

# HURRICANE SANDY

## IN NEW JERSEY AND NEW YORK

# B Glossary

**100-year flood:** See base flood.

**500-year flood:** Flood that has as 0.2 percent probability of being equaled or exceeded in any given year.

**Base flood:** Flood that has as 1 percent probability of being equaled or exceeded in any given year. Also known as the 100-year flood.

**Base flood elevation (BFE):** The water surface elevation resulting from a flood that has a 1 percent chance of equaling or exceeding that level in any given year. The BFE is measured in relation to a specified datum, such as the National Geodetic Vertical Datum or the North American Vertical Datum. The BFE is the basis of the insurance and floodplain management requirements of the National Flood Insurance Program (NFIP).

**Basement:** Under the NFIP, any area of a building having its floor subgrade on all sides. (Note: What is typically referred to as a “walkout basement,” which has a floor that is at or above grade on at least one side, is not considered a basement under the NFIP.)

**Beach nourishment:** A project type that typically involves dredging or excavating hundreds of thousands to millions of cubic yards of sediment and placing it along the shoreline.

**Best practice:** Technique that exceeds the minimum requirements of model building codes and/or design and construction standards for Federal, State, and local regulations.

**Breakaway wall:** A wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or supporting foundation system. Breakaway walls are required by the NFIP regulations for any enclosures constructed below the BFE beneath elevated buildings in coastal high hazard areas (also referred to as Zone V). In addition, breakaway walls are recommended in areas where floodwater flows at high velocities or contains ice or other debris.

**Building code:** Regulations adopted by local governments that establish standards for construction, modification, and repair of buildings and other structures.

**Bulkhead:** Wall or other structure, often of wood, steel, stone, or concrete, designed to retain or prevent sliding or erosion of the land. Occasionally, bulkheads are used to protect against wave action.

**Closed foundation:** A foundation that does not allow water to pass easily through the foundation elements below an elevated building. Examples of closed foundations include crawlspace and stem wall foundations, which are usually filled with compacted soil, slab-on-grade foundations, and continuous perimeter foundation walls.

**Coastal A Zone:** An area within a Special Flood Hazard Area (SFHA), landward of a Zone V, or landward of an open coast without a mapped Zone V. During base flood conditions, breaking wave heights in a Coastal A Zone are potentially greater than or equal to 1.5 feet. The inland limit of the Coastal A Zone is either (a) the Limit of Moderate Wave Action (LiMWA) if delineated on a Flood Insurance Rate Map (FIRM) or (b) designated by the authority having jurisdiction.

**Coastal Special Flood Hazard Area:** The portion of the SFHA where the source of flooding is coastal surge or inundation. It includes Zone VE and Coastal A Zone.

**Continuous load path:** The structural condition required to resist loads acting on a building. The continuous load path starts at the point or surface where loads are applied, moves through the building, continues through the foundation, and terminates where the loads are transferred to the soils that support the building.

**Critical and essential facility:** A facility that is essential for the delivery of vital services or protection of a community. Critical facilities include, but are not limited to, hospitals, emergency operation centers, fire and police stations, schools, and primary utility and transportation facilities. Critical facilities are Category III and IV buildings as defined in ASCE 7.

**Design flood elevation (DFE):** The DFE is the locally adopted regulatory flood elevation, including wave effects, and is measured relative to the National Geodetic vertical Datum, North American Vertical Datum, or other datum. If a community regulates to minimum NFIP requirements, the DFE is identical to the BFE. If a community chooses to exceed minimum NFIP requirements, the DFE exceeds the BFE.

**Dune:** See frontal dune and primary frontal dune.

**Erosion:** Under the NFIP, the process of gradual wearing away of land masses.

**Extratropical storm:** A storm system that is larger than usual, with established fronts, a cold core, and a shape resembling a comma instead of the roughly circular shape of tropical cyclones.

**Federal Emergency Management Agency (FEMA):** Agency created in 1979 to provide a single point of accountability for all Federal activities related to disaster mitigation and emergency preparedness, response, and recovery.

**Federal Insurance and Mitigation Administration (FIMA):** A component of FEMA that manages the NFIP and other programs designed to reduce future losses from natural disasters to homes, businesses, schools, public buildings, and critical facilities.

**Flood Insurance Rate Map (FIRM):** Under the NFIP, an official map of a community, on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. (Note: The latest FIRM issued for a community is referred to as the “Effective FIRM” for that community.)

