



Sonneratia alba – fringe mangroves during high tide in Bintuni Bay, West Papua, Indonesia (Photo by Sigit D. Sasmito/CIFOR)

SWAMP

Sustainable Wetlands Adaptation and Mitigation Program

What is SWAMP?

Carbon-rich mangroves and tropical peat swamp forests are among the most productive forests on earth. Deforestation of these wetlands are of immediate ecological and socioeconomic concern, already leading to major greenhouse emissions, increased vulnerability by communities to storm surges, threatened food and health security and the loss of wildlife, fish, and biodiversity. They are high priorities for inclusion in climate change adaptation and mitigation activities throughout the world, but are not well studied or understood. The **Sustainable Wetlands Adaptation and Mitigation Program (SWAMP)** is a collaborative effort between the Center for International Forestry Research (CIFOR) and the USDA Forest Service (USFS) with support from the US Agency for International Development (USAID) Bureau for Economic Growth, Education and the Environment (E3). SWAMP seeks to provide critical information on tropical wetland ecosystem values and to increase awareness of the tremendous potential role these ecosystems can play in climate change strategies.

Results from SWAMP has demonstrated that carbon stocks in these ecosystems are among the highest of any forest and that land cover change in these ecosystems results in very large emissions of greenhouse gasses. However, most countries do not have sufficient information to include wetlands in their national reporting to the United Nations nor to develop plans for avoiding GHG emissions from wetland conservation. By employing robust scientific approaches and methodologies, SWAMP is generating knowledge that is relevant to policy makers and practitioners regarding the sustainable management of wetlands in the face of changing global climate and threatened livelihoods of local communities.

The goal and objectives

The overall goal of the program is to provide policy makers with credible scientific information needed to make sound decisions relating to the role of tropical wetlands in climate change adaptation and mitigation strategies.

SWAMP objectives include:

- Quantify greenhouse gas emissions and C stocks from both intact wetlands and sites that have undergone land cover or management changes
- To develop ecosystem C-dynamics modeling tools suitable for tropical wetlands to support policy-relevant analyses. To scale-up local field study results to landscape, province, country, and global scales via remote sensing and spatially explicit land use cover change modeling
- To build the capacity of the policy community through dialogues and briefings; and of the resource management and scientific communities through research and technical transfer activities.

Where do we work?

SWAMP is global in its geographic scope, covering the-tropical regions of the Asia-Pacific, Africa and Latin America. SWAMP and SWAMP-leveraged studies have provided opportunities for data gathering ad capacity building for scientific community and briefings for policy community in 25 countries as shown on the map. We are preparing to work with more partners in more countries in the near future.



Notes: (M) Mangrove/(P) Peatland

What we have accomplished

The SWAMP project has been a major force in increasing our understanding of the carbon stocks and emissions arising from land use of mangroves and tropical peat swamp forests. Support from USAID has served as a global platform and has attracted very significant investments in applied research in many tropical nations utilizing SWAMP methodologies and protocols.

Communication about mangroves and tropical peat swamps and climate change has also been a major focus of SWAMP including:

- Publications in high-impact journals including ***Nature Geosciences*** and ***Proceedings of the National Academy of Sciences***
- The IPCC Guidelines on greenhouse gas emissions arising from wetlands and negotiators at UNFCCC meetings/sessions
- Symposium in the 2014 IUFRO World Congress, to share the results of SWAMP from Asia, Africa and Latin America
- Presentations in major regional and international workshops, side events and briefings targeted for decision makers
- Training on the SWAMP Protocol for carbon stock assessment to around 250 people who belong to around 30 agencies



The use of rod surface elevation table (rSET) combined with marker horizon to estimate surface elevation change and sediment accretion rate (Photo by Sofyan Kurnianto/CIFOR)

SWAMP has developed strong ties with USAID offices and US Embassies throughout the world and with many NGOs and private foundations. These partnerships magnify the long-term impact of SWAMP and establish linkages to ongoing development assistance and policy initiatives supported by the US Government. SWAMP funds have been leveraged with support from many other governments, universities, NGOs, and private foundations to address the critical information needs central to the SWAMP objectives.



Air sampling to estimate greenhouse gas fluxes using closed chambers in peatlands in Tanjung Puting National Park, Indonesia (Photo by Nisa Novita/CIFOR)

Challenges and opportunities ahead

Tropical forested wetlands are complex and diverse as are the peoples who are dependent upon them. There is still much to do and many important discoveries to be made as these forests continue to be under intense pressure for economic development such as oil palm plantations, shrimp ponds, croplands pastures, and other land uses. We are challenged to design our research and analysis to be more policy-relevant. We are currently focusing research in those sites and subject areas where large data gaps exist. Carbon stocks and emissions from land use changes need quantification for establishment of emissions baselines. Sediment and carbon accumulation rates in mangrove forests are critical to document in order to guide mitigation and adaptation strategies.

In the coming year, the SWAMP program will focus on synthesis and publication of policy-relevant results, regional and global assessments, publication of a global map of wet soils in the tropics, and the launching of an education web-based "Toolbox" accessible to all scientists, students, resource managers and decision makers on tropical wetlands.

If you are interested in learning more about SWAMP activities and/or discuss possible collaboration, please contact:

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More information about SWAMP can be found at www.cifor.org/swamp and about USFS International Programs at www.fs.fed.us/global.



Center for International Forestry Research

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