PRODUCT DESCRIPTION FOR STAKEHOLDERS
CERF Marine Biodiversity Hub

MARINE BIODIVERSITY RESEARCH
Prediction and Management of Australia's Marine Biodiversity

Product title: Predicted patterns of seabed biodiversity in the South-west Marine Region (SWMR).

Relevance of product to marine planning and management

This product provides planners and managers with biologically informed predictions about the patterns in species abundance, species richness and species evenness of seabed fishes and invertebrates on the outer shelf and slope in the SWMR. It can be used as follows:

1. To provide scientific analysis and input to planners and managers with the responsibility to conserve and managed marine biodiversity in the SWMR;
2. As a biological data input to models, where appropriate, of the marine environment in the SWMR (e.g. Marxan);
3. To compare predictions in patterns of seabed biodiversity in the SWMR with the findings of future biological surveys; and
4. To produce maps of predicted spatial patterns of species abundance, species richness and species evenness for seabed fishes and invertebrates in depths from 50 to 1500 metres;

It will be of value in planning and managing the conservation of marine biological diversity in the SWMR, particularly in relation to predicting areas of high biodiversity when there is very little or no biological data.

Product description

This product (i.e. Access data base) contains data (longitudes, latitude and biodiversity attribute variables) that describes the predicted spatial patterns of total species abundance, species richness and species evenness for both benthic invertebrates and demersal fish in the SWMR. The predicted patterns are represent as point data arranged on a 0.1 degree grid (~ 1.2 km^2) covering depths 50-1500 metres in the SWMR.

Interpretation of product

This product represents the predicted spatial patterns of species abundance, species richness and species evenness of benthic invertebrate and demersal fish communities in the SWMR. It provides a description of the structure rather than the composition (i.e. specific species) of benthic assemblages. Structure equates to total species abundance (the total number of individuals), species richness (the total number of species) and species evenness (relative proportions of species).

Data and information on the levels of uncertainty associated with predictions can be produced and made available but it is not provided in this product. If this matter is important to your work please phone or email the contact for further information.

Brief description of methods/data used develop output

The following provides a basic description of the methods and data used to produce this product:

1. Existing biological data (i.e. demersal fish and benthic invertebrate species) and physical data (i.e. dissolved oxygen, temperature, mud content of sediments, etc.) for the SWMR was collated from the following sources; CSIRO Atlas of Regional Seas (CARS) and range of biological surveys within the SWMR (e.g. West Australian Voyage of Discovery);

2. Biological data was used to identify biodiversity values (i.e. for total species abundance, species richness and species evenness) for all known biological sample sites in the SWMR;

3. Analyses were conducted to determine which physical variables/combinations of physical variables best explain the spatial patterns in biodiversity values identified in step 1 (i.e. looking for covariate physical variables that can be reliably used to predict benthic biodiversity);

4. The most reliable/meaningful covariate physical variables were identified and subsequently used as the basis to make a database of predictions of biological diversity values for all points on a 1 km2 grid for the SWMR between 50-1500 metres depths; and

5. A database was developed to capture latitude, longitude and biodiversity values. This was used to produce maps displaying patterns in benthic biodiversity.

Please phone or email the contact for a more detailed and technical explanation of the methods or data used to develop this product.

Advantages/improvements over existing products

The product provides the only available means to robustly predict patterns of benthic biodiversity at a range of spatial scales in the SWMR. The product uses the most recently available data on the physical environment and biology (demersal fish and benthic invertebrates) in the SWMR.

Conditions of use

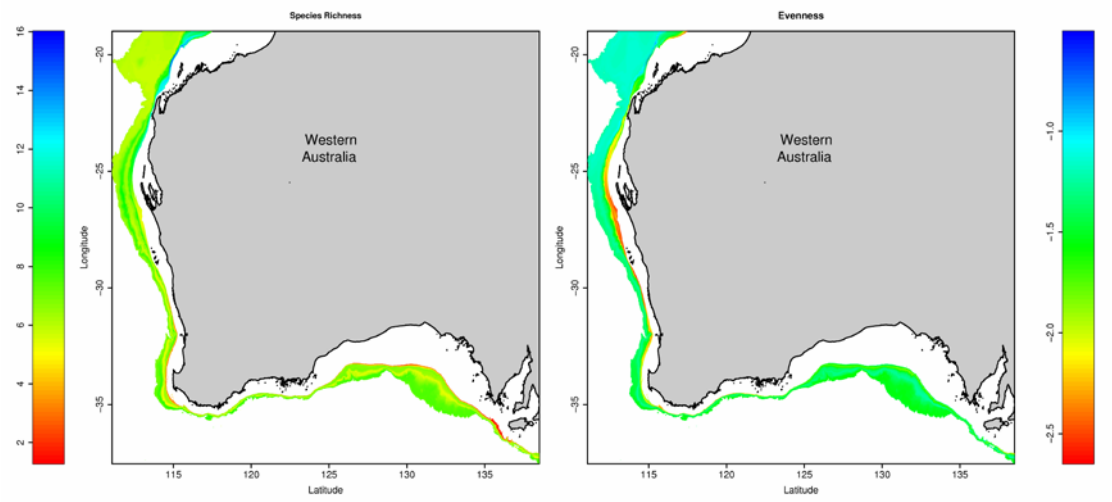
The product does not contain any confidential information. Data sets provided can be used by planners and managers, but contact the author if intending to use data in publications.

