

# Detailed Insights: Costa Rica

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## Welcome!

You have reached the CCN Inventory Tool Detailed Insights Report.

Congratulations! This geography has available data.

Potential data availability within the Inventory Tool ranges from Tier I, Tier II, or Tier III Carbon stock estimates.

This document includes country-specific insights and more detailed analysis, including carbon stocks, emissions factors, and ecosystem wetland area for mangrove, marsh, and seagrass habitats. This report details information for the selected geography, **Costa Rica**.

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

Resources referenced to calculate estimates for **Costa Rica** are listed below under ‘References’ at the end of this document.

If you have any questions or data you would like to add to the Coastal Carbon Network, please reach out to us at [CoastalCarbon@si.edu](mailto:CoastalCarbon@si.edu).

## Total Carbon Stock Estimates

Total Carbon stock estimates were calculated for each geography in total, and for mangrove, tidal marsh, and seagrass habitats when available.

We estimate that **Costa Rica** contains a mean estimate of  $1.00562 \times 10^7$  metric tonnes soil Carbon.

We estimate that **Costa Rica** contains between  $1.17638 \times 10^7$  to  $8.34863 \times 10^6$  metric tonnes of soil C to a depth of 1 m, with a mean estimate of  $1.00562 \times 10^7$  metric tonnes C.

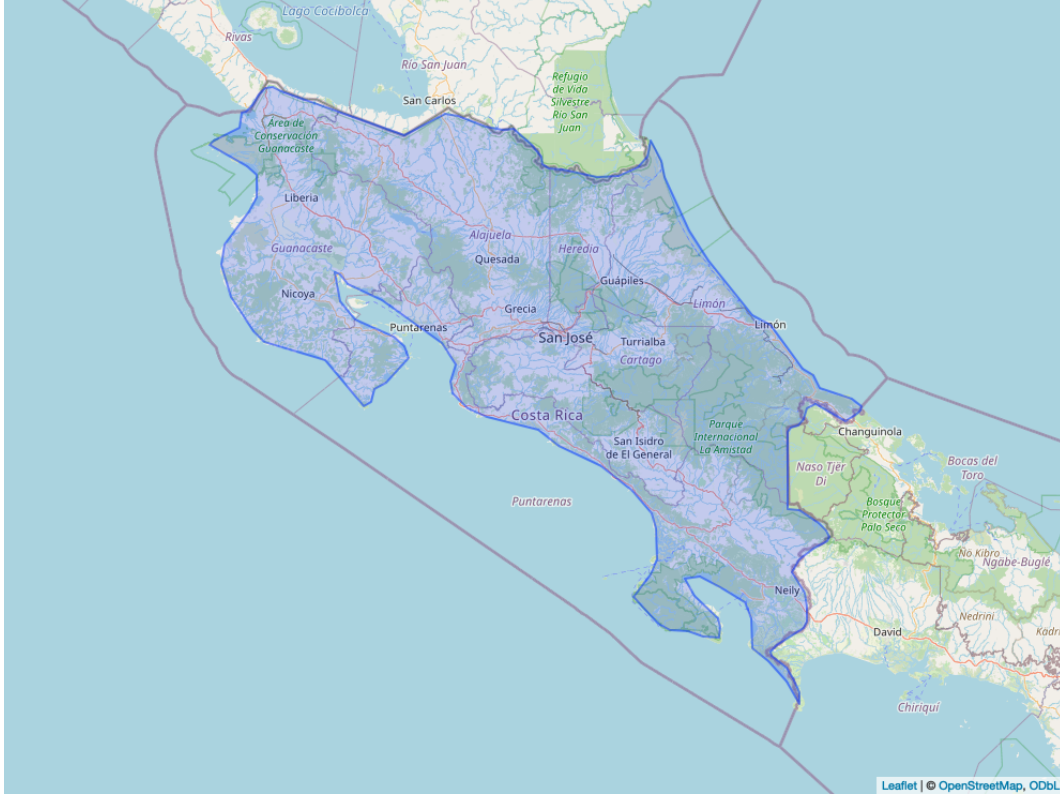


Figure 1: Costa Rica

Table 1: Total Geography Level Carbon Stocks

Country	Territory	Total Stocks	Upper CI	Lower CI
Costa Rica	Costa Rica	10056196	8348628	11763763

This total estimate includes total mangrove soil carbon stocks, with a mean estimate of  $9.65269 \times 10^6$  metric tonnes of soil C to a depth of 1 meter.

