



Reef neighbours

Background reading for teachers

This reading gives you the background for each slide, with sources you can check.

Mangroves

Mangroves are salt-tolerant trees and shrubs of tropical and subtropical shores. A study of 25 Indo-Pacific mangrove forests found they are among the most carbon-rich forests in the tropics, storing up to four times more carbon per hectare than most other tropical forests, largely in deep organic soils.¹ Their roots trap sediment and slow waves, and they are nurseries for many fish and shrimp.

Seagrass

Seagrasses are flowering marine plants. Seagrass meadows are a major food source for dugongs and green turtles, a habitat for thousands of species, and they greatly boost the productivity of coral reef fish.² A 2009 global review found that 29% of the known area of seagrass had disappeared since records began in 1879.² A 2021 study of 547 sites found that 19% of surveyed meadows had been lost since 1880, mainly because of coastal development and poor water quality.³

Losses in the Philippines

The Philippines had an estimated 450,000 hectares of mangroves in 1918. More than half has been lost, mainly to fishponds and other coastal development.⁴ Wetlands International Philippines cites a decline to about 289,000 hectares by 2007.⁵

Restoring mangroves properly

Planting mangroves on the seafront, on mudflats or seagrass beds, often fails because of wave action and unsuitable elevation. Mangrove scientists recommend reverting abandoned fishponds to mangroves instead, which is where most of the lost area can realistically be restored.⁶ This is worth stressing, because well-meant planting in the wrong place can waste effort and damage seagrass.

The storm shield experiment

The experiment is a simple model, not a measurement of real mangroves. Encourage students to think about what the model shows (roots slowing water and holding sediment) and what it leaves out (tides, root types, storm surge).

Sources

1. Donato, D.C. and others (2011). Mangroves among the most carbon-rich forests in the tropics. Nature Geoscience. Summary: [sciencedaily.com/releases/2011/04/110404173247.htm](https://www.sciencedaily.com/releases/2011/04/110404173247.htm)
2. Waycott, M. and others (2009). Accelerating loss of seagrasses across the globe threatens coastal ecosystems. PNAS 106: 12377-12381.
3. Dunic, J. and others (2021). Summary: sfu.ca/sfunews/stories/2021/07/global-study-shows-major-seagrass-losses-around-the-world.html
4. Inquirer (2024). Groups urge PH to restore mangroves in abandoned fishponds. newsinfo.inquirer.net/1905060
5. Wetlands International Philippines. Mangroves ensure food security, not compromise it. philippines.wetlands.org
6. Primavera, J.H. and others (2013), discussed in ACRS 2016 conference paper on mangrove restoration. a-a-r-s.org

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