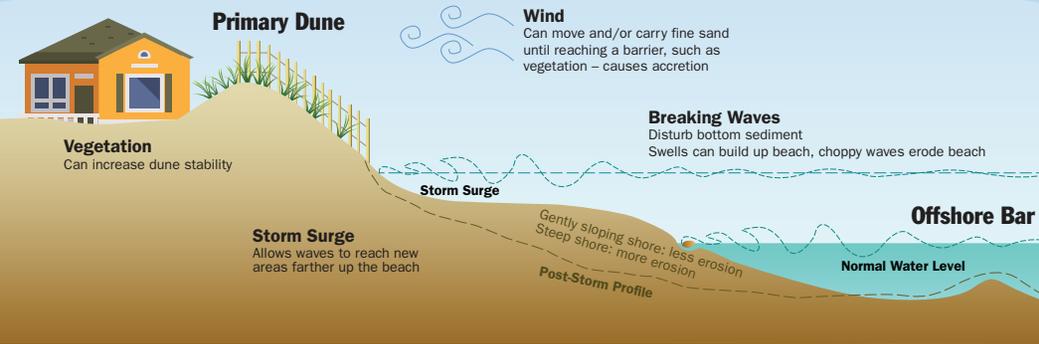


## Causes of Erosion and Deposition on a Beach



### Maintain a Healthy Dune System

A beach is defined as an expanse of sediment (sand) along the shoreline and ranges from beyond the furthest offshore bar to behind the dunes. On Long Island's South Shore, the sand that is deposited on our beaches comes from a nearshore current that predominantly moves from east to west but can change based on wind direction and wave angle. The sand is carried on shore with the tides, and can also be removed, depending on the season and the weather. As the sand builds up on the beach and dries, the wind deposits it into the dunes.

Dunes are fragile. It is important to maintain a healthy dune system in order to protect landward assets and maintain a beach after large coastal storms. You can do your part by staying out of vegetated areas and off the dune. Only access the beach by using designated dune cross-over paths.

### For additional information

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# Healthy Dune Systems

*A healthy dune system is stabilized by plant roots and works to protect against coastal storm's damaging wave energy and surge.*

New York Sea Grant is part of a nationwide network of 34 university-based programs working with coastal communities through the National Oceanic Atmospheric Administration (NOAA). Sea Grant research and outreach programs promote better understanding, conservation, and use of America's coastal resources. Sea Grant is funded in New York through SUNY and Cornell University and federally through NOAA.

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As fencing captures sand, it is buried and another row is placed in front of it to continue to build the dune.  
Image Credit: Kathleen Fallon



## Dune Formation

When sediment accumulates landward of the beach, a dune is formed. Grasses begin to grow on the dune, and assist with additional sand accumulation by trapping the wind blown sand. Over time, different types of native plants can take root.

Fencing along a beach serves two purposes:

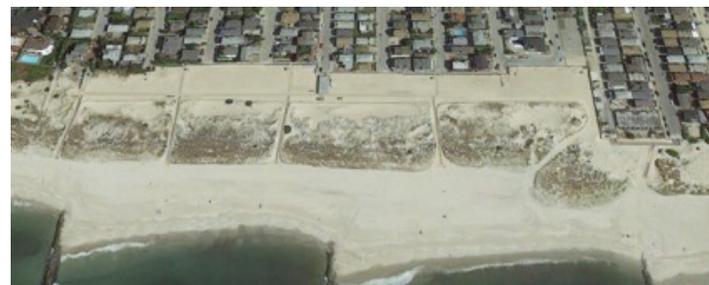
- 1) to designate the dune boundary and
- 2) to assist in dune building.

Dune boundaries are typically marked in order to determine the extent of the dune system and to mark the area so beachgoers stay out of this fragile habitat. Similar to plants, the fencing additionally works to trap and accumulate sand further building the dune.

## Dune Functions

Dunes provide protection during storms. Storms bring larger than normal waves to the shoreline and typically are accompanied by storm surge, which is an increase in ocean water on top of the normal tide. This elevated water level will reach further onto the beach, bringing the larger wave action with it. A healthy, expansive dune system will take the brunt of the destructive wave action, acting as a temporary barrier protecting inland assets.

Dunes act as a storehouse of sand that will naturally replenish an eroded beach. Storms can remove large amounts of sand from the beach. As the dune is broken down by the storm it can lay sand on the beach, hopefully replacing what was lost. After the storm passes, the dune-building cycle begins again.



Aerial images of the dunes at East Atlantic Beach in 2010 (above) before Superstorm Sandy, directly after in 2012 (middle). Sandy's storm surge eroded the dune system but the remnants protected many homes behind them from more extensive damage. The East Atlantic Beach Community and Town of Hempstead collaborated to replenish the dunes (bottom, 2017).



Image Credit: the Google Earth snapshots were provided by East Atlantic Beach Conservation Committee.