

Integrating Mangrove Ecosystems into NDCs

With the Global Mangrove Watch

The Global Mangrove Watch (GMW) is an online platform that provides remote sensing data and tools for global monitoring of mangroves, in scientific collaboration with Wetlands International, Aberystwyth University, soloEO, TNC, JAXA, NASA and a host of partners.

The Global Mangrove Watch represents a critical tool, based on the most accurate science, to support countries in the process of implementing, updating or revising their NDCs, and move towards ratcheting up national and collective ambition on the potential of blue carbon ecosystems for climate action.



Mangroves in Nationally Determined Contributions

Nature-based Solutions, including the protection, conservation and restoration of mangroves and other blue carbon ecosystems (such as seagrasses and tidal salt marshes), are an integral component of achieving the goals of the Paris Agreement.

Per hectare, healthy mangroves and their underlying soils sequester carbon at higher rates than terrestrial forests, making them critical ecosystems and allies for global climate action. Recent estimates demonstrate that preventing just 1% of mangrove loss globally results in 200,000,000 tons of carbon stored, while restoration of losses since 1996 could safeguard carbon in soil and aboveground biomass equivalent to 1.27 gigatons of CO₂ – equating to over 520 million barrels of oil, or the annual emissions of 49 million cars in the USA.¹

Importantly, mangroves are currently one of only three marine ecosystems currently recognized by IPCC Guidance – the 2013 Wetlands Supplement – for the measurable contribution that they can make to countries' emissions reductions strategies. Mangrove

ecosystems also provide critical benefits in helping frontline communities adapt and build resilience to a changing climate by protecting against extreme weather events, filtering water, and supporting sustainable livelihoods, such as fisheries.

Countries can include commitments to protect, conserve, and restore their mangroves for both their mitigation or adaptation benefits within their Nationally Determined Contributions (NDCs) under the Paris Agreement. Integrating mangroves in NDCs serves as a strong signal of national policy priorities, thus driving resources and action, both globally and nationally, for mangrove protection and restoration.

¹ https://www.mangrovealliance.org/wp-content/uploads/2022/09/The-State-of-the-Worlds-Mangroves-Report_2022.pdf

Mangroves in Nationally Determined Contributions cont.

Importantly, the potential of Nature-based Solutions (NbS) should be additional and complementary, not a substitute, to the critical need for countries to decarbonize in other sectors, such as energy and transport.

Blue carbon ecosystems are a largely untapped opportunity to enhance ambition and action in NDCs. Between the two NDCs submissions, only 58 out of 113 countries added new coastal and marine NbS for either mitigation or adaptation purposes.² These ecosystems offer a wide range of currently underused climate benefits to consider when enhancing national climate ambition and efforts to ensure the achievement of the goals of the Paris Agreement. Identifying and closing gaps in data, national reporting systems, and domestic policy frameworks are crucial elements for including blue carbon commitments in NDCs.³

By closing such gaps, the Global Mangrove Watch (GMW) offers Parties a critical resource to support the integration of mangrove commitments into NDC revisions that have local and national relevance – and in collectively ratcheting up ambition and action on mangrove and other blue carbon ecosystems.

² <https://ocean-climate.org/en/cop26-and-beyond-engaging-countries-to-further-include-coastal-and-marine-ecosystems-in-national-climate-commitments/>

³ https://static1.squarespace.com/static/5c7463aaa9ab95163e8c3c2e/t/5eebd558e9401b71cc31ab6a/1592513885741/Blue_Carbon_NDC_Guidelines_single.pdf

Using the Global Mangrove Watch

The Global Mangrove Watch ([GMW](#)) is an online platform that provides remote sensing data and tools for global monitoring of mangroves, in scientific collaboration with Wetlands International, Aberystwyth University, soloEO, TNC, JAXA, NASA and a host of partners.

It gives universal access to near real-time information on where and what changes there are to mangroves worldwide, and highlights critical examples of the value of mangroves.

The GMW is a free, easy-to-use, and scientifically robust tool for governments to move towards accurately integrating mangrove commitments into NDCs and other national reporting mechanisms like GHG inventories, based on their own domestic needs and priorities.

The GMW is the primary global source of information on mangrove status and extent. The Global Mangrove Watch's Climate and Policy Dashboard offers national status reports on integration of mangroves into international policy commitments.

