

Mangroves can cope with sea level rise by increasing soil height

A new report¹ by The Nature Conservancy and Wetlands International shows that mangroves can adapt to rising sea levels by building up soils in some locations, allaying fears that mangroves may be lost as sea levels rise. This is important because mangroves provide risk reduction services against coastal hazards such as waves and storm surges.

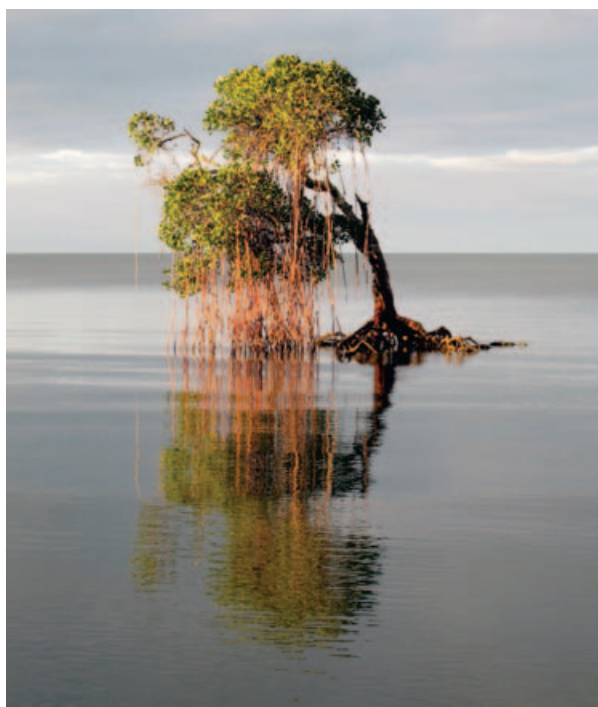


Image: Aymeric Desarmont

Mangroves can protect human lives and property by reducing the impacts of storm surges and waves. However, a major concern has been that mangroves may be lost as sea levels rise, leaving communities more exposed to coastal hazards. This review conducted by The Nature Conservancy and Wetlands International shows that under some circumstances, mangrove soils can build up at similar rates to local rises in sea level, allowing mangroves to survive in situ.

“We need to understand how mangrove soils build up, so that we can maintain suitable conditions for them to do so into the future,” says Nyoman Suryadiputra, Director of Wetlands International Indonesia. “Protecting mangroves is vital for many coastal communities who rely on them for their livelihoods as well as the coastal defence benefits they provide.”

Past evidence suggests that some mangrove soils have built up at rates between 1 mm and 10 mm per year. Currently, global mean sea level is rising at a rate of 3 mm per

year. This suggests that in some places, mangrove soil surfaces will be able to keep up with rising sea levels. This is key, as mangrove trees cannot survive if their aerial roots are submerged for long periods of time.

This latest report highlights the need to maintain, restore or enhance sediment supplies to mangrove areas. The sediments contribute to the build-up of soils, but the supply of sediment to many mangrove areas has been reduced because of dams built on rivers. Mangroves also need protecting from pollution and the felling of trees: the underground roots of healthy trees can push the soil up, while the roots of trees weakened by habitat degradation are less able to hold soils together, potentially leading to erosion and loss of surface soils. Restoring mangrove areas and safeguarding the health of trees can help mangrove soils to build up and so keep pace with sea level rise.

“In some areas, however, mangrove soils may not be able to build up fast enough to keep pace with sea level rise”, alerts report lead author Dr Anna McIvor of The Nature Conservancy. “In these areas, local planners should allow space for mangroves to colonise landward areas as sea levels rise. This will help to ensure that mangroves continue to reduce risks from coastal hazards into the future, benefiting local communities”.

Some mangrove forests have survived in the same location for thousands of years by building up soils beneath them as sea levels rose. In Twin Cays in Belize, mangroves have created a layer of old roots and sediments that is up to 8 m thick in some places. By building up soils, mangroves also help to lock up greenhouse gases such as carbon dioxide, and this provides another reason for protecting mangroves and their soils from degradation and loss.

