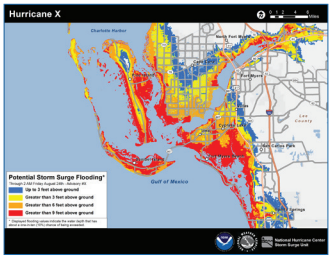
Potential Storm Surge Flooding

Tips for Media Professionals

The Potential Storm Surge Flooding *map is an experimental National Weather Service (NWS) product that provides valuable new information for forecasting and reporting on the storm surge associated with tropical cyclones. This fact sheet can help broadcast meteorologists, reporters, and other media professionals understand and use the new map.*

Although storm surge is often the greatest threat to life and property from a tropical storm or hurricane, many people do not understand this term and the threat it represents. Starting in 2014, the NWS's National Hurricane Center (NHC) will issue the *Potential Storm Surge Flooding* map for areas where storm surge is possible for a given storm. Developed over several years in consultation with broadcast meteorologists and others, the map will show:



- **Land areas** where, based on the latest NHC forecast, storm surge could occur.
- How **high above ground** the water could reach in those areas.

NHC will update the map **every six hours in association with each full advisory package**.

Overview

Major factors influence the amount of surge a given storm produces at a given location, including the hurricane's landfall location; storm intensity, size, forward speed, and angle of approach to the coast; the shape of the coastline; the width and slope of the ocean bottom; and local features such as barrier islands, bays, and rivers.

Factors the map takes into account:

- Flooding due to storm surge from the ocean, including adjoining tidal rivers, sounds, and bays
- Tides
- Land elevation
- Uncertainties in the track, landfall location, intensity, and size of the cyclone

Factors the map does not take into account:

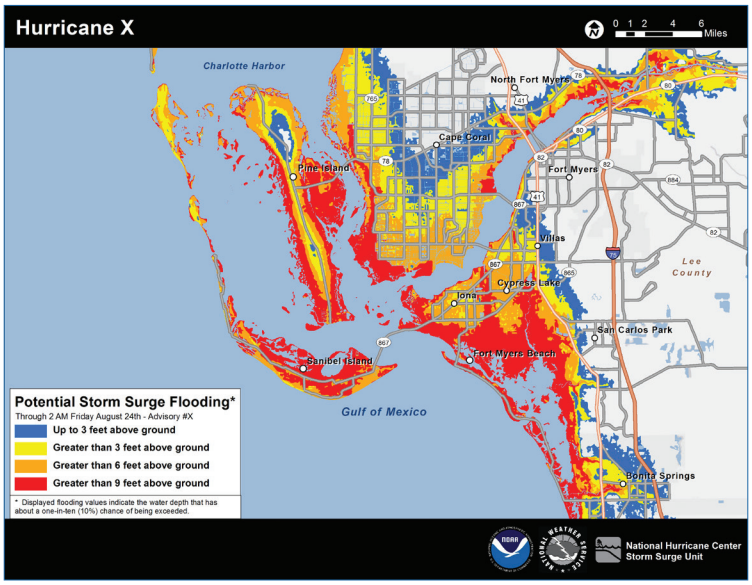
- Wave action
- Freshwater flooding from rainfall
- Flooding inside levees and overtopping

Timing and other variables:

- The map will typically be issued when a hurricane or tropical storm watch is first issued for any portion of the Gulf or East Coast of the United States, or approximately **48 hours** before the anticipated onset of tropical storm force winds.
- The map is subject to change every **six hours** in association with every new NHC full advisory package. Due to the processing time required to produce the map, **it will not be available until about 45 to 60 minutes following advisory release**.
- The map is based on the forecast movement and intensity of the current tropical storm or hurricane, and it takes into account likely forecast errors.
- The map represents a reasonable estimate of worst-case scenario flooding of normally dry land at particular locations due to storm surge. There is a 1-in-10 chance that the storm surge flooding at any particular location could be higher than the values shown on the map. The map is created from multiple runs of the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model.

6 Key Points to Communicate About the Map

When using this map while broadcasting or reporting on a tropical cyclone, it will be helpful to explain the following key concepts.



1. **Scope:** This is a map of potential flooding due to storm surge from the current tropical storm or hurricane. It is not a FEMA flood insurance rate map (FIRM) or an evacuation zone map. Life-threatening storm surge can occur in areas that are not in a floodplain. Also, evacuation zones can consider other critical factors that affect public safety, and these zones can be different from the areas shown on this map. **Urge people to always follow evacuation instructions from local officials**.

2. **Affected areas:** This map shows the **locations that could be affected by storm surge**. Areas are in different colors based on water level—red, orange, yellow, or blue, from highest to lowest. For someone living in these areas, conditions could become **life-threatening**. The levels on these maps are **potential ranges** for these areas, but this map cannot tell you exactly how high water will reach at any individual location or residence.

3. **Risk for other areas:** Weather conditions and the forecast can **change**. Even if your community is not in one of the colored areas shown on the map, that could change later, and your area could experience other hazards from the storm and face dangerous conditions such as **impassable roads**, **water and sewage problems**, **and power outages**. If power remains on, downed electrical wires can pose an **electrocution risk**. Local officials could issue evacuation or other instructions for many reasons. **Urge people to follow the evacuation instructions of local officials**.

