Myanmar's changing mangroves

Implications for nature, people and climate

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Mangroves of Myanmar: an important resource at risk

Myanmar is home to globally significant mangrove forests, which support numerous endangered species, and are vital to local economies and society. However, these forests are undergoing rapid changes, putting the people and nature that depend upon them at risk. The UN-REDD project "Integrating mangroves sustainable management, restoration and conservation into REDD+ Implementation" focuses on tackling the destruction and degradation of mangrove ecosystems by working with local mangrove-dependent communities. In order to aid this ambition and prioritize effort, a series of maps have been produced, detailing where mangroves are found in Myanmar, where they are changing and which areas are of particular importance for nature, people and climate change mitigation and adaptation.

The importance of mangroves globally

Mangrove forests, found in tropical and subtropical coastal intertidal areas, are critical forest ecosystems. Mangroves provide essential ecosystem services at global and local scales, including storing carbon, protecting people, nature and businesses from storms and coastal erosion, providing habitat for coastal

and marine wildlife and supporting the livelihoods of coastal communities.

Did you know mangroves store 3 to 4 times more carbon than tropical forests per hectare? Myanmar's mangroves store an estimated 119 million tonnes of carbon in their biomass and soils.

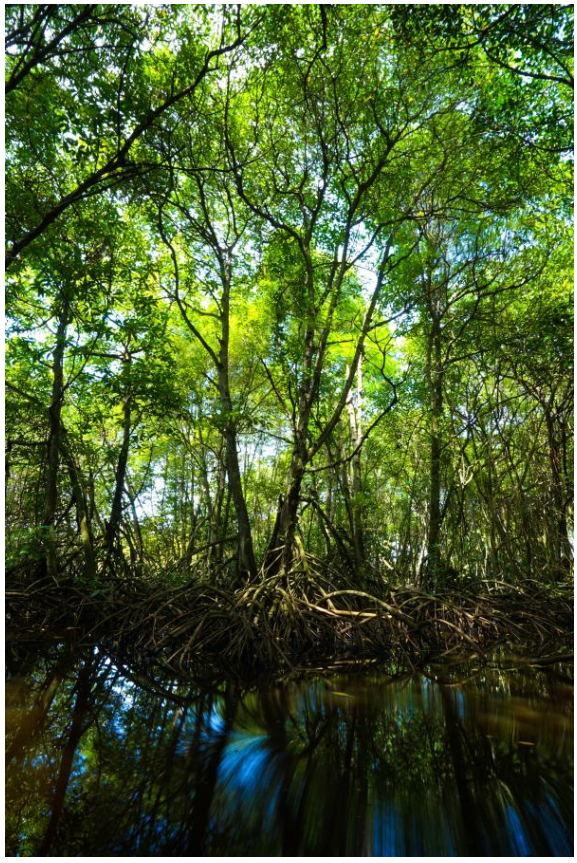
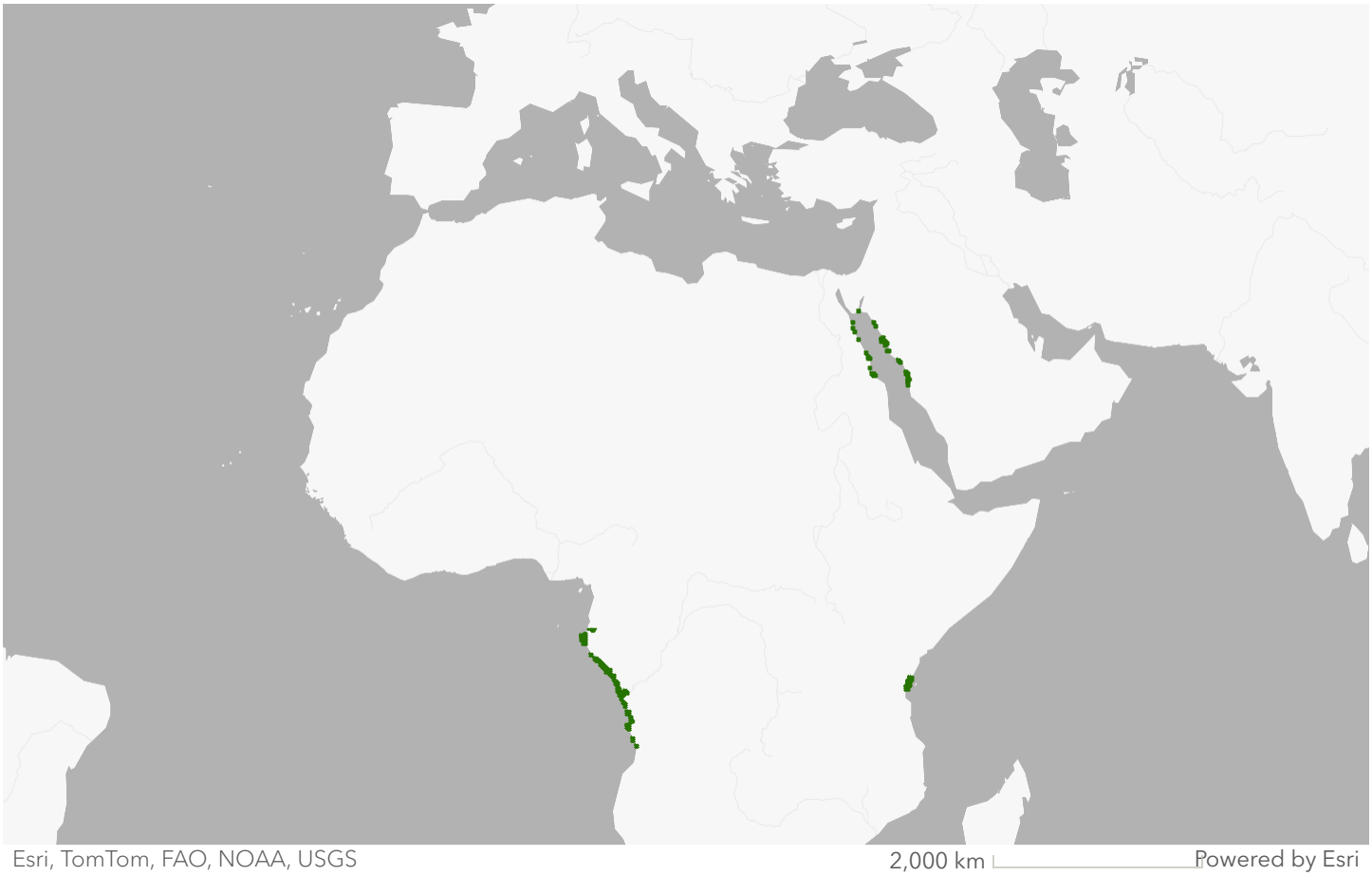
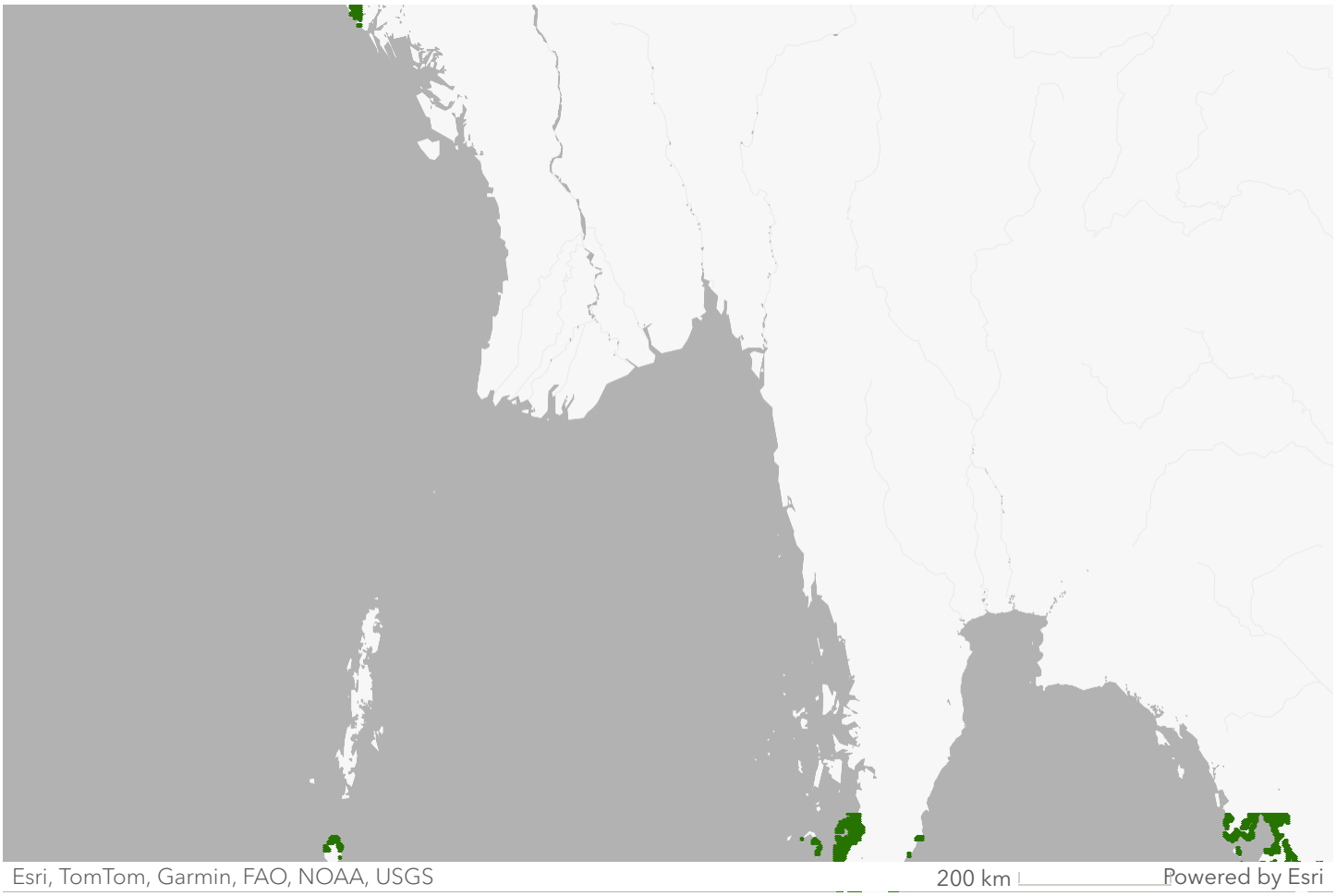


Photo by Aldino Hartan Putra via Unsplash



Mangroves are found in coastal areas throughout the tropics. Global datasets, such as Global Mangrove Watch, can be used to identify mangrove areas and monitor their change through time.

