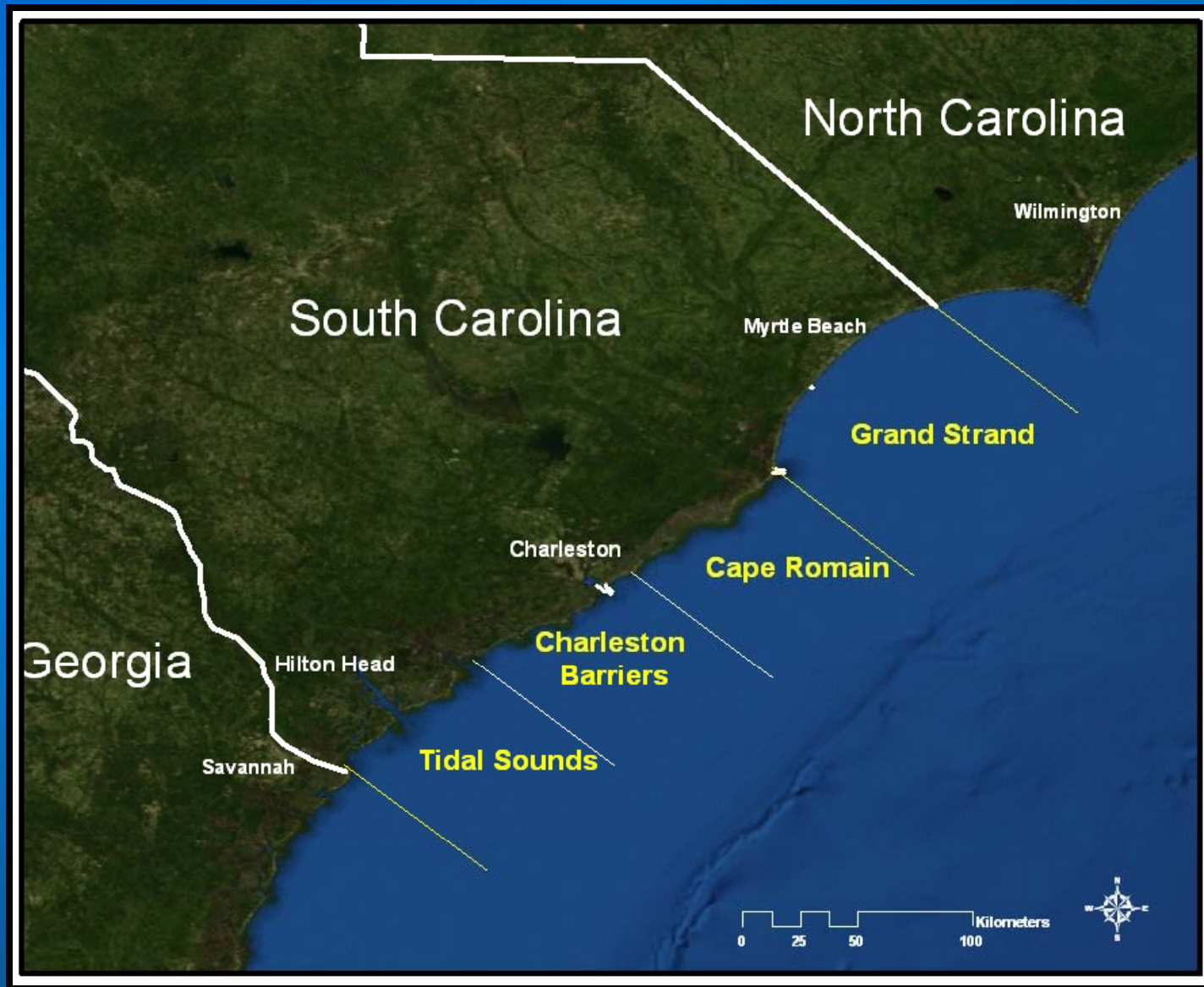




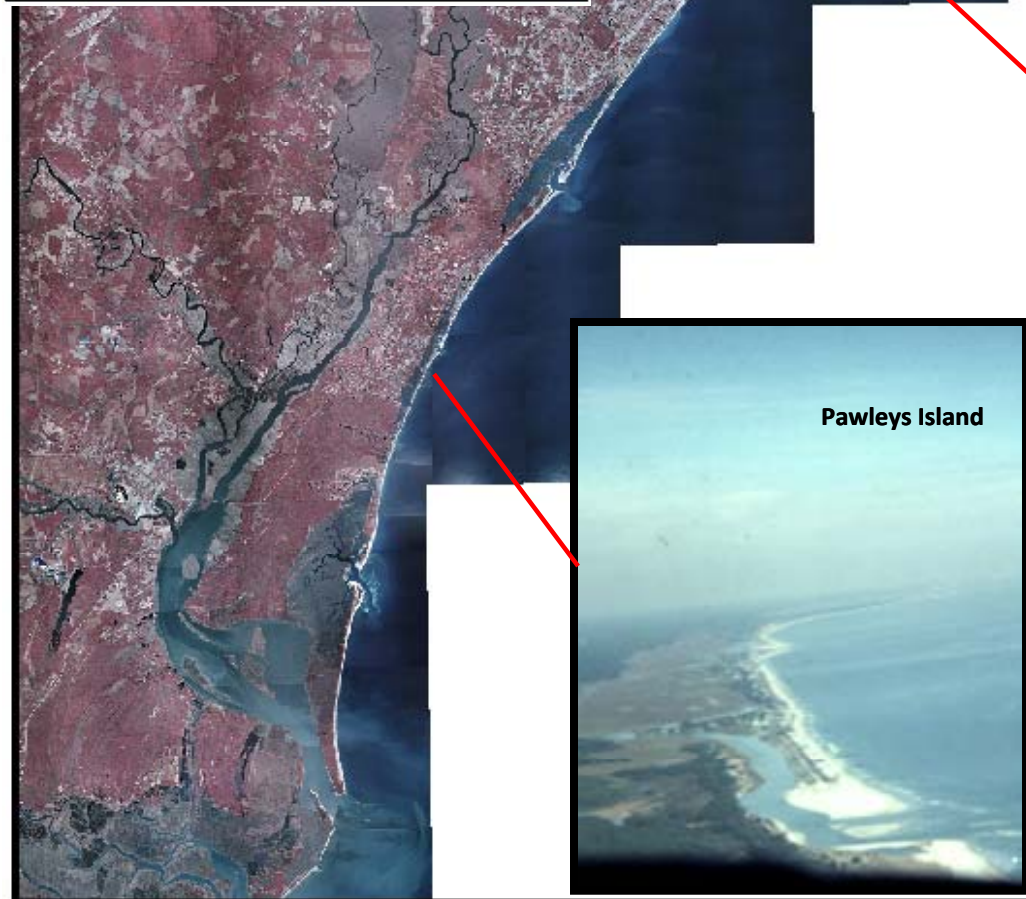
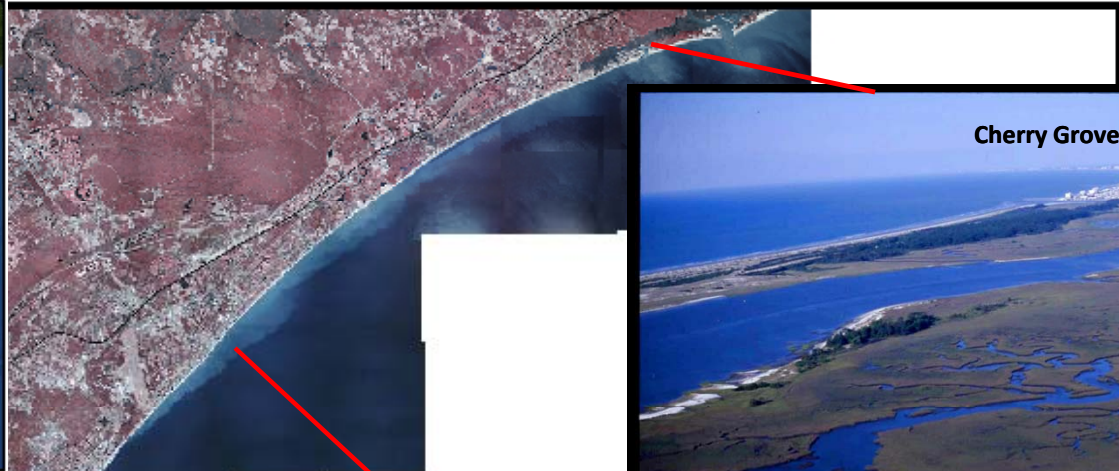
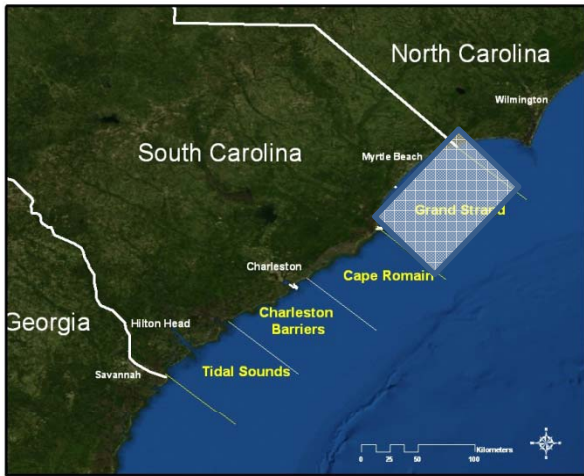
25 Yrs of Beachfront Management Act in South Carolina: Ebbs and Flows of the shoreline, structures and development

