National Park Service
U.S. Department of the Interior

Park Coastal Geology

Geologic Resources Division, Coastal Geology Team
Volume 1, Number 1, Fall 2002

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Welcome! **to the first Coastal Geology newsletter. This bi-annual newsletter is intended to be a forum for discussion and items of interest to National Park Service coastal land managers and stakeholders. This first issue will cover a range of topics including coastal research, boundary issues, and technical assistance. Future editions will include discussions about effective coastal management strategies, available coastal data and data sources, coastal mapping projects, protocols for monitoring shoreline change, and much more. We welcome your suggestions, article submissions, and short news items. If you have topics or questions for general discussion, please let us know, and we will ensure that the topics are discussed in the next edition.**

Coastal Geology is a fascinating and complex part of NPS coastal park management. We hope that this newsletter serves as a valuable tool in addressing coastal issues. We look forward to hearing from you!

**Sincerely,
Your Coastal Geology Team- Rebecca, Julia, Linda and Kim**

Natural Resource Management Issues in Southeast Region Coastal Parks

**Linda York, Coastal Geomorphologist
NPS Southeast Region
linda_york@nps.gov**

The Southeast Region of the National Park Service includes parks along the Atlantic Coast from the North Carolina-Virginia border southward to Florida, along the Gulf Coast from Florida to Louisiana, and those parks within the Caribbean. These coastal parks represent a wide variety of natural and cultural resources, and experience almost as wide a variety of resource management concerns and issues. Some of these concerns are shared by most of these parks, as well as by most coastal parks in other regions, such as shoreline erosion, relative sea-level rise, and threats from coastal storms. The following are two examples of ongoing coastal management issues within Southeast Region parks.

DE SOTO NATIONAL MEMORIAL

Major storms such as hurricanes, tropical storms, and "nor'easters," are a constant threat to the Southeast Region coastal parks, and damage from these storms can be extensive. On Friday, September 14, 2001, Tropical Storm Gabrielle struck De Soto National Memorial on Florida's Gulf Coast, with sustained winds of 70 mph, 10 inches of rain, and storm surges of 3 to 4 feet in conjunction with high tides. Park trails were inundated with floodwater from the Manatee River, and one 50-foot section of the nature trail was completely washed away. Numerous trees and shrubs, some 80- to 90-years old, were uprooted, blocking all foot and vehicular traffic for several days throughout the Park.

De Soto National Memorial Beach, adjacent to the Park's visitor center, was closed and fenced-off immediately after September 14th for visitor safety. The removal of a large portion of a 360-foot long, 10-foot high, 20-foot wide berm of sand and rock riprap left a 1-foot scarp (drop-off) down to the exposed large rocks. An emergency nourishment was completed in January 2002, which placed approximately 1,300 cubic yards of sand on the beach. This sand was a minimum quantity needed to restore a safe and negotiable drop-off from the end of the sand berm to the high water mark for visitor use. With the beach reopened and the fence removed, the historic viewshed was also restored for visitor enjoyment.

Additional repairs to restore park facilities, resources and operations to pre-Gabrielle level, have now been funded. These repairs include final restoration and grading of 500 feet of the park trail system, clearing of dead vegetation/fuels, additional pruning of storm-damaged trees throughout the park, and repairs to the Visitor Center. Approximately 600 cubic yards of additional sand will be placed on De Soto National Memorial Beach, and bay cedar shrubs will be planted in front of the berm, along with mangroves and cordgrass to provide a cover of native materials. This beach repair represents the Park's effort to manage a highly erosional shoreline, while striving to maintain a 16th century viewshed and beach to enhance the historical experience of the park visitor.

De Soto National Memorial Beach as it looked prior to Tropical Storm Gabrielle. (Photo courtesy of Charlie Fenwick, DESO)

Desoto National Memorial Beach after Tropical Storm Gabrielle, September 2001. The scarp cut by the storm and the exposed rocks can be seen. (Photo courtesy of Charlie Fenwick, DESO).

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WIN PRIZES, GLORY AND FAME!!

Can you identify this geologic feature and the park where it is found? If so, please send us your answers. A winner will be drawn December 10, 2002 (just in time for Christmas!). The lucky winner will receive a GRD prize package including a lovely green golfing shirt, stainless steel coffee mug, NPS lanyard, geologic CDs, and anything else we can scrape together. These items will make great stocking stuffers for friends and family! Good luck! We'll announce the winner in the next issue of *Coastal Park Geology*.

Send your answers to the NPS Geologic Resources Division:
kim_nelson@partner.nps.gov

TIMUCUAN ECOLOGICAL AND HISTORICAL PRESERVE

Tidal inlet migration and changes in inlet hydrodynamics caused by shoreline engineering are a concern at Timucuan Ecological and Historical Preserve located east of Jacksonville, Florida. The preserve encompasses approximately 46,000 acres that include the seaward confluence of the Nassau and St. Johns rivers. These rivers form an extensive estuarine system dominated by salt marsh coastal hammock habitat, and marine and brackish open waters. Ft. George Inlet, located between the Nassau and St. Johns rivers, has been migrating north since the jetty on the north side of St. Johns River (to the south of Ft. George Inlet) was capped and made impermeable in 1934. The jetty interrupted the longshore transport of sediment to the south. Recently, the northward migration rate has increased, and there has been significant shoaling within the Ft. George River in several areas. Ft. George Inlet is flood-dominated and is a major source of relatively clean marine water tidally feeding the marsh-estuarine system of the preserve. Natural resource managers at Timucuan are concerned about the impacts on water quality within the preserve from the inlet migration and shoaling and the potential for inlet closure. If the inlet closes, then the tidal range will decrease substantially throughout the bay area served by the inlet, and circulation in the lower reach of the Ft. George River will be reduced. The overall hydraulic system will change, and flow through creeks connecting with the St. Johns River would probably increase, bringing in more particulate matter and chemical constituents. The potential impact on the trophic state of the waters in the preserve is unknown.

