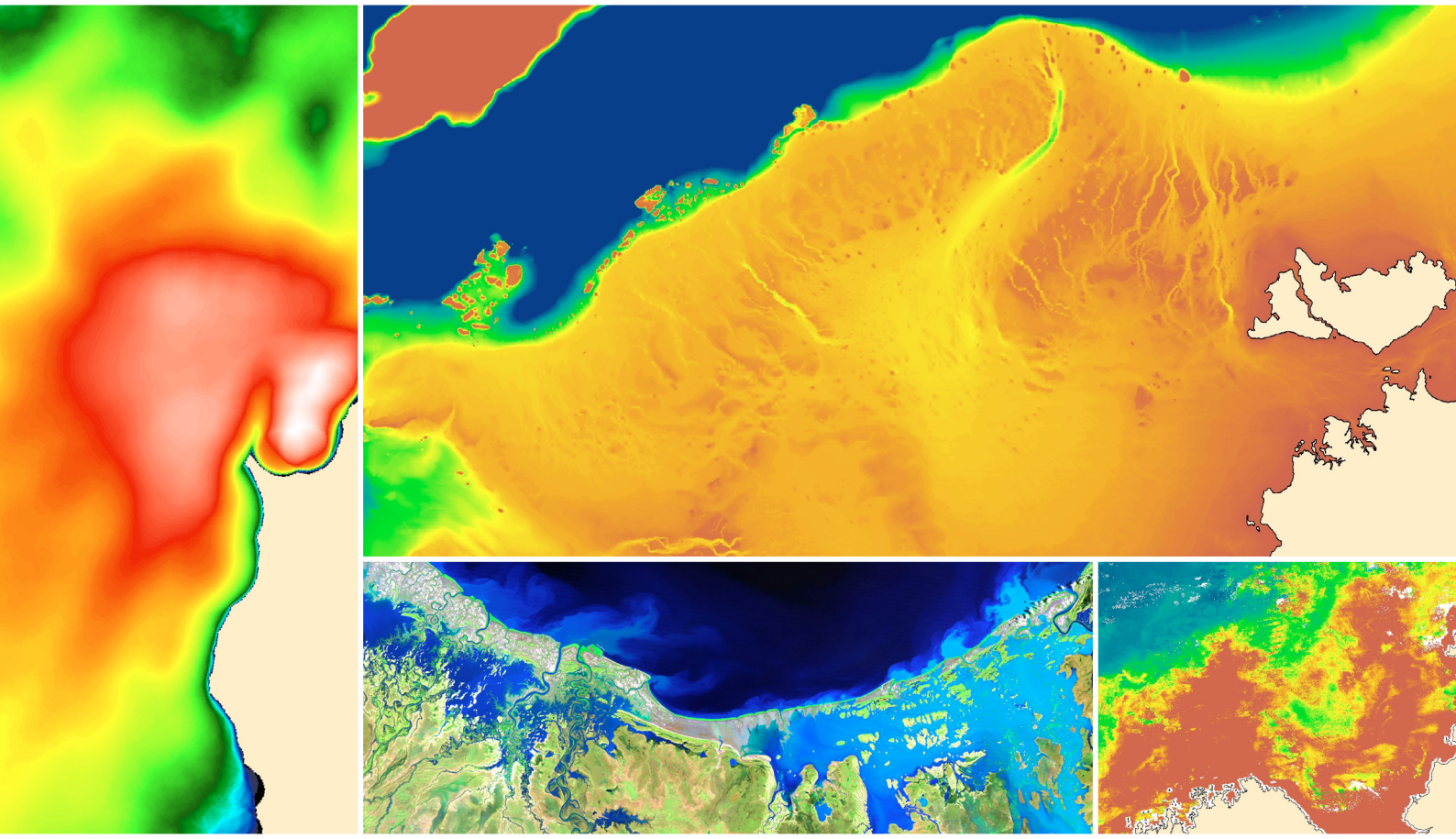
Australian Government
Geoscience Australia



Record 2013/21 | **GeoCat** 75846

Australian Marine Environmental Data

Descriptions and Metadata

Zhi Huang, Rachel Przeslawski, Johnathan Kool, Jin Li, Phil Bouchet, Scott Nichol.

Australian Marine Environmental Data

Descriptions and Metadata

GEOSCIENCE AUSTRALIA
RECORD 2013/21

Zhi Huang[1], Rachel Przeslawski[1], Johnathan Kool[1], Jin Li[1], Phil Bouchet[2], Scott Nichol[1]

Australian Government
Geoscience Australia

National Environmental Research Program

MARINE BIODIVERSITY hub

1. Coastal, Marine and Climate Change Group, Geoscience Australia
2. Oceans Institute, University of Western Australia

Department of Resources, Energy and Tourism

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Executive Summary

This report provides detailed descriptions (metadata) of 45 Australian marine environmental datasets that have been generated and collated by the Marine Biodiversity Hub as part of Theme 3 – National Ecosystems Knowledge, Project 1 – Shelf and Canyon Ecosystems Functions and Processes. The report also includes a map for each dataset to illustrate coverage and general spatial structure. The datasets contain both marine environmental and biological variables from diverse data sources and include both new and updated information. Among them, the national bathymetry grid and derived products, seabed sediment grids, seabed exposure (GEOMACS) parameters, water quality data, the national canyon dataset and connectivity layers were produced by Geoscience Australia. Other environmental and biological datasets are the outputs of oceanographic models and collections of various governmental and research organisations.

These datasets are important for the success of marine biodiversity research in Theme 3 Project 1 in that they describe key aspects of Australian marine physical, geochemical and biological environments. The physical and geochemical datasets not only characterise the static seabed features but also capture the temporal variation and three-dimensional interactions within marine ecosystems. The biological datasets represent a unique collection of fish and megafauna data available at the national scale. Together, these marine environmental datasets enhance our understanding of large-scale ecological processes driving marine biodiversity patterns. However, it should be noted that uncertainties and potential errors exist in these datasets due to limitations of data collection and processing methods. Data quality issues for individual datasets have been documented in this report where possible.

1 Introduction

1.1 Background

National marine environmental and biological data are valuable to marine resource management due to their capacity to provide a broad overview of marine ecosystems at a continental scale that is relevant to the jurisdiction of the Commonwealth Government. These data can assist in the identification and monitoring of important or vulnerable habitats, biota, and biophysical functions. For example, national biological (e.g. sponge, ophiuroid, demersal fish) and physical (e.g. geomorphic) datasets were instrumental in the establishment of Australian bioregions (Commonwealth of Australia 2005) and key ecological features upon which the Commonwealth Marine Reserve network was based (Commonwealth of Australia 2013).

The Marine Biodiversity Hub was established as part of the Australian Government's continuing effort to effectively manage its biodiversity and is funded through the National Environmental Research Program (NERP). The Hub includes four major themes, with Theme 3 being the development of ecosystems knowledge at a national scale, and incorporating the investigation of shelf and canyon ecosystem function and processes (Project 3.1). The aim of this project is to provide a better understanding of linkages between seabed physical features and ecological processes that sustain important areas for marine biodiversity (including Key Ecological Features; KEFs), and estimate and test connectivity between these important areas and those areas being actively managed for biodiversity conservation (i.e. Commonwealth Marine Reserves; CMRs). The work will also provide a perspective on biodiversity dynamics to inform future management under climate change. One of the key tasks of Project 3.1 is to generate and collate national marine environmental and biological datasets for use in the research and analysis of national shelf and canyon ecosystems. This report provides a summary of those datasets.

1.2 Objective & Scope

The objective of this report is to catalogue environmental and biological datasets that have been generated and collated by the NERP Marine Biodiversity Hub as part of Theme 3 Project 1 – Shelf and Canyon Ecosystems: Functions and Processes. This is accomplished through an itemised list of datasets grouped by discipline and supported by metadata and maps of data coverage. All metadata records contained in this report conform to the ANZLIC Metadata Profile (version 1.1; August 2007).

This catalogue is an update to Huang et al. (2010), meaning that the datasets presented in this report are either new or updated versions of those presented in that previous document. The catalogue includes only national-scale datasets developed by or relevant to NERP Project 3.1. In overview, the datasets include:

1. Bathymetry and geomorphology data which includes the latest version of national bathymetry data published by Geoscience Australia (Whiteway, 2009), several derivatives of the bathymetry data that characterise the seabed geomorphology and the newly published 50 m multibeam bathymetry grids produced by Geoscience Australia (https://www.ga.gov.au/products/servlet/controller?event=GEOCAT_DETAILS&catno=75175);

2. Seabed sediment data which includes three updated sediment parameters for north and northwest Australia predicted from Geoscience Australia's Marine Sediments (MARS) database (Passlow et al., 2005; Li, 2012);
3. Seabed exposure data represented by new variables from the Geological and Oceanographic Model of Australia's Continental Shelf (GEOMACS) developed by Geoscience Australia (Hughes et al., 2010);
4. Sea surface water quality variables derived from time-series analysis of MODIS satellite data generated by Geoscience Australia as part of Project 3.1;
5. A new national map of submarine canyons generated by Geoscience Australia as part of Project 3.1;
6. Oceanographic data derived by Geoscience Australia from the global Hybrid Coordinate Ocean Model (HYCOM);
7. Atmospheric and climate data obtained from the Bureau of Meteorology and a recently published global environmental dataset (Tyberghein et al., 2012);
8. Predicted and modelled connectivity/dispersal layers developed by Geoscience Australia as part of Project 3.1, and;
9. A number of biological data including information on fish, brittlestars, sponges, squat lobsters and megavertebrates that were collected and collated by various Australian and international agencies.

1.3 Characteristics, Strengths & Limitations of the New Datasets

The new marine datasets are from diverse data sources. They describe key aspects of Australian marine physical, geochemical and biological environments. The new physical and geochemical datasets not only characterise the static seabed features (e.g. bathymetry, geomorphology and seabed sediment type) but also capture the temporal variation and three-dimensional interactions within marine ecosystems (e.g. new GEOMACS variables, MODIS variables and connectivity/dispersal layers). The ability to describe spatial and temporal dynamics of marine physical/geochemical ecosystems is critical for understanding the influence of ecosystem processes on biodiversity dynamics, a key objective of Theme 3 Project 1. In addition, these datasets include several physical variables that are of improved quality from previous versions, due to either updated base data and/or improved modelling techniques (e.g. the bathymetry and sediment variables). However, the new physical and geochemical datasets also have various degrees of uncertainties and errors because they are the outputs of prediction, modelling and human interpretation. The uncertainties and errors on the base data have also been accumulated through the prediction and modelling processes. In recognition of these factors, the metadata records contained in this report detail the data quality information of the individual physical/geochemical datasets.

The biological datasets in this catalogue are confined to observational data at a national scale. Using only observational data has avoided uncertainties introduced by, for example, predicted biological datasets. An additional strength of the biological datasets included in this catalogue is that they are known to be collected or compiled by a single research team. This maximises the consistency of the data collection and processing procedures across time and space and thus reduces the impacts of various sampling times, taxonomic resolutions, and sampling methods and efforts on data quality. However, sparse data density, unbalanced spatial distribution and coarse spatial resolution are among

the limitations of the biological datasets. Again, details of the data quality information of these individual biological datasets can be found in their metadata records.

2 Metadata for National Marine Datasets

2.1 Bathymetry & Geomorphology

2.1.1 Australian Bathymetry and Topography

Dataset TITLE

Australian bathymetry and topography grid, June 2009

Dataset ALTERNATE TITLE (i.e. Dataset Name)

ausbath_09_v4

Dataset AUTHOR(S)

Tanya Whiteway

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

In 2005 Geoscience Australia and the National Oceans Office undertook a joint project to produce a consistent, high-quality 9 arc second (0.0025 decimal degree (dd) or ~250m at the equator) bathymetric grid for Australian waters. In 2009 a number of new datasets were included in an updated version of the grid.

The 2009 bathymetric grid of Australia was produced to include recently acquired datasets, and solutions to issues identified in the previous version. The revised grid has the same extents as its 2005 counterpart, including the Australian water column jurisdiction lying between 92^{o} E and 172^{o} E, and 8^{o} S and 60^{o} S. The waters adjacent to the continent of Australia and Tasmania are included, as are areas surrounding Macquarie Island, and the Australian Territories of Norfolk Island, Christmas Island, and Cocos (Keeling) Islands. The area selected does not include Australia's marine jurisdiction offshore from the Territory of Heard and McDonald Islands and the Australian Antarctic Territory.

As per the 2005 grid, the 0.0025 dd resolution is only supported where direct bathymetric observations are sufficiently dense (e.g. where swath bathymetry data or digitised chart data exist) (Webster and Petkovic, 2005). In areas where no sounding data are available (in waters off the Australian shelf), the grid is based on the 2 arc minute ETOPO (Smith and Sandwell, 1997) and 1 arc minute ETOPO (Amante and Eakins, 2008) satellite derived bathymetry. The topographic data (on shore data) is based on the revised Australian 0.0025dd topography grid (Geoscience Australia, 2008), the 0.0025dd New Zealand topography grid (Geographx, 2008) and the 90m SRTM DEM (Jarvis et al, 2008).

The final dataset has been provided in ESRI grid and ER Mapper (ers) formats. An associated shapefile has been produced so that the user can identify the input datasets that were used in the final grid.

IMPORTANT INFORMATION

This grid is not suitable for use as an aid to navigation, or to replace any products produced by the Australian Hydrographic Service. Geoscience Australia produces the 0.0025dd bathymetric grid of Australia specifically to provide regional and local broad scale context for scientific and industry projects, and public education.

The 0.0025dd grid size is, in many regions of this grid, far in excess of the optimal grid size for some of the input data used. On parts of the continental shelf it may be possible to produce grids at higher resolution, especially where LADS or multibeam surveys exist. However these surveys typically only cover small areas and hence do not warrant the production a regional scale grid at less than 0.0025dd.

There are a number of bathymetric datasets that have not been included in this grid for various reasons. Comments or queries about the data included in the grid (or excluded) can be directed to: IDEASRequests@ga.gov.au.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Bathymetry

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -60

E_LONG: 92

W_LONG: 172

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Jun-09

Data Currency ENDING DATE

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Known

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data came from a variety of systems with differing data densities and levels of accuracy. In the geographic extents 34^{o}N – 79^{o}S, 90^{o}E – 180^{o}E, GA holds approximately 1400 surveys that collected bathymetric data.

The procedures used to construct the bathymetric grid and their associated displays are detailed here. The input data were derived from a number of sources, were of variable vintages and quality. A number of approaches were required to process, check and edit the data. The availability of data also varied considerably throughout the region, effectively restricting the maximum useful resolution of the grid in areas where no soundings exist, to that of the satellite predicted bathymetry that was used as infill.

Acknowledgements:

The Digital Elevation Model (DEM) for New Zealand is based on the 250m DEM data supplied by Geographx New Zealand (www.geographx.co.nz).

The DEMs for Indonesian and Papua New Guinea are based on the SRTM DEM data supplied by the CGIAR Consortium (srtm.csi.cgiar.org/).

The deep ocean data (where high resolution data were not available) is based on the ETOPO1 and ETOPOV2G data supplied by the National Geophysical Data Center, US Department of Commerce (NGDC) (www.ngdc.noaa.gov/).

Data Quality POSITIONAL ACCURACY

The grid incorporates data from surveys acquired since 1963. Modern surveys which used GPS have a positional accuracy of 5 – 30 m depending on several factors, while earlier surveys which used dead reckoning and Transit satellite fixes had positions accurate to 50 – 2000 m depending upon the water depth and strength of currents. These surveys overlap in an irregular distribution. The grid cell size is 0.0025 deg (close to 250m), and it is estimated that 90% of cells give depths within 1 cell of their measured position. Nominal scale: 1:10,000,000 when imaged at 300 dpi

Data Quality ATTRIBUTE ACCURACY

Because various data sources were used to generate the Australian bathymetry grid, including single beam, multibeam and satellite derived bathymetry (see the History entry), the attribute accuracy also varies with locations. Generally, the attribute accuracy is much higher in continental shelf than in deeper areas. Nevertheless, no systematic and quantitative assessment of attribute accuracy has been carried out.

Data Quality LOGICAL CONSISTENCY

All the grids are checked at scale to verify that no data is incorrect, that there were no extraneous point segments, and that all values have the estimated correct bathymetric contour value.

Data Quality COMPLETENESS

This dataset is complete.

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Webster, M.A.

Petkovic, P.

Additional Metadata REFERENCES

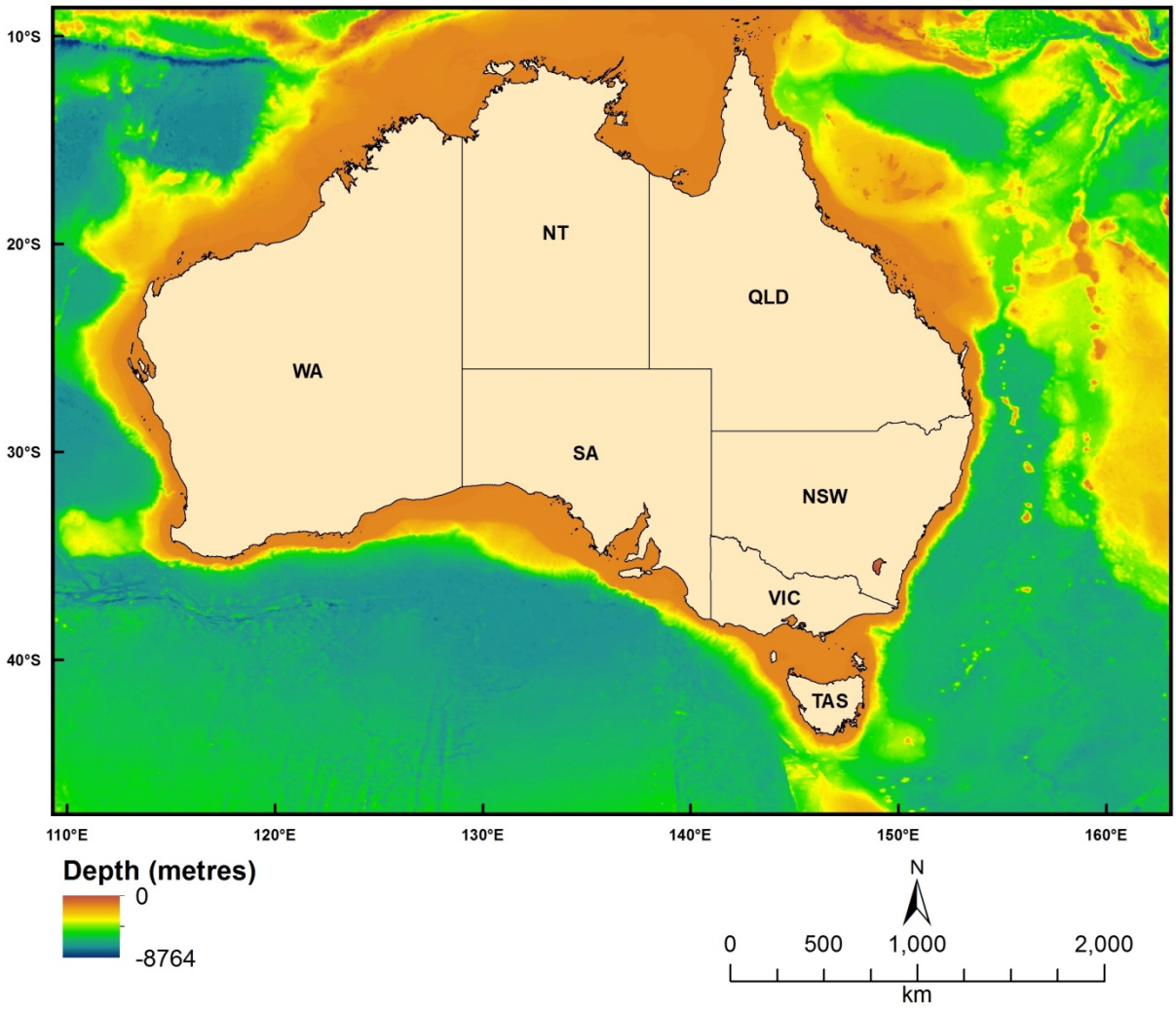

Figure 2.1.1 Australian bathymetry grid, 2009

2.1.2 Topographic Aspect

Dataset TITLE

Bathymetry derived topographic aspect grid

Dataset ALTERNATE TITLE (i.e. Dataset Name)

aspect_all1

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The grid was created from the Australian bathymetry and topography grid (2009, version 4). The data represents the degree of aspect of a slope surface (a rectangle of 3 by 3 cells).

Description Data Category

Oceans

Environment

Elevation

Description Keyword

Oceans, Bathymetry, Seafloor Topography

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -60

E_LONG: 92

W_LONG: 172

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data is a derived product from the 250 bathymetry and topography grid (2009, v4). The processing steps included:

1. The bathymetry grid was first subset into 14 grids, each of which covers an UTM zone (from 46^{o}S to 59^{o}S).
2. They were then projected into UTM coordinate system.
3. The aspect was calculated from these UTM grids separately using ArcGIS desktop with a rectangle window of 3 by 3 cells.
4. The 14 aspect grids were projected back to WGS84 coordinate system.
5. The final grid (this data) was the result of mosaicing the 14 aspect grids.

Data Quality POSITIONAL ACCURACY

This grid is a derived product from the Australian bathymetry and topography grid (2009, v4). The positional accuracy therefore inherits that of the bathymetry grid as below.

The bathymetry grid incorporates data from surveys acquired since 1963. Modern surveys which used GPS have a positional accuracy of 5 – 30 m depending on several factors, while earlier surveys which used dead reckoning and Transit satellite fixes had positions accurate to 50 – 2000 m depending upon the water depth and strength of currents. These surveys overlap in an irregular distribution. The grid cell size is 0.025 deg (close to 250m), and it is estimated that 90% of cells give depths within 1 cell of their measured position. Nominal scale: 1:10,000,000 when imaged at 300 dpi

Data Quality ATTRIBUTE ACCURACY

This grid is a derived product from Australian bathymetry and topography grid (2009, v4). Its attribute accuracy depends on that of the bathymetry grid.

Data Quality LOGICAL CONSISTENCY

The same procedure was used to process the 14 sub-grids.

Data Quality COMPLETENESS

This dataset is completed.

Contact Information CONTACT ORGANISATION

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Webster, M.A.

Petkovic, P.

Whiteway, T.

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

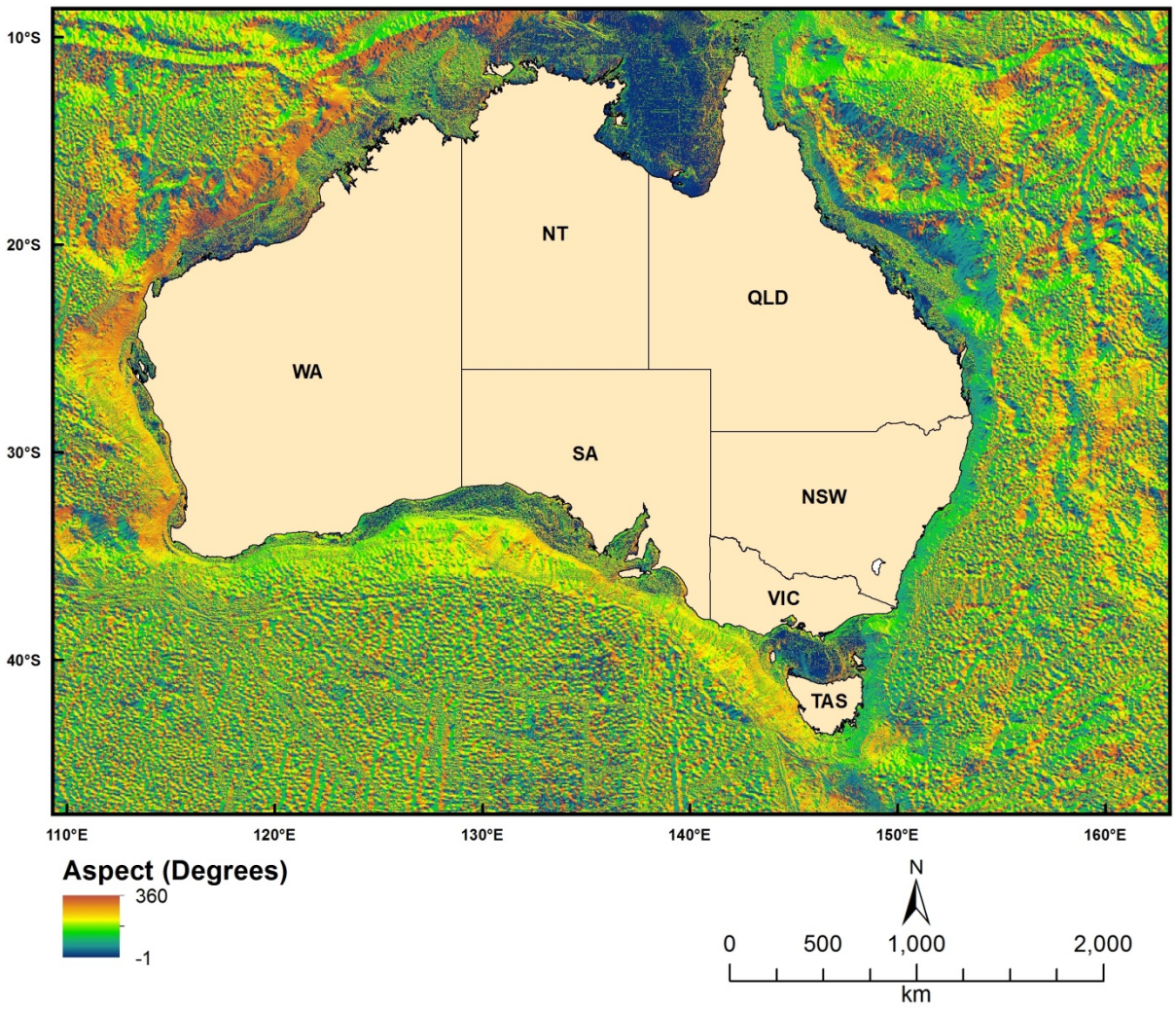

Figure 2.1.2 Topographic aspect

2.1.3 Topographic Slope

Dataset TITLE

Bathymetry derived topographic slope grid

Dataset ALTERNATE TITLE (i.e. Dataset Name)

slope_all1

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The grid was created from the Australian bathymetry and topography grid (2009, version 4). The data represents the degree of slope of an area of seabed (a rectangle of 3 by 3 cells).

Description Data Category

Oceans

Environment

Elevation

Description Keyword

Oceans, Bathymetry, Seafloor Topography

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -60

E_LONG: 92

W_LONG: 172

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data is a derived product from the 250 bathymetry and topography grid (2009, v4). The processing steps included:

1. The bathymetry grid was first subset into 14 grids, each of which covers an UTM zone (from 46s to 59s).

2. They were then projected into UTM coordinate system.

3. The slope (in degree) was calculated from these UTM grids separately using ArcGIS desktop with a rectangle window of 3 by 3 cells.

4. The 14 slope grids were projected back to WGS84 coordinate system.

5. The final grid (this data) was the result of mosaicing the 14 slope grids.

Data Quality POSITIONAL ACCURACY

This grid is a derived product from the Australian bathymetry and topography grid (2009, v4). The positional accuracy therefore inherits that of the bathymetry grid as below.

The bathymetry grid incorporates data from surveys acquired since 1963. Modern surveys which used GPS have a positional accuracy of 5 – 30 m depending on several factors, while earlier surveys which used dead reckoning and Transit satellite fixes had positions accurate to 50 – 2000 m depending upon the water depth and strength of currents. These surveys overlap in an irregular distribution. The grid cell size is 0.025 deg (close to 250m), and it is estimated that 90% of cells give depths within 1 cell of their measured position. Nominal scale: 1:10,000,000 when imaged at 300 dpi

Data Quality ATTRIBUTE ACCURACY

This grid is a derived product from Australian bathymetry and topography grid (2009, v4). Its attribute accuracy depends on that of the bathymetry grid.

Because various data sources were used to generate the Australian bathymetry grid, including single beam, multibeam and satellite derived bathymetry (see the History entry of the Australian bathymetry grid), the attribute accuracy also varies with locations. Generally, the attribute accuracy is much higher in continental shelf than in deeper areas. Nevertheless, no systematic and quantitative assessment of attribute accuracy has been carried out.

Data Quality LOGICAL CONSISTENCY

The same procedure was used to process the 14 sub-grids.

Data Quality COMPLETENESS

This dataset is completed.

Contact Information CONTACT ORGANISATION

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Contact Information CONTACT POSITION

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

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Petkovic, P.

Whiteway, T.

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Additional Metadata REFERENCES

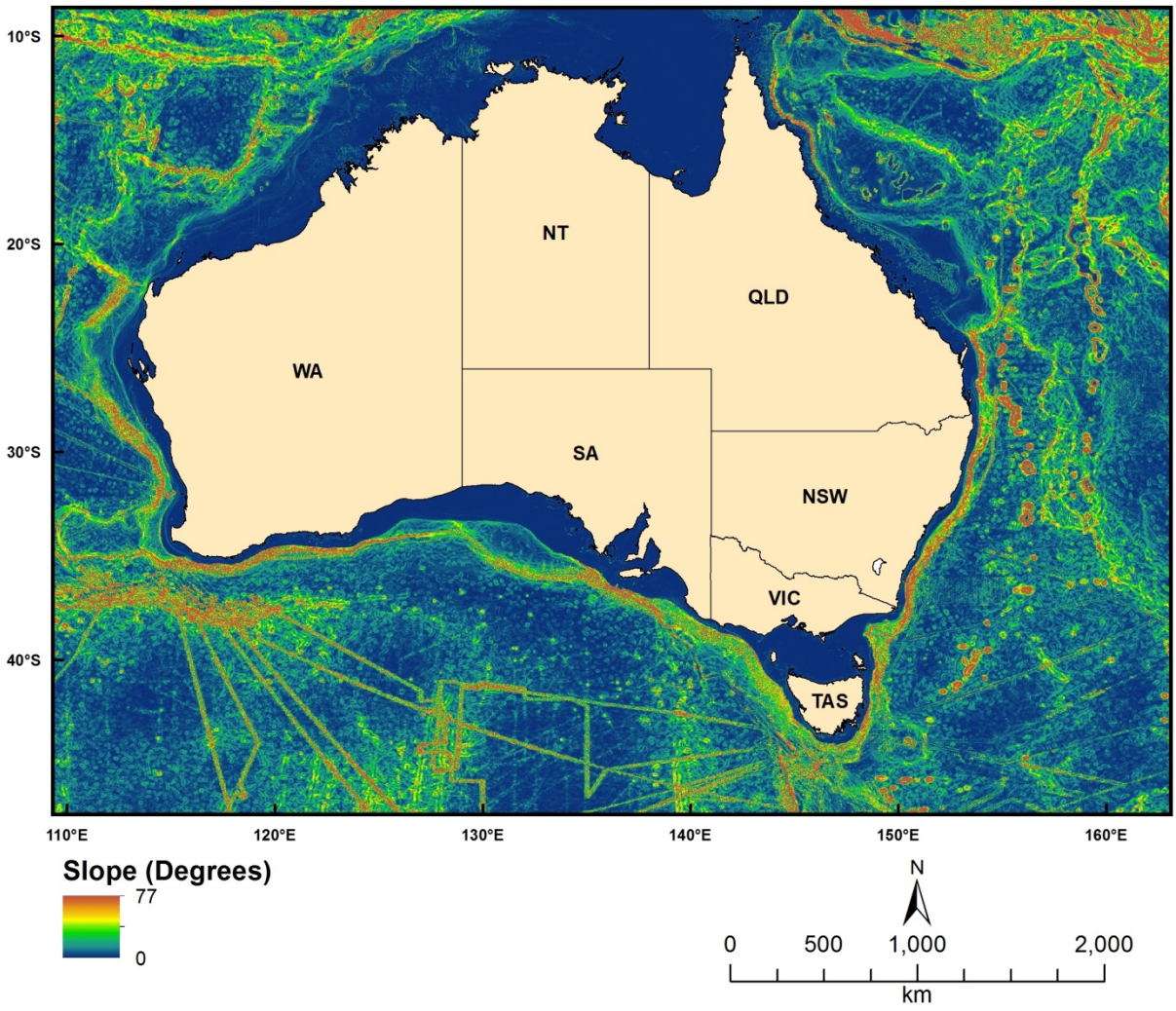

Figure 2.1.3 Topographic slope

2.1.4 Topographic Relief

Dataset TITLE

Bathymetry derived topographic relief grid

Dataset ALTERNATE TITLE (i.e. Dataset Name)

relief1

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The grid was created from the Australian bathymetry and topography grid (2009, version 4). The data represents the difference in elevation between the highest and lowest point within a specified area (a rectangle of 3 by 3 cells). The units are metres.

Description Data Category

Oceans

Environment

Elevation

Description Keyword

Oceans, Bathymetry, Seafloor Topography

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -60

E_LONG: 92

W_LONG: 172

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data is a derived product from the 250 bathymetry and topography grid (2009, v4). The relief grid was obtained by using the focal range function in ArcGIS desktop with a rectangle window of 3 by 3 cells.

Data Quality POSITIONAL ACCURACY

This grid is a derived product from the Australian bathymetry and topography grid (2009, v4). The positional accuracy therefore inherits that of the bathymetry grid as below.

The bathymetry grid incorporates data from surveys acquired since 1963. Modern surveys which used GPS have a positional accuracy of 5 – 30 m depending on several factors, while earlier surveys which used dead reckoning and Transit satellite fixes had positions accurate to 50 – 2000 m depending upon the water depth and strength of currents. These surveys overlap in an irregular distribution. The grid cell size is 0.025 deg (close to 250m), and it is estimated that 90% of cells give depths within 1 cell of their measured position. Nominal scale: 1:10,000,000 when imaged at 300 dpi

Data Quality ATTRIBUTE ACCURACY

This grid is a derived product from Australian bathymetry and topography grid (2009, v4). Its attribute accuracy depends on that of the bathymetry grid.

Data Quality LOGICAL CONSISTENCY

The same procedure was used to process the 14 sub-grids.

Data Quality COMPLETENESS

This dataset is completed.

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Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

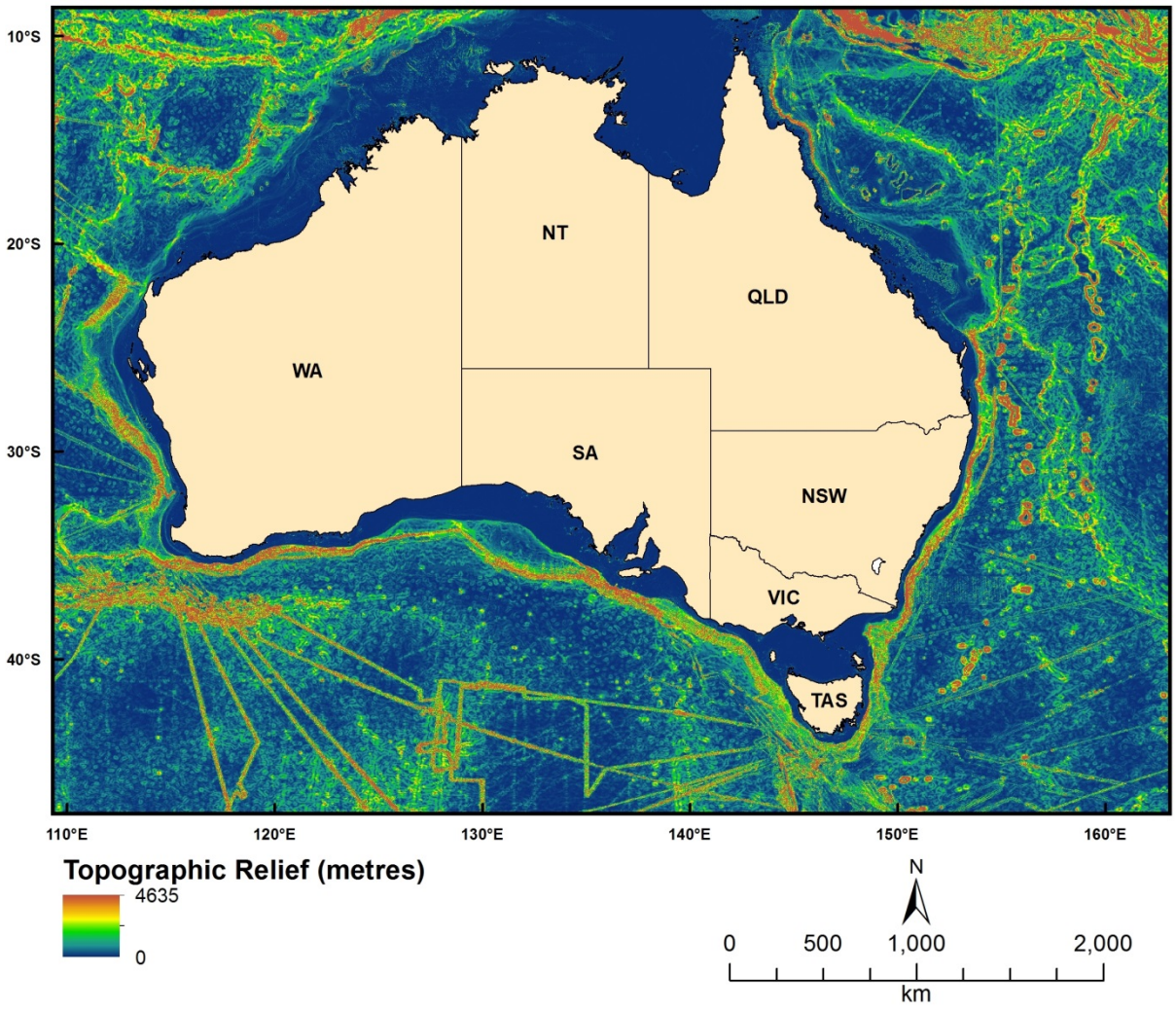

Figure 2.1.4 Topographic relief

2.1.5 Topographic Rugosity

Dataset TITLE

Bathymetry derived topographic rugosity grid

Dataset ALTERNATE TITLE (i.e. Dataset Name)

surface_all1

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The grid was created from the Australian bathymetry and topography grid (2009, version 4). The data represents seabed rugosity of an area of seabed (a rectangle of 3 by 3 cells). The rugosity was measured as surface area (Jenness, 2004). Higher surface area corresponds with higher rugosity.

