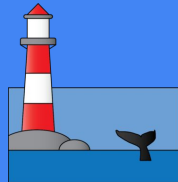


Marine Protected Area Mapping

S-122 & ProtectedSeas Navigator

Virgil Zetterlind, Director
virgil@protectedseas.net

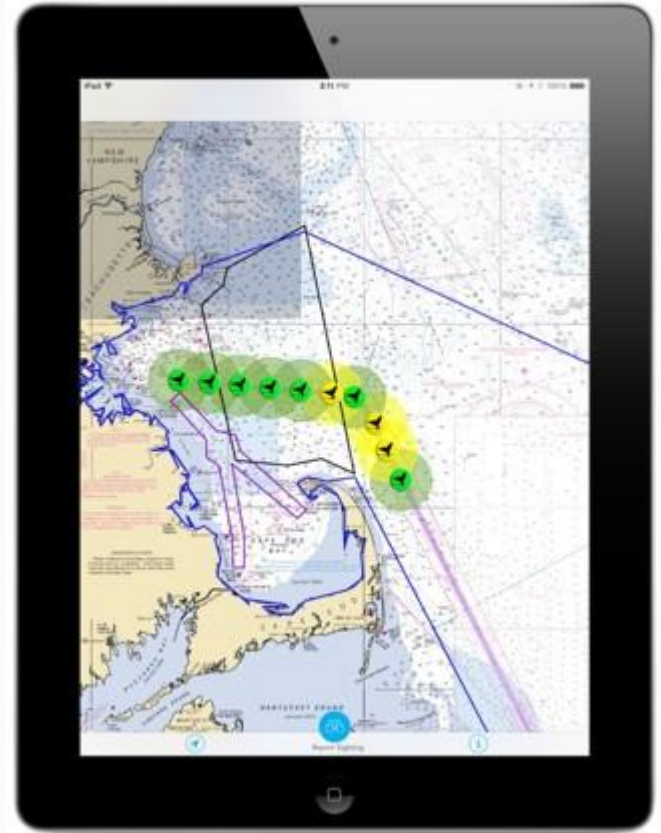
Anthropocene Institute



protectedseas

Global MPA Coverage and Expansion

- ~21,000 MPAs covering ~8% of the ocean. Massive variation on level of protection
- UN goal to have 30% of the ocean in protected areas by 2030 and potentially 50% by 2050
- New High Seas Treaty enabling MPAs in areas beyond national jurisdiction (BNJ)
- Significant informational challenges for both Marine Spatial Planning and Vessel Operations / Navigation



MPA Data Seascope

- World Data of Protected Areas (WDPA) from IUCN is the only 'official' global database
 - Required fields are minimal and do not include restriction information
 - Data quality and currency of nation state submissions is highly variable
 - Data license is restrictive
- At the country level, information is often spread across multiple databases in different governmental units with no uniformity in attributes and often minimal focus on activity restrictions relevant to S-122 (if it exists in a database at all)

ProtectedSeas Navigator

- Normalizes MPA and other Managed Area information to a globally consistent data model with a focus on human activity restrictions
- Captures and encodes the allowed, restricted, or prohibited status of 25+ individual fishing methods and other human activities including navigationally relevant restrictions
- Summarizes key restrictions and exceptions in plain text in multiple languages
- Provides references to source documents and boundaries
- Data built from public sources so that it can be licensed under creative commons
- More info and interactive map at: **<https://navigatormap.org>**

Navigator Audiences and Applications

- Policy and Planning
 - Inform local, national, and global MPA expansions by providing current baseline in MSP tools, scientific analysis, public websites, etc.
- Monitoring and Compliance
 - Provide boaters and fishers ready access to local rules through apps and chart products
 - Enable direct comparison to vessel activity in tools like Global Fishing Watch Marine Manager
- Ocean Science
 - Empower new types of effectiveness analysis by comparing strength of regulation or specific restrictions to other factors

Navigator at a Glance

21000+
AREAS



The number of marine areas that were independently resourced and reviewed by the Navigator team.