Dr Mark Spalding, senior marine scientist at The Nature Conservancy said, “It is essential that we protect mangrove forests as they provide many vital services, not just coastal defence, but also fisheries and carbon storage.”

Source: www.wetlands.org/News/tabid/66/articleType/ArticleView/articleId/3412/Default.aspx

¹ <http://www.wetlands.org/WatchRead/Currentpublications/tabid/56/mod/1570/articleType/ArticleView/articleId/3517/Default.aspx>

Local focus may maximize Hawaii's yellowfin tuna stock

The 2006 re-authorized Magnuson-Stevens Fishery Conservation and Management Act requires federally managed species to be regulated under annual catch limits. Highly migratory species, such as tuna and billfish, are exempted if they are subject to conservation and management measures by an international regional fishery management organization. Recent research, however, has led some Hawaii folks to question the "highly migratory" nature of yellowfin tuna caught locally.

The tagging studies indicate that nearly 90 percent of the 1- to 2-year-old yellowfin tuna (i.e. those weighing 15 to 30 pounds¹) sampled in Hawaii were locally spawned. They also show that the vast majority of the yellowfin do not leave Hawaiian waters throughout their lifetime.

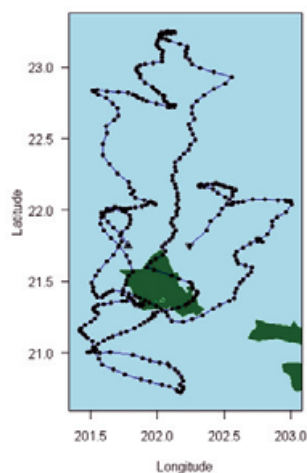
This research suggests that Hawaii's fishermen cannot rely on large influxes of yellowfin tuna from other regions to maintain their catch rates and replace harvest stocks. So maximizing the production from the "local stock" makes sense. How can this be done?

One option is to increase the minimum harvest size of commercially landed yellowfin. The current legal size for sale is 3 pounds. Yellowfin at this weight are about 16 inches in length and eight months old. They are not sexually mature, and their natural mortality rate (i.e., mortality not related to fishing) is quite high.

Natural mortality rates of Hawaii yellowfin drop to their lowest levels when the tuna are about 10 pounds (about 24 inches). If not caught by fishermen, many of the yellowfin at this size will survive and grow. They will not be lost to natural mortality nor will they migrate.

Once they reach two years old (30 pounds), they will quickly grow to reproductive size and contribute to local spawning and stocks.

The Western Pacific Regional Fishery Management Council (WPRFMC) conducted an informal poll at the Hawaii Fishing and Seafood Festival and the Fishermen's Forum held in conjunction with the 155th Council



Tagging and tracking studies show that most yellowfin tuna do not leave Hawaiian waters throughout their lifetime.



Satellite tagging of a 90-pound yellowfin tuna (image: Bruno Leroy).

meeting in October 2012 in Honolulu. People cast their vote on their preferred minimum commercial harvest size for yellowfin tuna. During the Fishing Festival, 259 votes (mostly from the general public) were cast. At the Fisherman's Forum, 63 votes (mainly from fishermen) were cast. Both groups agreed that the 3-pound minimum commercial harvest size is too small and that a larger size category should be used as the standard in Hawaii.

During the first half of 2013, the Council has worked in collaboration with National Marine Fisheries Service staff and a video filmmaker to draft a script for an educational video on yellowfin minimum size. The video will likely be developed in collaboration with the State of Hawaii's Department of Land and Natural Resources, as this agency develops the policy and rules for local fishery landings in Hawaii. In the interim, the Council re-affirmed its commitment to facilitating discussions on yellowfin minimum size and the science behind a potential increase in the minimum landed weight for commercial fisheries.

Source: *Pacific Islands Fisheries News, Summer 2013* <http://www.wpcouncil.org/2013/09/17/summer-2013-pacific-islands-fishery-newsletter/>

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¹. 1 pound = 0.45 kg; 1 inch = 2.54 cm