***Paul T. Gayes
Center for Marine and Wetland Studies
Coastal Carolina University***

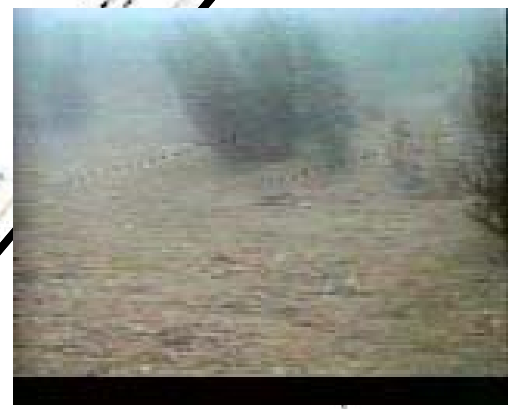
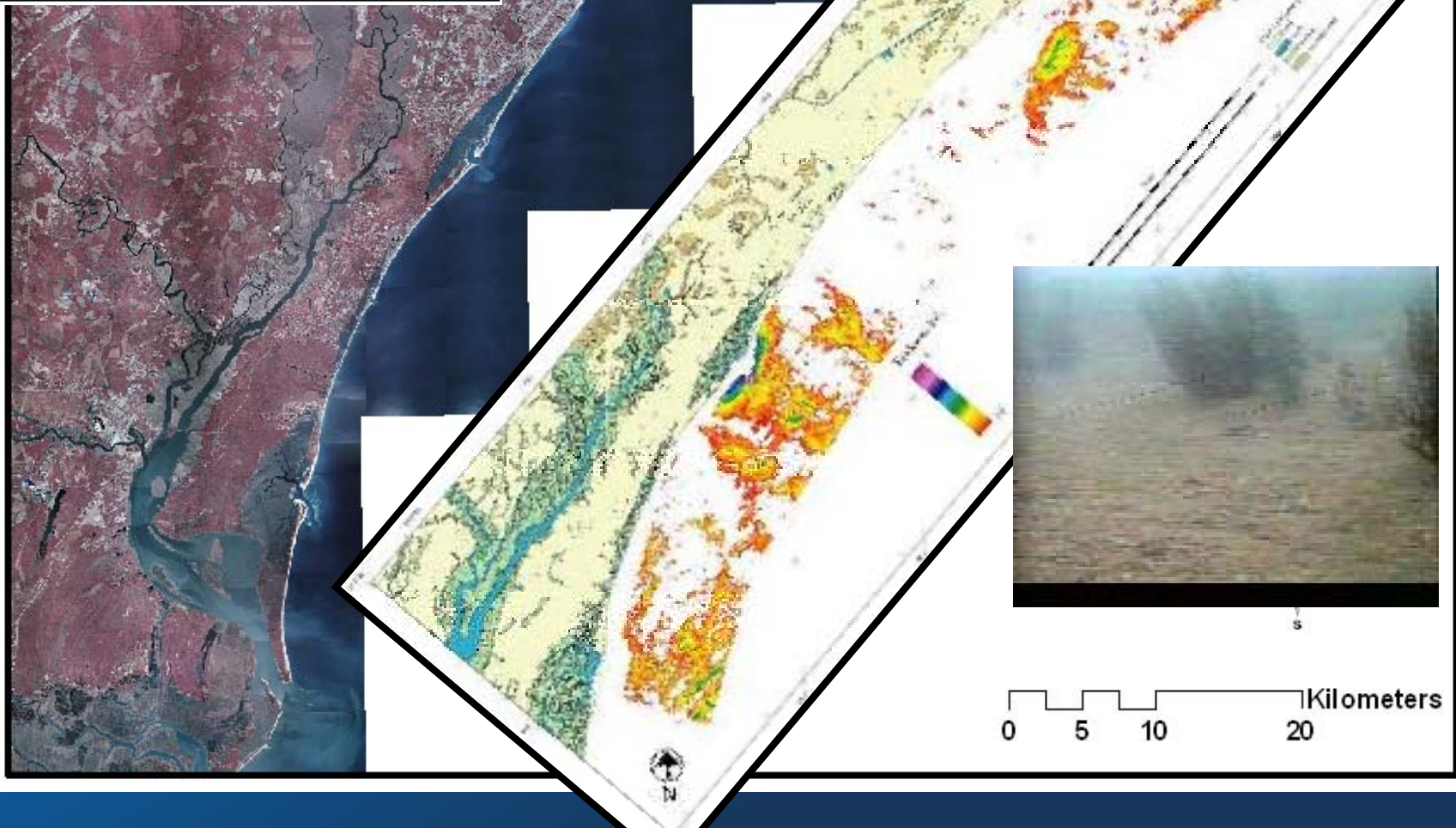
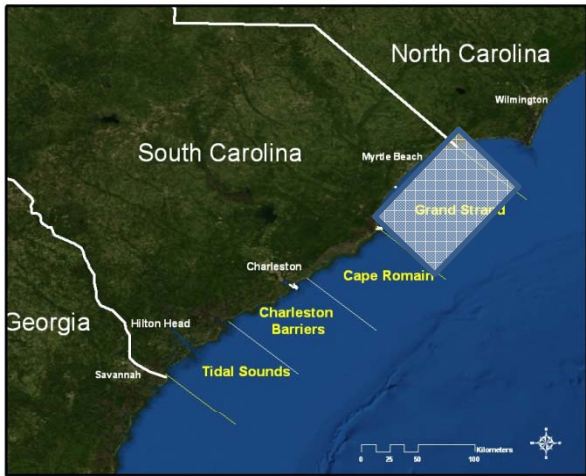
***NC Coastal Commission February 11, 2009
Beaufort, NC***

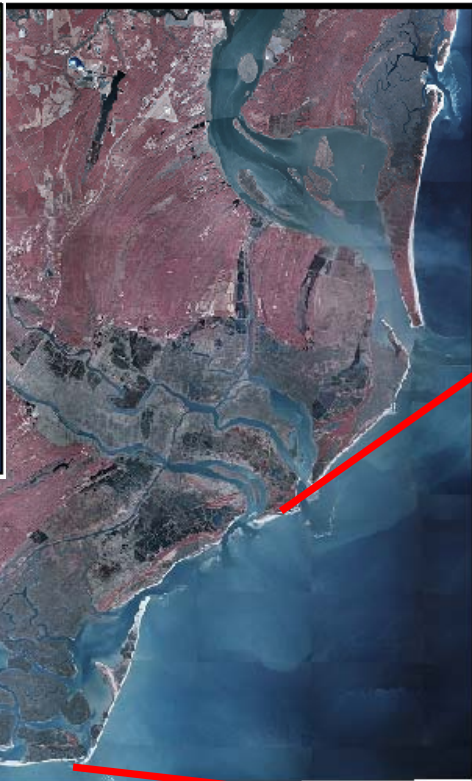
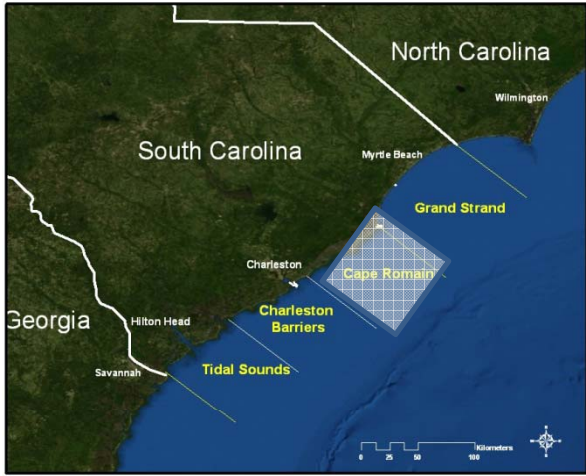