This map shows the global distribution of mangroves in the year 2020. Zoom in to explore.



Mangroves in Myanmar

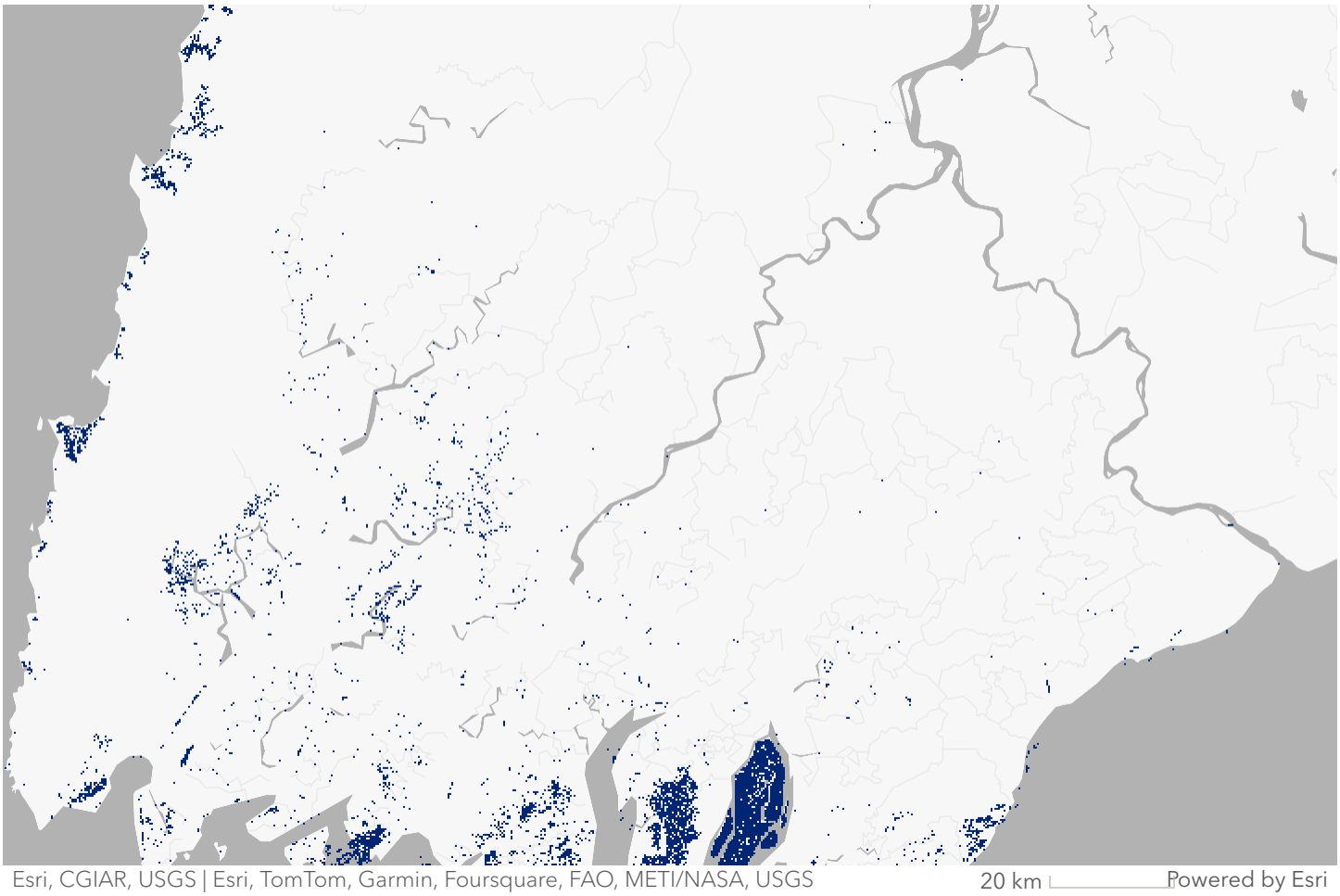
Using Global Mangrove Watch, it is possible to identify mangrove areas in Myanmar, which are found in all coastal regions of the country.

Myanmar contains an estimated 4% of the world's mangroves and 8.8% of the mangroves found in Southeast Asia (1–3). This makes it the country with the third largest area of mangroves in the region (4). Large concentrations of mangroves are found across the southernmost parts of the Ayeyarwady Delta, as well as in Rakhine state and Tanintharyi region (5).

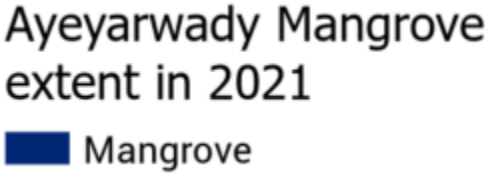
Global datasets can identify key areas of mangroves and monitor change in

them over large scales, both geographically and over time. However, national or local data, especially when collected from the ground, can yield more accurate results at the local scale. The distribution of mangroves in Ayeyarwady, Tanintharyi and Rakhine has been mapped in recent years by the UN-REDD Programme to monitor change and assess mangrove importance for people, nature and climate. Scroll down to explore the datasets.

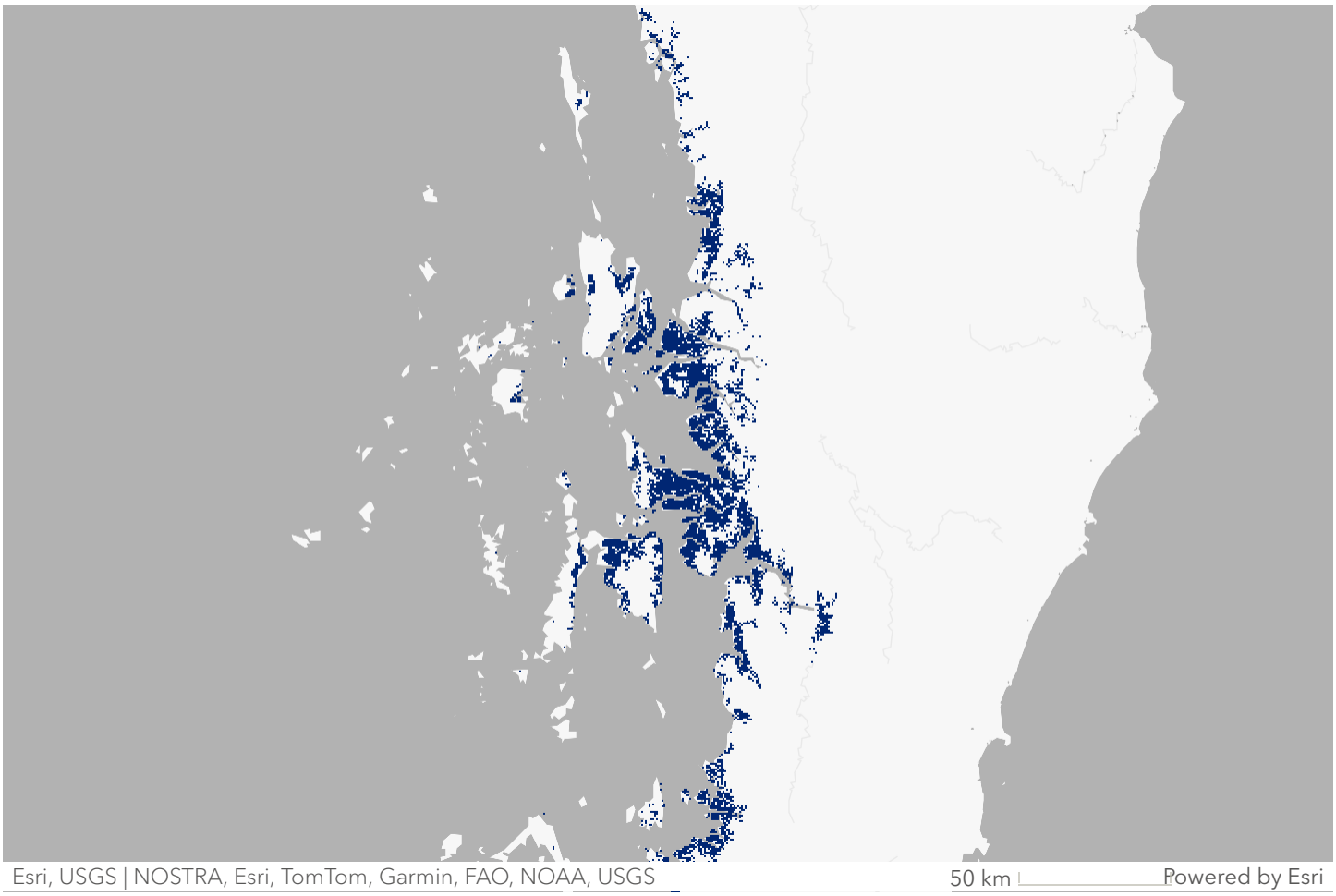
Data source: Mangrove coverage in 2020 (Global Mangrove Watch)



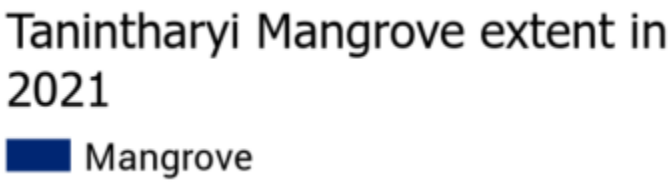
The **Ayeyarwady Delta** region has a high concentration of mangroves growing where land meets the sea. This map shows the extent of mangroves in Ayeyarwady for the year 2021.



Data Source: Mangrove extent (FAO 2023)



The Tanintharyi region in southern Myanmar is home to the largest region of remaining mature mangroves in Myanmar (3). Here you can explore the extent of mangroves in the region in 2021.



Data source: Mangrove extent (FAO 2023)

Supporting nature: Mangrove biodiversity and connectivity

Mangroves act as a habitat, breeding ground and nursery for many species and are hotspots of biodiversity. These include species such as the fishing cat (*Prionailurus viverrinus*), the lemon shark (*Negaprion brevirostris*), the mangrove pitta (*Pitta megarhyncha*) and several bee species that produce highly valued honey (3).

