

New Mangrove Peatlands found in Cambodia

Introduction

In tropical Southeast Asia, peat swamp forests are usually found in low-lying areas in river floodplains. In a field assessment conducted in Cambodia in August 2014, peatlands were found within coastal mangroves, which is highly unusual.

In 2012, a training workshop on detecting possible peatland areas using remote sensing and GIS technologies was held in Ho Chi Minh City, Vietnam. Utilizing the knowledge learned from this course, the Cambodian team had earlier estimated about 1,000 hectares of potential peatlands in the

Peam Krasop Wildlife Sanctuary mangrove area in Koh Kong Province, Cambodia. Consequently, a survey was planned to confirm the presence of the estimated peatlands area.

A preliminary survey in 2012 confirmed the presence of peatlands, but not their full extent. A detailed assessment was conducted from 6 to 15 August, 2014. The assessment was carried out by Peatland expert Dr Le Phat Quoi from Vietnam National University, who led the exercise, assisted by Julia Lo from the Global Environment Centre (Malaysia) and together with four staff from the Wetlands and Coastal Department, four rangers from Peam Krasop Wildlife Sanctuary and two local community members.

The survey was financed by the Sustainable Management of Peatland Forests in Southeast Asia (SEApeat) project, funded by the European Union through the Global Environment Centre.

Peam Krasop Wildlife Sanctuary

Peam Krasop Wildlife Sanctuary (PKWS) covers 23,750 hectares and is located on the southwestern coastal strip of Koh Kong Province. The sanctuary protects a significant area of coastal mangrove with rich flora and fauna. There are five villages in the PKWS study area, comprising Peam Krasop Pi, Koh Sralao, Ta Chat, Preak Svay and Koh Andet. The population of these five villages is 3,93. These local people derive significant benefits from the mangroves in the sanctuary, especially

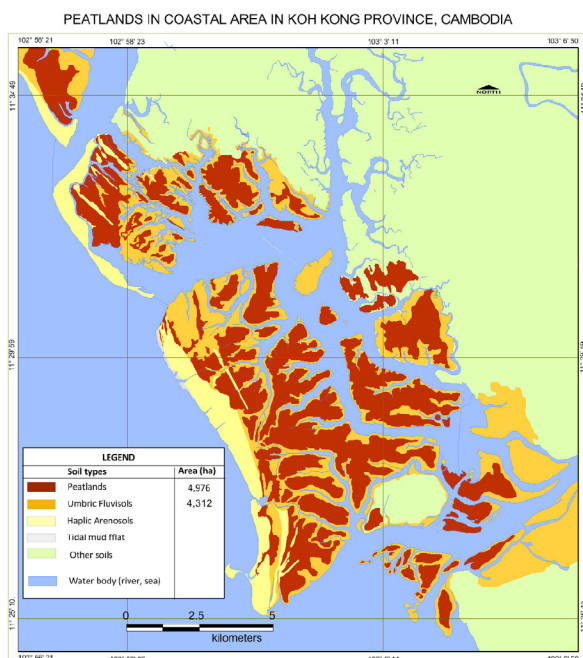
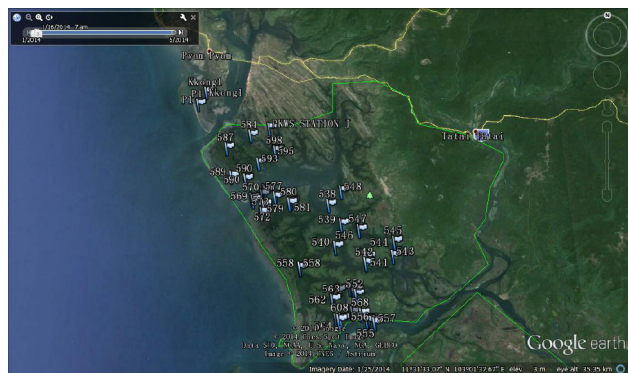
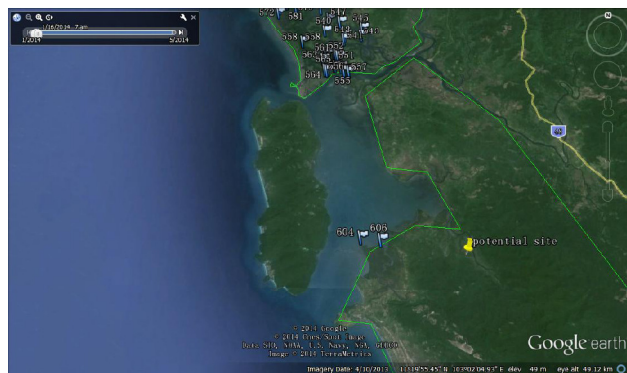


Figure 1: Map showing the location of peatlands in coastal areas in Koh Kong Province.



