

# Coastal Emergency Risks Assessment - CERA

## Real-Time Storm Surge and Wave Guidance

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The **Coastal Emergency Risks Assessment (CERA)** Group at Louisiana State University provides real-time and historical storm surge and wave information through its interactive online portal [cera.coastalrisk.live](http://cera.coastalrisk.live).

One of CERA's capabilities is the display of **storm surge and wave forecasts in real-time** during active or impending storms.

The modelling data is generated by the ADCIRC Surge Guidance System (ASGS) based on the ADCIRC model for surge and the coupled Simulating Waves Nearshore (SWAN) model for waves. Output data shown on the CERA website includes maxima, time series, and monitoring stations observations, among others.


The CERA website provides the generated data in various data formats for download. This document explains the structure of the downloadable model **time series** that can be obtained for each node within the model domain in the **JSON** file format.

By accessing and using the GIS data, you agree to the **CERA Terms & Conditions**.

The CERA Terms & conditions PDF document is included in each CERA download package.

[Download the CERA time series for a point of interest as a JSON file:](#)

Go to the CERA online portal at [cera.coastalrisk.live](http://cera.coastalrisk.live) and login with your user name. Use the 'model select' box at the top right of the website to choose the "**ADCIRC Surge Guidance System (ASGS)**". Use the select boxes at the upper part of the website to select the CERA storm run that you are interested in. The map sections along the right hand side of the website let you choose a desired map layer.

Activate the time series button  at the left side of the map (the button will turn blue). Click on the map to see the time series chart for the location of your interest. Click the 'Download' link at the top-right corner of the chart.

**The 'Download' link in a selected pop-up window downloads the time series for this particular location.** You can see the coordinates for the selected point in the header section of the chart.

[ZIP file structure:](#)

The CERA download is provided as a ZIP file which contains

- the time series (json file)
- the CERA Terms & Conditions
- the CERA Download File Description (this document)

[ZIP file name:](#)

The provided time series are related to the selected location for the particular model run that is currently displayed on the CERA website. The specifics of the used model parameters are encoded in the **ZIP** file name. The JSON file is named with the latitude/longitude coordinates of the selected point on the CERA map.

## Examples:

### CERA storm run:

- CERA\_MaxWaterElevation\_Lat29.767069\_Lon-89.431239\_TimeRange-2012082812-2012090212\_Storm-ISAAC\_Advisory-30\_Track-50-percent-VeerLeft\_ADCIRCMesh-ocprv19\_TimeSeries.zip

### CERA non-storm run:

- CERA\_MaxWaterElevation\_Lat29.767069\_Lon-89.431239\_TimeRange-2020060100-2020060412\_ADCIRCMesh-LAv20a\_TimeSeries.zip

**MaxWaterElevation:** forecast maximum water height above the vertical datum of the ADCIRC mesh (the highest water level during the model time range)

**MaxInundationDepth:** forecast maximum inundation depth (the highest inundation during the model time range) - Inundation over land means water height above ground. Inundation over water means water height above Mean Sea Level.

**MaxWindSpeed:** forecast maximum wind speed (the highest wind speed during the model time range)

**MaxWaveHeight:** forecast maximum significant wave height (the highest significant wave height for each node during the model time range)

**MaxWavePeriod:** forecast maximum peak wave period (the highest peak wave period during the model time range)

**WaterElevation:** forecast water height above the vertical datum of the ADCIRC mesh (the water level at a specific time during the model time range)

**InundationDepth:** forecast inundation depth (the inundation at a specific time during the model time range) - Inundation over land means water height above ground. Inundation over water means water height above Mean Sea Level.

**WindSpeed:** forecast wind speed (the wind speed at a specific time during the model time range)

**WaveHeight:** forecast significant wave height (The significant wave height at a specific time during the model time range)

**WavePeriod:** peak wave period (the highest peak wave period during the model time range)

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**Coordinates of selected location:** Latitude: 30.193901, Longitude: -90.152005

**Time Range:** All dates and times are in **UTC**.

- The storm model forecast started on Aug 28, 2012 12:00 UTC and ended on Sep 02, 2012 12:00 UTC.

- The non-storm model forecast started on June 01, 2020 00:00 UTC and ended on June 04, 2020 12:00 UTC.

**Storm / Advisory:** storm name: ISAAC. If a storm is present but no storm name exists yet, the storm number is used. National Hurricane Center (NHC) advisory 30

### Track variation:

- NHC-Forecast = National Hurricane Center (NHC) official forecast
- xx-percent-VeerLeft = xx% veer left (xx% of the way between the National Hurricane Center official forecast track and the left (west) edge of the cone of uncertainty)
- xx% VeerRight (xx% of the way between the National Hurricane Center official forecast track and the right (east) edge of the cone of uncertainty)

**ADCIRCMesh:** The underlying mesh used for the model run, here: ocprv19/LAv20a - ADCIRC mesh developed by Coastal Protection and Restoration Authority for the region of Louisiana 2012/2020

ADC/IRC mesh name	vertical datum	geographic region
LAv20a, LAERDCv5k	NAVD88	Louisiana
CenFlv7	NAVD88	Central Florida Atlantic
EGOMv20b	NAVD88	W Florida
NEFLGAv12b	NAVD88	NE Florida/Georgia
NGOMv19b	NAVD88	MS/AL/FL Panhandle
HSOFS	MSL	Atlantic/Gulf of Mexico
NCv999riv	MSL	North Carolina
NAC2014	NAVD88	Virginia/Maryland/Delaware/New Jersey/Connecticut/Rhode Island/Maine
SABv20b	MSL	E Florida/Georgia/South Carolina/North Carolina
SFLv11	NAVD88	South Florida
CTXCS2017, TXLA22a	NAVD88	Texas

### Time series json file:

The json file format is a language-independent data format that stores simple data structures and objects. The json file contains an **unordered** collection of human-readable name/value pairs. Due to this data structure the order of the key/value pairs can differ for each json file.

### JSON file example:

*The order of the key/value pairs is arbitrary.*

```

"lat": 28.7716,
"lon": -95.6168,
"layername": "MaxWaterElevation"
{
  "forecast_data": [
    {
      "time_UTC": "2012-08-28 13:00", "value_[unit]": null
    },
    {
      "time_UTC": "2012-08-28 14:00", "value_[unit]": null
    }
  ]
}
"vertical_datum": "MSL" (or "NAVD88"),

```

*selected location: latitude/longitude, WGS84*

*(max) water elevation, inundation above ground, significant wave height, wind speed, wave period*

*Forecast data values (from the underlying storm surge or flood model), Times are in UTC, values are in ft, mph, sec*

*The output is hourly for the time range of the selected model run*

*If applicable: The forecast (model) values for this location are reported relative to the 'Mean Sea Level' (MSL) or NAVD88 datum.*

### Coordinate reference system:

Geographic Coordinate System: GCS\_WGS\_1984  
Datum: D\_WGS\_1984  
Prime Meridian: Greenwich  
Angular Unit: Degree



Data servers are maintained by the Center for Computation and Technology, Louisiana State University.