**Release Notes**

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| **Model** | Extra-Tropical Storm Surge (ETSS)  |
| **Version** | V2.1 |
| **Implementation date/time** | 9/8/2015 |
| **Purpose**  | The Extra-Tropical Storm Surge model is a modification of the SLOSH model that uses GFS wind and pressure input to predict storm surge from large extra-tropical storms. With version 2.0, it produced storm surge only guidance to the coastline in most regions, and overland (based on storm surge only) for the East and Gulf of Mexico coastlines. Additionally, the post processing stage combined ETSS surge guidance with station based tidal predictions and observations (where available) to create bias corrected total water level guidance which was SHEF encoded and sent over the SBN.This upgrade (version 2.1) will 1. Resolve a problem with water flowing from one basin to another through the Bering Strait by using a new Bering-Beaufort-Chukchi Sea (eBBC) Alaska basin. The eBBC basin includes updated bathymetry and overland topography.
2. Provide overland guidance based on surge and tide for all U.S coastlines, which include tidal forcing for all domains. Higher resolution is available for the East and Gulf of Mexico coastlines.
3. Correct the SHEF encoding to use MLLW instead of MHHW as a vertical datum, and incorporate more stations.
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| **Changes being made for this release** | Model:1. Alaska basin (eBBC)
	1. Create a basin that covers both Bering Sea and Arctic AL
	2. Determine best wind drag coefficient to use for eBBC
	3. Create a basin that has over land information
2. Re-introducing the inundation algorithm based on surge and tide
	1. Added surge + tide and tideOnly products on 625m NDFD CONUS grid (for East and Gulf of Mexico coastlines)
3. Added tidal forcing to the all grids
	1. 37 constituents from ADCIRC EC-2014 (East coast and Gulf of Mexico)
	2. 13 constituents from OSU – TPXO Global Tidal model (West coast and Alaska)
4. Adjust SHEF products to use MLLW instead of MHHW for a vertical datum
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| **Developed by**  | NOAA/NWS/OST/Meteorological Development Laboratory (MDL) |
| **Runs on**  | The National Weather Service (NWS) Weather and Climate Operational Supercomputing System (WCOSS) |
| **Community software**  | None |
| **Input**  | Model: GRIB2 0.5 degree GFS dataPost-Processing: COOPS’ 6-minute water level observations (from NCEP’s BUFR tanks) |
| **Output and where to find it**  | Gridded Products: Satellite Broadcast Network* Storm Surge only – CONUS 5 km and 2.5 km GRIB2 files
* Storm Surge only – Alaska 6 km and 3.0 km GRIB2 files

NCEP NOMADS <http://nomads.ncep.noaa.gov/pub/data/nccf/com/etss/prod/etss.YYYYMMDD>* Storm Surge only – CONUS 2.5 km, Alaska 3.0 km GRIB2 files
* Surge + Tide – CONUS 2.5 km, Alaska 3.0 km GRIB2 files
* Surge + Tide – CONUS 625 m (missing for West coast) GRIB2 files
* Tide only – CONUS 625 m (missing for West coast) GRIB2 files

NWS NDGDhttp://weather.noaa.gov/pub/SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.slosh/* Storm Surge only – CONUS 2.5 km, Alaska 3.0 km GRIB2 files

Text Products: Satellite Broadcast Network* SHEF encoded water level guidance for station with NWSLI (typically COOPS or USGS). The type of water level guidance is either surge-only, surge + station tide, or observation based bias corrected surge + station tide
* Model specific text formatted surge only guidance for historic set of stations

NCEP NOMADS <http://nomads.ncep.noaa.gov/pub/data/nccf/com/etss/prod/etss.YYYYMMDD>* SHEF encoded water level guidance for station **with** NWSLI (typically COOPS or USGS). The type of water level guidance is either surge-only, surge + station tide, or observation based bias corrected surge + station tide
* CSV encoded water level guidance for stations **with or without** NWSLI. The type of water level guidance is either surge-only, surge + station tide, or observation based bias corrected surge + station tide.
* Surge only - model specific text formatted for historic set of stations
* Surge only and surge + modeled tide - updated model specific text formatted for a more inclusive set of stations

Websites:MDL also provides a station based total water level guidance websites:* Original site: <http://www.nws.noaa.gov/mdl/etsurge/> based on ETSS output, NOS-COOPs tide gauge data and NOS observations (where available). If observations are available, the total water level guidance is corrected based on the five-day bias.
* Updated site: <http://nws.weather.gov/mdlsurge/etsurge2.0/> using the same method as the original site, but based on the ETSS - CSV output which makes the site more robust.

OPC provides a map based depiction of surge guidance and pressure fields here: <http://www.opc.ncep.noaa.gov/et_surge/et_surge_info.shtml> |
| **Primary users**  | NCEP's Ocean Prediction Center (OPC), NCEP’s National Hurricane Center (NHC), NWS’s Eastern, Alaska, Southern, and Western Regions (HQ, coastal RFCs and WFOs) |
| **In the future**  | Implement ETSS2.2 and P-ETSS in late March or April of 2016* ETSS2.2 will migrate to the Cray and deal with Gulf of AK / West Coast surge disconnect.
* P-ETSS will create ensemble storm surge + tide inundation guidance based on the GFS ensemble members for input wind forcing.
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For more information on this model, please contact ncep.pmb.dataflow@noaa.gov .