Google maps showing the assessed sites.



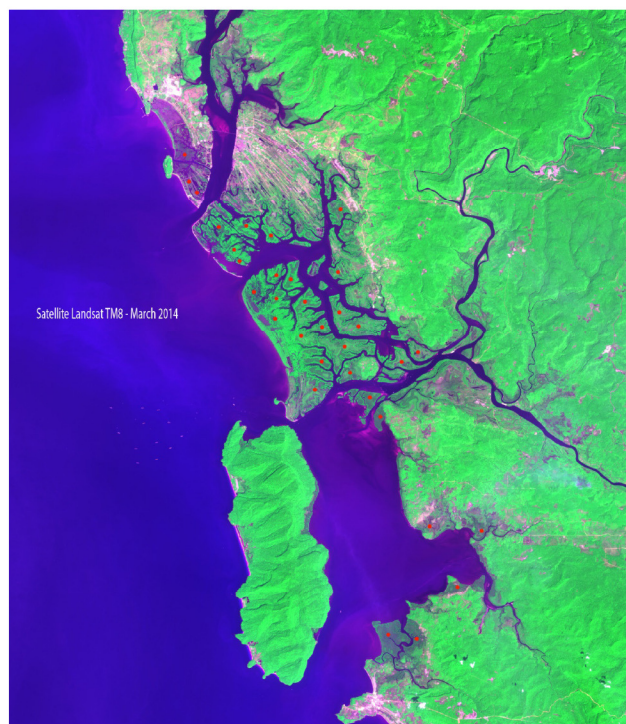
in terms of fishing; however, this has also lead to some negative impacts.

Methodology

Remote sensing has become a useful tool in vegetation assessment (Gandeseca et al., 2009) or for monitoring land use change/peatland degradation (Miettinen and Liew, 2010; Miettinen et al., 2012). This study combined remote sensing/ GIS technology and ground-truthing at the field for verification. Interpretation of satellite images (Lansat TM 8, taken in March 2014) was applied to identify peatland areas in the coastal mangrove forest of Koh Kong Province. Polygons of identified peatland areas were transposed onto GIS maps. The peat soil and its distribution was detected and delineated by band-2 satellite images, primarily within the mangrove area. Peat soil distribution was mapped using a spatial interpolation method based on collecting peat soils samples. The area of peatlands identified in the drawn polygons was surveyed and land-use and/or vegetation were recorded onto a map. The ground survey included peat depth measurement and a floristic survey.

The peatlands area

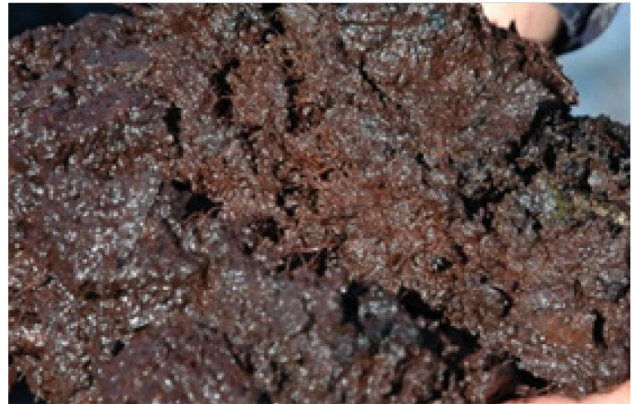
The mangrove of Peam Krasop Wildlife Sanctuary grows on several islands with extensive networks of connecting waterways. Altogether, 32 locations were assessed with a gauge auger, where peat depth was found to be in the range 44cm to 200cm, with an average depth of 115cm. A total of 4,976 hectares of the area was estimated to be peatlands.



