

Beach Nourishment and Dune Construction

Coastal communities are increasingly opting for beach nourishment. This process adds sand to beachfront areas affected by erosion. For flood hazard mapping, FEMA considers the protection nourished beaches and constructed dunes may provide only when certain criteria are met. This fact sheet explains those criteria.

What is beach nourishment?

Beach nourishment restores an eroding beach or creates a new one by adding sand along the shoreline. Beach nourishment projects aim to widen or raise a beach and advance the shoreline seaward. These projects are engineered to work like natural beaches. That is, they allow sand to shift in response to natural variations in waves and water levels.



Figure 1: Image of a beachfront home near the ocean

Beaches are dynamic in nature. They are likely to erode over time due to winds and waves. This reduces the positive effects of nourishment projects on flood hazards landward of the beach. Without regular maintenance, a raised or widened beach is only temporary.

Many nourishment projects add or rebuild a dune between the beach and the developed land beyond the beach. In some cases, dunes are enlarged or constructed separately. However, dunes are also dynamic. They are subject to erosion and can be washed away during major storms.

How do beach nourishment and dune construction affect FEMA's coastal flood hazard mapping studies?

When studying coastal flood hazards, FEMA only considers the effects of significant beach nourishment projects. The beach must have dimensions that affect the 1%-annual-chance flood hazards, be well established and



maintained for many years. Dune construction and reconstruction projects are treated in the same way. Similarly, dunes will be shown to reduce flood hazards in a flood mapping study if they are well-established and have dimensions that provide protection from hazards associated with the 1%-annual-chance flood. They must also have long-standing vegetation in place.

Federal Regulations (§44 CFR 65.11): Evaluation of sand dunes in mapping coastal flood hazard areas:

(a) General conditions. For purposes of the NFIP, FEMA will consider storm-induced dune erosion potential in its determination of coastal flood hazards and risk mapping efforts. The criterion to be used in the evaluation of dune erosion will apply to primary frontal dunes as defined in § 59.1, but does not apply to artificially designed and constructed dunes that are not well-established with long-standing vegetative cover, such as the placement of sand materials in a dune-like formation.

(b) Evaluation criterion. Primary frontal dunes will not be considered as effective barriers to base flood storm surges and associated wave action where the cross-sectional area of the primary frontal dune, as measured perpendicular to the shoreline and above the 100-year stillwater flood elevation and seaward of the dune crest, is equal to, or less than, 540 square feet.

(c) Exceptions. Exceptions to the evaluation criterion may be granted where it can be demonstrated through authoritative historical documentation that the primary frontal dunes at a specific site withstood previous base flood storm surges and associated wave action.

How does FEMA evaluate beach nourishment projects in a flood study?

Shorelines are dynamic. Some changes take place gradually, over longer periods of time, and others happen quickly. A single storm can cause major erosion. For coastal flood mapping studies, FEMA considers the nature of the beach nourishment.

New nourishment projects represent a “temporary disturbance” of the natural shoreline, reaching equilibrium over several years. These projects might reduce flood hazards over the short term, but a flood map is generally in effect for longer than the beach protection will last. If the beach nourishment represents a long-term, stable feature of the shoreline, FEMA may consider it a “prevailing condition” for mapping flood hazards.

FEMA’s guidance has details on how to evaluate beach nourishment projects in a flood study. See “Guidance for Flood Risk Analysis and Mapping: Coastal General Study Considerations,” section 4.4 (Analysis and Mapping of Temporary Shoreline Disturbances).

Additional Resources

- To access the flood maps for your community: visit the [Map Service Center](#), or contact the Flood Mapping and Insurance eXchange (FMIX) at 877-336-2627 or FEMA-FMIX@fema.dhs.gov.
- To learn more about flood insurance, visit www.FloodSmart.gov.