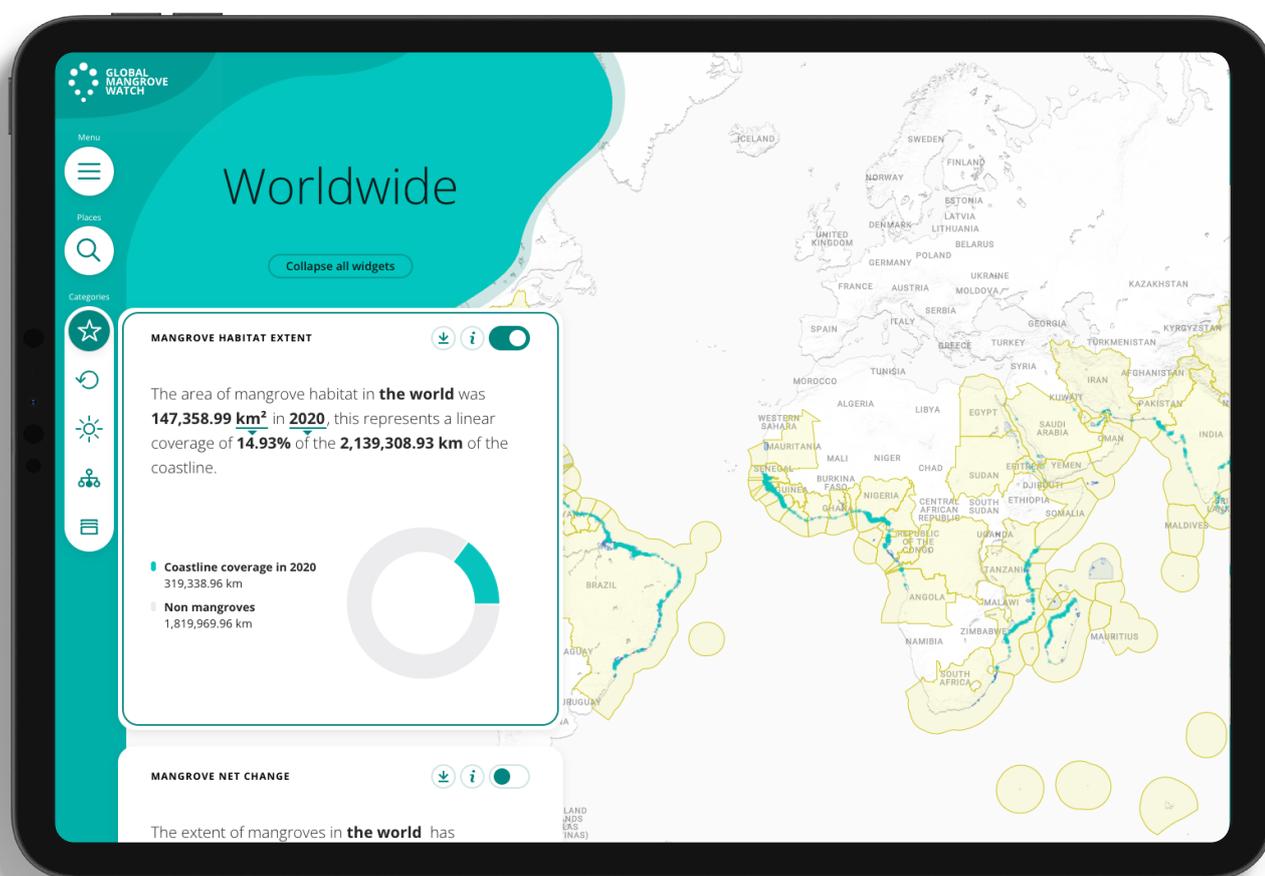
The dashboard also shows at a glance whether countries have included blue carbon ecosystems into their current NDC (for mitigation or adaptation), if mangroves are considered in the national forest definition, and if a country has specified implementing the IPCC Wetlands Supplement. Collectively, these elements support the improvement of a government's national GHG inventory and other reporting requirements like the Biennial Transparency Report.

Governments can utilize GMW data as a scientific baseline for setting and reporting on national commitments- for example, using GMW data to assess the current extent of mangroves in their territories under protection, and calculate the national carbon storage of their mangroves.

