



# A Glossary of Flood Terms for Professionals



## The Georgia Flood Literacy Project:

The Georgia Flood Literacy Project united professionals from various sectors of the coastal hazards and emergency management fields to discuss important measures of flood hazards and what terms are used when communicating about them. The Flood Literacy Taskforce implemented research for these terms and definitions through meeting discussions, agency resources, scientific articles, and survey results. This was an effort to work toward a consistent terminology for communicating about flooding among professionals and with the public.

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## Glossary Information:

This glossary provides professionals with a guide to flood communication as it contains clear, scientifically accurate and widely applicable term definitions. Callout boxes are included in blue for caveats and other additional information on the terms.

## Acronyms:

- FEMA, the Federal Emergency Management Agency
- GA DNR, the Georgia Department of Natural Resources
- NFIP, the National Flood Insurance Program
- NOAA, the National Oceanic and Atmospheric Administration
- NWS, the National Weather Service

0.2-percent annual chance flood – The type of flood that has a one-in-500 or 0.2% chance of occurring in any given year. A 0.2-percent annual chance flood is also known as a **500-year flood, but this latter term is not recommended for use.**

1-percent annual chance flood – The type of flood that has a one-in-100 or 1% chance of occurring in any given year. A 1-percent annual chance flood is also known as a **100-year flood, but this latter term is not recommended for use.** Synonym of *base flood*. See also *base flood elevation*.

Area of minimal wave action (MiWA) – The lower-hazard area (landward of the *LiMWA*) that is expected to receive breaking waves that are 1.5-foot or less during the *1-percent annual chance flood*.

Area of moderate wave action (MoWA) – The higher-hazard area (between the VE zone and the *LiMWA*) that is expected to receive breaking waves that are 1.5 – 3-feet during the *1-percent annual chance flood*.

Astronomical tide – The predicted or expected *tide*, based solely on effects related to astronomy. See also *tide* and *predicted water level*.

Backwater flooding – Upstream flooding caused by downstream conditions such as channel restriction and/or high flow in a downstream confluence system.

Base flood – The type of flood that has a one-in-100 or 1% chance of occurring in any given year. Synonym of *1-percent annual chance flood*. See also *base flood elevation*.

Base flood elevation (BFE) – The predicted height of the water surface resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. See also *1-percent annual chance flood* and *base flood*.

Coastal flooding – Flooding which occurs when sea water floods typically dry land from an adjacent body of water. Coastal flooding can occur as a result of higher-than-average *astronomical high tides*, *storm surge* associated with a storm, and/or onshore winds.

**Coastal flooding** can be made worse by rain events, resulting in a lack of infrastructure (e.g., storm sewers) to manage the combined volume of water.

Coastal resilience – The ability of a coastal community to adapt to changing conditions and withstand—and recover from— a societal, physical, economic, or ecological disruption.

Compound flooding – An extreme flooding event caused by a combination of oceanographic, hydrological, and meteorological processes (e.g., *astronomical high tides*, strong winds, *storm surge*, freshwater input from rainfall and *riverine flooding*), which can overwhelm the ability of a system to drain, leading to potential infrastructure impacts. See also *total water level*.

**Compound flooding** is very difficult to forecast.

Datum – A reference elevation from which to measure heights or depths. See also *tidal datum*.

Design flood elevation (DFE) – The elevation required by jurisdictional building codes for the construction of a building’s lowest floor to protect against the *1-percent annual chance flood*. The design flood elevation is generally the *base flood elevation* plus *freeboard* in jurisdictional ordinances.

Digital Flood Insurance Rate Map (DFIRM) flood zones – Geographic areas that FEMA has defined according to varying levels of flood risk. These flood zones are depicted on a community’s digital flood insurance rate map (DFIRM), and they are not the same as evacuation zones. Everyone lives in a *flood zone* based on risk of flooding. Synonym of *flood zones*.

Low-risk **DFIRM flood zones** are labelled with the letter X (unshaded). Moderate-risk **DFIRM flood zones** are labelled with the letters B, C, or X (shaded). High-risk **DFIRM flood zones** are labelled with the letters A or V.

