

Metadata: StormSense Comma Separated Values (CSV) and JavaScript Object Notation (JSON) for 72-Hour Forecasts (fore72)

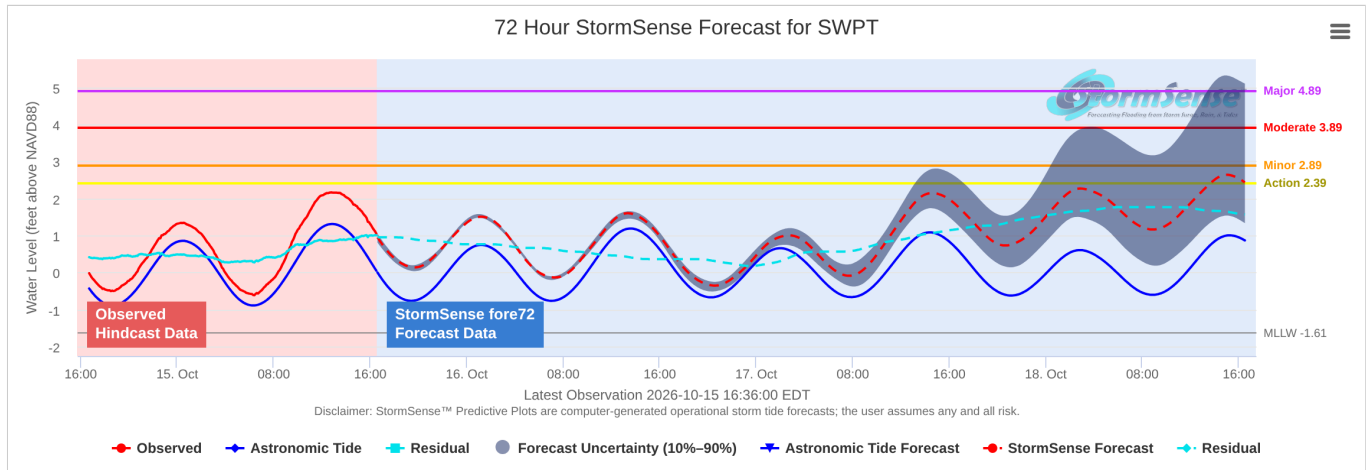


Figure 1. Example StormSense Chart of 72-hour forecast data (NAVD) at NOAA's Sewells Point tide gauge, in Norfolk, VA, issued October 15, 2026 at 16:36 EDT (2026-10-15T20:36:00Z) from the P-ETSS 12Z cycle. The red-shaded period is the observed hindcast leading up to the forecast; the blue-shaded period is the 72-hour forecast.

Figure 1 shows a StormSense 72-hour forecast chart and Table 1 the first rows of the matching download. Each field below is tied to the series it is drawn as in Figure 1 and to its column in Table 1.

Fields *fore72 downloads only include data series for the 72-hour forecast period (the dashed lines and shaded cone in the blue-shaded period of Figure 1; sample rows in Table 1)*

date_time_z	Date and time in Zulu/GMT (UTC), formatted as a string leading with the date as "YYYY-MM-DD" followed by the time (T) as "hh:mm:ss" and Z for Zulu time. Recorded in regular 6-minute intervals (0, 6, 12 ... 54 minutes past the hour), listed in chronological order (Table 1, first column).
astro_tide_ft	(Astronomic Tide Forecast) Harmonically predicted astronomical tide for the next 72 hours from the NWS P-ETSS model (solid blue line in the forecast period of Figure 1). Formatted in units of feet rounded to three decimal places (thousandth of a foot) relative to the North American Vertical Datum of 1988 (NAVD88).
surge_ft	Ensemble-mean storm surge from P-ETSS (the Probabilistic Extra-Tropical Storm Surge model of the NWS Meteorological Development Laboratory, run with an ensemble of weather forecasts): the water level change driven by forecast wind and air pressure. Hourly guidance interpolated to 6 minutes and smoothed with a 3-hour low-pass filter. Feet; a height difference, so the same in MLLW and NAVD88.
bias_ft	The observation-based correction P-ETSS adds to its surge, from the recent difference between the gauge's observations and the modeled tide plus surge; it is held or decays through the forecast, and is 0.000 where P-ETSS applies no correction. Feet; the same in MLLW and NAVD88.
residual_ft	(Residual) Forecast residual: the non-tidal part of the forecast, SSforecast_ft – astro_tide_ft (surge_ft + bias_ft), drawn as the dashed cyan line in Figure 1. Feet; the same in MLLW and NAVD88.
SSforecast_ft	(StormSense Forecast) The StormSense 72-hour storm tide forecast, the ensemble-mean total water level: astro_tide_ft + surge_ft + bias_ft (dashed red line in Figure 1). Formatted in units of feet rounded to three decimal places (thousandth of a foot) relative to the North American Vertical Datum of 1988 (NAVD88).
SSforecast_p10_ft	(Forecast Uncertainty (10%–90%)) 10th percentile of the ensemble total water level (P-ETSS's 90% exceedance level): the lower edge of the shaded cone of uncertainty in Figure 1. Formatted in units of feet rounded to three decimal places (thousandth of a foot) relative to the North American Vertical Datum of 1988 (NAVD88).
SSforecast_p90_ft	Upper edge of the cone in Figure 1: the 90th percentile of the ensemble total water level (P-ETSS's 10% exceedance level). Nine in ten ensemble members fall at or below it. Formatted in units of feet rounded to three decimal places (thousandth of a foot) relative to the North American Vertical Datum of 1988 (NAVD88).
surge_p10_ft, surge_p90_ft	10th and 90th percentiles of the ensemble storm surge (P-ETSS 90% and 10% exceedance). Feet; the same in MLLW and NAVD88.