**Flood Insurance Study (FIS):** Under the NFIP, an examination, evaluation, and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation, and determination of mudslide (i.e., mudflow) and flood-related erosion hazards in a community or communities. (Note: The NFIP regulations refer to FISs as “flood elevation studies.”)

**Freeboard:** Under the NFIP, a factor of safety usually expressed in feet above a flood level for the purposes of floodplain management. “Freeboard” tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.

**Frontal dune:** Ridge or mound of unconsolidated sandy soil extending continuously along shore landward of the sand beach and defined by relatively steep slopes abutting markedly flatter and lower regions on each side.

**Grade beam:** Section of a concrete slab that is thicker than the slab and acts as a footing to provide stability, often under load-bearing or critical structural walls. Grade beams are occasionally installed as lateral support for vertical foundation members where they enter the ground.

**High-rise building:** A building eight or more stories above grade.

**Historic building:** Any building that is:

- Listed individually in the National Register of Historic Places (National Register; a list maintained by the U.S. Department of the Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register; or
- Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary of the Interior to qualify as a registered historic district; or
- Individually listed in a State inventory of historic places in States with preservation programs that have been approved by the Secretary of the Interior; or
- Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:
  - By an approved State program as determined by the Secretary of the Interior; or
  - Directly by the Secretary of the Interior in States without approved programs.

**Hurricane:** Tropical cyclone, formed in the atmosphere over warm ocean areas, in which sustained wind speeds reach 74 miles per hour or more and blow in a large spiral around a relatively calm center or “eye.” Hurricane circulation is counterclockwise in the northern hemisphere and clockwise in the southern hemisphere.

**Inundation:** The total water level that occurs on normally dry ground as a result of a storm tide (expressed in terms of height above ground level).

**Island Mode:** The state of operating on power that is not connected to an electrical grid and is supplied through an alternate means of power generation (e.g., liquid fuel- or natural gas-operated generators).

**Joint Field Office (JFO):** A temporary Federal multiagency coordination center established locally to facilitate field-level domestic incident management activities related to prevention, preparedness, mitigation, response, and recovery.

**Limit of Moderate Wave Action (LiMWA):** Line shown on FIRMs to indicate the inland limit of the 1.5-foot breaking wave height during the base flood. FEMA requires new flood studies in coastal areas to delineate the LiMWA.

**Lowest Floor:** Under the NFIP, the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Sec. 60.3.

**Low-rise building:** A building between one and three stories above grade.

**Mean Lower Low Water (MLLW):** A tidal datum. The average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch.

**Mid-rise building:** A building between four and seven stories above grade.

**Mitigation:** Any action taken to reduce or permanently eliminate the long-term risk to life and property from natural and manmade hazards.

**Mitigation Assessment Team (MAT):** A team that FEMA quickly assembles and deploys in response to a natural or manmade disaster to evaluate the performance of buildings and related infrastructure. The MAT conducts field investigations at disaster sites, works closely with local and State officials to develop recommendations for improvements in building design and construction, and develops recommendations on code development and enforcement and mitigation activities that will lead to greater resistance to hazard events.

**National Flood Insurance Program (NFIP):** Federal program created by Congress in 1968 that makes flood insurance available in communities that enact and enforce satisfactory floodplain management regulations.

**National Oceanic and Atmospheric Administration (NOAA):** An agency within the U.S. Department of Commerce that specializes in the conditions of the oceans and atmosphere. NOAA reports daily weather forecasts, severe storm warnings, and climate monitoring to fisheries management, coastal restoration, and supporting marine commerce entities.

**National Weather Service (NWS):** One of six agencies under NOAA that produce weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy.

**North American Vertical Datum (NAVD):** Datum established in 1988 and used as a basis for measuring flood, ground, and structural elevations. NAVD is used in many recent Flood Insurance Studies rather than the National Geodetic Vertical Datum of 1929.

**Open foundation:** A foundation that allows water to pass through the foundation of an elevated building, reducing the lateral flood loads the foundation must resist. Examples of open foundations are pile, pier, and column foundations.

**Overwash:** Occurs when low-lying coastal lands are overtopped and eroded by storm surge and waves such that the eroded sediments are carried landward by floodwater, burying uplands, roads, and at-grade structures.

