Physical Representation - Benthic Classes

description

This atlas page illustrates a classification of the sea floor based on landscape features and substrate. The purpose of this type of classification is to identify areas of similar benthic characteristics, which may be related to habitat types and different species assemblages, but these associations have not been verified for this classification.

First, a Benthic Terrain Modeller (BTM) tool, developed by NOAA Coastal Services, was used to identify four landscape features that describe the terrain of the sea floor (depressions, slopes, flats and ridges). Next the four landscape features were combined with four ecologically meaningful depth ranges and four types of substrate, from an existing Provincial data layer (MSRM, 2002).

Landscape features	Depth ranges	Substrate types
Depressions	0 to 20 meters	Hard
Slopes	20 to 50 meters	Mud
Flats	50 to 200 meters	Sand
Ridges	Greater than 200 meters	Undefined

In total, 64 unique benthic classes were delineated, but the data illustrates a simplified set of 16, without delineation according to depth class.

This classification methodology is the same that was used by Parks Canada for their mapping and analysis of the Gwaii Haanas National Marine Conservation Area (NMCA), and was adapted from a benthic habitat model developed by The Nature Conservancy (TNC) (Ferdana *et al.*, 2006) and applied to marine ecoregional planning throughout the continental United States.
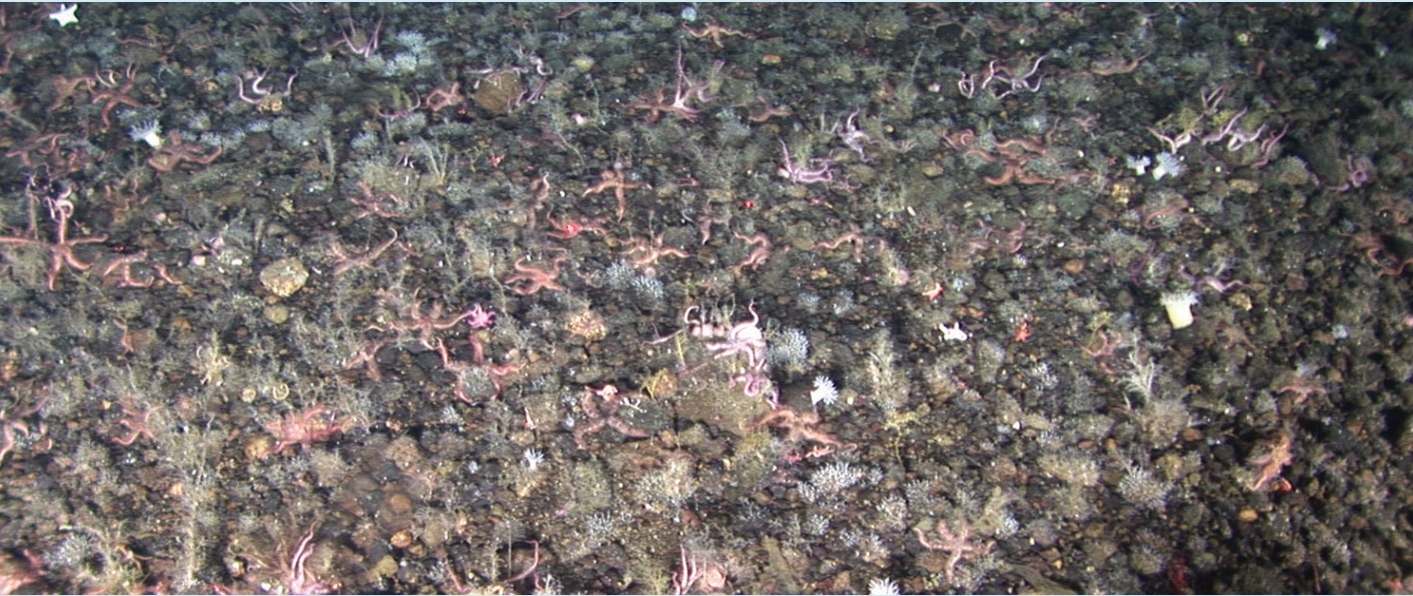

PHOTO: LIVING OCEANS SOCIETY

data sources

- Living Oceans Society – Bathymetry Data
- Marine Geoscience Data System – Bathymetry Data
- Natural Resources Canada – Bathymetry Data
- Parks Canada – Benthic Habitat Classification
- Province of British Columbia – BC Marine Ecological Classification – Substrate Data

data resolution

- Source bathymetric data was obtained at scales ranging from 1:250,000 to very fine scale multibeam bathymetry provided in a 2 metre grid for limited areas. The BTM tool was used on a 75 metre by 75 metre grid 'mosaic' of several data sets. Appropriate scale for use of these data should not be finer than 1:250,000.