Contact for further information
Piers Dunstan 03 6232 5382 Piers.Dunstan@csiro.au

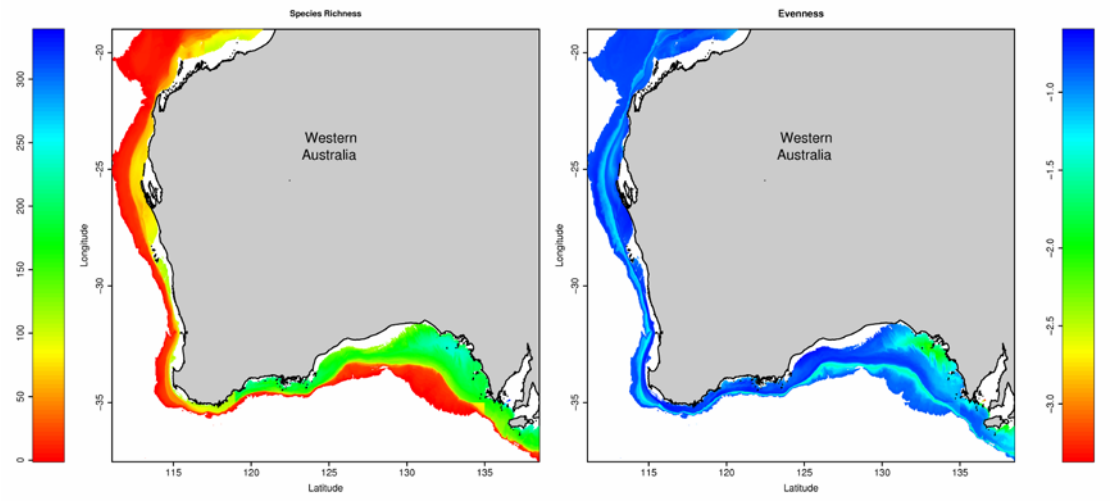
Attachments

1. Maps of species richness predictions of benthic invertebrates and demersal fish for the South-west Marine Region.
2. Metadata record for Predicted patterns of seabed biodiversity in SWMR (to be provided).

Attachment 1: Maps for species richness and species evenness predictions for South-west Marine Region; a) demersal fish species richness, 1b) demersal fish species evenness, 1c) benthic invertebrates species richness, and 1d) benthic invertebrates species evenness.



1a) 1b)



1c) 1d)

Attachment 2: Metadata record for predicted patterns of seabed biodiversity in the South-west Marine Regiona (SWMR). Version 1.0.

Short title : **MarLIN record number** : 8519 **Anzlic Identifier** : ANZCW0306008519 **ISO Topic**

Category/s Oceans

Data Type Aggregated/Derived Data

Area of Interest South Western Bioreg Data

Custodian Organisation : CSIRO Division of Marine and Atmospheric Research - Hobart
PO Box 1538
Hobart
TAS Australia
7001
http://www.cmar.csiro.au/

Jurisdiction : Australia

Contributors : Piers Dunstan

Acknowledgements : Geoscience Australia for sediment, bathymetry and benthic stress, CSIRO Marine and Atmospheric Research for CARS data SeaWifs for turbidity data. Funding: CERF Marine Biodiversity Hub

References :

Abstract : This product (i.e. csv files) contains data (longitude, latitude and attribute variables) that describe the predicted spatial patterns of seabed biodiversity composition for demersal fish and benthic invertebrates in the SWMR. The predicted patterns are represented as point data on a 0.01 degree grid (~1.2 km2) covering most of the SWMR.

Attributes Overview :
lat: latitude
long: longitude
depth: depth at point
N: predicted total abundance
S: predicted species richness
eta: predicted evenness

even.cat: predicted evenness summarised into categories by decile

Geographic Extent
Latitude 19 S to 37.53 S
Longitude 111.07 E to 138.5 E

Subject Categories and Search Word(s)

MarLIN Subject Categories

1383. Biogeography and biogeographic regions

Habitat Keywords

EARTH SCIENCE > Biosphere > Aquatic Habitat > Benthic Habitat

GCMD Keywords

EARTH SCIENCE > Land Surface > Landscape > Landscape Ecology
EARTH SCIENCE > Oceans > Marine Biology > Marine Habitat

ANZLIC Search Words

ECOLOGY
ECOLOGY Habitat
ECOLOGY Landscape
MARINE Biology
South Western Bioreg Data
Oceans

Originating Research Project

Not Entered

Beginning date : Not Known
Ending date : Not Known
Progress : Complete
Maintenance and Update Frequency : As required
Stored Data Format(s) DIGITAL – Text Files – Comma separated values
Stored Data Volume 75 MB of digital data
Specific Software Requirements
Stored Data Documentation
Stored Data Location
Available Format Type(s) Same As Stored
Access constraint
The data may be copied for distribution within DEWHA for their internal business

operations, but may not be provided to third parties. Enquiries from third parties should be directed to the CERF Hub.

Lineage This is an original derivation.

Positional accuracy

Data are based on interpolated values from a variety of sources. E.g. see CARS (Anzlic Identifier : ANZCW0306005960)

Parameter accuracy

Logical consistency report

Completeness Minimum and maximum depths are limited by availability of biological data

Contact

Piers Dunstan
CSIRO Division of Marine and Atmospheric Research - Hobart
PO Box 1538
Hobart
TAS Australia
7001
piers.dunstan@csiro.au

Metadata Access Public

Metadata Entry Created 20-July-2009 by Piers Dunstan

Metadata Last Updated 20-July-2009 by Piers Dunstan

Metadata Export

Show ANZLIC core metadata in ANZLIC XML format

Show full metadata in MarLIN (extended ANZLIC) XML format

Metadata Updateable By

Piers Dunstan