

What's the hubbub in the news about Terminal Groins?

Terminal Groins - Sounds more like a career ending football injury than a mechanism for attempting to stabilize a shifting beach profile! The Holden Beach Property Owners Association presents this information in our attempt to keep our members informed of current issues that affect coastal homeowners in North Carolina. At the end of this message there are links to many references on this subject available on the Internet. We encourage you to research this matter in more detail to form your own opinions and take action you judge appropriate.

What is the status of current state legislation?

NC SENATE BILL 832 grants the Coastal Resources Commission the jurisdiction and authority to respond to any request to build a terminal groin. The bill states, "*Whereas, it is reasonable to allow the Coastal Resources Commission to consider authorizing the construction of a terminal structure by variance or by rule making if the Commission finds that the criteria for issuance of a variance are met or adopts rules allowing construction...*"

The Town of Holden Beach supports this bill. The Board of Directors of the HB Property Owners Association encourages our membership to study the issue. If your review results in your support of the bill, we urge you to contact your lawmakers to bring this legislation for a vote. Please contact the NC Speaker of the House, Joe Hackney, at Joe.Hackney@ncleg.net and also contact your local NC representatives. You can find the listing at NC House of Representatives website <http://www.ncleg.net/House/house.html>.

What is a Terminal Groin?

A **Terminal Groin** is a long wall or hardened structure that extends out toward the ocean, usually perpendicular to the coastline, and adjacent to an inlet or at the end of coastal land mass that is prone to beach erosion. The configuration of a terminal groin may be a straight line or resemble an "L" or "J" shape. Its principal purpose is to minimize and control down-drift sediment losses and beach erosion by catching shifting sand along the shoreline. You can see in Chart 1, the Ft. Macon terminal groin configuration and the positive effect on the shoreline.

Chart 1. From *NCBIWAonTerminalGroins0507-Fort Macon Terminal Groin*



What is the difference between Jetties and other groins?

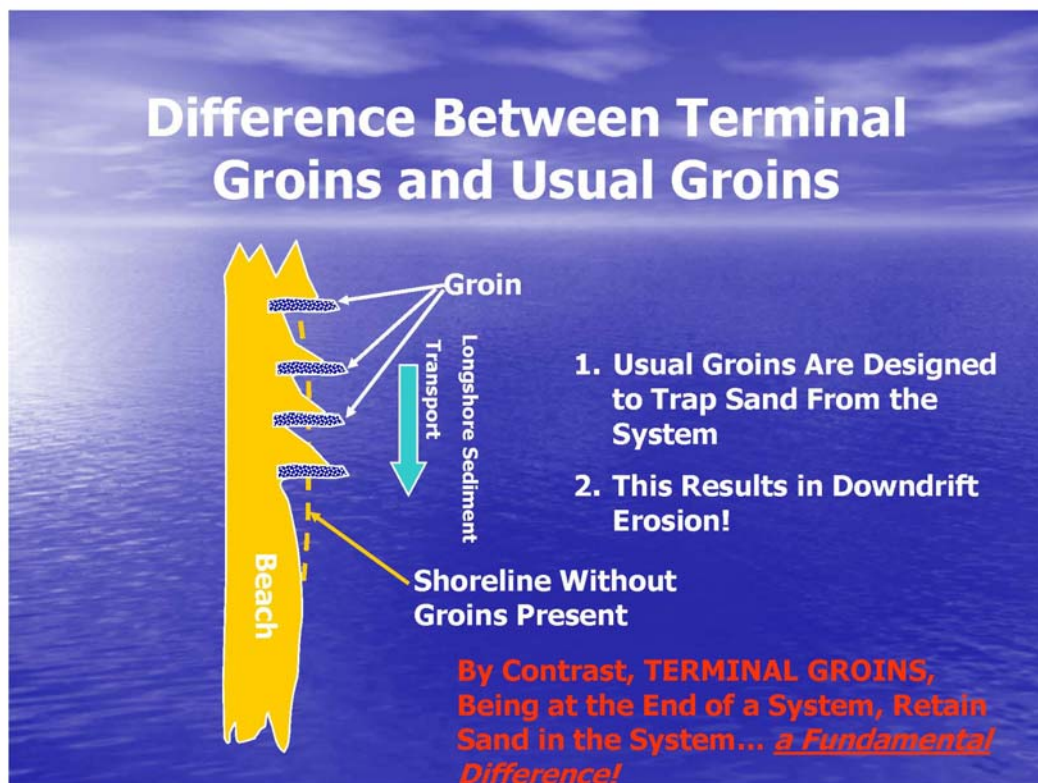
Jetties are hardened structures, mostly stone, commonly used for stabilizing inlets and navigation channels. They extend seaward projecting out from the shoreline and usually run parallel along inlets and channels. Their principal role is to control the navigation depth of channels and prevent intrusion of sediment movement along the shoreline from the effects of currents, waves, and tides.