Large Range in Morphology and Dominant Processes
Four Zones defined by morphology/processes and development

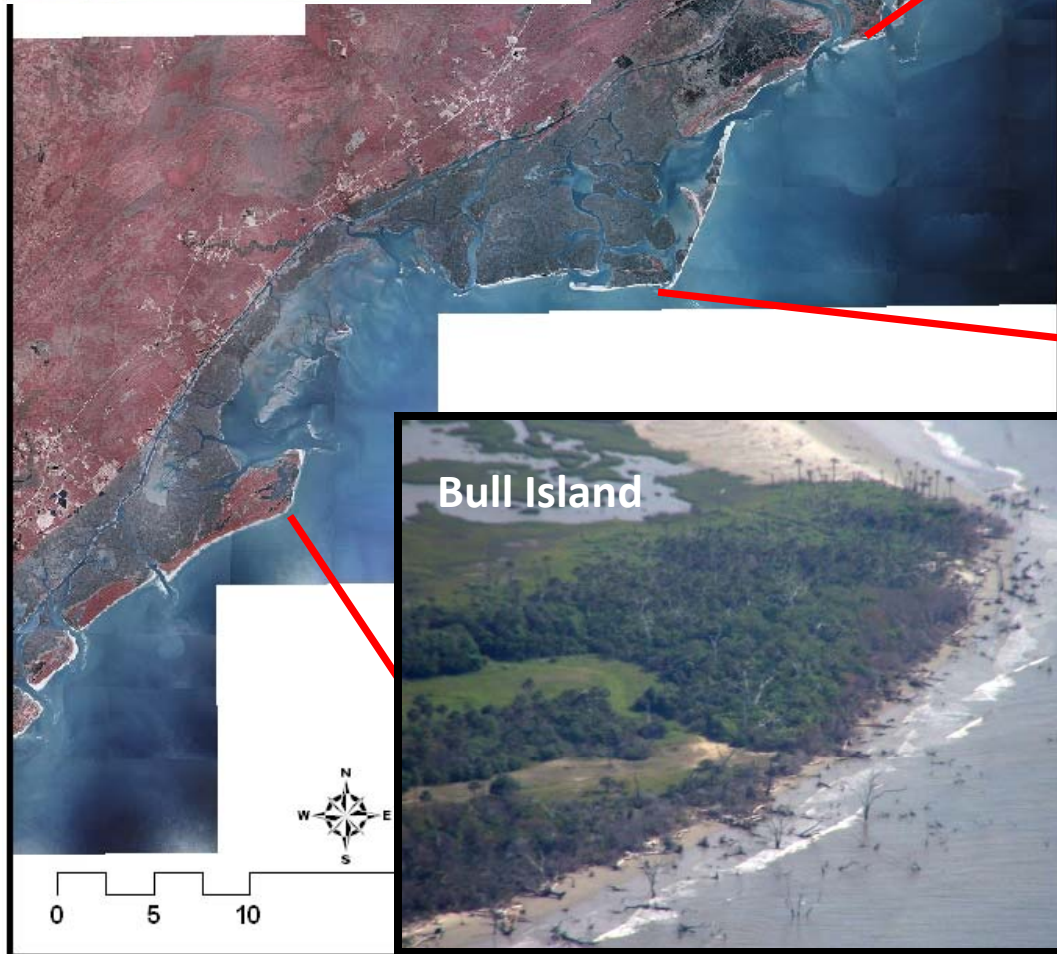


0 5 10 20 Kilometers





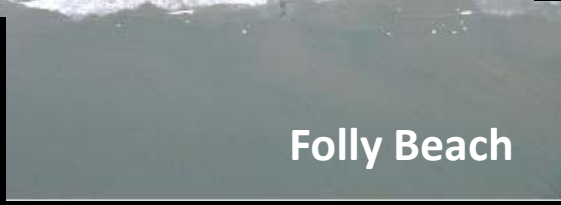
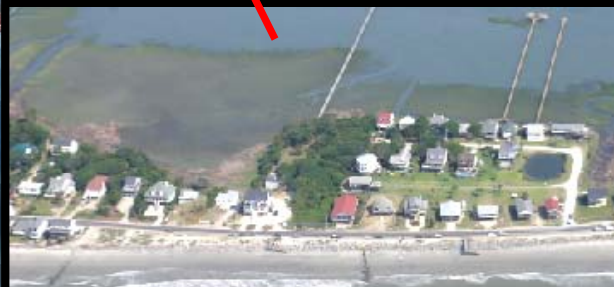
Santee Delta/ Cedar Island



Bull Island



Cape Romain



Consider recent history at Cape Hatteras

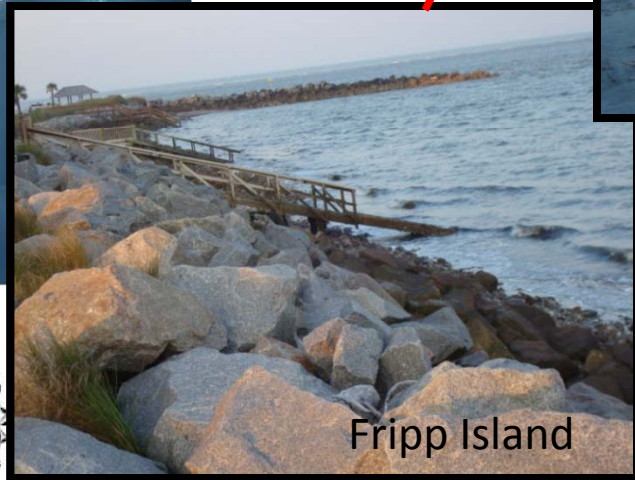
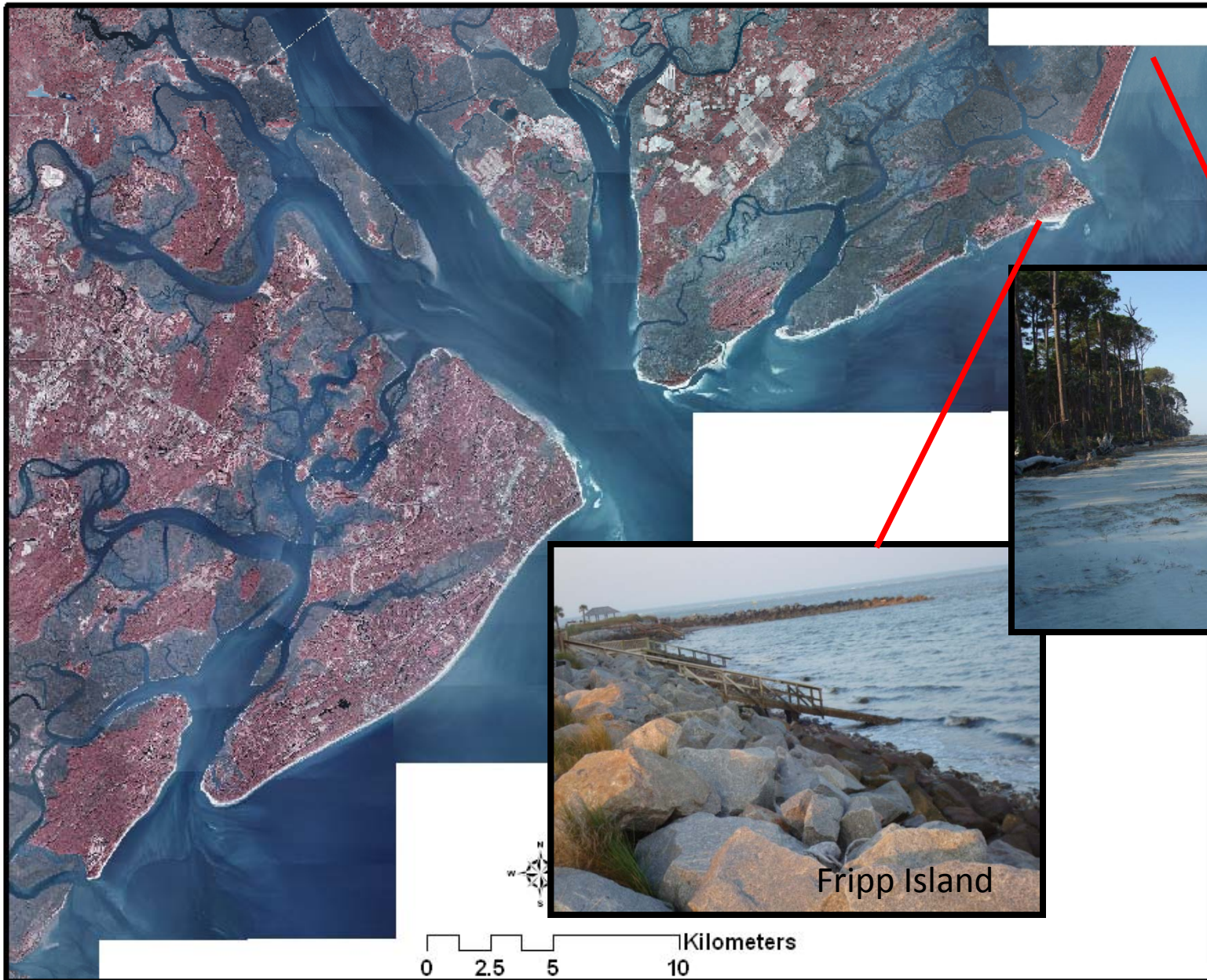