The loss and degradation of mangrove habitat threatens endangered wildlife, including species like mud crabs, white shrimp and molluscs that local communities depend upon for food, medicines and materials (6–8).

Top left photo: Mangrove Pitta (Pitta megarhyncha) Nakornthai, on AdobeStock

Bottom left photo: Lemon shark (Negaprion brevirostris) BetoBormann, on AdobeStock

Middle photo: Fishing cat (Prionailurus viverrinus) photocech, on AdobeStock

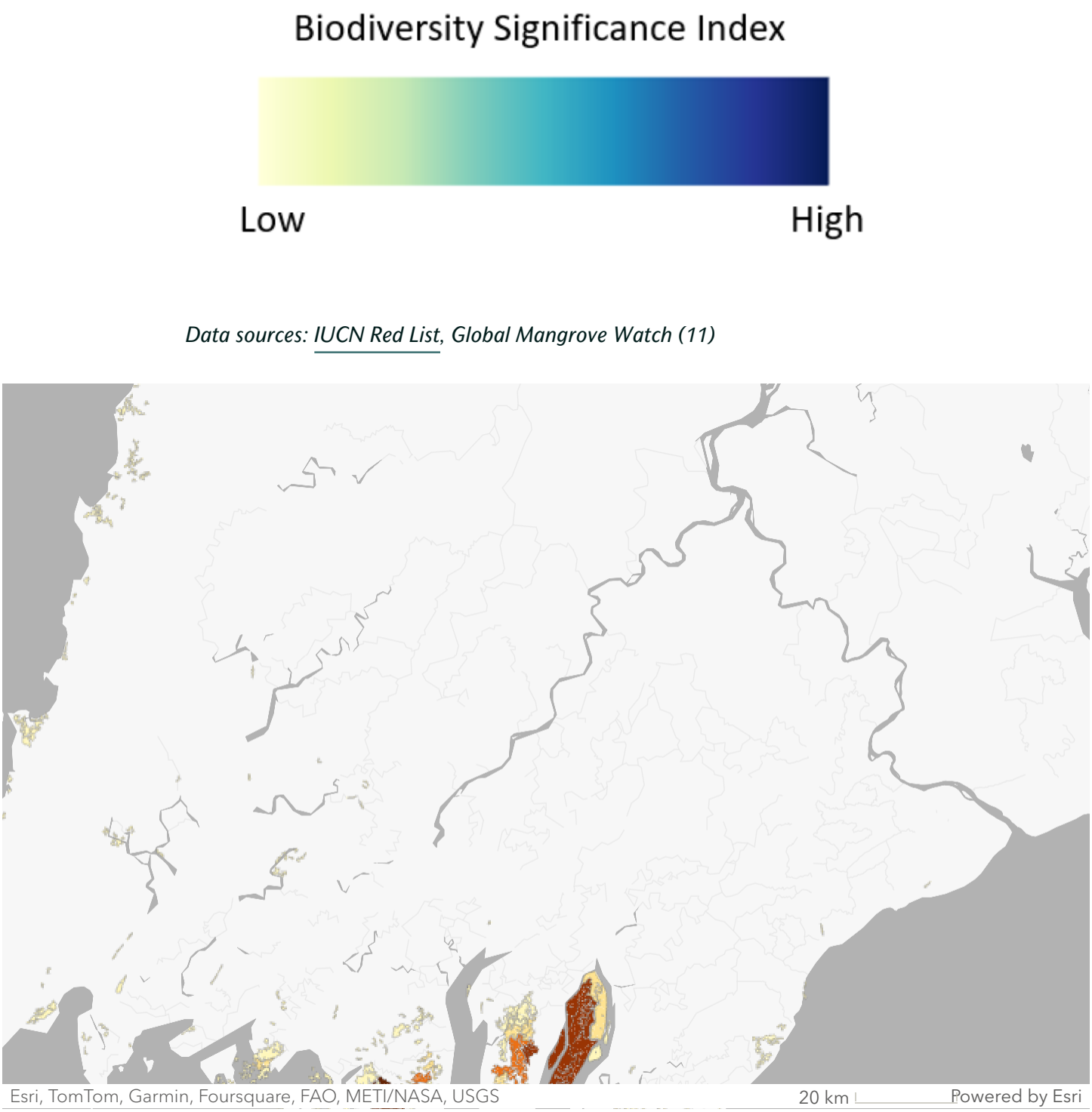
Top right photo: Irrawaddy dolphin (Orcaella brevirostris) Goran, on AdobeStock

Bottom right photo: Brown-winged kingfisher (Pelargopsis amauroptera) Tareq, on AdobeStock

Biodiversity

To measure areas of significance for biodiversity a layer of rarity weighted richness was prepared using the IUCN Red List range data (9) for mangrove associated plants, marine vertebrates, birds and terrestrial vertebrates. Species richness refers to the number of species in an area, while rarity weighted richness captures both species richness as well as the endemism of species.

Mangrove cover data from Global Mangrove Watch was combined with rarity weighted richness to produce maps showing the area of habitat (10) for each of the species included in the analysis. These maps were then used to compute a single rarity weighted richness map for Ayeyarwady and Tanintharyi. This analysis follows similar approaches to a recent UNEP report on global mangroves (4). This map displays the results of this analysis, clipped to Myanmar. Areas of high importance, in blue, are seen along the Myanmar coastline.

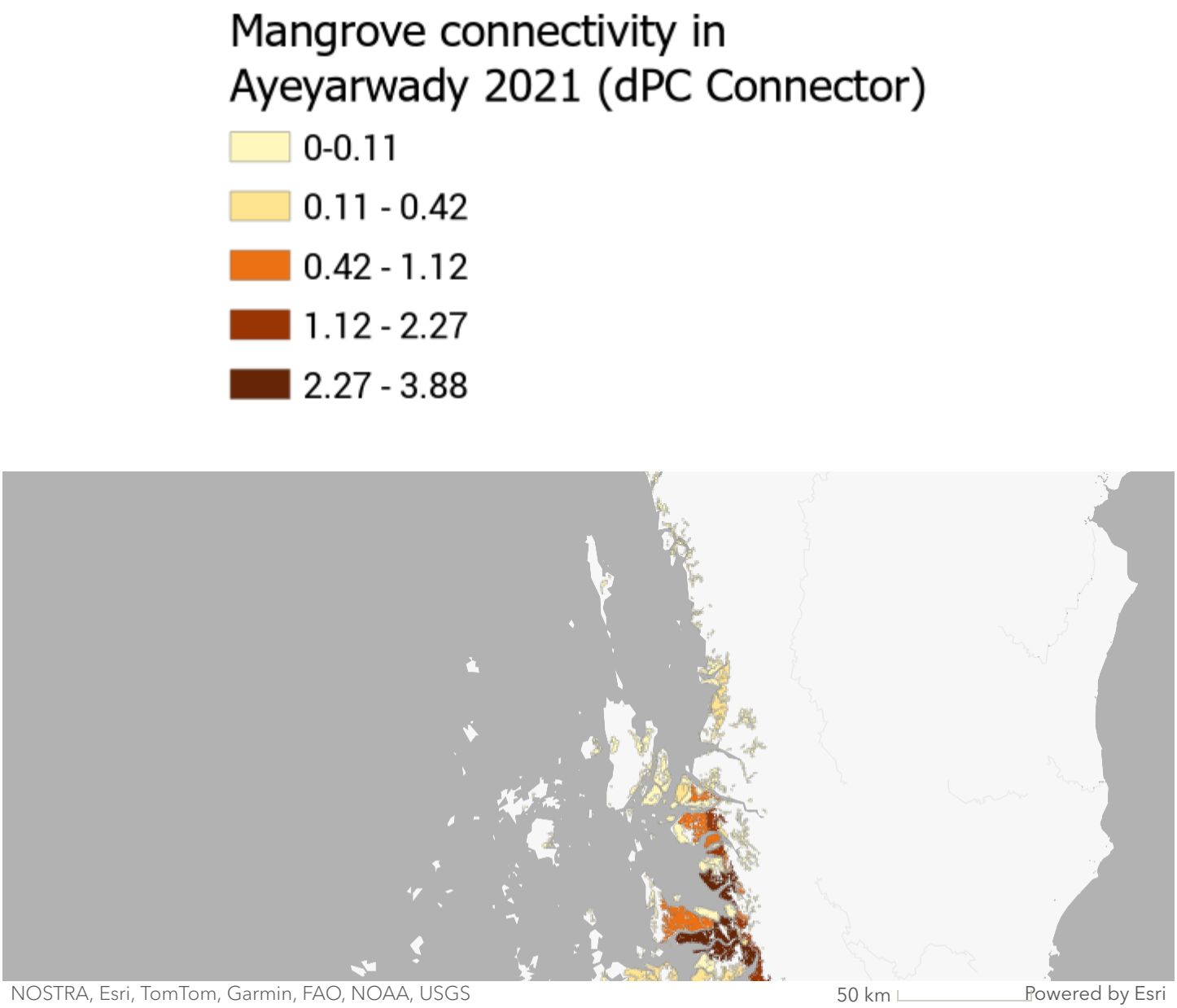


Data sources: IUCN Red List, Global Mangrove Watch (11)

