

# SECURE : Lower Mekong Initiative

## Sustainable Ecosystems for Coastal, Urban, and River Environments: A Global Network of Elevation and Landscape Resilience Data

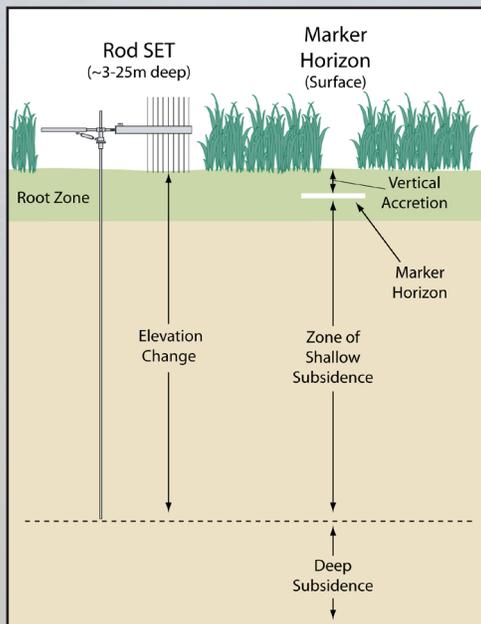
This regional SECURE project will quantify the impacts associated with sea-level rise and hydropower dams on Mekong River wetlands through direct measures of wetland accretion, elevation, and subsidence from a network of stations spanning the delta and upper freshwater reaches of the river. Data synthesis will lead to assessments of wetland vulnerability under current sea-level rise and river conditions, and under future conditions (accelerated sea-level rise plus reduced sediment load caused by dams) through the application of numerical models.

Wetland accretion, elevation, and subsidence rates will be measured with high resolution using the surface elevation table – marker horizon (SET – MH) method, which is based on establishing a benchmark elevation for a site by driving stainless steel rods to bedrock or a stable layer in the subsurface up to 25 meters deep. The SET, an adjustable measuring device, is attached to the benchmark to obtain readings of the land surface relative to the benchmark. Researchers return to these sites periodically to obtain surface accretion measures from the marker horizons and elevation change rates for each benchmark, both of which are used to calculate shallow subsidence rates.



Coastal Mangrove Forest

Mekong River wetlands build vertically through the accumulation of mineral sediments and plant matter. If their vertical development does not keep pace with sea-level rise, then they will gradually become submerged until they convert to shallow open water or mudflat, and their ecological functions are lost. What is not known for this region are the vertical accretion and subsidence rates for either the delta or riverine wetlands, the sediment delivery rate to the wetlands (needed to counterbalance subsidence), and the degree to which dams will reduce sediment delivery to the wetlands. Both the current and future vulnerability outcomes described above can be used to establish minimum thresholds for sediment loads of the river, thereby informing best management practices for operating the hydropower dams and siting infrastructure development projects.



## SECURE Program Activities:

### Completed:

- A total of 9 SET – MH stations were installed in coastal habitats of the Mekong River delta in Vietnam at Can Gio and Ca Mau in summer 2010 and spring 2011
- In cooperation with the US Embassy in Bangkok, Thailand and the US Consulate in Ho Chi Minh City, Vietnam, additional SET – MH gear was shipped for installation in Cambodia and Thailand, spring 2011

### Planned (FY2011-12):

- Reconnaissance of the Mekong River delta to select additional SET – MH stations in deep-flooding and medium-flooding habitats, September 2011
- Convene special session on SECURE network at Society of Wetland Scientists 2nd Asia Chapter Meeting in Kuching, Malaysia, September 2011
- Install SET – MH stations in coastal habitats of Cambodia and Thailand, winter 2011/2012
- Coordinate/plan the installation of SET – MH stations in the Mekong River corridor with cooperators from Vietnam, Cambodia, Laos, and Thailand to provide baseline data prior to dam construction, 2012-2013

For further information contact: Dr. Donald Cahoon at 301-497-5523 or visit: [www.pwrc.usgs.gov/set](http://www.pwrc.usgs.gov/set)

