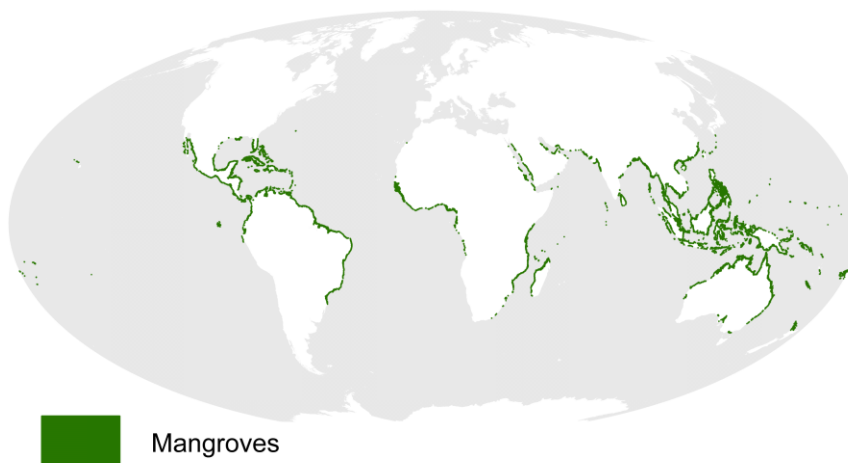


## Global Distribution of Mangroves USGS (2011)



<b>Description:</b>	This dataset shows the global distribution of mangrove forests, derived from earth observation satellite imagery.
<b>Citation(s):</b>	Giri C, Ochieng E, Tieszen LL, Zhu Z, Singh A, Loveland T, Masek J, Duke N (2011). Status and distribution of mangrove forests of the world using earth observation satellite data (version 1.3, updated by UNEP-WCMC). <i>Global Ecology and Biogeography</i> 20: 154-159. Paper DOI: 10.1111/j.1466-8238.2010.00584.x; Data URL: <a href="http://data.unep-wcmc.org/datasets/4">http://data.unep-wcmc.org/datasets/4</a>
<b>Temporal range:</b>	1997-2000
<b>Geographical range:</b>	Global
<b>Supplementary information:</b>	Attribute table: ISO 3166 3 character code of country (ISO3); surface area (AREA_KM2; in sq-km; calculated using Global Mollweide equal-area projection); surface area (AREA_M2; in sq-m; calculated using Global Mollweide equal-area projection).
<b>Purpose of creation:</b>	The aim was to use a globally consistent and repeatable methodology, to produce a high-resolution dataset.
<b>Creation methodology:</b>	The dataset was created using Global Land Survey (GLS) data and the Landsat archive. Approximately 1,000 Landsat scenes were interpreted using hybrid supervised and unsupervised digital image classification techniques. See Giri et al. (2011) for full details.
<b>Version:</b>	1.3 (June 2015)
<b>Data lineage:</b>	Changes to this dataset include: <ul style="list-style-type: none"> <li>- Ver 1.1: Country codes (ISO3) added by UNEP-WCMC.</li> <li>- Ver 1.2 (October 2013): Duplicate polygons were identified and removed, bringing the total number of polygons in the dataset down to 1,397,008. Additionally two areas of incorrect mangrove in New Zealand were removed (inland north of Lake Waikare; outside the mouth of Kaipara Harbour). Additionally, the areas of east and west Pacific were found to be shifted in version 1.1. As the shift was not uniform in direction or distance, they were moved in small batches of clusters, based on ArcGIS Online imagery and World Street Map. During final checks on the final dataset, it was found that mangrove data were absent from the Comoros, Mayotte, the Seychelles and Bermuda: data from an earlier draft version of the dataset were</li> </ul>

hence incorporated for these areas.

- Ver. 1.3 (June 2015): Just under 10,000 extraneous features were deleted from Papua New Guinea, Belize City, the Jaffna Peninsula of Sri Lanka, and Eastern Java/Bali. Corrections were made to polygons in Peninsular Malaysia (101.3E, 3N; 101.75E, 2.6N; 102E, 2.44N), Northern Sumatra, Myanmar (94.3E, 18.7N), and Thailand (98.3E, 9N; 98.5E, 8N; 99.9E, 6.4N). Mangroves incorrectly lining the main streets of Abu Dhabi were also removed.