Connectivity

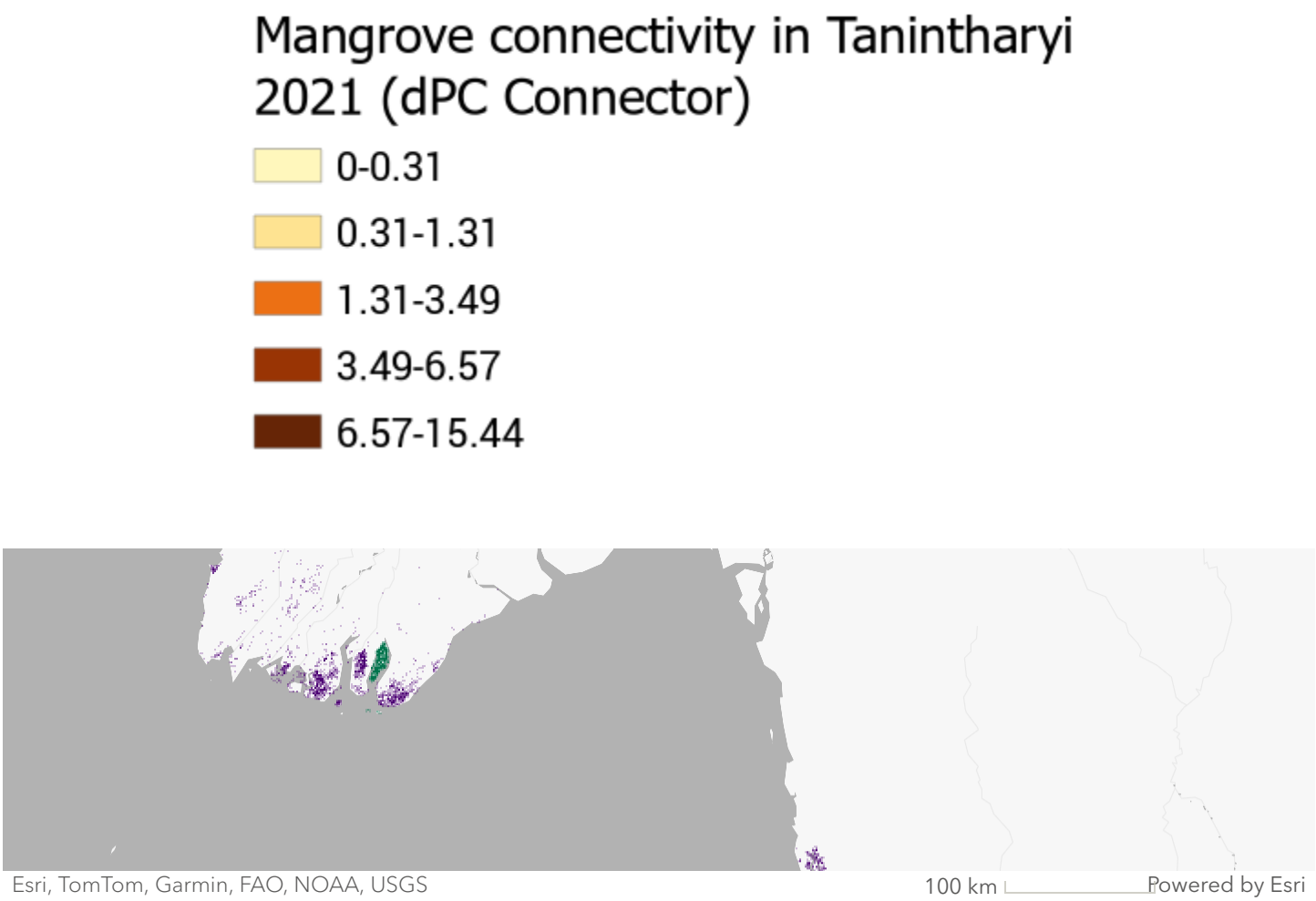
The connectivity of mangrove habitats is essential for their survival. It plays an important role in supporting the rich biodiversity found within these ecosystems by providing access to habitats for many species. Connectivity also allows for the dispersal of seeds and facilitates the maintenance of genetic diversity. This helps mangroves to adapt to changing environmental conditions.

This map shows the distribution of a value known as the "dPC connector". This is one fraction of the probability of connectivity (PC) index, an index that measures the importance of the change in landscape connectivity due to the removals of individual patches. This fraction highlights important "stepping stones" that link to other patches. Without these "stepping stones", patches would not be well connected or, in some cases, connected at all. The largest patches in the Ayeyarwady Delta are shown to be the most important, as their removal would significantly decrease mangrove connectivity in the area. In particular, the southern parts of Labutta district have some mangrove patches with the highest dPC connector values (ranging from 2.27-3.88). These areas play a crucial role in maintaining the connectivity of mangroves in the region. The Meinmahla Kyun Wildlife Sanctuary in Pyapon district is another significant area that contributes to mangrove connectivity.



In Tanintharyi, Myeik district has several patches of mangroves with high dPC connector values (ranging from 6.57 to 15.44), which likely hold immense importance for maintaining the overall connectivity of the mangrove ecosystem in the region.

Connectivity between mangrove patches can be reduced through direct impacts (e.g., deforestation for coastal infrastructure development) and indirect impacts (e.g., pollution resulting in the degradation of mangroves). If a highly ranked patch is removed, it would disproportionately reduce the overall connectivity of the mangrove ecosystem. Therefore, protecting and restoring these important mangrove patches is vital for preserving biodiversity and ecosystem services.



Protected Areas and Key Biodiversity Areas

Another way of understanding the importance of mangrove areas for nature is to examine where protected areas (PAs) and Key Biodiversity Areas (KBAs) have been designated or identified. For example, Lampi Marine National Park in the Myeik Archipelago of Tanintharyi has a high diversity of mangrove species recorded in a relatively small extent of mangroves (12).

Approximately 34% of mangroves benefit from some level of legal protection in Myanmar, but many remain "unclassified" with ambiguous tenure. However, only 3% of Myanmar's mangroves are within protected areas (CDE Myanmar, based on 2016 mangrove extent (13)). This makes them more vulnerable to extraction and land use change (14).

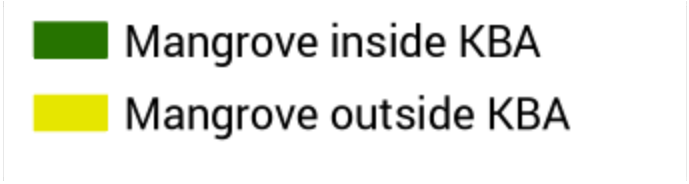
Use the map to explore where mangroves were found inside protected areas in Ayeyarwady and Tanintharyi in 2021.

Data sources: Mangrove extent (FAO); protected areas (15). N.B. that some PAs may be missing or out of date.

Key Biodiversity Areas (KBAs) are sites deemed to be of global significance for biodiversity conservation and are defined according to internationally agreed criteria (16,17). KBA sites are proposed following a global standard, and then reviewed independently and nominated for acceptance into the World Database on KBAs, managed by BirdLife International. The Ayeyarwady Delta KBA in Ayeyarwady and the Myeik Archipelago KBA in Tanintharyi contain large areas of mangroves.

Most mangroves in the Ayeyarwady Delta and Tanintharyi region in Myanmar are located outside of protected areas. However, these mangrove areas might be equally or even more important to biodiversity conservation, due to limited high-quality data when delineating KBAs. Protecting these mangroves is crucial, and KBAs can serve as important tools for governments and conservation organizations to prioritize their efforts to conserve mangroves outside protected areas. Measures can include promoting sustainable resource management practices and collaborating with local communities and stakeholders to identify conservation and sustainable development strategies that benefit both people and biodiversity.

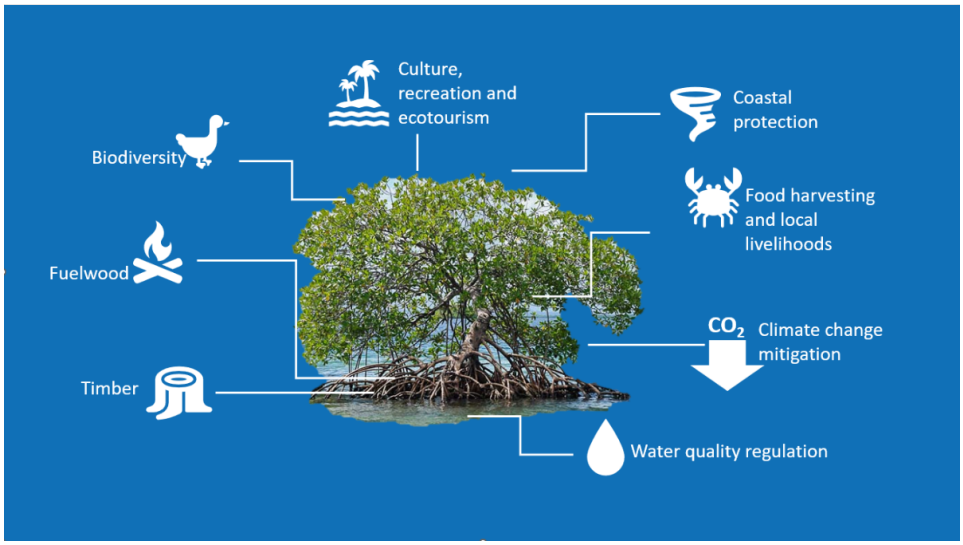
Use the map to explore KBAs overlapping with mangroves in Ayeyarwady and Tanintharyi in 2021.



Data sources: Mangrove extent (FAO); Key Biodiversity Areas (IUCN)

Supporting communities: Mangroves and people

Mangrove forests and their associated resources play an important role in the country's socio-economic development, providing highly valued commercial products, and supporting fisheries and ecotourism (18).



Mangroves provide many ecosystem services that support the livelihoods and wellbeing of local communities.

Mangroves play a significant role in the daily lives of local communities in Myanmar, providing food, fuel, income and protection from extreme weather and coastal erosion. Many local communities pursue subsistence livelihoods, relying on mangroves for fish catches, honey, algae and fruit (5,6). Mangroves act as nursery grounds for fish, molluscs and crustaceans, such as mud crabs, which are an important source of food and income. Poles and timber from mangroves are used as raw materials in house and boat construction. They are also used as fishing stakes by coastal fishers (7).

For many people, mangroves support important sources of income. One study found that nearly 80% of income for low-income households in mangrove areas (in this case Meinmahla Kyun and Bogalay township) came from mangrove forest products (8). Other studies have put the total household

income from mangrove forest products in Myanmar at between 1,119,957 MMK or USD 784 per year (8) and 16,467,468 MMK or USD 10,987 per year (19). Research has indicated that the gender of the head of a household does not influence the overall household livelihood dependence on forest resources generally (including mangroves) (8).

Crabs fished from mangroves (Member of CF, at Warpanar village, Amar Township, Pyapon District, Ayeyarwady region) (Photo credit: MERN)

Mangroves also deliver indirect socio-economic benefits by storing carbon, improving water quality, protecting coastal areas from storms and erosion, providing building materials and yielding medicine. Non-timber and non-fish mangrove products have been valued at 45 USD/ha/year, while protection against coastal erosion has been valued at 974 USD/ha/year (Exchange rate: 1 Myanmar Kyat (MMK) = 0.0010 USD) (20). Mangroves provide a wide range of non-monetary benefits, but these tend to be less well understood than monetary benefits (21). Non-monetary benefits also include recreational and cultural services and are of high importance to local indigenous traditions, knowledge and religions.

