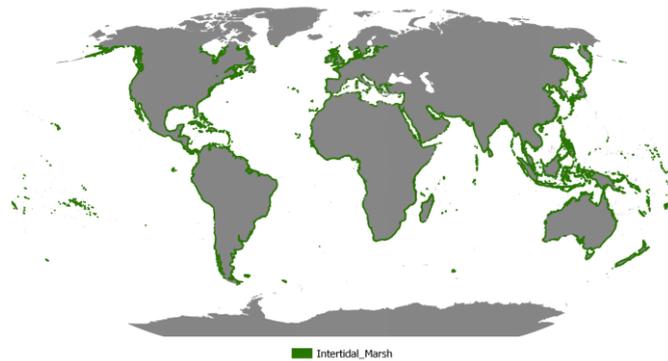


## Global Distribution of Tidal Flat Ecosystems



**Description:** The dataset contains global maps of tidal flat ecosystems produced via a supervised classification of 707,528 Landsat Archive images. Each pixel was classified into tidal flat, permanent water or other with reference to a globally distributed set of training data.

**Citation(s):** Murray N. J., Phinn S. R., DeWitt M., Ferrari R., Johnston R., Lyons M. B., Clinton N., Thau D. & Fuller R. A. (2019) The global distribution and trajectory of tidal flats. *Nature*. 565:222-225. <http://dx.doi.org/10.1038/s41586-018-0805-8>

Data available at: <https://www.intertidal.app/download> or <http://data.unep-wcmc.org/datasets/47>

**Temporal range:** 1984-2016

**Geographical range:** Global

**Supplementary information:** The image collection consists of a time-series of 11 global maps of tidal flats at 30m pixel resolution for set time-periods (1984–1986; 1987–1989; 1990–1992; 1993–1995; 1996–1998; 1999–2001; 2002–2004; 2005–2007; 2008–2010; 2011–2013; 2014–2016). The 2014-2016 global extent can be downloaded through the Ocean Data Viewer but for previous time- periods please see <https://www.intertidal.app/download/direct-download>.

This product depicts tidal flat ecosystems around the global coastline.

**Purpose of creation:** The maps were created to identify the non-vegetated areas of Earth's coastline that undergo regular tidal inundation. In some areas, these occur as tidal flats up to 24-km wide, such as the tidal mudflats of western Europe and East Asia. Our analysis included 56 predictor layers, many of which were Landsat composite metrics designed to identify individual pixels that undergo frequent wetting and drying.

**Creation methodology:** The dataset contains global maps of tidal flat ecosystems produced via a supervised classification of 707,528 Landsat Archive images. Each pixel was classified into tidal flat, permanent water or other with reference to a globally distributed set of training data. The classification was implemented along the entire global coastline between 60° North and 60° South from 1 January 1984 to 31 December 2016.

Dataset ID: MUR-001

Pixels classified as tidal flat in the analysis represent several types of tidal flat ecosystems, including unconsolidated fine-grain sediments (tidal mudflats), unconsolidated coarse-grain sediments (tidal sand flats), and consolidated sediments, organic material or rocks (wide tidal rock-platforms), while excluding spectral signatures indicating the presence of vegetation dominated intertidal ecosystems such as mangroves and vegetated marshes. The analysis aimed to identify pixels that are subject to regular tidal inundation, and therefore may also include other intertidal systems where intertidal dynamics are observable.

Version: 1.0 (2019)

Data lineage:

Category: Biogenic habitat

Keywords: landsat derived; uq; murray; tidal flats; intertidal; coastal

Similar datasets: WCMC-027, WCMC-013-014

Limitations: The approach achieved >82% accuracy when compared to independent, globally distributed, validation data. In many areas on earth pixels undergo a similar wetting and drying regime, so it is possible to find areas of aquaculture and coastal development that display similar dynamics. In addition, areas where there were few satellite images available for the analysis, or where the water is highly turbid, may also cause commission error.

Owing to the variable availability of Landsat images over the study period, each time step in the intertidal change data has a varying extent. This variation makes it difficult to interpret the dataset as a time series. To do so, QA layers may be used to develop masks of the minimum extent where the classifier was implemented. Furthermore, as a time-series where each time-step has variable accuracy, we recommend using an appropriate statistical model rather than direct measures of area change. Please read the paper or contact the corresponding author for further information.

Maintenance frequency: Data are updated on a yearly basis.

Main access/use constraint: Creative Commons Attribution 4.0 Unported (CC BY 4.0). See <https://creativecommons.org/licenses/by/4.0/> for details. Free to (1) copy and redistribute the material in any medium or format, (2) remix, transform, and build upon the material for any purpose, even commercially. You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

Other access/use constraints:

Dataset ID: MUR-001

Contact organisation: The University of Queensland

Organisation type: Creator Acronym:

Name: Dr. N. Murray Position: Research Fellow

City: Brisbane Country: Australia

E-mail: murr.nick@gmail.com

Web site: <https://www.uq.edu.au/>

Data format(s): Raster (.tif, geotiff)

Distribution format(s): Raster (.tif, geotiff) Dataset size (uncompressed): ~3.5 GB

Webpage and/or download: [https://wcmc.io/MUR\\_001](https://wcmc.io/MUR_001)

Other webpage: <https://www.intertidal.app/home>

Web map service: [https://gis.unep-wcmc.org/arcgis/rest/services/marine/MUR\\_001\\_Intertidal\\_Marsh/MapServer](https://gis.unep-wcmc.org/arcgis/rest/services/marine/MUR_001_Intertidal_Marsh/MapServer)

#### Factsheet:

Resolution, scale: 30m Reference system: WGS 1984

West bounding: -180 East bounding: 180

South bounding: -60 North bounding: 60

Metadata standard: UNEP-WCMC Specific Date of metadata: 16/01/2019