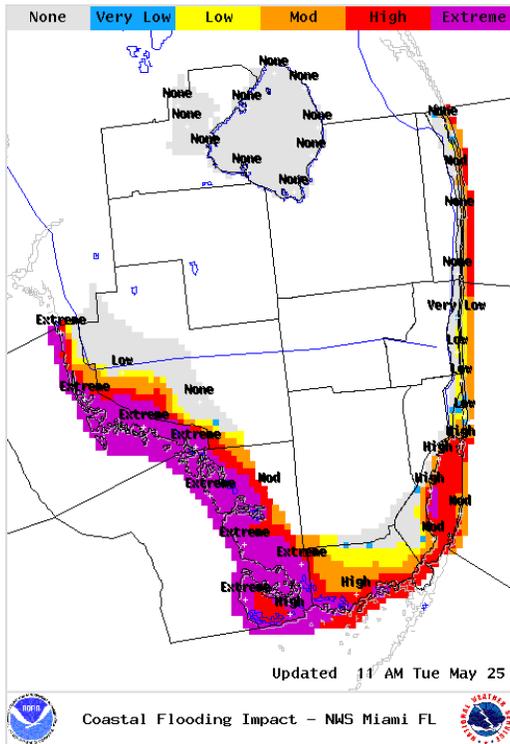




Experimental

Tropical Cyclone Coastal Flood Impact Product



Description: Issued by the local Weather Forecast Office (WFO) during tropical cyclone situations, the *Tropical Cyclone Coastal Flood Impact* product responsibly depicts the potential impact of the associated storm surge and tide hazard from a location-centric perspective. It converts the most relevant threat assessment information into descriptions of potential impact using a color-coded index scale ranging from 0 to 5, *None* to *Extreme*. Levels are based on the resulting height of sea water inundation as derived from the projected magnitude of surge, but with the likelihood of occurrence also factored in by using probabilistic storm surge information. Astronomical tides are then added in, while local topography is subtracted out, in order to yield a general depiction of the vertical measure of water that might be realized from a landfalling tropical cyclone. Locally, the assessment accounts for such situational information as the effects of wind speed and direction, slope of the continental shelf, local bathymetry and dry-land relief, coastal configuration (barrier islands, bays, inlets, mouths of rivers, etc.), and tidal heights. At this time, the effects of battering waves are not explicitly considered. The assessment

effectively employs both deterministic (e.g., the latest forecast) and probabilistic (e.g., associated forecast uncertainty) components resulting in a more complete expression of the potential impact of coastal flooding. Product release is triggered by the issuance of a tropical cyclone Watch or Warning within the defined area. Routine updates are provided shortly after each official advisory and are continued until coastal flooding is no longer an immediate threat to local communities.

Utility: The *Tropical Cyclone Coastal Flood Impact* product uses an index scheme to distill the abundance of storm surge and tide information into a single plan-view map of possible sea water inundation that is easy-to-understand. The product is designed to motivate users to take proportionate action regarding preparedness and evacuation activities in vicinity of the coast, while helping to prevent information paralysis. Importantly, it highlights the minimum actions to be taken and relates them to generalized impacts. For more-sophisticated users, this product serves as an excellent starting point for critical decision-making and is a coherent briefing tool. In gridded form, it can be ingested into Geographic Information Systems to address specific vulnerabilities, in context of the actual meteorological situation, for a more detailed assessment of the potential impact from coastal flooding.

For Example: Upon the issuance of a tropical cyclone Watch or Warning, coastal residents might investigate the *Tropical Cyclone Coastal Flood Impact* product to acquire personal awareness and assess the likelihood for local evacuation orders. Officials would have a greater indication of the extent to which certain locations are being threatened, as well as those areas in danger of being hardest hit by combined surge and tide waters by coarsely considering the resulting sea water inundation.

Note: The example image depicts the potential impact of coastal flooding (e.g., sea water inundation) resulting from storm surge and tide associated with a hypothetical landfalling tropical cyclone upon South Florida (e.g., Test Hurricane Suiter, 2009). The context of the event is for a Category 3 hurricane to make landfall in vicinity of Broward and Palm Beach counties in approximately 48 hours. For this example, the potential impact for Lake Okeechobee is not included.