Mangroves used for building materials (3-Bawathit@LayKyaw Community Forest, Amar Township, Pyapon District, Ayeyarwady region) (Photo credit: MERN)

In many coastal communities, clearly divided gender roles mean that men and women may use and depend upon mangroves in different ways. For example, while certain forestry activities such as management and logging are predominantly undertaken by men, the collection of fruit and the planting can be predominately undertaken by women. Both men and women are involved in fishing but in different activities (22,23). Women tend to fish in coastal ecosystems, while men fish in the open ocean. Women's fishing activities are often seen as an extension of their traditional household role, and their labor is often unpaid (24). Because of their different interactions with mangrove forests, men and women tend to possess different types of knowledge about these ecosystems and may be impacted by mangrove loss and degradation in different ways. At the same time, women tend to be underrepresented in decision-making on the management and use of forest resources. The rights of women and some ethnic groups to own and access forests and land are more likely to be ignored or neglected (25–27). Ensuring the meaningful participation of different stakeholder groups in designing and implementing activities, along with more systematic collection and use of information on people's dependencies on mangroves, can help to create more sustainable and equitable outcomes for conservation, management and restoration.

Crab fattening site using Mangrove Friendly Aquaculture system (3-Bawathit@LayKyaw Community Forest, Amar Township, Pyapon District, Ayeyarwady region) Photo credit: MERN

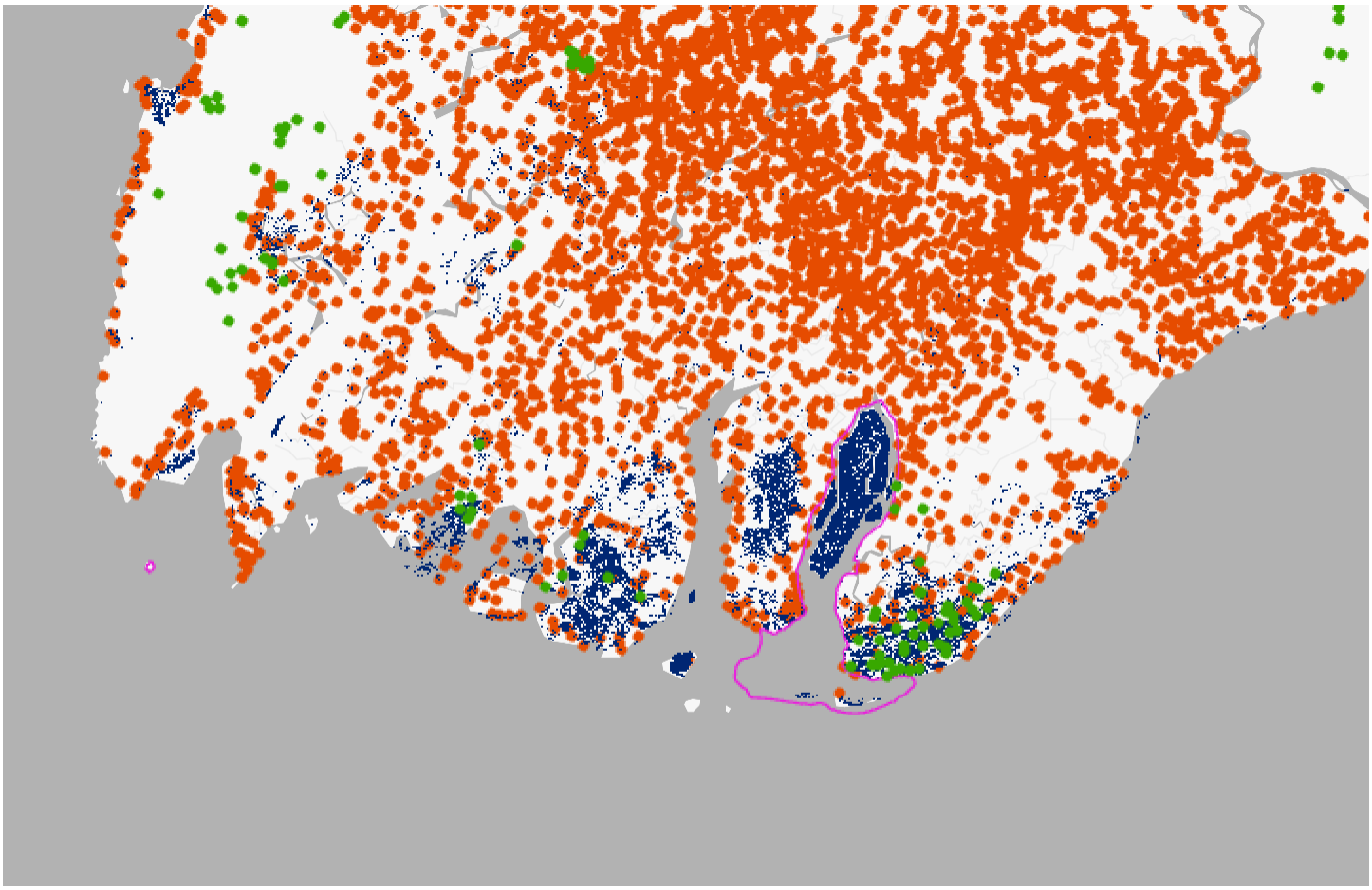
Community forestry in mangroves

Community Forests (CFs) are designated by legal land use agreements and management plans between communities and the Myanmar Forestry Department. These agreements allow the forests to be used by communities, while promoting their sustainable management (28).

Community forestry has been linked to net mangrove gains globally. These outcomes are strongest where tenure rights are secure and governance is well-defined, alongside increased national commitments, policies and programmes (29). Importantly, CFs in Myanmar have been shown to improve the livelihoods of communities through access to timber, fuel and non-timber forest products (30).

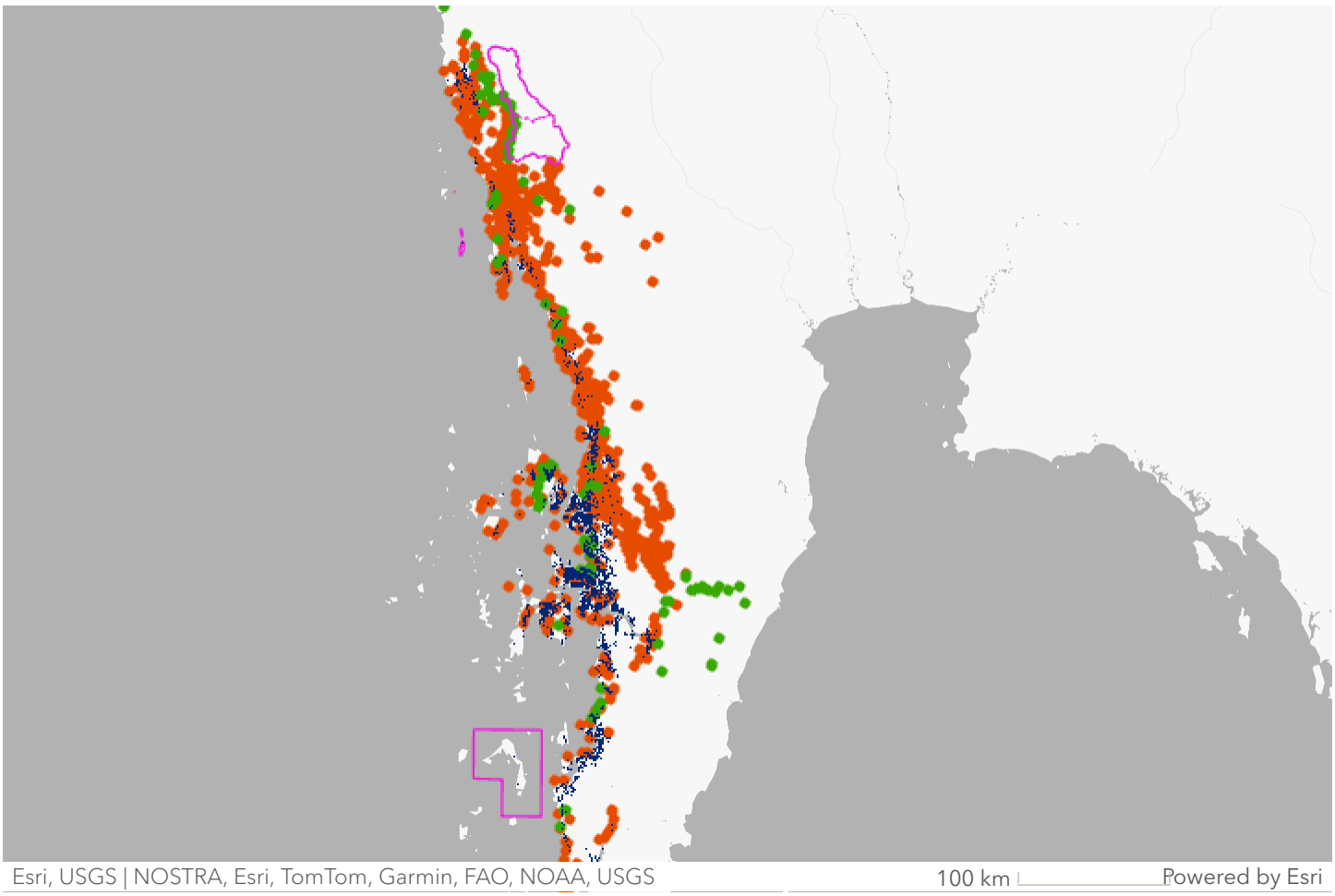
> *"Community Forests provide many benefits, both tangible, like timber and fuelwood, and intangible, like nursery grounds and food for fish, shrimps and crabs, and shelter during cyclones. Community Forests also mean a right to establish linked enterprises, allowing communities to legally produce and export products to other areas." Paing Htet Thu, Programme Officer at MERN.*

The location and role of CFs are one way to look at the connections between people and mangroves. According to a draft database of pre-2021 data, at least 140 CFs in Myanmar are located in mangrove areas, covering 15,000 ha.



