Madagascar Country Insights

21 Feb 2025

Congratulations! This country has available data.

This page includes country-specific insights and more detailed analysis, including carbon stocks, emissions factors, and ecosystem wetland area for mangrove, marsh, and seagrass ecosystems. This report details information for the selected country, **Madagascar**.

Please explore the rest of the dashboard for more exciting visualizations, map features, and data.

Resources referenced to calculate estimates for **Madagascar** are listed below under 'References' at the bottom of this document.

Total Carbon Stock Estimates

Total Carbon stock estimates were calculated for each country and habitat At this time total Carbon stock estimates do not include seagrass

We estimate that **Madagascar** contains between 56400595.51 to 38910424.88 metric tonnes of soil C to a depth of 1 m, with a mean estimate of 47655510.2 metric tonnes C.

country	territory	habitat	total_stocks	total_stocks_lower	total_stocks_upper	total_stocks_se
Madagascar	Madagascar	total	47655510	56400596	38910425	4461778

This total estimate includes total mangrove carbon stocks, from NA to NA metric tonnes of soil C to a depth of 1 m, with a mean estimate of 43502722.53

country	territory	habitat	total_stocks	total_stocks_lower	total_stocks_upper	total_stocks_se
Madagascar	Madagascar	mangrove	43502723	NA	NA	3970799

This total estimate also includes total tidal marsh carbon stocks, ranging from NA to NAmetric tonnes of soil C to a depth of 1 m, with a mean estimate of 4152787.67

country	territory	habitat	total_stocks	total_stocks_lower	total_stocks_upper	total_stocks_se
Madagascar	Madagascar	marsh	4152788	NA	NA	583933.3

Seagrass carbon stocks were not included in the total value due to lack of a global, transparent, and independently assessed seagrass habitat map, however, best available areas and stocks for **Madagascar** are explored in the following 'Wetland Areas and Activities' section.

Wetland Areas and Activities

We estimate mangrove area in **Madagascar** to be 238396.896893235 to 18410.4333036088 hectares, with a mean estimate of 271503.030340423 hectares according to Global Mangrove Watch Bunting et al. (2018).

We estimate tidal marsh area in **Madagascar** to be 9864.27197582115 to 18410.4333036088 hectares, with a mean estimate of hectares according to Worthington et al. (2024).

We estimate seagrass area to be **Madagascar** to be a mean of 579346 hectares, according to McKenzie et al. (2020), aggregating data from multiple sources.

McKenzie et al. (2020) classifies seagrass area estimates as either high or medium to low confidence. seagrass_area_high_confidence % of the estimated seagrass area of **Madagascar** is considered high to medium confidence, while seagrass_area_low_confidence % of the estimated seagrass area is categorized as low confidence.

Calculated Stocks and Emissions Factors

This section of the report details whether data is available to estimate Tier I, Tier II, or Tier III value estimates for tidal marsh, mangrove, and seagrass ecosystems in **Madagascar**.

If data for the selected country is available in the Coastal Carbon Atlas, we have applied a Tier II emission factor based on a simple average of country specific data queried from the Atlas.

Data from **Madagascar** includes 97 soil profiles from 97watersheds. This data comes from 1 different habitat types.

If there is not yet any country specific information in the Coastal Carbon Atlas, we instead applied IPCC Tier I estimate. IPCC Tier I estimates for mangrove, marsh, and seagrass ecosystems are listed below. **SOURCE**

The table in this section also details whether the calculated Tier II value is significantly different from the estimated Tier I values. This is observed in the "Overlap" column.

Table 4: IPCC Tier I Value Estimates

Habitat	Mean	Lower_CI	Upper_CI
mangrove	386	351	424
marsh	255	254	297
seagrass	108	84	139

Table 5: Availiability of Tier I and Tier II Data

Country	Territory	Habitat	Tier	Overlap
Madagascar	Madagascar	mangrove	Tier II	Country-specific average is significantly less than Tier I
Madagascar	Madagascar	marsh	Tier I	NA
Madagascar	Madagascar	seagrass	Tier I	NA

Tier I Carbon Stocks

This table includes Tier I Carbon Stocks included for **Madagascar**.

country	territory	habitat	stock_MgHa_mean	stock_MgHa_lowerCI	stock_MgHa_upperCI	tierCI	carbon_pool
Madagascar	Madagascar	marsh	255	254	297	TierI	soil
Madagascar	Madagascar	seagrass	108	84	139	TierI	soil

Tier II Carbon Stocks

This table includes Tier II Carbon Stock estimates for **Madagascar**. Estimates in this table were derived from data queried from the Coastal Carbon Atlas. SOURCE

country	territory	habitat	tier	carbon_pool	stock_MgHa_mean	stock_MgHa_lowerCI	stock_MgHa_upperCI
Madagascar	Madagascar	mangrove	TierII	soil	160.2292	9.043124	177.9534

Tier III Carbon Stocks

Tier III carbon stocks were estimated, when available, from remote sensing data from Maxwell et al 2021 and Sanderman et al 2018. The table below details whether estimated values are available for **Madagascar**, and any overlap with associated Tier I or Tier II values.

If there are no Tier III estimates associated with the selected country, please refer to Tier I and Tier II tables.

country	territory	habitat	stock_MgHa_mean	stock_MgHa_lowerCI	stock_MgHa_upperCI	tierIII_overlaps_tierIII	tierIII_greaterlessthan_tierIII	tierIII_overlaps_tierI	tierI
Madagascar	Madagascar	mangrove	252.0123	218.6788	285.3459	greater than	Remote-sensing esimate is significantly greater than country-specific average	less than	Remote-sensing esimate is significantly less than Tier I	Tier III

References

Bunting, Pete, Ake Rosenqvist, Richard M. Lucas, Lisa-Maria Rebelo, Lammert Hilarides, Nathan Thomas, Andy Hardy, Takuya Itoh, Masanobu Shimada, and C. Max Finlayson. 2018. "The Global Mangrove Watch—a New 2010 Global Baseline of Mangrove Extent." *Remote Sensing* 10 (10): 1669. https://doi.org/10.3390/rs10101669.

McKenzie, Len J, Lina M Nordlund, Benjamin L Jones, Leanne C Cullen-Unsworth, Chris Roelfsema, and Richard K F Unsworth. 2020. "The Global Distribution of Seagrass Meadows." *Environmental Research Letters* 15 (7): 074041. https://doi.org/10.1088/1748-9326/ab7d06.

Worthington, Thomas A., Mark Spalding, Emily Landis, Tania L. Maxwell, Alejandro Navarro, Lindsey S. Smart, and Nicholas J. Murray. 2024. "The Distribution of Global Tidal Marshes from Earth Observation Data." *Global Ecology and Biogeography* 33 (8). https://doi.org/10.1111/geb.13852.