Jenness, J. S. (2004). "Calculating landscape surface area from digital elevation models," Wildlife Society Bulletin 32, 829-839.

Description Data Category

Oceans

Environment

Elevation

Description Keyword

Oceans, Bathymetry, Seafloor Topography

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -60

E_LONG: 92

W_LONG: 172

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data is a derived product from the 250 bathymetry and topography grid (2009, v4). The processing steps include:

1. The bathymetry grid was first subset into 14 grids, each of which covers an UTM zone (from 46s to 59s).

2. They were then projected into UTM coordinate system.

3. The rugosity (surface area) was calculated from these UTM grids separately using an AML program written after Jenness (2004) with a rectangle window of 3 by 3 cells.

4. The 14 rugosity grids were projected back to WGS84 coordinate system.

5. The final grid (this data) was the result of mosaicing the 14 rugosity grids.

Data Quality POSITIONAL ACCURACY

This grid is a derived product from the Australian bathymetry and topography grid (2009, v4). The positional accuracy therefore inherits that of the bathymetry grid as below.

The bathymetry grid incorporates data from surveys acquired since 1963. Modern surveys which used GPS have a positional accuracy of 5 – 30 m depending on several factors, while earlier surveys which used dead reckoning and Transit satellite fixes had positions accurate to 50 – 2000 m depending upon the water depth and strength of currents. These surveys overlap in an irregular distribution. The grid cell size is 0.025 deg (close to 250m), and it is estimated that 90% of cells give depths within 1 cell of their measured position. Nominal scale: 1:10,000,000 when imaged at 300 dpi.

Data Quality ATTRIBUTE ACCURACY

This grid is a derived product from Australian bathymetry and topography grid (2009, v4). Its attribute accuracy depends on that of the bathymetry grid.

Because various data sources were used to generate the Australian bathymetry grid, including single beam, multibeam and satellite derived bathymetry (see the History entry of the Australian bathymetry grid), the attribute accuracy also varies with locations. Generally, the attribute accuracy is much higher in continental shelf than in deeper areas. Nevertheless, no systematic and quantitative assessment of attribute accuracy has been carried out.

Data Quality LOGICAL CONSISTENCY

The same procedure was used to process the 14 sub-grids.

Data Quality COMPLETENESS

This dataset is completed.

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Metadata Date METADATA DATE

20MAR2013

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Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Webster, M.A.

Petkovic, P.

Whiteway, T.

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Jenness, J. S. (2004). "Calculating landscape surface area from digital elevation models," Wildlife Society Bulletin 32, 829-839.

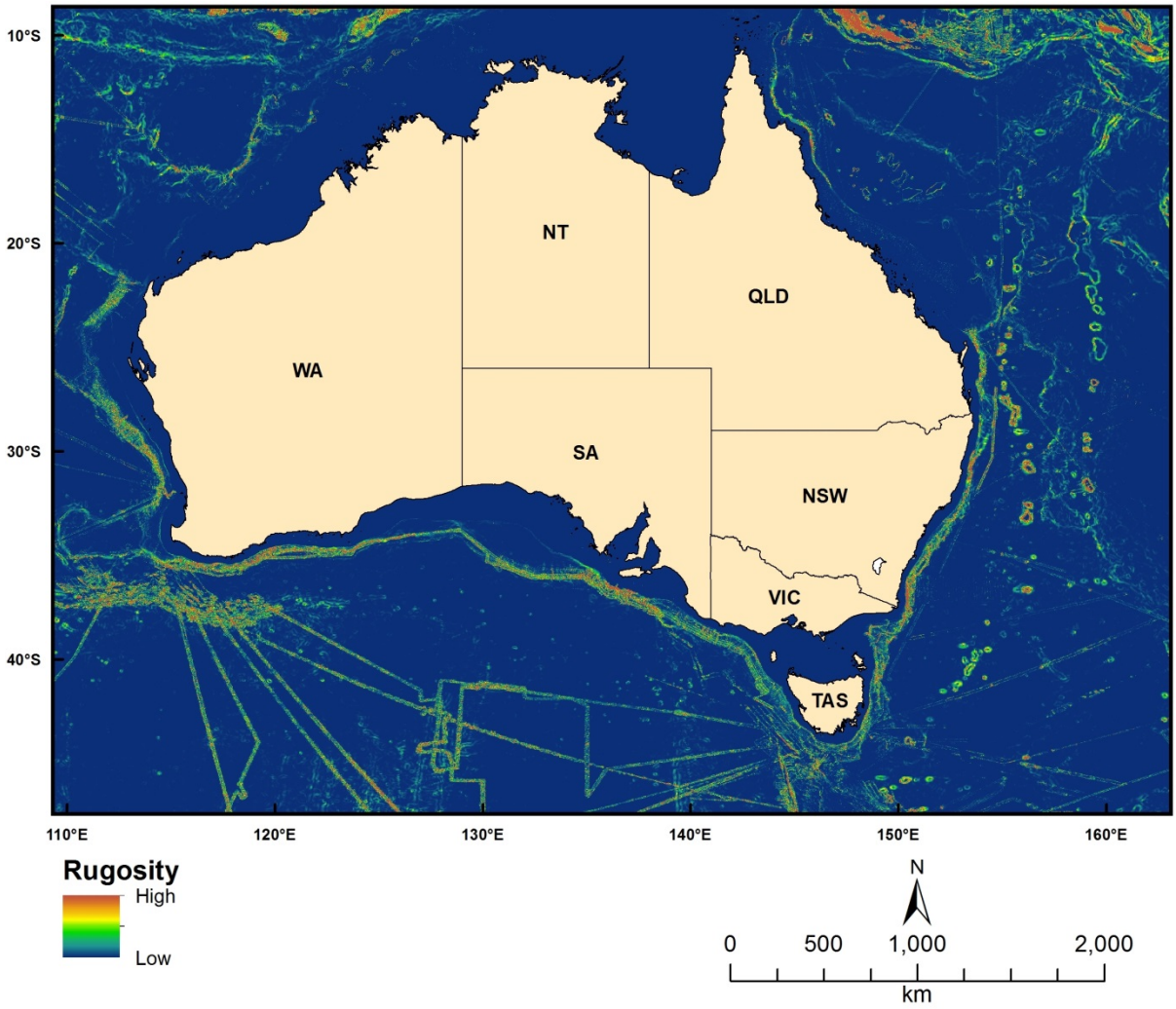

Figure 2.1.5 Topographic rugosity

2.1.6 50 metre multibeam bathymetry grids

Dataset TITLE

50m Multibeam Dataset of Australia 2012

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset contains all multibeam data (as tiles) held by Geoscience Australia on August 2012 within the specified area. The data has been gridded to 50m resolution. The tiles are projected into suitable WGS84 UTM zones.

Some deeper data has also been interpolated within the mapped area.

Description Data Category

Oceans

Environment

Elevation

Description Keyword

Oceans, Bathymetry, Multibeam

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -60

E_LONG: 90

W_LONG: 174

COORDINATE SYSTEM DESCRIPTION

Projection: UTM

Datum: WGS84

Units: metre

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 50

Temporal Resolution:

Data Currency BEGINNING DATE

2012

Data Currency ENDING DATE

25-Jan-13

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL ASCII xyz text

DIGITAL CARIS Grid file

DIGITAL GeoTIFF

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL ASCII xyz text

DIGITAL CARIS Grid file

DIGITAL GeoTIFF

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Geoscience Australia is the national custodian of an extensive multibeam dataset. Along with the multibeam data collected by the Australian Government, Geoscience Australia also holds numerous datasets that have been submitted from other institutions in the international scientific community and that lie within and around Australian waters.

Geoscience Australia is releasing this data to facilitate the use of, and access to, bathymetry data in the wider mapping community. This dataset is a tiled compilation of all the multibeam data held by Geoscience Australia lying within the outer edge of the offshore area of Australia, as well as some data in international waters, as at August 2012. The data is gridded to a resolution of 50 metres, which

allows for a significant amount of detail to be seen. The data is also projected into suitable WGS84 UTM zones.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

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20MAR2013

Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Wilson, O.

Spinoccia, M.

Buchanan, C .

Additional Metadata REFERENCES

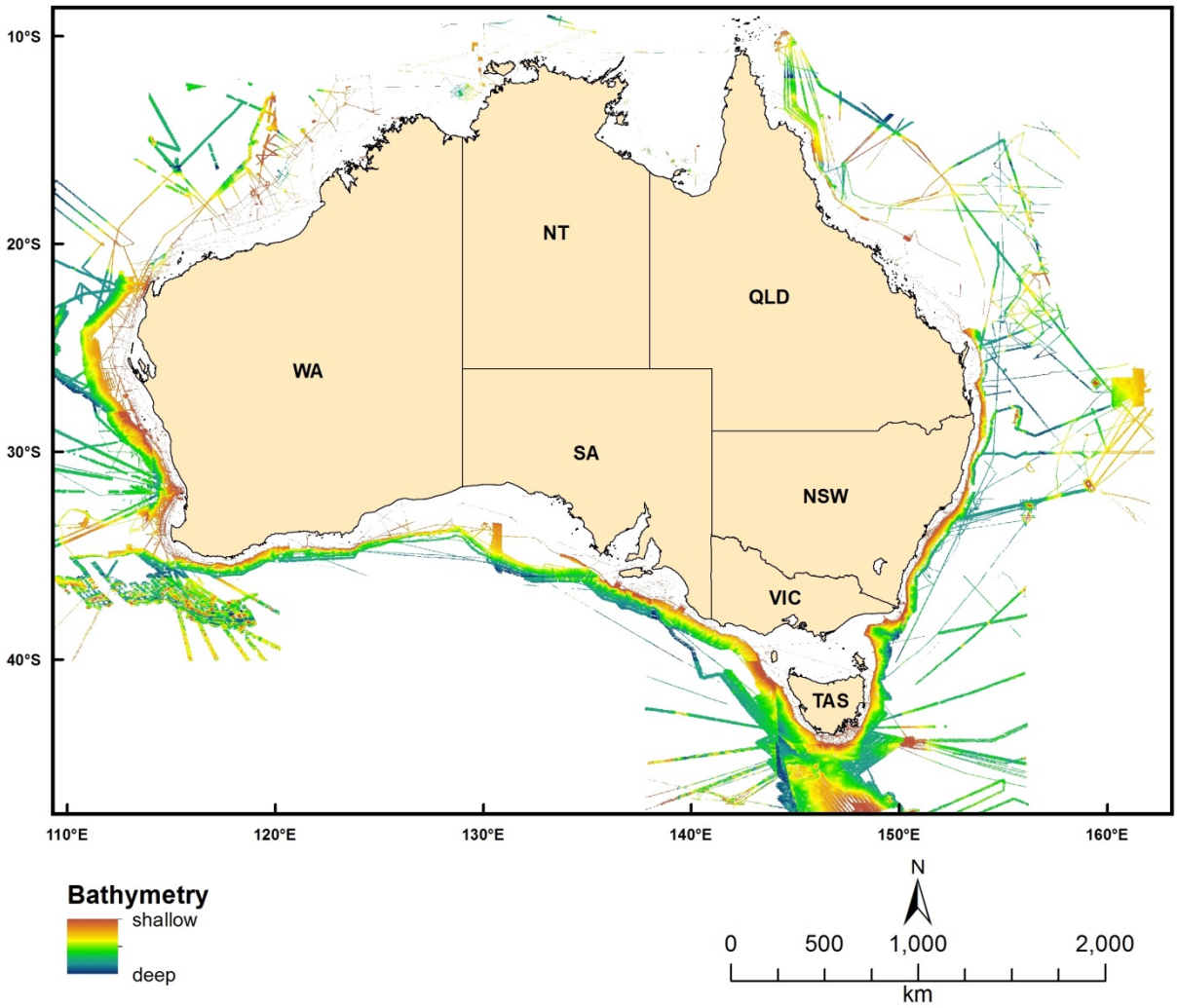

Figure 2.1.6 Coverage of 50m multibeam bathymetry grids

2.2 Seabed Sediment Data

2.2.1 Gravel Percentage

Dataset TITLE

Predicted seabed gravel content in the north-northwest region of the Australian continental EEZ 2013

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Predicted seabed gravel content in the NNW region of the Australian continental EEZ

Dataset AUTHOR(S)

Jin Li

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset provides the spatially continuous data of predicted seabed gravel content (sediment fraction greater than 2000 μm) expressed as a weight percentage ranging from 0 to 100%, presented in 0.0025 decimal degree (dd) resolution raster grids format and ascii text file. The dataset covers the north-northwest region of the Australian continental EEZ. This dataset supersedes previous predictions of seabed gravel content for the region with demonstrated improvements in accuracy. Accuracy of predictions varies based on density of underlying data and level of seabed complexity. Artefacts occur in this dataset as a result of insufficient samples in relevant areas. This dataset is intended for use at regional scale. The dataset may not be appropriate for use at local scales in areas where sample density is insufficient to detect local variation in sediment properties. To obtain the most accurate interpretation of sediment distribution in these areas, it is recommended that additional samples be collected and interpolations updated.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Sediments, Sediment Composition

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8.884891

S_LAT: -25.532391

E_LONG: 112.9222

W_LONG: 142.1522

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Mar-31-03

Data Currency ENDING DATE

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL text (.csv) file

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL text (.csv) file

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Sediment samples were exported from Geoscience Australia's Marine Sediments database (MARS), an Oracle database developed by Geoscience Australia in line with ANZLIC data standards. A subset of this data was selected for use in predicting spatial distribution of gravel content based on a set of

data quality control criteria (see Li et al. 2010 and 2012). Predicting the spatial distribution of gravel content at a 0.0025 decimal degree resolution was undertaken using a combined method of random forest and ordinary kriging (see Li et al. 2010, 2011a and 2012). The spatial interpolation method used was experimentally selected from over 40 methods/sub-methods based on assessment of predictive errors (Li et al. 2010, 2011a and 2012) and was refined for gravel content based on further experimental testing during Nov 2012 to March 2013. The predictions in raster grids and ascii text file were generated in R. Final file is in WGS 84 coordinate system with a 0.0025 dd spatial resolution.

Data Quality POSITIONAL ACCURACY

Sediment samples used in the interpolation incorporate data from various surveys since 1899 by a range of organisations. Modern surveys which used GPS have a positional accuracy of 5-30 m, while earlier surveys which had positions probably accurate to 50 – 2000 m depending upon the water depth and strength of currents. Only samples with positional information recorded to 0.001 dd accuracy were used in the spatial interpolation.

Data Quality ATTRIBUTE ACCURACY

Not Applicable

Data Quality LOGICAL CONSISTENCY

Point data at each grid cell was checked to ensure that the sum of gravel, mud and sand content was 100%. Interpolated grids were further checked by visual comparison with maps initially produced in R to ensure no errors were introduced during the process of producing the grid file.

Data Quality COMPLETENESS

This dataset is completed.

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Jin Li

Additional Metadata ACKNOWLEDGEMENTS

Xiaojing Li extracted sediment samples from MARS database. Tony Nicholas and Scott Nichol provided some samples collected in 2012. Zhi Huang provided bathymetry, slope, distance to coast, and relief data. Tanya Whiteway and Chris Lawson clarified relevant issues associated with bathymetry data. Anna Potter provided clarification on data quality control aspects.

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Li, J., Heap, A. D., Potter, A., Daniell, J. J., 2011a. Predicting Seabed Mud Content across the Australian Margin II: the Performance of Machine Learning Methods and Their Combinations with Ordinary Kriging and Inverse Distance Squared. Geoscience Australia Record 2011/07. Geoscience Australia, Canberra, 69 pp.

Li, J., Potter, A., Huang, Z., Daniell, J. J., Heap, A. D., 2010. Predicting Seabed Mud Content across the Australian Margin: Comparison of Statistical and Mathematical Techniques Using a Simulation Experiment. Geoscience Australia, Record 2010/11. Geoscience Australia, Canberra, 146 pp.

Li, J., Potter, A., Huang, Z., Heap, A., 2012. Predicting Seabed Sand Content across the Australian Margin Using Machine Learning and Geostatistical Methods. Geoscience Australia Record 2012/48, Geoscience Australia, Canberra,115pp.

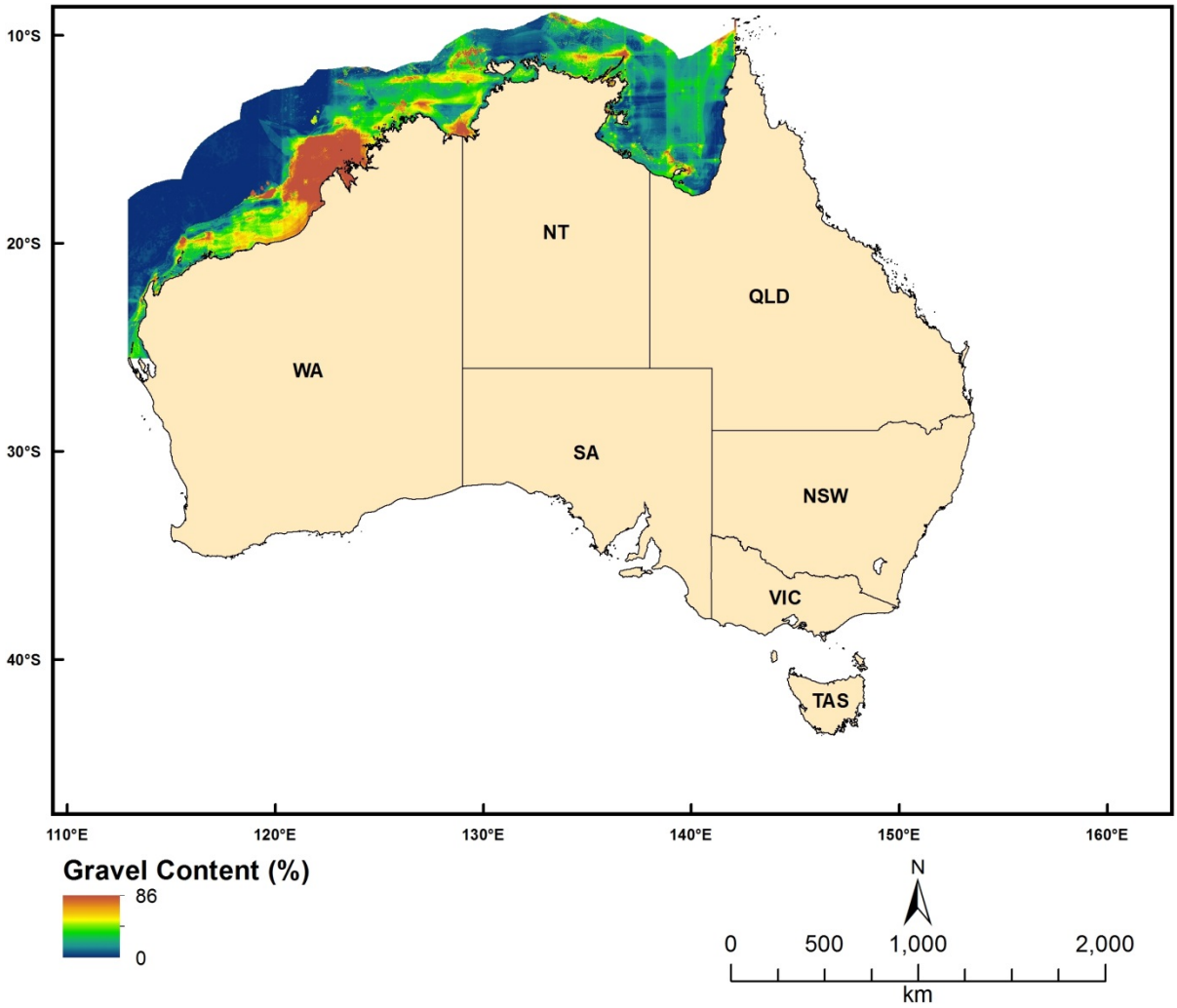

Figure 2.2.1 Predicted seabed gravel content for the North and North-West Marine Regions

2.2.2 Mud Percentage

Dataset TITLE

Predicted seabed mud content in the north-northwest region of the Australian continental EEZ 2013

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Jin Li

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset provides the spatially continuous data of predicted seabed mud content (sediment fraction finer than 63 μm) expressed as a weight percentage ranging from 0 to 100%, presented in 0.0025 decimal degree (dd) resolution raster grids format and an ascii text file. The dataset covers the north-northwest region of the Australian continental EEZ. This dataset supersedes previous predictions of seabed mud content for the region with demonstrated improvements in accuracy. Accuracy of predictions varies based on density of underlying data and level of seabed complexity. Artefacts occur in this dataset as a result of insufficient samples in relevant areas. This dataset is intended for use at regional scale. The dataset may not be appropriate for use at local scales in areas where sample density is insufficient to detect local variation in sediment properties. To obtain the most accurate interpretation of sediment distribution in these areas, it is recommended that additional samples be collected and interpolations updated.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Sediments, Sediment Composition

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8.884891

S_LAT: -25.532391

E_LONG: 112.9222

W_LONG: 142.1522

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Mar-31-03

Data Currency ENDING DATE

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL text (.csv) file

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL text (.csv) file

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Sediment samples were exported from Geoscience Australia's Marine Sediments database (MARS), an Oracle database developed by Geoscience Australia in line with ANZLIC data standards. A subset of this data was selected for use in predicting spatial distribution of gravel content based on a set of data quality control criteria (see Li et al. 2010 and 2012). Predicting the spatial distribution of mud content at a 0.0025 decimal degree resolution was undertaken using a combined method of random forest and ordinary kriging (see Li et al. 2010, 2011a and 2012). The spatial interpolation method used was experimentally selected from over 40 methods/sub-methods based on assessment of predictive errors (Li et al. 2010, 2011a and 2012) and was refined for mud content based on further experimental

testing during Nov 2012 to March 2013. The predictions in raster grids and as an ascii text file were generated in R. Final file is in WGS 84 coordinate system with a 0.0025 dd spatial resolution.

Data Quality POSITIONAL ACCURACY

Sediment samples used in the interpolation incorporate data from various surveys since 1899 by a range of organisations. Modern surveys which used GPS have a positional accuracy of 5-30 m, while earlier surveys which had positions probably accurate to 50 – 2000 m depending upon the water depth and strength of currents. Only samples with positional information recorded to 0.001 dd accuracy were used in the spatial interpolation.

Data Quality ATTRIBUTE ACCURACY

Not Applicable

Data Quality LOGICAL CONSISTENCY

Point data at each grid cell was checked to ensure that the sum of gravel, mud and sand content was 100%. Interpolated grids were further checked by visual comparison with maps initially produced in R to ensure no errors were introduced during the process of producing the grid file.

Data Quality COMPLETENESS

This dataset is completed.

Contact Information CONTACT ORGANISATION

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Additional Metadata ACKNOWLEDGEMENTS

Xiaojing Li extracted sediment samples from MARS database. Tony Nicholas and Scott Nichol provided some samples collected in 2012. Zhi Huang provided bathymetry, slope, distance to coast, and relief data. Tanya Whiteway and Chris Lawson clarified relevant issues associated with bathymetry data. Anna Potter provided clarification on data quality control aspect.

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Li, J., Heap, A. D., Potter, A., Daniell, J. J., 2011a. Predicting Seabed Mud Content across the Australian Margin II: the Performance of Machine Learning Methods and Their Combinations with Ordinary Kriging and Inverse Distance Squared. Geoscience Australia Record 2011/07. Geoscience Australia, Canberra, 69 pp.

Li, J., Potter, A., Huang, Z., Daniell, J. J., Heap, A. D., 2010. Predicting Seabed Mud Content across the Australian Margin: Comparison of Statistical and Mathematical Techniques Using a Simulation Experiment. Geoscience Australia, Record 2010/11. Geoscience Australia, Canberra, 146 pp.

Li, J., Potter, A., Huang, Z., Heap, A., 2012. Predicting Seabed Sand Content across the Australian Margin Using Machine Learning and Geostatistical Methods. Geoscience Australia Record 2012/48, Geoscience Australia, Canberra,115pp.

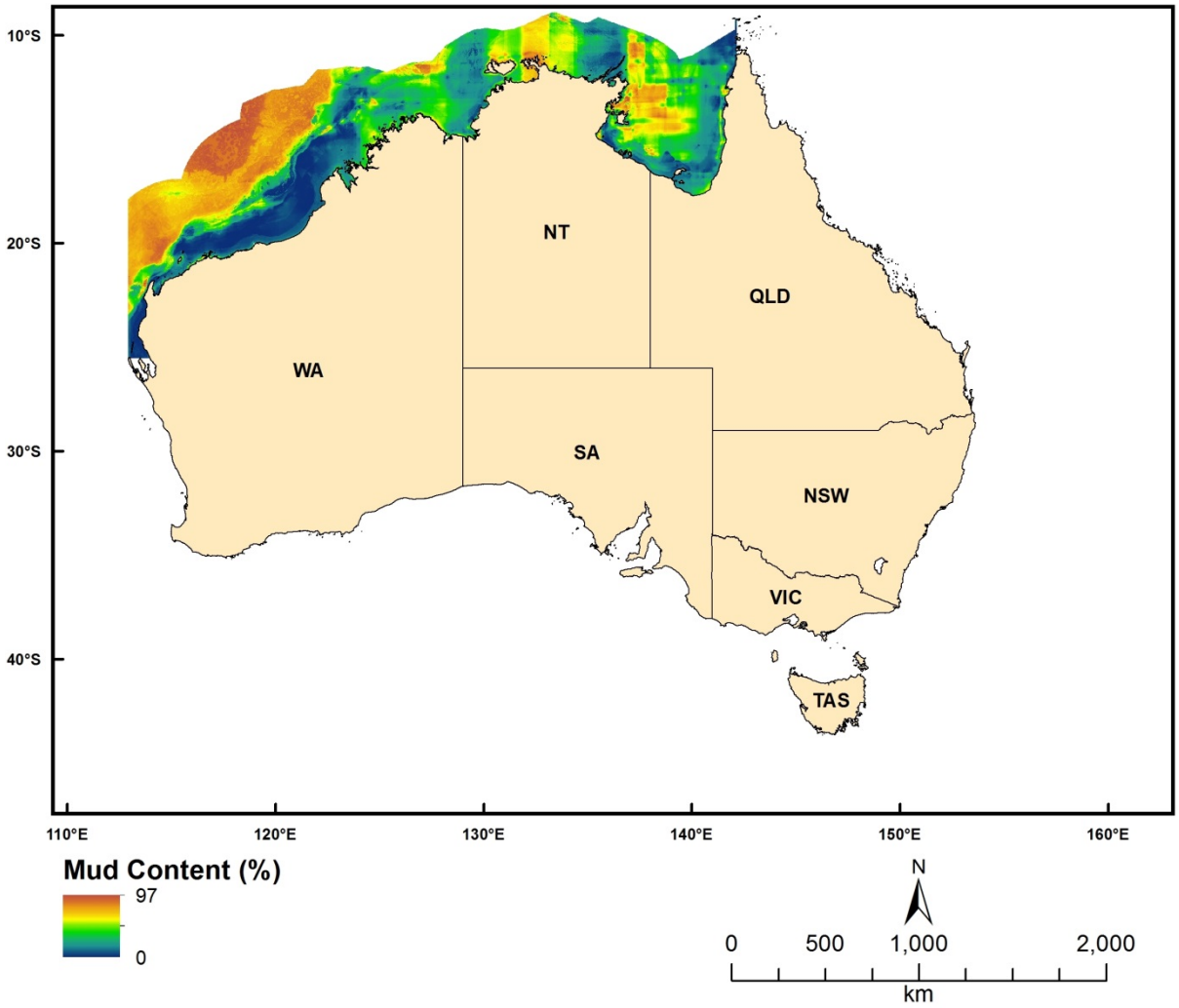

Figure 2.2.2 Predicted seabed mud content for the North and North-West Marine Regions

2.2.3 Sand Percentage

Dataset TITLE

Predicted seabed sand content in the north-northwest region of the Australian continental EEZ 2013

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Jin Li

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset provides the spatially continuous data of predicted seabed sand content (sediment fraction greater than 2000 μm) expressed as a weight percentage ranging from 0 to 100%, presented in 0.0025 decimal degree (dd) resolution raster grids format and an ascii text file. The dataset covers the north-northwest region of the Australian continental EEZ. This dataset supersedes previous predictions of seabed sand content for the region with demonstrated improvements in accuracy. Accuracy of predictions varies based on density of underlying data and level of seabed complexity. Artefacts occur in this dataset as a result of insufficient samples in relevant areas. This dataset is intended for use at regional scale. The dataset may not be appropriate for use at local scales in areas where sample density is insufficient to detect local variation in sediment properties. To obtain the most accurate interpretation of sediment distribution in these areas, it is recommended that additional samples be collected and interpolations updated.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Sediments, Sediment Composition

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8.884891

S_LAT: -25.532391

E_LONG: 112.9222

W_LONG: 142.1522

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.0025

Temporal Resolution:

Data Currency BEGINNING DATE

Mar-31-03

Data Currency ENDING DATE

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Unknown

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL text (.csv) file

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

DIGITAL text (.csv) file

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Sediment samples were exported from Geoscience Australia's Marine Sediments database (MARS), an Oracle database developed by Geoscience Australia in line with ANZLIC data standards. A subset of this data was selected for use in predicting spatial distribution of sand content based on a set of data quality control criteria (see Li et al. 2010 and 2012). Predicting the spatial distribution of sand content at a 0.0025 decimal degree resolution was undertaken using a combined method of random forest and ordinary kriging (see Li et al. 2010, 2011a and 2012). The spatial interpolation method used was experimentally selected from over 40 methods/sub-methods based on assessment of predictive errors (Li et al. 2010, 2011a and 2012) and was refined for sand content based on further

experimental testing during Nov 2012 to March 2013. The predictions in raster grids and as an ascii text file were generated in R. Final file is in WGS 84 coordinate system with a 0.0025 dd spatial resolution.

Data Quality POSITIONAL ACCURACY

Sediment samples used in the interpolation incorporate data from various surveys since 1899 by a range of organisations. Modern surveys which used GPS have a positional accuracy of 5-30 m, while earlier surveys which had positions probably accurate to 50 – 2000 m depending upon the water depth and strength of currents. Only samples with positional information recorded to 0.001 dd accuracy were used in the spatial interpolation.

Data Quality ATTRIBUTE ACCURACY

Not Applicable

Data Quality LOGICAL CONSISTENCY

Point data at each grid cell was checked to ensure that the sum of gravel, mud and sand content was 100%. Interpolated grids were further checked by visual comparison with maps initially produced in R to ensure no errors were introduced during the process of producing the grid file.

Data Quality COMPLETENESS

This dataset is completed.

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Additional Metadata METADATA AUTHOR

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Additional Metadata ACKNOWLEDGEMENTS

Xiaojing Li extracted sediment samples from MARS database. Tony Nicholas and Scott Nichol provided some samples collected in 2012. Zhi Huang provided bathymetry, slope, distance to coast, and relief data. Tanya Whiteway and Chris Lawson clarified relevant issues associated with bathymetry data. Anna Potter provided clarification on data quality control aspect.

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Li, J., Heap, A. D., Potter, A., Daniell, J. J., 2011a. Predicting Seabed Mud Content across the Australian Margin II: the Performance of Machine Learning Methods and Their Combinations with Ordinary Kriging and Inverse Distance Squared. Geoscience Australia Record 2011/07. Geoscience Australia, Canberra, 69 pp.

Li, J., Potter, A., Huang, Z., Daniell, J. J., Heap, A. D., 2010. Predicting Seabed Mud Content across the Australian Margin: Comparison of Statistical and Mathematical Techniques Using a Simulation Experiment. Geoscience Australia, Record 2010/11. Geoscience Australia, Canberra, 146 pp.

Li, J., Potter, A., Huang, Z., Heap, A., 2012. Predicting Seabed Sand Content across the Australian Margin Using Machine Learning and Geostatistical Methods. Geoscience Australia Record 2012/48, Geoscience Australia, Canberra,115pp.

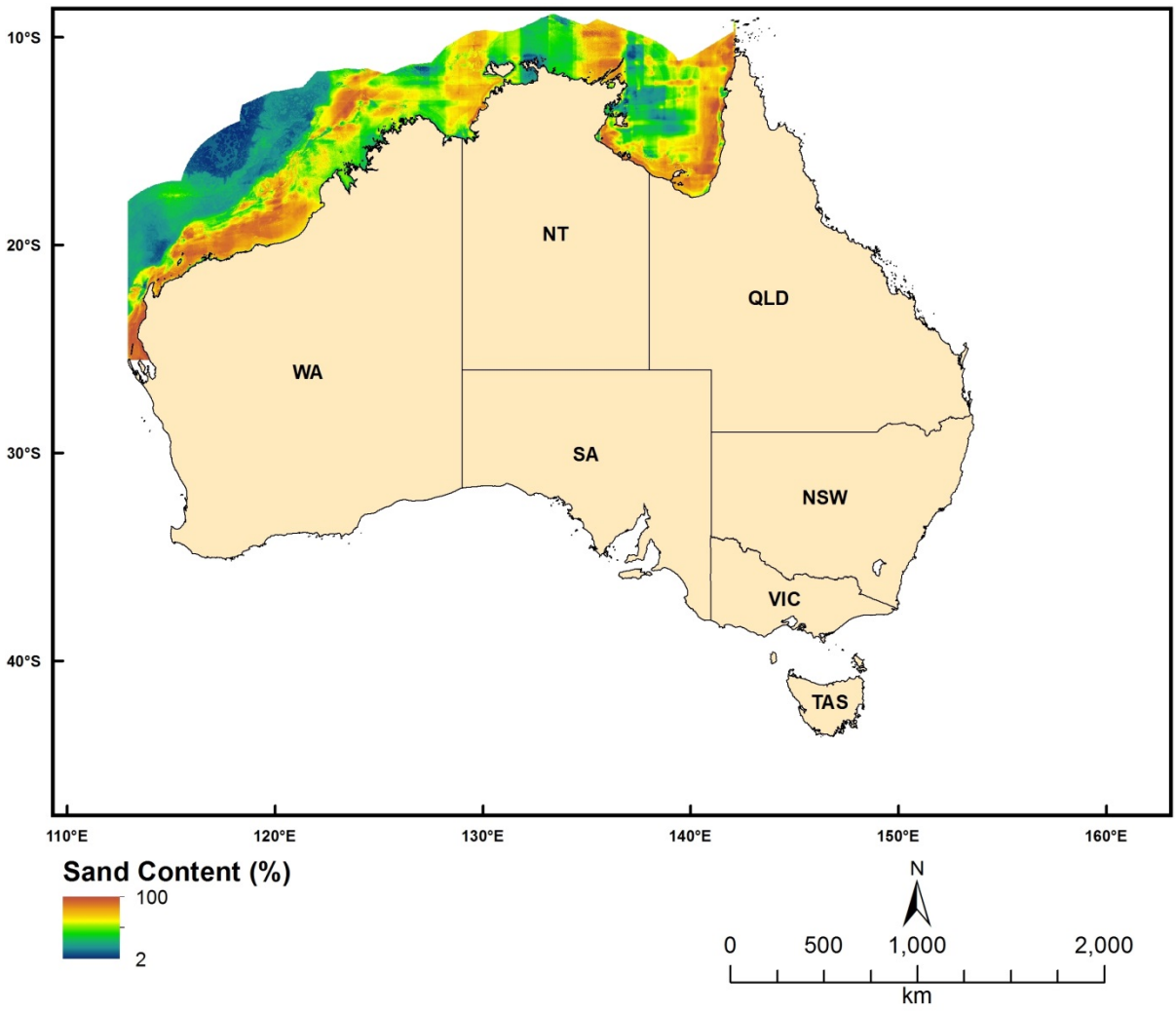

Figure 2.2.3 Predicted seabed sand content for the North and North-West Marine Regions

2.3 Geological and Oceanographic Model of Australia's Continental Shelf (GEOMACS)

2.3.1 Percentage of time the Shields Parameter Exceeds 0.25

Dataset TITLE

Percentage of time the Shields parameter exceeds 0.25

Dataset ALTERNATE TITLE (i.e. Dataset Name)

geomacs_pe

Dataset AUTHOR(S)

Michael Hughes

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This data represents the percentage of time the Shields parameter (Shields, 1936) exceeds 0.25. The Shields parameter (non-dimensional bed shear stress) value of 0.25 is assumed to be the threshold for creating disturbed patches on the seabed. This value is several times larger than that required to initiate traction bedload transport (~0.05) and falls in the middle of the ripple and dune bedform stability field. It represents conditions when the seabed is highly mobile and where patches of disturbed habitat are likely to be created.

Shields, A. 1936. Application of similarity principles and turbulence research to bed-load movement. Mitteilunger der Preussischen Versuchsanstalt f¨ur Wasserbau und Schiffbau 26: 5–24

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Habitat, Marine Sediments

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -7

S_LAT: -44

E_LONG: 110

W_LONG: 156

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.1

Temporal Resolution:

Data Currency BEGINNING DATE

Jan-10

Data Currency ENDING DATE

Jan-10

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Geoscience Australia's GEOMACS (Geological and Oceanographic Model of Australia's Continental Shelf) model was utilised to produce hindcast hourly time series of continental shelf (~20 – 300 m depth) bed shear stress on a 0.1 degree grid covering the period March 1997 to February 2008 (inclusive). The hindcast data represents the combined contribution to the bed shear stress by waves, tides, wind and density-driven circulation. The Shields parameter was obtained from the GEOMACS model.

Please refer to Hughes et al. (2010) for further details.

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

Data Quality POSITIONAL ACCURACY

The dataset is estimated on a 0.1 dd grid resolution.

Data Quality ATTRIBUTE ACCURACY

Output is from a mathematical model – there are no direct field observations. The GEOMACS model does not include the effects of wave breaking and refraction/diffraction or non-linear shallow-water effects on the tide, therefore the model is not considered useful in <10 m water depth, and in many regions in <30 m water depth; depending on the dominant wave period, tidal range and bathymetric complexity (Hughes & Harris 2008). Conversely, seabed disturbance produced by the wave, tide and current input variables appears not to extend beyond 150 m depth. The temporal domain includes 11 years and therefore contains limited information on events with long return intervals at specific locations, e.g. tropical cyclones.

Data Quality LOGICAL CONSISTENCY

The model output has been visually checked for artefacts and spurious data. Tests conducted to ensure data are reliable and valid.