This map shows the approximate distribution of villages and CFs (as designated by the Forest Department) in the Ayeyarwady Delta up to 2020 (estimated using available data). There are several clusters of CFs in the delta, with some established in disaster-prone areas following Cyclone Nargis.

Data sources: Mangrove extent (FAO 2023), Villages (MIMU), Forest Department Community Forests (Oswald 2020), protected areas (15).



In Tanintharyi, numerous coastal villages and community forests are located near or within mangrove forests. These mangroves play an important role in supporting and sustaining local livelihoods. Here, several CFs have been established to counter the threat of shrimp farm establishment (source in prep).

Data sources: Mangrove extent (FAO 2023), Villages (MIMU), Forest Department Community Forests (Oswald 2020), protected areas (15).

A growing number of CFs have been established in mangroves in recent years. However, many CFs face challenges, sometimes resulting in less effective management practices, CFs becoming "inactive" or CF land being converted to other uses (source: CDE/local CSOs study on Mangrove CFs in Myeik and Kyaukpyu). This limits their effectiveness as a measure for mangrove conservation, sustainable use and restoration, but there are opportunities to address this gap.

Interventions that integrate traditional as well as scientific knowledge, while maintaining strong community leadership and ownership are more likely to be successful in the long term (31). Restoration and management interventions that are "people-centered" can yield multiple benefits including food security, improved livelihoods, biodiversity conservation and improved ecosystem functioning (32).

The success of community forests for conserving mangroves and benefiting people relies on several factors. Paing Htet Thu (MERN) explains:

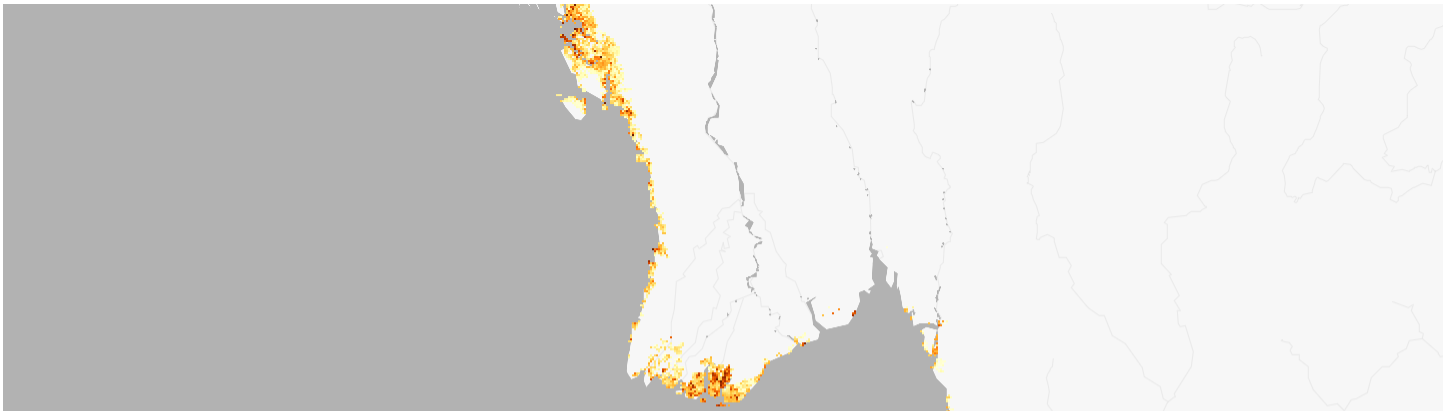
> *"Ensuring conservation outcomes requires awareness of the importance of healthy mangroves to communities. Secondly, communities must receive technical support to promote sustainable management and enterprises. Strengthening land tenure rights through policy support and establishing equitable benefit-sharing mechanisms for community groups are also key to achieving long-term outcomes." Paing Htet Thu, Programme*

Officer at MERN.

Member of CF trapping the crab in the mangrove CF of Warpanar village, Amar Township, Pyapon District, Ayeyarwady region (Photo credit: MERN)

Tackling climate change: Mangroves, carbon and coastal protection

Mangroves store considerable amounts of carbon in their biomass and in surrounding soil, with the majority sequestered deep into their associated soils. In Myanmar, it has been estimated that mangroves store 119 million tonnes of carbon in their biomass and soils (33). This means that conserving, sustainably managing and restoring mangroves can contribute to global efforts to reduce greenhouse gas emissions and limit climate change.



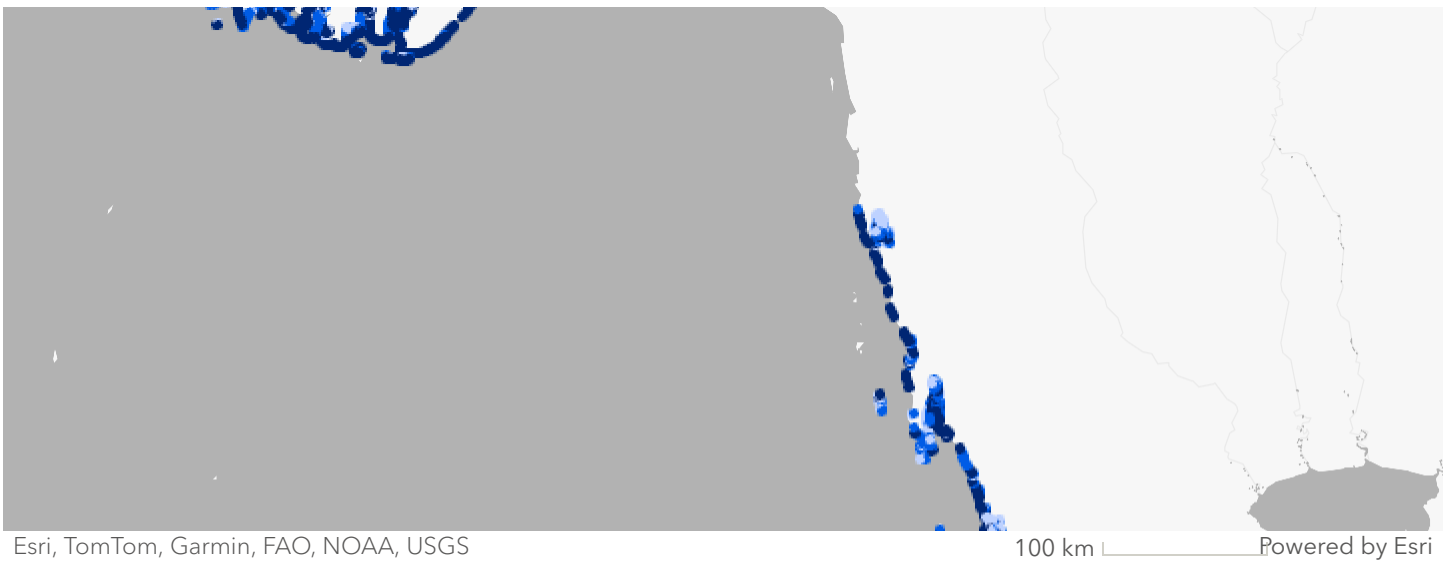
Mangroves store most of the carbon they sequester into their associated soils. Use the map (34) to explore mangrove soil organic carbon stocks in Myanmar (distribution based on the year 2000 mangrove extent).

Data source: Global map of mangrove forest soil carbon (34), clipped to Myanmar

Mangroves also play a significant role in building and sustaining **resilience to climate change**. Myanmar is at significant risk of tropical storms and cyclones. These can devastate coastal communities, livelihoods, and infrastructure, and result in deaths in extreme cases. These risks are higher for groups that are considered vulnerable, such as women, children, ethnic minority groups and migrants.

This map shows where population density is highest along the coastline of the Ayeyarwady Delta and Tanintharyi region.

Data source: WorldPop



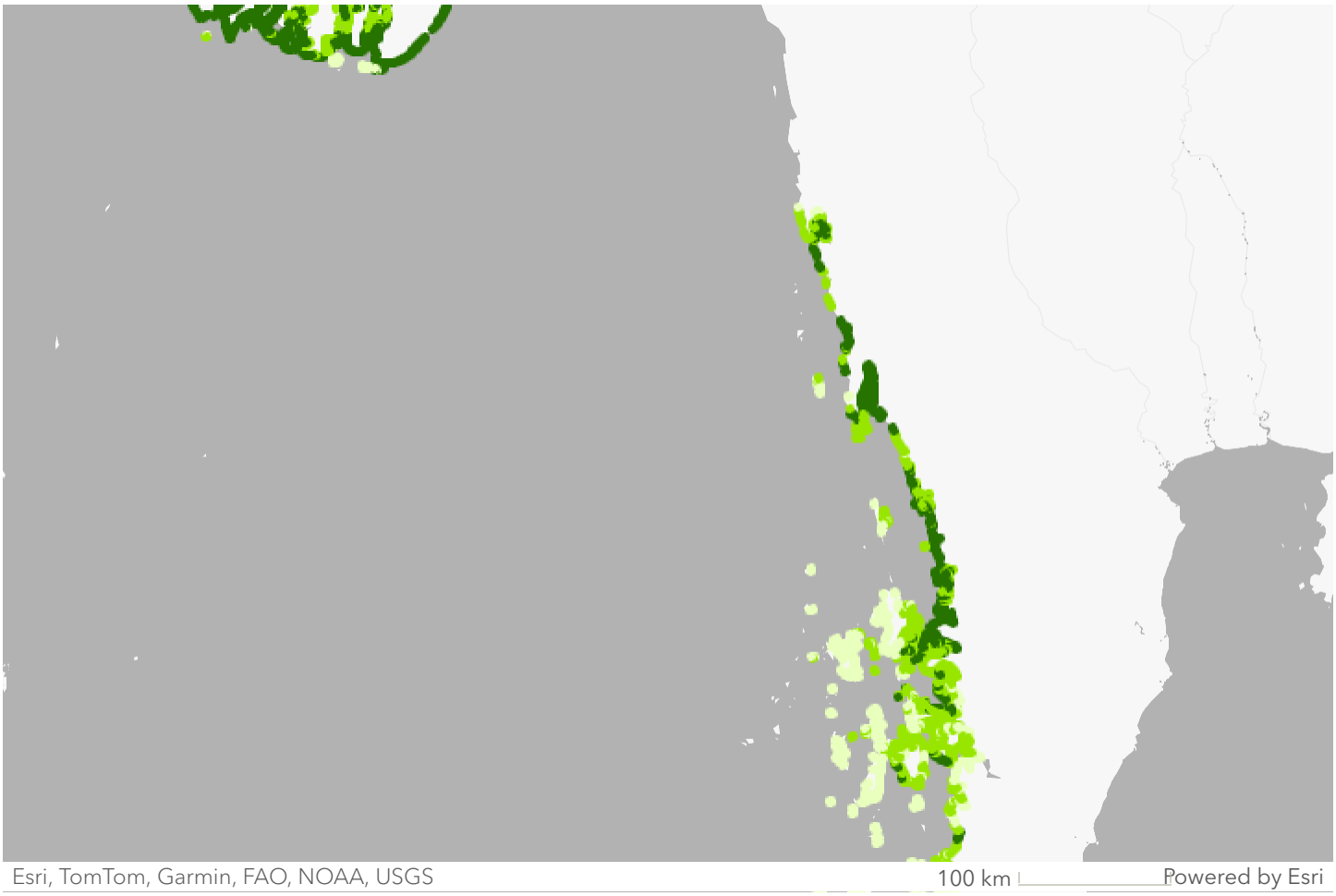
Healthy mangroves can act as a nature-based solution against tropical storms and cyclones by reducing the height and energy of waves as they pass through them (35). This helps to reduce habitat loss and physical damage to coastal structures like houses. Given that Myanmar is very vulnerable to extreme weather events, conserving and restoring mangroves is crucial to enhancing the resilience of coastal communities in the face of climate change.