Timucuan Ecological and Historical Preserve

The St. Johns River mouth/Ft. George Inlet is presently being considered as a potential demonstration project for the Northeast Florida Regional Sediment Management program. Three alternatives for bypassing or backpassing sand at Ft. George and St. Johns River entrances have been proposed. Although one of the alternatives removes a major portion of a large flood shoal within Ft. George River, none of the alternatives prevents inlet migration, or significantly reduces the possibility of inlet closure. Thus, the future water quality within Timucuan Ecological and Historical Preserve is a continuing concern.

Surfing Resources in National Parks

Adam Stein, Geoscientist-in-the-Park
The Surfrider Foundation
astein@surfrider.org

In 2002, the National Park Service (NPS) is collaborating with the Surfrider Foundation (www.surfrider.org) as part of the GeoScientists-in-the-Parks program to inventory and categorize all surfing resources in NPS managed lands. Park management actions can directly impact natural and recreational resources such as surfing, but very limited information about NPS surfing resources exists. When this information is easily accessible, it can be effectively used for park planning and management actions. For example, Gateway National Recreation Area modified a beach nourishment plan to minimize impacts to their surfing resources.

Fort Point NHS in Golden Gate National Park
Photo: www.swell.com

The main goal of the Surfrider Foundation/NPS collaborative program is to obtain information on surfing locations within park boundaries, as well as adjacent locations that may be affected by park management decisions (e.g. well known surf break immediately downdrift of park boundary where beach nourishment is planned). The project recognizes that some surf spots will need to remain confidential to protect other park resources, and such information will remain internal to the NPS. Thus far the project has had positive results, identifying surfing areas in over 25 NPS managed sites from the San Juan National Historic Site to Redwood

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National Park. However, more information is needed from NPS staff who are familiar with our surfing resources. Please contact Adam Stein (astein@surfrider.org) with this information.

Playa Linda at Canaveral National Seashore
Photo: www.swell.com

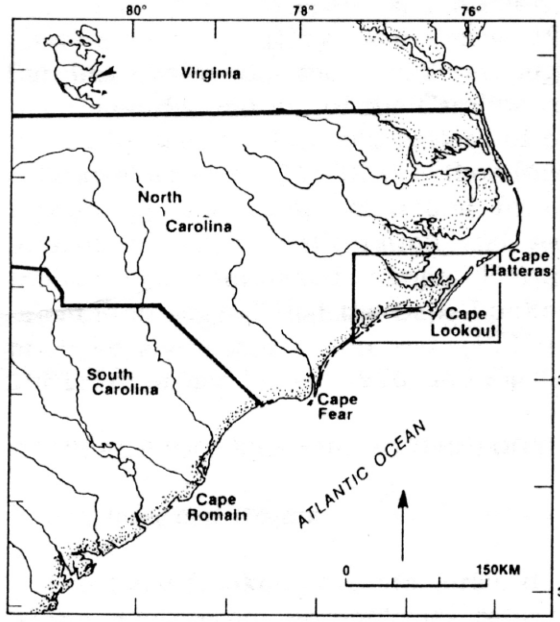

FIGURE 1 – Cape Lookout National Seashore

Process-Response, Geomorphic and Ecologic Mapping of Core Banks, Cape Lookout National Seashore, NC

Robert M. White, Geoscientist-in-the-Park
Geology and Coastal Resource Management, East Carolina University
Greenville, NC 27858
whitermw@yahoo.com

Stanley R. Riggs, Professor of Geology
East Carolina University
Graham Bldg, Greenville, NC 27858
riggss@mail.ecu.edu

Barrier islands are complex, dynamic systems that require integration of ecologic, geologic, climatologic and human processes to understand. Modern management of barrier islands requires scientific knowledge to develop sound policy and guidelines, methods of implementation, and mechanisms of evaluation. The management challenge lies partly in the dynamic state of barrier islands. Landscape-level change reflects both short-term ecological succession and geological-scale time frames such as impacts of sea-level rise on overwash barrier islands. These processes are driven by climate forcing at both temporal scales. North Carolina is fortunate to have over 300 miles of coastline. This vast stretch of varying barrier island systems presents an excellent opportunity for coastal ecological and geological processes and resource management study.

Fifty-six miles of eastern North Carolina shoreline was designated Cape Lookout National Seashore in 1966 (Fig.1), and land acquisition began shortly thereafter. The area includes Shackleford Island and the Core Banks. Core Banks extend from Cape Lookout to Ocracoke Inlet. The Core Banks system is divided into North and South Core Banks by Drum Inlet, which was opened in 1971 by the U.S. Army Corps of Engineers to replace the closing Old Drum Inlet.

