

## THE MANGROVE RESTORATION POTENTIAL MAP

The Mangrove Restoration Potential Map is a unique interactive tool developed to explore potential mangrove restoration areas worldwide and model the potential benefits associated with such restoration. The mapping tool was developed by The Nature Conservancy and IUCN, in collaboration with the University of Cambridge, and can be found on [maps.oceanwealth.org/mangrove-restoration](https://maps.oceanwealth.org/mangrove-restoration)



The Mangrove Restoration Potential Map (MRP Map) includes new assessments of the extent of mangrove losses and degradation since 1996, using modelling based on the most recent maps from Global Mangrove Watch.

- 9,736 km<sup>2</sup> of mangrove have been lost since 1996.
- 1,389 km<sup>2</sup> of mangroves have degraded over the same period.
- Current data suggest an average loss rate of 0.21% annually from 1996 to 2016, higher than the average for tropical and subtropical forest losses.
- At national level, losses are recorded in 97% of the countries and territories with mangroves (105 out of 108), while degradation is recorded in 76% (82 out of 108).
- Areas of degradation have the best restoration potential – and respond to rapid and effective intervention.

## Why Mangrove Loss and Degradation Matters

Healthy mangroves are a precious, almost priceless resource, and yet over the past 50 years the world has witnessed staggering levels of mangrove loss and degradation. Mangroves can quite literally save lives during storms, but losing mangroves also means losing livelihoods, food security, valuable timber production, coastal defence and one of the most efficient and important carbon stores on the planet.

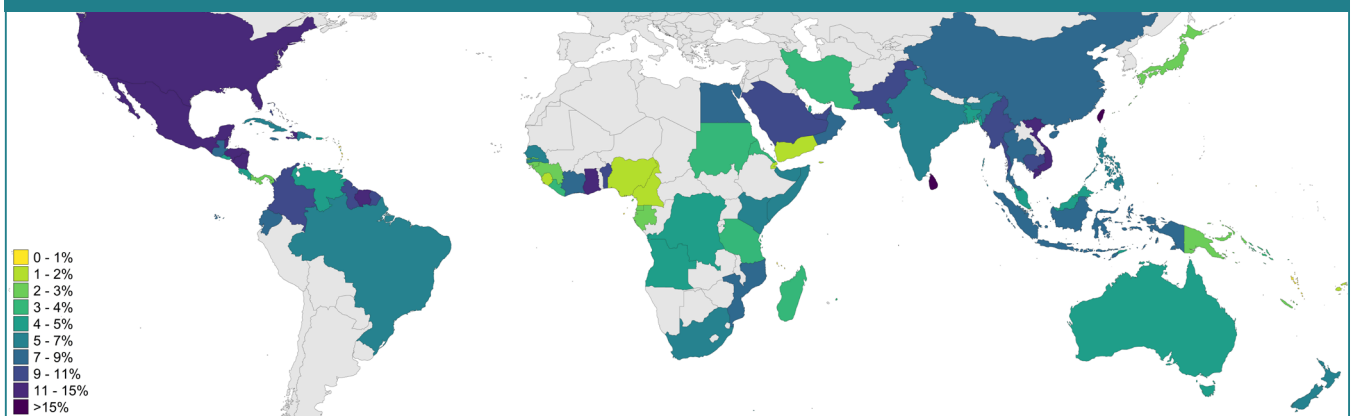
Mangrove forests are found in almost every warm coastal region of the world, but vast areas have been lost or degraded. Some have been cleared for short-term gains for agriculture or aquaculture, others have been over-harvested for firewood, timber, or charcoal production, often by poor communities. In some places mangroves have been lost to urban expansion and the development of coastal infrastructure, including roads and ports. But their loss is also our loss. The profits and benefits from loss and degradation are typically short-term, and often only flow to a small number of people. These benefits are dwarfed by the losses as coastal communities lose one of the most productive ecosystems on Earth.

## Mangrove Losses and Gains, 1996 to 2016

In 2018 the Global Mangrove Watch (GMW) team released the latest and most detailed maps of current mangrove distribution, and with this a time-series on mangrove losses that went back to 1996. Their latest map of mangrove coverage in 2016 shows some 136,714 km<sup>2</sup> of mangroves in 108 countries world-wide. Even in natural settings, mangrove forests can be opportunistic and dynamic, and so any time-series will show areas of expansion as well as loss. From the latest GMW maps, we were able to develop a maximum extent of mangroves over this time (some 145,594 km<sup>2</sup>), and could then calculate and locate mangrove losses and gains worldwide. Losses total 9,736 km<sup>2</sup> since 1996.

From this work it is clear that mangrove losses continue on every continent, although rates of loss have declined. Earlier records showed 1.04% annual losses worldwide in the 1980s, and 0.72% annual losses in the 1990s. The current data suggest an average loss rate from 1996 to 2016 of 0.21% annually, though this is still higher than the average for tropical and subtropical forest losses<sup>1</sup>. Detailed analysis by date and by region can be found in tables on page 4.

**The proportion of mangrove lost by country since 1996.** It is important to note that for some countries, particularly in Asia, quite extensive areas were lost prior to this data and are not incorporated into the model.



<sup>1</sup> Based on Keenan et al, 2015.



## Mangrove Degradation Between 1996 and 2016

In many locations mangroves remain in place but have been impacted and changed. Perhaps the most widespread causes of degradation are intensive harvesting for timber and fuelwood and changes to riverine inputs, with falling levels of freshwater flows or nutrient and sediment loads as a result of upstream water abstraction and dams. For example, freshwater abstraction from the Indus River has led to a reduction in water flows into the Indus Delta, with dramatic effects on mangroves – even where mangrove cover remains, there has been a change in the species and the biomass. Other causes of degradation can include pollution events such as oil spills, changes in sea level leading to drying out or flooding of mangroves, or the impact of extreme events such as hurricanes and flooding.