Evacuation zones – Areas that serve as a resource for local evacuation decision-making during emergencies resulting from hurricane storm surge or riverine flooding. Evacuation zones are based on factors such as proximity to water, elevation of homes, elevation of roads, and location of levee construction.

First Floor Height – The height of the first lowest floor above the adjacent grade, measured in feet.

Flash flood – A rapid, extreme, and potentially life-threatening flow of high water into a typically dry area, or a rapid water level rise in a waterbody above a predetermined flood level. Ongoing flooding (see *compound flooding*) can intensify to flash flooding in cases where rainfall intensity results in a rapid surge of rising flood waters.

**Flash floods** can begin within six hours of an intense rainfall, dam failure, ice jam, or other causative event. However, this time threshold may vary by region.

Flood – A general and temporary condition of partial or complete inundation of typically dry lands from rivers, oceans, or precipitation.

Flood advisory – An announcement by the NWS when flooding is imminent or already occurring, but where there is a low threat to life or property. **GA DNR and its Flood Literacy Taskforce do not recommend the use of this term because it is being phased out of the forecasting lexicon used by the NWS to reduce confusion among the general public.** See also *flood warning* and *flood watch*.

Flood categories – Terms which categorize the severity of flood impacts.

- Minor flooding - Flood category indicating minimal or no property damage but possibly some public threat such as impacts to roadways or low-lying areas. Minor flooding is sometimes referred to **shallow coastal flooding, but this latter term is not recommended for use.**
- Moderate flooding - Flood category indicating some inundation of structures and roads near the stream. Some evacuations of people and/or transfer of property to higher elevations may be necessary.

Thresholds and datums may vary by location, which could impact the number of minor, moderate, or major flood events that are recorded each year.

- **Major flooding** - Flood category indicating extensive inundation of structures and roads, as well as property damage. Significant evacuations of people and/or transfer of property to higher elevations may be necessary.

**Flood stage** – The water level at which flooding of typically dry land occurs in reference to the measured gage height.

The term **flood stage** is most often used to describe the level of **riverine flooding**.

**Flood warning** – An announcement by the NWS when flooding is imminent or already occurring and there is serious threat to life or property.

**Flood warnings** and **flood watches** can also be used in the event of a flash flood.

**Flood watch** – An announcement by the NWS when conditions are favorable for flooding to occur which could cause a serious threat to life or property.

**Flood zones** – Geographic areas that FEMA has defined according to varying levels of flood risk. These flood zones are depicted on a community’s digital flood insurance rate map (DFIRM), and they are not the same as evacuation zones. Everyone lives in a flood zone based on risk of flooding. *Synonym of Digital flood insurance rate map (DFIRM) flood zones.*

Low-risk **flood zones** are labelled with the letter X (unshaded). Moderate-risk **flood zones** are labelled with the letters B, C, or X (shaded). High-risk **flood zones** are labelled with the letters A or V.

**Floodplain** – Any area susceptible to *inundation* by water from any source. See also *regulatory floodplain*.

**Floodwall** – A primarily vertical artificial barrier engineered to contain the waters of a river or other waterways which may rise during seasonal or extreme weather events.

**Floodway** – Portion of the *regulatory floodplain* that must be kept free of development so the *base flood* can be discharged without cumulatively increasing the water surface elevation beyond a maximum of one foot according to NFIP guidelines. A floodway usually consists of the stream channel and land along its sides.

**Fluvial flooding** – The flooding of typically dry areas caused by the increased water level of an established river when water overflows onto surrounding banks, shores, and neighboring land. It can be caused by excess freshwater coming from severe or prolonged rain events, snow melt, and/or saltwater coming up the rivers. *Synonym of riverine flooding.*

**Freeboard** – An additional height required to be added to building elevations to account for uncertainties in the determination of flood elevations (expressed in feet above a flood level). A freeboard mandate can be added in a municipality’s jurisdictional ordinances, with height requirements based on zone or level of risk.