During the tropical season of 1999, Middle Core Banks formed by the re-opening of Old Drum Inlet. Opening and closing of ephemeral inlets is fairly common along this barrier island especially throughout the north end of North Core Banks.

Core Banks appeared barren and featureless from the early 1900's through the early 1960's (Ashe, 1906; Cobb, 1907; Fisher, 1962) and slowly evolved to a more vegetated state through the 1970's (Godfrey and Godfrey, 1976). Today it has a more consistent foredune and is vegetated throughout with well-developed back barrier *Spartina alterniflora* and *Juncus roemerianus* marshland, *Myrica cerifera* and *Baccharis halimifolia* scrub-shrub, *Spartina patens* maritime grassland and interior algal flats (Fig.2).

Has climate, sea level change, or human use led to these landscape modifications? What will the future evolution be if global sea level continues to rise? What are the likely consequences and management issues resulting from future change? The objectives of ongoing research on Core Banks are to develop the recent geologic and ecological evolution of the system. Ultimately, the results of this re-

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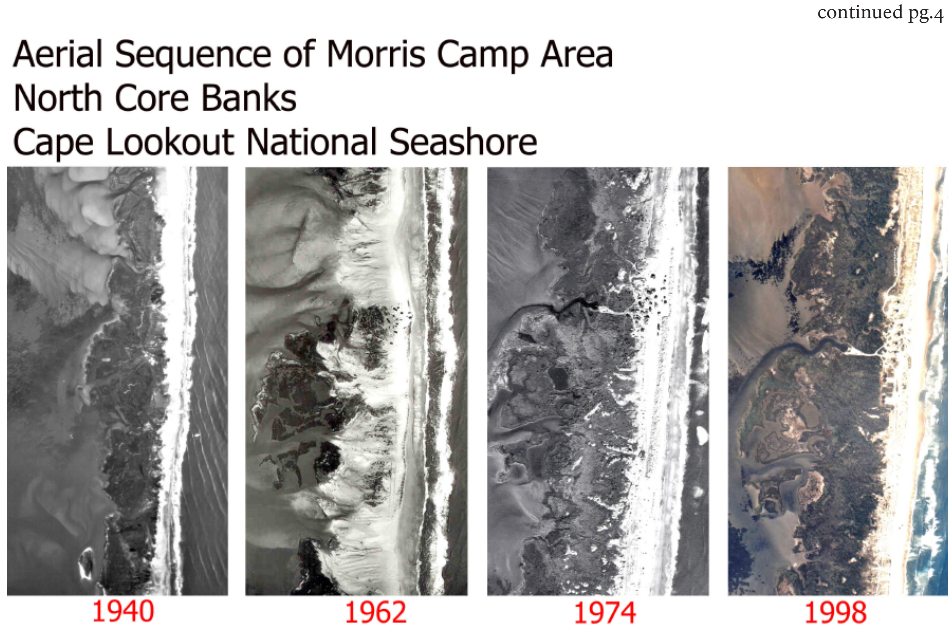

FIGURE 2 – Georeferenced Aerial Photograph Sequence from 1940 through 1998, Morris Camp, North Core Banks