Furthermore, the capacity of the Global Mangrove Watch to provide data on both baseline habitat cover and historic change, can provide Governments the baseline to consider a country's blue carbon investment potential - for example, by estimating the mangrove forest area that can qualify for blue carbon financing.

How to use the Global Mangrove Watch

Governments can use the following GMW tools to include mangrove ecosystem management activities into their new or updated NDCs and reporting:



Mangrove Habitat Extent

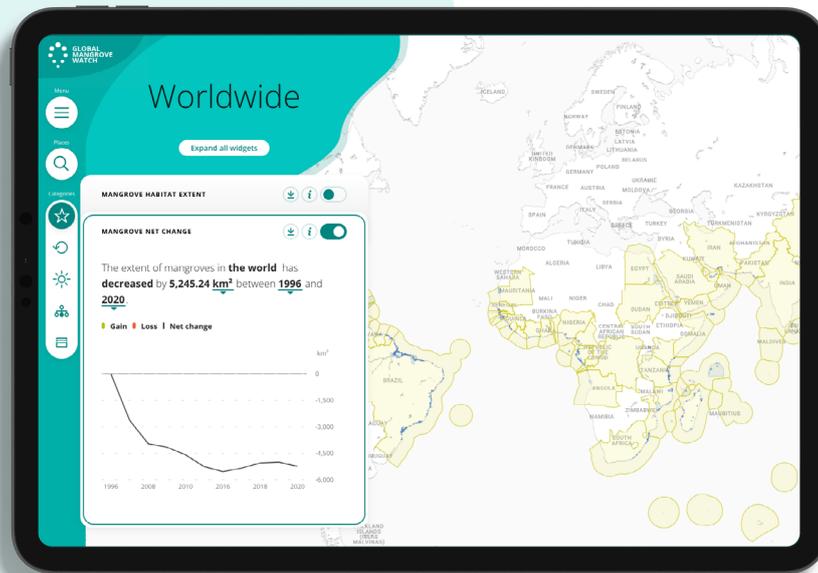
The GMW mangrove extent layer describes the national areal extent of mangrove habitat (km²) and the length of coast with mangrove forests, in the years 1996, 2007-2010 and 2015-2020. This layer allows governments and other stakeholders to track the progress of mangrove extent against national and international goals, setting a baseline for reporting progress and establishing targets for the UNFCCC or other conventions. This layer also allows governments to know the location and extent of these ecosystems in their countries, allowing them to better articulate relevant priorities and actions for mangrove management activities in their future NDCs.

Mangrove Net Change

This layer describes the change in the areal extent of mangrove habitat (km²) in the years 1996, 2007-2010 and 2015-2020. This enables governments to track how the extent of mangroves has changed over time for the purpose of inventory reporting, establish a baseline for setting national commitments, and visualize the national impact of conservation and restoration efforts. The loss rate and net change are also critical components necessary to understand blue carbon investment potential in addition to climate mitigation potential.

Mangrove Blue Carbon

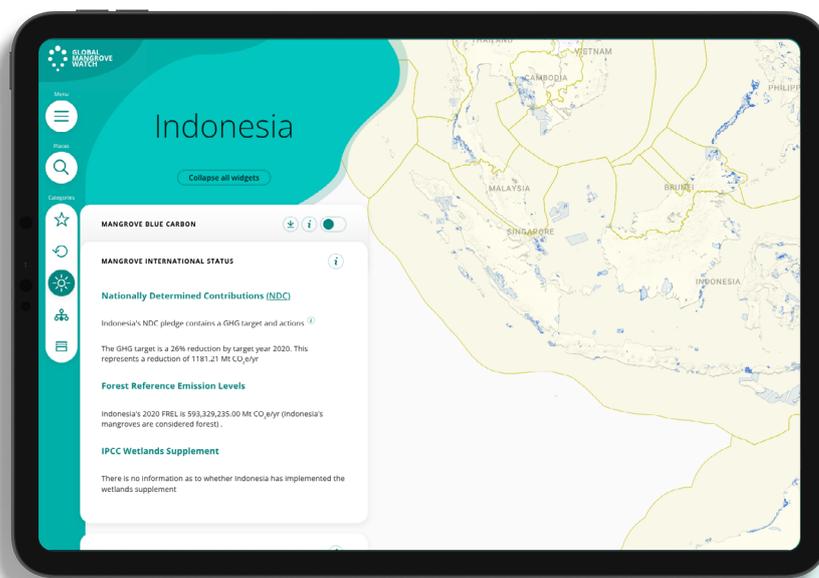
With an established understanding of habitat coverage and change, governments need to know how much carbon these ecosystems store. This layer describes the quantity and density of carbon stored in mangrove biomass and soil at national and global scales with the best available science from a combination of remotely sensed measurements, and regionally-specific models, validated in-situ field data⁴. With this tool, governments can review carbon stocks, and include the contribution of national mangrove forests towards NDC targets.



