

Title

NSW seabed landforms derived from marine lidar data 2022

Abstract

Seabed landform features were classified from the New South Wales statewide marine lidar dataset, acquired in 2018 by Fugro Pty Ltd on behalf of the Department of Planning and Environment (data available for download on SEED, see below). Seabed features were extracted from the marine lidar data and classified into seabed landform classes. Classified landform features include reefs, plains, peaks, scarps, depressions and channels. These landforms capture variation in the shape and structure of reef outcrops along the NSW coastal and nearshore environment. Features were classified using the Seabed Landforms Classification Toolset developed for ArcGIS by the Coastal and Marine Unit, DPE (Linklater et al. 2023) which are publicly available on SEED (<https://datasets.seed.nsw.gov.au/dataset/seabed-landforms-classification-toolset>) and GitHub (<https://github.com/LinklaterM/Seabed-Landforms-Classification-Toolset/>).

The statewide dataset is provided as ArcGIS shapefiles divided into 9 segments along the coast. The data covers 4060 km², extending from the coastline (0 m AHD) to a maximum of 50 m depth, reaching an average depth of 35 m. Data coverage extends a maximum distance of 9 km offshore, with coverage extending on average 3 km offshore.

This dataset provides an understanding of the extent and distribution of submerged reefs along the NSW coast, which contributes fundamental baseline information for managers, users and custodians of the marine environment.

This dataset was funded by the Marine Estate Management Authority and NSW Climate Change Fund through the Coastal Management Funding Package.

Please cite this dataset as: Linklater, M., Morris, B., Kinsela, M., Ingleton, T. and Hanslow, D. (2022), Exploring patterns of reef distribution along the southeast Australian coast using marine lidar data. Manuscript in preparation.

NSW statewide marine lidar data – available for download on SEED: <https://datasets.seed.nsw.gov.au/dataset/marine-lidar-topo-bathy-2018>

Linklater, M., Morris, B.D. and Hanslow, D.J. (2023), Classification of seabed landforms on continental and island shelves. *Frontiers in Marine Science*, 10, <https://www.frontiersin.org/articles/10.3389/fmars.2023.1258556/full>.

Linklater, M., Ingleton, T. C., Kinsela, M. A., Morris, B. D., Allen, K. M., Sutherland, M. D., & Hanslow, D. J. 2019. Techniques for classifying seabed morphology and composition on a subtropical-temperate continental shelf. *Geosciences*, 9(3), 141.

Resource locator

[Data Quality Statement](#)

Name: Data Quality Statement

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Data quality statement for NSW seabed landforms derived from marine lidar data 2021

Function: download

[Download Package Seabed landforms derived from marine lidar data - 01 - Tweed to Yamba](#)

Name: Download Package Seabed landforms derived from marine lidar data - 01 - Tweed to Yamba

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Data (Shapefile)

Function: download

[Download Package Seabed landforms derived from marine lidar data - 02 -](#)

Name: Download Package Seabed landforms derived from marine lidar data - 02 - Yamba to Arakoon

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Data (Shapefile)

[Yamba to Arakoon](#)

Function: download

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Name: Download Package Seabed landforms derived from marine lidar data - 03 - Arakoon to Forster

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Data (Shapefile)

Function: download

[Download Package Seabed landforms derived from marine lidar data - 04 - Forster to Newcastle](#)

Name: Download Package Seabed landforms derived from marine lidar data - 04 - Forster to Newcastle

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Data (Shapefile)

Function: download

[Download Package Seabed landforms derived from marine lidar data - 05 - Newcastle to Broken Bay](#)

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Function: download

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Description:

Data (Shapefile)

Function: download

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Description:

Data (Shapefile)

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Data (Shapefile)

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[Storymap for seabed landforms](#)

Name: Storymap for seabed landforms

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

ArcGIS Storymap for NSW seabed landforms derived from marine lidar data 2022

Function: download

[Mapservice - NSW seabed landforms derived from marine lidar data 2022](#)

