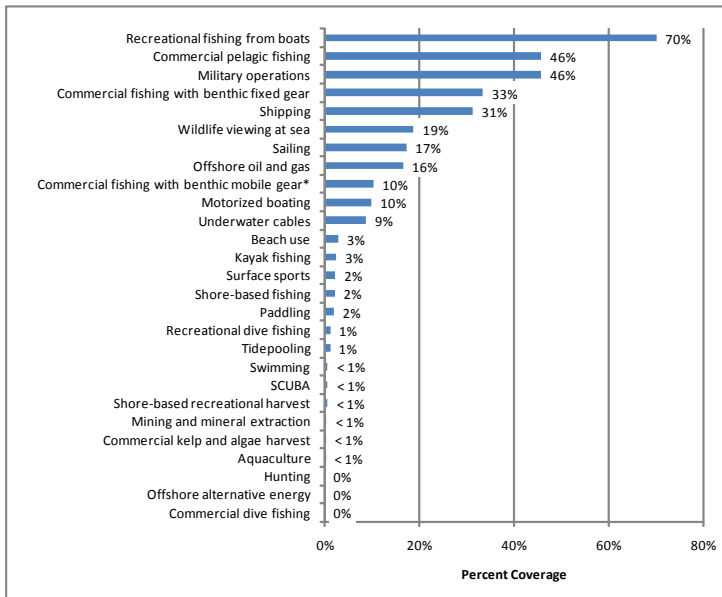
NOAA's National Marine Protected Areas (MPA) Center's mission is to facilitate the effective use of science, technology, training, and information in the planning, management, and evaluation of the nation's system of marine protected areas. The MPA Center works in partnership with federal, state, tribal, and local governments and stakeholders to develop a science-based, comprehensive national system of MPAs. These collaborative efforts will lead to a more efficient, effective use of MPAs now and in the future to conserve and sustain the nation's vital marine resources.



Ocean Uses Atlas heat map of overlapping dominant uses within the MBNMS



LOOKING AT USES WITHIN THE MBNMS



ANALYSIS

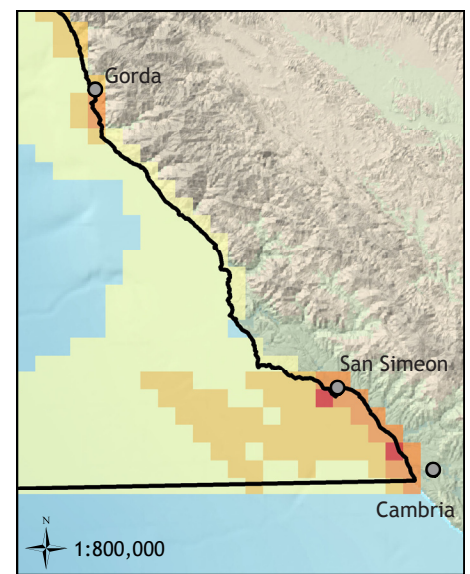
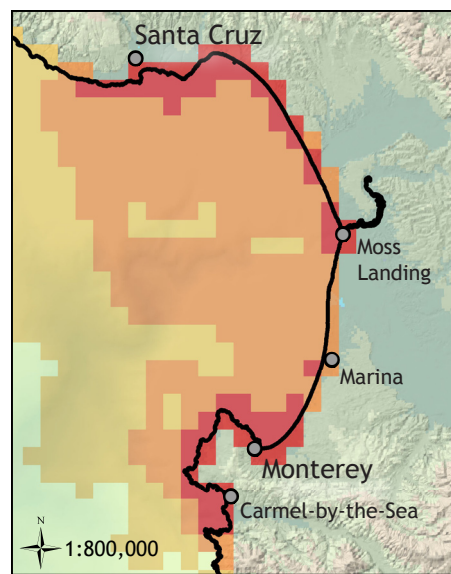
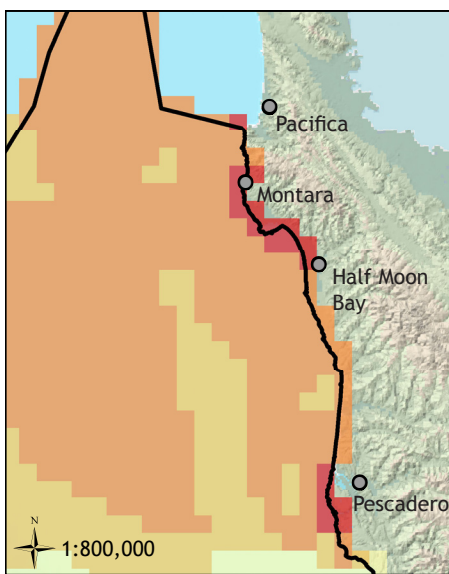
General Ocean Use Patterns in the MBNMS

The heat map on the previous page and the graph on the left illustrate that 24 ocean uses have dominant use areas located within the MBNMS. Dominant use areas are those where most of the use occurs, most of the time. Use is generally higher in coastal areas and near population centers, but shipping, fishing, and military activities create distinct offshore patterns. Ocean uses are generally influenced by access, oceanography, and regulations, among other factors.

Utility for MBNMS EBM Initiative:

- For any ocean activity, what is the general use footprint and where are the dominant use areas (where most of the use occurs most of the time)?
- Which uses occur within the Sanctuary? Which cover the greatest or least areal extent?
- How will any new regulations affect an existing use or suite of uses and user groups?