⁴ Simard et al. (2019), Sanderman et al. (2018), and Bunting et al. (2018).

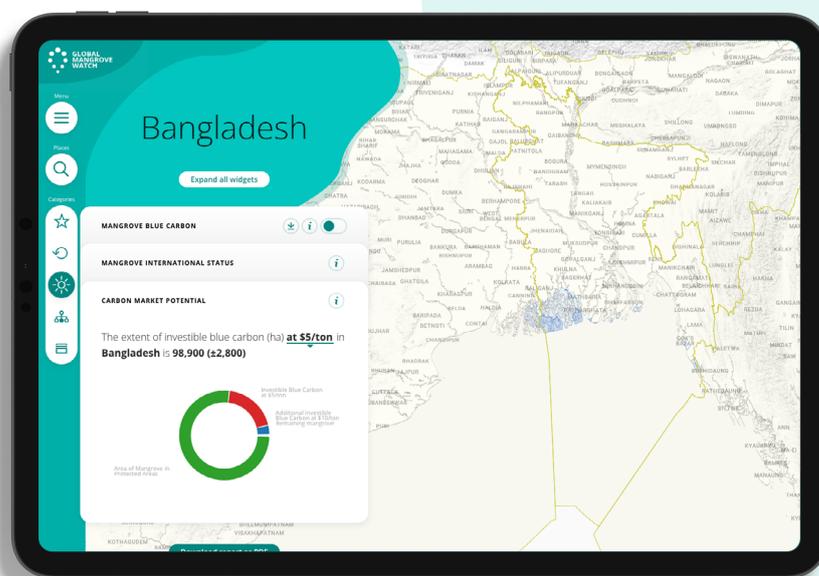
Mangrove international status

This layer of the GMW offers national status reports on integration of mangroves into international policy commitments with at-a-glance data on (1) whether coastal and marine nature-based solutions are included in a specific country's NDC; (2) if a country has specified implementing the IPCC Wetlands Supplement; and (3) if mangroves are considered in the national forest definition for engaging in REDD+. Collectively, this information allows governments to better understand the landscape of where other countries are already using coastal and marine NbS, and where there might be opportunities to enhance their use in future NDC revisions.



Carbon market potential

NDCs are one of many entry points for securing climate finance, including the potential for carbon-related actions, making it important for countries to track investible carbon areas (defined as those under imminent threat of loss or decline if left unprotected by a conservation intervention) that can be protected through carbon financing. Through the GMW, governments can estimate the area of mangrove forest that can qualify for blue carbon financing that is financially sustainable for over 30 years, based on prices of \$5/ton and \$10/ton⁵ (noting that market price may change over time). This information can be used to better understand the potential of blue carbon finance at a national scale, while keeping in consideration NDC ambition and evolving decisions around Article 6 in the Paris Agreement that may impact carbon market engagement potential.



⁵ Numbers based on [Zeng et al. \(2021\)](#)

Benefits & limitations of the GMW

The Global Mangrove Watch provides an effective means for periodic mapping and monitoring of mangroves over national, regional and global scales, in a uniform manner, with consistent data and classification algorithms for all areas and time frames.

This enables a more consistent and accurate comparison of extent between different countries and regions, as well as analysis of change trends over time, than comparing data obtained from different sources.

While the Global Mangrove Watch can provide important input to mangrove inventory, assessment and monitoring, knowledge of the local context and collection of in situ data remains critical for ensuring locally relevant outputs.

Conclusion

Nature-based Solutions - including the protection, conservation and restoration of mangrove and other blue carbon ecosystems - are an integral component of reaching the 1.5°C target laid out by the Paris Agreement.