Charleston Harbor

Morris Island

Folly Beach

0 1 2 4 Kilometers





MB Pavilion Area 1929



Like Most Coastal States South Carolina Has Developed Increasingly Massive and Static Infrastructure Advancing Towards a Migrating Shoreline

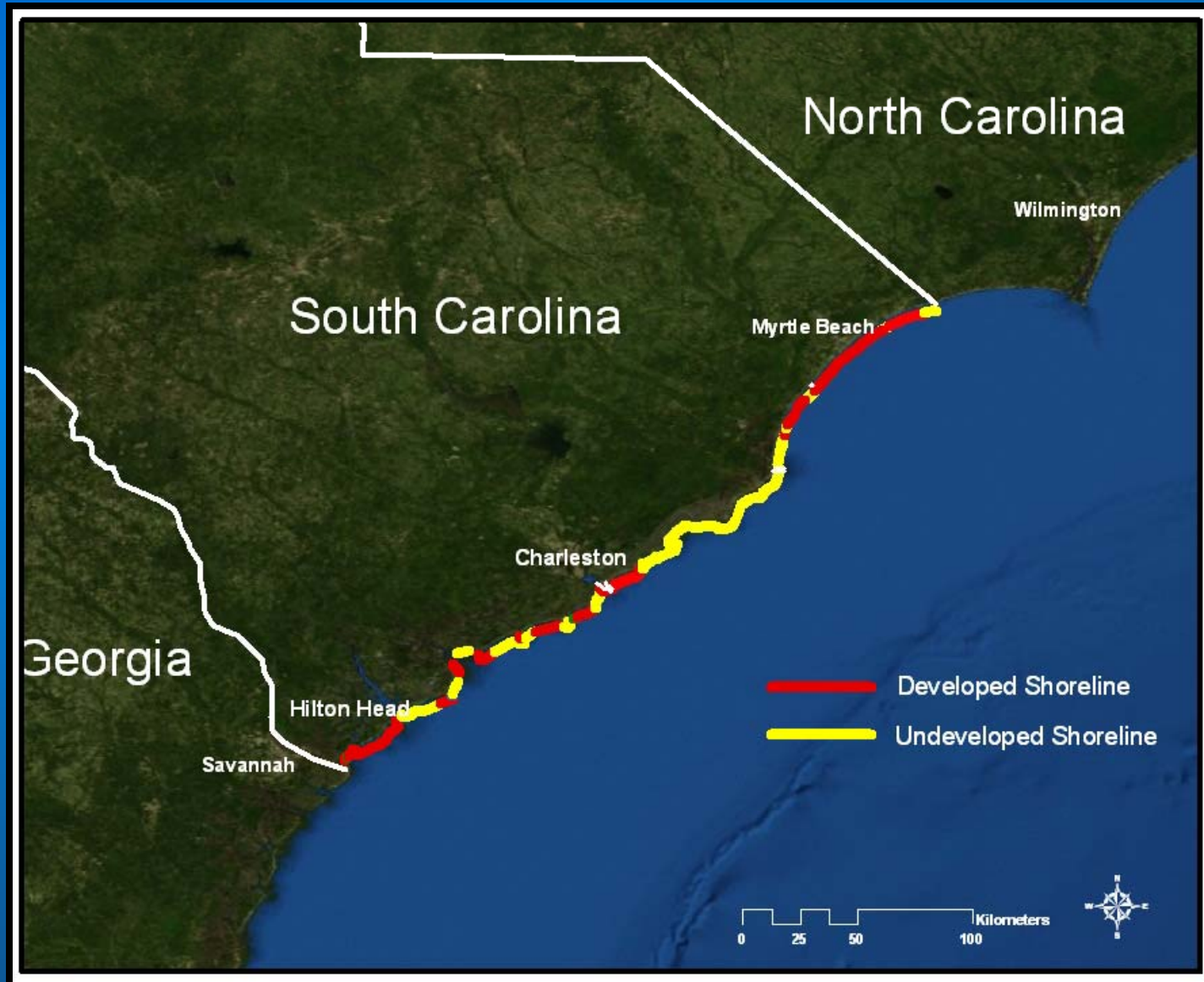
South Carolina Coastal Zone Management

1977-1988

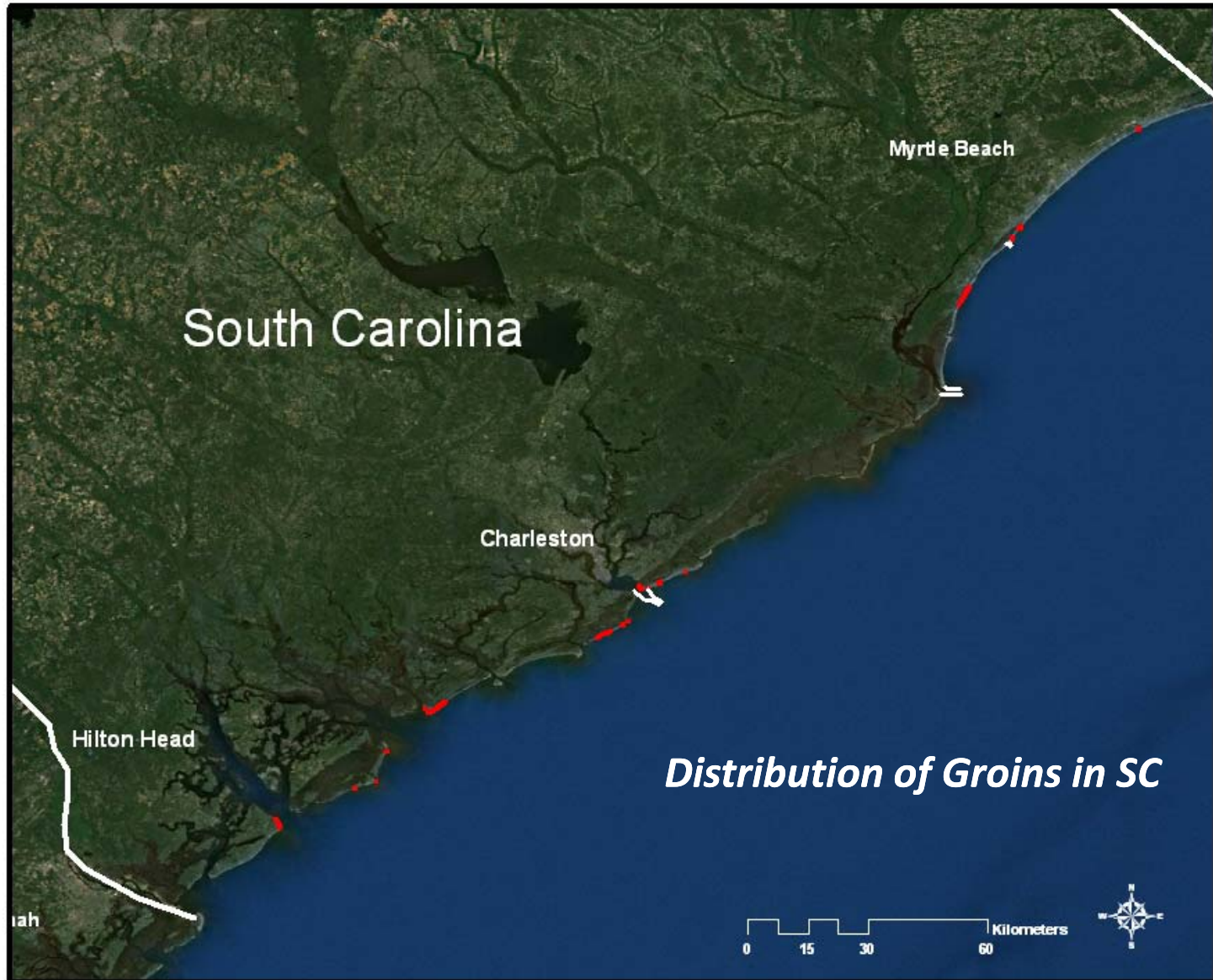


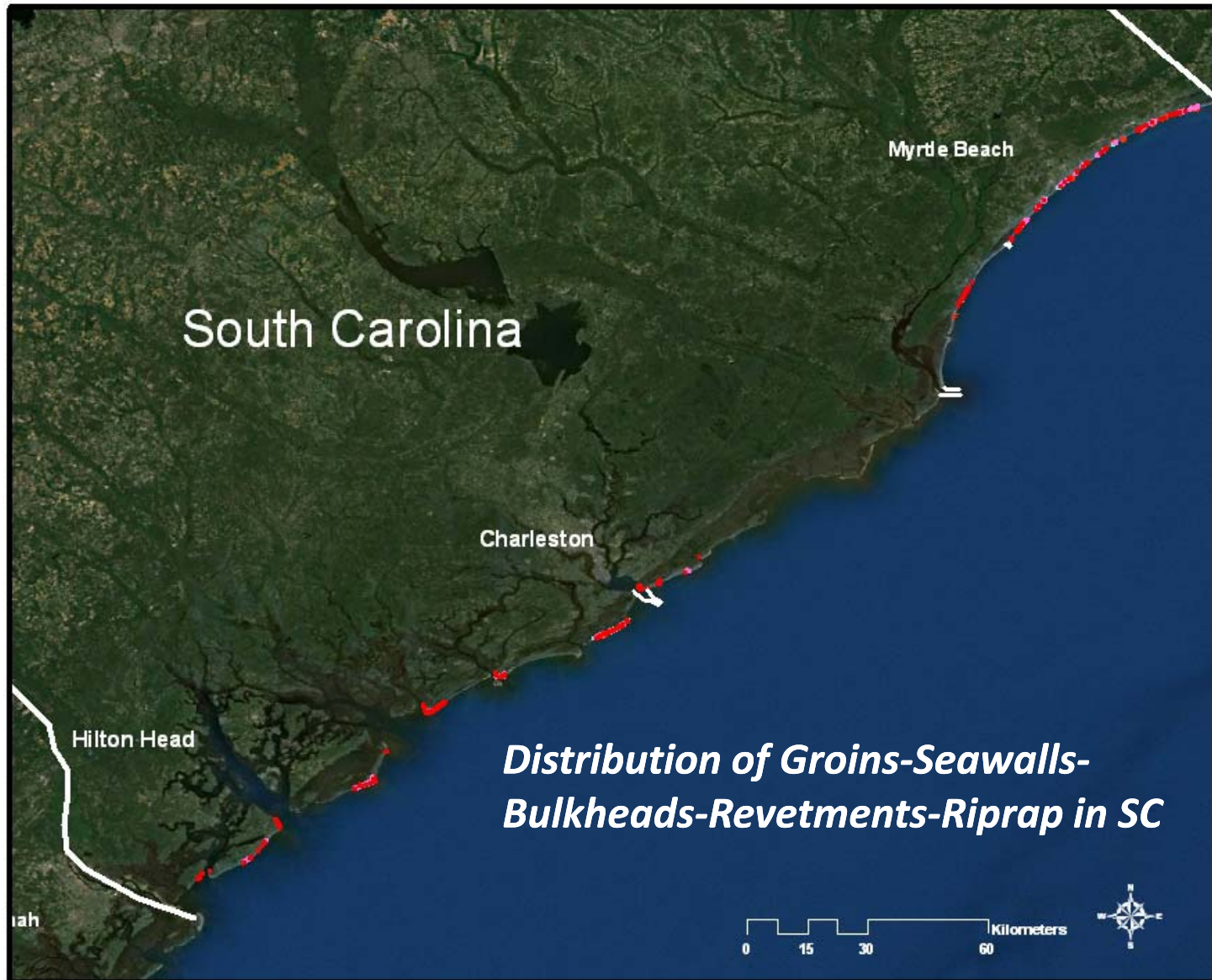
Courtesy of Bill Eiser-SC OCRM

- *Limited jurisdiction*
- *Critical line set at the scarp line, or at the landward toe of the primary dune*
- *No jurisdiction landward of this line*
- *Seawalls routinely permitted*



A Significant Percentage of the South Carolina Coast Remains Undeveloped





1987 South Carolina Blue Ribbon Committee on Beachfront Management



- *Appointed by Coastal Council in 1987*
25 members: gov't, private, academic
Asked to propose long-term solutions to
beach erosion issues; balance
public/private interests
Found ~ 57 miles "critically eroding"

*Recommended changes to the 1977 SC
Coastal Tidelands and Wetlands Act*

➤ *1988 Beachfront Management Act*

1987 South Carolina Blue Ribbon Committee on Beachfront Management



- *Consensus on threats to:*
 - *Beach/dune existence*
 - *Life and property*
 - *Tourism industry/coastal economy*
 - *Coastal/marine habitats*
- *“Findings of Fact:”*
 - *Sea level rise “scientifically documented,” and may increase*
 - *Armoring “has not proven effective”*
 - *“Retreat” is best long-term strategy*

1988 Beachfront Management Act (BMA)

- *Implemented recommendations of the Blue Ribbon Committee*
- *Created two new lines of jurisdiction*
- *Baseline methodology for standard zones (natural and armored), and inlet zones (stabilized and unstabilized)*
- *Setback line dependent on erosion rate*

- *Landward most position of the shoreline in 40 yrs*
- *Eroded vegetation line on aerial photos*

INLET HAZARD ZONES



- *Crest of the Primary Dune*
- *Defined -Beach Surveys*
- *Shore parallel contours*

