

In a changing climate



IMAGE: Shell Midden site, Cape Palmerston.



IMAGE: Aboriginal stone fish trap at low tide.



IMAGE: Extreme climate events are projected to rise.



IMAGE: Mangroves and wetlands help store carbon.

Values and services

Coastal ecosystems provide more values and services related to human well-being than any other ecosystem type (Millennium Ecosystem Assessment). These values and services are listed below:

- Food
- Fibre, timber, fuel
- Medicines
- Biodiversity
- Biological regulation
- Freshwater Storage and retention
- Nutrient Cycling
- Recreational
- Atmospheric cycling and fertility
- Atmospheric and climate regulation
- Human disease control
- Waste processing
- Flood/ storm protection
- Erosion control
- Aesthetics/ Cultural values
- Hydrological

Millennium Ecosystem Assessment

Ecological and cultural

With over 1200km of coast line in the Mackay Whitsunday Isaac Natural Resource Management (MWI NRM) region there are substantial areas of coastal and marine ecosystems that include seagrass, mangroves, estuarine wetlands, saltmarshes, brackish flats, Melaleuca (paperbark) swamps and sedge lands. These areas are also significant to Traditional Owners as important sources of traditional bushfoods and medicines and evidence of occupation with significant sites such as fish traps and middens found throughout the region. Coastal ecosystems are also under significant pressure from urban and agricultural development.

Mitigation from extreme events

An important service from coastal and marine communities in the MWI NRM region is their mitigation of damage from extreme weather events. These ecosystems absorb the energy of storm-driven waves and wind and can reduce storm surge water levels by slowing the flow of water and reducing surface waves (McIvor et. al 2012). Retention/ re-instatement of coastal ecosystems can be more cost effective than using structural approaches from mitigating of damage in extreme events (Mangi et al. 2011, Queensland Government 2012).

Carbon storage

Coastal ecosystems also tend to have higher stores of carbon than other terrestrial ecosystems. Tropical rainforests tend to have equal amounts of carbon stored in plants and soil; however wetlands and coastal and marine communities may store up to 10 times more carbon in sediments than in above-ground biomass (Pidgeon 2009). Furthermore, carbon stored in marine communities is stored over longer time scales than that in above-ground biomass as sediments will accrete vertically in response to rising sea levels (McLeod et al. 2011).

A stocktake of carbon in vegetation communities in the MWI NRM region has been undertaken from 2013 land use data using FullCAM. FullCAM is the model used to construct Australia's national greenhouse gas emissions for the land sector. Estimates of carbon (C) storage from coastal and marine ecosystems have also been taken from international literature, as FullCAM only considers soil C in mangroves to 30cm and does not estimate carbon storage in seagrass communities.

VALUES OF COASTAL ECOSYSTEMS



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Australian Government

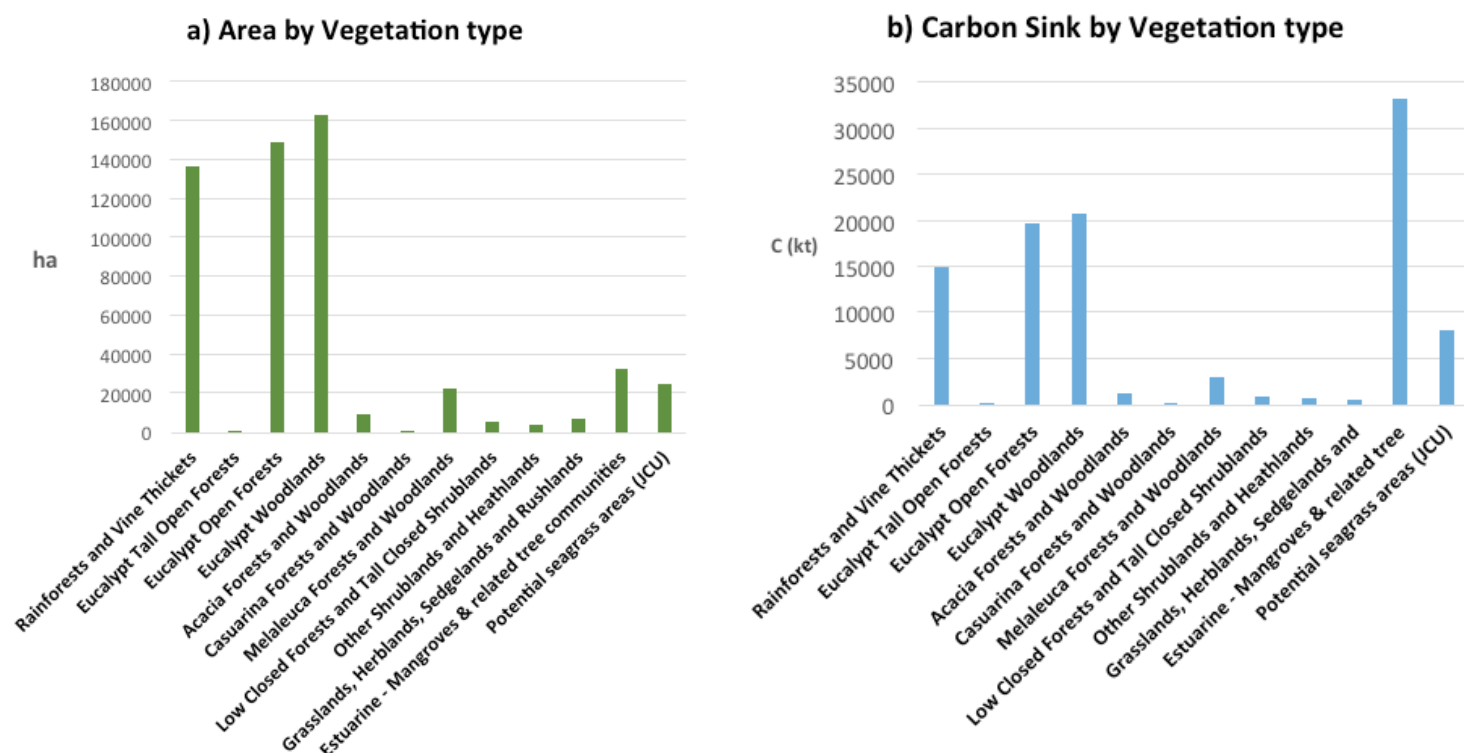


Figure 1: Major vegetation types in the MWI NRM region by a) land area and b) carbon sink – or amount of carbon stored

Figure 1 shows a) area in the region by vegetation community and b) results from analyses of average carbon content. Although rainforests, eucalypt forests and woodlands have the greatest area in the region carbon storage is much higher in coastal ecosystems such as mangroves.

As the climate changes and extreme weather events are projected to occur more frequently; protection and re-instatement where possible of coastal ecosystems is becoming more important to ensure maintenance of services to humans, the environment, carbon storage and ultimately water quality to the Great Barrier Reef.

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