The Georgia Coastal Ecosystems Long-Term Ecological Research program (GCE LTER) started in 2000. GCE scientists study the marshes and estuaries of the Georgia coast to understand how these ecosystems function, track how they change over time, and predict how they might be affected by future variations in climate and human activities. During this funding cycle (GCE-II) we continued a program of research that addresses the five LTER core areas (primary production, populations, organic matter cycling, inorganic nutrients, disturbance) through a combination of long-term observations, field surveys, experimental manipulations and modeling.

Signature publications from GCE-II included: 1) **Schaefer & Alber (2007)** evaluated the relationship between watershed nutrient loading and riverine export for 12 southeastern rivers, and found that their average N export was only 9% of watershed nutrient loading compared to global estimates of 25%. This analysis was featured as a Synthesis and Emerging Ideas paper in *Biogeochemistry*. 2) **Cai (2011)** synthesized dissolved inorganic carbon (C) measurements from GCE cruises and other data on C flow to construct a carbon budget for the South Atlantic Bight. He suggested that the marsh is a sink for atmospheric CO_2 and that it laterally exports a large quantity of inorganic and organic carbon. This challenges the conventional view that estuarine degassing is supported by riverine C and that lateral export from marshes can be ignored. 3) **Hollibaugh et al. (2011)** began an evaluation of the temporal dynamics of ammonia-oxidizing Archaea, a group of microbes that convert ammonia to nitrite. Information on these microbes may improve our understanding of nitrogen cycling and controls on nitrogen pollution. 4) **Ho et al. (2010)** found that high-latitude plants are better food for herbivores. To the extent that superior foods lead to larger body sizes, high-quality plants could be one mechanism behind Bergmann's rule (animals are larger at high latitudes). This paper was published in the *American Naturalist* and attracted considerable attention from the press. 5) **McKay & Di Iorio** (**2010**) constructed heat and salt budgets for the Duplin River and identified a fortnightly pulse in mixing that causes the salinity gradient to reverse, something that has never been seen before at these time scales, and that could create a barrier for export of material. 6) Radium isotope data from the upper Duplin indicated considerable groundwater discharge, which is often overlooked as a source of water and nutrients to estuaries (**Porubsky et al. 2011**). 7) Studies of fresh, brackish and salt marsh wetlands show that they provide different levels of ecosystem services and that the loss of services due to sea level rise may be less than that forecast from losses of wetland area alone (**Craft et al. 2009**). 8) Archaeological studies of Georgia back barrier islands found shell deposits and evidence of Native American occupation going back 4,500 y (**Thompson & Turck 2010). 9) Robinson et al. (2010)** combined ecological and genetic analyses to reveal how abundance and genetic diversity of larvae vary from inland to offshore, with important implications for populations of snails, barnacles, and other organisms. **10) Guo & Pennings (2011)** found that different factors drive the landscape distribution of plants and invertebrates. Their experiments showed that freshwater plants were excluded from saltier sites by physical stress, whereas salt marsh plants were excluded from fresh sites by increased competition. Overall, GCE scientists published 139 journal publications and 62 books, theses,

and other one-time publications, and obtained external grants from NSF, DOE and elsewhere to roughly double our efforts.

The GCE-LTER also has strong programs in information management, education and outreach. 7 MS theses and 11 PhD dissertations were completed by GCE-LTER graduate students, and we routinely involve undergraduates in our research, many of whom have gone on to graduate school. The GCE Schoolyard program provides in-service training in field ecology for K-12 educators, and we have published a children's book, "*And the Tide Comes In*," as part of the LTER schoolyard series. The project provides outreach to coastal managers through the Georgia Coastal Research Council, which promotes science-based management of Georgia coastal resources by facilitating information transfer between scientists and managers. The GCE information management program meets the highest LTER IM standards. At the close of GCE-II there were 480 online data sets in the GCE data catalog, and 455 in the GCE data portal, representing over 6 million data records which are accessed by a diverse user community. Finally, the GCE website (https://gce-lter.marsci.uga.edu/) provides public access to information and data from the project and previous research on the Georgia coast. Between 2001 and 2012 over 615,000 visitors from 227 distinct countries and territories were logged on the GCE website, accounting for over 2.2 million page views.