date of analysis

- 2009

reviewers

- Kim Conway, Natural Resources Canada
- Zach Ferdana, The Nature Conservancy
- Krista Royle, Greg MacMillan, Parks Canada

reviewer comments

- One reviewer recommended deleting polygons smaller than a minimum mapping unit based on source data resolution (~12,000 square metres). This was done, and details can be found in the metadata file.
- The Southwest Deep ocean out to the exclusive economic zone (EEZ) has been processed (smoothed) more in the BTM mapping due to the discontinuous results of the numerous widespread multibeam surveys in the area. From a geological perspective this area is very active with black smokers (hydrothermal vents) that produce their own unique ecosystems as well as potentially very large sulphide deposits. Potential new trench and hydrothermal vent areas are not represented in the BTM mapping.

caveats of use

- Accuracy of benthic classes has not been verified or field-tested.
- Be advised that this data set is a mosaic of several data sets each of which has been 'cleaned' somewhat. This mosaic is a long way from the source data and was created only to allow bathymetric terrain modelling. It must NOT be used for navigation.
- Recommended date of expiry for use of these data in a marine planning context: None provided.

map, feature data and metadata access

- Visit *www.bcmca.ca/data* for more information.

references

- For more detailed information on the Marine Ecosections of *British Columbia see: Ministry of Sustainable Resource Management (MSRM), Decision Support Services Branch. British Columbia Marine Ecological Classification Marine Ecosections and Ecounits, Version 2.0.* Report prepared for Coastal Task Force, Resources Information Standards Committee. 2002. *www.ilmb.gov.bc.ca/risc/pubs/coastal/marine/version 2/bcmec_version_2.pdf*
- Information on the software used for the BTM: Wright, D. J., E. R. Lundblad, E. M. Larkin, R. W. Rinehart, J. Murphy, L. Cary-Kothera, and K. Draganov. ArcGIS Benthic Terrain Modeler, Corvallis, Oregon, Oregon State University, Davey Jones Locker Seafloor Mapping/Marine GIS Laboratory and NOAA Coastal Services Center. 2005. *www.csc.noaa.gov/digitalcoast/tools/btm/index.html*
- The conceptual framework for the software is also presented in: Lundblad, E., Wright, D.J., Miller, J., Larkin, E.M., Rinehart, R., Battista, T., Anderson, S.M., Naar, D.F., and Donahue, B.T. *A benthic terrain classification scheme for American Samoa*, Marine Geodesy, 29(2). 2006. 89-111.
- Ferdaña , Z., M.W. Beck, and D. Dorfman. (Editors). Improving Methods for marine regional assessments: Examples from the Pacific Northwest. *The Nature Conservancy*, Arlington, VA 2006. 51-53.
- Robinson, Clifford L.K. and Royle, Krista. *An Analysis of Habitat Representation of the Proposed NMCA within the Strait of Georgia Marine Region*. Report prepared by the Western and Northern Service Centre, Parks Canada. 2008.
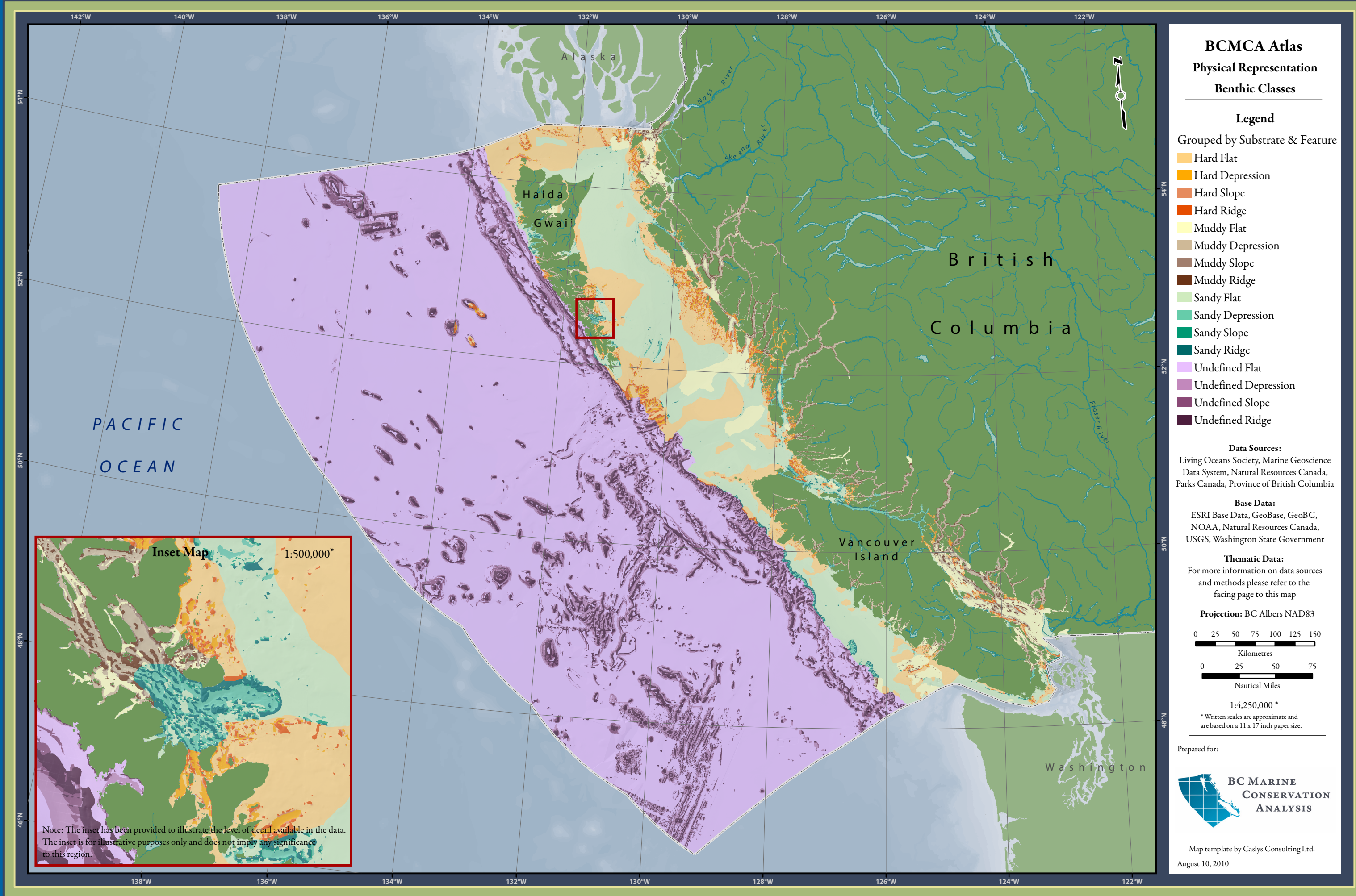
BCMCA Atlas