STANDARD ZONES



Armored / Developed Shorelines



*DeBordieu Beach, SC (2006)
Renourished 2006*



*Washout Area Folly Beach, SC (1996)
3 years after nourishment*

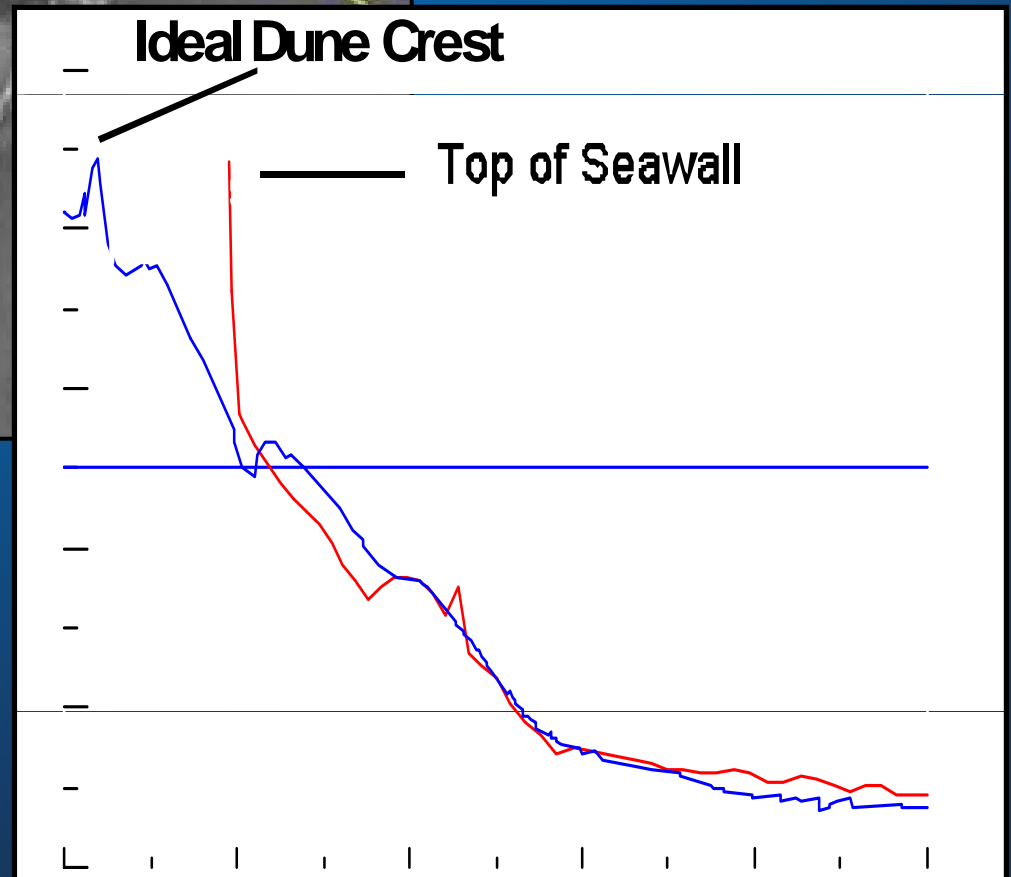


*Pawleys Island, SC (2006)
renourished 1998*

2000 OCRM Baseline



*Jurisdictional Line Based on
Volume and Morphology
Rather Than a Shoreline*



- Baseline updated every 10 yrs.
- Long Term = Retreat Policy

Set-Back Line

40 x annual erosion rate

Base Line

5535

5530

1988 BMA Restrictions

- *No construction seaward of the baseline*
- *No new seawalls*
- *Existing seawalls, if destroyed, could be replaced with sloping structures 10' from the building foundation*
- *All vertical seawalls to be removed after 30 years, and replaced with sloping structures*



Hurricane Hugo, 1989

Initial Challenges Natural

- *Many destroyed houses rebuilt farther landward, behind the baseline (Urban/suburban renewal)*
- *Destroyed seawalls replaced with sloping structures 10' from building foundation*



1989 Lucas Lawsuit

Early Legal Challenges

- ***Lucas lots were totally seaward of the baseline, unbuildable under 1988 BMA***
- ***Lucas sued, claiming a taking***
- ***Case went to US Supreme Court, which ruled in his favor in 1992 and remanded the case for damages***

1990 Revisions to BMA

- *Construction seaward of the baseline could now be authorized under a “special” permit*
- *No larger than largest, never >5,000 s.f.*
- *As far landward as practical, no farther seaward than neighboring houses*
- *Never on primary dune or active beach*
- *No seawall as part of foundation*
- *If the house is ever located on the active beach, it must be removed**
- *Destroyed seawalls could not be rebuilt*
- *DBR threshold at 80% in 1990, 66 2/3% in 1995, 50% in 2005*
- *30-year time limit on vertical walls eliminated*

1992 Lucas Lawsuit Resolution



- *While courts were determining damages, settled out of court*
- *State issued 2 special permits to Lucas*
- *State purchased lots for \$425k each, plus \$725k awarded (\$1.575M total)*
- *State sold lots, transferred permits*
- *Lots were built on in 1995 and 1998*



South Carolina State Policy Remains Essentially a Retreat Policy

*Some tightening – Seawall Provision
Some Loosening- Special Permit*

*In Practice... Implementation and Associated Thorny
Issues... Delayed by Extensive Beach Nourishment....*

“Mid-term Solution...to Long Term Issue”



2005 Folly Beach Renourishment

South Carolina Beach Nourishment 1990-2008

Area	Year	Length (miles)	Cost	Sand Volume (cubic yards)
Seabrook Island	1990	1.1	\$1,500,000	700,000
Debidue Beach	1990	1.0	\$1,000,000	200,000
Hilton Head Island	1990	6.6	\$10,000,000	2,000,000
Hunting Island	1991	1.5	\$2,900,000	800,000
Folly Beach	1993	5.3	\$15,000,000	2,500,000
Edisto Beach	1995	2.0	\$1,500,000	150,000
Grand Strand	1996-98	26.0	\$54,000,000	5,000,000
Hilton Head Island	1997	7.0	\$11,000,000	2,000,000
Sullivans Island	1998	0.5	\$200,000	35,000
Debidue Beach	1998	1.5	\$1,500,000	250,000
Pawleys Island	1998	2.5	\$1,200,000	250,000
Daufuskie Island	1998	3.5	\$6,000,000	1,400,000
Sea Pines-HHI	1999	0.8	\$1,200,000	200,000
Folly Beach	2005	5.3	\$12,500,000	2,300,000
Debidue Beach	2006	1.5	\$5,600,000	600,000
Edisto Beach	2006	3.5	\$8,000,000	875,000
Hunting Island	2006	3.0	\$4,300,000	570,000
Hilton Head Island	2007	6.0	\$19,000,000	2,700,000
Folly Beach	2007	1.9	\$7,500,000	485,000
Grand Strand	2007-08	26.0	\$40,700,000	2,900,000
Isle of Palms	2008	2.6	\$9,900,000	885,000
21 Projects	1990- 2008	96.2	\$194,150,000	27,700,000

At Present In South Carolina....Existing groins may be reconstructed, repaired, and maintained.

New groins may only be allowed on beaches that have high erosion rates with erosion threatening existing development or public parks.

(this is an issue for us-emergency orders etc.)



In addition to these requirements, new groins may be constructed and existing groins may be reconstructed only in furtherance of an on-going beach renourishment effort which meets the criteria set forth in R.30-14(G), and in accordance with the following:

(a) The applicant shall institute a monitoring program for the life of the project to measure beach profiles along the groin area and adjacent and downdrift beach areas sufficient to determine erosion/accretion rates. For the first five years of the project, the monitoring program must include, but is not necessarily limited to:

- (i) establishment of new monuments;*
- (ii) determination of the annual volume and transport of sand; and*
- (iii) annual aerial photographs.*

Subsequent monitoring requirements must be based on results from the first five-year report.

(b) Groins may only be permitted after thorough analysis demonstrates that the groin will not cause a detrimental effect on adjacent/downdrift areas. The applicant shall provide a financially binding commitment, such as a performance bond or letter of credit that is reasonably estimated to cover the cost of reconstructing or removing the groin and/or restoring the affected beach through renourishment pursuant to subsection (c).

(c) If the monitoring program established pursuant to subsection (a) shows an increased erosion rate along adjacent or downdrift beaches that is attributable to a groin, the department must require either that the groin be reconfigured so that the erosion rate on the affected beach does not exceed the pre-construction rate, that the groin be removed, and/or that the beach adversely affected by the groin be restored through renourishment.

(d) Adjacent and downdrift communities and municipalities must be notified by the department of all applications for a groin project.

(e) An adjacent or downdrift property owner that claims a groin has caused or is causing an adverse impact shall notify the department of such impact. The department shall render an initial determination within sixty (60) days of such notification. Final agency action shall be rendered within twelve months of notification. An aggrieved party may appeal the decision pursuant to the Administrative Procedures Act.

(f) In an area in which new groins have been permitted, or in an area in which existing groins have been reconstructed or repaired, access along the beach from one groin compartment to another must be maintained or improved. If access is impacted or eliminated, temporary access around or over the groin must be established immediately. Within thirty days of notification from the Department, a plan to provide permanent access around or over the groin must be submitted by the entity responsible for the groin construction. This permanent access plan must be implemented within ninety days of the Department approval.