**Ground level** – The elevation of the surface on which a structure is built.

**High tide flooding** – The flooding that occurs in the absence of a storm when sea water floods typically dry land due to higher-than-average high tides (occurs when the moon is new or full - see *spring tide*; and when the moon and/or sun is closest to earth - see *perigean spring tide*)

**High tide flooding** is becoming more frequent as sea levels rise in Coastal Georgia.

and *proxigean spring tide*) and/or strong onshore winds. High tide flooding is sometimes referred to as ***nuisance flooding, sunny-day flooding, blue-sky flooding, or shallow coastal flooding but these four latter terms are not recommended for use.***

Hydrology and Hydraulic (H&H) Study – The study of movement of water, including the volume, rate of flow, and water surface elevation as it moves through a watershed, basin, channel, or man-made structure. An H&H study can be used as part of planning, designing, and constructing flood reduction and restoration projects.

Inland flooding – The flooding of typically dry, low-lying areas away from the coast resulting from poor drainage.

Inundation – The process of covering typically dry land with flood water.

King tide – The highest *astronomical tides* of the year that occur during a new or full moon and a perigee or proxigee. ***GA DNR and its Flood Literacy Taskforce do not recommend the use of this term because it is not scientifically defined and has taken on several meanings.***

Levee – A man-made structure, usually an earthen embankment, engineered to contain, control, or divert the flow of water to reduce risk from temporary flooding.

Limit of moderate wave action (LiMWA) – The inland limit of the area expected to receive breaking waves that are 1.5 – 3-feet during the *1-percent annual chance flood*. The limit of moderate wave action is the boundary between the *area of moderate wave action (MoWA)* and the *area of minimal wave action (MiWA)*.

Lowest floor – A building’s lowest floor that is habitable and enclosed (including the basement), which is typically the most vulnerable to flooding.

Mean high water (MHW) – The average of the daily high tide(s) over a 19-year cycle of earth-moon distance changes.

Mean higher high water (MHHW) – The average of the higher of the daily high tide(s) over a 19-year cycle of earth-moon distance changes.

Mean low water (MLW) – The average of the daily low tide(s) over a 19-year cycle of earth-moon distance changes.

Mean lower low water (MLLW) – The average of the lower of the daily low tide(s) over a 19-year cycle of earth-moon distance changes.

Mean sea level (MSL) – The average height of the surface of the sea for all stages of the tides at a given location over a 19-year period, usually determined from hourly height readings. It is **not** a synonym of *mean tide level*.

Mean tide level (MTL) – The mathematical average of the mean high water and mean low water levels. Mean tide level is also called half tide level. It is **not** a synonym of *mean sea level*.

Perigean spring tide – A *tide* that occurs when a new or full moon coincides with the moon reaching its closest point of approach to Earth (when the moon is at its perigee). Perigean spring tides typically occur 6-8 times per year and exhibit higher high tides and lower low tides compared to *spring tides*. Perigean spring tides may be referred to as ***extreme high tides, but this latter term is not recommended for use***. See also *spring tide* and *proxigean spring tide*.

Pluvial flooding – Flooding that occurs when an extreme rainfall event causes a flood independent of an overflowing water body.

Predicted water level – Generic term for any forecasted water level.

Proxigean spring tide - A tide that occurs when a new or full moon coincides with the moon reaching its closest points of approach to Earth (when the moon is at its most extreme perigee of the year). Proxigean spring tides typically occur once every 18 months and have the highest high tides and lowest low tides compared to *spring tides* and *perigean spring tides*. Proxigean spring tides may be referred to as ***extreme high tides, but this latter term is not recommended for use***. See also *spring tide* and *perigean spring tide*.

Reasonable worst-case scenario – A 10% chance of exceedance for a given event at any given location. This term most often refers to a 10% chance of storm surge and the timing of winds from tropical storms or hurricanes being worse than expected and is often used for planning purposes.

Regulatory floodplain – Any area susceptible to *inundation* by water from any source subject to jurisdictional flood damage prevention ordinances to protect against inundation from the *1-percent annual chance flood* but may also include other areas as stipulated in jurisdictional ordinances. See also *floodplain* and *special flood hazard area*.

Repetitive loss property – Any insured building that has incurred flood-related damage on two occasions, in which the cost of the repair, on the average, equaled or exceeded 25% of the market value of the structure at the time of each such flood event. See also *severe repetitive loss property*.

Residual risk – The level of flood risk for people and assets located in a *floodplain* that remains after implementation of flood risk reduction actions.