Data Quality COMPLETENESS

This dataset is completed.

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Metadata Date METADATA DATE

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Additional Metadata METADATA AUTHOR

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Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

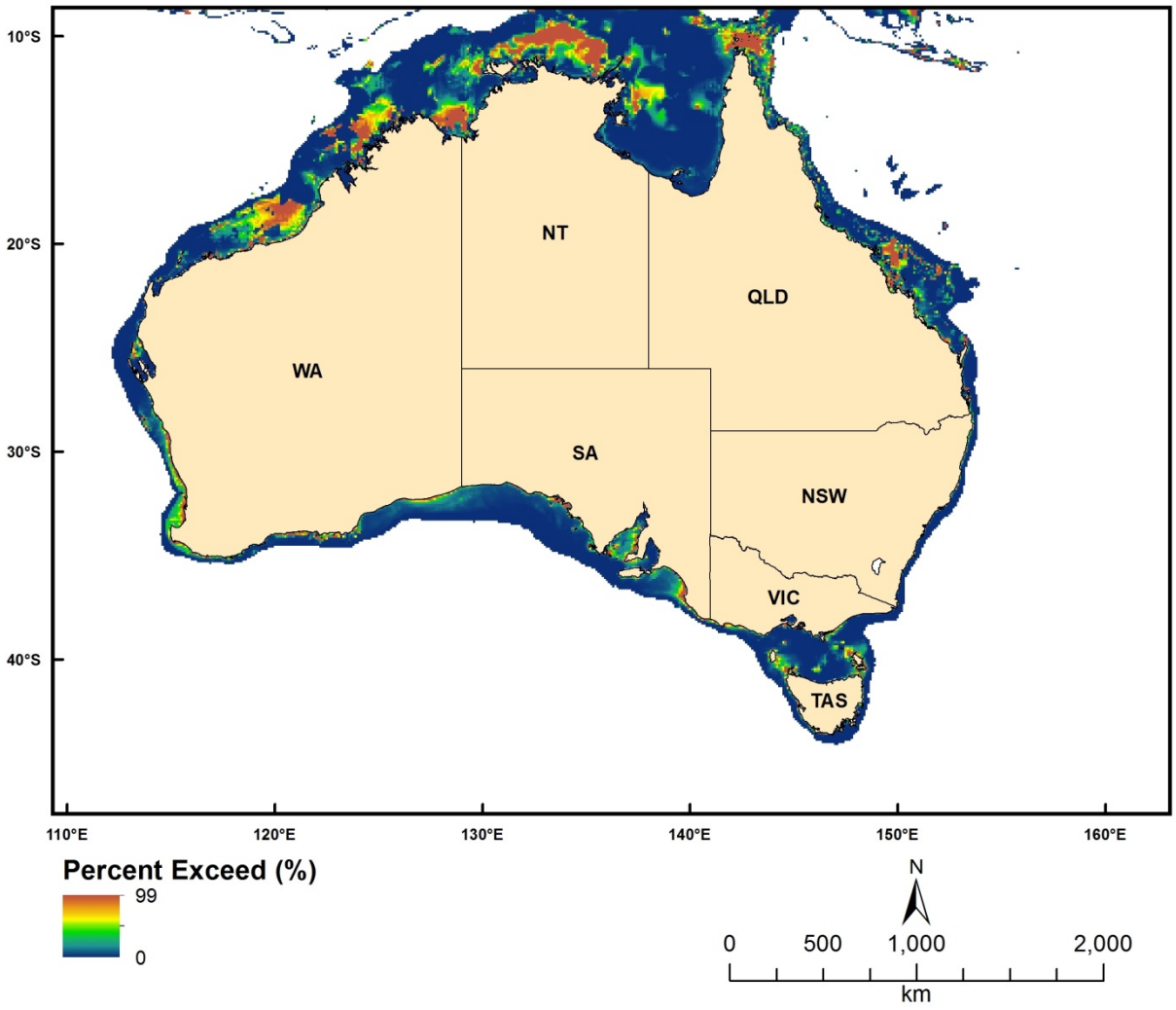

Figure 2.3.1. Percentage of time the Shields Parameter exceeds 0.25

2.3.2 The Integrated Shields Parameter Exceeding 0.25 Divided by the Integrated Total Shields Parameter

Dataset TITLE

The integrated Shields parameter exceeding 0.25 divided by the integrated total Shields parameter

Dataset ALTERNATE TITLE (i.e. Dataset Name)

geomacs_r

Dataset AUTHOR(S)

Michael Hughes

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This data represents the integrated Shields (Shields, 1936) parameter exceeding 0.25 divided by the integrated total Shields parameter. The Shields parameter (non-dimensional bed shear stress) value of 0.25 is assumed to be the threshold for creating disturbed patches. This value is several times larger than that required to initiate traction bedload transport (~0.05) and falls in the middle of the ripple and dune bedform stability field. It represents conditions when the seabed is highly mobile and where patches of disturbed habitat are likely to be created.

Shields, A. 1936. Application of similarity principles and turbulence research to bed-load movement. Mitteilunger der Preussischen Versuchsanstalt f¨ur Wasserbau und Schiffbau 26: 5–24

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Habitat, Marine Sediments

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -7

S_LAT: -44

E_LONG: 110

W_LONG: 156

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.1

Temporal Resolution:

Data Currency BEGINNING DATE

Jan-10

Data Currency ENDING DATE

Jan-10

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Geoscience Australia's GEOMACS (Geological and Oceanographic Model of Australia's Continental Shelf) model was utilised to produce hindcast hourly time series of continental shelf (~20 – 300 m depth) bed shear stress on a 0.1 degree grid covering the period March 1997 to February 2008 (inclusive). The hindcast data represents the combined contribution to the bed shear stress by waves, tides, wind and density-driven circulation. The Shields parameter was obtained from the GEOMACS model. The dataset was calculated using Equation 5.2 in Hughes et al. (2010).

Please refer to Hughes et al. (2010) for further details.

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

Data Quality POSITIONAL ACCURACY

The dataset is estimated on a 0.1 dd grid resolution.

Data Quality ATTRIBUTE ACCURACY

Output is from a mathematical model – there are no direct field observations. The GEOMACS model does not include the effects of wave breaking and refraction/diffraction or non-linear shallow-water effects on the tide, therefore the model is not considered useful in <10 m water depth, and in many regions in <30 m water depth; depending on the dominant wave period, tidal range and bathymetric complexity (Hughes & Harris 2008). Conversely, seabed disturbance produced by the wave, tide and current input variables appears not to extend beyond 150 m depth. The temporal domain includes 11 years and therefore contains limited information on events with long return intervals at specific locations, e.g. tropical cyclones.

Data Quality LOGICAL CONSISTENCY

The model output has been visually checked for artefacts and spurious data. Tests conducted to ensure data are reliable and valid.

Data Quality COMPLETENESS

This dataset is completed.

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Additional Metadata ACKNOWLEDGEMENTS

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Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

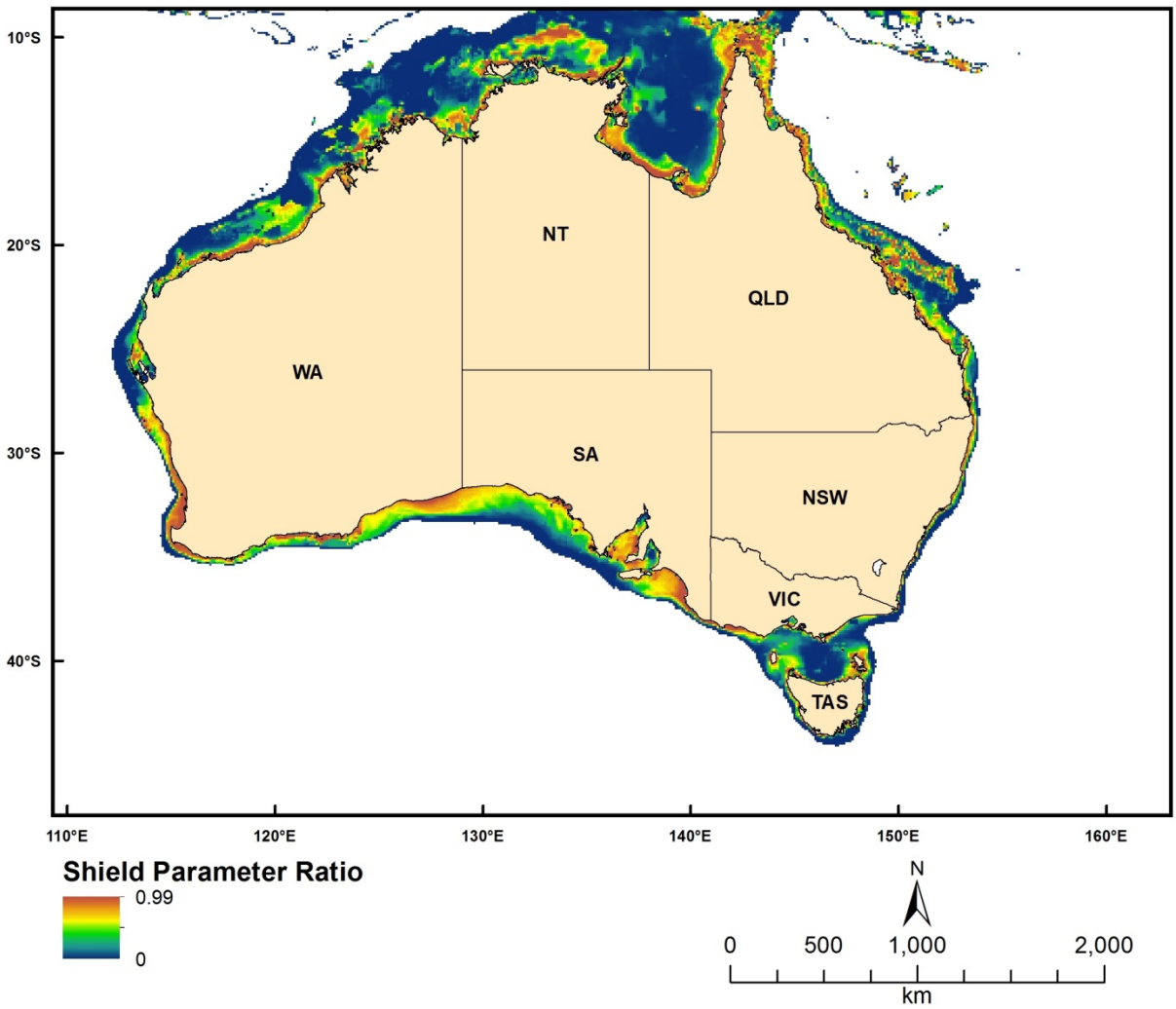

Figure 2.3.2 The Integrated Shields Parameter exceeding 0.25 divided by the Integrated Total Shields Parameter

2.3.3 Average Time between Events When the Shields Parameter Exceeds 0.25 Based on a POT Analysis

Dataset TITLE

Average time between events when the Shields parameter exceeds 0.25

Dataset ALTERNATE TITLE (i.e. Dataset Name)

geomacs_ri

Dataset AUTHOR(S)

Michael Hughes

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This data represents the average time between events when the Shields parameter (Shields, 1936) exceeds 0.25 based on a Peaks-Over-Thresholds (POT) analysis. The Shields parameter (non-dimensional bed shear stress) value of 0.25 is assumed to be the threshold for creating disturbed patches. This value is several times larger than that required to initiate traction bedload transport (~0.05) and falls in the middle of the ripple and dune bedform stability field. It represents conditions when the seabed is highly mobile and where patches of disturbed habitat are likely to be created. The unit for the dataset is day.

Shields, A. 1936. Application of similarity principles and turbulence research to bed-load movement. Mitteilunger der Preussischen Versuchsanstalt f¨ur Wasserbau und Schiffbau 26: 5–24

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Habitat, Marine Sediments

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -7

S_LAT: -44

E_LONG: 110

W_LONG: 156

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.1

Temporal Resolution:

Data Currency BEGINNING DATE

Jan-10

Data Currency ENDING DATE

Jan-10

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Geoscience Australia's GEOMACS (Geological and Oceanographic Model of Australia's Continental Shelf) model was utilised to produce hindcast hourly time series of continental shelf (~20 – 300 m depth) bed shear stress on a 0.1 degree grid covering the period March 1997 to February 2008 (inclusive). The hindcast data represents the combined contribution to the bed shear stress by waves, tides, wind and density-driven circulation. The Shields parameter was obtained from the GEOMACS model.

Please refer to Hughes et al. (2010) for further details.

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

Data Quality POSITIONAL ACCURACY

The dataset is estimated on a 0.1 dd grid resolution.

Data Quality ATTRIBUTE ACCURACY

Output is from a mathematical model – there are no direct field observations. The GEOMACS model does not include the effects of wave breaking and refraction/diffraction or non-linear shallow-water effects on the tide, therefore the model is not considered useful in <10 m water depth, and in many regions in <30 m water depth; depending on the dominant wave period, tidal range and bathymetric complexity (Hughes & Harris 2008). Conversely, seabed disturbance produced by the wave, tide and current input variables appears not to extend beyond 150 m depth. The temporal domain includes 11 years and therefore contains limited information on events with long return intervals at specific locations, e.g. tropical cyclones.

Data Quality LOGICAL CONSISTENCY

The model output has been visually checked for artefacts and spurious data. Tests conducted to ensure data are reliable and valid.

Data Quality COMPLETENESS

This dataset is completed.

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Additional Metadata ACKNOWLEDGEMENTS

Peter Harris

Brendan Brooke

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

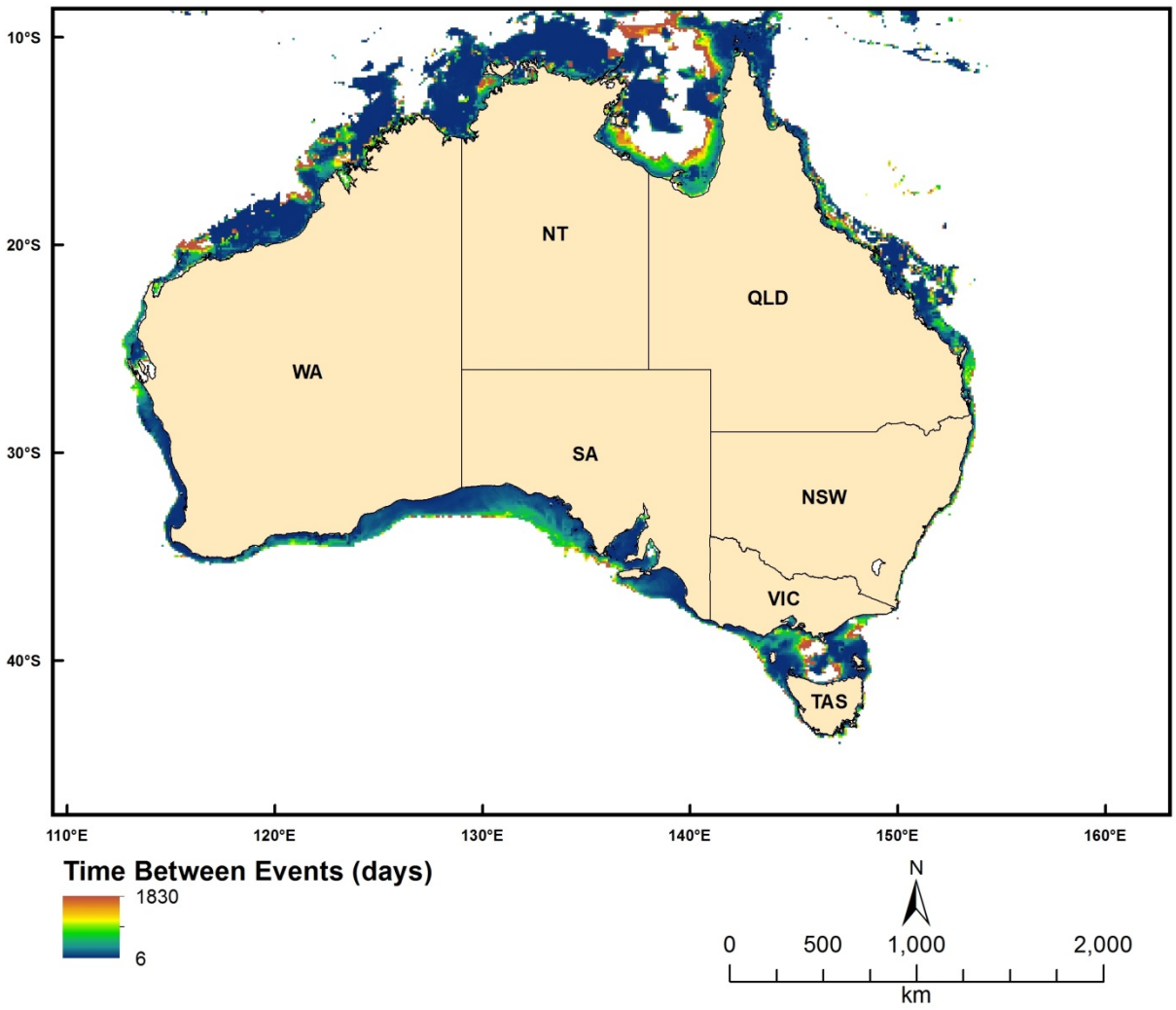

Figure 2.3.3 Average time between events when the Shields Parameter exceeds 0.25 based on a POT analysis

2.3.4 Ecological Disturbance Index

Dataset TITLE

Ecological disturbance index

Dataset ALTERNATE TITLE (i.e. Dataset Name)

geomacs_ed

Dataset AUTHOR(S)

Michael Hughes

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

This data represents a dimensionless ecological disturbance index, as the ratio of ecological succession and disturbance recurrence interval times the fraction of the area disturbed in any event. Small values of the ecological disturbance index represent decreasing proportions of time when disturbed/recovering habitats are present.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Habitat, Marine Sediments

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -7

S_LAT: -44

E_LONG: 110

W_LONG: 156

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution: 0.1

Temporal Resolution:

Data Currency BEGINNING DATE

Jan-10

Data Currency ENDING DATE

Jan-10

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Geoscience Australia's GEOMACS (Geological and Oceanographic Model of Australia's Continental Shelf) model was utilised to produce hindcast hourly time series of continental shelf (~20 – 300 m depth) bed shear stress on a 0.1 degree grid covering the period March 1997 to February 2008 (inclusive). The hindcast data represents the combined contribution to the bed shear stress by waves, tides, wind and density-driven circulation.

The ecological disturbance index is calculated using the following equation:

ED=FA*ES/RI

Where ED is the ecological disturbance index, FA is the spatial fraction multiplier, ES is the ecological succession (in days), and RI is the recurrence interval (in days). In this study, FA was assigned 1.0. ES equals 1 year (365 days) for mud, 3 years (1095 days) for sand and 5 years (1825 days) for gravel. While, RI is the average time between events when the Shields parameter exceeding 0.25 (the geomacs_ri layer).The seabed sediment was classified into gravel, sand or mud using a simple classification scheme (Folk, 1974). Grid cells were assigned to the gravel class if percent gravel was

>30, and if the percent gravel was <30 they were assigned to either the sand or mud class depending on which ever had the largest percentage. The sediment grain size data used for this exercise were from the predicted layers of Li et al. (2011).

Please refer to Hughes et al. (2010) for further details.

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

Li, J., Heap, A.D., Potter, A., Huang, Z., 2011. Seabed gravel content across the Australian continental EEZ 2011, http://www.ga.gov.au/meta/ANZCW0703014835.html

Li, J., Heap, A.D., Potter, A., Huang, Z., 2011. Seabed sand content across the Australian continental EEZ 2011, http://www.ga.gov.au/meta/ANZCW0703014867.html

Data Quality POSITIONAL ACCURACY

The dataset is estimated on a 0.1 dd grid resolution.

Data Quality ATTRIBUTE ACCURACY

Output is from a mathematical model – there are no direct field observations. The GEOMACS model does not include the effects of wave breaking and refraction/diffraction or non-linear shallow-water effects on the tide, therefore the model is not considered useful in <10 m water depth, and in many regions in <30 m water depth; depending on the dominant wave period, tidal range and bathymetric complexity (Hughes & Harris 2008). Conversely, seabed disturbance produced by the wave, tide and current input variables appears not to extend beyond 150 m depth. The temporal domain includes 11 years and therefore contains limited information on events with long return intervals at specific locations, e.g. tropical cyclones.

The attribute accuracy of the sediment layers also influences the attribute accuracy of this dataset.

Data Quality LOGICAL CONSISTENCY

The model output has been visually checked for artefacts and spurious data. Tests conducted to ensure data are reliable and valid.

Data Quality COMPLETENESS

This dataset is completed.

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Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Folk, R.L., 1974. Petrology of sedimentary rocks. Austin, Texas, Hemphills, 182pp.

Hughes, M.G., Harris, P.T., Brooke, B.P., 2010. Seabed exposure and ecological disturbance on Australia's continental shelf: Potential surrogates for marine biodiversity. Geoscience Australia Record 2010/43, 77pp.

Li, J., Heap, A.D., Potter, A., Huang, Z., 2011. Seabed gravel content across the Australian continental EEZ 2011, http://www.ga.gov.au/meta/ANZCW0703014835.html

Li, J., Heap, A.D., Potter, A., Huang, Z., 2011. Seabed sand content across the Australian continental EEZ 2011, http://www.ga.gov.au/meta/ANZCW0703014867.html

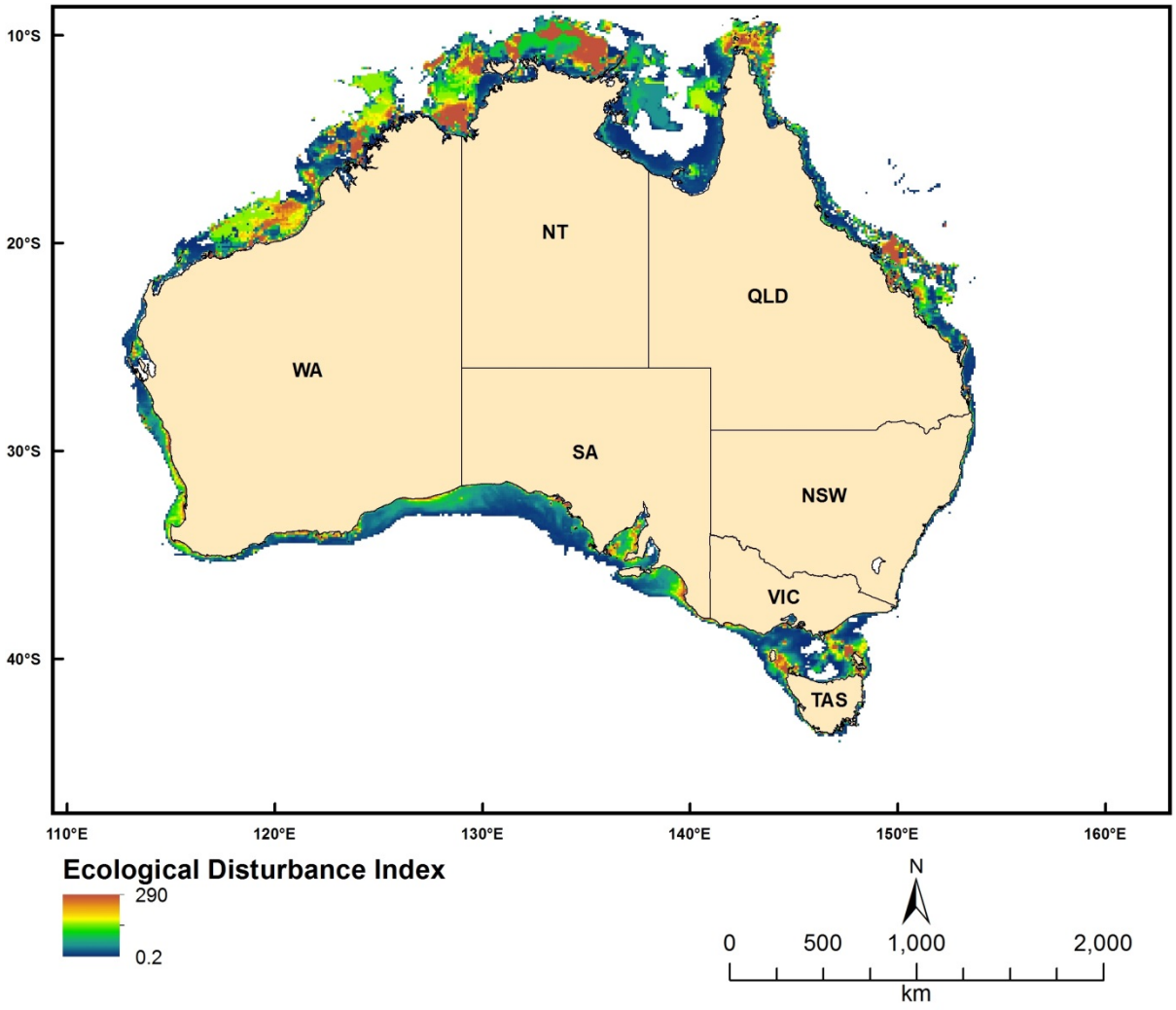

Figure 2.3.4 Ecological Disturbance Index

2.4 Time-series MODIS Water Quality Datasets

2.4.1 Chlorophyll a

Dataset TITLE

MODIS derived Chlorophyll a datasets

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The datasets measure the Chlorophyll a concentrations of ocean surface waters. They are derived products from MODIS (aqua) images using NASA's SeaDAS image processing software. The extent of the datasets covers the entire Australian EEZ and surrounding waters (including the southern ocean). The spatial resolution of the datasets is 0.01 dd. The datasets contain 36 monthly Chlorophyll a layers between 2009 and 2011. The unit of the datasets is mg/m^3.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Water Quality

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -60

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Jan-09 to Dec-11

Description NOMINAL SCALE

Spatial Resolution: 0.01

Temporal Resolution: monthly

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The Chlorophyll a datasets were derived products of MODIS (Aqua) images. SeaDAS (version 6.1) was used to process the MODIS data from raw to L3 products. SeaDAS provides several algorithms for Chlorophyll products. The algorithm used here is the standard algorithm (OC3) (O'Reilly et al., 1998). The sequences of processing included:

1. raw - L1A,

2. L1A - L1B,

3. L1B - L2,

4. L2 - L3 (spatial) binning, and

5. L3 binning to L3 time-binning.

The first four steps were applied to all individual (daily) raw images. After completing the above steps for one-month-worth-of images (around 300 images), in the fifth step, four weekly images were generated:

1. week1: from the 1st to the 7th of the month;

2. week2: from the 8th to the 14th of the month;

3. week3: from the 15th to the 21st of the month;

4. week4: from the 22nd to the last day of the month.

The four weekly images were exported as HDF files, then imported into ArcGIS and converted into ArcInfo grids. Next, the four grids were mosaiced into a monthly image using the averaging method.

The above processes were repeated to generate the final 36 monthly datasets between 2009 and 2011.

O'Reilly, J.E., Maritorena, S., Mitchell, B.G., Siegel, D.A., Carder, K.L., Garver, S.A., et al., 1998. Ocean color algorithms for SeaWiFS, Journal of Geophysical Research, 103, 24937-24953.

Data Quality POSITIONAL ACCURACY

The spatial resolution of the MODIS data used to derive Ocean Color products are about 1km. The same resolution was maintained for the final monthly data (e.g. 0.01 dd). Given the high accuracy of spatial referencing during the SeaDAS processing, the positional accuracy was estimated to be within 1 km.

Data Quality ATTRIBUTE ACCURACY

The attribute accuracy of the Chlorophyll a datasets depends on the algorithm used. The OC3 algorithm is suitable for case-1 water (open ocean). In the case of Australian waters, the estimated Chlorophyll a concentrations are reliable for the vast majority of areas except along the coast (e.g., within 10-20 km from the coast, case 2 waters). However, a quantitative test on the attribute accuracy could not be carried out due to the lack of ground truth samples.

Data Quality LOGICAL CONSISTENCY

The same algorithm and processing steps and parameters were used to process all images.

Data Quality COMPLETENESS

The datasets cover an extent between 100 to 170 longitude and -60 to -5 latitude. The holes (NoDATA) in the datasets were the results of the quality flags applied during the MODIS processing.

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Metadata Date METADATA DATE

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Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Edward King of CSIRO (for providing access to the MODIS raw data and permission to use SeaDAS software)

NCI facilities

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

O’Reilly, J.E., Maritorena, S., Mitchell, B.G., Siegel, D.A., Carder, K.L., Garver, S.A., et al., 1998. Ocean color algorithms for SeaWiFS, Journal of Geophysical Research, 103, 24937-24953.

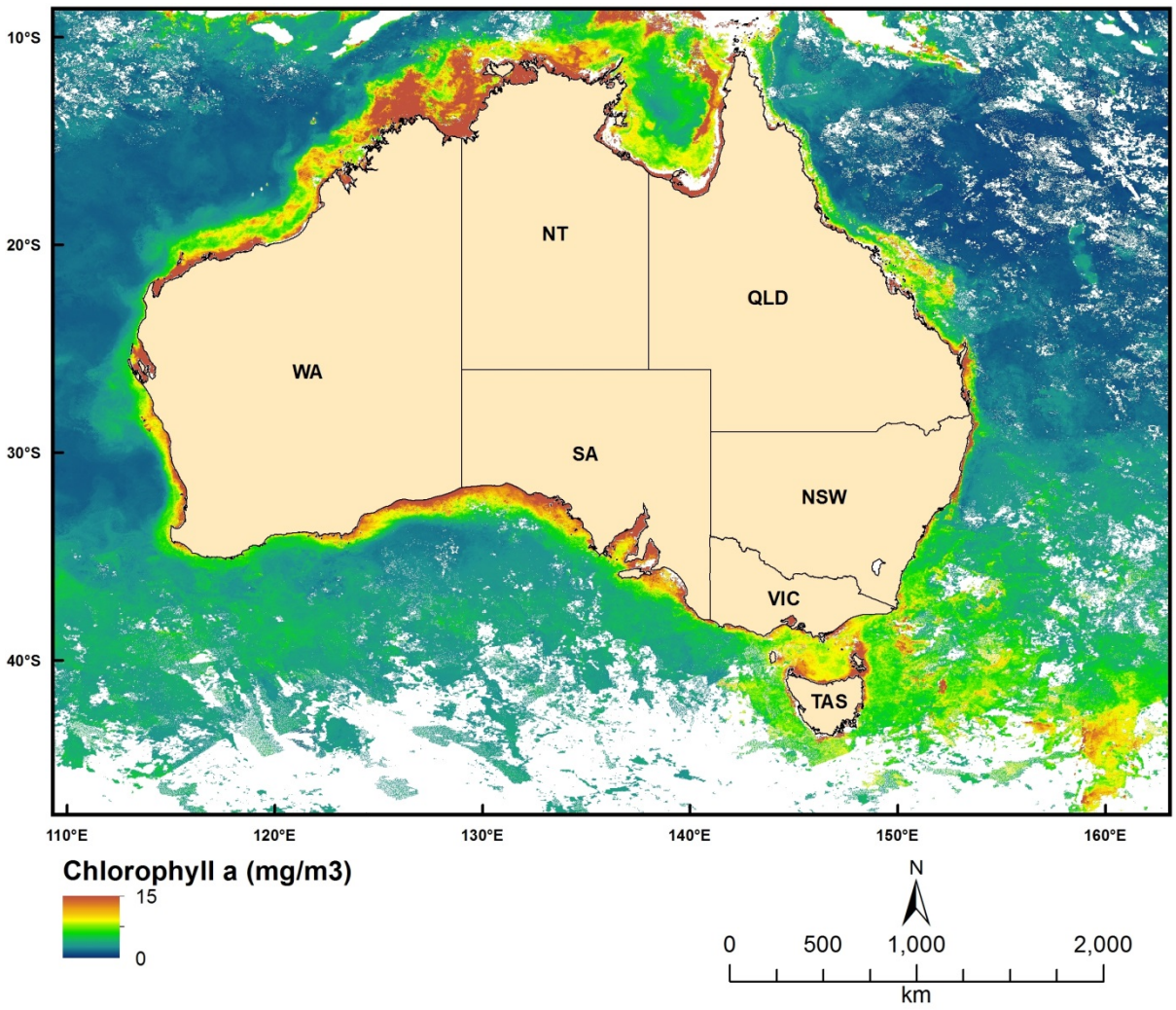

Figure 2.4.1 MODIS-derived Chlorophyll-a concentrations for May 2009

2.4.2 Coloured Dissolved Organic Matter

Dataset TITLE

MODIS derived CDOM datasets

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The datasets measure the Coloured Dissolved Organic Matter (CDOM) concentrations of ocean surface waters. They are derived products from MODIS (aqua) images using NASA's SeaDAS image processing software. The extent of the datasets covers the entire Australian EEZ and surrounding waters (including the southern ocean). The spatial resolution of the datasets is 0.01 dd. The datasets contain 36 monthly CDOM layers between 2009 and 2011. The unit of the datasets is 1/m.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Water Quality

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -60

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Jan-09 to Dec-11

Description NOMINAL SCALE

Spatial Resolution: 0.01

Temporal Resolution: monthly

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The CDOM datasets are derived products of MODIS (Aqua) images. SeaDAS (version 6.1) was used to process the MODIS data from raw to L3 products. The algorithm used here was based on a modified QAA (Lee et al., 2002) algorithm (Zhu and Yu, 2012):

j1=0.63

j2=0.88

aw_443=0.00696

ap_443=j1 * power(bbp_555,j2)

ag_443=a_443 - aw_443 - ap_443

Where a_443 is total absorption coefficient at 443 nm, aw_443 is water absorption coefficient at 443 nm, ap_443 is particles absorption coefficient at 443 nm, bbp_555 is particles backscatter coefficient at 555 nm, and ag_443 is CDOM absorption coefficient at 443 nm.

bbp_555 and a_443 from QAA algorithm can be directly derived using SeaDAS.

The sequences of processing included:

1. raw - L1A,

2. L1A - L1B,

3. L1B - L2,

4. L2 - L3 (spatial) binning, and

5. L3 binning to L3 time-binning.

The first four steps were applied to all individual (daily) raw images to obtain bbp_555 and a_443 products. After completing the above steps for one-month-worth images (around 300 images), in the fifth step, four weekly images were generated:

1. week1: from the 1st to the 7th of the month;

2. week2: from the 8th to the 14th of the month;

3. week3: from the 15th to the 21st of the month;

4. week4: from the 22nd to the last day of the month.

The four weekly images were exported as HDF files, then imported into ArcGIS and converted into ArcInfo grids. Next, the weekly products of bbp_555 and a_443 were entered into the above-described algorithm to calculate weekly CDOM products. Finally, the four weekly CDOM grids were mosaiced into a monthly image using the averaging method.

The above processes were repeated to generate the final 36 monthly datasets between 2009 and 2011.

Lee, Z.P., Carder, K.L., Arnone, R.A., 2002. Deriving inherent optical properties from water color: a multiband quasi-analytical algorithm for optically deep waters, Applied Optics, 41, 5755-5772.

Zhu, W.; Yu, Q.; , "Inversion of Chromophoric Dissolved Organic Matter From EO-1 Hyperion Imagery for Turbid Estuarine and Coastal Waters," Geoscience and Remote Sensing, IEEE Transactions on , vol.PP, no.99, pp.1-13, 0 doi: 10.1109/TGRS.2012.2224117

Data Quality POSITIONAL ACCURACY

The spatial resolution of the MODIS data used to derive Ocean Color products are about 1km. The same resolution was maintained for the final monthly data (e.g., 0.01 dd). Given the high accuracy of spatial referencing during the SeaDAS processing, the positional accuracy was estimated to be within 1 km.

Data Quality ATTRIBUTE ACCURACY

The attribute accuracy of the CDOM datasets depends on the algorithm used. The modified QAA algorithm is suitable for case-1 and case-2 waters. However, a quantitative test on the attribute accuracy could not be carried out due to the lack of ground truth samples.

Data Quality LOGICAL CONSISTENCY

The same algorithm and processing steps and parameters were used to process all images.

Data Quality COMPLETENESS

The datasets cover an extent between 100 to 170 longitude and -60 to -5 latitude. The holes (NoDATA) in the datasets were the results of the quality flags applied during the MODIS processing.

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Metadata Date METADATA DATE

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Additional Metadata ACKNOWLEDGEMENTS

Edward King of CSIRO (for providing access to the MODIS raw data and permission to use SeaDAS software)

NCI facilities

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Lee, Z.P., Carder, K.L., Arnone, R.A., 2002. Deriving inherent optical properties from water color: a multiband quasi-analytical algorithm for optically deep waters, Applied Optics, 41, 5755-5772.