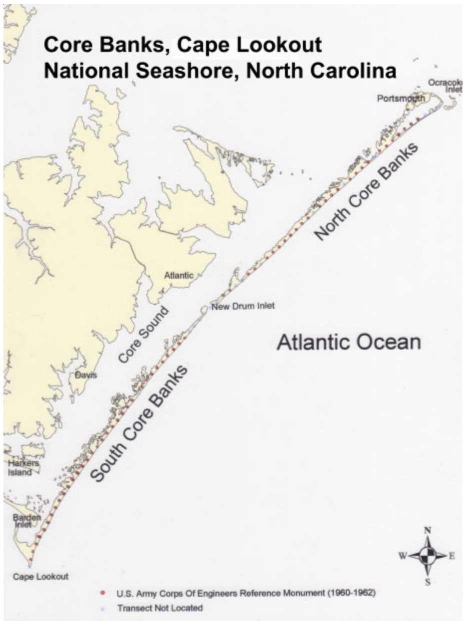

FIGURE 3 – Location of Existing U.S. Army Corps of Engineers Benchmarks

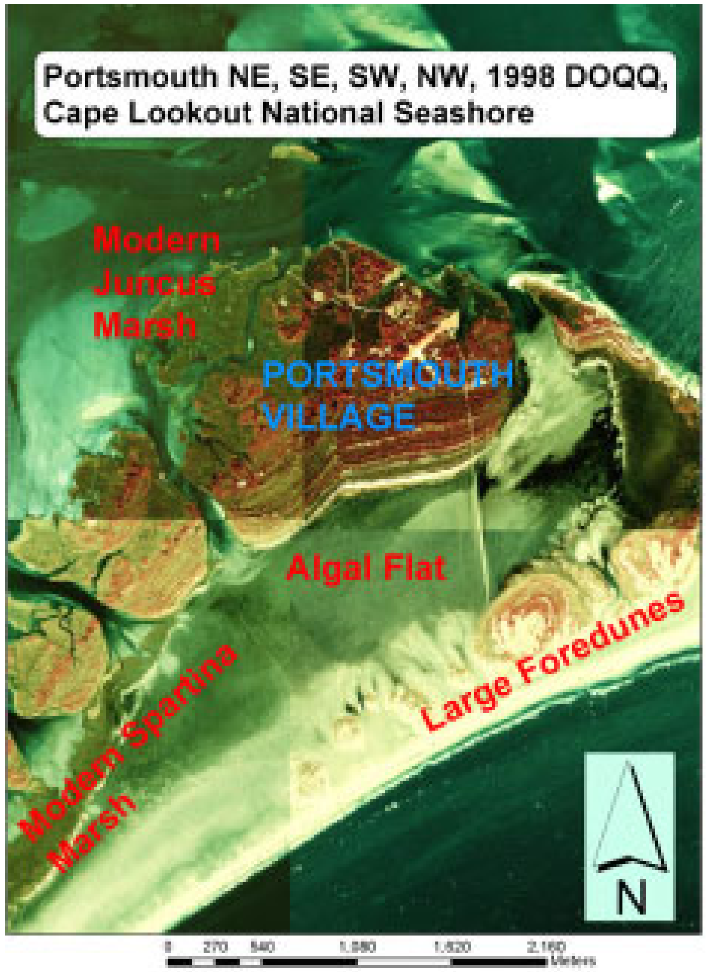

FIGURE 4 – View of Modern Core Banks, Portsmouth SW, DOQQ 1998.

search may be used to assist in evaluation of future change within other protected, yet developed shorelines. Understanding process and response differences between developed and "natural" systems will allow formulation of concepts to aid future barrier island resource management.

The U.S. Army Corps of Engineers (USACE) placed benchmarks on transects spaced 3000 feet apart in 1960 – 1962 throughout the entire length of Core Banks (Fig. 3). The transects were established perpendicular to the shoreline, and the concrete and galvanized steel benchmarks were used as control points to measure future island migration and shoreline change. The USACE Core Banks surveying project was part of a cost/benefit analysis to consider construction of a foredune from Ocracoke Inlet to Cape Lookout. The dune would be constructed similar to the man-made foredune from Ocracoke to the Virginia border, and its purpose would be to abate shoreline erosion. Shortly after the USACE study was completed the NPS adopted Core Banks as part of Cape Lookout National Seashore, and the foredune was never constructed.

Sixty of the original benchmarks have been excavated within the foredunes, overwash flats and maritime grasslands of the Core Banks during 2001 and resurveyed using GPS. The purpose of this survey is to examine vertical and horizontal change in island geometry.

Georeferenced aerial photography from 1960, 1962, 1971, 1974, 1983, 1997 and Digital Orthophoto Quarter Quandrangles from 1998 have facilitated an examination of vegetation community succession. These ecological indicators are being used to supplement GPS topographic data to understand island system change throughout the 20th century. Community succession is used as an indicator of coastal processes and island evolution. Thus far, greater than 1,100 acres of back barrier marsh, primarily on North Core Banks, has developed since 1962 (Fig.4). Back barrier wetland formation is an indicator of a natural progression of the system as sediment is transported and deposited into the shallow estuarine environment through overwash and ephemeral inlet processes. The marsh development observed on Core Banks differs from recent work on other North Carolina barrier island systems. Riggs (2002) identified basin-wide back barrier and estuarine shoreline wetland loss in other areas of the Albemarle-Pamlico basin where human modification has occurred. Our results may be indicative of the value of maintenance of a barrier island system through natural evolution. Based on our GPS survey data, the foredune and beach berm of Core Banks has increased in elevation an average of 3.9 feet since 1960. This appears to have resulted in an island system that is less frequently inundated by overwash and perhaps more stable. Foredunes have formed throughout the Core Banks and very large dunes have formed on the north end of North Core Banks. Protection of northern North Core Banks by newly established foredunes has allowed interior island succession from tidal flat, to algal flat, and eventually *Spartina alterniflora* marsh. The formation of interior-island marsh in this region appears to be indicative of a lower energy system.

SUMMARY

Core Banks is different from most barrier islands along the East Coast as it is allowed to evolve naturally and to maintain a natural landscape. Is the system more "healthy" than other barrier island shorelines? How different are sedimentation processes on "natural" compared to human modified barrier islands? What do the differences mean for long-term maintenance of the island systems?

As our surveying and geomorphic analysis has shown, this island system is more stable than earlier in the 20th century. Is this state change due to climate, weather patterns, human activity or other? Our ongoing work on the Core Banks includes completion of vegetation and geomorphic mapping. These data will be incorporated into a GIS to track island evolution and succession. For now, the idea of island stability proposed by the USACE in 1960 has apparently evolved naturally on the Core Banks.

Researchers involved with ongoing work on the Core Banks would like to thank the Southeast Region of the National Park Service and NPS Geoscientist-in-the-Parks pro-

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gram for funding. Additionally, we would like to thank Cape Lookout National Seashore personnel for logistical support.

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Godfrey, P. and Godfrey, M. 1976. Barrier Island Ecology of Cape Lookout National Seashore and Vicinity, North Carolina: National Park Service Scientific Monograph Series, No. 9, 160pp.

