Geodesy for Coastal Science, Management, and Community Resilience

Sentinel Sites

Geospatial Infrastructure for Sentinel Sites

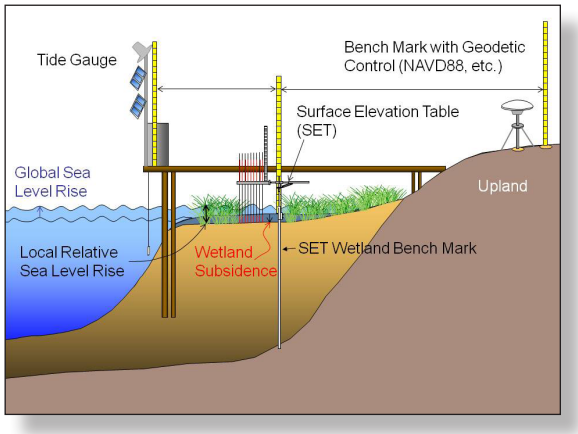
Monitoring the Impact of Sea Level Rise and Coastal Innundation

Sentinel Sites

Using a place-based approach, sentinel sites concentrate infrastructure and resources to effectively track the status of ecosystem integrity in the face of changing local sea levels and land elevations. Sentinel sites consist of local positional control networks and high-accuracy geodetic connections to: the National Spatial Reference System (NSRS), local GPS-based Continuously Operating Reference Stations (CORS), tide gauges, Surface Elevation Tables (SETs), and ecological monitoring infrastructure. The sentinel site program allows for standardized monitoring of changes in key ecosystem variables, such as elevation, water levels, and biological processes.

Geospatial Infrastructure

A precise geospatial infrastructure must be established over time to ensure accurate monitoring of land and water-level change in the most sensitive ecosystems. In the sentinel sites, a local network of benchmarks connects the area to the NSRS for precise positioning; regional subsidence can be monitored by CORS; and the SETs can measure small, local changes in the unconsolidated sediments that underlay coastal ecosystems.



Connecting tide gauges and SETs to an accurate vertical datum is essential for coastal sea level-change monitoring and risk assessment.

Preparing for Climate Change

The highly productive and critical ecosystems that exist at the land-water interface will be most affected by climate change and the resulting changes in global sea levels. These ecosystems protect coastal communities, improve water quality, and mitigate the impacts of inundation. Sentinel sites provide the opportunity to consistently monitor critical ecosystem health indicators, allowing both scientists and managers to track exactly what is happening to the ecosystem. With this knowledge, steps may be taken to protect coastal areas from the negative impacts of local sea level change. Sentinel sites provide the foundation for long-term monitoring of sea level and other impacts of climate change.

Contact NGS ECO to learn more:
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