**Category:** Biogenic habitat

**Keywords:** coastal, blue carbon, remote sensing, satellite, USGS, mangrove, forest, habitat, ecosystem

**Similar datasets:** WCMC-011, WCMC-012

**Limitations:** Results were validated using existing distribution data and published literature. Note that small patches (< 900-2,700 sq-m) of mangrove forests cannot be identified using this approach. This methodological approach had a number of challenges, such as cloud cover and noise. There may also be areas where land cover was misclassified.

Known issues:

- As the dataset may still contain overlapping polygons, a dissolve operation (within a GIS) might be needed before surface area calculations are carried out.
- Satellite tile omissions were found in Thailand (coast adjacent to Ko Tarutao, southwest Thailand, and at 98.8E and 8.2N) and in Peninsular Malaysia (101E, 3.6N; 101.2E, 1.95N) when creating version 1.3;
- Missing data in Thailand (98.8 degrees East, 8.2 degrees North), which can be compared with the World Atlas of Mangroves (2010) dataset.
- Mangrove occurrence data adjacent to the Gahirmata Marine Sanctuary and north of Paradwip in India appear to be better in the World Atlas of Mangroves (2010) as the occurrence data in this dataset have too great an extent, particularly at the eastern end.
- Mangroves represented in the World Atlas of Mangroves (2010) dataset and other resources are not documented on Ko Tarutao (Thailand) or on Pulau Rupert Island (Northern Sumatra) in this dataset.
- Sharply defined gap in mangrove distribution on the Yucatan Peninsula (Mexico) at -90.3W and 21N, which is not present in the World Atlas of Mangroves (2010) dataset.

In addition to the present dataset (WCMC-010 (2011)), UNEP-WCMC distributes two other global mangrove data layers (WCMC-011 (2010), WCMC-012 (1997)). The two most recent datasets were both created using satellite imagery: WCMC-10 (2011) used a globally consistent methodology, whilst WCMC-011 (2010) also included observed data from various national/regional/international and other contributors.

**Maintenance frequency:** Corrections are made on an ad-hoc basis.

**Main access/use constraint:** UNEP-WCMC General Data License (excluding WDPA). See [www.unep-wcmc.org/policies/general-data-license-excluding-wdpa#data\\_policy](http://www.unep-wcmc.org/policies/general-data-license-excluding-wdpa#data_policy) and [www.unep-wcmc.org/policies](http://www.unep-wcmc.org/policies). For commercial use, please contact [business-support@unep-wcmc.org](mailto:business-support@unep-wcmc.org).

Dataset ID: WCMC-010

Other access/use None  
constraints:

Contact organisation: UN Environment World Conservation Monitoring Centre

Organisation type: Custodian Acronym: UNEP-WCMC

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Data format(s): Vector (polygon; .shp)

Distribution format(s): Vector (polygon; .shp) Dataset size (uncompressed): 0.98 Gb

Webpage and/or download: <http://data.unep-wcmc.org/datasets/4>

Other webpage: <http://www.arcgis.com/home/item.html?id=62b6797f5091428fa89e10f7b3a1f73c>

Web map service: [http://ec2-54-204-216-109.compute-1.amazonaws.com:6080/arcgis/rest/services/marine/WCMC\\_010\\_MangrovesUSGS2011/MapServer](http://ec2-54-204-216-109.compute-1.amazonaws.com:6080/arcgis/rest/services/marine/WCMC_010_MangrovesUSGS2011/MapServer)

Factsheet: <http://wcmc.io/mangroves>

Resolution, scale: 30 m Reference system: WGS 1984

West bounding: -180.0 East bounding: 180.0

South bounding: -38.8 North bounding: 32.4

Metadata standard: UNEP-WCMC Specific Date of metadata: 01/07/2015