Zhu, W.; Yu, Q, "Inversion of Chromophoric Dissolved Organic Matter From EO-1 Hyperion Imagery for Turbid Estuarine and Coastal Waters," Geoscience and Remote Sensing, IEEE Transactions, vol.PP, no.99, pp.1-13, 0 doi: 10.1109/TGRS.2012.2224117

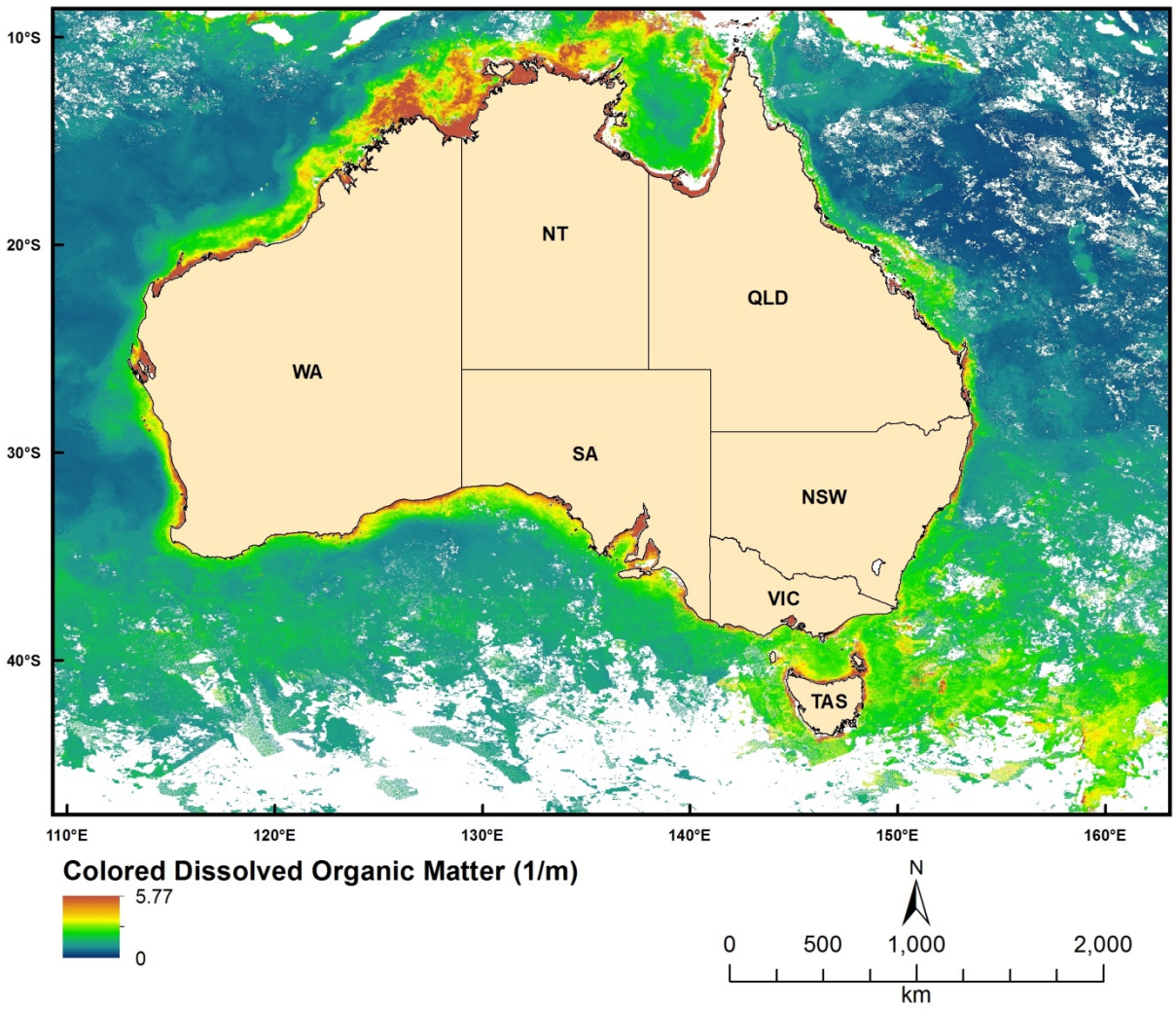

Figure 2.4.2 MODIS-derived Coloured Dissolved Organic Matter concentrations for May 2009

2.4.3 Total Suspended Sediment

Dataset TITLE

MODIS derived TSM datasets

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The datasets measure the Total Suspended Materials (TSM) concentrations of ocean surface waters. They are derived products from MODIS (aqua) images using NASA's SeaDAS image processing software. The extent of the datasets covers the entire Australian EEZ and surrounding waters (including the southern ocean). The spatial resolution of the datasets is 0.01 dd. The datasets contain 36 monthly TSM layers between 2009 and 2011. The unit of the datasets is g/m^3.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Water Quality

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -60

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Jan-09 to Dec-11

Description NOMINAL SCALE

Spatial Resolution: 0.01

Temporal Resolution: monthly

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The TSM datasets are derived products of MODIS (Aqua) images. SeaDAS (version 6.1) was used to process the MODIS data from raw to L3 products. The algorithm used here is the Clark algorithm (Clark et al., 1980):

a0=0.490330

a1=-2.712882

a2=3.412666

a3=-8.336478

a4=12.111023

a5=-5.961926

nLw1: Normalised water-leaving radiance at 443 nm

nLw2: Normalised water-leaving radiance at 488 nm

nLw4: Normalised water-leaving radiance at 551 nm

X=log10((nLw1 + nLw2) / nLw4)

TSM=power(10, (a0 + X * (a1 + X * (a2 + X * (a3 + X * (a4 + X * a5))))))

The nLw1 and nLw2 can be derived directly using SeaDAS. In addition, Normalised water-leaving radiance at 547 nm and 555 nm were derived to calculate nLw4 (simple averaging).

The sequences of processing included:

1. raw - L1A,

2. L1A - L1B,

3. L1B - L2,

4. L2 - L3 (spatial) binning, and

5. L3 binning to L3 time-binning.

The first four steps were applied to all individual (daily) raw images to obtain the four Normalised water-leaving radiance products. After completing the above steps for one-month-worth images (around 300 images), in the fifth step, four weekly images were generated:

1. week1: from the 1st to the 7th of the month;

2. week2: from the 8th to the 14th of the month;

3. week3: from the 15th to the 21st of the month;

4. week4: from the 22nd to the last day of the month.

The four weekly images were exported as HDF files, then imported into ArcGIS and converted into ArcInfo grids. Next, the weekly images of the four products were entered into the Clark algorithm described above to calculate weekly TSM products. Finally, the four TSM weekly grids were mosaiced into a monthly image using the averaging method.

The above processes were repeated to generate the final 36 monthly datasets between 2009 and 2011.

Clark, D.K., Baker, E.T., Strong, A.E., 1980. Upwelled spectral radiance distribution in relation to particulate matter in sea water, Boundary-Layer Meteorology, 18, 287-298.

Data Quality POSITIONAL ACCURACY

The spatial resolution of the MODIS data used to derive Ocean Color products are about 1km. The same resolution was maintained for the final monthly data (e.g., 0.01 dd). Given the high accuracy of spatial referencing during the SeaDAS processing, the positional accuracy was estimated to be within 1 km.

Data Quality ATTRIBUTE ACCURACY

The attribute accuracy of the TSM datasets depends on the algorithm used. The Clark algorithm is suitable for case-1 water (open ocean). In the case of Australian waters, the estimated TSM concentrations are reliable for the vast majority of areas except along the coast (e.g., within 10-20 km from the coast, case 2 waters). However, a quantitative test on the attribute accuracy could not be carried out due to the lack of ground truth samples.

Data Quality LOGICAL CONSISTENCY

The same algorithm and processing steps and parameters were used to process all images.

Data Quality COMPLETENESS

The datasets cover an extent between 100 to 170 longitude and -60 to -5 latitude. The holes (NoDATA) in the datasets were the results of the quality flags applied during the MODIS processing.

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Additional Metadata METADATA AUTHOR

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Additional Metadata ACKNOWLEDGEMENTS

Edward King of CSIRO (for providing access to the MODIS raw data and permission to use SeaDAS software)

NCI facilities

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Additional Metadata REFERENCES

Clark, D.K., Baker, E.T., Strong, A.E., 1980. Upwelled spectral radiance distribution in relation to particulate matter in sea water, Boundary-Layer Meteorology, 18, 287-298.

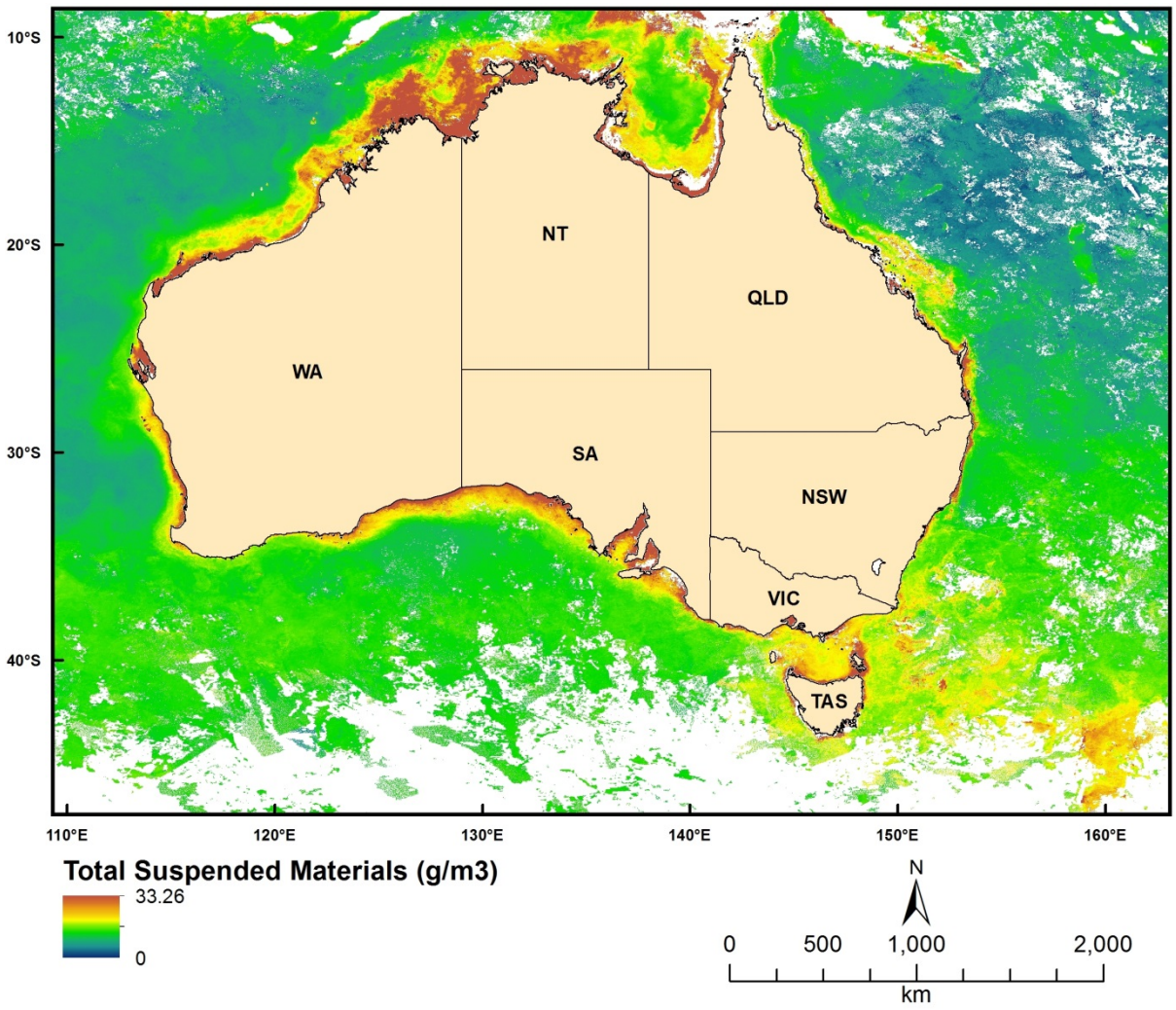

Figure 2.4.3 MODIS-derived Total Suspended Materials concentrations for May 2009

2.4.4 K490

Dataset TITLE

MODIS derived K490 datasets

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The datasets measure the K490 parameter (Downwelling diffuse attenuation coefficient at 490 nm, a turbidity parameter) of Australian oceans. They are derived products from MODIS (aqua) images using NASA's SeaDAS image processing software. The extent of the datasets covers the entire Australian EEZ and surrounding waters (including the southern ocean). The spatial resolution of the datasets is 0.01 dd. The datasets contain 36 monthly k490 layers between 2009 and 2011. The unit of the datasets is 1/m.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Water Quality

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -60

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Jan-09 to Dec-11

Description NOMINAL SCALE

Spatial Resolution: 0.01

Temporal Resolution: monthly

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The K490 datasets are derived products of MODIS (Aqua) images. SeaDAS (version 6.1) was used to process the MODIS data from raw to L3 products. SeaDAS provides several algorithms for K490 products. The algorithm used here is the standard algorithm (OBPG) (Werdell, 2005). The sequences of processing included:

1. raw - L1A,

2. L1A - L1B,

3. L1B - L2,

4. L2 - L3 (spatial) binning, and

5. L3 binning to L3 time-binning.

The first four steps were applied to all individual (daily) raw images. After completing the above steps for one-month-worth images (around 300 images), in the fifth step, four weekly images were generated:

1. week1: from the 1st to the 7th of the month;

2. week2: from the 8th to the 14th of the month;

3. week3: from the 15th to the 21st of the month;

4. week4: from the 22nd to the last day of the month.

The four weekly images were exported as HDF files, then imported into ArcGIS and converted into ArcInfo grids. Next, the four grids were mosaiced into a monthly image using the averaging method.

The above processes were repeated to generate the final 36 monthly datasets between 2009 and 2011.

Werdell, P.J., 2005. OceanColor K490 algorithm evaluation. http://oceancolor.gsfc.nasa.gov/REPROCESSING/SeaWiFS/R5.1/k490_update.html (accessed 10/10/2011).

Data Quality POSITIONAL ACCURACY

The spatial resolution of the MODIS data used to derive Ocean Color products are about 1km. The same resolution was maintained for the final monthly data (e.g., 0.01 dd). Given the high accuracy of spatial referencing during the SeaDAS processing, the positional accuracy was estimated to be within 1 km.

Data Quality ATTRIBUTE ACCURACY

The attribute accuracy of the K490 datasets depends on the algorithm used. The OBPG algorithm is suitable for case-1 water (open ocean). In the case of Australian waters, the estimated K490 parameter are reliable for the vast majority of areas except along the coast (e.g., within 10-20 km from the coasts, case 2 waters). However, a quantitative test on the attribute accuracy could not be carried out due to the lack of ground truth samples.

Data Quality LOGICAL CONSISTENCY

The same algorithm and processing steps and parameters were used to process all images.

Data Quality COMPLETENESS

The datasets cover an extent between 100 to 170 longitude and -60 to -5 latitude. The holes (NoDATA) in the datasets were the results of the quality flags applied during the MODIS processing.

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

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Additional Metadata ACKNOWLEDGEMENTS

Edward King of CSIRO (for providing access to the MODIS raw data and permission to use SeaDAS software)

NCI facilities

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Werdell, P.J., 2005. OceanColor K490 algorithm evaluation. http://oceancolor.gsfc.nasa.gov/REPROCESSING/SeaWiFS/R5.1/k490_update.html (accessed 10/10/2011).

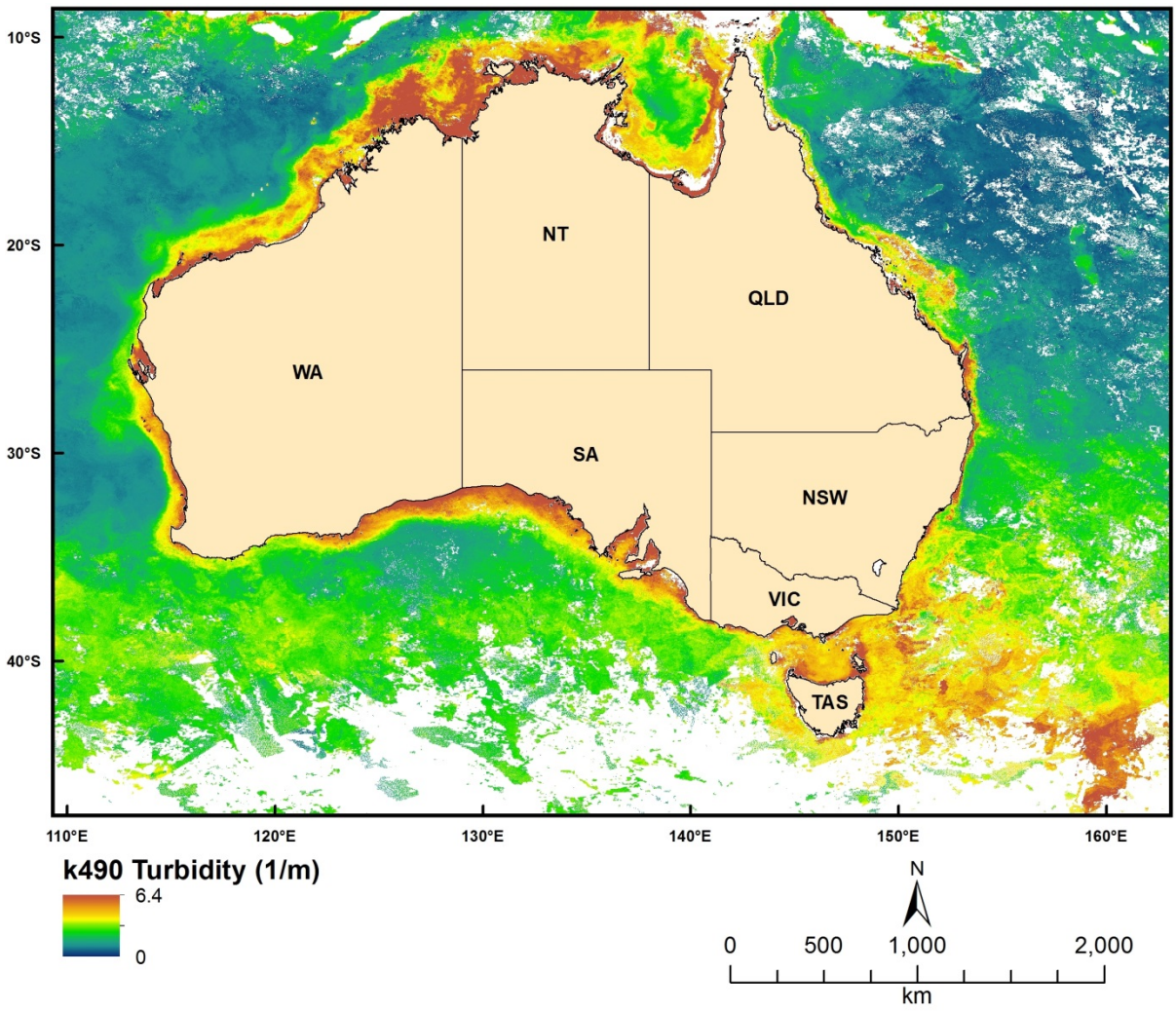

Figure 2.4.4 MODIS-derived K490 measures for May 2009

2.4.5 Euphotic Depth

Dataset TITLE

MODIS derived Zeu datasets

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The datasets measure the Euphotic Depth (Zeu) of Australian oceans. They are derived products from MODIS (aqua) images using NASA's SeaDAS image processing software. The extent of the datasets covers the entire Australian EEZ and surrounding waters (including the southern ocean). The spatial resolution of the datasets is 0.01 dd. The datasets contain 36 monthly Zeu layers between 2009 and 2011. The unit of the datasets is metre.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Water Quality

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -60

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Jan-09 to Dec-11

Description NOMINAL SCALE

Spatial Resolution: 0.01

Temporal Resolution: monthly

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The Zeu datasets are derived products of MODIS (Aqua) images. SeaDAS (version 6.1) was used to process the MODIS data from raw to L3 products. The algorithm used here is based on the model of Morel (Morel and Maritorena, 2001). The sequences of processing included:

1. raw - L1A,

2. L1A - L1B,

3. L1B - L2,

4. L2 - L3 (spatial) binning, and

5. L3 binning to L3 time-binning.

The first four steps were applied to all individual (daily) raw images. After completing the above steps for one-month-worth images (around 300 images), in the fifth step, four weekly images were generated:

1. week1: from the 1st to the 7th of the month;

2. week2: from the 8th to the 14th of the month;

3. week3: from the 15th to the 21st of the month;

4. week4: from the 22nd to the last day of the month.

The four weekly images were exported as HDF files, then imported into ArcGIS and converted into ArcInfo grids. Next, the four grids were mosaiced into a monthly image using the averaging method.

The above processes were repeated to generate the final 36 monthly datasets between 2009 and 2011.

Morel, A. and Maritorena, S., 2001. Bio-optical properties of oceanic waters: A reappraisal, Journal of Geophysical Research, 106, 7163-7180.

Data Quality POSITIONAL ACCURACY

The spatial resolution of the MODIS data used to derive Ocean Color products are about 1km. The same resolution was maintained for the final monthly data (e.g., 0.01 dd). Given the high accuracy of spatial referencing during the SeaDAS processing, the positional accuracy was estimated to be within 1 km.

Data Quality ATTRIBUTE ACCURACY

The attribute accuracy of the Zeu datasets depends on the algorithm used. The Morel algorithm is suitable for case-1 water (open ocean). In the case of Australian waters, the estimated Euphotic depths are reliable for the vast majority of areas except along the coast (e.g., within 10-20 km from the coast, case 2 waters). However, a quantitative test on the attribute accuracy could not be carried out due to the lack of ground truth samples.

Data Quality LOGICAL CONSISTENCY

The same algorithm and processing steps and parameters were used to process all images.

Data Quality COMPLETENESS

The datasets cover an extent between 100 to 170 longitude and -60 to -5 latitude. The holes (NoDATA) in the datasets were the results of the quality flags applied during the MODIS processing.

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Edward King of CSIRO (for providing access to the MODIS raw data and permission to use SeaDAS software)

NCI facilities

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Morel, A. and Maritorena, S., 2001. Bio-optical properties of oceanic waters: A reappraisal, Journal of Geophysical Research, 106, 7163-7180.

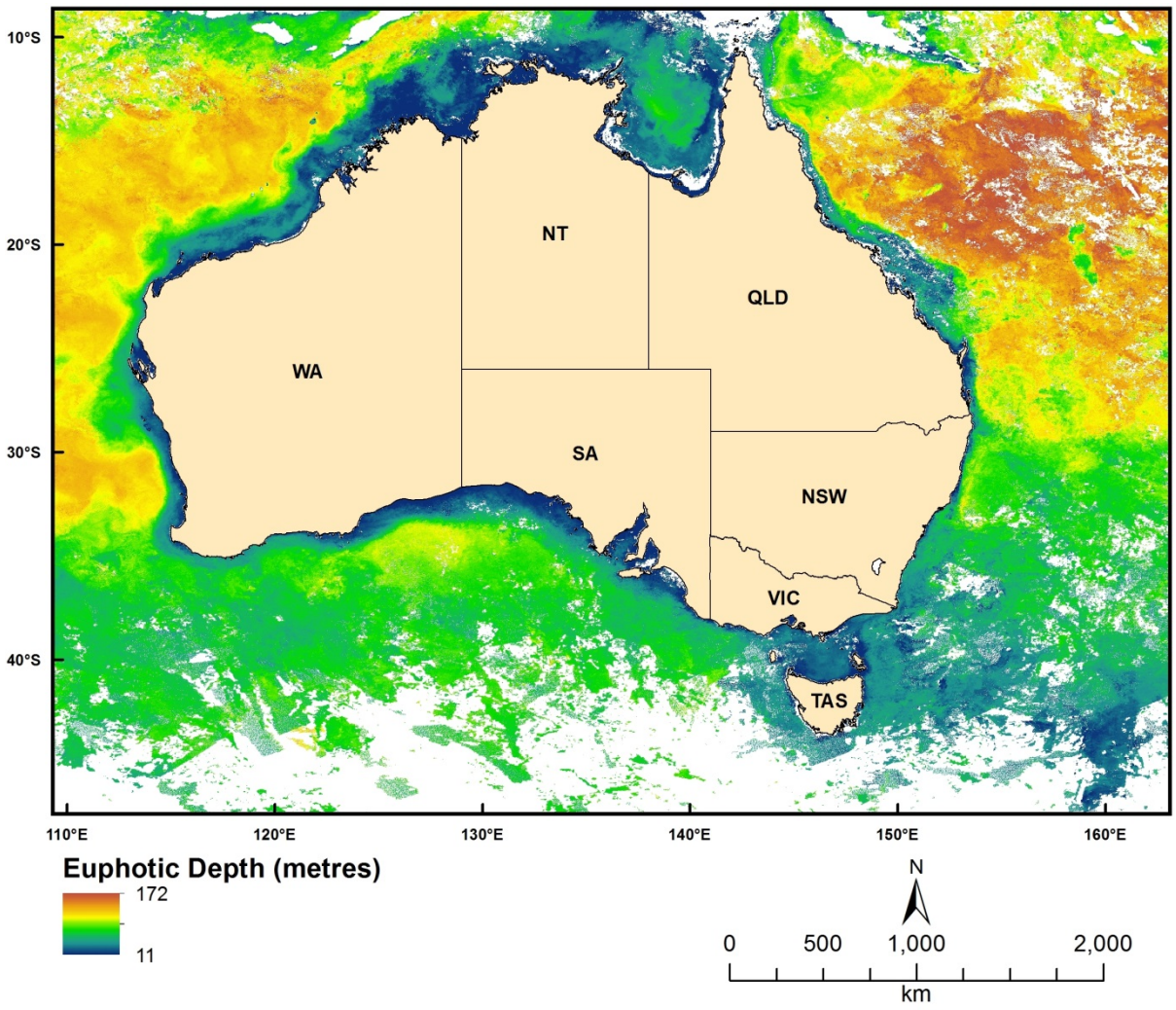

Figure 2.4.5 MODIS-derived Euphotic Depth for May 2009

2.4.6 Sea Surface Temperature

Dataset TITLE

MODIS derived SST datasets

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

The datasets measure the Sea Surface Temperature (SST) of Australian oceans. They are derived products from MODIS (aqua) images using NASA's SeaDAS image processing software. The extent of the datasets covers the entire Australian EEZ and surrounding waters (including the southern ocean). The spatial resolution of the datasets is 0.01 dd. The datasets contain 36 monthly SST layers between 2009 and 2011.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Water Quality

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -60

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Jan-09 to Dec-11

Description NOMINAL SCALE

Spatial Resolution: 0.01

Temporal Resolution: monthly

Data Currency BEGINNING DATE

Dec-12

Data Currency ENDING DATE

Dec-12

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo grid

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The SST datasets are derived products of MODIS (Aqua) images. SeaDAS (version 6.1) was used to process the MODIS data from raw to L3 products. SeaDAS provides two SST products. The products presented here are sea surface temperature measured using the 11 and 12 micron channels. The algorithm used is the standard algorithm (OBPG) (Franz, 2006). The sequences of processing included:

1. raw - L1A,

2. L1A - L1B,

3. L1B - L2,

4. L2 - L3 (spatial) binning, and

5. L3 binning to L3 time-binning.

The first four steps were applied to all individual (daily) raw images. After completing the above steps for one-month-worth images (around 300 images), in the fifth step, four weekly images were generated:

1. week1: from the 1st to the 7th of the month;

2. week2: from the 8th to the 14th of the month;

3. week3: from the 15th to the 21st of the month;

4. week4: from the 22nd to the last day of the month.

The four weekly images were exported as HDF files, then imported into ArcGIS and converted into ArcInfo grids. Next, the four grids were mosaiced into a monthly image using the averaging method.

The above processes were repeated to generate the final 36 monthly datasets between 2009 and 2011.

Franz, B. 2006. Implementation of SST Processing within the OBPG, http://oceancolor.gsfc.nasa.gov/DOCS/modis_sst/ (accessed: 10/10/2011).

Data Quality POSITIONAL ACCURACY

The spatial resolution of the MODIS data used to derive Ocean Colour products are about 1km. The same resolution was maintained for the final monthly data (e.g., 0.01 dd). Given the high accuracy of spatial referencing during the SeaDAS processing, the positional accuracy was estimated to be within 1 km.

Data Quality ATTRIBUTE ACCURACY

The attribute accuracy of the SST datasets depends on the algorithm used. The OBPG algorithm is suitable for case-1 and case-2 waters. Note that because we chose the quality levels better than 2, this would generally ensure high quality SST data. However, a quantitative test on the attribute accuracy could not be carried out due to the lack of ground truth samples.

Data Quality LOGICAL CONSISTENCY

The same algorithm and processing steps and parameters were used to process all images.

Data Quality COMPLETENESS

The datasets cover an extent between 100 to 170 longitude and -60 to -5 latitude. The holes (NoDATA) in the datasets were the results of the quality flags applied during the MODIS processing.

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Additional Metadata ACKNOWLEDGEMENTS

Edward King of CSIRO (for providing access to the MODIS raw data and permission to use SeaDAS software)

NCI facilities

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

Franz, B. 2006. Implementation of SST Processing within the OBPG, http://oceancolor.gsfc.nasa.gov/DOCS/modis_sst/ (accessed: 10/10/2011).

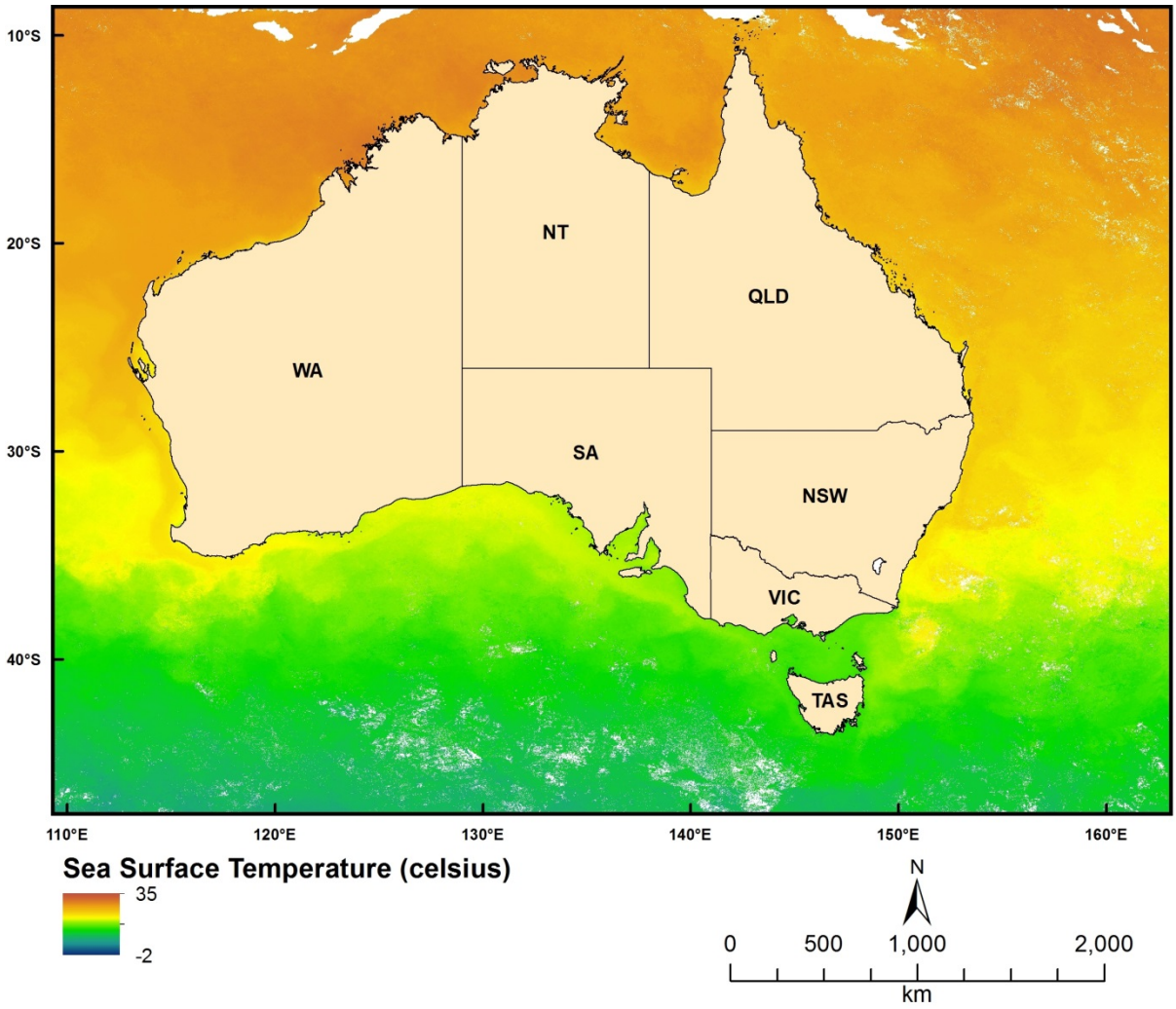

Figure 2.4.6 MODIS-derived Sea Surface Temperature for May 2009

2.5 National Submarine Canyons of Australia

Dataset TITLE

National Submarine Canyons of Australia

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Canyons_final.shp

Dataset AUTHOR(S)

Zhi Huang

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

On the Australian margin, submarine canyons have formed along all sides of the continent and are exposed to the potential influence of large-scale ocean currents, including the Leeuwin Current (western to southern margins) and the East Australian Current (eastern margin). Recognised in marine bioregional plans as potential biodiversity hotspots, many of these canyons sit within the new national network of Commonwealth Marine Reserves.

This GIS polygon layer contains 713 submarine canyons along the Australian continental margin. The locations and extents of these canyons were derived from a range of bathymetry datasets.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Geophysics, Submarine Canyons, Bathymetry

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8.88

S_LAT: -46.86

E_LONG: 110.63

W_LONG: 159.23

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

12-Feb-2013

Data Currency ENDING DATE

12-Feb-2013

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL Shapefile

Access AVAILABLE FORMATS Digital/Non-Digital Description

DIGITAL Shapefile

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Three bathymetry datasets were used:

1. Geoscience Australia's 250m national bathymetry grid,
2. Geoscience Australia's 50m multibeam bathymetry grids, and
3. James Cook University's 100m Great Barrier Reef and Coral Sea bathymetry grid.

The hill-shaded layers of these bathymetry grids were generated to display 3-D effects. The extent of individual canyons was manually digitised as a GIS polygon using these hill-shaded layers to aid mapping. The heads and foots of individual canyons were also identified in the process. After mapping the initial number of submarine canyon candidates a filtering process was applied by defining a canyon as a feature with the following bathymetric characteristics: (i) water depth at the canyon head less than 4000 m; (ii) depth range between the canyon head and foot greater than 600 m, and; (iii)

incision of the canyon head greater than 100 m. On this basis, a total of 713 canyons were mapped for the Australian mainland margin.

Data Quality POSITIONAL ACCURACY

The canyon polygons were digitised from the bathymetry datasets. There are two major sources of positional errors. The first one is associated with the accuracy and spatial resolution of the bathymetry datasets. Most canyons were located from the 50m multibeam bathymetry grids and thus have highest positional accuracy. The second source is associated with the manual digitising process which has caused a small degree of positional error along the canyon boundary. An approximate estimation of the averaged positional error is within 200 metres.

Data Quality ATTRIBUTE ACCURACY

no attribute

Data Quality LOGICAL CONSISTENCY

The same person was involved in the whole identifying and digitising process using the same procedures. There was slight but minimum inconsistency in different stages of processes.

Data Quality COMPLETENESS

This dataset is completed.

Contact Information CONTACT ORGANISATION

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Metadata Date METADATA DATE

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Additional Metadata METADATA AUTHOR

Zhi Huang

Additional Metadata ACKNOWLEDGEMENTS

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

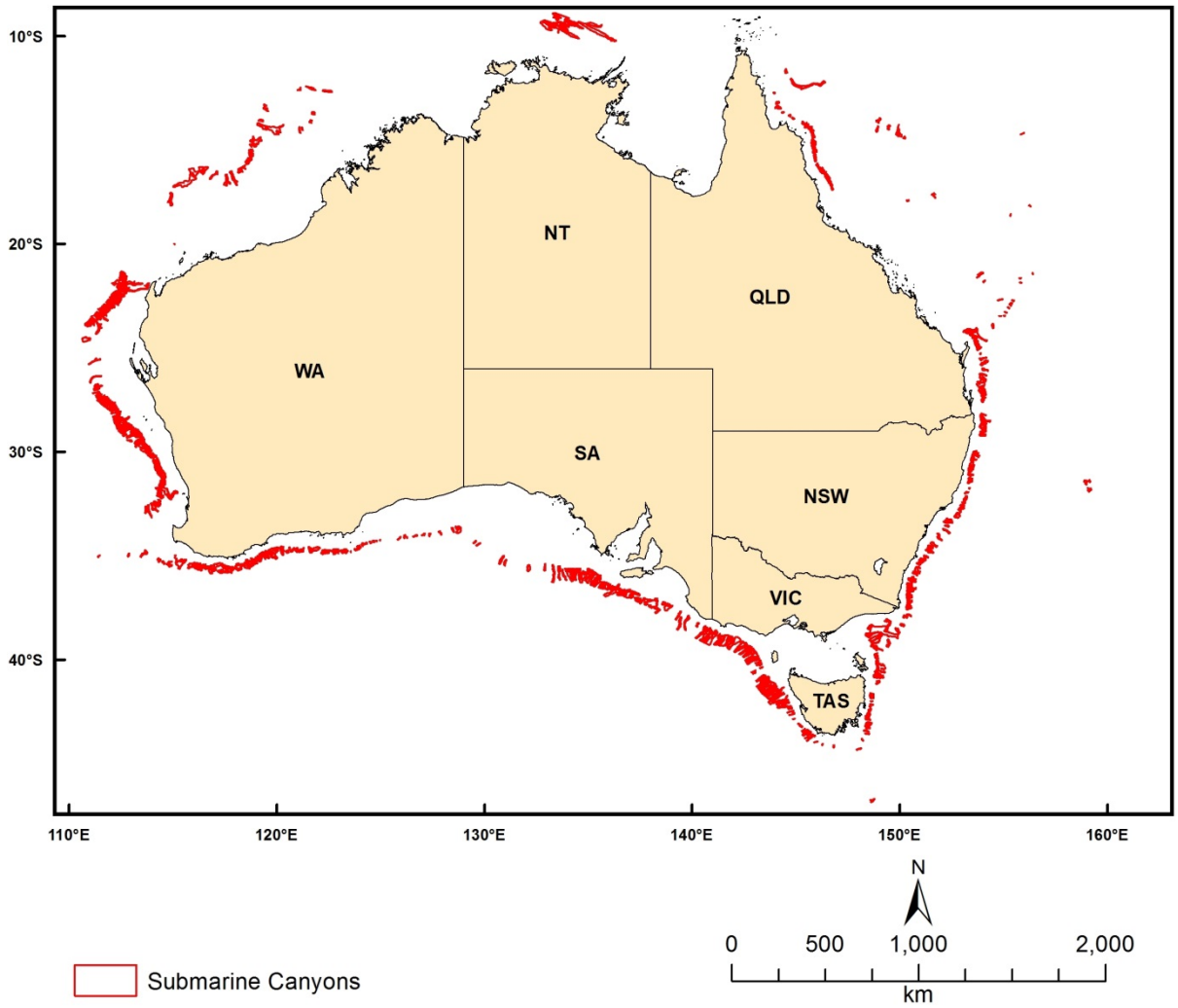

Figure 2.5 Submarine Canyons

2.6 Modelled Oceanographic Layers

2.6.1 Sea surface height

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) sea surface height

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Modeled sea surface height produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

The HYCOM consortium is a multi-institutional effort sponsored by the National Ocean Partnership Program (NOPP), as part of the U. S. Global Ocean Data Assimilation Experiment (GODAE), to develop and evaluate a data-assimilative hybrid isopycnal-sigma-pressure (generalized) coordinate ocean model (called HYbrid Coordinate Ocean Model or HYCOM). The GODAE objectives of three-dimensional depiction of the ocean state at fine resolution in real time, provision of boundary conditions for coastal and regional models, and provision of oceanic boundary conditions for a global coupled ocean-atmosphere prediction model, are being addressed by a partnership of institutions that represent a broad spectrum of the oceanographic community.