**Post-tropical storm:** A type of extratropical storm that was once tropical.

**Pre-FIRM building:** A building for which construction or Substantial Improvement occurred on or before December 31, 1974, or before the effective date of an initial FIRM, whichever is later.

**Primary frontal dune:** Under the NFIP, a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.

**Resilience:** The ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions.

**Saffir-Simpson Hurricane Wind Scale:** Measures a hurricane's intensity on a 1–5 scale to give an estimate of the potential property damage and flooding expected. Wind speed is the determining factor in the scale. A Category 1 hurricane is the weakest, with winds from 74–95 mph (maximum, 1-minute sustained speeds), and a Category 5 hurricane is the strongest, with winds over 155 mph. Refer to Table B-1.

Table B-1: Saffir-Simpson Hurricane Scale Wind Speeds and Pressures

Strength	Sustained Wind Speed <sup>1</sup> (mph)	Gust Wind Speed <sup>2</sup> (mph)	Pressure (mb <sup>3</sup> )
Category 1	74–95	89–116	>980
Category 2	96–110	117–134	965–979
Category 3	111–130	135–159	945–964
Category 4	131–155	160–189	920–944
Category 5	>155	>189	<920

1 1-minute sustained over open water

2 3-second gust over open water

3 mb = millibars

SOURCE: [HTTP://WWW.NHC.NOAA.GOV/ABOUTSSHS.SHTML](http://www.nhc.noaa.gov/aboutsshs.shtml)

**Scour:** The localized loss of soil, often around a foundation element due to flood flow obstruction or interaction.

**Seawall:** Solid barricade built at the water's edge to protect the shore and prevent inland flooding.

**Shearwall:** Load-bearing wall or non-load-bearing wall that transfers in-plane lateral forces from lateral loads acting on a structure to its foundation.

**Soft office:** An office opened in response to an event to perform administrative tasks, i.e., customer services, office support, etc.

**Special Flood Hazard Area (SFHA):** Under the NFIP, the land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. The area may be designated as Zone A on the Flood Hazard Boundary Map. After detailed ratemaking has been completed in preparation for publication of the FIRM, Zone A usually is refined into Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, or V1-30, VE, or V.

**Storm surge:** An abnormal rise of water over and above the astronomical tide caused by a severe storm such as a tropical cyclone or nor'easter. Storm surge is one of the main causes of coastal inundation. Large waves also raise coastal water levels and ride on top of the storm surge to cause extreme damage.

**Storm tide:** The combined effect of storm surge, existing astronomical tide conditions, and breaking wave setup.

**Substantial Damage:** Under the NFIP, damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

**Substantial Improvement:** Under the NFIP, any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures that have incurred Substantial Damage, regardless of the actual repair work performed. However, the term does not include either:

- Any project for improvement of a structure to correct existing violations of State or local health, sanitary, or safety code specifications that have been identified by the local code enforcement official and that are the minimum necessary to ensure safe living conditions, or
- Any alteration of a “historic structure,” provided that the alteration does not preclude the structure’s continued designation as a “historic structure.”

**Sustained wind speed:** Wind speed determined by averaging observed values over a 1-minute period used for the Saffir-Simpson Wind Scale.

**Tropical cyclone:** A storm with a concentric circulation, tropical convection near the center, and a core of warm air near the center.

**Tropical wave:** A roughly linear-shaped feature of lower pressure, clouds, and showers embedded within the flow of the tropical trade winds moving from east to west.

**Undermining:** Process whereby the vertical component of erosion or scour exceeds the depth of the base of a building foundation or the level below which the bearing strength of the foundation is compromised.

**Uplift:** Hydrostatic pressure caused by water under a building. It can be strong enough to lift a building off its foundation, especially when the building is not properly anchored to its foundation.

**Wind shear:** The change in wind speed and/or wind direction with increasing height in the atmosphere. Excessive wind shear disrupts tropical cyclone formation and can also destroy well-developed hurricanes.

**Zone A:** Under the NFIP, the area subject to inundation by the 100-year flood where wave action does not occur or where waves are less than 3 feet high.

**Zone V:** Under the NFIP, an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high-velocity wave action from storms or seismic sources. This area is subject to inundation by the base flood, where wave heights or wave run-up depths are 3 feet or higher.

**Zone X:** Under the NFIP, areas where the flood hazard is lower than that in the SFHAs.