Name: Mapservice - NSW seabed landforms derived from marine lidar data 2022

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

ESRI REST Mapservice for NSW seabed landforms derived from marine lidar data 2022

Function: download

Unique resource identifier

Code 3f00d173-aa85-4e58-8dda-97948d772700

Presentation form Map digital

Edition 1

Dataset language English

Metadata standard

Name ISO 19115

Edition 2016

Dataset URI <https://datasets.seed.nsw.gov.au/dataset/3f00d173-aa85-4e58-8dda-97948d772700>

Purpose To support coastal and marine research, planning and management

Status Completed

Spatial representation

Type vector

Spatial reference system

Code identifying the spatial reference system 4283

Spatial resolution 5 m

Topic category

Keyword set	
keyword value	MARINE-Coasts MARINE MARINE-Reefs PHOTOGRAPHY-AND-IMAGERY-Remote-Sensing GEOSCIENCES-Geomorphology WATER ECOLOGY-Habitat ECOLOGY-Landscape
Originating controlled vocabulary	
Title	ANZLIC Search Words
Reference date	2008-05-16
Geographic location	
West bounding longitude	150.17
East bounding longitude	153.73
North bounding latitude	-37.55
South bounding latitude	-28.13
Vertical extent information	
Minimum value	-100
Maximum value	2228
Coordinate reference system	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711
Temporal extent	
Begin position	2018-07-01
End position	N/A
Dataset reference date	
Resource maintenance	
Maintenance and update frequency	Not planned
Contact info	
Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew

Lineage

Statewide marine lidar data was collected along the NSW coast in 2018, with elevation data collected down to an average of 35 m depth. This dataset represents a classification of seabed landforms derived from this marine lidar data, which delineates the prominent seabed features observed. This classification defines areas of reefs, peaks (uppermost part of the reef surface), plains, depressions and channels (within the reef surface), and scarps (areas greater than 10 degrees slope). The statewide dataset is provided as ArcGIS shapefiles divided into 9 segments along the coast, covering 4060 km² of NSW coastal waters. Features were classified using the Seabed Landforms Classification Toolset (ArcGIS), developed by DPE (Linklater & Morris, 2022) which applies the methodological framework presented in Linklater et al. (2019). In this classification approach, ruggedness (VRM, Walbridge et al. 2018), slope, finescale and broadscale Bathymetric Position Index (Slope Position, Evans et al. 2014) variables were derived from the marine lidar bathymetric dataset and used to characterise prominent features within the seascape. Procedures were implemented to reduce potential noise within the dataset and identify the full extent of reef outcrops. Manual editing was performed to separate inferred reef outcrops from soft sediment bedforms, with the resulting classification focused on identifying the presence, extent and character of submerged reef outcrops within the marine lidar dataset. The classification output was reviewed and edited by the data creator to capture observed and interpreted seabed features. The resulting layer was externally reviewed to ensure scientific rigour and data integrity.

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Walbridge, S., Slocum, N., Pobuda, M., Wright, D.J., 2018. Unified geomorphological analysis workflows with Benthic Terrain Modeler. *Geosciences*, 8(3), 94.

Evans, J., Oakleaf, J., Cushman, S., 2014. An ArcGIS Toolbox for Surface Gradient and Geomorphometric Modeling, Version 2.0-0. Available online:
<https://github.com/jeffrejevans/GradientMetrics>.

Limitations on public access

Scope dataset

DQ Topological Consistency

Explanation ArcInfo was used to do a topological consistency check to detect flaws in the spatial data structure. No polygon overlaps were detected.

DQ Absolute External Positional Accuracy

Explanation This dataset represents seabed features classified from 5 m cell size input bathymetry data, with no ground-truthing undertaken. Polygons smaller than 100 m² were eliminated. Due to the variability in sediment movement, precise feature boundaries can be variable over time.

Responsible party

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
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Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

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Metadata date 2024-02-26T13:30:48.700762

Metadata language