

The Indo-Pacific Forest Carbon Study

A collaborative study with the US Forest Service, Institute of Pacific Islands Forestry, International Programs, and the Center for International Forest Research



Yap Crew
Indo-Pacific Forest Carbon Study
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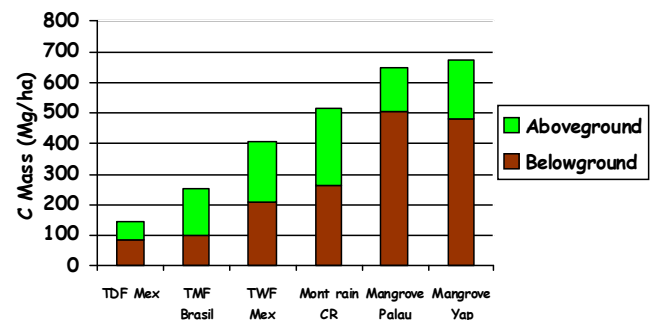
Recent work by IPIF scientists have found that the C pools of mangroves exceed that of upland tropical forests because they exist on C-rich peat soils and have relative high levels of aboveground biomass (Fig. 1). Mangrove forests are widely distributed in the western Pacific and have been subject to high rates of land cover change related to aquaculture and coastal development. Southeast Asia supports the world's largest areas of mangrove originally

extending over 6.8 million ha representing 34-42% of the world's total. These forests are vulnerable to land cover change and global change especially sea level rise. Because of the many ecosystem services they provide and the high quantity of C they store, they would be ideal candidates for REDD strategies.

Scientists at the center for International Forestry Research (CIFOR) have reported that tropical forests over peat soils in the Asian Pacific also contain immense C pools that when subjected to land cover change are significant sources of anthropogenic emissions of CO₂ and CH₄. Yet little quantitative work exists in accurately ascertaining the C pools of undisturbed forests and the rate of loss associated with land cover change. This study is intended to fill that critical gap in the lack of quantification of C pools (sinks) of tropical forests occurring over peat soils. The 2-year study will focus gathering this information in both mangroves and peatland forests of the western Pacific, the Philippines, and Indonesia (Kalimantan and Sulawesi).

Because of the immensely large belowground and above ground C pools these are predicted to be among the largest terrestrial C pools in the tropical world (Fig. 1). Greater quantification is needed to ascertain these C pools to insure proper accounting of their values. These are also sites currently threatened by the synergistic effects of land use, and global change. These are also some of the most significant and largest

Ecosystem C pools of Selected Tropical Forests



Soils only to a 1m depth - Palau mangrove mass to 160 cm was ~963 Mg/ha and at Yap mass to 231 cm was 1,232Mg/ha. From Jaramillo et al. (2003), Kauffman et al. (1995), Hughes et al. (1999), Hughes and Kauffman (in prep) and Kauffman and Heider (in prep).

terrestrial C pools in the tropical world and their collapse would result in a tremendous shift of these sites from C sinks to atmospheric sources. Their collapse would represent significant consequences to biological diversity and the cultures that are dependent upon them. Yet remarkably little work has been conducted in the field to accurately quantify C pools and dynamics with land cover change. Additionally, we need to understand the vulnerability of these forests to climate change.

The Study will occur along a latitudinal gradient across the western Pacific including the Republic of Palau, the Federated States of Micronesia, the Philippines, Sulawesi and Kalimantan, Indonesia. This collaborative study will provide important information concerning C pools in some of the most vulnerable forest ecosystems on earth. It will provide decision makers with the necessary information needed for tropical forest mitigation and adaptation related to global change. This project can lead to expanded collaborations between CIFOR and Forest Service in the fields of forest governance and policy as well as ecology. It would strengthen relationships between two globally respected international forest research organizations. Finally, it will provide training and capacity building for young scientists in both the USA and SE Asia.

Objectives of the Indo-Pacific forest C study

- Quantify Ecosystem C pools of tropical mangrove and peatland forests of the Indo-pacific; among the largest C pools are earth and among the most vulnerable due to climate change and land cover change
- Provide information on C dynamics to international commissions such as IPCC and UNCCC on these relatively unstudied forest types
- Provide information necessary in the development of REDD strategies and other adaptation/mitigation strategies
- Provide information needed to value these forests in international and national C markets
- Model potential fates of forests and C pools associated with impacts of climate change – sea level rise, changes in temp, etc

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