A presentation by the North Carolina Beach, Inlet & Waterway Association (NCBIWA) further identifies:

- A **jetty** is a navigation structure solely designed to control channel shoaling, position, and alignment.
- A **terminal groin** is a shore protection structure which can provide some navigation benefits.

A **Usual Groin** is another type of hardened structure extending seaward perpendicular from the shoreline, but it is placed anywhere along the shoreline. Intended purpose is also to trap sand in an attempt to stabilize the coastline. The New Jersey shore is known for implementing usual groins. Unfortunately, the results demonstrate down-drift erosion around the usual groin and the coastline is formed into a saw tooth configuration. By contrast, **Terminal groins** are placed at the end of a beach land mass and attempt to retain sand loss without causing erosion up-drift.

Chart 2, From Robert G. Dean presentation - *Difference Between Terminal Groins and Usual Groins*



PROS and CONS - What the experts are saying.

(excerpts from various sources on the internet)

PROS:

- A terminal groin will significantly reduce beach erosion, reduce the frequency of beach nourishment projects and slow the migration of inlets. This structure can enhance public recreation areas by creating wide sandy beaches and reducing the amount of sediment in inlets to help recreational boaters and fisherman maneuver through inlets.
- These erosion control structures have a proven track record in North Carolina and are widely used in coastal states around the nation. There are two existing terminal groins in North Carolina — at Fort Macon (Beaufort Inlet) in Carteret County and at the Pea Island Wildlife Refuge (Oregon Inlet) in Dare County - that have successfully slowed beach erosion without the type of adverse impacts predicted by many. Currently only Oregon and North Carolina do not allow a new terminal groins.
- A terminal groin is designed to be relatively unobtrusive. The only currently permitted management tools at inlets are sandbags, which are unsightly and environmentally unfriendly. Sandbags often impede public access and enjoyment of the beach strand as well as impairing the rebuilding of a wide, sandy beach. A terminal groin would restore a wide, sandy beach, enhancing public access and enjoyment while also improving environmental habitat.
- A comprehensive Environmental Impact Study would be required before the construction of any terminal groin could be approved. The EIS process allows significant public input from all stakeholders and end-users. The proposed statute also requires long-term monitoring of the structure's performance.
- In fact, groins already have been proven successful in North Carolina and elsewhere without any major disruption to the natural flow of sand.
- North Carolina has two successful examples of terminal groins — one of the north end of Pea Island in Dare County and the other on the east end of Bogue Banks in Carteret County — that have not created the type of adverse impacts being predicted by those who oppose Senate Bill 599.
- The negative impacts feared by some have simply not materialized at Pea Island. Here's why: a terminal groin quickly traps sand to form an accretion fillet that protects the shoreline — but once the fillet is formed, sand continues to move into the inlet by passing over, through or around the seaward end of the groin. In other words, the terminal groin has a temporarily impact and then allows sand to continue its normal flow.
- The Bogue Banks groin has experienced similar results. While a formal monitoring program was not established, beach surveys and aerial photos of the area clearly demonstrate the groin has not had any significant negative impacts on the shoreline west of the structure.