This map demonstrates where mangroves play the greatest role in reducing storm surges, analysed using the InVEST Coastal Vulnerability Model.

Data source: output of InVEST coastal vulnerability model, modelling undertaken by the UN-REDD programme.

The InVEST Coastal Vulnerability Model uses indices to calculate exposure to erosion and inundation during storms where mangroves are present and where they are not. Using the model, in combination with population density estimates, makes it possible to identify where mangroves may play an

important role in reducing the vulnerability of coastal populations.



Ayeyarwady and northern Tanintharyi have higher population densities, more mangrove presence, and higher exposure to waves (while nearby islands shelter central and southern Tanintharyi). Therefore, mangroves in these areas are highlighted as being particularly important in reducing the vulnerability of coastal populations to storm surges.

Data source for coastal vulnerability maps: Output of InVEST coastal vulnerability model, modelling undertaken by UN-REDD Programme.

Myanmar's changing mangroves

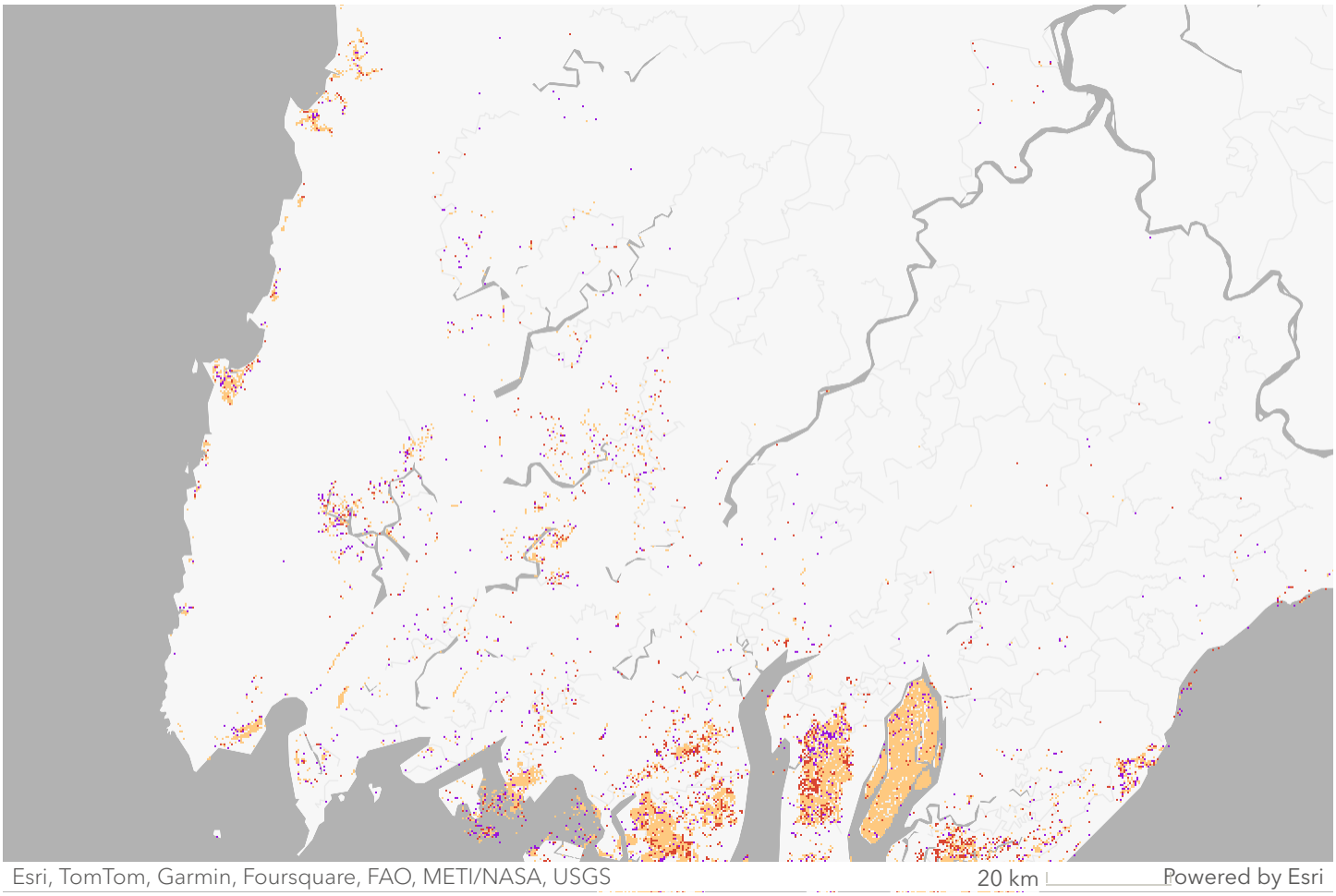
Although Myanmar still retains substantial mangrove cover, it has been a global hotspot of mangrove loss and degradation. The main drivers of mangrove deforestation are conversion to rice paddies, charcoal production and aquaculture for shrimp farming. Extreme weather events, such as Cyclone Nargis in 2008, have also contributed to losses (3,36).

Over 64% of mangrove cover in the Ayeyarwady Delta was estimated to have been lost between 1978 and 2011 (37).

An analysis of mangrove areas in **Rakhine, Tanintharyi and Ayeyarwady** shows that mangroves in all three regions decreased between 1996 and 2016, with rates of loss highest in Rakhine, followed by Ayeyarwady and Tanintharyi.

Analysis undertaken by the UN-REDD Programme for the period between 2016-2021 shows that while mangrove loss has occurred in all three regions up to 2021, there have also been mangrove gains.

Data source: Mangrove extent and change (FAO 2023)



The Ayeyarwady Delta, for example, has continued to experience losses in mangrove cover overall. Approximately 68.7 hectares of mangroves remained stable between 2016 and 2021, while 16.6 hectares of mangroves were lost, 12.5 were hectares gained.

Data Source: Mangrove change 2016-2021 (FAO 2023)

Historically, Tanintharyi has experienced comparatively lower deforestation rates compared to other regions in Myanmar. This is, in part, due to the poor infrastructure in the region that reduces access (38). However, despite relatively low deforestation rates, studies have shown high levels of degradation within the remaining mangrove areas (3).

Analysis of change between 2016 and 2021 shows some areas of loss, but a net gain in mangrove extent overall. Approximately 248.4 hectares of mangrove remained stable, with 6.7 hectares lost and 9.1 hectares gained.

Zoom into the map to explore areas of mangrove that experience loss and gain between 2016 and 2021.

Data Source: Mangrove change 2016-2021 (FAO 2023)

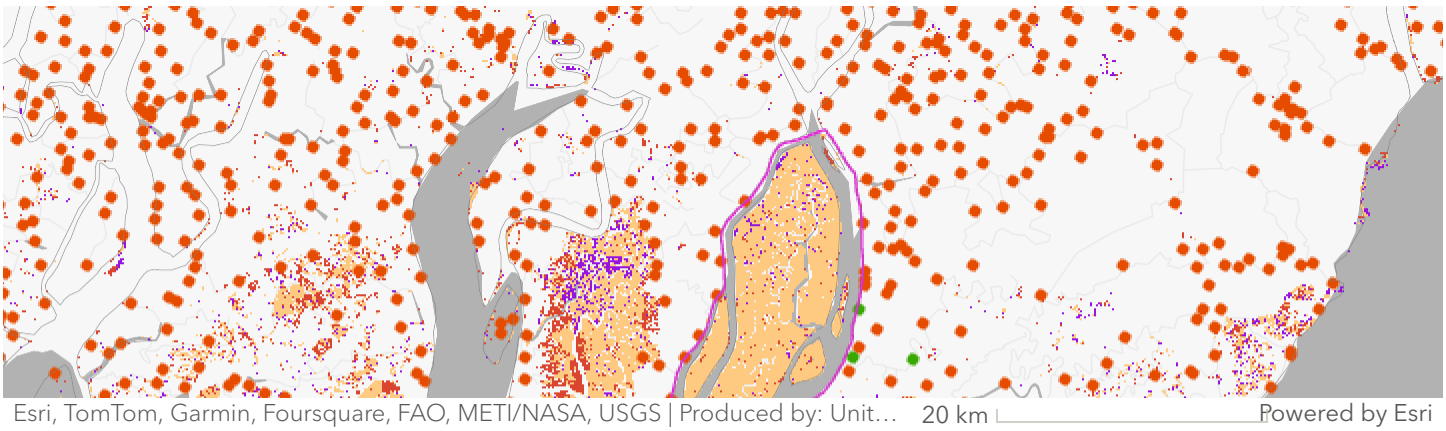
Implications of losing mangroves in Myanmar

Given the global and local significance of Myanmar's mangroves, what do these changes mean for the role of these forests in supporting local communities, combatting climate change and sustaining biodiversity and ecosystem services?

As mangroves provide such a wide range of services and benefits, a reduction in the area and condition of mangroves will likely have serious impacts on people.