Using the 2016 GMW base maps we have developed global assessment of mangrove degradation using a new modelling approach that looks at changes in key vegetation parameters. We estimated that 1,389 km<sup>2</sup> of

mangrove forests have been degraded since 1996. We also modelled the rate of change and the trajectory, with areas classified as degraded, declining or recovering.

Mangrove losses are such that mangrove restoration is increasingly seen as a critical component of both conservation and shrewd coastal management – a genuine ‘win-win’ opportunity. Where mangroves are degraded rather than lost, they present an opportunity for rapid and effective intervention. Restoration of such areas may require little more than a reduction in or cessation of damaging actions. Some ecosystem services such as disaster risk reduction are still maintained by degraded mangroves, albeit at lower levels. Allowing trees to recover to full diversity and stature will safeguard and enhance these services and prevent the sometimes disastrous consequences of full loss, such as subsidence and erosion, which can make recovery a challenging and highly costly task. The role of the MRP Map in identifying areas with the greatest potential for restoration is discussed in a separate Information Brief.



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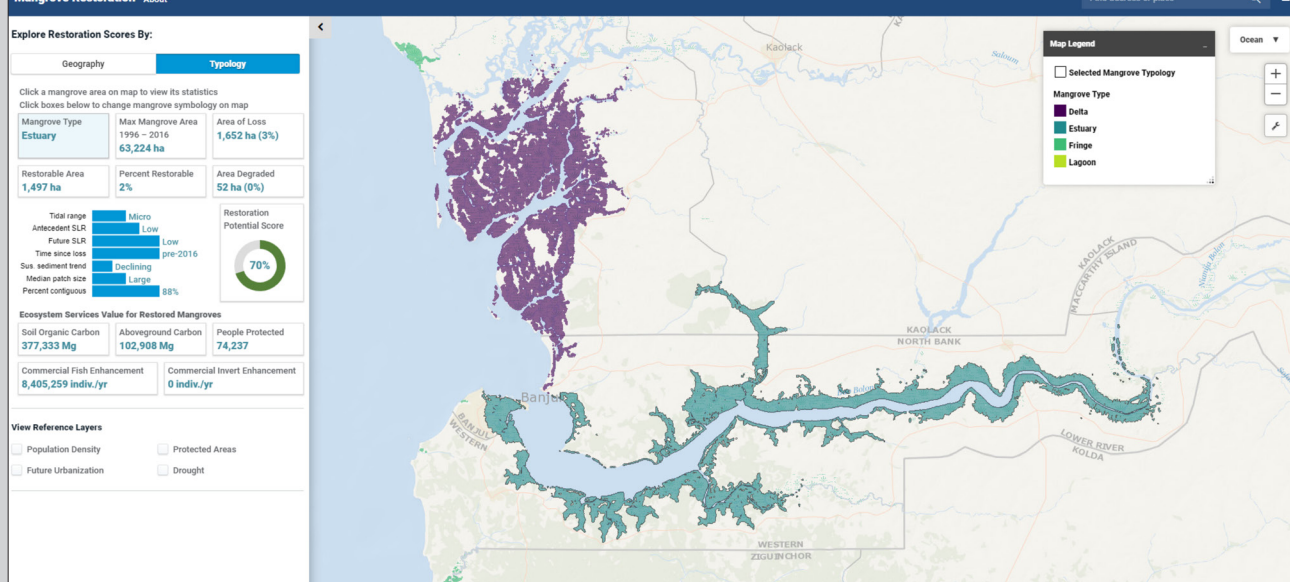
## Global mangrove losses and gains, 1996-2016, including annualised percentage change

Variable	1996	2007	2010	2016	1996-2016
Extent (km <sup>2</sup> )	142,795	138,901	137,629	136,714	-
Losses (km <sup>2</sup> )	-	5,969	3,498	3,057	8,437
Gains (km <sup>2</sup> )	-	2,074	2,227	2,142	2,356
% Change	-	-2.73	-0.92	-0.66	-4.26
Annual % Change	-	-0.25	-0.31	-0.11	-0.21

## By region: global mangrove net losses and gains, 1996-2016, including annualised percentage change

Region	1996 Area km <sup>2</sup>	2016 Area km <sup>2</sup>	Loss km <sup>2</sup>	Gain km <sup>2</sup>	% Change	Annual % Change
Australia & New Zealand	10,332	10,037	370	74	-2.86	-0.14
East & Southern Africa	7,630	7,329	424	122	-3.95	-0.2
East Asia	159	159	12	13	0.55	0.03
North & Central America & the Caribbean	22,702	21,072	2,196	566	-7.18	-0.36
Pacific Islands	6,410	6,327	146	63	-1.29	-0.06
South America	19,632	19,063	1,106	537	-2.9	-0.14
South Asia	8,701	8,492	435	226	-2.4	-0.12
South East Asia	46,789	44,060	3,308	579	-5.83	-0.29
The Middle East	334	319	19	4	-4.54	-0.23
West & Central Africa	20,107	19,857	422	171	-1.24	-0.06
<b>Total km<sup>2</sup></b>	<b>142,795</b>	<b>136,714</b>	<b>8,437</b>	<b>2,356</b>	<b>-4.26</b>	<b>-0.21</b>

### Mangrove Restoration



Explore the Mangrove Restoration Potential Map at [maps.oceanwealth.org/mangrove-restoration](https://maps.oceanwealth.org/mangrove-restoration)

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