

CBIN Research Interests

John B Anderson, Rice University

- Determining erosion rates in alpine glacial environments using seismic data, swath bathymetry data, and sediment cores to calculate sediment volumes of fjords in southern Chile and the Antarctic Peninsula
- Examining rates of mountain denudation in mountainous settings
- Geomorphic features that indicate organized meltwater conduits beneath the ice sheet and the role that meltwater may have played in ice stream instability during the most recent retreat of the ice sheet from the continental shelf
- Evolution of Gulf Coast bays and coastal barriers, focusing on the response of these systems to past changes in the rate of sea-level rise and sediment supply

Andrew Ashton, Woods Hole Oceanographic Institution

- Development and testing of numerical and conceptual models of the formation and evolution of coastal sedimentary environments
- Plan-view delta evolution along wave-dominated coasts
- Coastal response to climate change, sea-level rise, and anthropogenic activities
- Application of 'reduced complexity' morphodynamic models to study earth-surface evolution

Bald Head Island Conservancy (Suzanne Dorsey and Tom Hancock)

- Promote sustainable living on barrier islands
- Effect of erosion on beach habitat as well as federally threatened/endangered animals and plants to design predictive models that will accurately determine future global climate change (and anthropogenic) impacts on barrier islands of southeastern North Carolina
- Define/describe the Bald Head Island freshwater aquifer to plan future development that is compatible with island resources and therefore environmentally sustainable

- Determine the range, number of individuals and best management strategy for the deer population currently inhabiting the island
- Construction of a population model of live oak (*Quercus virginiana*) inhabiting the maritime forest at Bald Head Woods
- Practical and efficient system for continuously monitoring key habitats on Bald Head Island, such as base-line information about the natural dynamics of the systems found on the island to use for comparative purposes when disturbance events occur (natural or human induced)

Edward Barbier, University of Wyoming

- Economics and ecology of the risk of invasive plant establishment from the horticultural trade in North America
- Ecology and economics of commercialization when plants carry a risk of becoming invasive
- Water scarcity and economic growth in Wyoming
- Economic analysis of upstream-downstream water allocation in developing countries
- Initiative on population, consumption and the environment: demographic and economic factors determining coastal land conversion into commercial shrimp Farms, Thailand.

Mark J Brooks, University of South Carolina

- Co-evolution of Carolina Bays and stream-associated eolian deposits
- Late Pleistocene-Early Holocene Hunter-Gather adaptations on the South Atlantic Coastal Plain and archaeological site formation processes

Greg Carter, University of Southern Mississippi

- Remote sensing of vegetation and coastal aquatic systems
- Environmental biophysics
- Invasive species

- Biodiversity and barrier island ecology

Jenifer Dugan, University of California - Santa Barbara

- Coastal marine ecology and conservation, with an emphasis on soft sediment habitats, such as exposed sandy beaches and wetlands

R. Michael Erwin, University of Virginia - Patuxent

- Investigations of coastal wetlands and their associated waterbird populations
- Assessment of potential effects of sea-level rise on coastal wetlands and bird habitats
- Evaluations of the ecological effects of marsh management techniques on federal refuges and parks
- Monitoring island restoration methods and wildlife responses
- Investigation of the role of migratory waterbirds in the avian influenza threat
- Technical assistance to land managers on decisions involving wetland habitat manipulations, restoration, or enhancement.

Rusty Feagin, Texas A&M University

- Coastal plant ecology and spatial analysis of sand dunes, salt marshes, estuaries/bayous, and adjacent upland habitats
- Community ecology, with emphasis on how individual plant interactions influence community dynamics of succession, retrogression, and migration
- Principles of ecological restoration
- Spatial processes of coastal plant migration, including how coastal vegetation responds to and modifies its physical environment, particularly in the context of long-term sea level rise versus short-term extreme disturbances
- Effects of global climate change and urbanization upon coastal plant community distribution using Geographic Information Systems (GIS)

Taylor Field, University of Tennessee

- The evolution of ecophysiological mechanisms, primarily related to water relations and photosynthetic functions, in relation to structure in plants
- The evolution of plant function through time
- The early diversification of flowering plants from an ecophysiological perspective, including evolutionary diversification of xylem hydraulic mechanisms, leaf gas-exchange performance, flower water relations, and root biology

Amy Freestone, Smithsonian Environmental Research Center

- Marine community ecology
- Invasion ecology
- Spatial ecology
- Biogeography
- How ecological mechanisms reciprocally drive and are driven by the latitudinal diversity gradient.