Percent of entire MBNMS that is a dominant use area for individual uses. Additional analyses can be refined or normalized to more accurately reflect the spatial scales of uses (shore-based, open water, etc.).



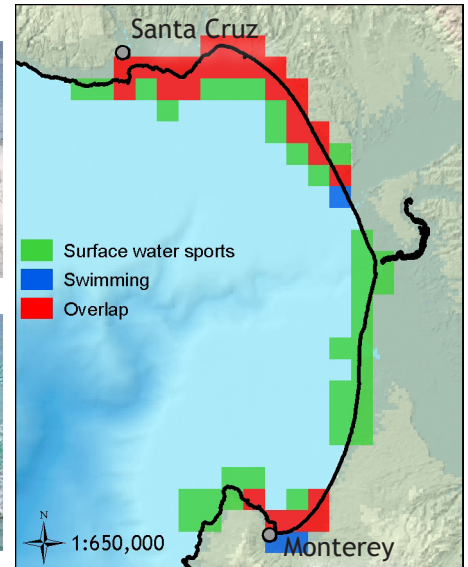
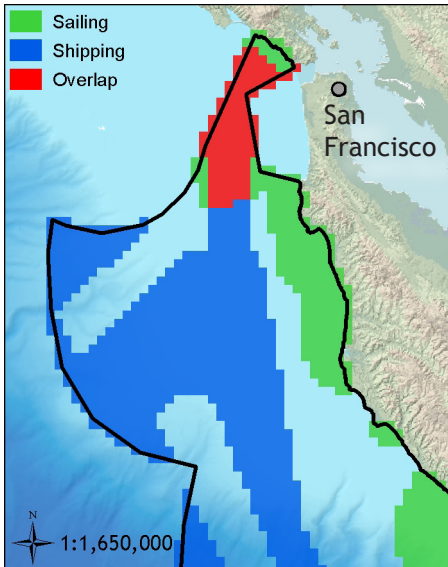
High concentrations of use near occur harbors, bays, population centers, and access points. Color ramp of uses is identical to full map of MBNMS on page 2.

Hotspots and Overlap

Use analysis in the Sanctuary can reveal hotspots that exist at a localized scale, such as population centers, bays, access points, and seamounts. Nearly 60% of the Sanctuary sees dominant use from three or more separate uses, and only 5.6% of the area is not used heavily by any use. Areas of dominant use might be of increased concern for outreach, resource protection, and monitoring.

Utility for MBNMS EBM Initiative:

- Where are the most heavily-used areas of the Sanctuary? Do current outreach, research, and monitoring efforts target these areas, or are there better ways to coordinate monitoring and management to understand cumulative impacts and ecosystem health?
- What is the level of use at or near prioritized resources (spawning grounds, rare habitat, shipwrecks etc.)? Are uses that might have negative (or positive) impacts on these resources being pursued in these areas?



Overlapping dominant use areas of two potentially conflicting pairs of uses: sailing and shipping (left) and surface water sports and swimming (right)

Conflict and Compatibility

A busy ocean means that uses can conflict in both direct (within user groups, between user groups) and indirect (through the impacts one use has on ecosystem services that another use relies upon) ways. It is useful to analyze uses further to discover whether these use conflicts may result in potential injury, property damage, economic losses or the unsuccessful pursuit of a use. While there are times when users mitigate their own conflicts, planners can help to curtail potentially hazardous and problematic situations when they understand where uses are occurring. Ocean use data can identify areas where uses overlap, focus research efforts on exploring co-occurring uses, and determine the implications of emerging uses or increases in the intensity of existing uses. As planners and managers work towards sustainable use and comprehensive planning, having a more comprehensive understanding of where uses occur will be a pivotal component to their success.

Utility for MBNMS EBM Initiative:

- Where are potentially conflicting uses occurring? Would the expansion of an existing use infringe upon other users? How might management plans minimize these conflicts?
- How would emerging uses like alternative energy development fit in with current activities in the Sanctuary? If there are multiple sites with suitable oceanographic conditions for an energy project, which one will affect the least amount of existing users and receive the most public support?



CONCLUSIONS

An improved understanding of ocean uses can lead to more efficient outreach, more effective planning and management and yield a wealth of benefits for MPA managers and planners. For example, marine areas are managed on a nested scale (from international, national, regional, state and local perspectives). The Atlas data points managers to local scale “hotspots” and highlights the significance of piers, harbors and access points for ocean use. As shown in these maps, Sanctuary hotspots in Monterey are localized. This allows managers to see where uses are concentrated, where they overlap and where there are minimal uses and impacts. Managers can then start to make comparisons between places where many uses overlap and where no uses are occurring. They can also target their outreach to specific user groups for more efficient and effective management. Knowing which user groups are the most affected by planning decisions is also important for conflict resolution and trade-off analysis as planning efforts move forward. In this way ocean use data can improve and inform thoughtful decision making. This document is a starting point for a longer term conversation about how ocean use patterns can inform spatial resource management and planning in the ocean, coasts and Great Lakes. The MPA Center will continue to explore the utility of this data through refining our methods and gathering further data on ocean uses in other regions. The MPA Center is also delving into analysis on conflicts and compatibilities among ocean uses. As the needs of communities are explored around the nation, ocean use data can serve as a powerful piece of the puzzle for reaching the goals of sustainable use and management for present and future generations.

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