(g) The applicant must have written approval from the local government which has jurisdiction in the area where the project is proposed.

SC Experience On the Ground

Largely Repair and Maintenance

Relatively limited new groin installation

Associated with beach nourishment projects

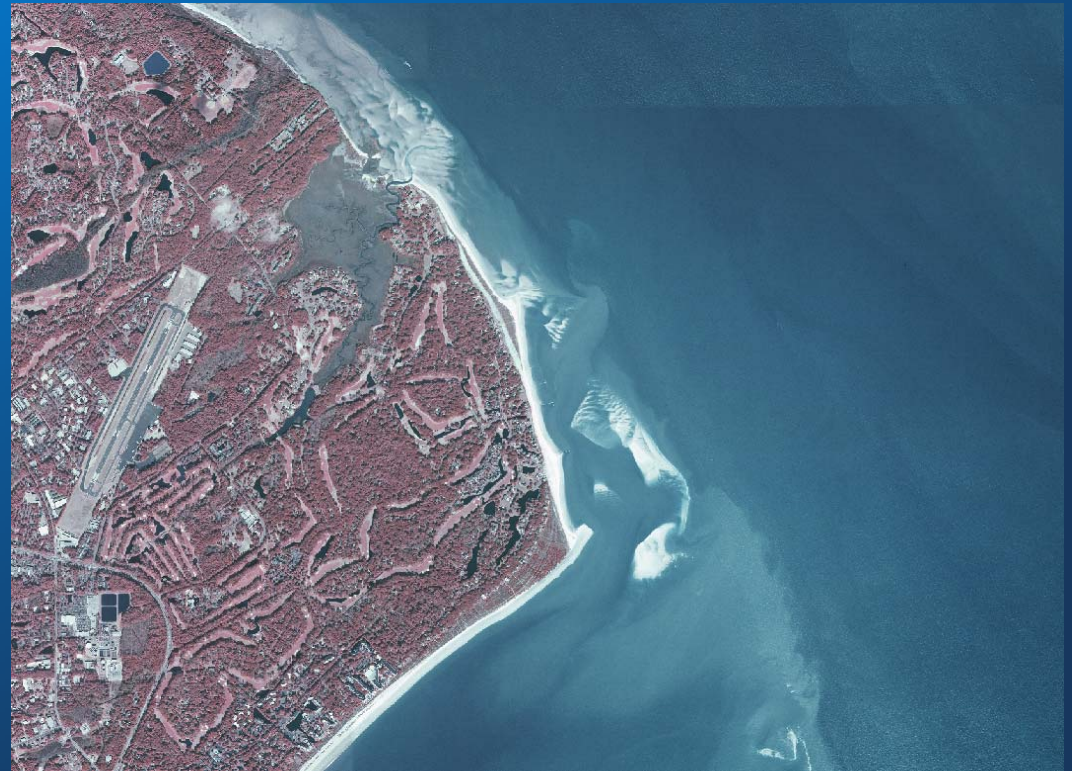
Hunting Island, Garden City

One Terminal Structure Was Permitted (Folly Beach) But Was Not Built

Another is Being Discussed at Debordieu

In general..Groin Behavior Has Been Mixed

Hilton Head - Successful in Concert With Systematic Renourishment



1994

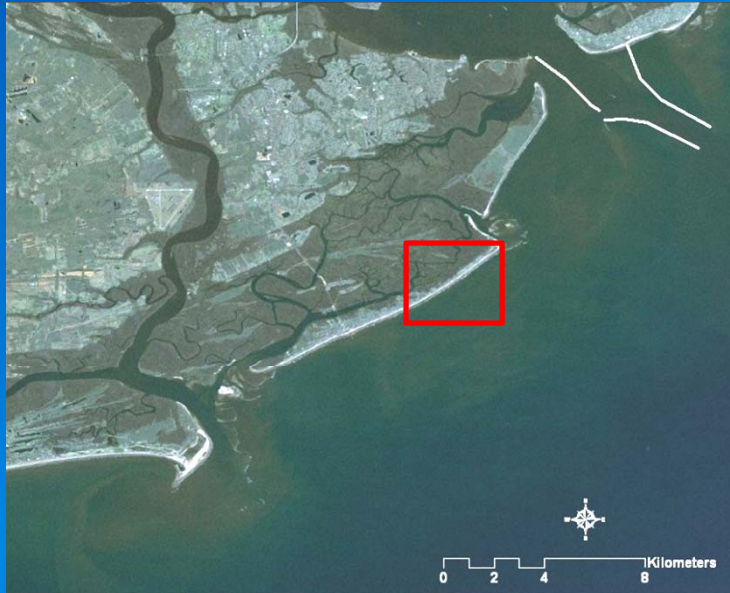
1996

1997 Nourishment

2006

2007 Nourishment

Folly Beach Washout



18 months after 1993 nourishment

1993 Nourishment

1994

1999

2005-2006 Nourishment

2006



- *1993 Nourishment* → *~1995 Construction of Home*
- *Shortly After Under considerable erosional pressure*
- *2005 Nourishment –pressure relieved* → *Again under erosional pressure*



Photo: Construction of 2005 Renourishment

****Folly Beach is exempt from parts of BMA due to effects of Jetty Structures (8 miles north)*

2008-2009 SC Shoreline Change Advisory Committee

- **Need to revisit 1987 Blue Ribbon Committee on Beachfront Management**
 - Federal, state, and local officials
 - Scientific community
 - Range of stakeholders
- **Need to examine science and policy issues related to beachfront and estuarine shorelines...**
 - ...to project and prepare for future social, economic, and natural resource impacts of shoreline change

SCDHEC: OCRM Science & Policy - Microsoft Internet Explorer

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Address http://www.scdhec.gov/environment/ocrm/science/shoreline_comm.htm

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OCRM - Science and Policy

Shoreline Change Initiative

In 2007, DHEC-OCRM initiated a Shoreline Change Initiative to organize existing data collection and research efforts, identify additional research needs, and formulate policy options to guide the management of South Carolina's estuarine and beachfront shorelines.

Shoreline Change Advisory Committee

The Shoreline Change Advisory Committee is an integral part of DHEC's multi-year Shoreline Change Initiative. Comprised of a broad cross-section of coastal stakeholders, the committee will begin to organize existing shoreline research, identify research priority needs and explore policy options to ensure the long-term sustainability of our state's coastal resources. The committee will meet regularly and conclude its business in late 2008. Public comment will be received at scheduled meetings at the beginning and end of the committee process. Written comments will be accepted on an ongoing basis.

Written comments may be submitted via email to davisbc@dhcc.sc.gov or via surface mail to:

Braxton Davis, Ph.D.
 SCDHEC-OCRM
 1362 McMillan Ave.
 Suite 400
 Charleston, SC 29405

Background

Twenty years ago, a "blue ribbon panel" was convened by the former South Carolina Coastal Council (now SCDHEC-OCRM) to address what was considered a "crisis" situation involving our beaches. Recognizing the threats of chronic erosion, gradual sea level rise, increased shoreline development, and a lack of comprehensive beachfront planning and management, the panel developed recommendations that provided guidance to state regulators and legislators in developing state beach management policies. Most of their recommendations were adopted into law through the Beachfront Management Act of 1989. Over the past two decades, the Beachfront Management Act and associated regulations have significantly limited development and hard stabilization of the