4. **Potential water depths:** Note that the potential water depths are shown as **above ground**, not above mean sea level or normal tide levels. Local land elevations are taken into account, along with tides, when creating the map. However, the depicted water levels do not account for rainfall or waves.

5. **Coastal versus inland hazards:** While impacts at the coast could be more significant because of large and dangerous breaking waves, storm surge is often **not just a coastal threat**. Storm surge can cause dangerous flooding well inland from the coast, and the map will show this potential flooding. Although heavy rainfall is usually the primary cause of inland flooding, the *Potential Storm Surge Flooding* map **does not** include the rainfall contribution to inland flooding.

6. **Timing:** Explain that the map will be updated every **six hours**, and people should continue to monitor the storm and listen to instructions from local officials.

Quick Tips

Use these quick messaging points to convey important information about storm surge hazards when time is short or space is limited.

- Storm surge can be **extremely dangerous**, and it poses a significant threat of drowning.
- Storm surge can cause water levels to rise quickly and flood large areas—sometimes in just minutes. You could be left with no time to take action if you haven't already evacuated as instructed.
- Tropical storms, category 1 or 2 hurricanes, major hurricanes, and post-tropical cyclones can all cause **life-threatening** storm surge.
- Storm surge is **not** just a coastal threat. Storm surge can affect inland communities, including some areas that are many miles from the coastline.
- Find out **today** if you live in a storm surge evacuation zone. Factor the possibility of evacuation into your hurricane preparedness plan.
- Storm surge can occur before, during, and after the center of a storm passes an area.
- Storm surge can sometimes cut off evacuation routes, so do not delay leaving if an evacuation instruction is given for your area.
- During the peak of a storm surge, it is unlikely that emergency responders will be able to reach you if you are in danger.
- Even if your community is not directly affected by storm surge, it could experience other hazards of the storm and face dangerous conditions such as impassable roads, water and sewage problems, and power outages.
- Local officials could issue evacuation or other instructions for many reasons. **Always follow the evacuation instructions of local officials**.

More Detailed Information

When you have the time or space to go into more detail, the following information can be used to help educate the public about storm surge hazards and preparedness.

What is storm surge?

- Storm surge is an abnormal rise of seawater caused mainly by the forces of a storm's winds. Water levels can rise quickly and flood large areas—sometimes in just minutes, and you could be left with no time to take action if you haven't already evacuated as instructed.
- Storm surge can occur before, during, or after the center of a storm passes through an area. Storm surge can sometimes cut off evacuation routes, so don't delay leaving if an evacuation is ordered for your area.
- Storm surge values do not correspond well to the hurricane wind categories (of the Saffir-Simpson Hurricane Wind Scale) that range from 1 to 5. These categories are based only on winds and do not account for storm surge. Tropical storms, category 1 or 2

hurricanes, major (category 3 to 5) hurricanes, and post-tropical cyclones can all cause life-threatening storm surge.

» Storm surge can also occur with non-tropical storms such as Nor'easters and other winter storms. The *Potential Storm Surge Flooding* map will only be issued for **tropical cyclones** (or **post-tropical cyclones** such as Sandy 2012 at final landfall). For information on surge associated with other storms, refer to the coastal flood products issued by your local NWS office.

» Storm surge is **not** just an immediate coastal threat. It can affect inland communities, including some areas that are many miles from the coastline.

Sandy 2012. Sandy was a post-tropical cyclone with hurricane-force winds when it made landfall in New Jersey. Peak storm-surge-induced flooding was 9 feet above ground in parts of New York and New Jersey.

Ike 2008. Hurricane Ike made landfall near the north end of Galveston Island as a Category 2 hurricane. Storm-surge-induced flooding was over 10 feet on the Bolivar Peninsula of Texas. Hurricane Ike also produced a 10-foot storm surge in southwest Louisiana, 100 miles from the landfall location.

Why should I be concerned?

» Storm surge is often the greatest threat to life and property from a hurricane. It poses a significant threat for drowning. A mere **six inches** of fast-moving flood water can knock over an adult. It takes only **two feet** of rushing water to carry away most vehicles—including pickups and SUVs.

» During the peak of a storm surge event, it is unlikely that emergency responders will be able to reach you if you are in danger.

» Many areas on the U.S. Gulf and East Coast areas are vulnerable to storm surge, including some areas located up to several miles inland from the coastline. **Find out today, well before a hurricane approaches, if you live in a storm surge evacuation zone**.

What if my neighborhood is in a dry land area on the *Potential Storm Surge Flooding* map?

» Even if your community is not in one of the colored areas shown on the map, it could experience other hazards from the storm and face dangerous conditions such as **impassable roads**, **water and sewage problems**, **and power outages**. If power remains on, downed electrical wires can pose an **electrocution risk**.

» Weather conditions and the forecast can **change**. Local officials could issue evacuation or other instructions for many reasons. **Always follow the evacuation instructions of local officials**.

For More Information

The NWS looks forward to seeing how media professionals use this experimental product as part of their graphic packages. For more information, contact Jamie Rhome at Jamie.R.Rhome@noaa.gov.