CONS:

- Any coastal structure designed to trap or hold sand in one location will, without question, deprive another area of that sand. In simple terms, any structure (including terminal groins) that traps sand will cause erosion elsewhere. Permitting the construction of terminal groins will harm the coast and place downdrift property at risk.
- An open letter signed by 43 of the country's top coastal scientists reports: "There is no debate: A structure placed at the terminus of a barrier island, near an inlet, will interrupt the natural sand bypass system, deprive the ebb and flood tide deltas of sand and cause negative impacts to adjacent islands."
- Proponents of S832 point to the terminal groins at Beaufort Inlet and Oregon Inlet as success stories. These structures have also been referred to as jetties in the past, but we will use the terminology in S832. Our data indicate that beaches in the vicinity of both structures have required huge volumes of beach nourishment for decades (at least 20 million cubic yards of sand at a cost \$43 million, without an adjustment for inflation). Therefore, these two structures have at best, had no impact on the stability of the island adjacent to the structure, and at worst, have caused downdrift erosion necessitating massive renourishment. Dr. Stan Riggs has published detailed analyses indicating that the structure at Oregon Inlet has impacted the stability of Highway 12 on the Outer Banks and required its constant maintenance.
- The unfettered flow of sand through natural inlets is an important mechanism maintaining barrier island health. Blocking this flow of sand will inhibit the ability of the barrier island to respond to rising sea level and storms.
- Project proponents indicate that the structures will be made "leaky" or permeable so that sand will move to downdrift beaches. This is a classic example of "having your cake and eating it too." The principle of conservation of mass indicates that one cannot build a structure that will both trap sand and still allow the constant flow of the original budget of sand down-drift.
- One of the many benefits of the hard structure ban to North Carolina coastal communities is the general lack of lawsuits related to erosion control structures. In contrast, the state of Florida which permits coastal hard structures is awash in constant lawsuits (property owner versus property owner, community versus community). This leaves many coastal management decisions up to the courts. This poor method of public beach management is one that we have largely avoided in North Carolina. If terminal groins are built along the North Carolina coast, rest assured that there will be lawsuits and legal battles related to those structures and the erosion that they may, or may not have caused.

Current Status

- Terminal groins and other "hard structures," are currently prohibited by NC State law. There have been only a few exceptions, most notably historic Fort Macon in Carteret County and the Bonner Bridge at Pea Island Wildlife Refuge in Dare County.
- NORTH CAROLINA SENATE BILL 832, entitled "CRC May Permit Terminal Groin." sponsored by NC Senator Julia Boseman-New Hanover county, and co-sponsored by

Senators Harry Brown –Jones & Onslow counties, Jean Preston- Carteret, Craven, Pamlico counties and R. C. Soles, Jr.- Brunswick, Columbus, Pender counties passed the Senate by 37–10 on April 30, 2009. It is referred to the Committee on Environment and Natural Resources.

- As of this date, the NC Speaker of the House, Joseph Hackney, has not scheduled it for a vote.

Town of Holden Beach Position

On Tuesday July 13, 2009 HBPOA Directors Ron Skubic and John Lytvinenko met with David Hewett, Town Manager, Town of Holden Beach. The purpose of the meeting was to obtain the current facts about “terminal groins”. David Hewett shared the many benefits of a Terminal Groin and how it could help Holden Beach with erosion on the east end of the island. He discussed his upcoming trip to Raleigh as a member of “*Save Our Sand Committee*” to meet with NC Speaker of the House, Joe Hackney. ***Save Our Sand: The Inlet Solution*** is a group of coastal local governments from Dare County to Brunswick County who are seeking a proven, long-term solution for managing our coast at shifting inlets. He discussed further that, if and when this legislation is passed, the town will invest in researching how best to utilize terminal groins at Holden Beach and will conduct a cost/benefit analysis.