Physical Representation

Benthic Classes

Legend

Grouped by Substrate & Feature

- Hard Flat
- Hard Depression
- Hard Slope
- Hard Ridge
- Muddy Flat
- Muddy Depression
- Muddy Slope
- Muddy Ridge
- Sandy Flat
- Sandy Depression
- Sandy Slope
- Sandy Ridge
- Undefined Flat
- Undefined Depression
- Undefined Slope
- Undefined Ridge

Data Sources:
Living Oceans Society, Marine Geoscience Data System, Natural Resources Canada, Parks Canada, Province of British Columbia

Base Data:
ESRI Base Data, GeoBase, GeoBC, NOAA, Natural Resources Canada, USGS, Washington State Government

Thematic Data:
For more information on data sources and methods please refer to the facing page to this map

Projection: BC Albers NAD83

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0   25  50  75  100 125 150
Kilometres

0        25       50        75
Nautical Miles
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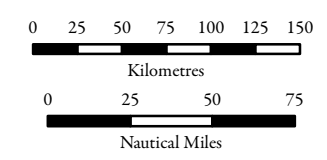
1:4,250,000 *

* Written scales are approximate and are based on a 11 x 17 inch paper size.

Prepared for:

BC MARINE CONSERVATION ANALYSIS

Map template by Caslys Consulting Ltd.

August 10, 2010

Alaska

Nass River

Skeena River

Haida Gwaii

British Columbia

Fraser River

PACIFIC OCEAN

Vancouver Island

Washington

Inset Map

1:500,000*
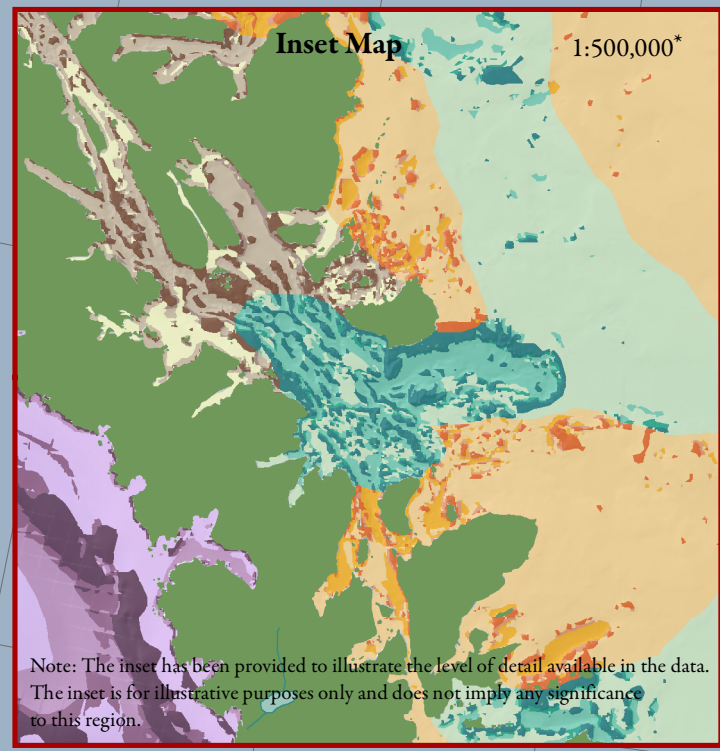
Note: The inset has been provided to illustrate the level of detail available in the data. The inset is for illustrative purposes only and does not imply any significance to this region.