8
YEARS



The time it took the Navigator team to research, compile and summarize the legal protections for the global MPA database.

8000+
PAGES



The size of the Navigator database of all worldwide legal restrictions for marine managed and protected areas if printed.

42
PERSON YEARS



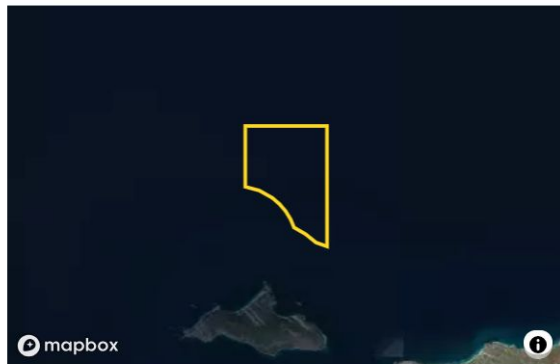
The labor that the small but dedicated team at ProtectedSeas put in to complete the global MPA review.

2400+
AREA BOUNDARIES DIGITIZED



The number of boundaries the Navigator team created from legal descriptions for areas where no digital boundary existed previously.

Location



Purpose

To preserve and protect the exposed sandy beaches, offshore reefs and rocky subtidal habitat, and rocky bottom dominated by urchins, giant kelp and surfgrass.

Species of Concern: Multiple

Regulations Summary




Restrictions

1. Take of all living marine resources is prohibited.
2. Possessing fishing gear on board a vessel unless such gear is stowed and not available for immediate use.
3. Possessing any Sanctuary resource, except legally-taken fish on board a vessel at anchor or in transit.

Allowed

None.

Key Information


TYPE	MPA
DESIGNATION	Federal Marine Reserve
LOCATED IN 	CA USA
AREA 	61 km² MARINE AREA 61 km² TOTAL AREA ⓘ
MANAGED BY 	NOAA National Marine Fisheries Service

Governing Regulations

 15 C.F.R. § 922.73

[REGULATIONS TEXT](#)

Gear and Activity Restrictions

	FISHING GEAR	ACTIVITIES
PROHIBITED 	Bottom Trawling Commercial Fishing Gillnetting Hook And Line Longlining	Dragging Dredging Drilling Industrial or Mineral Exploration Removal of Historic Artifacts

Farallon Islands - Example of Management Complexity



Managed Areas

Southeast Farallon Island State Marine Conservation Area
Greater Farallones National Marine Sanctuary
Greater Farallones National Marine Sanctuary - Boating Restricted Area
Point Reyes to Point Arguello Netting Restricted Area
Highly Migratory Species Protection Area - Driftnet Closures
Coastal Pelagic Species Limited Entry Zone
Pacific Leatherback Conservation Area
Recreational Rockfish Conservation Areas
Non-Trawl Rockfish Conservation Area
Pacific Essential Fish Habitats

Fishing Gears

Bottom Trawling: Prohibited
Gillnetting: Prohibited
Hook and Line: Restricted
Trolling: Restricted
Nets: Prohibited
Traps and Pots: Prohibited
Spear Fishing: Prohibited
Longlining: Prohibited
Miscellaneous Gear: Prohibited
Recreational Fishing: Restricted
Commercial Fishing: Restricted
Tribal Exemptions: Yes

Other Activities

Discharge: Restricted
Speed: Restricted
Entry: Restricted
Diving: Restricted
Removal of Historic Artifacts: Prohibited
Anchoring: Restricted
Dredging: Prohibited
Industrial or Mineral Exploration: Restricted
Construction: Restricted
Drilling: Restricted

Protected Seas Participation with S-122 and NIPWG

- Offer lessons learned and support for an official, global MPA data standard that encapsulates restrictions and regulations
- Provide Navigator as a free resource to help in S-122 design, prototyping, and testing
- Potentially offer Navigator in S-122 format as an unofficial global dataset – especially until official country level data becomes available
- Partner with IHO member countries to ensure Navigator data is current and up to date