Riggs, S.R. 2002. Shoreline Erosion in North Carolina Estuaries. UNC-SG-01-11. North Carolina Sea Grant, Soundfront Series. 68pp.

United States Army Corps of Engineers, December 1964. Ocracoke Inlet to Beaufort Inlet, North Carolina. Combined Hurricane Report-Ocracoke Inlet to Beaufort Inlet, and Beach Erosion Report on Cooperative Study of Ocracoke Inlet to Cape Lookout.

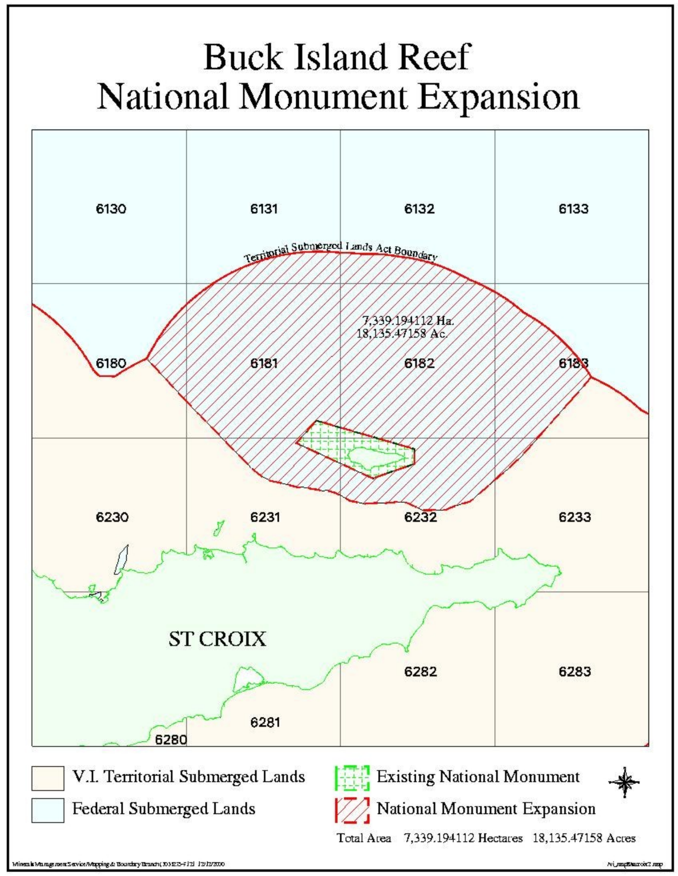

FIGURE 3 – National Monument area expansion following detailed boundary investigation.

Digging Deep to Protect an Underwater Treasure

Robert E. Johnson, Cartographer
Minerals Management Service
Mapping & Boundary Branch
Lakewood, CO (303) 275-7186

Leland F. Thormahlen, Chief
Minerals Management Service
Mapping and Boundary Branch
Lakewood, CO (303) 275-7120

In an effort to give greater protection to the fragile coral resources of the Virgin Islands, the President, on January 17, 2001, signed Proclamations 7399 and 7392. Their signing was the culmination of years of work by the Secretary of Interior and staff, along with employees from National Park Service (NPS), Minerals Management Service (MMS), United States Geological Survey (USGS), and others. But how were the odd shapes of these new and expanded monuments determined? Here is the inside story.

FIGURE 1 – Rocks at west end of Buck Island, South of St. Thomas USVI.

The first step required to determine most offshore boundaries is to establish a baseline (See accompanying article "MBWG Helps with Offshore Boundaries"). The baseline includes the seaward most points along the coastline – *including* rocks and islands. National Oceanographic and Atmospheric Administration (NOAA) nautical charts are the standard source for this information. But many rocks marked on charts with an asterisk symbol require field checking to see if they qualify for use in the baseline. If the rock is above water at low tide it can be included in the baseline. If the rock remains below water at low tide, it cannot be used (Fig.1).

Next a Territorial Submerged Lands Act Boundary was calculated at 3 nautical miles from the baseline. Control of the submerged lands out to 3 nautical miles from the baseline was granted to the states by the Submerged Lands Act of 1953, as amended (43 USC 1301) and Outer Continental Shelf Lands Act of 1953, as amended (43 USC 1331); and to territories, such as the Virgin Islands, by the Territorial Submerged Lands Act (TSLA) of 1974 (48 USC 1705). But a careful reading of the TSLA reveals this clause... *There are excepted from the transfer made by subsection (a) hereof - …all submerged lands adjacent to property owned by the United States above the line of mean high tide.* That would indicate that there may be some areas within 3 nautical miles that were retained under U.S. Jurisdiction and were not relinquished to the territories. But to our knowledge, in over 25 years since the enactment of the TSLA, no one had ever mapped the affected areas!

Digging deep into Virgin Islands (VI) land

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FIGURE 2 - Property boundary monuments were often in poor shape or non-existent.

records to determine land ownership was a daunting task. In many cases the paper records were hard to find or non-existent, and there was no way of telling if we had ever located them all. Often the legal descriptions were vague or confusing and they seldom contained coordinates of the type needed by a GIS system. GPS surveys were conducted where necessary. These too were often hampered by lack of monuments or marking of property lines on the ground (Fig.2).