The Global Mangrove Watch represents a critical tool, based on the most accurate science, to support countries in the process of implementing, updating or revising their NDCs, and move towards ratcheting up national and collective ambition on the potential of blue carbon ecosystems for climate action.

The Global Mangrove Watch is also a valuable resource for international policymakers to assess **collective global progress** on mangrove restoration and blue carbon action towards the long-term goals of the Paris Agreement.

Currently, the GMW maps are used as the official UN indicator to assess mangrove progress towards SDG 6.6.1 (“change in the extent of water-related ecosystems over time”).

The GMW has also been proposed as the official dataset for reporting mangrove extent and changes under the UNFCCC Global Stocktake to support the world’s collective progress towards achieving the Paris Agreement.

Further Reading

The **Global Mangrove Alliance** is a world-wide collaboration between NGOs, governments, academics and communities working together towards a global vision for scaling up the recovery of mangroves through equitable and effective expansion of mangrove protection and restoration, in order to build a host of opportunities for coastal peoples and biodiversity around the planet.



For more information about the Global Mangrove Alliance and the state of the world's mangrove ecosystems, see the State of the World's Mangroves Report 2022. www.mangrovealliance.org/wp-content/uploads/2022/09/The-State-of-the-Worlds-Mangroves-Report_2022.pdf



There are numerous further UNFCCC processes, bodies, and ongoing negotiations where countries may advance efforts to address ocean-climate challenges and strengthen recognition of the role of coastal and marine nature-based climate solutions. This document by GMA partners summarizes many key entry points: static1.squarespace.com/static/603e674744293f085766ad7d/t/629a3826476ede10472acf7d/1654274089350/UNFCCC-ocean-climate-options-3-june-2022.pdf



For more information about the opportunities for blue carbon in NDCs and technical guidance on the inclusion of coastal wetlands within new and updated NDCs:

Full Guidelines

static1.squarespace.com/static/5c7463aaa9ab95163e8c3c2e/t/5eebd558e9401b71cc31ab6a/1592513885741/Blue_Carbon_NDC_Guidelines_single.pdf



Executive Summary

static1.squarespace.com/static/5c7463aaa9ab95163e8c3c2e/t/5f27860f8dd86201c1337f2d/1596425746332/BCI+NDC_ExecSum_Final_singles.pdf



For an analysis on the distribution of existing NDCs that integrate blue carbon ecosystems as climate mitigation or adaptation solutions:

ocean-climate.org/en/cop26-and-beyond-engaging-countries-to-further-include-coastal-and-marine-ecosystems-in-national-climate-commitments/



For an analysis of blue carbon and mangroves in NDCs and the relative strength of those commitments:

faircarbon.org/content/fc/bluecarboninnDCsmap



For further reading on options for ocean-based sectoral mitigation targets, policies, or measures for countries to include in new or updated NDCs:

files.wri.org/d8/s3fs-public/2021-04/enhancing-nationally-determined-contributions-opportunities-ocean-based-climate-action.pdf?VersionId=zEiY0PuwHyP_zzc7UGjt.QFF4ooK0Vmu



For additional reading on the inclusion of broader natural climate solutions into NDCs: www.conservation.org/docs/default-source/publication-pdfs/guide-to-including-nature-in-ndcs.pdf?sfvrsn=99aecda2_2

For further information on the ocean and the UNFCCC Global Stocktake:



www.iucn.org/sites/default/files/content/documents/2021/the_ocean_and_the_unfccc_gst.pdf

For more information on mangrove's investment potential:



[Global potential and limits of mangrove blue carbon for climate change mitigation \(nus.edu.sg\)](https://nus.edu.sg)

Key Authors:



The Global Mangrove Watch (GMW) platform is the leading source of geospatial information related to mangroves worldwide and the evidence base informing the Global Mangrove Alliance (GMA). The Global mangrove Watch (GMW) was established in 2011 under the Japan Aerospace Exploration Agency's (JAXA) Kyoto & Carbon Initiative by Aberystwyth University, soloEO and the International Water Management Institute, with the aim to provide open access geospatial information about mangrove extent and changes to the Ramsar Convention on Wetlands. Today, The Nature Conservancy, Wetlands International, Aberystwyth University, and soloEO are working with JAXA, NASA and a host of partners to develop the Global Mangrove Watch Platform.