The partnership members are the Florida State University Center for Ocean-Atmospheric Prediction Studies (FSU/COAPS), the University of Miami Rosenstiel School of Marine and Atmospheric Science (UM/RSMAS), the Naval Research Laboratory/Stennis Space Center (NRL/STENNIS), the Naval Oceanographic Office (NAVOCEANO), the Fleet Numerical Meteorology and Oceanography Center (FNMOC), the Naval Research Laboratory/Monterey (NRL/MONTEREY), the National Oceanographic and Atmospheric Administration/National Centers for Atmospheric Prediction/Marine Modeling and Analysis Branch (NOAA/NCEP/MMAB), the NOAA National Ocean Service (NOAA/NOS), the NOAA Atlantic Oceanographic and Meteorological Laboratory (NOAA/AOML), the NOAA Pacific Marine Environmental Laboratory (NOAA/PMEL), Planning Systems Inc., Los Alamos National Laboratory (LANL), Service Hydrographique et Océanographique de la Marine (SHOM), Laboratoire des Ecoulements Géophysiques et Industriels (LEGI), The Open Source Project for a Network Data Access Protocol (OPeNDAP), the University of North Carolina (UNC), Rutgers University, the University of South Florida (USF), Fugro-GEOS/Ocean Numerics, Horizon Marine Inc., Roffer's Ocean Fishing Forecasting Service Inc. (ROFFS), Orbimage, Shell Oil Company, ExxonMobil Corp., the NOAA/National Weather Service/Tropical Prediction Center (NOAA/NWS/TPC), the NOAA/National

Weather Service/Ocean Prediction Center (NOAA/NWS/OPC), the University of Michigan, and the University of the Virgin Islands (UVI).

The academic, governmental, and commercial entities involved in the partnership have long histories of supporting and carrying out a wide range of oceanographic and ocean prediction-related research. All institutions are committed to developing and demonstrating the performance and application of eddy-resolving, real-time global, Atlantic, and Pacific Ocean prediction systems using the HYbrid Coordinate Ocean Model (HYCOM), a data-assimilative hybrid isopycnal-sigma-pressure (generalized) coordinate ocean model.

The prediction systems will be transitioned for operational use by the U.S. Navy at the Naval Oceanographic Office (NAVOCEANO), Stennis Space Center, MS, and at the Fleet Numerical Meteorology and Oceanography Centre (FNMOC), Monterey, CA, and by NOAA at the National Centers for Environmental Prediction (NCEP), Washington, D.C. The systems will run efficiently on a variety of massively parallel computers and will include sophisticated data assimilation techniques for assimilation of satellite altimeter sea surface height and sea surface temperature as well as in situ temperature, salinity, and float displacement. The partners intend to make results available to the GODAE modeling community and to general users on a 24/7 basis via a comprehensive data management strategy.

This collaborative partnership provides the means to leverage and accelerate the efforts of existing and planned projects, as well as new opportunities for collaboration and cooperation among the partners ranging from research to the operational level. The anticipated results of this effort include integrated analyses/reanalyses for research programs, a foundation for model enhancement based on testing of hypotheses, synthesis of remotely sensed and in situ data, and inputs to coastal, regional, atmospheric, and ice prediction systems. Improved open-ocean nowcasts and forecasts will be applied to search and rescue operations, shipping routes, tracking of icebergs and major pollutants, commercial fisheries, etc.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Currents, Sea Surface Height

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data is available from the HYCOM data server (http://hycom.org/dataserver). Data was subset for the Australian region using wget in a bash script. Example:

wget "http://tds.hycom.org/thredds/ncss/grid/GLBa0.08/expt_90.6/2009?var=u&spatial=bb&north=-5&south=-50&east=170&west=100&time_start=2009-01-01T00:00:00Z&time_end=2009-01-02T00:00:00Z&addLatLon" -O outputfile.nc -b

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

HYCOM Consortium

Contact Information CONTACT POSITION

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Contact Information SUBURB/PLACE/LOCALITY

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

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Additional Metadata ACKNOWLEDGEMENTS

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Rainer Bleck (Columbia University; NASA Goddard Institute for Space Studies)

Eric Chassignet (Florida State University)

Joe Metzger (US Naval Research Laboratory)

Michael McDonald (Florida State University)

Additional Metadata REFERENCES

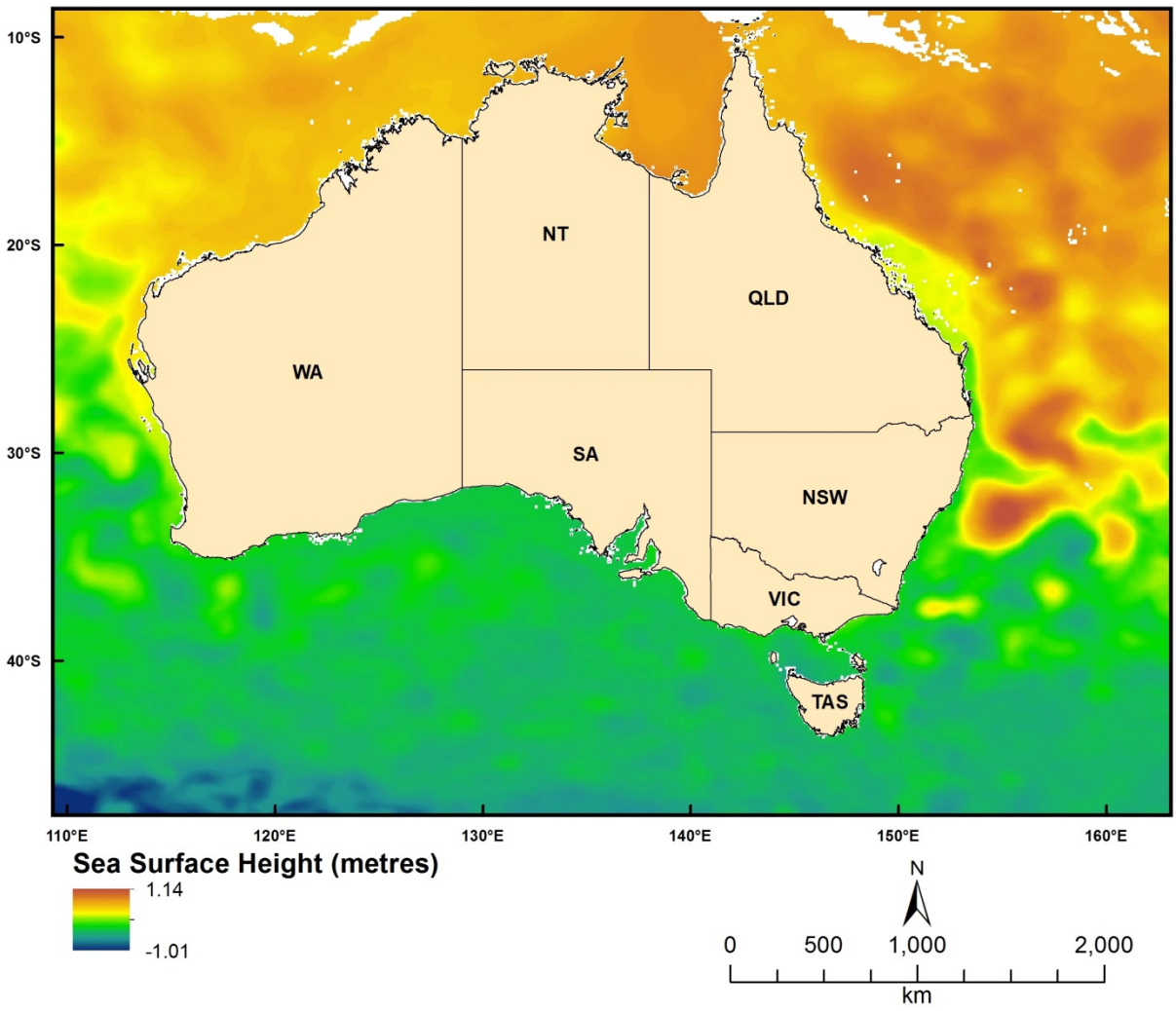

Figure 2.6.1 Modelled (HYCOM) Sea Surface Height

2.6.2 Mixed layer depth – definition 1

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) mixed layer depth (definition 1 - 0.20°C change from the surface)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Modeled oceanographic data produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

The HYCOM consortium is a multi-institutional effort sponsored by the National Ocean Partnership Program (NOPP), as part of the U. S. Global Ocean Data Assimilation Experiment (GODAE), to develop and evaluate a data-assimilative hybrid isopycnal-sigma-pressure (generalized) coordinate ocean model (called HYbrid Coordinate Ocean Model or HYCOM). The GODAE objectives of three-dimensional depiction of the ocean state at fine resolution in real time, provision of boundary conditions for coastal and regional models, and provision of oceanic boundary conditions for a global coupled ocean-atmosphere prediction model, are being addressed by a partnership of institutions that represent a broad spectrum of the oceanographic community.

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Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Currents, Ocean Mixed Layer, Ocean Temperature

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data is available from the HYCOM data server (http://hycom.org/dataserver). Data was subset for the Australian region using wget in a bash script. Example:

wget "http://tds.hycom.org/thredds/ncss/grid/GLBa0.08/expt_90.6/2009?var=u&spatial=bb&north=-5&south=-50&east=170&west=100&time_start=2009-01-01T00:00:00Z&time_end=2009-01-02T00:00:00Z&addLatLon" -O outputfile.nc -b

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

.

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Metadata Date METADATA DATE

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Additional Metadata METADATA AUTHOR

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Additional Metadata ACKNOWLEDGEMENTS

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Michael McDonald (Florida State University)

Additional Metadata REFERENCES

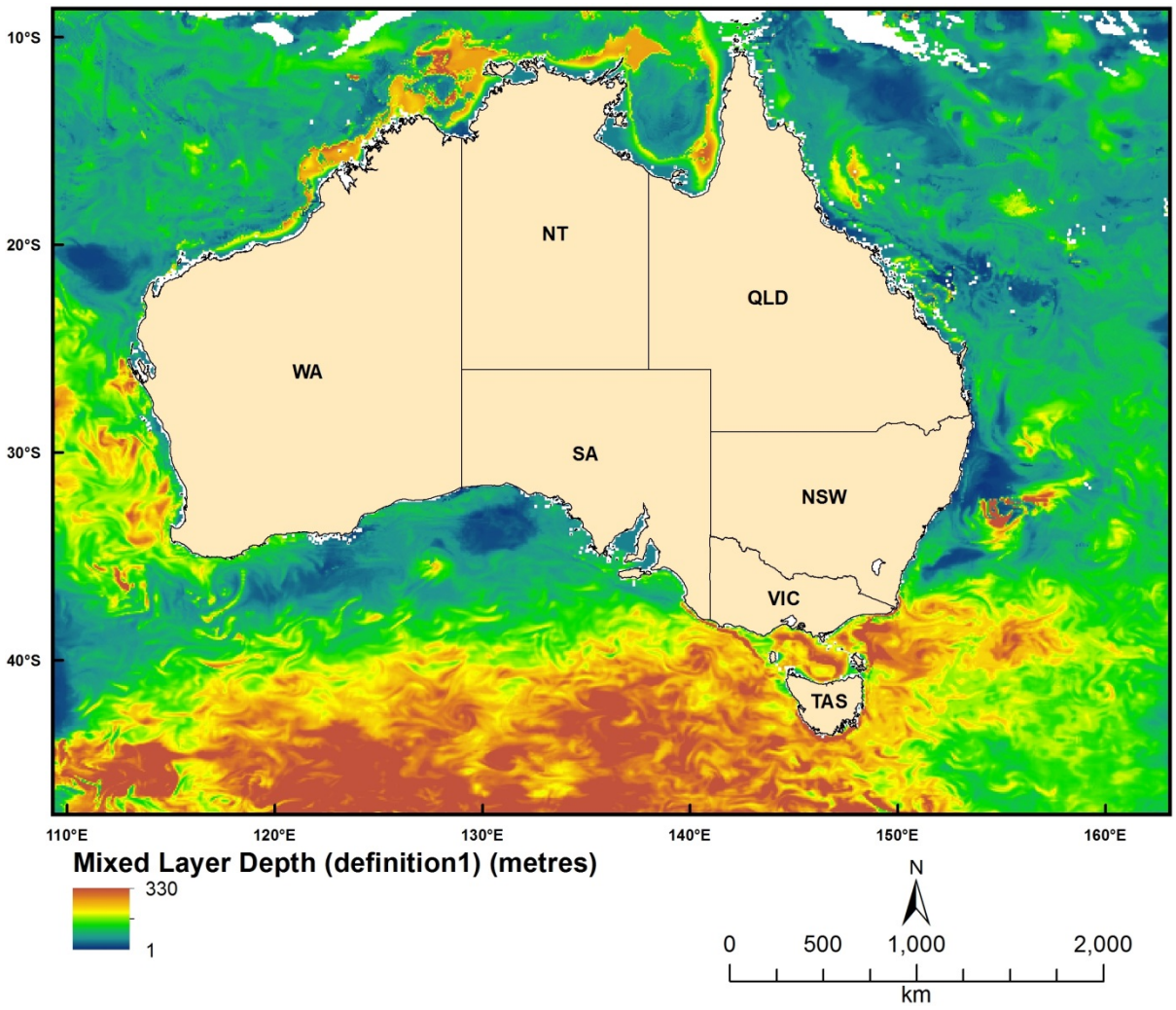

Figure 2.6.2 Modelled (HYCOM) Mixed Layer Depth (definition 1 - 0.20 ^{o}C change from the surface)

2.6.3 Mixed layer depth – definition 2

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) mixed layer depth (definition 2 - 0.03 kg/m3 change from the surface)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Modeled oceanographic data produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

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Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Currents, Ocean Mixed Layer, Ocean Temperature

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

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wget "http://tds.hycom.org/thredds/ncss/grid/GLBa0.08/expt_90.6/2009?var=u&spatial=bb&north=-5&south=-50&east=170&west=100&time_start=2009-01-01T00:00:00Z&time_end=2009-01-02T00:00:00Z&addLatLon" -O outputfile.nc -b

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

HYCOM Consortium

Contact Information CONTACT POSITION

Contact Information MAIL ADDRESS 1

Contact Information SUBURB/PLACE/LOCALITY

Contact Information STATE/LOCALITY 2

Contact Information COUNTRY

Contact Information POSTCODE

Contact Information TELEPHONE

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Contact Information ELECTRONIC MAIL ADDRESS

wallcraft@nrlssc.navy.mil

Metadata Date METADATA DATE

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Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

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George Halliwell (NOAA Atlantic Oceanographic and Meteorological Laboratory)

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Michael McDonald (Florida State University)

Additional Metadata REFERENCES

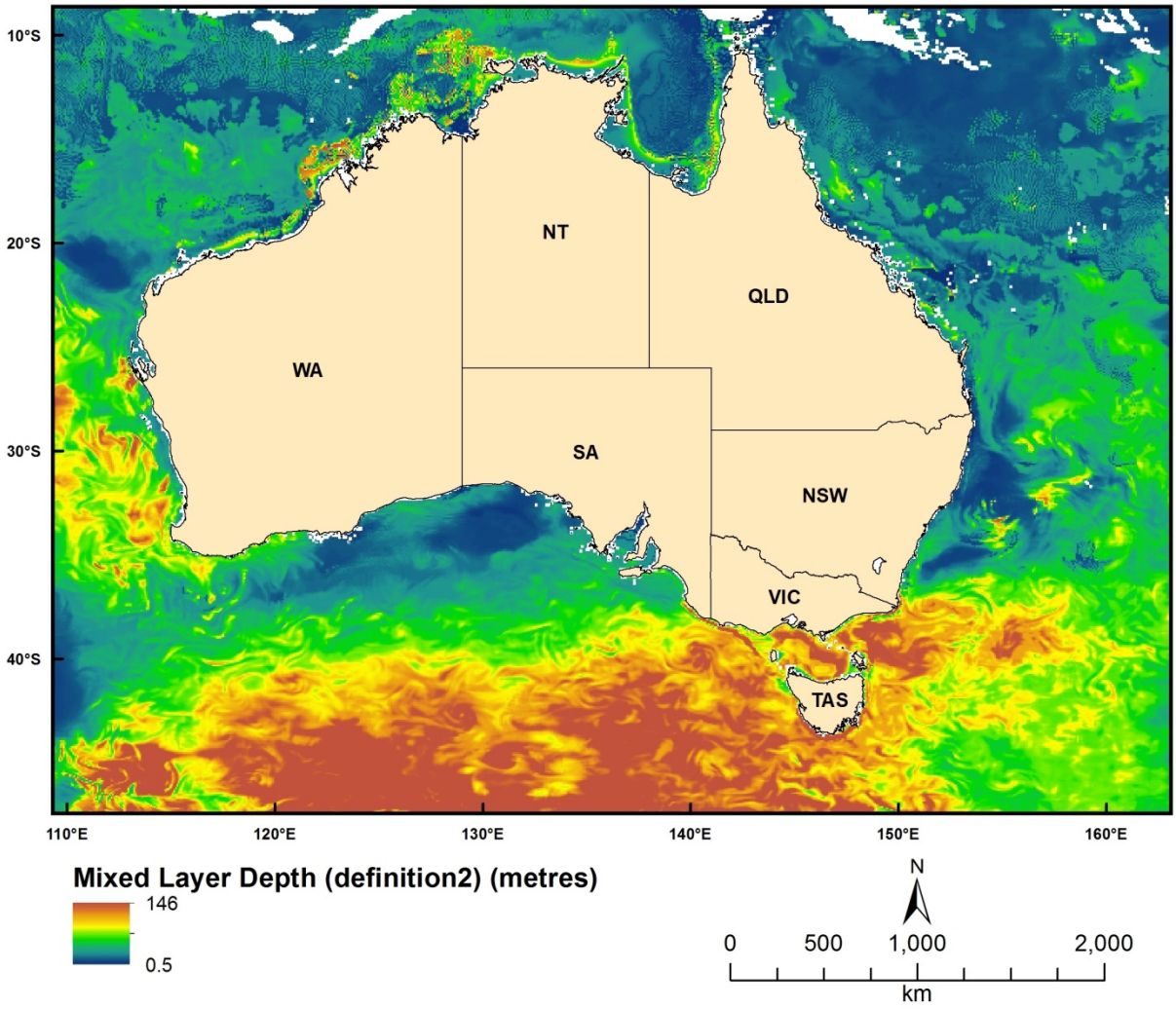

Figure 2.6.3 Modelled (HYCOM) Mixed Layer Depth (definition 2 - 0.03 kg/m^3 change from the surface)

2.6.4 Air-sea flux

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) water flux into the ocean (kg/m²/s)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Modeled oceanographic data produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

The HYCOM consortium is a multi-institutional effort sponsored by the National Ocean Partnership Program (NOPP), as part of the U. S. Global Ocean Data Assimilation Experiment (GODAE), to develop and evaluate a data-assimilative hybrid isopycnal-sigma-pressure (generalized) coordinate ocean model (called HYbrid Coordinate Ocean Model or HYCOM). The GODAE objectives of three-dimensional depiction of the ocean state at fine resolution in real time, provision of boundary conditions for coastal and regional models, and provision of oceanic boundary conditions for a global coupled ocean-atmosphere prediction model, are being addressed by a partnership of institutions that represent a broad spectrum of the oceanographic community.

The partnership members are the Florida State University Center for Ocean-Atmospheric Prediction Studies (FSU/COAPS), the University of Miami Rosenstiel School of Marine and Atmospheric Science (UM/RSMAS), the Naval Research Laboratory/Stennis Space Center (NRL/STENNIS), the Naval Oceanographic Office (NAVOCEANO), the Fleet Numerical Meteorology and Oceanography Center (FNMOC), the Naval Research Laboratory/Monterey (NRL/MONTEREY), the National Oceanographic and Atmospheric Administration/National Centers for Atmospheric Prediction/Marine Modeling and Analysis Branch (NOAA/NCEP/MMAB), the NOAA National Ocean Service (NOAA/NOS), the NOAA Atlantic Oceanographic and Meteorological Laboratory (NOAA/AOML), the NOAA Pacific Marine Environmental Laboratory (NOAA/PMEL), Planning Systems Inc., Los Alamos National Laboratory (LANL), Service Hydrographique et Océanographique de la Marine (SHOM), Laboratoire des Ecoulements Géophysiques et Industriels (LEGI), The Open Source Project for a Network Data Access Protocol (OPeNDAP), the University of North Carolina (UNC), Rutgers University, the University of South Florida (USF), Fugro-GEOS/Ocean Numerics, Horizon Marine Inc., Roffer's Ocean Fishing Forecasting Service Inc. (ROFFS), Orbimage, Shell Oil Company, ExxonMobil Corp., the NOAA/National Weather Service/Tropical Prediction Center (NOAA/NWS/TPC), the NOAA/National Weather Service/Ocean Prediction Center (NOAA/NWS/OPC), the University of Michigan, and the University of the Virgin Islands (UVI).

The academic, governmental, and commercial entities involved in the partnership have long histories of supporting and carrying out a wide range of oceanographic and ocean prediction-related research. All institutions are committed to developing and demonstrating the performance and application of eddy-resolving, real-time global, Atlantic, and Pacific Ocean prediction systems using the HYbrid Coordinate Ocean Model (HYCOM), a data-assimilative hybrid isopycnal-sigma-pressure (generalized) coordinate ocean model.

The prediction systems will be transitioned for operational use by the U.S. Navy at the Naval Oceanographic Office (NAVOCEANO), Stennis Space Center, MS, and at the Fleet Numerical Meteorology and Oceanography Centre (FNMOC), Monterey, CA, and by NOAA at the National Centers for Environmental Prediction (NCEP), Washington, D.C. The systems will run efficiently on a variety of massively parallel computers and will include sophisticated data assimilation techniques for assimilation of satellite altimeter sea surface height and sea surface temperature as well as in situ temperature, salinity, and float displacement. The partners intend to make results available to the GODAE modeling community and to general users on a 24/7 basis via a comprehensive data management strategy.

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Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Mixed Layer, Ocean Temperature, Sea Surface Height, Ocean Pressure, Water Pressure, Atmosphere, Atmosphere Water Vapor, Precipitable Water

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data is available from the HYCOM data server (http://hycom.org/dataserver). Data was subset for the Australian region using wget in a bash script. Example:

wget "http://tds.hycom.org/thredds/ncss/grid/GLBa0.08/expt_90.6/2009?var=u&spatial=bb&north=-5&south=-50&east=170&west=100&time_start=2009-01-01T00:00:00Z&time_end=2009-01-02T00:00:00Z&addLatLon" -O outputfile.nc -b

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

HYCOM Consortium

Contact Information CONTACT POSITION

Contact Information MAIL ADDRESS 1

Contact Information SUBURB/PLACE/LOCALITY

Contact Information STATE/LOCALITY 2

Contact Information COUNTRY

Contact Information POSTCODE

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

wallcraft@nrlssc.navy.mil

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

Alan Wallcraft (US Naval Research Laboratory)

George Halliwell (NOAA Atlantic Oceanographic and Meteorological Laboratory)

Rainer Bleck (Columbia University; NASA Goddard Institute for Space Studies)

Eric Chassignet (Florida State University)

Joe Metzger (US Naval Research Laboratory)

Michael McDonald (Florida State University)

Additional Metadata REFERENCES

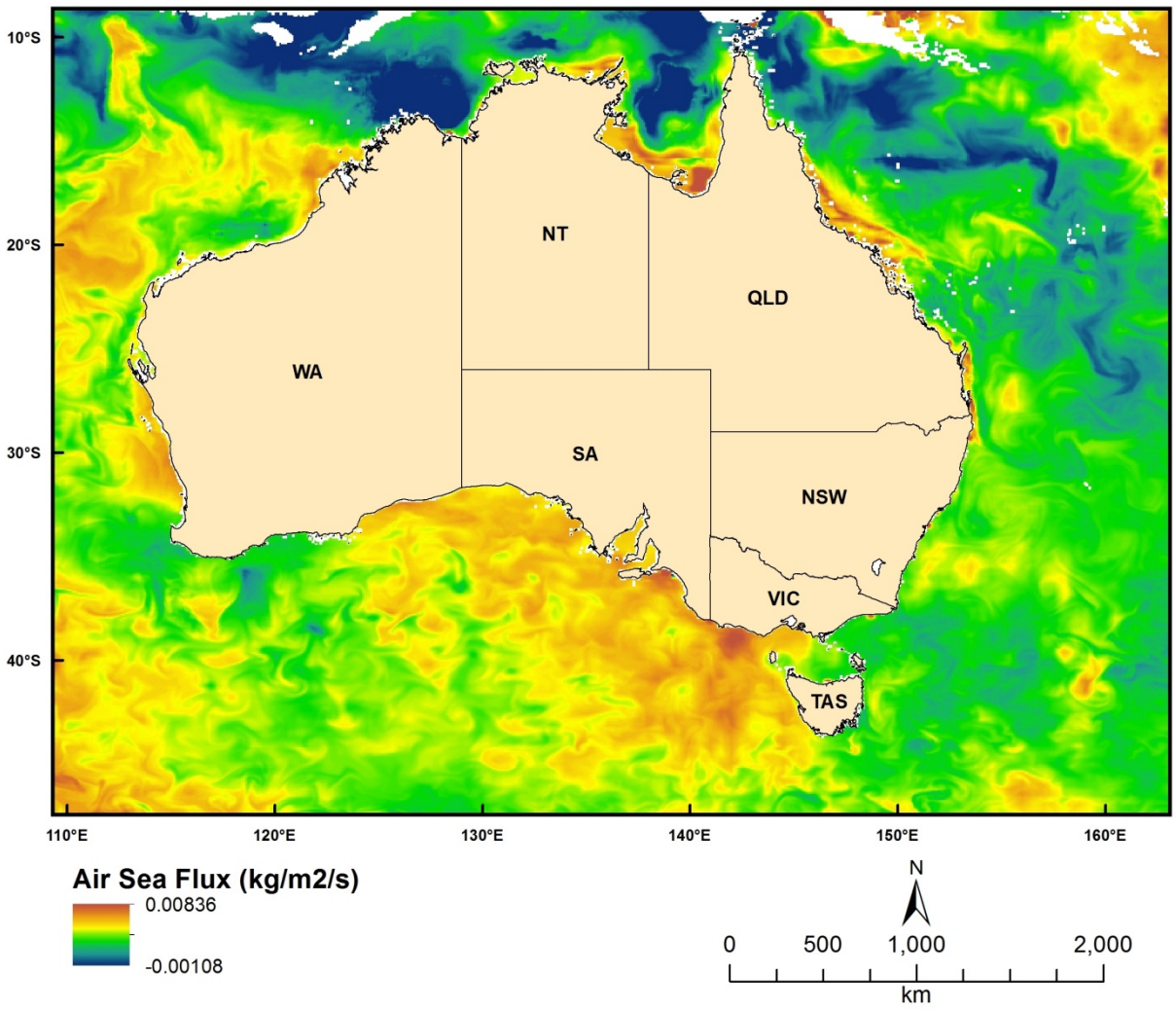

Figure 2.6.4 Modelled (HYCOM) Air Sea Flux

2.6.5 East-west current velocity

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) east-west current velocity (u - m/s)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Modeled oceanographic data produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

The HYCOM consortium is a multi-institutional effort sponsored by the National Ocean Partnership Program (NOPP), as part of the U. S. Global Ocean Data Assimilation Experiment (GODAE), to develop and evaluate a data-assimilative hybrid isopycnal-sigma-pressure (generalized) coordinate ocean model (called HYbrid Coordinate Ocean Model or HYCOM). The GODAE objectives of three-dimensional depiction of the ocean state at fine resolution in real time, provision of boundary conditions for coastal and regional models, and provision of oceanic boundary conditions for a global coupled ocean-atmosphere prediction model, are being addressed by a partnership of institutions that represent a broad spectrum of the oceanographic community.

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The prediction systems will be transitioned for operational use by the U.S. Navy at the Naval Oceanographic Office (NAVOCEANO), Stennis Space Center, MS, and at the Fleet Numerical Meteorology and Oceanography Centre (FNMOC), Monterey, CA, and by NOAA at the National Centers for Environmental Prediction (NCEP), Washington, D.C. The systems will run efficiently on a variety of massively parallel computers and will include sophisticated data assimilation techniques for assimilation of satellite altimeter sea surface height and sea surface temperature as well as in situ temperature, salinity, and float displacement. The partners intend to make results available to the GODAE modeling community and to general users on a 24/7 basis via a comprehensive data management strategy.

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Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Currents, Eddies

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data is available from the HYCOM data server (http://hycom.org/dataserver). Data was subset for the Australian region using wget in a bash script. Example:

wget "http://tds.hycom.org/thredds/ncss/grid/GLBa0.08/expt_90.6/2009?var=u&spatial=bb&north=-5&south=-50&east=170&west=100&time_start=2009-01-01T00:00:00Z&time_end=2009-01-02T00:00:00Z&addLatLon" -O outputfile.nc -b

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

HYCOM Consortium

Contact Information CONTACT POSITION

Contact Information MAIL ADDRESS 1

Contact Information SUBURB/PLACE/LOCALITY

Contact Information STATE/LOCALITY 2

Contact Information COUNTRY

Contact Information POSTCODE

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

wallcraft@nrlssc.navy.mil

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

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Eric Chassignet (Florida State University)

Joe Metzger (US Naval Research Laboratory)

Michael McDonald (Florida State University)

Additional Metadata REFERENCES

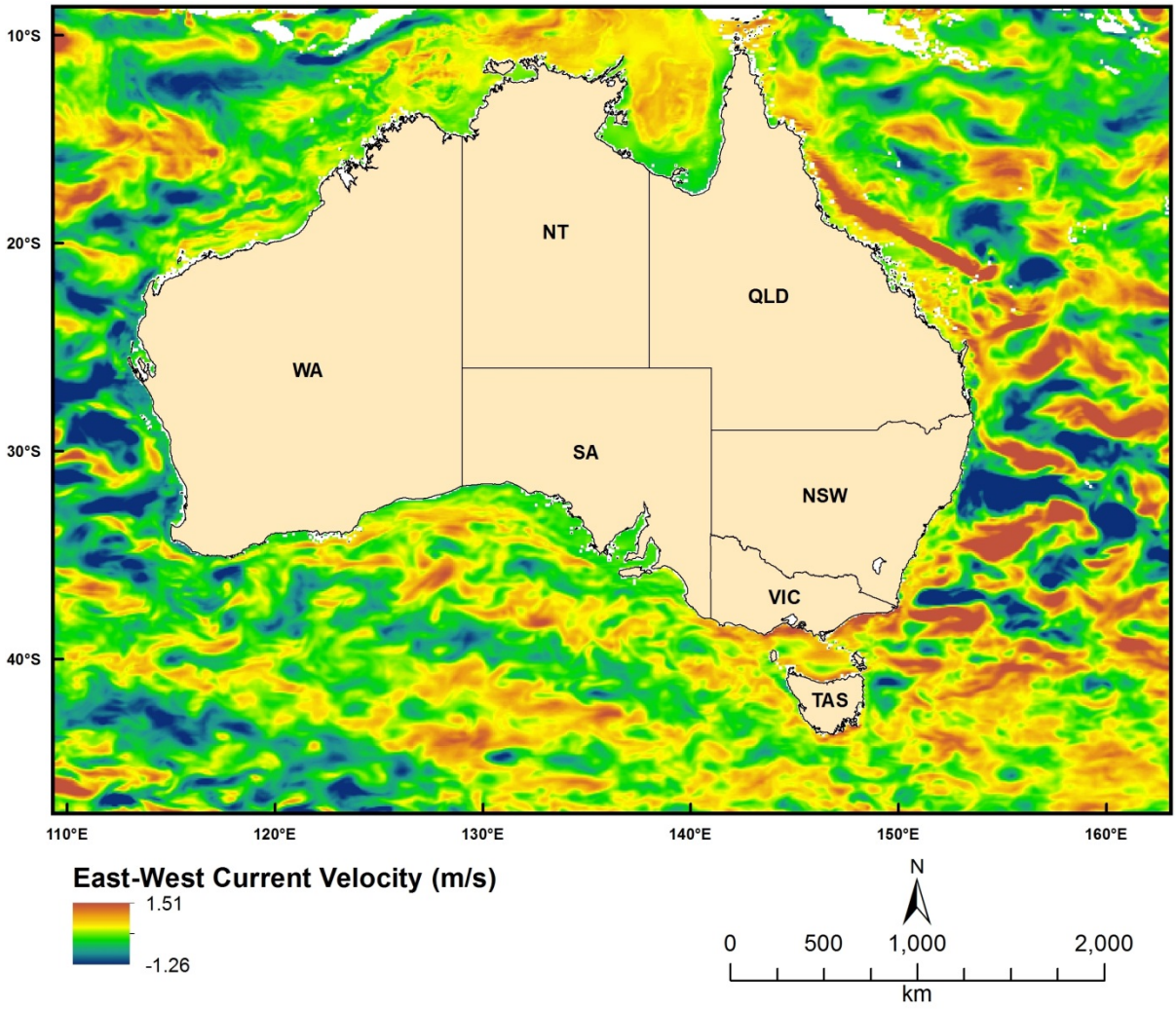

Figure 2.6.5 Modelled (HYCOM) East-West Current Velocity

2.6.6 North-south current velocity

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) north south current velocity (v - m/s)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Modeled oceanographic data produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

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Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Currents, Eddies

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data is available from the HYCOM data server (http://hycom.org/dataserver). Data was subset for the Australian region using wget in a bash script. Example:

wget "http://tds.hycom.org/thredds/ncss/grid/GLBa0.08/expt_90.6/2009?var=u&spatial=bb&north=-5&south=-50&east=170&west=100&time_start=2009-01-01T00:00:00Z&time_end=2009-01-02T00:00:00Z&addLatLon" -O outputfile.nc -b

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

HYCOM Consortium

Contact Information CONTACT POSITION

Contact Information MAIL ADDRESS 1

Contact Information SUBURB/PLACE/LOCALITY

Contact Information STATE/LOCALITY 2

Contact Information COUNTRY

Contact Information POSTCODE

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

wallcraft@nrlssc.navy.mil

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

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George Halliwell (NOAA Atlantic Oceanographic and Meteorological Laboratory)

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Eric Chassignet (Florida State University)

Joe Metzger (US Naval Research Laboratory)

Michael McDonald (Florida State University)

Additional Metadata REFERENCES

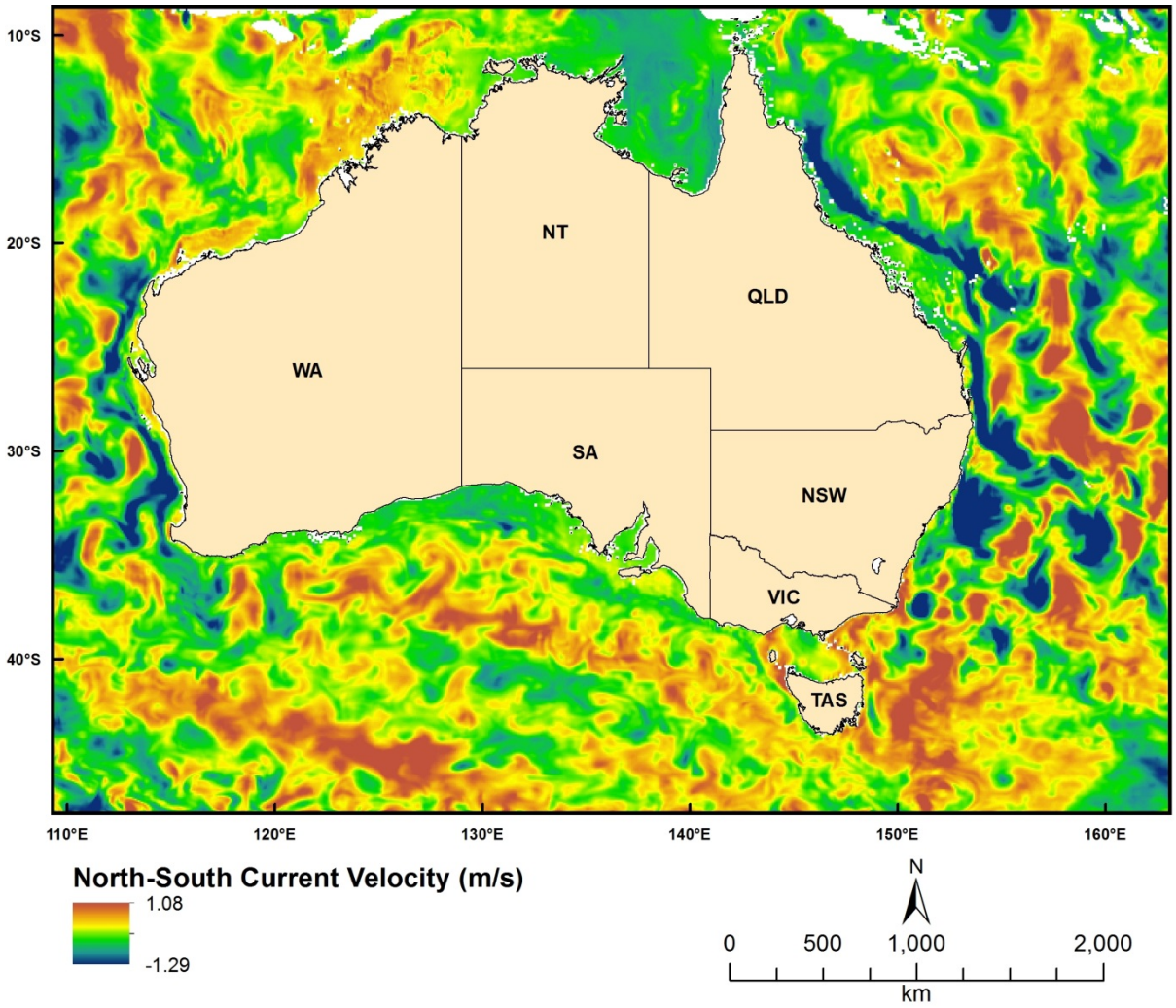

Figure 2.6.6 Modelled (HYCOM) North-South Current Velocity

2.6.7 Vertical current velocity

Dataset TITLE

HYbrid Coordinate Ocean Model (HYCOM) vertical velocity (w - m/s)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

HYCOM Consortium

Dataset CUSTODIAN

HYCOM Consortium

Dataset JURISDICTION

Australia

Description ABSTRACT

Derived product from modeled oceanographic data produced by the HYbrid isopycnal COordinate Model (HYCOM). See www.hycom.org.