Once these surveys were completed however, lateral boundaries (equidistant lines) separating VI submerged lands from Federal submerged lands could be calculated between the shoreline and the TSLA and International Boundaries. Existing NPS lands on St. John, for example, resulted in Federal submerged lands being projected offshore, while private lands, including a number of private inholdings within the park, resulted in Territorial submerged lands being mapped offshore.

Areas for inclusion in the new Offshore Monument Areas were then chosen from those parcels shown to be retained under federal control (Fig.3). For more on this story see *Underwater parks: Three Case Studies and a Primer on Marine Boundary Issues*, The George Wright Forum, Volume 19, No. 1, 2002.

Interesting Websites for Coastal Managers

CA coastal photographic survey
www.californiacoastline.org

NPS Digital Image Archive
www.nps.gov./pub_aff/imagebase.html

NPS Submerged Cultural Resources Unit
http://www.nps.gov/scru/home.htm

USGS Coastal and Marine Geology Program
http://marine.usgs.gov/

USGS Mapping Coastal Change Hazards
http://coastal.er.usgs.gov/hurricanes/mappingchange/index.html

U.S. Climate Change Science Program
http://www.climatescience.org/

Upcoming Coastal Conferences and Meetings

WEB SITE	DATE	TITLE	GENERAL INFORMATION	LOCATION	ABSTRACT DEADLINE
http://www.scseagrant.org/icsr/icsr_themes.htm	Nov. 20-24	**Sixth Annual International Conference on Shellfish Restoration**	Conference will focus on Shellfish resource management, habitat restoration and community awareness	Charleston, SC	Aug.1, 2002
http://www.estuaries.org/Conference/conference.html	April 13-16, 2003	**Inaugural National Conference on Coastal and Estuarine Habitat Restoration**	Nationwide forum that will focus on the goals and practices of coastal and estuarine habitat restoration	Baltimore, MD	Sept. 13, 2002
www.csc.noaa.gov/ cz2003	July 13-17, 2003	**Coastal Zone Management through Time**	Coastal Zone Management conference that will address port and harbor, regional, and aquatic resource management issues	Baltimore, MD	Sept. 16, 2002
http://www.coastalsediments.net/pages/topics.htm	May 18-23, 2003	**Coastal Sediments 2003: Crossing Disciplinary Boundaries**	Coastal Sediment transport, coastal engineering and coastal geomorphology	Clearwater Beach, Florida	Sept. 1, 2002
http://www.csc.noaa.gov/GeoTools/htm/register.htm	Jan. 6-9, 2003	**Coastal GeoTools 2003**	Conference will focus on geospatial technologies for coastal management of resources	Charleston, SC	closed
http://fish.washington.edu/news/erf/	Sept 14-18, 2003	**ERF 2003 Estuaries on the Edge: Convergence of Ocean, Land and Culture**	17th Biennial Conference of the Estuarine Research Federation	Seattle, WA	Check back later in 2002
http://www.georgewright.org/2003.html	Apr 14-18, 2003	**George Wright Society Biennial Conference**	Protecting our Diverse Heritage: The Role of Parks, Protected Areas, and Cultural Sites	San Diego, CA	Oct. 21, 2002

If you find the answer to the Contest rather baffling, this photo might help you out. It is from the same National Park found on page 2. Please submit your answers to the Geologic Resources Division (kim_nelson@nps.gov) by December 10, 2002!

NPS COASTAL GEOLOGY CONTACT LIST

Please contact the NPS Coastal Geology Team for scientific and/or regulatory assistance involving coastal management issues in National Parks (see below for past and current examples of technical assistance).

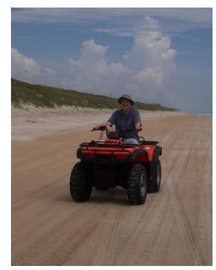
Rebecca Beavers, Ph.D.
Coastal Geology Coordinator
Geologic Resources Division
P.O. Box 25287
Denver, Colorado 80225
303-987-6945
rebecca_beavers@nps.gov

Rebecca at a meeting on the Oregon Coast, 2002

Julia Brunner
Policy and Regulatory Specialist
Geologic Resources Division
P.O. Box 25287
Denver, Colorado 80225
303-969-2012
julia_f_brunner@nps.gov

Julia and her son, Jake, 2002

Linda York, Ph.D.
Coastal Geomorphologist
Southeast Regional Office
100 Alabama St. SW
NPS/ Atlanta Federal Center
Atlanta, GA 30303
404-562-3113 x 537
linda_york@nps.gov