Satellite map showing the mangrove of PKWS; red dots indicate areas to be surveyed.

Peat-forming mangrove have been widely reported (Joosten, 2010) and mangrove peat is not uncommon in other parts of the world, e.g., Belize (McKee and Faulkner, 2000). However, mangrove peat in Southeast Asia is not common. Therefore, this recent finding of mangrove peat in Koh Kong Province can shed new light on the development of peatlands in Cambodia.

The peat material found here is not uniform and varies in terms of colour and rate of decomposition (see images next page). Some of the peat was well decomposed, whereas some were still in fibric stage, the fibres of plant material still clearly visible.



Peat samples.

The outer layer, roughly 50m along the coast of these islands, is dominated by tall *Rhizophora apiculata* and *Rhizophora mucronata*. This area is a typical mudflat area. However, as we move further inland to about 100 to 150m, there is a clear change in vegetation in terms of species and tree height.

In general, four zones of vegetation were identified:

- 1) stunted *Rhizophora apiculata* only
- 2) stunted *Ceriops tagal* only
- 3) stunted *Ceriops tagal* with tall *Lumnitzera littorea*
- 4) mixed species of *Hibiscus tilliaceous*, *Xylocarpus granatum* and *Melaleuca cajuputi*

In total, 14 tree species were recorded during this survey, all common mangrove species with the exception of *Melaleuca cajuputi*, which is a species typical to freshwater swamps.

The area is known to host a variety of wildlife including fishing cats, otters, bears, pelicans, adjutant storks, hornbills, tigers, elephants and

rhinoceros. Dolphins are present in the area's water bodies. The mangroves are an important resource for local fishermen who harvest crabs and shellfish in this area.

The main plant species identified include:

- *Lumnitzera racemosa*
- *Excoecaria agallocha*
- *Rhizophora apiculata*
- *Rhizophora mucronata*
- *Brugueira gymnorhiza*
- *Melaleuca cajuputi*
- *Heritiera littoralis*
- *Xylocarpus granatum*
- *Lumnitzera littorea*
- *Ceriops tagal*
- *Avicennia alba*
- *Scyphiphora hydrophyllacea*
- *Glochidion littorale*
- *Phoenix paludosa*
- *Nypa fruticans*
- *Acrostichum speciosum*
- *Pandanus sp.*

Threats to the Peam Krasop Wildlife Sanctuary

There is sand mining activity in the area adjacent to PKWS. Although it is carried out outside the PKWS boundaries, it has been reported that further mining activity will be carried out on the eastern boundary of PKWS. In the long term, this activity may have a serious impact on the integrity of the peatland/mangrove ecosystem of PKWS. No detailed information was available pertaining to the sand mining company and its operations. In addition, the harvesting of resources, including forest products, may have a negative impact on the mangrove forests; however, in general, the level of harvesting is relatively low.

Conclusion

The peatlands of Peam Krasop Wildlife Sanctuary are the first peatlands to be documented in Cambodia. Its occurrence in a mangrove forest is unusual. The only other peat recorded in mangrove forests in the region are in Sulawesi, Indonesia. It is recommended that further surveys be conducted elsewhere along the coastline of

Cambodia to identify additional peatland areas. Further studies should be undertaken pertaining to the nature of the peat and the specific biodiversity of the area, which may be unique. Further studies, especially on the peat material pertaining to bulk density, pH, salinity and carbon content are recommended for this site. It will also be worth taking additional surveys to understand why certain tree species have been stunted in their growth in the peatland areas.

Acknowledgements

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This assessment was made possible through the SEApeat project and was funded by the European Union (EU), and implemented by the Global Environment Centre. The project seeks to reduce deforestation and degradation of peatland forests in Southeast Asia by working closely with local communities and organizations to improve knowledge of peatland areas and protect them from unsustainable development.

View from the sea.





Pokok.

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GEC's mission is to support the protection of the environment and sustainable use of the natural

resources to meet local, regional and global needs, through strategic partnerships with communities and like-minded organisations.

The SEApeat project, funded by the European Union, seeks to reduce deforestation and GHG emissions via degradation of peatland forests in Southeast Asia.

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