Area Type Breakdown in Navigator

- Total sites w/ Boundaries = 21,000+
 - 13,400 MPAs
 - 5400 Other / Unclassified
 - 2500 Fisheries Management Area
 - 900 Vessel Restricted Area
 - 750 Recreational Area
 - 460 Water Quality Area
 - 155 OECM
 - 23 Voluntary Area
 - 6 Vessel Reporting Areas

Navigationally Relevant Restrictions by Area Count

Restriction	Prohibited	Restricted
Entry	495	6187
Discharge	4258	3193
Speed	n/a	2199
Stopping	271	350
Anchoring	740	2191
Landing	287	1081

Additionally, ~6000 areas are No Take and ~8600 areas are Restricted Take

The ProtectedSeas S-122 Code Project Goals

- Develop software to batch generate S-122 data from Navigator
- Help detail strengths and weaknesses of each S-122 version to inform future revisions
- Provide a testable, large S-122 MPA dataset to HO's and OEMs that is up to date and is internationally complete

S-122 GML Prototype Circa 2020

Northwestern Hawaiian Islands Marine Refuge

Managed By: Hawaii Department of Land and Natural Resources

Purpose: To establish a marine refuge in the Northwestern Hawaiian Islands for the longterm conservation and protection of the unique coral reef ecosystems and the related marine resources and species, to ensure their conservation and natural character.

 Feedback

Restricted: 1. Entry into the refuge is prohibited without a permit.
2. Fishing or taking of marine life within the refuge is prohibited.

Allowed: Persons may enter the refuge to engage in activities that do no harm to the coral reef ecosystem for the following purposes:
1. Scientific or education purposes;
2. Non-extractive purposes undertaken to further the knowledge of resources or which provide for enhanced resources protection or benefit resource management; and
3. Subsistence, traditional and customary practices by Native Hawaiians.

Governing Regulation: HAR § 13-60.5
Effective: Year-round

Report Violations to: (808) 643-DLNR (3567)

Latest Updates:
For the latest fishing regulation information:
Check the [the Western Pacific Regional Fishery Management Council](#)
In season changes to commercial and recreational fishing regulations, call the Hawaii Department of Natural Resources, Division of Aquatic Resources, at (808) 587-0100 or visit the DLNR [website](#).
Announcements by the Division of Aquatic Resources are made available [here](#).

- Site name
- Managing Authority
 - With OnlineResource link to authority webpage
- Boundary
- Regulation text summary
 - With OnlineResource link to full regulation
- Restrictions from enumerated S-122 list mapped to Navigator activity codes

S-122 Prototype Current Status

- Existing code still has some validation issues especially concerning links and normalization to meet GML and S-100 rules
- Would require additional formulation to meeting v1.0 maximum file size rules and to create a distribution catalog
- Open to working with HOs and others to continue proof of concept and refinements

S-122 Change Proposals

- ProtectedSeas Would prefer to see geoJSON as a format option with less strict file size limitations
 - Native support in a wider range of tools than GML
- Recommend NIPWG specify a minimum attribute set / encoding standard for S-122 data covering navigational restrictions with optional attributes meeting wider interest in S-122 as a MPA data exchange format

S-122 Challenges for Adoption Still to Be Addressed

- HOs are almost never responsible for environmental regulations
 - Responsible agency(s) differ by country
 - Many may not have resources to produce S-122
- Many MPA restrictions are focused on fishing or extractive uses and not navigation (relevance to SOLAS)
 - Broad S-122 spec may increase motivation for non-HOs to create data
 - but is arguably outside the scope of IHO remit
- MPAs are often multi-jurisdictional and multi-use further complicating representing clear, concise information to mariners
 - Different use cases for voyage planning vs bridge navigation

Thank You!

