



“New Jersification” [MC]

Adapted from California Coastal Commission

Grades: 9-12

Time: 45 minutes to 1 hour

Goals: To demonstrate how non-natural structures can cause faster and more detrimental erosion to a barrier island.

Objectives:

Students will be able to: define beach erosion and “New Jersification;” describe non-natural structures that have been used to protect New Jersey’s barrier beaches; and to understand the ramifications of stopping the natural migration of barrier islands.

Materials:

- 12-inch rulers (4 per group)
- Rectangular pans
- Fine sand
- Tap water
- White paper
- Pencils/pens

Procedures:

1. Pre-Activity (introduction): Discuss beach erosion, dune erosion, and the protection of beachfront property. Describe the processes that create and shape New Jersey’s beaches including wind, waves, tides, and storms. Explain why New Jersey’s beaches are no longer “natural” because of man-made additions such as groins, jetties, and bulkheads that have been put in place to keep the barrier islands from shifting naturally. Describe the effects these permanent structures have had on our beaches and introduce the term “New Jersification.”
2. Activity: Divide the class into groups of 3-4 students and pass out all the materials to each group. Have the students pour approximately 4 inches of sand into one end of the pan. Gently add water up to 2 inches to the opposite side of the pan. Have them divide their white paper into four even sections and sketch their initial beach model. One student in the group will be in charge of making waves, using one of the rulers.

Gentle waves are created directly into the “beach” and all members of the group will sketch what happens to their beach in this simulation. This would be considered a normal barrier beach. Have them describe the erosion effects and how the coastline changed.



Reposition the sand so it looks like it did in the beginning. Another student in the group aligns the other rulers in the sand perpendicular to the coastline, representing groins. Again, the student in charge of making waves creates gentle waves, and this is sketched. Have the students describe what effect the groins have on the natural erosion of the coastline.

Reposition the sand a third time, keeping the groins where they are. Create waves on an angle to the coastline. Have the students sketch what they see and describe what happens to the sand in between the groins.

3. Post-Activity (review): Describe the term littoral drift and how the last demonstration was more accurate in showing what a typical erosion pattern on New Jersey's beaches is like. Discuss the social and political aspects of beach protective structures on public and private lands. Discuss the more natural structures that could be used to protect beachfront property as well as a barrier island as a whole.

Key Words:

Beach erosion

Dune erosion

Barrier island

Groins

Jetties

Bulkheads

Storm surge

“New Jersification”

Background Information:

Adapted from Learn NC and Tom Moriarty

A natural barrier island ebbs and flows, just as tides will do daily. On one side of the island, waves, currents, tides, and winds will erode the sand away; on the other side, the sand will accrue. Barrier islands will change shape and appear to move closer to the mainland and north and south parallel to the coastline as time progresses. Because of this natural shift in the landscape, and the overdevelopment of these islands, decision makers have added hardened structures to literally stop an island from moving altogether.

These structures, such as rock sea walls, bulkheads, groins, and jetties, were once thought of as permanent solutions to the problem of barrier island movement and erosion. What decisions makers failed to realize was that these hardened structured not only continued to allow coastal erosion to occur, it exacerbated the problem. If you place a hardened structure next to one piece of property, the erosion to the neighboring property would increase. In the case of groins along the New Jersey coastline, for example, an aerial photo would reveal a series of eroded beaches. This is one reason beach replenishment is funded every three to five years.



When storm surges, hurricanes, and tropical storms come in contact with barrier islands, they are slowed down and their power is slightly diminished. The purpose of a barrier island is to act as a “barrier” for the mainland. When coastal erosion, due to the placement of hardened structures, occurs, these natural phenomena have no place to go but directly onto the mainland. Since the mainland is much more developed than a barrier island, this causes much more damage.

New Jersey has become a perfect example of urban sprawl, overpopulation, and overuse of barrier island communities. So much so, that the term “New Jersification” has been coined and used to describe the layout of the land. According to Tom Moriarty, its “symptoms are easy to recognize: loss of open space, increased crowding on roads and in shopping malls, and a general erosion of the quality of life.” If you were to view an aerial photograph of one particular barrier island, Ocean City, you would see that it is virtually covered by neatly spaced homes and the streets are laid out in a grid. The open space of the island has become limited to the beach itself and there are no longer any natural landmarks throughout the island. By contrast, Seaside Heights and Seaside Park are part of the largest revenue industry for New Jersey, but they boast having Island Beach State Park, a state-owned and operated Natural Park, as part of their barrier island.

This idea of “New Jersification” draws attention to the fact that a vast majority of the barrier island communities along New Jersey’s coast have been altered to fit the lifestyle of not just the avid beach vacationer, but now the person who wishes to make these islands their permanent home. A further example of this is Long Beach Island. This tight-knit community, encompassing eighteen miles of land, have everything they need right on the island, from gas stations to supermarkets, so there is never a need to leave the island and travel to the mainland. What began as a seasonal vacation island from Memorial Day through Labor Day, has now been altered as more people have chosen to live there on a more permanent basis. Where most stores and shops closed for the winter, now they are staying open throughout the year to be available to a different clientele. Because there is only one causeway to get onto and off of the island, though, this poses a problem with traffic and congestion as more and more people come to the island to vacation or to live. It also caused a lot of problems when the island needed to be evacuated during Hurricane Sandy.