Examining mangroves in and around one site can help to highlight their significance and the implications of change.

Deforestation or degradation of mangroves can result in loss of ecosystem services and habitat for biodiversity. Photo credit: Mohmed Nazeeh via Unsplash



The largest mangrove protected area in Myanmar is Meinmahla Kyun Wildlife Sanctuary in the Ayeyarwady Delta. This protected area hosts many mangroves (including the critically endangered mangrove species *Sonneratia griffithii*), and serves as a habitat for various important species, including the elusive fishing cat. However, legal protection does not necessarily mean that these mangroves are healthy and well-conserved.

Analysis of mangrove change between 2016 and 2021 showed that mangrove extent in this protected area has remained largely stable, with small patches of mangrove loss and gain, compared to neighbouring unprotected mangroves. However, degradation is reportedly increasing. This is challenging to monitor through satellite image analysis alone. Degrading or losing the last remaining large patches of intact mangrove will likely have severe consequences for the people and species that rely upon them.

Historical and ongoing degradation (such as extraction of wood for use as fuel) has resulted in highly disturbed mangrove vegetation. Anecdotal evidence suggests that this has resulted in decreased fish and crustacean landings. As shown on the map, there are many villages and several CFs near the protected areas. Further loss and degradation could significantly affect the livelihoods of local communities through reduced seafood catches, increased risk of coastal erosion and larger storm surge impacts. Although there are no significant stands of undisturbed mangrove, pockets of high mangrove diversity in the protected area suggests greater potential co-benefits of restoration (39).

Data Source: Mangrove change 2016-2021 (FAO 2023), Villages (MIMU), Forest Department Community Forests (Oswald 2020), protected areas (15)

Addressing mangrove loss: Conserving and restoring mangroves

Mangrove loss and degradation have important implications for nature, people, climate change and sustainable development in Myanmar. Therefore, concrete options for conservation, sustainable use and restoration must be explored. Protecting existing mangrove forests and restoring mangrove areas lost or degraded in the past can provide a nature-based solution for reducing the risks of climate change and natural disasters and building resilience. Local communities should be supported to conserve and restore mangroves through strategies such as community forestry and Indigenous and Community Conserved Areas.

Conserving mangroves

As noted above, only around 3% of Myanmar's mangroves are within formal Protected Areas (13). Myanmar has a goal to increase the total coverage of protected areas to 10% by 2030. However, there is no specific goal for mangroves (according to the National Forestry Master Plan, 2001-02 to 2030-31). The conservation of remaining intact mangroves is crucial to

sustaining the benefits mangroves provide to local communities, and meeting conservation and climate change goals.

UNESCO Biosphere Reserves and Ramsar sites, and community-based conserved areas, have been suggested as some of the best approaches to preserve mangroves while involving local communities (3). Protecting mangroves and reducing deforestation rates is more efficient and cost-effective than reforesting or restoring degraded mangroves, as these processes can take years, be expensive and have varying levels of success (33, 34).

Identifying areas of importance for ecosystem services and biodiversity conservation can provide crucial information to ensure that conservation resources are being used effectively. This can be done through spatial mapping of mangrove importance for biodiversity and ecosystem services, as well as engaging with and learning from communities that rely upon mangroves for their livelihoods.

Image credit: Mohmed Nazeeh (via Unsplash)

Restoring mangroves

Rehabilitation programmes, linked to promoting the socio-economic development of rural communities and the establishment of plantations, have facilitated the restoration of mangrove forests in various locations in Myanmar (5). Mangroves also regenerate passively and can rapidly recolonize open or abandoned aquaculture mudflats where conditions are appropriate (42).

There are a range of approaches and tools that can help to identify and prioritize areas for restoration, including in Myanmar's mangroves.

The Nature Conservancy's (TNC) global map of mangrove restoration potential aims to help practitioners identify key mangrove priority restoration areas (43). The approach factors in the likelihood of success to encourage mangrove restoration projects at national, regional and global levels. The map uses several sources of data on factors that can influence restoration suitability. This includes current and historic distribution of mangroves, local drivers of mangrove loss and degradation, environmental and social factors, as well as climate change projections including sea level rise and extreme weather events. An online decision-making support tool on Global Mangrove Watch can show the extent of degraded mangroves, how much land is available for restoration, priority restoration areas, and opportunities for implementing restoration projects.

Areas that are more likely to be restorable are those that have a large tidal range, and good sediment supply, and that are unaffected by significant urban development or coastal erosion. Users can estimate the likely gains from mangrove restoration activities, such as fish catch, carbon storage and protection from flooding. Mangrove areas with restoration potential are shown at broad scale, so further investigations are needed to consider planning processes, local community needs and socio-ecological conditions.

The restoration map identifies a restorable area of 161,195ha (11.26% of the total mangrove area) in Myanmar and a mean restoration potential score of 85%, which is considered to be "highly restorable". It is important to note that this approach seeks to offer a broad prioritization and is designed to be considered in conjunction with other national and local factors, such as land tenure and rights, resource use and other conditions "on the ground".

Restoration costs and benefits

Se.plan is another tool that can identify areas for potential restoration and compare the potential benefits of forest restoration activities. The tool combines bio-physical data with information on selected benefits (such as carbon storage, biodiversity conservation and wood products), as well as estimated costs for restoration, to identify areas suitable or unsuitable for restoration. This can provide an initial indication of areas for restoration, which can then be discussed and analyzed in further detail with stakeholders and through ground-truthing.

Overview of the se.plan restoration suitability model inputs and outputs

Using se.plan to explore potential for restoration in three districts of Tanintharyi - Myeik, Kawthaung and Dawei districts – shows that around 28% of mangrove areas in the Kawthaung district are suitable for restoration activities (medium to high restoration potential). Comparatively, around 13% of Myeik mangrove areas and around 7% of Dawei mangrove areas are estimated to be suitable for restoration activities.

Restoration of mangrove areas in Kawthaung may have the greatest benefits for endangered species, biodiversity intactness, forest employment, wood fuel harvest and plantation growth rates. In contrast, mangrove areas in Dawei offer the highest potential for above-ground carbon storage. Although restoration activities in Kawthaung could result in a lot of potential benefits, this area also has the highest estimated opportunity costs (see the table below).

Benefits and costs of potential mangrove restoration activities in three districts of the Tanintharyi Region. Results generated using the se.plan tool.

Restoration suitability for mangrove areas in Kawthaung district, Tanintharyi Region

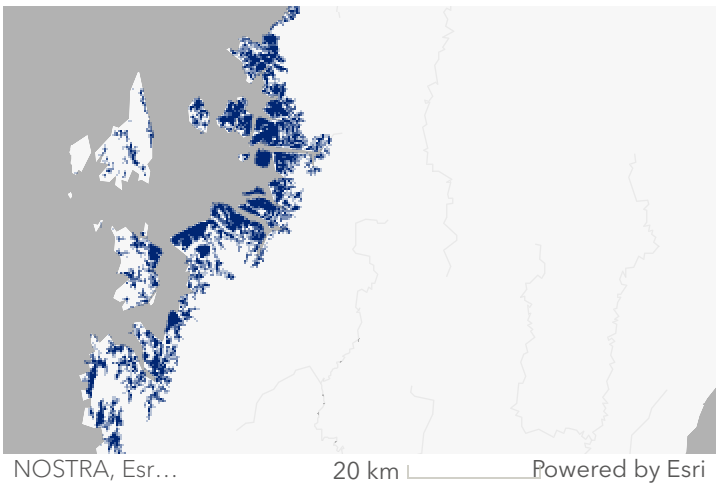
· Total mangrove areas: 35,974 hectares

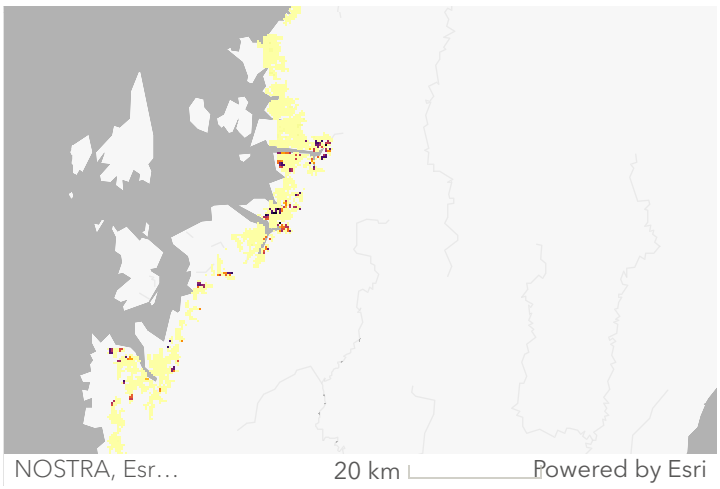
· Around 28% of mangrove areas are suitable for restoration activities

· 72% or areas are considered unsuitable, with 52% of these classified as low potential for restoration (i.e., can be restored but with higher costs)

Use the slider below to explore the extent of mangroves in 2016, and the suitability of areas within those for restoration identified using the se.plan

tool.





Data source: Mangrove extent (FAO 2023)

More than trees: The multiple benefits of mangroves

Mangroves provide multiple benefits to people in Myanmar as well as contributing to reaching global goals on climate change mitigation and biodiversity conservation.

Understanding the benefits, consequences and trade-offs of mangrove gains and losses can inform protection, restoration and management decisions. Local communities rely upon these forests and can play an important role in

their conservation, management and restoration through strategies such as community forestry, locally-led restoration and Indigenous and Community Conserved Areas.

Photo credit: efesenko on AdobeStock

Protecting mangroves in Myanmar provides significant ecological, economic and social benefits. From an ecological perspective, mangroves are crucial to maintaining healthy coastal ecosystems. Mangroves also offer economically valuable resources, such as timber and fisheries that support the livelihoods of local communities and sustain industries in the region. Socially, mangroves hold cultural significance by providing recreation opportunities and fostering community development. They intertwine with local customs representing a cultural heritage that is deeply valued.

By recognizing the importance of mangrove ecosystems and implementing effective conservation measures, Myanmar can secure a sustainable future for its environment and people.

Resources

Find out more about the UN-REDD Myanmar Mangroves project here

Scoping report: Options for analysing mangrove ecosystem services and biodiversity in Myanmar here

For more information about mangrove communities and community action, see this webstory

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