Tropical Cyclone Coastal Flood Impact Definitions

Impact Levels	Description
Extreme	<ul style="list-style-type: none"> Threat: An extreme threat to life and property; the likelihood for combined storm surge and astronomical tide resulting in sea water inundation of 8 feet or higher. Minimum Action: Prepare for the likelihood of extreme to catastrophic coastal flood damage. Potential Impact: An extreme impact to communities in the specified area. Coastal flooding capable of causing widespread inundation of the surge zone by sea water, possibly reaching several miles inland for low-lying areas. Extreme beach erosion with several new inland cuts likely created. Many large sections of near-shore roads washed out and/or low-lying escape routes flooded. Powerful scouring surge and tide waters greatly accentuated by intense battering wind waves breaching dunes and seawalls in widespread locations to result in structural damage to numerous shoreline buildings, with several washing into the sea. Damage accentuated from considerable floating debris. Extensive damage to marinas, docks, and piers. Numerous small craft broken away from moorings.
High	<ul style="list-style-type: none"> Threat: A critical threat to life and property; the likelihood for combined storm surge and astronomical tide resulting in sea water inundation of 6 to 8 feet. Minimum Action: Prepare for the likelihood of major coastal flood damage. Potential Impact: A high impact to communities in the specified area. Coastal flood waters capable of causing partial inundation of the surge zone by sea water, especially for low-lying areas. Severe beach erosion. Several sections of near-shore roads washed out and/or low-lying escape routes flooded. Scouring surge and tide waters accentuated by battering wind waves breaching dunes and seawalls in scattered locations to result in structural damage to several shoreline buildings, with a few washing into the sea. Damage accentuated by floating debris. Damage to marinas, docks, and piers. Several small craft broken away from moorings, especially in unprotected anchorages.
Moderate	<ul style="list-style-type: none"> Threat: A significant threat to life and property; the likelihood for combined storm surge and astronomical tide resulting in sea water inundation of 4 to 6 feet. Minimum Action: Prepare for the likelihood of moderate coastal flood damage. Potential Impact: A moderate impact to communities in the specified area. Coastal flood waters capable of causing major beach erosion. A few sections of near-shore escape roads weakened or washed out, especially in historically vulnerable low spots. Surge and tide waters accentuated by wind waves breaching dunes and seawalls in scattered locations to result in structural damage to a few shoreline buildings, mainly in historically vulnerable spots. Minor damage to marinas, docks, and piers. A few small craft broken away from moorings, especially in unprotected anchorages.
Low	<ul style="list-style-type: none"> Threat: An elevated threat to life and property; the likelihood for combined storm surge and astronomical tide resulting in sea water inundation of 2 to 4 feet. Minimum Action: Prepare for the likelihood of minor to locally moderate coastal flood damage. Potential Impact: A low impact to communities in the specified area. Coastal flood waters capable of causing moderate to locally major beach erosion. Very heavy surf breaching dunes in isolated locations, mainly in historically vulnerable spots.
Very Low	<ul style="list-style-type: none"> Threat: A limited threat to life and property; the likelihood for combined storm surge and astronomical tide resulting in sea water inundation of 1 to 2 feet. Minimum Action: Prepare for the likelihood of minor coastal flood damage. Potential Impact: A very low impact to communities in the specified area. Coastal flood waters capable of causing heavy surf and moderate beach erosion.
None	<ul style="list-style-type: none"> Threat: No discernable threat to life and property; no surge waters expected. Minimum Action: Evaluate personal and community disaster plans and ensure seasonal preparedness activities are complete. Potential Impact: Coastal flooding is not expected; impact should be negligible. Surf conditions may still be rough with minor beach erosion.

Note: In all cases, listen to local authorities and obey any evacuation orders for your coastal area. Remember, increasing wind and rising waters can cut off escape routes well in advance of landfall.