

SPOC Science

Coastal & Near Coastal Phenology of GA

Science Goals

The primary target for SPOC is the Sapelo Island National Estuarine Research Reserve which currently has numerous active data sets being collected from Gross Primary Productivity to water quality. Our remotely sensed data will be compared with ground based measurements for quality verification and validation.

Specific quantities that will be derived from SPOC include, but are not limited to, the following:

- Gross primary productivity of coastal wetlands
- Normalized Difference Vegetation Index of coastal vegetation
- Chlorophyll-a reflectance of estuarine and coastal waters
- Phycocyanin reflectance of inland and estuarine waters
- Colored Dissolved Organic Material reflectance
- Total Suspended Sediment reflectance

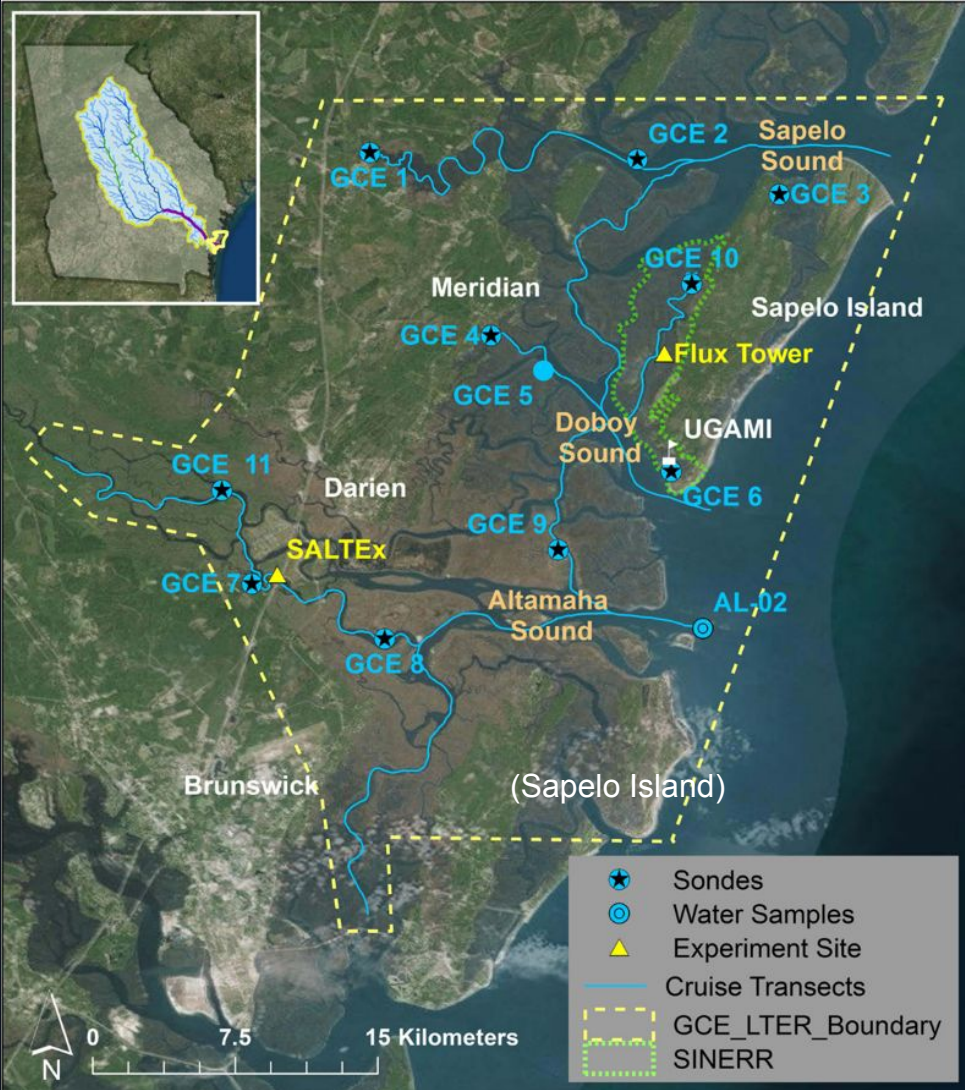
Hyperspectral Data

SPOC is primarily focused on the MODIS and Landsat 8 bands 1 - 4, though spoc has the capability to generate up to 16 spectral bands, with a minimum of ~1 nm bandwidth, of data at a time. SPOC can dynamically choose any 16 bands with its 433 nm - 866 nm range. An example binning scheme is seen here:

NASA Relevance

SPOC helps further push the envelope of all three of NASA's core Earth observation initiatives: Climate Change Research Initiative, Global Earth Observation, and the Oceans Action Plan.

1. By collecting hyperspectral data in a very small form factor, SPOC demonstrates a very cost effective platform for monitoring climate related data such as moisture content
2. SPOC will be fully capable of monitoring large swaths of land due to its fast orbital period
3. SPOC will be very adept at monitoring algal blooms by being able to differentiate species through hyper-spectral analysis.



The Sapelo Island National Estuarine Research Reserve off the coast of Georgia showing the eddy covariance flux tower, where GPP is measured, and other measuring locations (Alber et al 2015).



Landsat 8 Image acquired of coastal Georgia, USA on March 26 2015. The image shows the complex estuarine and wetland ecosystems that SPOC will attempt to quantify. <http://lpdaac.usgs.gov>

Wavelength (nm)	Bandwidth (nm)	QE	SNR (per pixel)
443	20	0.48	181
490	20	0.53	185
510	20	0.52	171
555	20	0.52	157
670	20	0.55	139
750	20	0.50	83
865	40	0.33	63