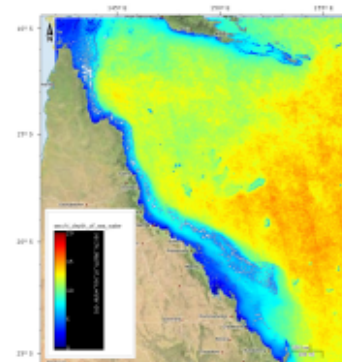


## Satellite-derived photic depth (secchi depth) on the Great Barrier Reef (NERP TE 2.3, 4.1, eReefs) (UQ, NASA, BOM)



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Title	Satellite-derived photic depth (secchi depth) on the Great Barrier Reef (NERP TE 2.3, 4.1, eReefs) (UQ, NASA, BOM)
Date	2015-12-16
Date type	Publication
Abstract	<p>This dataset consists of daily estimates of photic depth on the Great Barrier Reef from MODIS satellite imagery (from 2002 - 2015) using a quasi-analytical algorithm. This algorithm is based on a Type II linear regression of log-transformed satellite and in situ data (2002- 2012).</p> <p>This algorithm was developed as part of data delivery for several NERP projects and was implemented into the NASA SeaDAS tool for processing MODIS imagery. This algorithm and its data products are now routinely run by the Bureau of Meteorology as part of the eReefs Water Quality Dashboard.</p> <p>The data produced from this algorithm were key input datasets for the analysis of NERP TE project 4.1 and integrated as part of the NERP TE 2.3 GBR/TS environmental conditions reports.</p> <p>Method:</p> <p>The satellite imagery was first broken down into its estimated Inherent Optical Properties (IOP) using a quasi-analytical algorithm, outlined in [1]. This process converts the multi-spectral satellite images into an estimate of the various optical properties of the water such as backscattering and absorption of the water. The IOPs were then used to estimate the depth where 10% of the surface light (PAR) level was still available (Z10%).</p> <p>A regression of the in situ ZSD (secchi depth) values against the matching satellite estimates of Z10% was used to adjust the satellite-derived Z10% to ZSD. A Type II linear regression (RMA) of log-transformed satellite and in situ data was used to estimate ZSD for the GBR according to:</p> $ZSD = 10^{\frac{\log_{10}(Z10\%) - a_0}{a_1}}$ <p>where <math>a_0</math> and <math>a_1</math> are 0.529 and 0.816 for MODIS-Aqua (<math>N = 71</math>; <math>r_2 = 0.83</math>; <math>RMSE = 0.096</math>).</p> <p>The regional tuning parameters <math>a_0</math> and <math>a_1</math> were determined by regression between satellite and in-situ secchi depth measurements from AIMS and QDPI.</p> <p>More details about the methods used to create this dataset can be found in [2].</p> <p>Format:</p> <p>This data is available in NetCDF raster format from the BOM Marine Water Quality THREDDS server. This server also makes the data available various formats from the following services: OpenDAP, WMS and WCS.</p>

[http://ereeftds.bom.gov.au/ereefs/tds/catalogs/ereefs\\_data.html](http://ereeftds.bom.gov.au/ereefs/tds/catalogs/ereefs_data.html)

The data for this dataset is available in the mwq P1D Aggregation, mwq P1W Aggregation, mwq P1M Aggregation, mwq P6M Aggregation, mwq P1A Aggregation service end points. These correspond to daily and weekly, monthly, 6 monthly and annual aggregates respectively. The secchi depth estimates correspond to the SD\_MIM\_\* data layers in the service end points.

#### References:

1. Lee, Z.; Carder, K.L.; Arnone, R.A. Deriving inherent optical properties from water color: A multiband quasi-analytical algorithm for optically deep waters. *Appl. Opt.* 2002, 41, 5755–5772.

2. Weeks, S.; Werdell, P.J.; Schaffelke, B.; Canto, M.; Lee, Z.; Wilding, J.G.; Feldman, G.C. Satellite-Derived Photic Depth on the Great Barrier Reef: Spatio-Temporal Patterns of Water Clarity. *Remote Sens.* 2012, 4, 3781-3795.

Metadata language	eng
Character set	UTF8
Hierarchy level	Dataset

### OnLine resource

Linkage	<a href="https://eatlas.org.au/data/uuid/35f5a701-0daf-4b73-a210-fce5b30256cc">https://eatlas.org.au/data/uuid/35f5a701-0daf-4b73-a210-fce5b30256cc</a>
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Protocol	WWW:LINK-1.0-http--link
Linkage	<a href="https://eatlas.org.au/nerp-te/gbr-aims-coastal-turbidity-river-discharge-4-1">https://eatlas.org.au/nerp-te/gbr-aims-coastal-turbidity-river-discharge-4-1</a>
Protocol	WWW:LINK-1.0-http--related
Linkage	<a href="https://eatlas.org.au/nerp-te/gbr-aims-monitoring-torres-strait-coral-2-3">https://eatlas.org.au/nerp-te/gbr-aims-monitoring-torres-strait-coral-2-3</a>
Protocol	WWW:LINK-1.0-http--related
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Protocol	WWW:LINK-1.0-http--related

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Role	Point of contact
Topic category	Oceans

### Keyword

Keyword	marine
Type	Theme

### Extent

Description	Great Barrier Reef, Australia
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### Resource constraints

Use limitation	The data is provided by the Bureau of Meteorology and the licensing is determined by their service.
File identifier	35f5a701-0daf-4b73-a210-fce5b30256cc
Metadata language	eng
Character set	UTF8

### Metadata author

Individual name	eAtlas Data Manager
Organisation name	Australian Institute of Marine Science (AIMS)
Role	metadataContact
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