Linda at work on Canaveral National Seashore, 2002

Examples of Technical Assistance Provided by NPS Coastal Team

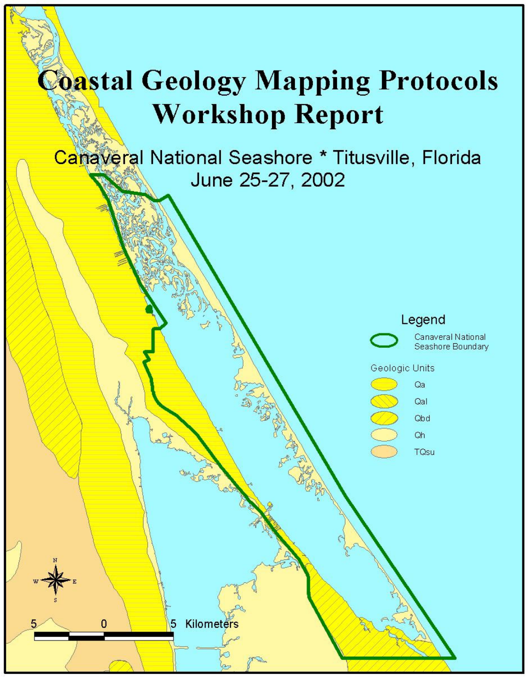
- **Provided post-storm evaluation of tropical storm Isidore impacts on Gulf Islands National Seashore natural and cultural resources.**

- **Assisted Cape Hatteras National Seashore to steadfastly oppose a 30-year-old U.S. Army Corps of Engineers plan to build mile-long jetties on either side of Oregon Inlet, a major navigation channel within the seashore.**

- **Found that the NPS's statutory, regulatory, and policy mandates gives War in the Pacific National Historic Park the undisputed authority to protect park resources from the negative impacts of laying fiber-optic cable across park coral reefs.**

- **Continue to assist Northeast Region Coastal and Barrier Network to develop protocols for monitoring shoreline change.**

- **Continue to aid Golden Gate National Recreation Area in evaluating alternatives and the impacts of potential U.S. Army Corps of Engineers shoreline stabilization project at Ocean Beach.**



Coastal Geology Mapping Protocols for Atlantic and Gulf National Park Units

Rebecca Beavers
Coastal Geology Coordinator
Geologic Resources Division
rebecca_beavers@nps.gov

Kim Nelson
Coastal Geologist
Geologic Resources Division
kim_nelson@nps.gov

A comprehensive geologic resource inventory and mapping program is necessary for the effective management of our coastal national parks. At present, the National Park Service (NPS) recognizes 97 coastal units that encompass more than 7,300 miles of shoreline. In coastal areas, surficial and subsurface geology are complexly intertwined with park flora, fauna, water, air, and cultural resources. In addition, relative sea-level rise, geologic hazards, and anthropogenic modifications create an immediate need for detailed geologic mapping in coastal areas. *Presently, no mapping products or standards exist to meet this need.* The Geologic Resources Inventory (GRI), cooperatively administered by the NPS Inventory and Monitoring Program and the NPS Geologic Resources Division, took an important first step in meeting the geologic and surficial landform mapping requirements of NPS coastal park units.

The GRI coordinated and funded a Coastal Mapping Protocols workshop on June 25-27, 2002 at Canaveral National Seashore to address coastal park mapping needs and coastal management issues. This workshop brought together 38 federal, state, academic, and private industry employees including park managers, coastal geologists, resource specialists, information technology specialists and inventory & monitoring coordinators, to establish coastal mapping protocols for Atlantic and Gulf coastal parks in the National Park Service. Workshop participants discussed coastal park management issues and formulated a draft list of Coastal Landform Mapping (CLM) units that should be incorporated into coastal geology mapping products. GRI staff members will integrate the identified coastal mapping units into the NPS Geology-GIS Data Model, the documented standard for digital geologic maps within the NPS.

Building upon this list of mapping units, an inventory of the significant geologic resources contained within each coastal unit will be identified during GRI scoping meetings. In addition, scoping meetings will determine individual park mapping priorities and needs. The GRI will attempt to provide coastal National Park units with bedrock geology, surficial geology and/or landform mapping products. Mapping products should include GIS digital coverages, hard copy geologic maps, and/or supplemental information regarding significant geologic features and processes found within each park unit. When possible, the GRI may also supply coastal parks with existing bathymetric, topographic, and benthic habitat mapping coverage. These maps will provide the geologic framework and base cartographic information necessary for park managers to effectively monitor coastal change and shoreline dynamics. GRI coordinators have outlined several inventory action items and more specific project tasks related to CLM to include in the FY2003 GRI work plan.

The participants of the Coastal Mapping Protocols Workshop strongly encouraged a "holistic" ecosystem approach for the effective management of our federally protected coastal parks. To understand the broad range of multi-faceted coastal issues commonly confronting coastal park managers, coastal landform maps should be integrated with biological and physical system components, including vegetation, species habitat, and oceanographic variables. Park infrastructure, boundary information, shoreline engineering, and cultural resources may also be integrated with the final geologic map products. GRI staff members will work with coordinators of other Natural Resource inventories and their partners to identify and initiate possible integrated data collection and mapping projects. Cooperative projects may allow significant cost savings for the inventories and higher quality data products for park managers. These additional mapping components will increase understanding of complex coastal environments, allowing park managers to make better-informed and more effective management decisions.