Riverine flooding – The flooding of typically dry areas caused by the increased water level of an established river when water overflows onto surrounding banks, shores, and neighboring land. It can be caused by excess freshwater coming from severe or prolonged rain events, snow melt, and/or saltwater coming up the rivers. Synonym of *fluvial flooding*.

This definition may vary among local governments.

For grant applicants, it is beneficial to identify ***repetitive loss properties*** to increase the likelihood of being selected and reducing the local share of the grant.

Sea level change – the change in the ocean’s average water level over time. Includes a **global rise** observed worldwide in the ocean basins and a **local component**, which can add to or subtract from the global rise. The combination of the global rise and the local component provides the measured relative sea level change at any specific site.

Georgia is experiencing **sea level rise** and is expected to see a rise of 3.74 - 6.33 feet by 2100 according to NOAA’s intermediate and intermediate-high predictions for Georgia.

Sea, Lake and Overland Surges from Hurricanes (SLOSH) model – A computerized numerical model developed by the NWS to estimate *storm surge* heights resulting from historical, hypothetical, or predicted hurricanes by considering the atmospheric pressure, size, forward speed, and track data. These parameters are used to create a model of the wind field which drives the *storm surge*.

This definition may vary among local governments.

Severe repetitive loss property – Any insured building for which at least two separate NFIP claim payments have been made with the cumulative amount of such claims exceeding the market value of the insured structure; or four or more separate NFIP claims payments have been made with the amount of each claim exceeding \$5,000, and with the cumulative amount of claims payments exceeding \$20,000. See also *repetitive loss property*.

For grant applicants, it is beneficial to identify **severe repetitive loss properties** to increase the likelihood of being selected and reducing the local share of the grant.

Special flood hazard area – The land in the *floodplain* within a community subject to a 1% or greater chance of flooding in any given year as shown on a Digital Flood Insurance Rate Map (DFIRM). See also *regulatory floodplain*.

Spring tide – A *tide* that occurs during a new or full moon. Spring tides typically occur twice per month and exhibit higher than average high tides and lower than average low tides. See also *perigean spring tide* and *proxigean spring tide*.

The **storm surge** from a Category 3-5 hurricane can cause flooding in all coastal counties and can push saltwater as much as 30 miles inland (NWS’s Official Georgia Hurricane Guide).

Storm surge – A rise in coastal water levels, measured as the height of the water above the *astronomical tide*. Storm surge is exacerbated by wind and storm events.

Storm tide – The level of sea water relative to a *datum* resulting from the combination of astronomical tide and storm surge.

Most **stormwater** is not treated in any way before entering nearby canals, ditches, or waterways.

Stormwater – Surface water resulting from precipitation. Stormwater runoff occurs when precipitation falls on a surface that cannot absorb water.

Substantial damage – Damage of any origin sustained by a structure whereby the cost of restoring the structure to its pre-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred. See also *substantial improvement*.

This definition may vary among local governments.

Substantial improvement – Any reconstruction, rehabilitation, addition or other improvement to a structure, the total cost of which equals or exceeds 50% of the market value of the structure before the start of construction of the improvement. See also *substantial damage*.

This definition may vary among local governments.

Tidal datum – A standard elevation defined by a certain phase of the *tide* and used as a reference to measure local water levels. See also *datum*.

Tide – The observed alternating rise and fall in sea level with respect to the land due to the *astronomical tide* and other local impacts (e.g., wind, water temperature, speed of the Gulf Stream). See also *astronomical tide*, *total water level*, and *storm tide*.

Total water level – Total water depth relative to a *datum* resulting from a combination of oceanographic, hydrological, and meteorological processes (e.g., astronomical high tides, strong winds, *storm surge*, freshwater input from rainfall and *riverine flooding*), which has the potential to overwhelm the ability of a system to drain, leading to potential infrastructure impacts. See also *compound flooding*.

The *total water level* is very difficult to forecast.

Velocity zone (V zone) – 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 of 3-feet or greater during the *1-percent annual chance flood*. Sometimes referred to as the coastal high hazard area.

Wave height – The vertical distance between the crest (peak) and the trough of a wave.