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The prediction systems will be transitioned for operational use by the U.S. Navy at the Naval Oceanographic Office (NAVOCEANO), Stennis Space Center, MS, and at the Fleet Numerical Meteorology and Oceanography Centre (FNMOC), Monterey, CA, and by NOAA at the National Centers for Environmental Prediction (NCEP), Washington, D.C. The systems will run efficiently on a variety of massively parallel computers and will include sophisticated data assimilation techniques for assimilation of satellite altimeter sea surface height and sea surface temperature as well as in situ temperature, salinity, and float displacement. The partners intend to make results available to the GODAE modeling community and to general users on a 24/7 basis via a comprehensive data management strategy.

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Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Circulation, Ocean Currents, Eddies. Ocean Mixed Layer, Ocean Temperature, Sea Surface Temperature, Water Temperature, Salinity/density, Salinity, Sea Surface Height

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2000

Data Currency ENDING DATE

27-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL NetCDF

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data was generated calculating vertical velocity from horizontal velocity values on the basis of the continuity equation. Values were written into NetCDF format using a Java-based program.

For details on the HYCOM model itself, refer to the documentation at www.hycom.org.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

HYCOM Consortium

Contact Information CONTACT POSITION

Contact Information MAIL ADDRESS 1

Contact Information SUBURB/PLACE/LOCALITY

Contact Information STATE/LOCALITY 2

Contact Information COUNTRY

Contact Information POSTCODE

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

johnathan.kool@ga.gov.au

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

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George Halliwell (NOAA Atlantic Oceanographic and Meteorological Laboratory)

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Eric Chassignet (Florida State University)

Joe Metzger (US Naval Research Laboratory)

Michael McDonald (Florida State University)

Additional Metadata REFERENCES

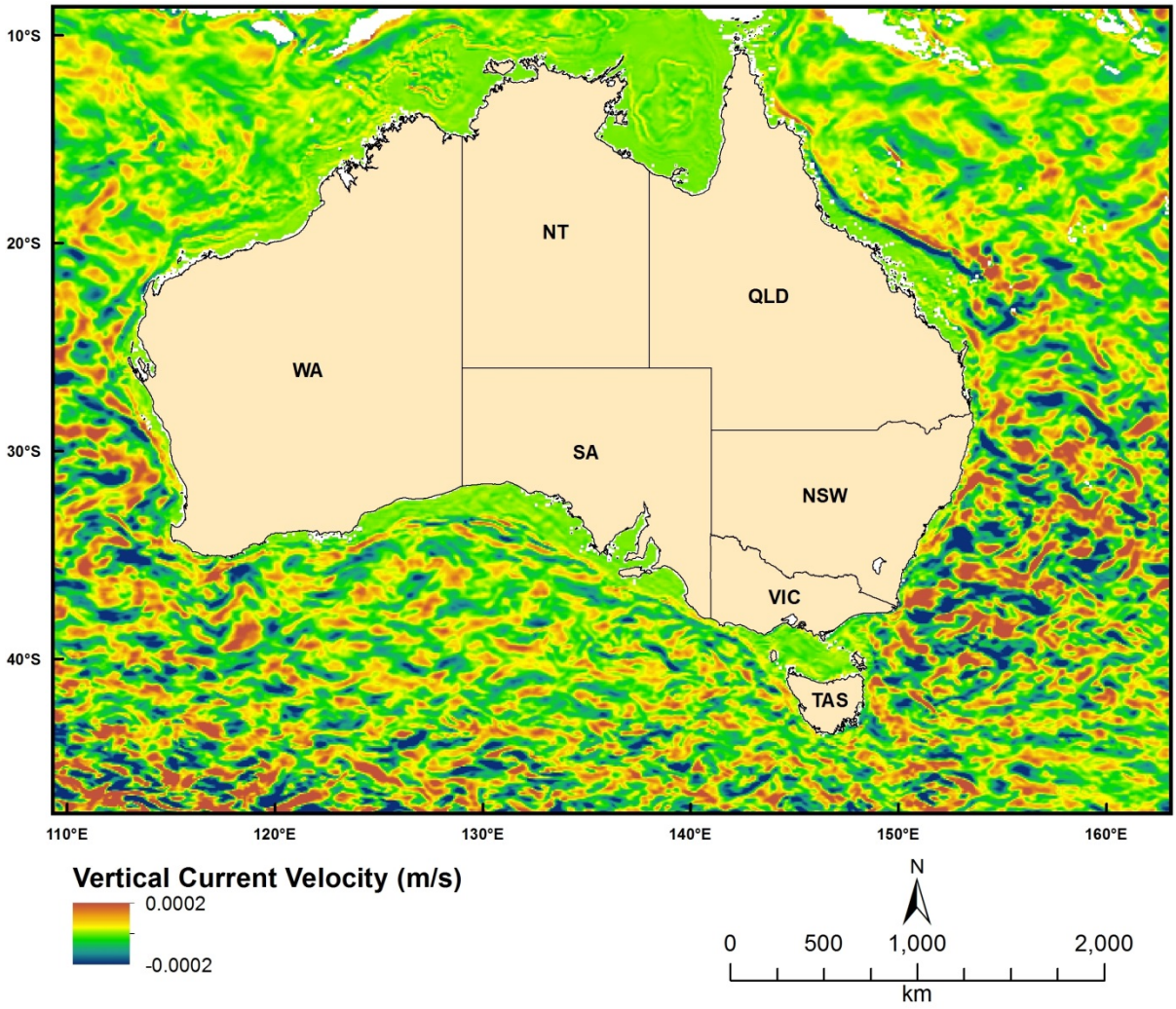

Figure 2.6.7 Modelled (HYCOM) Vertical Current Velocity

2.7 Atmospheric and Climate Layers

2.7.1 Tropical Cyclone Data

Dataset TITLE

Australian Government Bureau of Meteorology (BOM) Tropical Cyclone Database

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

BOM

Dataset CUSTODIAN

BOM

Dataset JURISDICTION

Australia

Description ABSTRACT

Details of all tropical cyclones that are known to have occurred are contained in a database maintained by the Bureau of Meteorology. After a tropical cyclone has occurred, tropical cyclone meteorologists reanalyse the cyclone and compile what is known as the 'best track' and a report.

Description Data Category

Oceans

Environment

ClimatologyMeteorologyAtmosphere

Description Keyword

Atmosphere, Atmospheric Phenomena, Cyclones

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -3

S_LAT: -45

E_LONG: 38

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

1970

Data Currency ENDING DATE

04-Mar-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated each day

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL Shapefile

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Public Access

Data Quality LINEAGE

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Australian Government - Bureau of Meteorology

Contact Information CONTACT POSITION

Contact Information MAIL ADDRESS 1

Contact Information SUBURB/PLACE/LOCALITY

Contact Information STATE/LOCALITY 2

Contact Information COUNTRY

Contact Information POSTCODE

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

Australian Government - Bureau of Meteorology

Additional Metadata REFERENCES

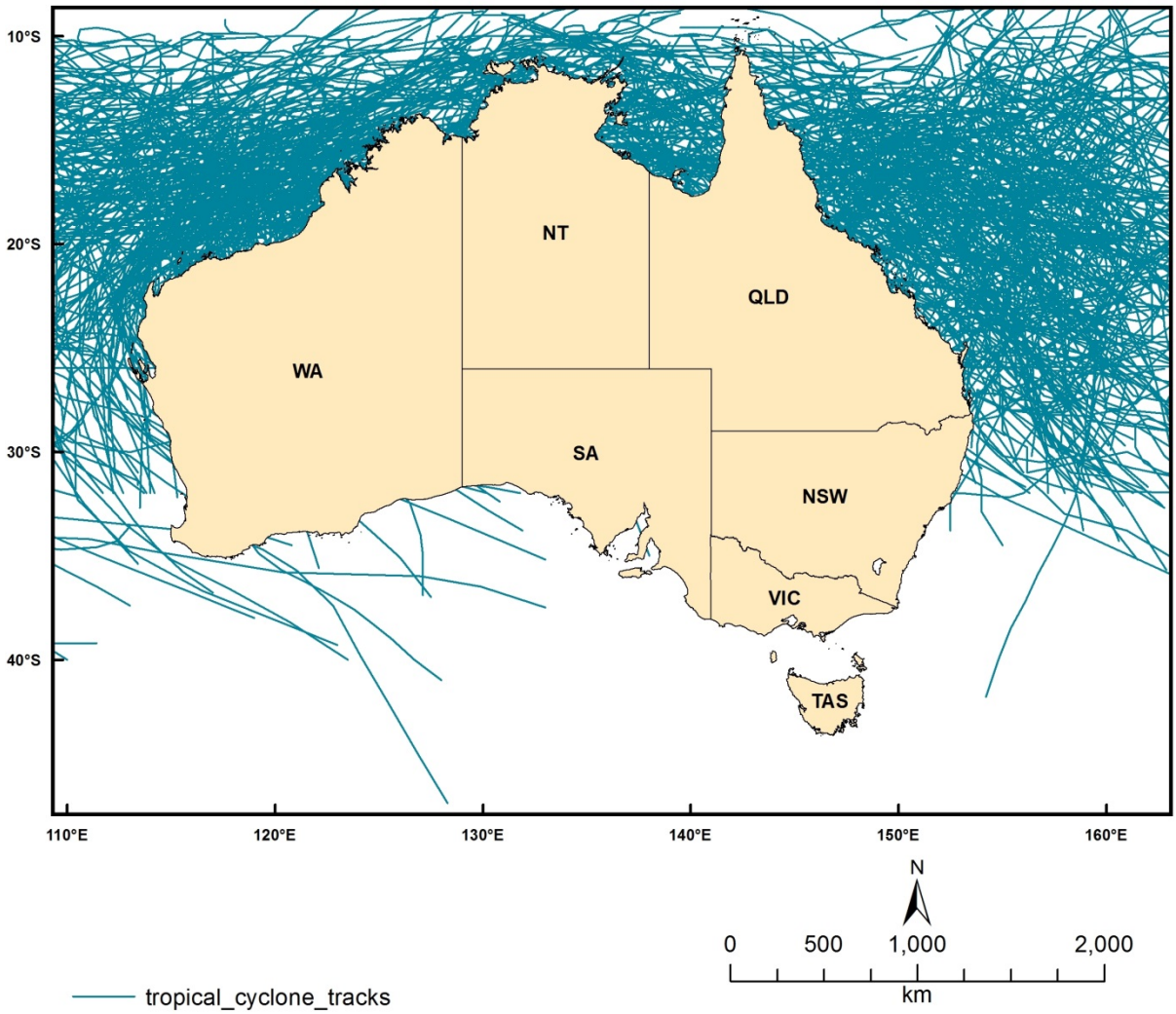

Figure 2.7.1 Historical tropical cyclone tracks

2.7.2 Calcite

Dataset TITLE

Bio-Oracle climate data - calcite (mol/m^3)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Lennert Tyberghein

Dataset CUSTODIAN

Lennert Tyberghein, Ghent University

Dataset JURISDICTION

Australia

Description ABSTRACT

The oceans harbour a great diversity of organisms whose distribution and ecological preferences are often poorly understood. Species distribution modelling (SDM) could improve our knowledge and inform marine ecosystem management and conservation. Although marine environmental data are available from various sources, there are currently no user-friendly, high-resolution global datasets designed for SDM applications. This study aims to fill this gap by assembling a comprehensive, uniform, high-resolution and readily usable package of global environmental rasters. This particular dataset provides a modelled estimate of the amount of calcite ($CaCO_3$) present in the surface layer of ocean water. The value is a temporal mean (mol/m^3) derived from seasonal climatologies (2002-2009). Calcite is an essential chemical requirement for a wide variety of organisms producing hard skeletons and shells (e.g. coral reefs, crustaceans, molluscs), and calcite levels are expected to change in response to ongoing ocean acidification.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Ocean Chemistry

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: 90

S_LAT: -90

E_LONG: -180

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2010

Data Currency ENDING DATE

04-Mar-11

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo Grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact the data custodian

Data Quality LINEAGE

Please refer to the following article:

Tyberghein, Lennert; Verbruggen, Heroen; Pauly, Klaas; Troupin, Charles ;

Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental

dataset for marine species distribution modelling. Global Ecology and Biogeography 21, 272-281.

http://www.oracle.ugent.be/

http://www.phycology.ugent.be/reprints/oracle.pdf

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Metadata Date METADATA DATE

20MAR2013

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Additional Metadata ACKNOWLEDGEMENTS

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Frederic Mineur (Queens University Belfast, UK)

Olivier De Clerck (Ghent University, Belgium)

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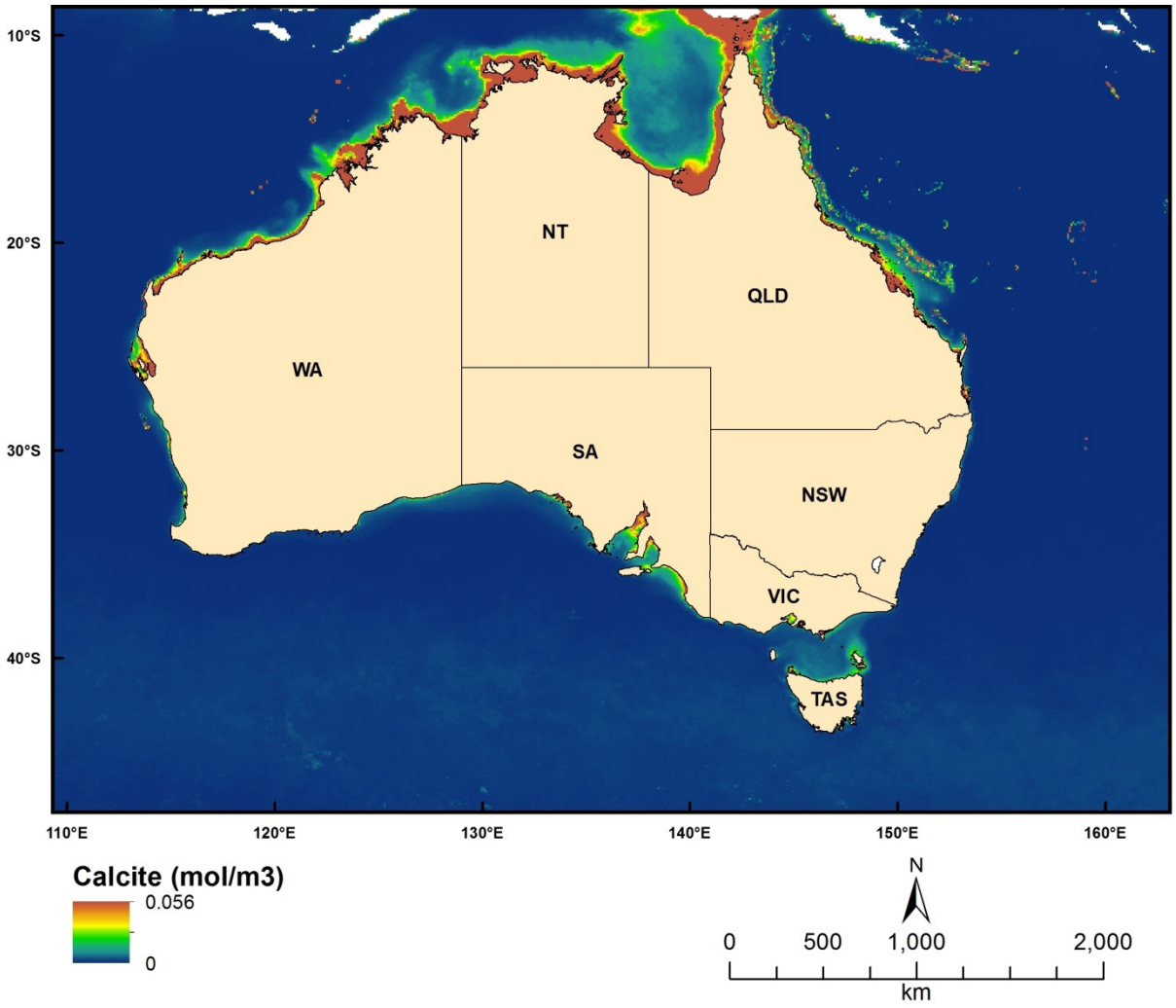

Figure 2.7.2 Modelled (Bio-ORACLE) Calcite concentrations

2.7.3 Cloud mean

Dataset TITLE

Bio-Oracle climate data - cloud cover (temporal mean from monthly images 2005-2010)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Lennert Tyberghein

Dataset CUSTODIAN

Lennert Tyberghein, Ghent University

Dataset JURISDICTION

Australia

Description ABSTRACT

The oceans harbour a great diversity of organisms whose distribution and ecological preferences are often poorly understood. Species distribution modelling (SDM) could improve our knowledge and inform marine ecosystem management and conservation. Although marine environmental data are available from various sources, there are currently no user-friendly, high-resolution global datasets designed for SDM applications. This study aims to fill this gap by assembling a comprehensive, uniform, high-resolution and readily usable package of global environmental rasters. This particular dataset provides an estimate of the mean cloud cover as a percentage/frequency over a particular pixel location, derived from monthly sets of Terra-MODIS images (2005-2010). Cloud coverage has the potential to mitigate the impacts of solar radiation exposure – e.g. heat-induced coral bleaching.

Description Data Category

Oceans

Environment

Description Keyword

Atmosphere, Clouds, Cloud Amount/frequency

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: 90

S_LAT: -90

E_LONG: -180

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2010

Data Currency ENDING DATE

04-Mar-11

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo Grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact the data custodian

Data Quality LINEAGE

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Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental

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Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental dataset for marine species distribution modelling. Global Ecology and Biogeography 21, 272-281.

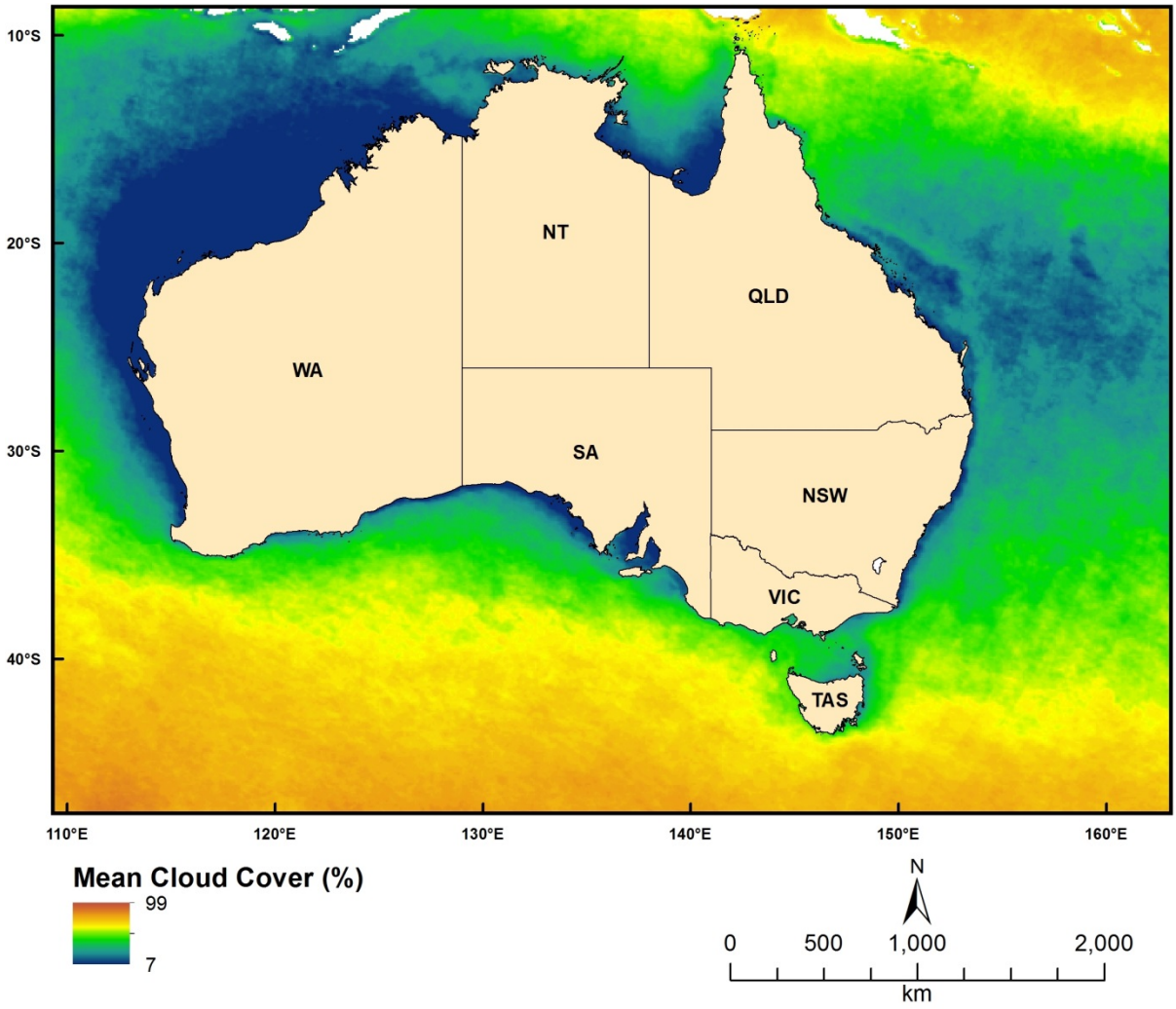

Figure 2.7.3 MODIS-derived Temporal Mean Cloud Cover

2.7.4 Cloud minimum

Dataset TITLE

Bio-Oracle climate data - cloud cover (temporal minimum from monthly images 2005-2010)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Lennert Tyberghein

Dataset CUSTODIAN

Lennert Tyberghein, Ghent University

Dataset JURISDICTION

Australia

Description ABSTRACT

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Description Data Category

Oceans

Environment

Description Keyword

Atmosphere, Clouds, Cloud Amount/frequency

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: 90

S_LAT: -90

E_LONG: -180

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2010

Data Currency ENDING DATE

04-Mar-11

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo Grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

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Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental

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Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Metadata Date METADATA DATE

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Tyberghein, Lennert; Verbruggen, Heroen; Pauly, Klaas; Troupin, Charles ;

Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental dataset for marine species distribution modelling. Global Ecology and Biogeography 21, 272-281.

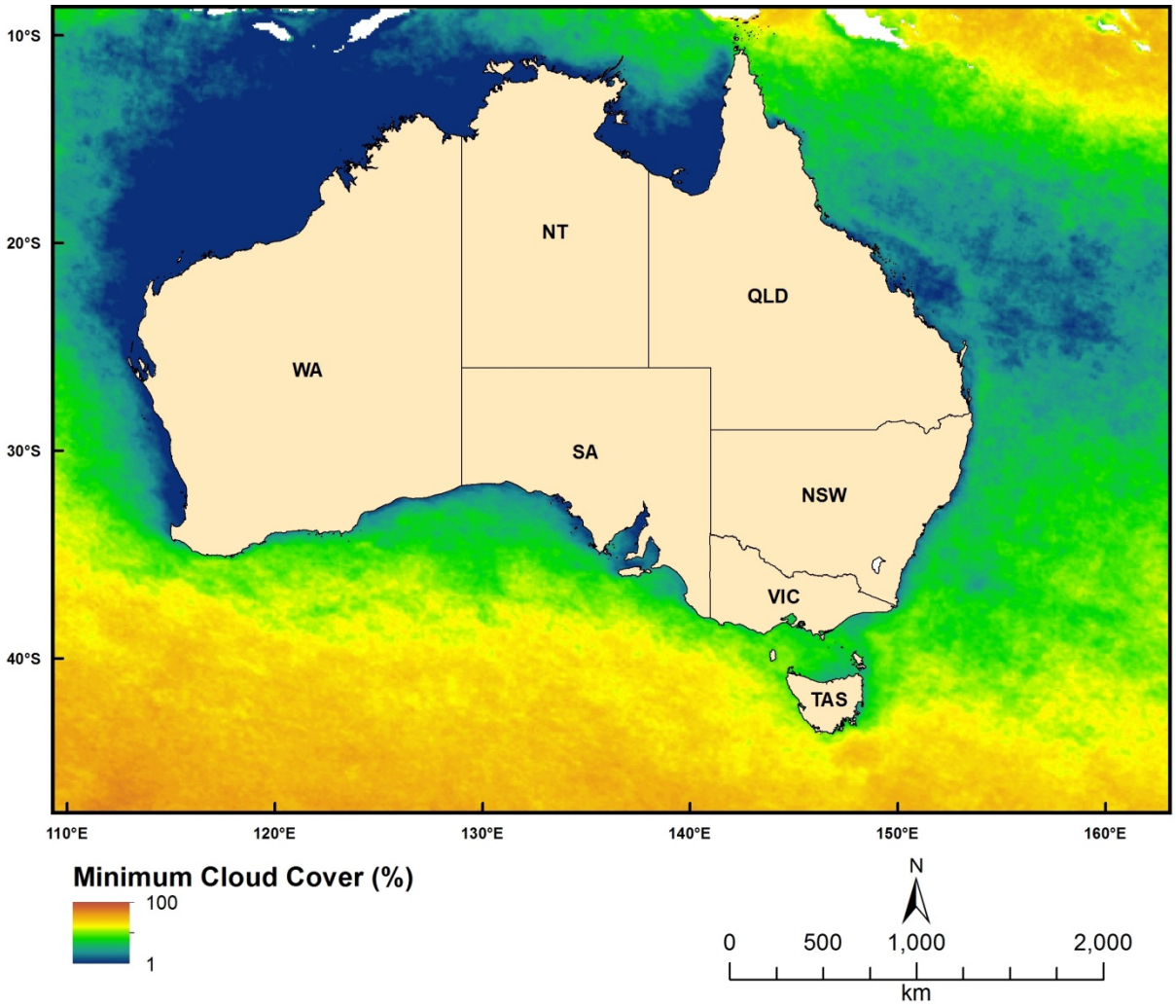

Figure 2.7.4 MODIS-derived Temporal Minimum Cloud Cover

2.7.5 Cloud maximum

Dataset TITLE

Bio-Oracle climate data - cloud cover (temporal maximum from monthly images 2005-2010)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Lennert Tyberghein

Dataset CUSTODIAN

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Dataset JURISDICTION

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Description ABSTRACT

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Description Data Category

Oceans

Environment

Description Keyword

Atmosphere, Clouds, Cloud Amount/frequency

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: 90

S_LAT: -90

E_LONG: -180

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2010

Data Currency ENDING DATE

04-Mar-11

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo Grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact the data custodian

Data Quality LINEAGE

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Tyberghein, Lennert; Verbruggen, Heroen; Pauly, Klaas; Troupin, Charles ;

Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental

dataset for marine species distribution modelling. Global Ecology and Biogeography 21, 272-281.

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Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Metadata Date METADATA DATE

20MAR2013

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Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

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Olivier De Clerck (Ghent University, Belgium)

Additional Metadata REFERENCES

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Mineur, Frederic and De Clerck, Olivier 2012. Bio-ORACLE: a global environmental dataset for marine species distribution modelling. Global Ecology and Biogeography 21, 272-281.

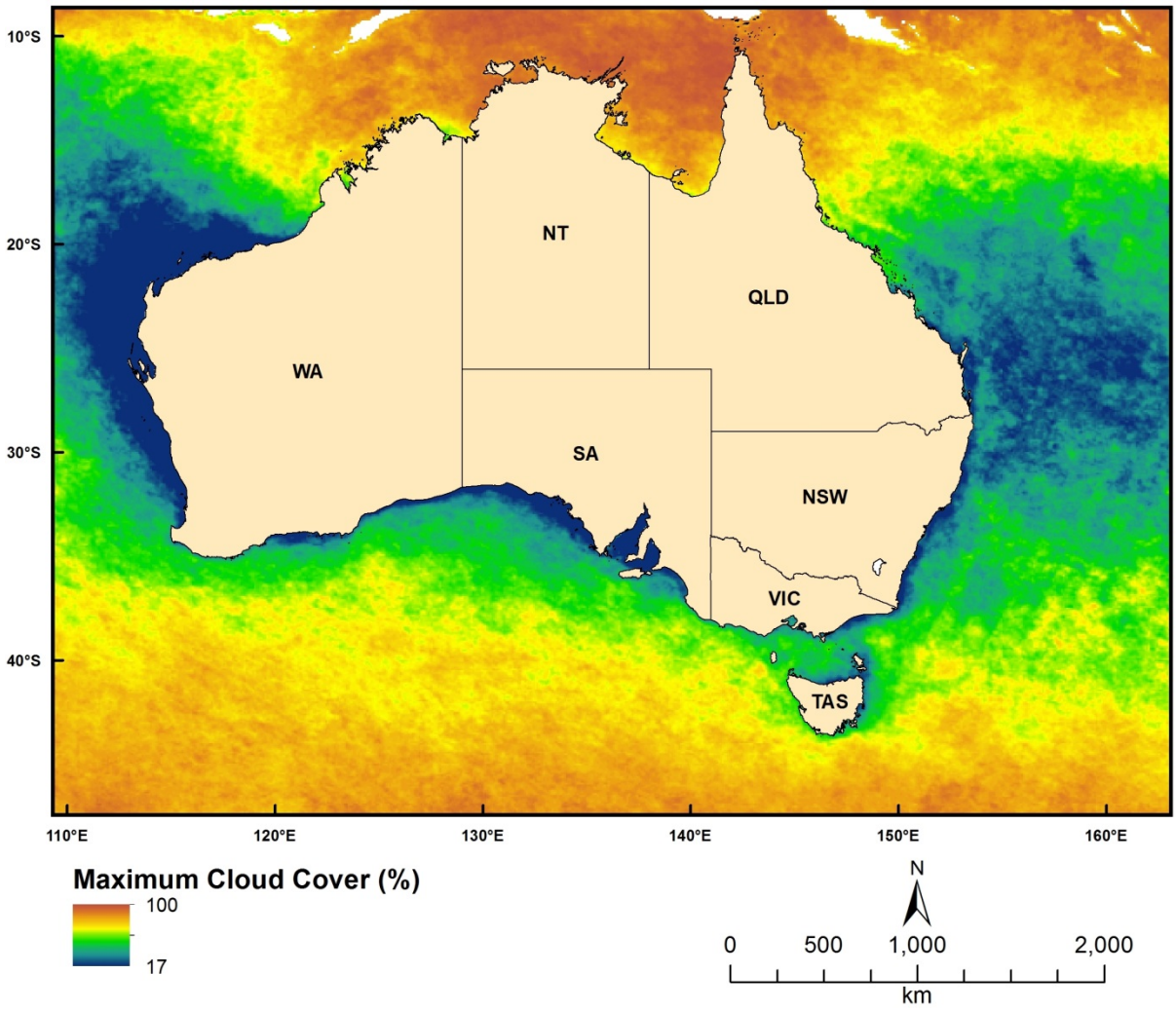

Figure 2.7.5 MODIS-derived Temporal Maximum Cloud Cover

2.7.6 PH

Dataset TITLE

Bio-Oracle climate data - pH (mean of interpolated measurements)

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Lennert Tyberghein

Dataset CUSTODIAN

Lennert Tyberghein, Ghent University

Dataset JURISDICTION

Australia

Description ABSTRACT

The oceans harbour a great diversity of organisms whose distribution and ecological preferences are often poorly understood. Species distribution modelling (SDM) could improve our knowledge and inform marine ecosystem management and conservation. Although marine environmental data are available from various sources, there are currently no user-friendly, high-resolution global datasets designed for SDM applications. This study aims to fill this gap by assembling a comprehensive, uniform, high-resolution and readily usable package of global environmental rasters. This particular dataset provides a modelled estimate of pH, derived from interpolations of *in-situ* measurements (World Ocean Database 2009). Ocean pH levels are expected to be affected by ongoing ocean acidification.

Description Data Category

Oceans

Environment

Description Keyword

Atmosphere, Clouds, Cloud Amount/frequency

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: 90

S_LAT: -90

E_LONG: -180

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2010

Data Currency ENDING DATE

04-Mar-11

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL ArcInfo Grid

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact the data custodian

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dataset for marine species distribution modelling. Global Ecology and Biogeography 21, 272-281.

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Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Additional Metadata REFERENCES

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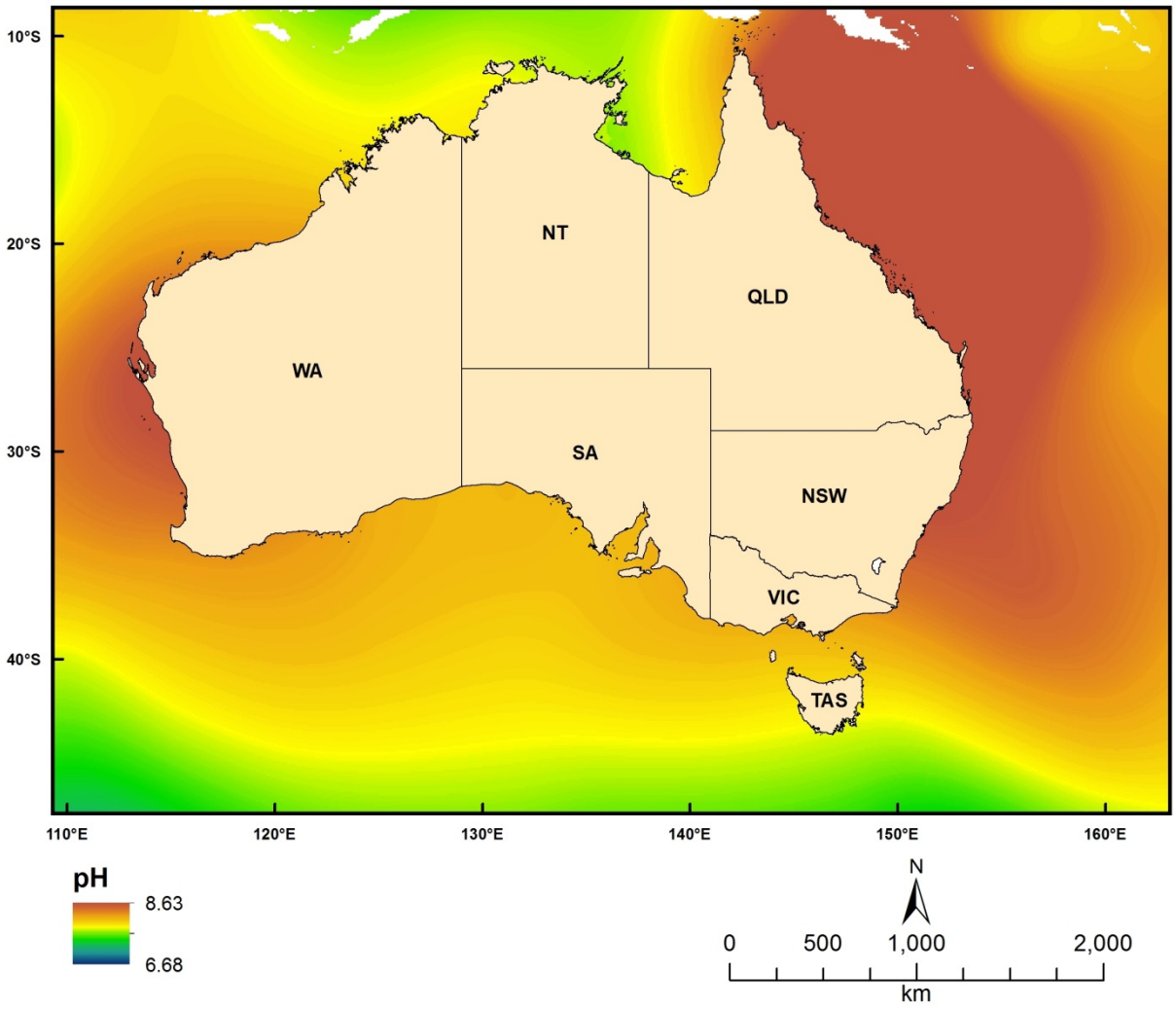

Figure 2.7.6 Modelled (Bio-ORACLE) pH Values

2.8 Predicted and Modelled Connectivity/Dispersal Layers

2.8.1 Particle Tracks

Dataset TITLE

Conn4D - 4-dimensional biophysical connectivity model - particle tracks

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Johnathan Kool

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

Connectivity research involves investigating the presence, strength and characteristics of spatiotemporal relationships between populations of organisms. Typically, marine organisms release large numbers (often on the order of millions) of young (larvae), which are difficult to follow via physical tracking. Instead, researchers have turned to numerical simulations, coupling models of ocean movement with larval behaviour.

The model described here uses oceanographic data (typically provided by ocean models such as HYCOM, BlueLink, POM or ROMS) to disperse artificially intelligent particles. The fundamental physical processes at work are advection and diffusion, however the particles are able to respond in a flexible manner to other parameters as well, for example temperature, salinity, or prey fields. Due to the object-oriented architecture of the model, various components can be changed, improved or modified without altering the base structure of the code.

This particular data set contains point locations of the simulated particles over time. This point cloud data forms the basis of the other analytical products (i.e. dispersal surfaces, source and sink capacity, total and net activity).

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Invertebrates, Fish, Coastal Processes, Coral Reefs, Marine Geophysics, Submarine Canyons, Ocean Circulation, Advection, Diffusion, Ocean Currents

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

01-Jan-09 to 27-Feb-13

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

04-Apr-2013

Data Currency ENDING DATE

Dataset Status PROGRESS

underDevelopment

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data was produced by using ocean velocity fields provided by the HYCOM model (www.hycom.org) to drive a biophysical dispersal model written in Java (Conn4D: source code available at https://github.com/jkool/Conn4D).