Erv Garrison, University of Georgia

- Geoarchaeology in terrestrial and underwater contexts
- Examining the paleoenvironments and ecologies of historic and prehistoric human landscapes in the US and Europe using earth science techniques

Jane Gemma, University of Rhode Island

- Arbuscular mycorrhizal (AM) fungi and their ecology and physiology.
- Early events that lead to the formation of the symbiosis between plant roots and AM fungi
- Mycorrhizal relationships of ferns and fern-allies and the role of AM fungi in plant succession and restoration of disturbed habitats

- Revegetation of barren dunes at Cape Cod National Seashore and on Hawaiian beaches and young lava flows and the relationship between plants, fungi, and development of vegetative cover.
- Ability of AM fungi to enhance the drought tolerance of plant
- Use of AM fungi in cultivating endangered plant species
- Dutch elm disease and biocontrol

James Gibeaut, Texas A&M University – Corpus Christi

- Measuring and understanding coastal change using topographic lidar, remote sensing, GIS, and field surveys
- Development of virtual computer models of coastal environments for k-12 education
- Modeling the effects of sea-level rise and storms on barrier-island environments and projecting future change

Tara Greaver, Environmental Protection Agency – Office of Research and Development

- Ecosystem response to anthropogenic change, specifically nitrogen addition and climate change factors
- Stable isotopes as tracers of biogeochemical cycling
- Water and nutrient relations of coastal ecosystems

Patrick Hesp, Louisiana State University

- Coastal geomorphology
- Aeolian geomorphology and dune dynamics
- Coastal management

Heather Joesting, Wake Forest University

- Effect of daily and seasonal abiotic stresses on barrier island sand dune vegetation

- Response and recovery of barrier island sand dune vegetation following extreme episodic storm events (hurricane, tropical storm, nor'easter)
- Coupling between leaf orientation, leaf structure, incident sunlight, and photosynthetic potential
- Coastal management using native vegetation to promote healthy ecosystems on barrier islands

Richard Koske, University of Rhode Island

- Physiological ecology of arbuscular mycorrhizal (AM) fungi
- Role of the fungi in primary succession
- Events occurring prior to root colonization (e.g., spore germination, the attraction of germ tubes to roots, and parasitism of spores by soil microorganisms)
- Taxonomic surveys of AM fungi in sand dunes of North America and the Hawaiian Islands
- Incorporation of AM fungal inoculum during a planting of beachgrass at Cape Cod National Seashore
- Addition of AM fungi newly constructed golf greens
- Using AM fungi in potting mixes to grow endangered Hawaiian plant species

Nicholas Kraus, US Army Corps of Engineers – ERDC Coastal and Hydraulics Laboratory

- Advancing knowledge and developing predictive technology to reduce the cost of dredging, promote navigation channel reliability, and understand the sediment-sharing interactions between inlets and adjacent beaches.

Kam Biu Liu, Louisiana State University

- How climate changes occurring over multiple timescales (from millennial to multidecadal) affect the geosphere-biosphere and how human societies respond to these environmental changes
- Producing paleoecological records of global environmental changes
- Understanding the patterns and processes of changes occurring in different components of the climate system (tropical cyclones, ENSO, monsoons, westerlies, arctic front)

Kelly Lucas, University of Southern Mississippi

- Barrier island ecology and vegetation
- Remote sensing in coastal environments
- Barrier island resiliency and sustainability

Robert Mihovil, Mihovil Photography

- Photographic watercolor prints that capture the historic architecture and natural beauty of Galveston Island, Texas

Karl Nordstrom, Rutgers University

- Understanding the dynamic processes affecting the size, shape and location of beaches and dunes in ocean, estuarine, and tidal inlet environments
- Assessment of winds, waves, and currents and the effect of these processes on coastal sedimentation and landform evolution
- Analysis of natural hazards, land use, and restoration of naturally-functioning environments in developed municipalities.

Charles Peterson, University of North Carolina – Chapel Hill

- Marine benthic ecology
- Community organization of soft-bottom benthic systems in estuaries and lagoons

- Importance and nature of predation and intra- and interspecific competition in benthic communities and the role of resource limitation in suspension-feeding bivalve populations
- Paleoecology, invertebrate fisheries management, estuarine habitat evaluation, and barrier island ecology.

