

PEM and the Environment

The PEM system is among the most environmentally safe solutions to beach erosion control and it is used in European Habitat Areas.

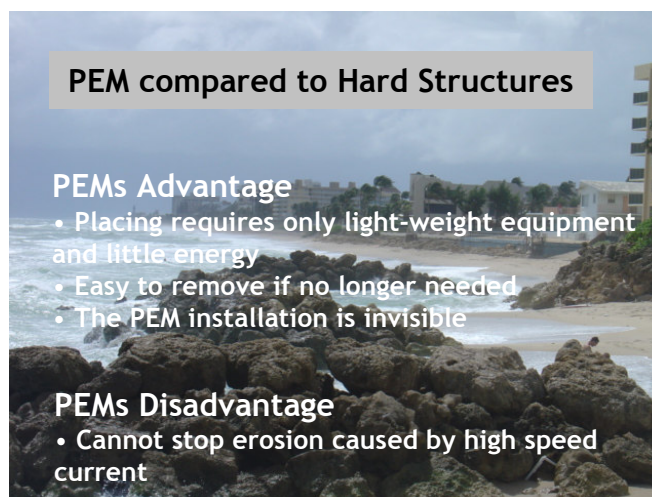
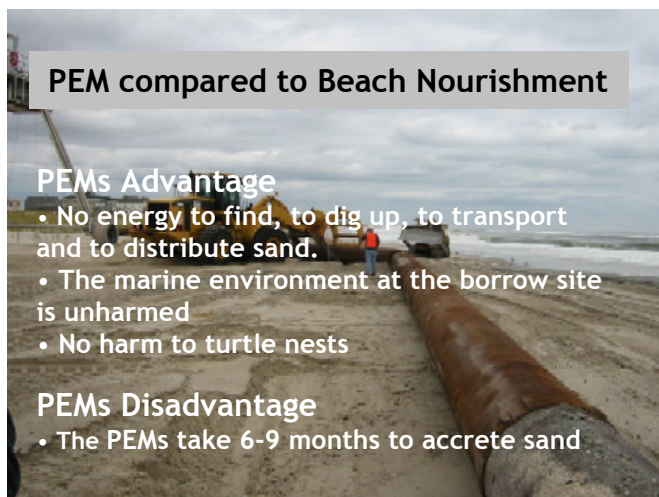
It may be used in combination with beach nourishment to retain sand, or as a stand-alone solution if enough sand is available in the system.

The PEM system:

- Is unobtrusive
- Is placed subsurface and the installation is invisible to the beach visitor
- Uses no power or other energy during operation
- Is robust as it consists of independent modules and requires little maintenance
- Supplements the beach with sand very similar to the original type of sand
- Has no known effect on flora or fauna

Over time, sand will build up forming a slight convex shape. The surplus of sand will be transported by the wind further onto the beach and eventually to the dunes. This provides protection for the dune and bluff in the event of a storm.

The cost of using PEM is much lower than traditional erosion control . More miles of beach can be protected for the same money.



The PEM system is permitted to be used in sensitive areas

The PEM system is used in Habitat Area 111, Southern Funen, Denmark.

The permitting was based on 14 different types of habitat (environmental areas, plants or animals).

The result of the evaluation performed by the Authorities was that the PEMs had no environmental impact, if any a positive impact. The positive impact was a result of the accretion of sand and raising of the seafloor and the beach, which will reduce over-wash of the dunes. During storms, over-wash had previously resulted in destruction of certain types of rare plants that did not regenerate.

As a result the PEM System was approved for installation on the European Habitat Area No 111, Eriks Hale, Marstal, Denmark.

Turtle-friendly design

The PEM system has been installed in Africa where turtles are present, and no negative effect was noted, however consistent monitoring was never performed. We look forward to consistent monitoring in the USA.

We believe the PEM System is among the most turtle-friendly systems:

- A beach with the PEMs installed is easier to access for a turtle than a nourished beach, as the profile is naturally flat and has no scarps.
- No relocation of nests, as is often the case when a beach is nourished
- The PEM modules are initially placed 1-2 ft under the sand and within reach when a turtle digs its nest. As more sand is accreted the module will be lower, and after a season or two it may be 4-6 ft under the beach surface, out of reach for the turtle.
- The area of the PEM tubes on a beach is 2-3 square ft. per mile of beach equal to 1:300,000, so they are hard to find. However sooner or later a turtle will hit a module when making a nest, and the question is what is going to happen. The top of the PEM module is equipped with foam.
- The design of the modules will be adjusted if tests will show that a different design is more suitable for beaches with turtles