Table 1. Example StormSense Table of the first rows of 72-hour forecast data (NAVD) at NOAA's Sewells Point tide gauge, in Norfolk, VA, issued October 15, 2026 at 16:36 EDT (2026-10-15T20:36:00Z).

date_time_z	astro_tide_ft	surge_ft	bias_ft	residual_ft	SSforecast_ft	SSforecast_p10_ft	SSforecast_p90_ft	surge_p10_ft	surge_p90_ft
2026-10-15T20:36:00Z	0.000	1.000	-0.052	0.948	0.947	0.807	1.047	0.860	1.100
2026-10-15T20:42:00Z	-0.050	1.000	-0.052	0.948	0.897	0.762	0.997	0.864	1.100
2026-10-15T20:48:00Z	-0.099	1.000	-0.052	0.948	0.849	0.718	0.949	0.869	1.100
2026-10-15T20:54:00Z	-0.145	1.000	-0.052	0.948	0.803	0.676	0.902	0.873	1.100
2026-10-15T21:00:00Z	-0.192	1.000	-0.052	0.948	0.757	0.634	0.856	0.877	1.099
2026-10-15T21:06:00Z	-0.236	1.000	-0.052	0.948	0.712	0.593	0.811	0.882	1.099
2026-10-15T21:12:00Z	-0.279	1.000	-0.051	0.949	0.669	0.554	0.767	0.885	1.098
2026-10-15T21:18:00Z	-0.321	1.000	-0.051	0.949	0.627	0.516	0.724	0.889	1.097

P-ETSS levels are tied to each gauge's own record: the median difference between the observations and P-ETSS over the 24 hours before the forecast starts is added to astro_tide_ft, SSforecast_ft and its percentiles (0.00 ft at most NOAA gauges). At stations without a P-ETSS point, the files keep the same fields with the 36-hour forecast in astro_tide_ft, residual_ft and SSforecast_ft and the P-ETSS-only fields left blank (null in the JSON).

Each CSV has a JSON twin at the same address with .json in place of .csv: station, product, datum, units, time_zone, updated, source, fields and a link to this metadata, then a data list with one record per CSV row keyed by the field names above (numbers in feet, blanks as null).

NWS Flood Thresholds

The flood categories on NAVD88 charts (colored lines labeled at the right of Figure 1) are defined by the National Weather Service (NWS), not by StormSense. NWS forecast offices set them for each forecast gauge together with local emergency managers, based on the impacts observed near that gauge, and publish them through the [National Water Prediction Service](#). StormSense refreshes them from NWPS with every update and shows them only at stations tied to an NWS gauge; thresholds that NWS publishes in MLLW are shifted to NAVD88 with the station's MLLW–NAVD88 separation.

- **Action (yellow)** The level at which the NWS and its partners begin preparing for possible flooding; water may reach the edges of low-lying areas, but significant impacts are not yet expected.
- **Minor (orange)** Minor flooding: minimal or no property damage, but possibly some public threat, such as water over low-lying roads, parking lots and parks near the shore.
- **Moderate (red)** Moderate flooding: some inundation of structures and roads near the water, with some evacuations of people or moving of property to higher ground.
- **Major (purple)** Major flooding: extensive inundation of structures and roads, with significant evacuations of people and transfer of property to higher elevations.

MLLW translation datum

- **MLLW** Mean Lower Low Water: the average of the lower of each day's two low tides over the National Tidal Datum Epoch (1983–2001). The gray MLLW line in Figure 1 marks where the MLLW zero (the chart datum used on nautical charts and in tide tables) sits on the NAVD88 scale, labeled with its NAVD88 elevation.

Datum source: For most NOAA-operated tide gauges the MLLW–NAVD88 separation is NOAA's published value for that station. USGS, VDEM and StormSense sensors natively report live water levels in NAVD88 only, so their MLLW translation datum is derived from [NOAA VDatum](https://vdatum.noaa.gov/vdatumweb/) (<https://vdatum.noaa.gov/vdatumweb/>).