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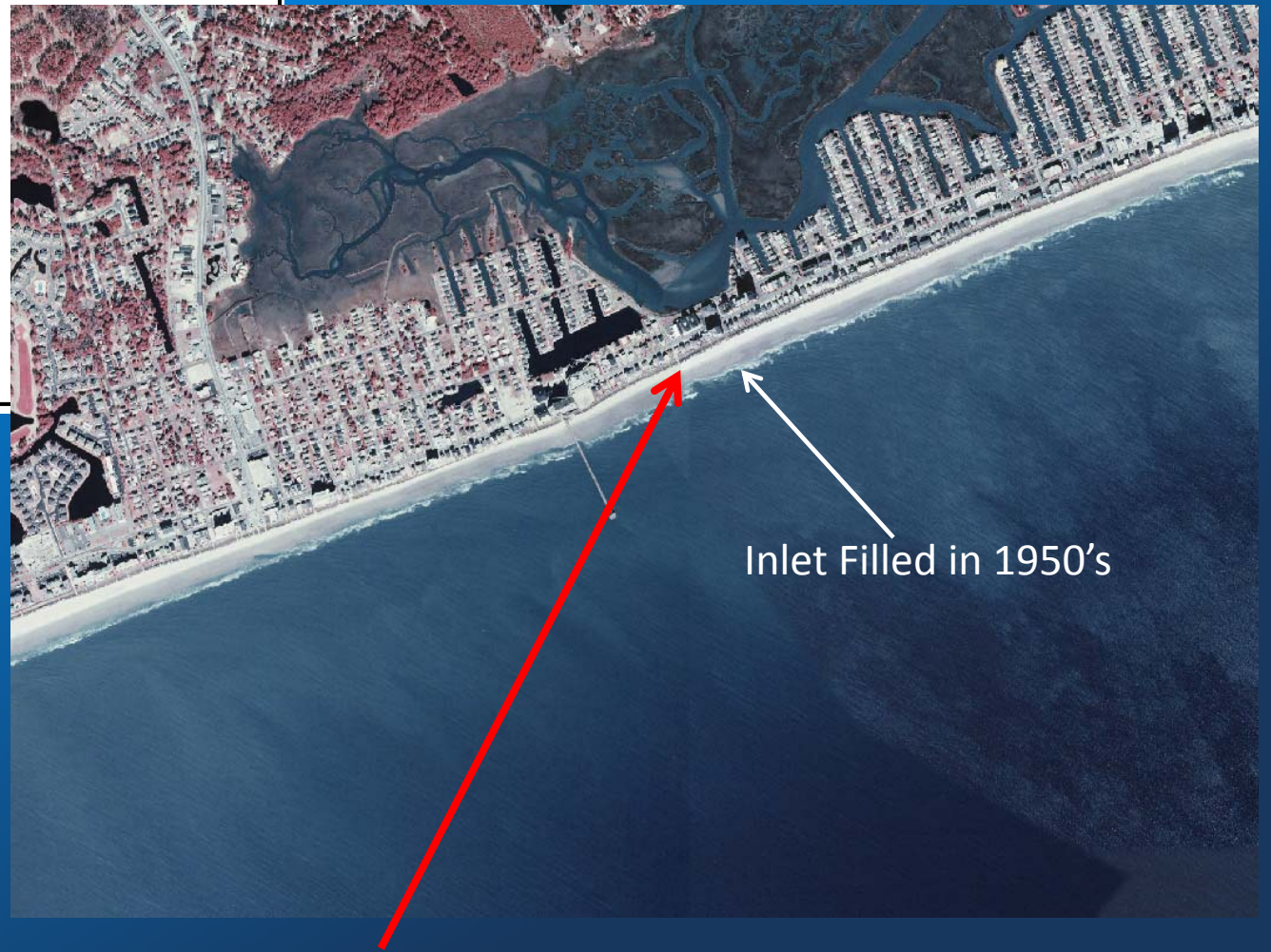
http://www.scdhec.gov/environment/ocrm/science/shoreline_comm.htm

Governor's Climate Energy & Commerce Advisory Committee

*Recommended a Panel be appointed by Legislature/Governor to:
consider potential adaptation strategies for the state to
potential future climate change and sea level rise*

“Unintended Consequences”

1994
1997 Nourishment
1999
2006
2008 Renourishment



*Renourishment in some areas is building upper beach seawards over time
Successfully Petitioned to move Baseline Seaward*

General Consensus.. South Carolina Coast is in Better Condition Than Prior to BMA..

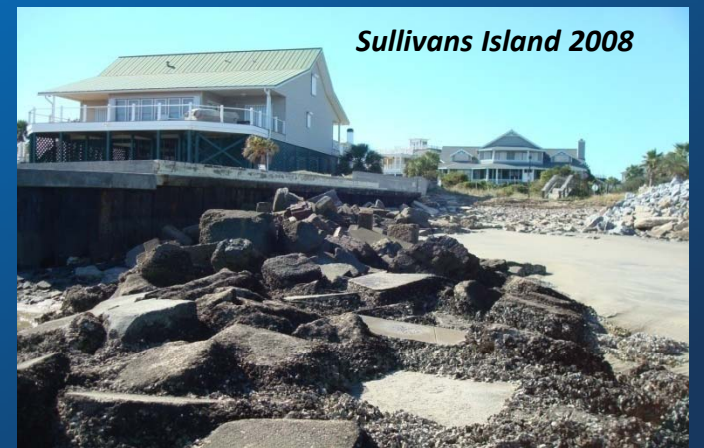
Local Beach Front Management Plans and Dedicated Nourishment Are Responsible

Conditions Like These Still Exist in Areas That Are Nourished and Heavily Engineered

Success Is In The Eye Of The Beholder... Is Goal To Protect Structures or Public Beach or Both...



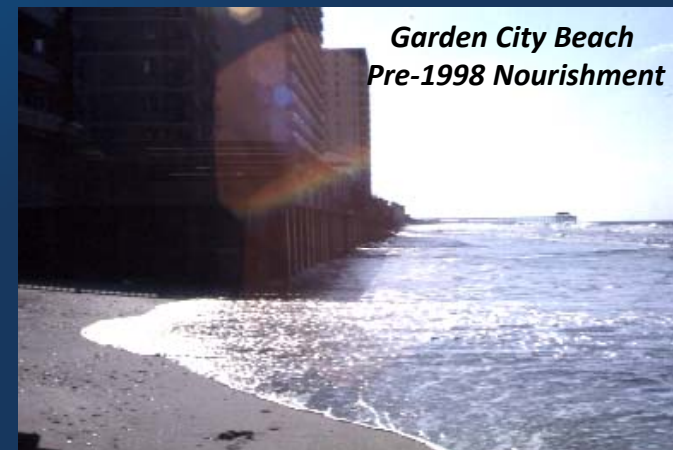
**Garden City Beach
Post -1998 Nourishment**



Sullivan's Island 2008



Isle of Palms 2008



**Garden City Beach
Pre-1998 Nourishment**

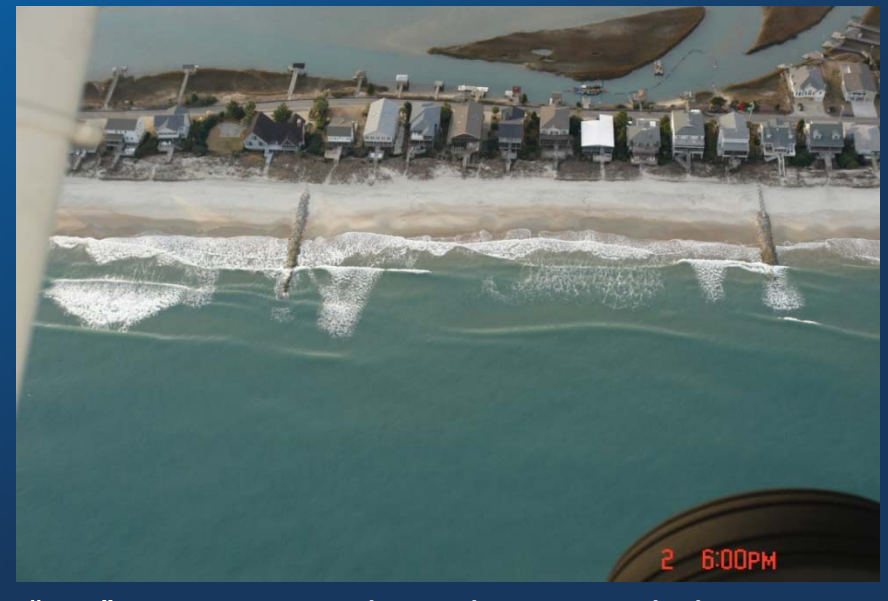


Conceptual Goal of Retreat is NOT Happening In Mid Term

State Panel-Presently Reviewing State of Beach and BMA

Long Term Issues: Concerns for Continued Sea Level Rise, Changes in Climate (Dynamics) or Economic Capacity to Absorb Operational Costs Remain

Episodic Issues: Readiness for Katrina, Hugo or Direct of Cat 2?



"Zero" Erosion—Repeated Nourishment--Breeched During Hugo