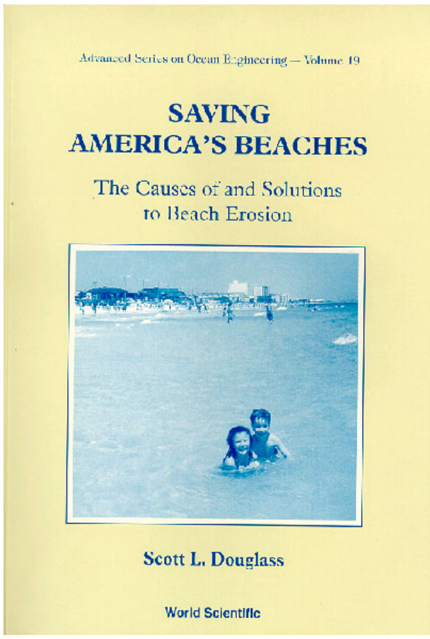
Please see www.nature.nps.gov/grd/geology/gri/coastal for workshop report, including MS power point presentations, and Coastal Park fact sheets.

In Memory of Jim Allen - A Great Friend of our Coastal Parks

Jim Allen (Right) and John Stiner (Resource Manager), conducting a GPS shoreline survey at Canaveral National Seashore, June 2002.

James R. Allen died on July 30, 2002. Jim Allen was a coastal geomorphologist in the U.S. Geological Survey (USGS) and National Park Service. He often said that he had the best job in the world, being paid to work on beaches throughout the coastal national parks. Jim received his Ph.D. at Rutgers University in the early 1970s where he was supervised by Norbert Psuty. Early in his career, Jim taught at Northeastern University in Boston and at the University of Arkansas. In 1981 Jim returned to Boston, to serve as a coastal geomorphologist for the National Park Service, and later he was transferred into the USGS. Jim's fieldwork extended from Acadia National Park to Padre Island National Seashore. Most recently, Jim was active in developing a shoreline monitoring program for the Northeast coastal parks, using knowledge gained from many years of research in Cape Cod National Seashore, Gateway National Recreation Area, and Fire Island National Seashore. Most uniquely, Jim was able to simultaneously communicate his knowledge of coastal sediment dynamics to the park ranger, park superintendent, and university colleague on the same site visit. His enthusiasm was unparalleled. He will be missed by all of us who knew him as a friend and a colleague, but he will be fondly remembered for his longstanding contributions to our coastal parks.

RECOMMENDED READINGS



SAVING AMERICA'S BEACHES: The Causes and Solutions to Beach Erosion

Scott L. Douglas

Advanced Series on Ocean Engineering - Vol. 19
104 pages

This book tells you where beach sand comes from, how waves are formed and how they break and move sand down the coast, how "works of man" have blocked this movement and caused beach erosion, and what can be done to save the beaches for future generations of Americans. A three-part prescription for healthy beaches is proposed: "backing off," "bypassing sand," and "beach nourishment." So if you love waves and beaches, and care about the future of your favorite beach spot, then read this book while you enjoy the beach.

Contents:

- Beaches — America's Longest Playgrounds
- Our Jeweled Necklace of Sand — The Geology of Beaches
- Surf's Up! — Waves and Their Effect on Beaches
- "Sand Thieves" of the Beach — How We Are Destroying Our Beaches
- "Designer Beaches" — Beach Nourishment Engineering
- The Prescription for Saving America's Beaches
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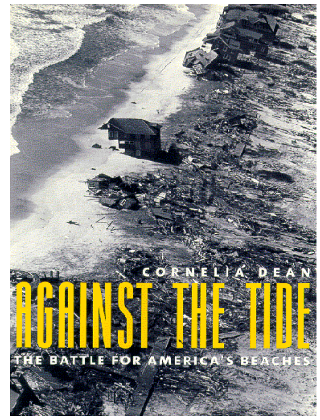

AGAINST THE TIDE: The Battle for America's Beaches

Cornelia Dean

Columbia University Press
296 pages

Castles built on sand are doomed, they say. But in our hunger for an ocean view from the living-room window, we keep building things we expect to last on beaches that never stay still. In *Against the Tide*, Cornelia Dean, science editor of *The New York Times*, outlines the global coastal management crisis and all the elaborate engineering methods developed to stave off erosion—revetments, sand-trapping devices, seawalls, groins and jetties, even artificial seaweed beds. In clear, journalistic style, she explains how all of these devices have failed to stop the inexorable march of coastal erosion. And they've failed at a staggering cost to taxpayers, despite the fact that they're usually deployed to protect private property. The world's sandy beaches continue eroding, and nowhere is this more visible than in the U.S., where oceanfront construction has been proceeding at a fast and furious pace for decades. Of course, the perfectly natural process of erosion is only considered a "problem" if it threatens buildings or property. Dean writes: "There is a kind of constituency of ignorance, people who have so much invested in coastal real estate that they do not want to hear how vulnerable it is."

Using examples from Galveston to Cape Cod, and a few places on the West Coast, Dean shows how building each "protective" structure has led to the need for more protection in a game humans are destined to lose to the ocean. "American political institutions," she writes, "are ill-suited to the indeterminacy and elasticity of nature." Part of the problem is that people are reluctant to admit that natural processes threatening our carefully planned and paid-for civilization are good and necessary parts of a dynamic ecosystem, and our efforts to prevent them will invariably buy us more trouble. Dean believes that it's time to make peace with the rising sea level and stop fighting nature. *Against the Tide* should be required reading for waterfront property owners, coastal zone managers, the Army Corps of Engineers, and beach lovers everywhere. —*Therese Littleton*

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