In follow up emails, David Hewett stated “*Last week local government representatives from the entire NC coast, i.e. the "Save Our Sand Committee," met with Speaker of the House, Joe Hackney, in an effort to convince him to let Senate Bill 832 "Terminal Structures" be heard and debated by the full House of Representatives. Currently the bill is languishing in committee at his bequest with no movement forward.* David Hewett urged all homeowners to send letters, emails or call to encourage Speaker Joe Hackney to bring the Terminal Groin legislation to a vote.

Conclusion and Call to Action

Many coastal experts and local governments around the country agree that terminal groins can be an effective way to minimize beach erosion, enhance beach renourishment projects, and slow down the migration of inlets. On the other hand, many experts believe that adding any kind of hardened man-made structure can cause erosion at other spots along the shoreline. Terminal groins are legal in every coastline state, with the exception of Oregon and North Carolina. Reference materials provide many examples around the country in which terminal groins have helped significantly to minimize beach erosion and give evidence of beach enhancement. Fort Macon and Pea Island are two good examples.

Chart 3 is an example of how a strategically placed low profile terminal groin at Ocean Isle/Shallotte Inlet could enhance the east end of their island. A similar structure at the east of Holden Beach has the potential for the same effect.

Chart 3. From NCBIWAonTerminalGroins0507- Example at Ocean Isle Beach/Shallotte Inlet



Unfortunately, given the current state laws, we are not able to test these theories. The key purpose of NC SENATE BILL 832 is to grant the Coastal Resources Commission the jurisdiction and authority to respond to any request to build a terminal groin. As stated earlier, the Town of Holden Beach supports this bill. The Board of Directors of the HB Property Owners Association encourages our membership to study the issue and take appropriate action.

Please contact **NC Speaker of the House, Joe Hackney** at Joe.Hackney@ncleg.net and contact your local NC representatives. You can find the listing at NC House of Representatives website <http://www.ncleg.net/House/house.html>

Respectfully submitted by,

John Lytvinenko and Ron Skubic, HBPOA Directors

References:

“Terminal Structures: Definitions, Processes and Examples”. Meeting of North Carolina Coastal Resources Commission, February 11, 2009. Robert G. Dean, University of Florida - Coastal and Oceanographic Engineering Dept.

http://dcm2.enr.state.nc.us/CRC/dean_feb09.pdf

Terminal Groins at Coastal Inlets. ASBPA Position Paper – April 2008

<http://www.asbpa.org/pdfs/ASBPATerminalGroinsatCoastalInletsPositionPaperFinal.pdf>

Summer09News - North Carolina Beach, Inlet & Waterway Association

<http://www.ncbiwa.org/Summer09News.pdf>

NCBIWAonTerminalGroins0507 North Carolina Beach, Inlet & Waterway Association presentation

<http://www.inletsolutions.org/Portals/0/NCBIWAonTerminalGroins0507.pdf>

Holding the line on terminal groins. Orrin H. Pilkey and Andrew S. Coburn, Raleigh News and Observer Published: Wed, Mar. 12, 2008

<http://www.newsobserver.com/opinion/columns/story/997184.html>

US Army Corps of Engineers

<http://chl.erdc.usace.army.mil/chl.aspx?p=s&a=ARTICLES;514&g=41>

Save Our Sand: The Inlet Solution

<http://www.inletsolutions.org/>

NC Government – House of Representatives Contacts:

NC Speaker of the House, Joe Hackney, -- Joe.Hackney@ncleg.net or call 919-733-3451

Representative Dewey Hill -- Dewey.Hill@ncleg.net or call 919-733-5830
(House Representative District 20)

Representative Frank Iler – Frank.Iler@ncleg.net or call 919-301-1450
(House Representative District 17)

NC House of Representatives website <http://www.ncleg.net/House/house.html>