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Geoscience Australia

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marine@ga.gov.au

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Johnathan Kool

Claire Paris (University of Miami, Florida)

Ashwanth Srinivasan (University of Miami, Florida)

Bob Cowen (Oregon State University, Oregon)

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

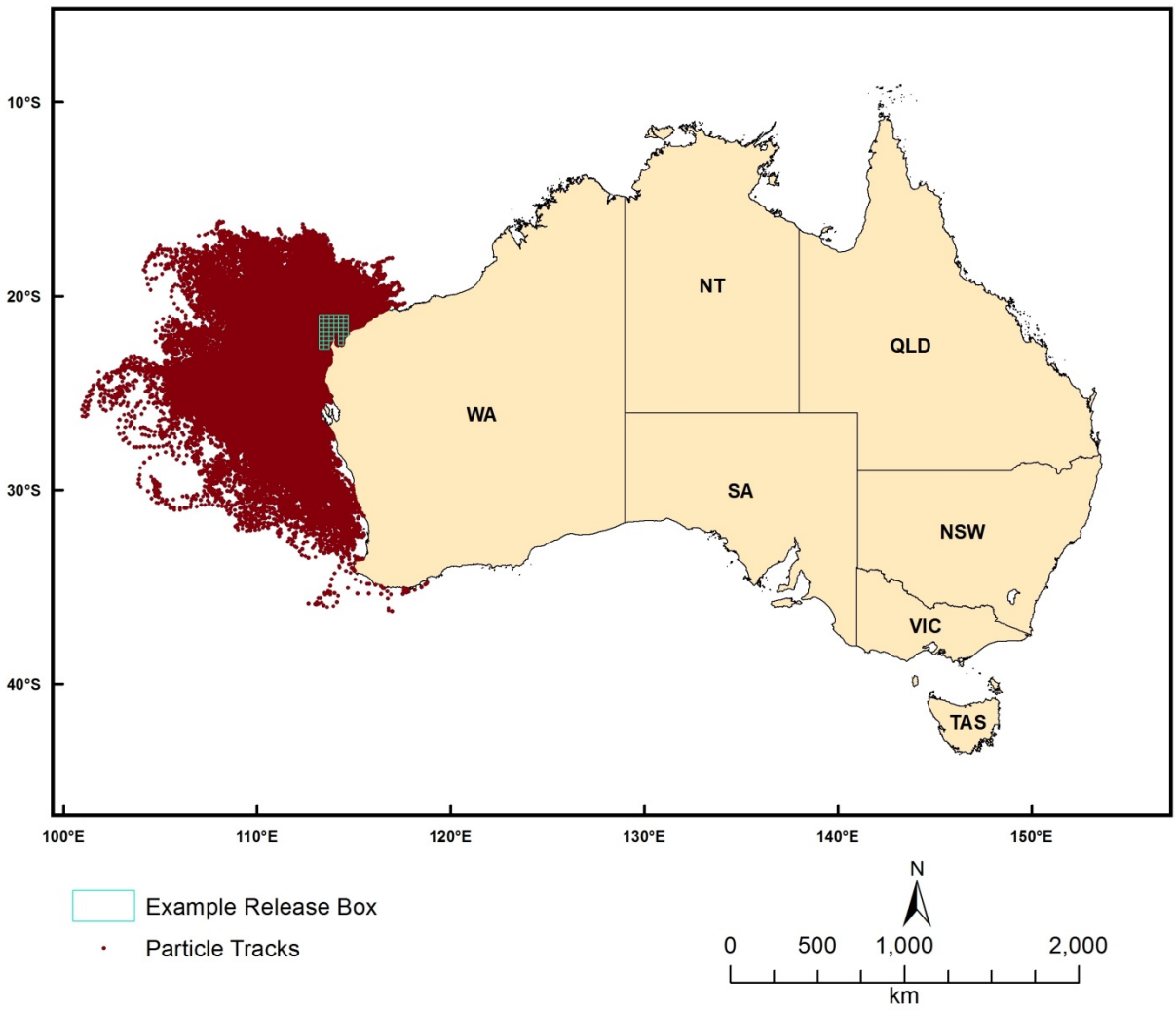

Figure 2.8.1 Modelled (Conn4D) particle tracks released from the Ningaloo area, Western Australia

2.8.2 Dispersal Surface

Dataset TITLE

Conn4D - 4-dimensional biophysical connectivity model - dispersal surface

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Johnathan Kool

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

Connectivity research involves investigating the presence, strength and characteristics of spatiotemporal relationships between populations of organisms. Typically, marine organisms release large numbers (often on the order of millions) of young (larvae), which are difficult to follow via physical tracking. Instead, researchers have turned to numerical simulations, coupling models of ocean movement with larval behaviour.

The model described here uses oceanographic data (typically provided by ocean models such as HYCOM, BlueLink, POM or ROMS) to disperse artificially intelligent particles. The fundamental physical processes at work are advection and diffusion, however the particles are able to respond in a flexible manner to other parameters as well, for example temperature, salinity, or prey fields. Due to the object-oriented architecture of the model, various components can be changed, improved or modified without altering the base structure of the code.

This particular data set represents the density of particles integrated over time. Density is estimated using a radial focal function. The density values are generally best visualized using a log scale.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Invertebrates, Fish, Coastal Processes, Coral Reefs, Marine Geophysics, Submarine Canyons, Ocean Circulation, Advection, Diffusion, Ocean Currents

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COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

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Units: Decimal Degree

Description Temporal EXTENT

01-Jan-09 to 27-Feb-13

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

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Dataset Status PROGRESS

underDevelopment

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

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Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data was produced by using ocean velocity fields provided by the HYCOM model (www.hycom.org) to drive a biophysical dispersal model written in Java (Conn4D: source code available at https://github.com/jkool/Conn4D).

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Metadata Date METADATA DATE

20MAR2013

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Bob Cowen (Oregon State University, Oregon)

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

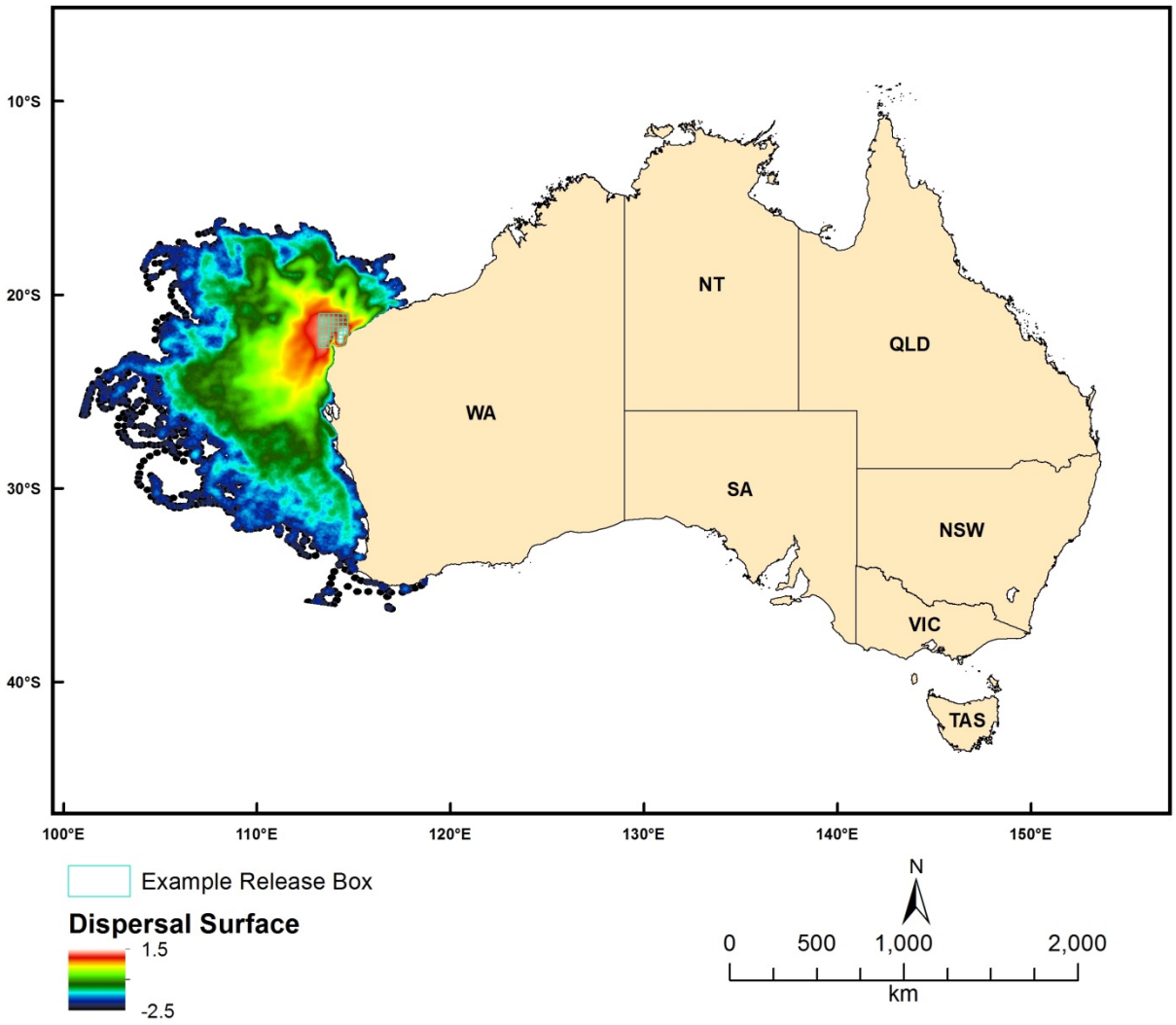

Figure 2.8.2 Modelled (Conn4D) dispersal surface (as Log10 Point Density within 20km Radius) from particles released from the Ningaloo area, Western Australia

2.8.3 Source Capacity

Dataset TITLE

Conn4D - 4-dimensional biophysical connectivity model - source capacity

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Johnathan Kool

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

Connectivity research involves investigating the presence, strength and characteristics of spatiotemporal relationships between populations of organisms. Typically, marine organisms release large numbers (often on the order of millions) of young (larvae), which are difficult to follow via physical tracking. Instead, researchers have turned to numerical simulations, coupling models of ocean movement with larval behaviour.

The model described here uses oceanographic data (typically provided by ocean models such as HYCOM, BlueLink, POM or ROMS) to disperse artificially intelligent particles. The fundamental physical processes at work are advection and diffusion, however the particles are able to respond in a flexible manner to other parameters as well, for example temperature, salinity, or prey fields. Due to the object-oriented architecture of the model, various components can be changed, improved or modified without altering the base structure of the code.

This data set represents the degree to which polygons act as a source of particles to a selected set of destination polygons (from a general set of sources to a selected set of destinations). The source polygons can be of arbitrary size, shape and configuration.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Invertebrates, Fish, Coastal Processes, Coral Reefs, Marine Geophysics, Submarine Canyons, Ocean Circulation, Advection, Diffusion, Ocean Currents

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

01-Jan-09 to 27-Feb-13

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

04-Apr-2013

Data Currency ENDING DATE

Dataset Status PROGRESS

underDevelopment

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data was produced by using ocean velocity fields provided by the HYCOM model (www.hycom.org) to drive a biophysical dispersal model written in Java (Conn4D: source code available at https://github.com/jkool/Conn4D).

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Johnathan Kool

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Bob Cowen (Oregon State University, Oregon)

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

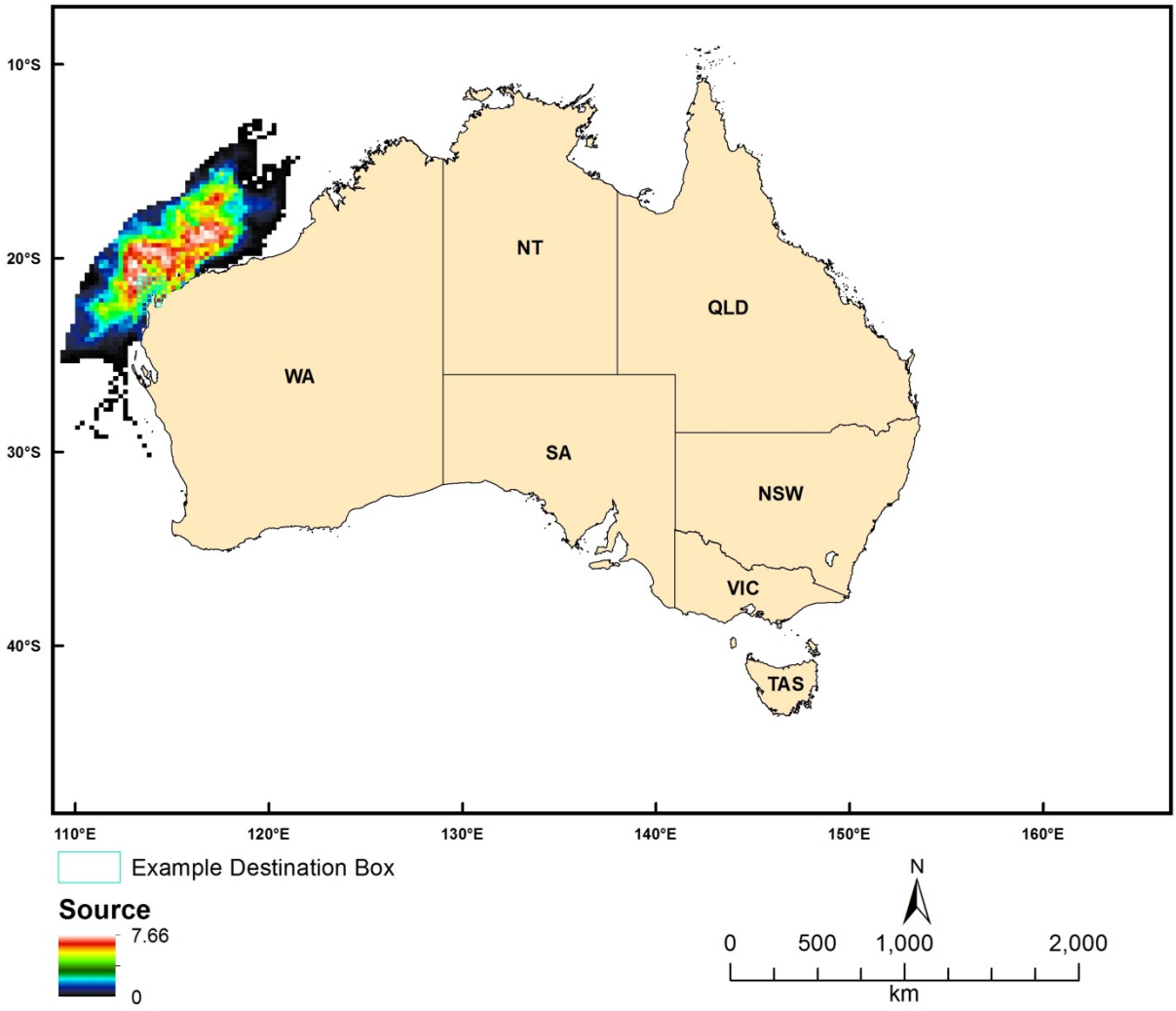

Figure 2.8.3 Modelled (Conn4D) source capacity (as Log Count) from particles intersecting the Ningaloo area, Western Australia

2.8.4 Sink Capacity

Dataset TITLE

Conn4D - 4-dimensional biophysical connectivity model - sink capacity

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Johnathan Kool

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

Connectivity research involves investigating the presence, strength and characteristics of spatiotemporal relationships between populations of organisms. Typically, marine organisms release large numbers (often on the order of millions) of young (larvae), which are difficult to follow via physical tracking. Instead, researchers have turned to numerical simulations, coupling models of ocean movement with larval behaviour.

The model described here uses oceanographic data (typically provided by ocean models such as HYCOM, BlueLink, POM or ROMS) to disperse artificially intelligent particles. The fundamental physical processes at work are advection and diffusion, however the particles are able to respond in a flexible manner to other parameters as well, for example temperature, salinity, or prey fields. Due to the object-oriented architecture of the model, various components can be changed, improved or modified without altering the base structure of the code.

This data set represents the degree to which destination polygons act as a sink to particles sent out from a selected set of source polygons (from selected source to a general set of destinations). The destination polygons can be of arbitrary size, shape and configuration.

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Invertebrates, Fish, Coastal Processes, Coral Reefs, Marine Geophysics, Submarine Canyons, Ocean Circulation, Advection, Diffusion, Ocean Currents

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

01-Jan-09 to 27-Feb-13

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

04-Apr-2013

Data Currency ENDING DATE

Dataset Status PROGRESS

underDevelopment

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data was produced by using ocean velocity fields provided by the HYCOM model (www.hycom.org) to drive a biophysical dispersal model written in Java (Conn4D: source code available at https://github.com/jkool/Conn4D).

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

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Ashwanth Srinivasan (University of Miami, Florida)

Bob Cowen (Oregon State University, Oregon)

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

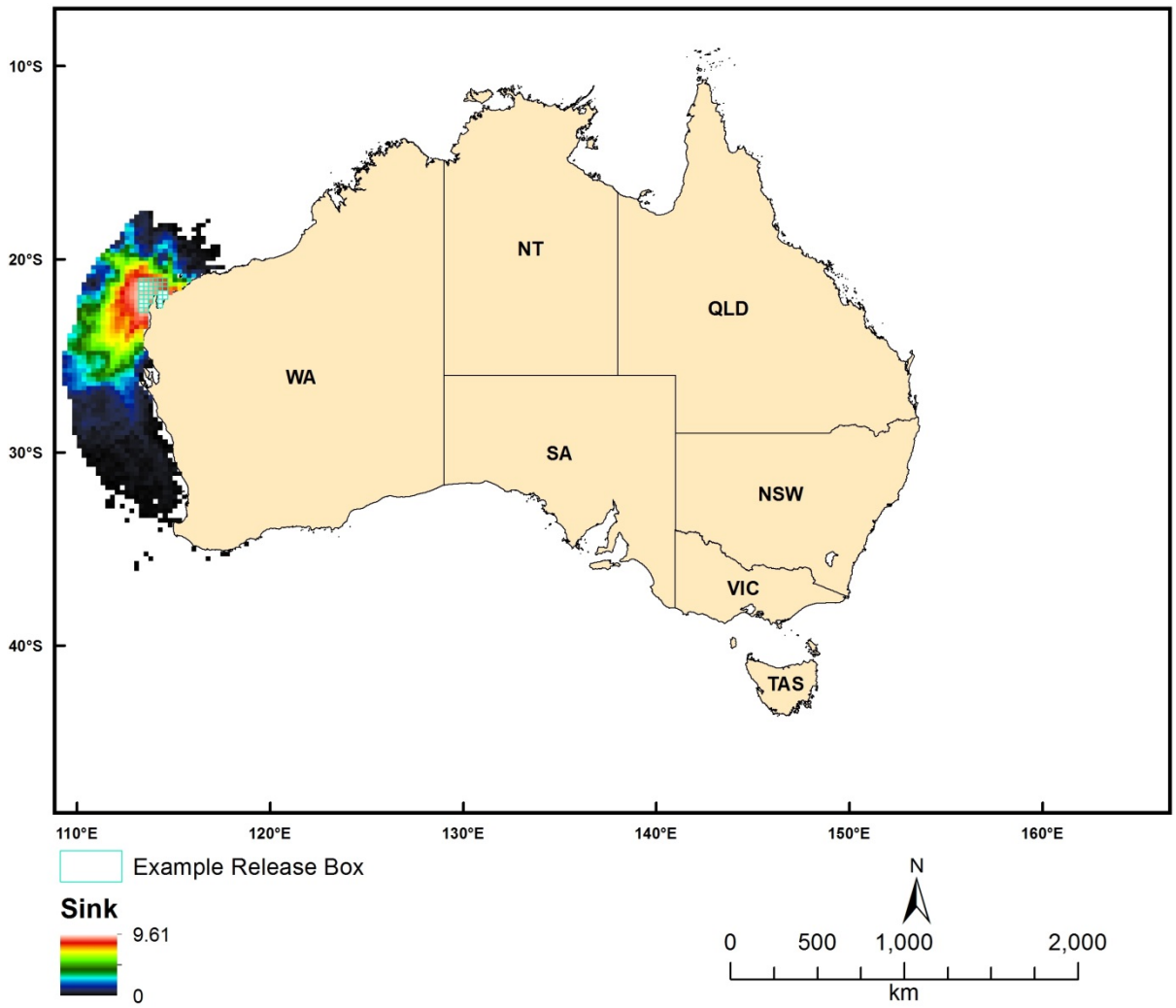

Figure 2.8.4 Modelled (Conn4D) sink capacity (as Log Count) from particles released from the Ningaloo area, Western Australia

2.8.5 Total Activity

Dataset TITLE

Conn4D - 4-dimensional biophysical connectivity model - total activity

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Johnathan Kool

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

Connectivity research involves investigating the presence, strength and characteristics of spatiotemporal relationships between populations of organisms. Typically, marine organisms release large numbers (often on the order of millions) of young (larvae), which are difficult to follow via physical tracking. Instead, researchers have turned to numerical simulations, coupling models of ocean movement with larval behaviour.

The model described here uses oceanographic data (typically provided by ocean models such as HYCOM, BlueLink, POM or ROMS) to disperse artificially intelligent particles. The fundamental physical processes at work are advection and diffusion, however the particles are able to respond in a flexible manner to other parameters as well, for example temperature, salinity, or prey fields. Due to the object-oriented architecture of the model, various components can be changed, improved or modified without altering the base structure of the code.

This data set represents the degree to which polygons act as both a source and sink of particles, giving an indication of the total activity taking place (source capacity + sink capacity).

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Invertebrates, Fish, Coastal Processes, Coral Reefs, Marine Geophysics, Submarine Canyons, Ocean Circulation, Advection, Diffusion, Ocean Currents

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

01-Jan-09 to 27-Feb-13

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

04-Apr-2013

Data Currency ENDING DATE

Dataset Status PROGRESS

underDevelopment

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data was produced by using ocean velocity fields provided by the HYCOM model (www.hycom.org) to drive a biophysical dispersal model written in Java (Conn4D: source code available at https://github.com/jkool/Conn4D).

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

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20MAR2013

Additional Metadata METADATA AUTHOR

Johnathan Kool

Additional Metadata ACKNOWLEDGEMENTS

Johnathan Kool

Claire Paris (University of Miami, Florida)

Ashwanth Srinivasan (University of Miami, Florida)

Bob Cowen (Oregon State University, Oregon)

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Additional Metadata REFERENCES

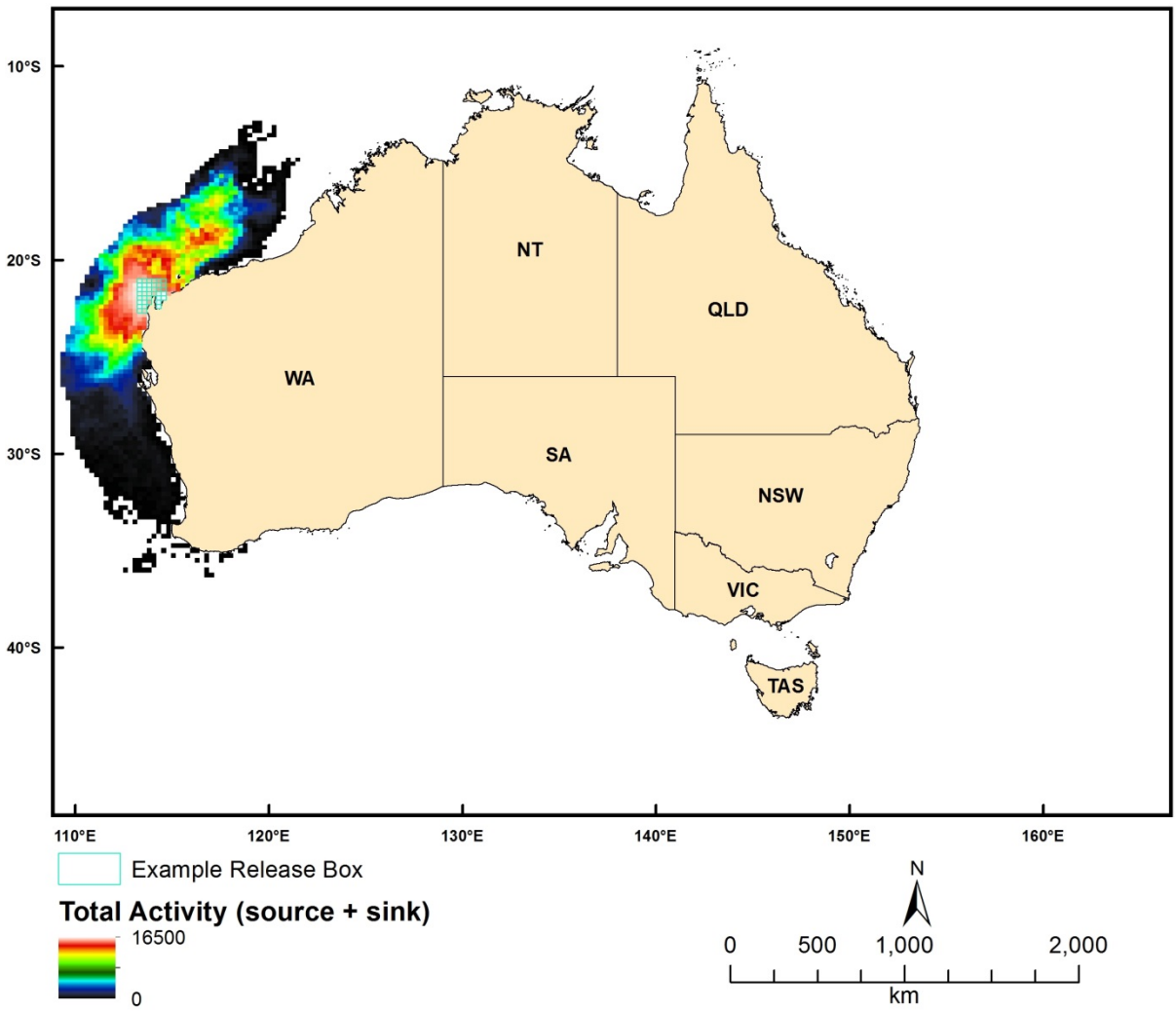

Figure 2.8.5 Modelled (Conn4D) total activity from particles released from the Ningaloo area, Western Australia

2.8.6 Net Activity

Dataset TITLE

Conn4D - 4-dimensional biophysical connectivity model - net activity

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Johnathan Kool

Dataset CUSTODIAN

Geoscience Australia

Dataset JURISDICTION

Australia

Description ABSTRACT

Connectivity research involves investigating the presence, strength and characteristics of spatiotemporal relationships between populations of organisms. Typically, marine organisms release large numbers (often on the order of millions) of young (larvae), which are difficult to follow via physical tracking. Instead, researchers have turned to numerical simulations, coupling models of ocean movement with larval behaviour.

The model described here uses oceanographic data (typically provided by ocean models such as HYCOM, BlueLink, POM or ROMS) to disperse artificially intelligent particles. The fundamental physical processes at work are advection and diffusion, however the particles are able to respond in a flexible manner to other parameters as well, for example temperature, salinity, or prey fields. Due to the object-oriented architecture of the model, various components can be changed, improved or modified without altering the base structure of the code.

This data set represents the difference between the degree to which polygons act as source and sink of particles, giving an indication of the net activity taking place (source capacity - sink capacity).

Description Data Category

Oceans

Environment

Description Keyword

Oceans, Marine Biology, Marine Invertebrates, Fish, Coastal Processes, Coral Reefs, Marine Geophysics, Submarine Canyons, Ocean Circulation, Advection, Diffusion, Ocean Currents

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -5

S_LAT: -50

E_LONG: 100

W_LONG: 170

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

01-Jan-09 to 27-Feb-13

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

04-Apr-2013

Data Currency ENDING DATE

Dataset Status PROGRESS

underDevelopment

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

The data was produced by using ocean velocity fields provided by the HYCOM model (www.hycom.org) to drive a biophysical dispersal model written in Java (Conn4D: source code available at https://github.com/jkool/Conn4D).

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

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Additional Metadata METADATA AUTHOR

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Additional Metadata ACKNOWLEDGEMENTS

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Claire Paris (University of Miami, Florida)

Ashwanth Srinivasan (University of Miami, Florida)

Bob Cowen (Oregon State University, Oregon)

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

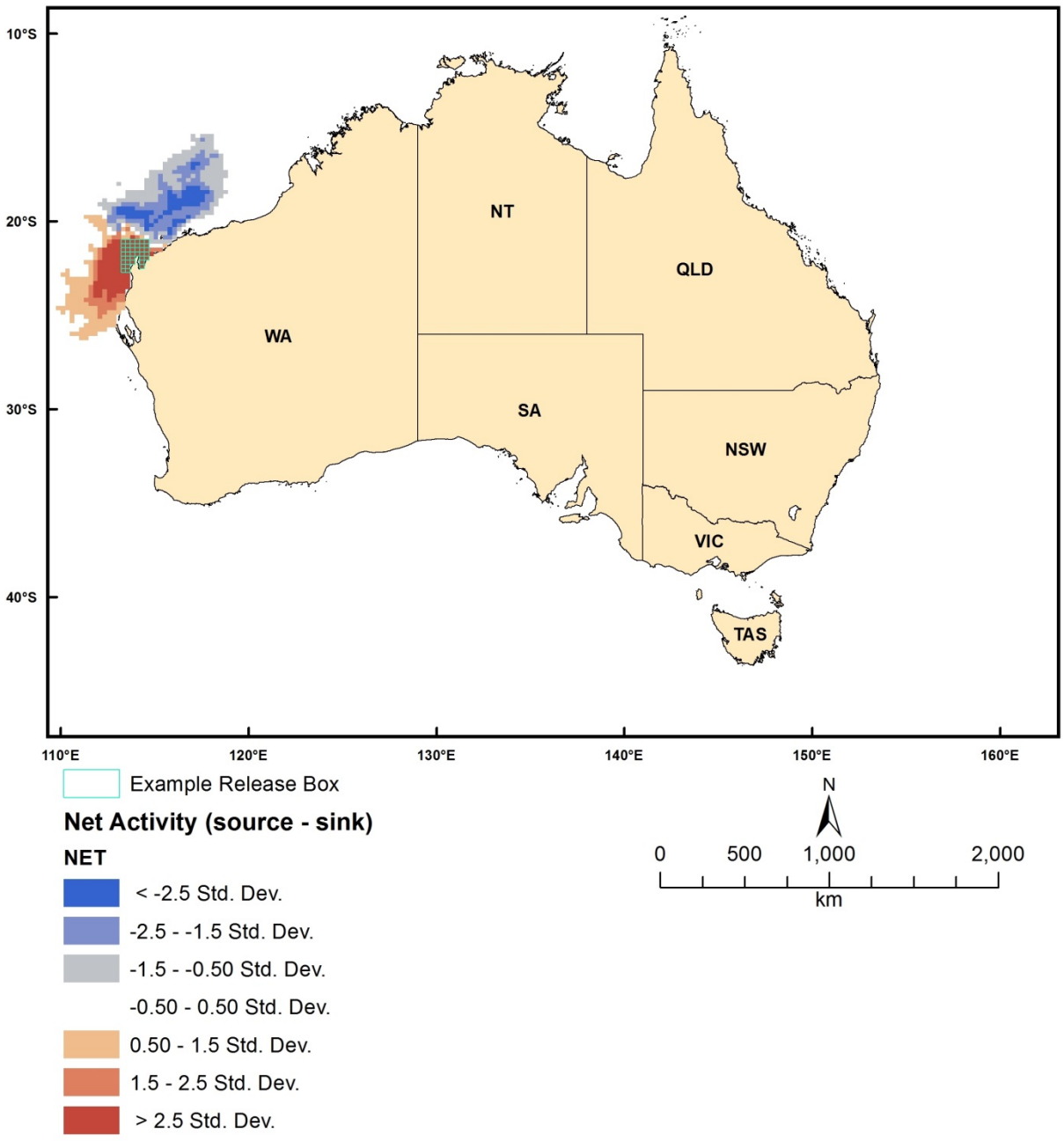

Figure 2.8.6 Modelled (Conn4D) net activity from particles released from the Ningaloo area, Western Australia

2.9 Biological Data

2.9.1 Western Australian Sea Around Us Fish Data

Dataset TITLE

Sea Around Us Project (SAUP) - West Australian Marine Fisheries

Dataset ALTERNATE TITLE (i.e. Dataset Name)

SAUP

Dataset AUTHOR(S)

Dataset CUSTODIAN

Fisheries Centre, The University of British Columbia

Dataset JURISDICTION

Western Australia

Description ABSTRACT

Fisheries landings and associated expanded effort for the West Australian EEZ and coastal waters. Catches expressed as annual, gear-specific tonnage of species caught in each half degree spatial cell over period spanning 1950-2006. Effort expressed as kilowatt sea days, which corresponds to the power of the vessel's main engine and the days of fishing it was employed for (in measures where there is no time unit, this has been annualised to make it the equivalent of continuous power).

Positional accuracy is 0.5 decimal degrees

Description Data Category

Oceans

Environment

Biota

Description Keyword

Biosphere, Aquatic Habitat, Pelagic Habitat, Zoology, Fish, Marine Biology, Oceans, Agriculture, Agricultural Aquatic Sciences, Fisheries

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8.25

S_LAT: -38.75

E_LONG: 93.25

W_LONG: 129.75

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

Data Currency ENDING DATE

31-Dec-06

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

DIGITAL shapefile

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact data custodian

Data Quality LINEAGE

Dataset derived by disaggregating and assigning reported catches from FAO, ICES, NAFO and other international agencies into half degree spatial cells using a series of constraints including the statistical areas used in the original datasets (e.g. FAO statistical areas), the known distributions of the exploited species, and a database of fishing access arrangements developed by J. Alder, W. Swartz, and others, and which provides information on the operations of distant water fishing fleets in the waters (or EEZ) of maritime countries. Effort dataset consists of independently derived measures of spatialised fishing effort.

Potential human error when identifying species. Some catches recorded as unidentified

Effort dataset was derived independently and is incomplete (does not cover all grid cells in all years)

Data Quality POSITIONAL ACCURACY

0.5 decimal degree

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Fisheries Centre The University of British Columbia

Contact Information CONTACT POSITION

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Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Reg Watson

Additional Metadata ACKNOWLEDGEMENTS

Additional Metadata REFERENCES

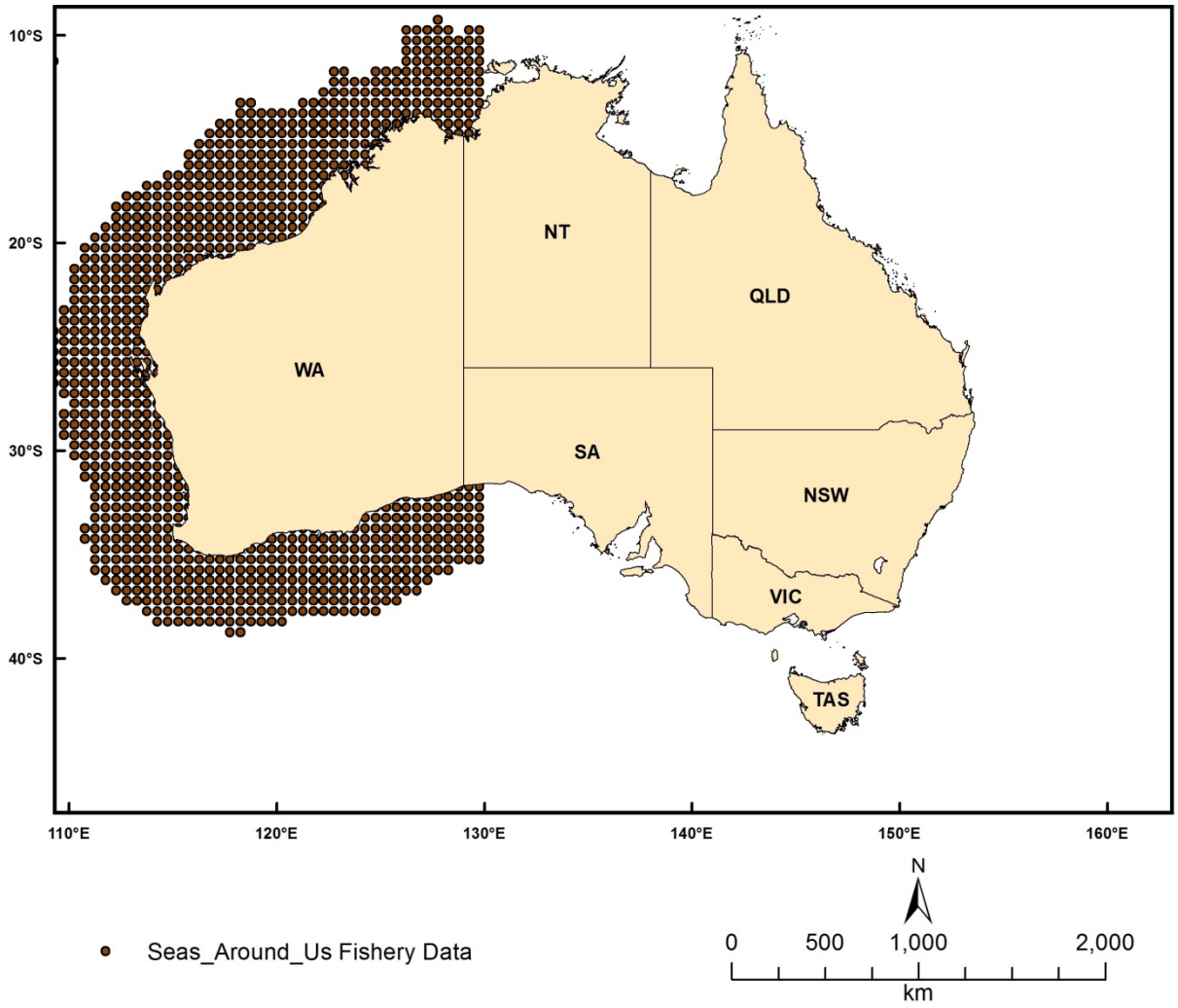

Figure 2.9.1 Locations of Sea-Around-Us fish data

2.9.2 Australian Brittlestars

Dataset TITLE

Brittlestars of Australia

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Ophiuroids of Australia

Dataset AUTHOR(S)

Dataset CUSTODIAN

Museum of Victoria

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset comprises records of brittle stars (Ophiuroidea) collected from within Australia's EEZ. Data is collated from museum collections in Australia and overseas and from the scientific literature. Records includes the number of specimens collected, the institution where they are lodged and a catalogue number where available; taxonomic information (species name, higher taxonomy, identifier, taxomomic certainty) and locality information (latitude, longitude, depth, survey, station).