This total estimate also includes total tidal marsh carbon stocks, ranging from  $2.94573 \times 10^5$  to 1788.87 metric tonnes of soil C to a depth of 1 m, with a mean estimate of  $4.03511 \times 10^5$

We estimate seagrass soil carbon stocks for **Costa Rica** to have a mean estimate of 1728

## Wetland Areas and Activities

We estimate mangrove area in **Costa Rica** to be 34060 to 44970 hectares, with a mean estimate of 38790 hectares according to Global Mangrove Watch Bunting et al. (2018).

We estimate tidal marsh area in **Costa Rica** to be 958.5 to 1789 hectares, with a mean estimate of hectares according to Worthington et al. (2024).

We estimate seagrass area to be **Costa Rica** to be a mean of 16 hectares, according to McKenzie et al. (2020), which aggregates global seagrass data from a number of sources.

## 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 **Costa Rica**.

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 **Costa Rica** included in the Coastal Carbon Atlas consists of 179 soil profiles from 59 watersheds. This data comes from 2 distinct habitat type(s).

In the case that 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.

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 2: IPCC Tier I Value Estimates

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

## Data Availability by Tier

Table 3: Availability of Tier I and Tier II Data

Country	Territory	Habitat	Tier	Overlap
Costa Rica	Costa Rica	mangrove	Tier II	Country-specific average is significantly less than Tier I
Costa Rica	Costa Rica	marsh	Tier I	No Tier II data available at this time
Costa Rica	Costa Rica	seagrass	Tier I	No Tier II data available at this time

## Tier I Carbon Stocks

This section includes Tier I Carbon Stocks included for **Costa Rica**. In the case that all habitats; mangrove, tidal marsh, and seagrass have available Tier II estimates, please refer to Table 2: IPCC Tier I Value Estimates for applicable Tier I values.

Table 4: Tier I Carbon Stock Estimates

Country	Territory	Habitat	Mean Stock (MgHa)	Lower CI	Upper CI
Costa Rica	Costa Rica	marsh	255	254	297
Costa Rica	Costa Rica	seagrass	108	84	139

Good news! The selected country has Tier II data for each available habitat. Please refer to Table 2: IPCC Tier I Value Estimates for applicable Tier I estimates and Table 5: Tier II Carbon Stock Estimates.

## Tier II Carbon Stocks

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

A selected country may have available Tier II values for one or multiple habitats, this is dependent on core data accessible through the Coastal Carbon Atlas. At the time of analysis, referencing Version 1.5.0, **Costa Rica** represents a total of 179 cores across 2 distinct habitats.

Table 5: Tier II Carbon Stock Estimates

Country	Territory	Habitat	Mean Stock (MgHa)	Lower CI	Upper CI	Standard Error
Costa Rica	Costa Rica	mangrove	249	225	272	11.91779

## 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 **Costa Rica**, and any overlap with associated Tier I or Tier II values.