Orin Pilkey, Duke University

- Basic and applied coastal geology, focusing primarily on barrier island coasts

Norbert Psuty, Rutgers University

- Shoreline processes and sedimentation, including shoreline erosion, coastal dune processes, and estuarine sedimentation related to sea-level rise

Stanley Riggs, East Carolina University

- Modern coastal systems, extending from inland river, lake, and pocosin environments, to estuarine and barrier island systems, and seaward across the continental shelf
- Sedimentation, Quaternary and Tertiary stratigraphy, coastal and mineral resources, and their inter-relationship with the development of human civilization
- Integrating scientific understanding, utilization and management of various coastal systems including such critical issues as climate change, sea-level rise, shoreline erosion and land loss, hazard zone delineation, inlet dynamics, water quality, habitat preservation, and natural resources

Abby Sallenger, USGS – Center for Coastal and Watershed Studies

- Coastal-erosion hazards arising from extreme storms throughout the United States

- Using airborne lidar to survey hundreds of kilometers of coast both before and after extreme storms to detect change

William K. Smith, Wake Forest University

- How plants are adapted to their respective habitats and the development of mechanistic explanations for the observed distribution patterns of different species in harsh or extreme environments (e.g. deserts, alpine, forest understory, barrier islands)
- Understanding adaptations in physiological processes, as well as structural/functional relationships at the leaf, crown, canopy and stand levels

Isdale Straughan, University of Southern California (retired)

- Marine and estuarine environments of tropical Australia and the Great Barrier Reef, Tierra del Fuego and the Strait of Magellan, Hawaii, Alaska, Southern California, Gulf of Mexico, and Central America
- Analysis of the impact of man's activities including pollution on the environment
- Determining the normal natural fluctuations of an area in order to have a baseline against which to determine the significance and importance of changes due to human activities
- Long-term studies (seven-year study in the estuarine region of the Brisbane River, fifteen-year study of the ecology of sandy beaches in Southern California, and ten years of observations in tropical rainforests)

David Thomas, American Museum of Natural History

- Archaeological research on St. Catherine's Island, off the Atlantic Coast of Georgia
- Using remote sensing technology to discover the long-lost site of the Franciscan mission St. Catalina de Guale (1566-1680)
- Using a sophisticated array of remote sensing technologies to map the subsurface structure the ruins of the Spanish Mission (1620-80) outside of Santa Fe, New Mexico

Davin Wallace, Rice University

- Using an integration of core, LIDAR, seismic, and experimental modeling data along coastal Texas and Louisiana to study the evolution of barrier island systems, hurricane impacts on coastal system
- Coastal hazards and how they effect humans

John Whitehead, Appalachian State University

- Ways to attach monetary values to environmental and natural resources for use in benefit-cost analyses (e.g., sea-level rise, recreational fishing).

Amy Williams, Texas A&M University

- Coastal research
- Coastal management
- Environmental education

Angela Witmer, Texas A&M University

- Ecology of sandy beaches
- Ecology of the today's beaches, incorporating the changes that are occurring due to erosion, barrier island migration, and storm events, to better understand the future of sandy beaches
- Seasonal changes of intertidal macrofaunal invertebrates in relation to the physical environment along the coast of Texas
- Changes resulting from hurricanes and the recovery of the beach organisms
- Invertebrate mating systems and behavior examining the evolutionary stability of mixed mating systems

Don Young, Virginia Commonwealth University

- Ecology of coastal plants, with a primary emphasis on woody species, especially those that form shrub thickets
- Adaptive mechanisms for survival and success in coastal environments and the interplay of physical stresses and biotic interactions on the distribution of plants in coastal environments
- Specific environmental and biotic factors affecting the distribution of barrier island plants
- Successional processes in coastal environments
- Shrub expansion in coastal environments
- Ecological significance of coastal storms, ecology of coastal wetlands
- Control of invasive species in coastal areas
- Effects of salinity and flooding on plant ecophysiological processes
- Restoration of coastal communities.

Rob Young, Western Carolina University

- Coastal processes and coastal management

- Hurricanes
- Wetlands
- Environmental restoration
- Holocene landscape evolution in the southern Appalachians