Description Data Category

Oceans

Environment

Biota

Description Keyword

Biosphere, Aquatic Habitat, Benthic Habitat, Zoology, Echinoderms, Oceans, Marine Biology, Marine Invertebrates

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -50

E_LONG: 105

W_LONG: 165

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2013

Data Currency ENDING DATE

15-Feb-13

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Please cite the data set using the following format: National Environmental Research Program (NERP) Marine Biodiversity Hub [year-of-data-download], [Title], [data-access-URL], accessed [date-of-access].

Data Quality LINEAGE

Data is collated from museum collections in Australia and overseas and from the scientific literature

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Museum of Victoria

Contact Information CONTACT POSITION

Tim O'Hara

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Museum of Victoria

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tohara@museum.vic.gov.au

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Rachel Przeslawski

Additional Metadata ACKNOWLEDGEMENTS

Data was sourced from the NERP Marine Biodiversity Hub – the Marine Biodiversity Hub is supported through funding from the Australian Government's National Environmental Research Program (NERP), administered by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

Additional Metadata REFERENCES

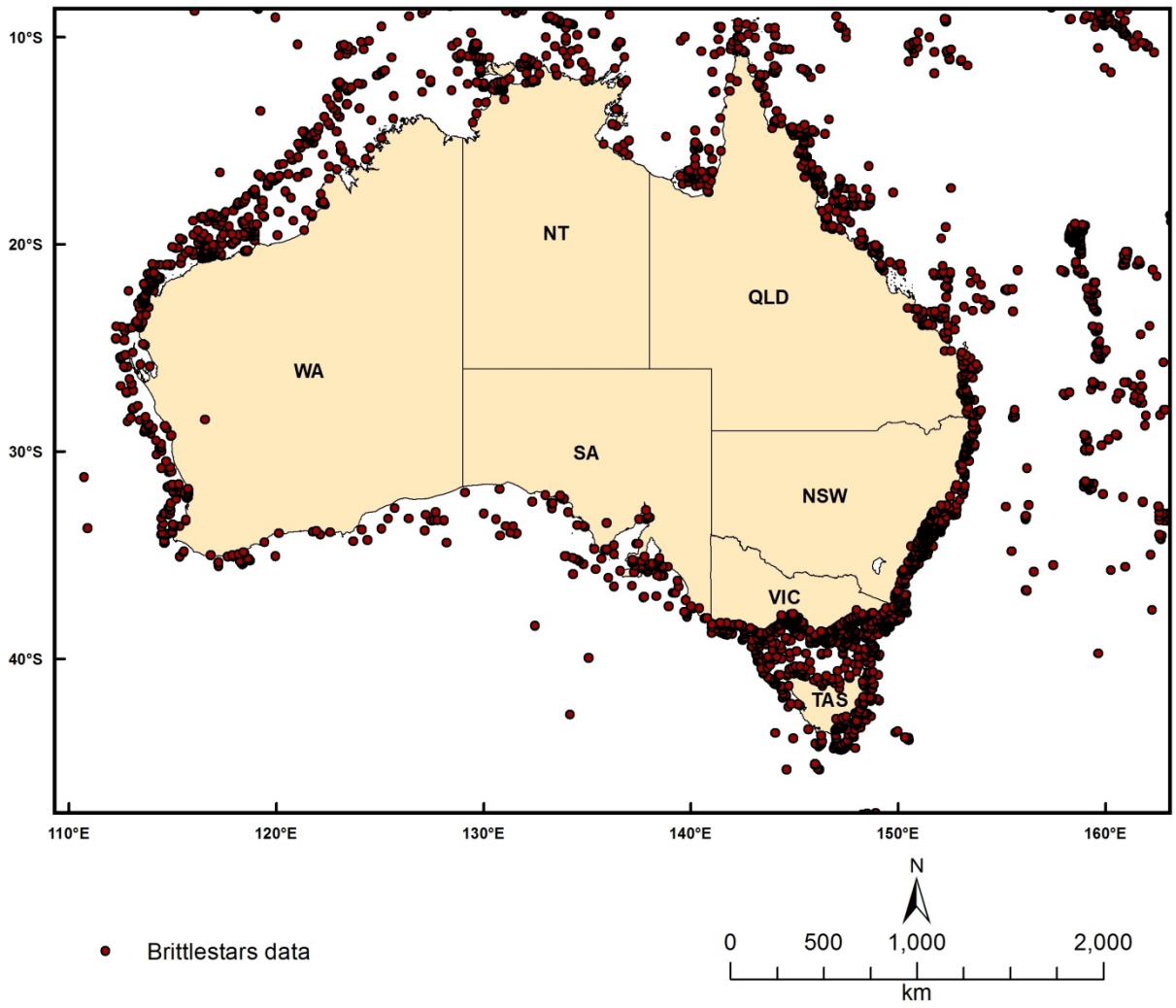

Figure 2.9.2 Locations of Australian Brittlestars Data

2.9.3 Fish AFMA catch data

Dataset TITLE

Commonwealth Fisheries Footprint

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Dataset AUTHOR(S)

Dataset CUSTODIAN

Australian Fisheries Management Authority (AFMA)

Dataset JURISDICTION

Australia

Description ABSTRACT

These coverages are from AFMA logbook data summarised to a common six minute grid by BRS for DSEWPaC. The following gear types are covered: scallop dredge, other line, unknown net, gill net, unknown line, pelagic long line, demersal long line auto, demersal long line, squid jig, aquaculture hand dive, lobster hand dive, abalone hand dive, pelagic purse seine trawl, pelagic mid-water trawl, pelagic demersal otter, demersal Danish seine trawl, demersal beam trawl, spanner trap, finfish crab lobster trap. All data are vetted for confidentiality, such that data are not shown where a reporting cell contains the catches of less than 5 boats.

The data provided is a summary where any activity has a value of 1 and cells without any fishing are given a value of zero.

Description Data Category

Oceans

Environment

Biota

Description Keyword

Oceans, Marine Biology, Fish

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -10

S_LAT: -45

E_LONG: 110

W_LONG: 165

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

1996 to 2003

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2012

Data Currency ENDING DATE

04-Apr-13

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

notPlanned

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact data custodian

Data Quality LINEAGE

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Australian Fisheries Management Authority (AFMA)

Contact Information CONTACT POSITION

Collection Manager

Contact Information MAIL ADDRESS 1

73 Northbourne Avenue

Contact Information SUBURB/PLACE/LOCALITY

Canberra City

Contact Information STATE/LOCALITY 2

ACT

Contact Information COUNTRY

Australia

Contact Information POSTCODE

2600

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Piers Dunstan (CSIRO)

Additional Metadata ACKNOWLEDGEMENTS

Additional Metadata REFERENCES

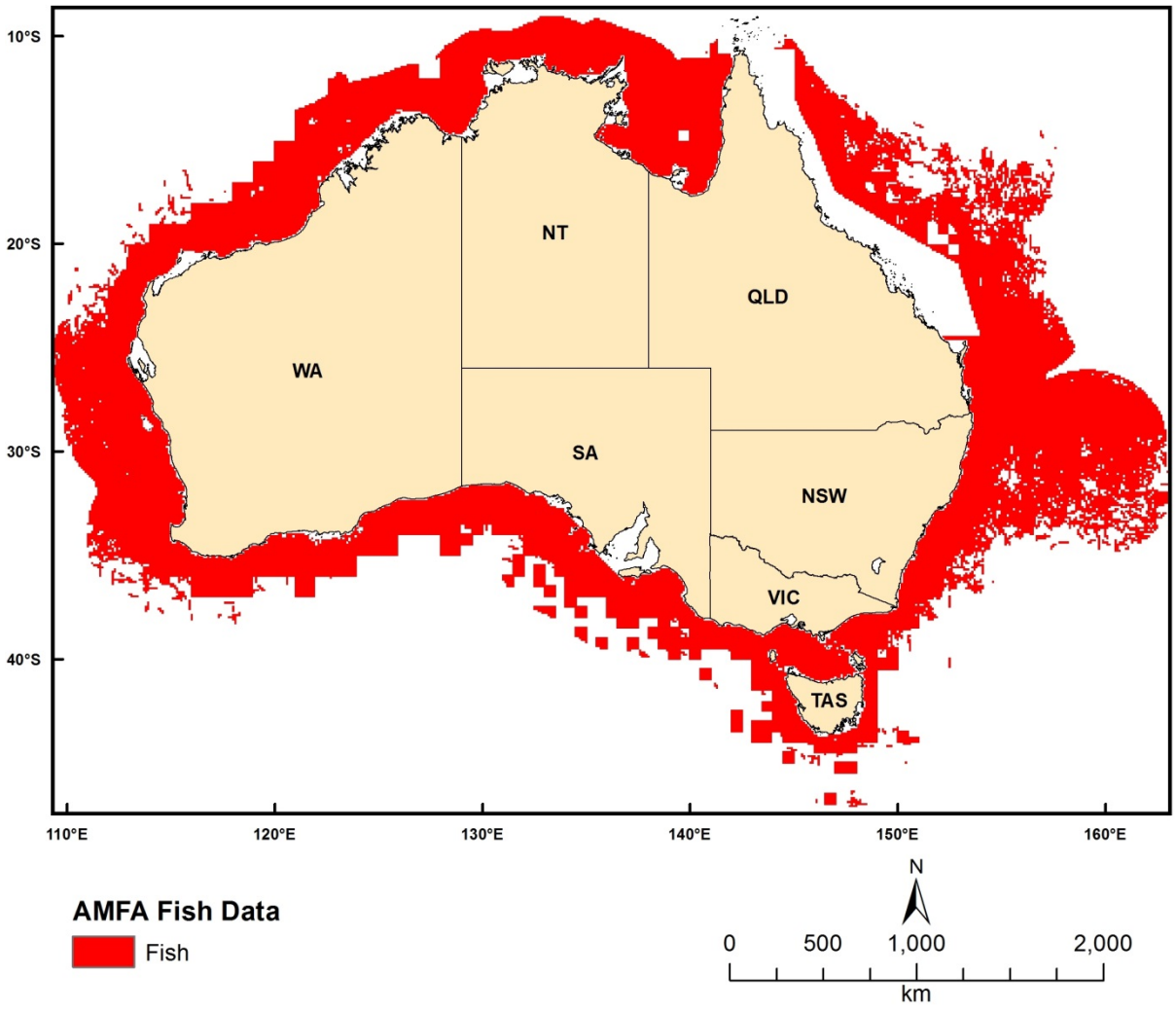

Figure 2.9.3 Locations of AFMA fish catch data

2.9.4 Australian National Fish Collection (CSIRO)

Dataset TITLE

Australian National Fish Collection

Dataset ALTERNATE TITLE (i.e. Dataset Name)

CSIRO Australian National Fish Collection

Dataset AUTHOR(S)

Dataset CUSTODIAN

CSIRO Marine and Atmospheric Research (CMAR)

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset gives species-level identifications for ~22% of finfish housed in the Australian National Fish Collection at CSIRO Marine and Atmospheric Research in Hobart (~148,000 specimens as of Feb 2013 which includes marine, estuarine, and freshwater species). The dataset is available via the Atlas of Living Australia (www.ala.org) with ~26,000 marine species listed. The Australian National Fish Collection is a comprehensive and internationally-renowned biodiversity reference and research facility. Since its foundation by Ian Munro in 1943, the collection has grown to house more than 148 000 finfish specimens representing more than 3000 species. These include Australian, Antarctic and Indo-Pacific oceanic, inshore, estuarine and river fishes. The Collection holds 195 holotypes (primary type specimens) and 1540 paratypes (supplementary specimens) of 300 newly described species. It also contains a substantial amount of voucher material relating to published books and papers, illustrations and photographs. A valuable component of the Collection is the large Photographic Index of Australian Fishes and the radiographs, which are useful for detailed bone studies. The Collection also contains hundreds of jars of ichthyoplankton (fish eggs and larval fish), some of which are unsorted, and collections of otoliths (ear bones, for determining the age of fish).

Description Data Category

Oceans

Environment

Biota

Description Keyword

Biosphere, Aquatic Habitat, Benthic Habitat, Estuarine Habitat, Pelagic Habitat, Zoology, Fish, Oceans, Marine Biology

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: 45

S_LAT: -85

E_LONG: 75

W_LONG: 180

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

1943

Data Currency ENDING DATE

2011

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact data custodian

Data Quality LINEAGE

Approximately 2,800 of Australia's estimated 4,500 fish species are represented in the collection. Judged by the diversity of species it holds, the Collection is among the largest in the Southern Hemisphere. All specialist collections strive for quality and diversity. The Collection focuses on Indo Pacific shark and ray, and temperate and Southern Ocean species making it a pre-eminence among international collections. The 135,000 specimens from 2,800 species (representing 300 fish families) include oceanic, deep-water, demersal, inshore, estuarine, river and lake fishes. Most are from Australian waters, but there are also collections from Papua New Guinea, the Bismarck Archipelago and the Solomon Islands, as well as fish from New Zealand, the Antarctic continent and sub-Antarctic islands, Europe and South-east Asia, including Sri Lanka, Malaysia, the Philippines and Japan. The Collection holds 35 holotypes and 200 paratypes of 70 species new to science. It also contains a

substantial amount of voucher material relating to published books and papers, illustrations and photographs. A valuable component of the Collection is the large Photographic Index of Australian Fishes (PIAF) and the radiographs, which are useful for detailed bone studies. The Collection also contains hundreds of jars of ichthyoplankton (fish eggs and larval fish), some of which are unsorted, and collections of otoliths (ear bones, for determining the age of fish). A computerized index of the contents of the Collection has been developed using Texpress software designed by KE Software of Melbourne. This index will be linked up with other CSIRO collections and museum systems in the near future. A substantial collection from the Tasmanian Department of Sea Fisheries, together with material from museums, professional fishermen and other Government organisations, has been incorporated into the Collection, which is managed by a staff of three people. The in-house CSIRO database was partially uploaded to the Atlas of Living Australia in 2011 for public access.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

CSIRO Marine and Atmospheric Research (CMAR)

Contact Information CONTACT POSITION

Collection Manager

Contact Information MAIL ADDRESS 1

Castray Esplanade

Contact Information SUBURB/PLACE/LOCALITY

Hobart

Contact Information STATE/LOCALITY 2

TAS

Contact Information COUNTRY

Australia

Contact Information POSTCODE

7000

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Contact Information ELECTRONIC MAIL ADDRESS

alastair.graham@csiro.au

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Rachel Przeslawski

Additional Metadata ACKNOWLEDGEMENTS

Additional Metadata REFERENCES

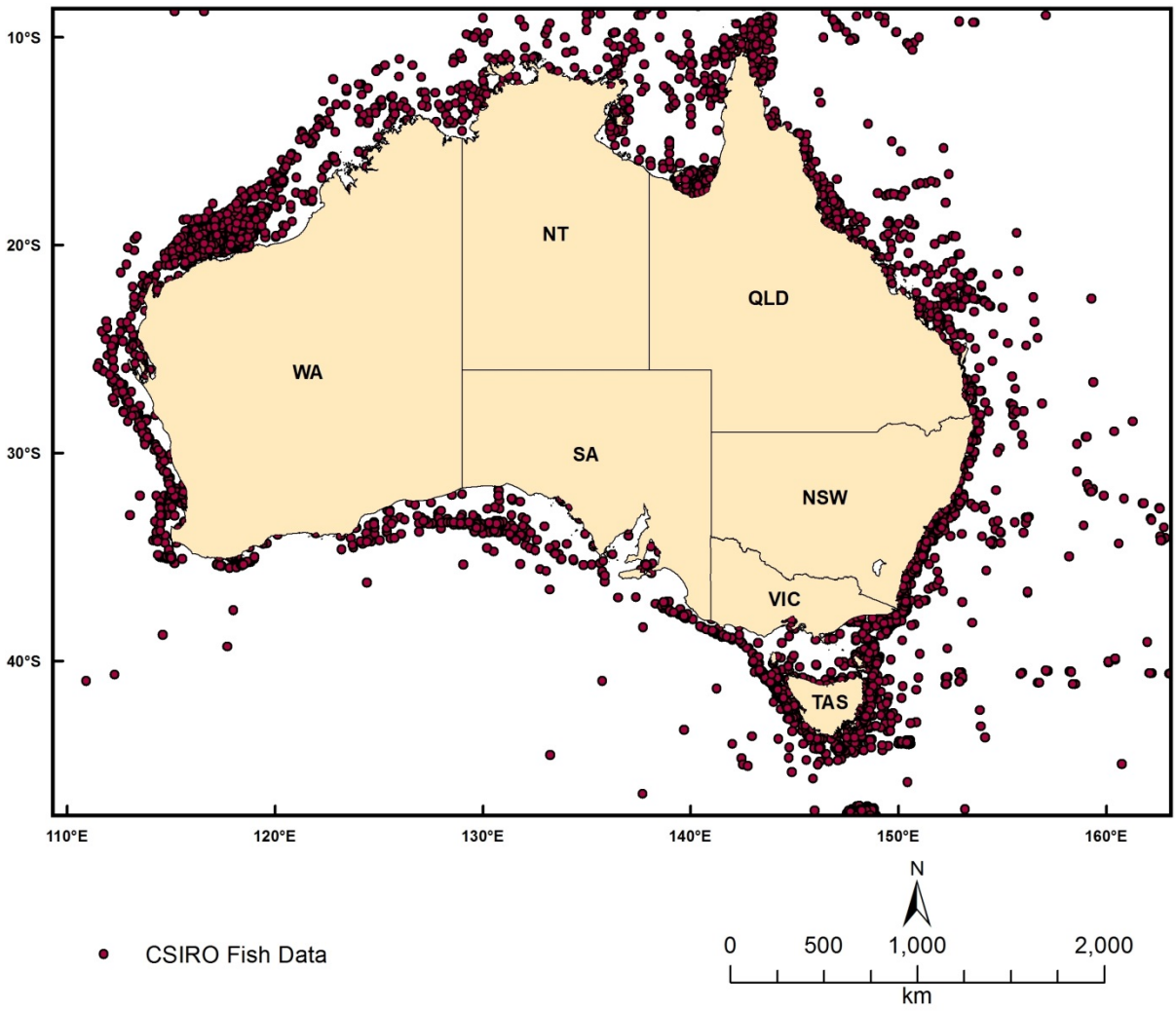

Figure 2.9.4 Locations of CSIRO fish data

2.9.5 Australian megavertebrates

Dataset TITLE

Megavertebrates of Australian EEZ

Dataset ALTERNATE TITLE (i.e. Dataset Name)

OBIS-SEAMAP for Australian EEZ

Dataset AUTHOR(S)

Dataset CUSTODIAN

Duke University (Global Database); CSIRO (Australian database; custodian Tony Rees)

Dataset JURISDICTION

Australia

Description ABSTRACT

OBIS-SEAMAP (Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations) is an initiative of the Census of Marine Life which was started in 2002 under researchers at Duke University. OBIS-SEAMAP is a spatially and temporally interactive online archive for marine mammal, sea turtle, and seabird data. Data is contributed from providers all over the world.

OBIS-SEAMAP can be accessed here: http://seamap.env.duke.edu.

The observation data held by OBIS-SEAMAP are collected from various data providers worldwide. They are registered into the OBIS-SEAMAP database and presented on the web site upon data providers' permission. The ownership of the data belongs to the data providers.

Description Data Category

Oceans

Environment

Biota

Description Keyword

Biosphere, Aquatic Habitat, Pelagic Habitat, Zoology, Reptiles, Vertebrates, Birds, Mammals, Oceans, Marine Biology, Fish, Marine Birds, Marine Mammals

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -50

E_LONG: 105

W_LONG: 165

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2002

Data Currency ENDING DATE

2013

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Frequently

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact data custodian

Data Quality LINEAGE

OBIS-SEAMAP project was established by the Census of Marine Life program in 2002 under the leadership of Duke University. The project involves a consortium of organisations and individuals who share a vision to make marine biogeographic data freely available to the public. SEAMAP is one of the participating network data nodes of OBIS (http://www.iobis.org), which in turn, is a member and data provider of the Global Biodiversity Information Facility (GBIF; http://www.gbif.org). Data providers contribute data which are then aggregated by specific marine taxa (SEAMAP), up to all marine biogeographic data (OBIS), and finally to global (including terrestrial) biogeographic data (GBIF). Compared to GBIF and OBIS, SEAMAP promotes the storage and publication of many more types of data (i.e., effort, animal behavior, etc.) while providing additional features and tools for both data providers and potential users interested in marine megavertebrates.

Each dataset which is contributed to OBS-SEAMAP has its own history and lineage which can be accessed via meta-data for individual datasets at http://seamap.env.duke.edu.

[lineage text was modified from Kot CY, Fujioka E, Hazen LJ, Best BD, Read AJ, et al. (2010) Spatio-Temporal Gap Analysis of OBIS-SEAMAP Project Data: Assessment and Way Forward. PLoS ONE 5(9): e12990. doi:10.1371/journal.pone.0012990]

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Duke University

Contact Information CONTACT POSITION

Patrick Halpin

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A328 Levine Science Research Center, Nicholas School of the Environment

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Durham

Contact Information STATE/LOCALITY 2

North Carolina

Contact Information COUNTRY

United States

Contact Information POSTCODE

27708

Contact Information TELEPHONE

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

mgel-tech@env.duke.edu

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Rachel Przeslawski

Additional Metadata ACKNOWLEDGEMENTS

Census of Marine Life;

Various data providers as listed at http://seamap.env.duke.edu

Additional Metadata REFERENCES

Kot CY, Fujioka E, Hazen LJ, Best BD, Read AJ, et al. (2010) Spatio-Temporal Gap Analysis of OBIS-SEAMAP Project Data: Assessment and Way Forward. PLoS ONE 5(9): e12990. doi:10.1371/journal.pone.0012990

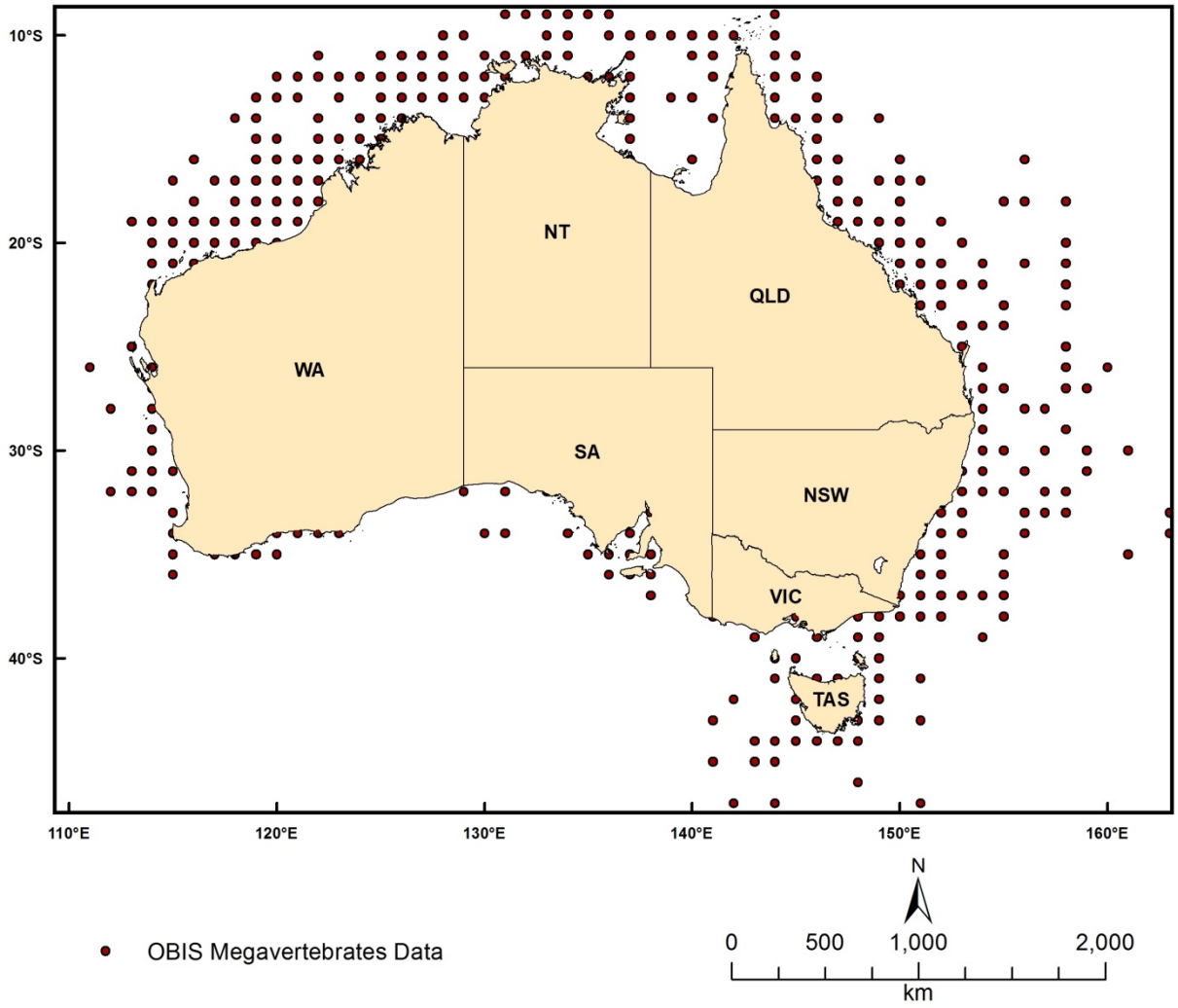

Figure 2.9.5 Locations of OBIS megavertebrates data

2.9.6 Australian Porifera

Dataset TITLE

Queensland Museum Porifera

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Queensland Museum Sponges

Dataset AUTHOR(S)

Dataset CUSTODIAN

Museum of Queensland

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset gives species-level identifications for all sponges housed in the collection of the Queensland Museum (~22, 000 specimens as of Feb 2013). The Queensland Museum has a strong focus on marine invertebrates as the dominant components of Australia's vast reef and seabed faunas. Sponges (Porifera) are an important contributor to this the seabed and reef faunas, including the Great Barrier Reef. The collection contains over 22,000 specimens of approximately 5,000 nominal species housed at South Bank Brisbane, being amongst the largest in the southern hemisphere, including 169 type specimens. 100% of the collection is databased at the Atlas of Living Australia (www.ala.org.au). Most specimens were purpose-collected during the 1990s and 2000s in collaboration with the marine natural products chemistry industry, and tested for bioactive compounds of potential interest to the pharmaceutical industry, available through nature bank http://www.nature-bank.com.au. A large proportion of the collection has now been genetically sequenced (http://www.spongebarcoding.org)

Description Data Category

Oceans

Environment

Biota

Description Keyword

Biosphere, Aquatic Habitat, Benthic Habitat, Zoology, Sponges, Oceans, Marine Biology, Marine Invertebrates

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -50

E_LONG: 105

W_LONG: 165

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2012

Data Currency ENDING DATE

2012

Dataset Status PROGRESS

Completed

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Updated as needed

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact data custodian

Data Quality LINEAGE

Species-level identifications of sponges were completed at the Queensland Museum (led by Dr John Hooper), and the associated in-house database was uploaded to the Atlas of Living Australia in 2012 for public access.

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Museum of Queensland

Contact Information CONTACT POSITION

John Hooper

Contact Information MAIL ADDRESS 1

Museum of Queensland

Contact Information SUBURB/PLACE/LOCALITY

South Brisbane

Contact Information STATE/LOCALITY 2

QLD

Contact Information COUNTRY

Australia

Contact Information POSTCODE

4101

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Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

john.hooper@qm.qld.gov.au

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Rachel Przeslawski

Additional Metadata ACKNOWLEDGEMENTS

Paul Alvern

Additional Metadata REFERENCES

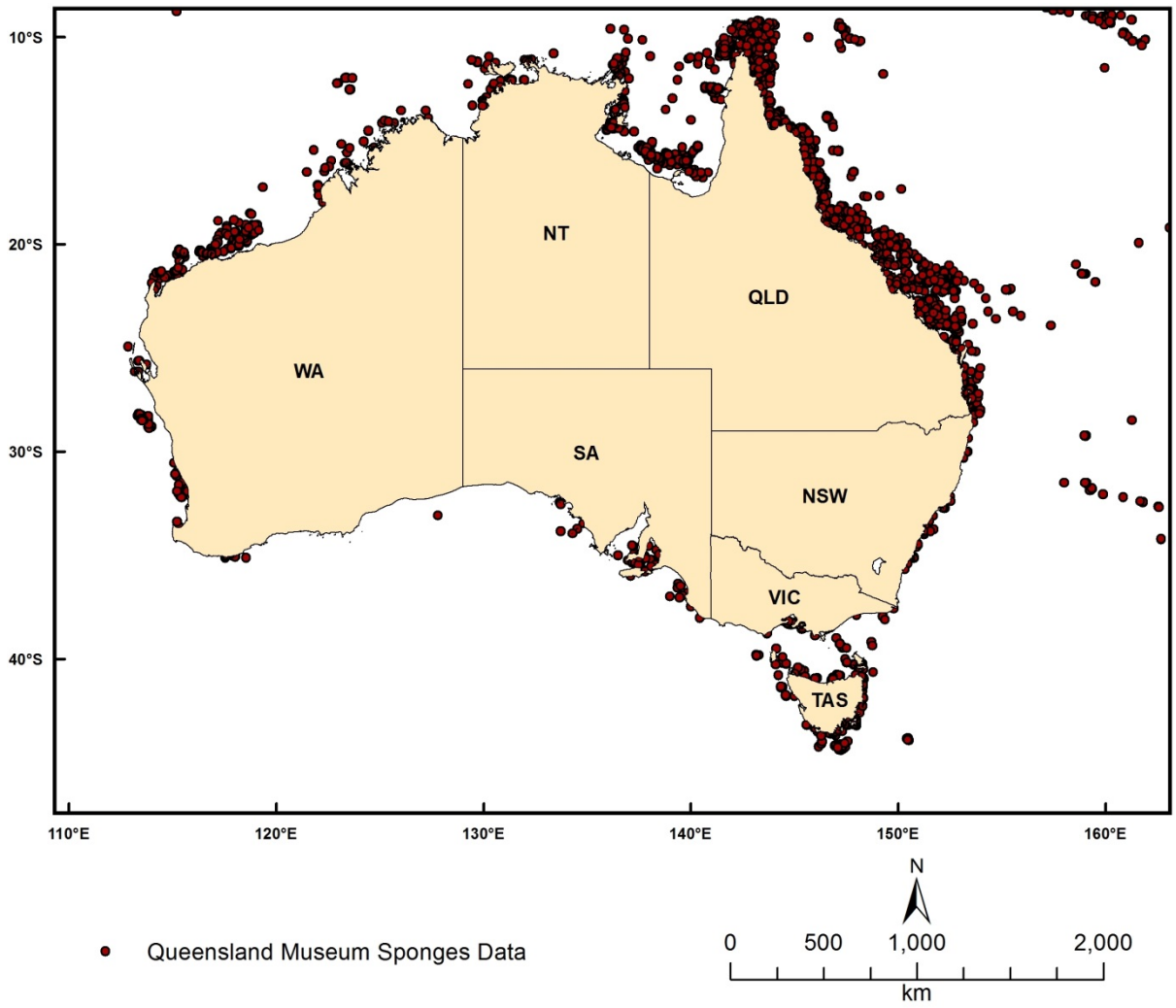

Figure 2.9.6 Locations of Queensland Museum sponge data

2.9.7 Australian squat lobsters

Dataset TITLE

Squat lobsters of Australia

Dataset ALTERNATE TITLE (i.e. Dataset Name)

Galatheids of Australia

Dataset AUTHOR(S)

Dataset CUSTODIAN

Museum of Victoria

Dataset JURISDICTION

Australia

Description ABSTRACT

This dataset comprises records of squat lobsters (Galatheoidea and Chirostyloidea) collected from within Australia's EEZ. Data is collated from museum collections in Australia and overseas and from the scientific literature. Records includes the number of specimens collected, the institution where they are lodged and a catalogue number where available; taxonomic information (species name, higher taxonomy, identifier, taxonomic certainty) and locality information (latitude, longitude, depth, survey, station)

Description Data Category

Oceans

Environment

Biota

Description Keyword

Biosphere, Aquatic Habitat, Benthic Habitat, Zoology, Crustaceans, Oceans, Marine Biology, Marine Invertebrates

Description GEOGRAPHIC EXTENT POLYGON(S)

N_LAT: -8

S_LAT: -50

E_LONG: 105

W_LONG: 165

COORDINATE SYSTEM DESCRIPTION

Projection: Geographic

Datum: WGS84

Units: Decimal Degree

Description Temporal EXTENT

Description NOMINAL SCALE

Spatial Resolution:

Temporal Resolution:

Data Currency BEGINNING DATE

2013

Data Currency ENDING DATE

2013

Dataset Status PROGRESS

onGoing

Dataset Status MAINTENANCE AND UPDATE FREQUENCY

Not Planned

Access STORED FORMATS Digital/Non-Digital Description

Access AVAILABLE FORMATS Digital/Non-Digital Description

Access ACCESS CONSTRAINT

Contact data custodian

Data Quality LINEAGE

Data was collated from museum collections in Australia and overseas and from the scientific literature

Data Quality POSITIONAL ACCURACY

Data Quality ATTRIBUTE ACCURACY

Data Quality LOGICAL CONSISTENCY

Data Quality COMPLETENESS

Contact Information CONTACT ORGANISATION

Museum of Victoria

Contact Information CONTACT POSITION

Researcher

Contact Information MAIL ADDRESS 1

Museum of Victoria

Contact Information SUBURB/PLACE/LOCALITY

Melbourne

Contact Information STATE/LOCALITY 2

VIC

Contact Information COUNTRY

Australia

Contact Information POSTCODE

3001

Contact Information TELEPHONE

+61 3 8341 7440

Contact Information FACSIMILE

Contact Information ELECTRONIC MAIL ADDRESS

amccall@museum.vic.gov.au

Metadata Date METADATA DATE

20MAR2013

Additional Metadata METADATA AUTHOR

Rachel Przeslawski

Additional Metadata ACKNOWLEDGEMENTS

McCallum, A. W. (Museum of Victoria), Ahyong, S., Poore, G.C.B., Taylor, J., Schnabel, K., Baba, K., Macpherson, E

Additional Metadata REFERENCES

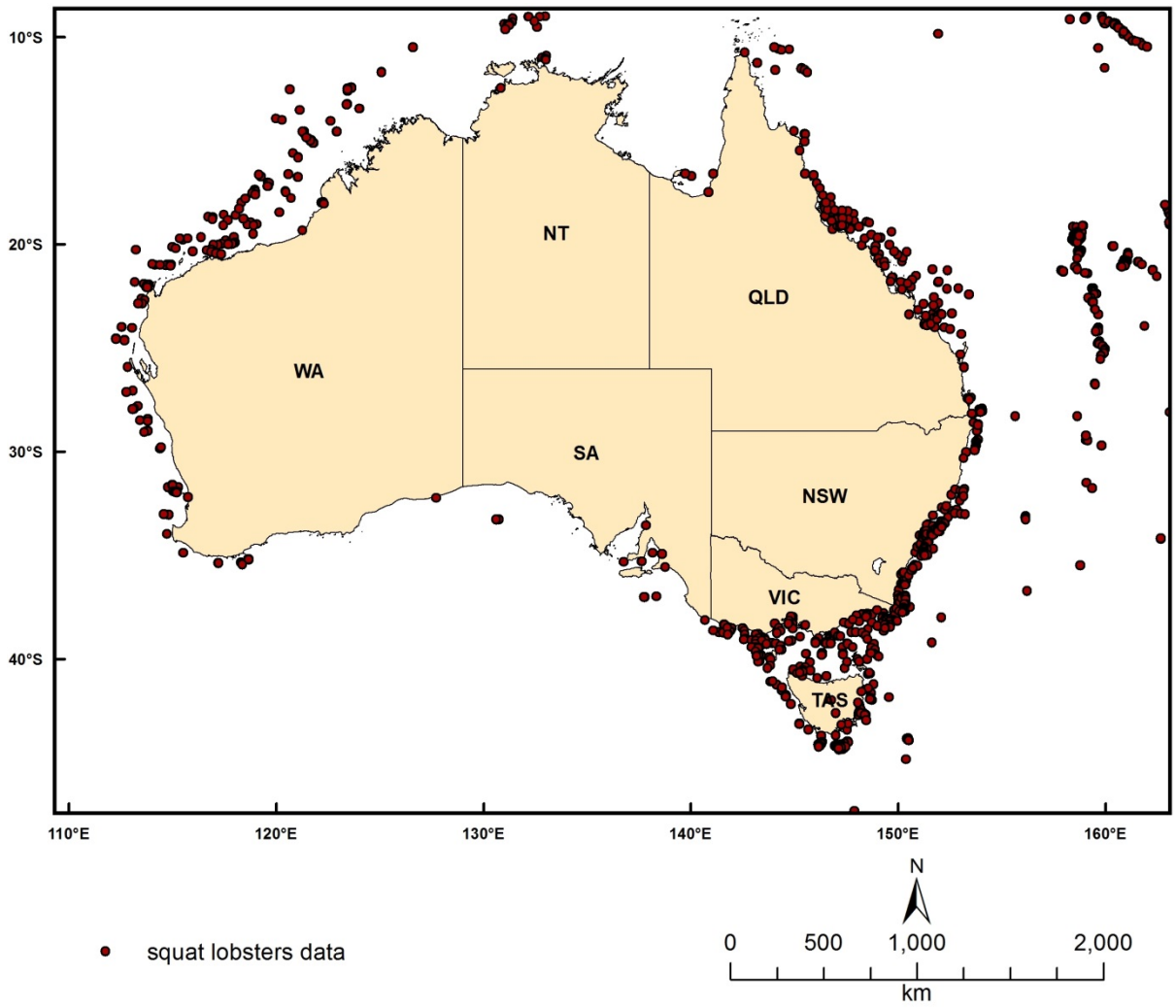

Figure 2.9.7 Locations of Squat Lobsters Data

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