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

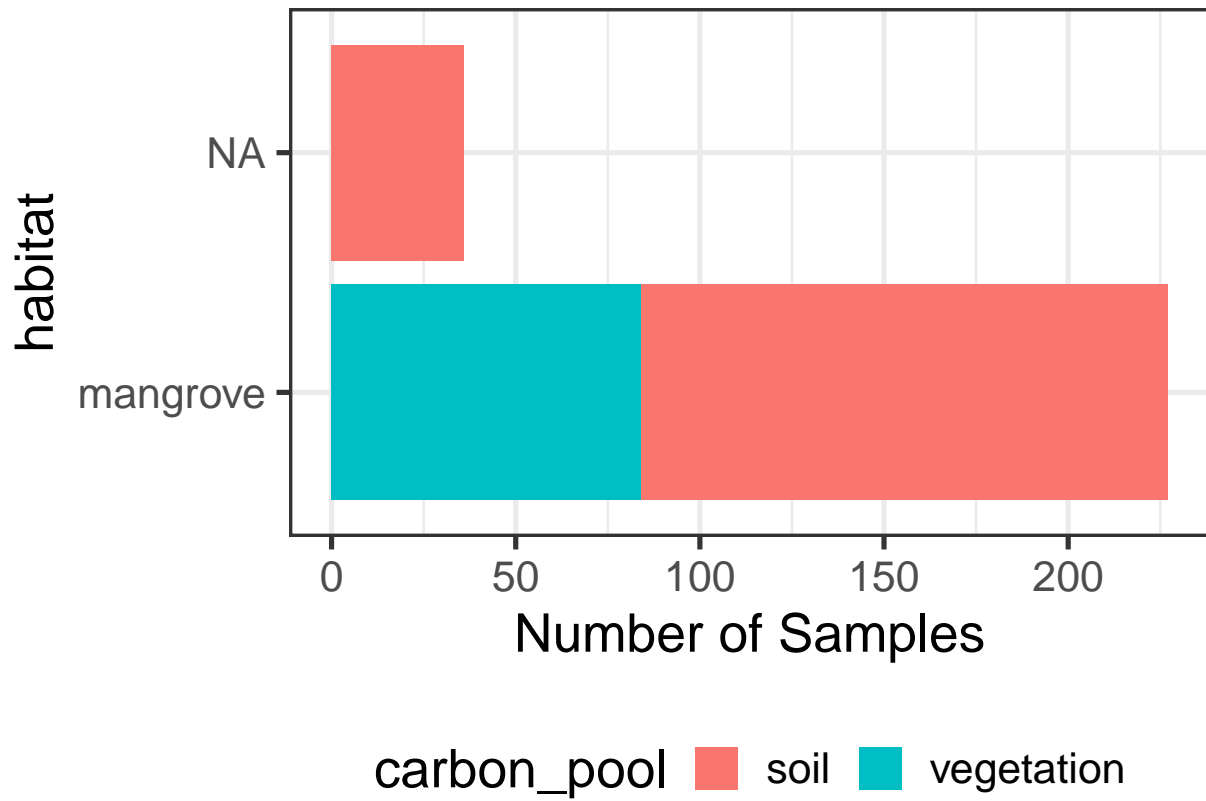
Table 6: Tier III Carbon Stock Estimates

Country	Territory	Habitat	Mean Stock (MgHa)	Lower CI	Upper CI
Costa Rica	Costa Rica	mangrove	336	265	407

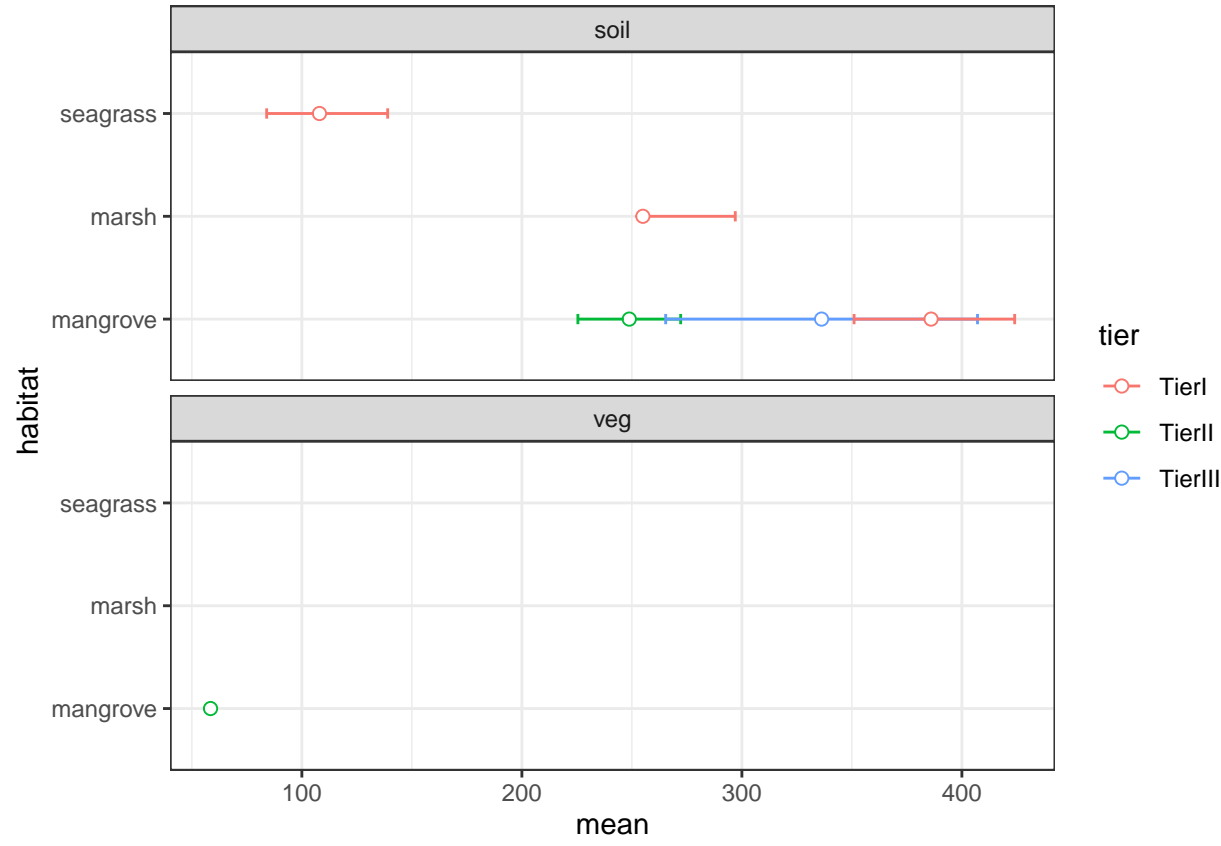
In the selected geography, Costa Rica, Tier III estimated stock MgHa values are greater than Tier II values estimated from Coastal Carbon Atlas Data. In this case, the Tier III Remote-sensing estimate overlaps country-specific average. Additionally, estimated Tier III stock values derived from remote sensing are less than estimates Tier I values. In this case, the Tier III Remote-sensing estimate overlaps Tier I estimate.

## Visualizations

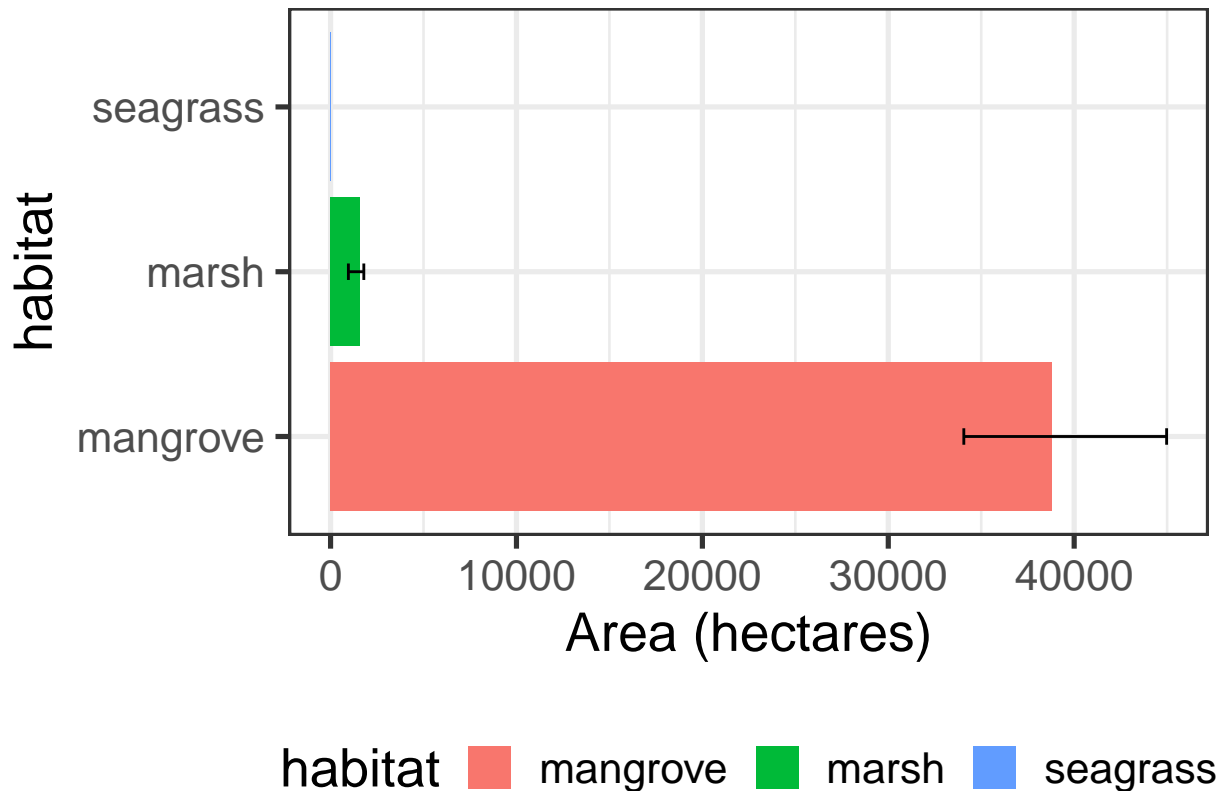
### 1. Data Metrics



2. Emissions Factors



### 3. Activity Data



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