Modernizing SSU and High Seas Workflows
(Hazard Services JTTI Updates)
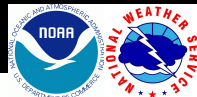
Interdepartmental Hurricane Conference

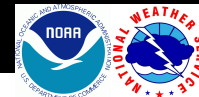*Nate Hardin, Taylor Trogdon, Daniel Nietfeld, Darrel Kingfield*

March 4, 2021

- Provide opportunity to demonstrate new tools and technologies for NWS in alignment with NWS

- Close collaboration between GSL and NHC, OPC, HFO, OCP, OSTI, AFS, and OAR/WPO

- Funded by OAR, not NWS!

WEATHER PROGRAM OFFICE
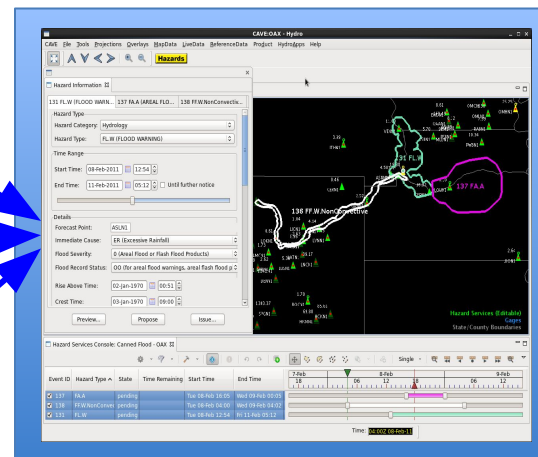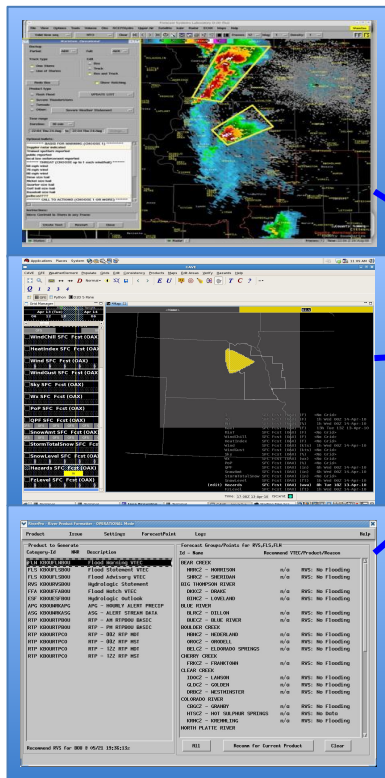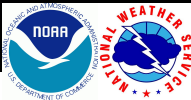National Oceanic and Atmospheric Research

WarnGen
(<1 hour)

Graphical Hazard Generator
(Hours, Days)

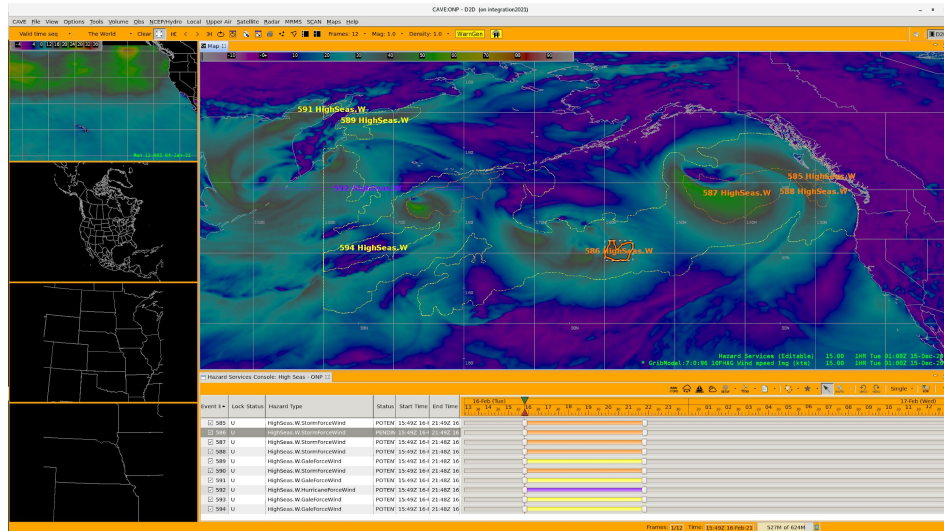**RiverPro**
(Days)
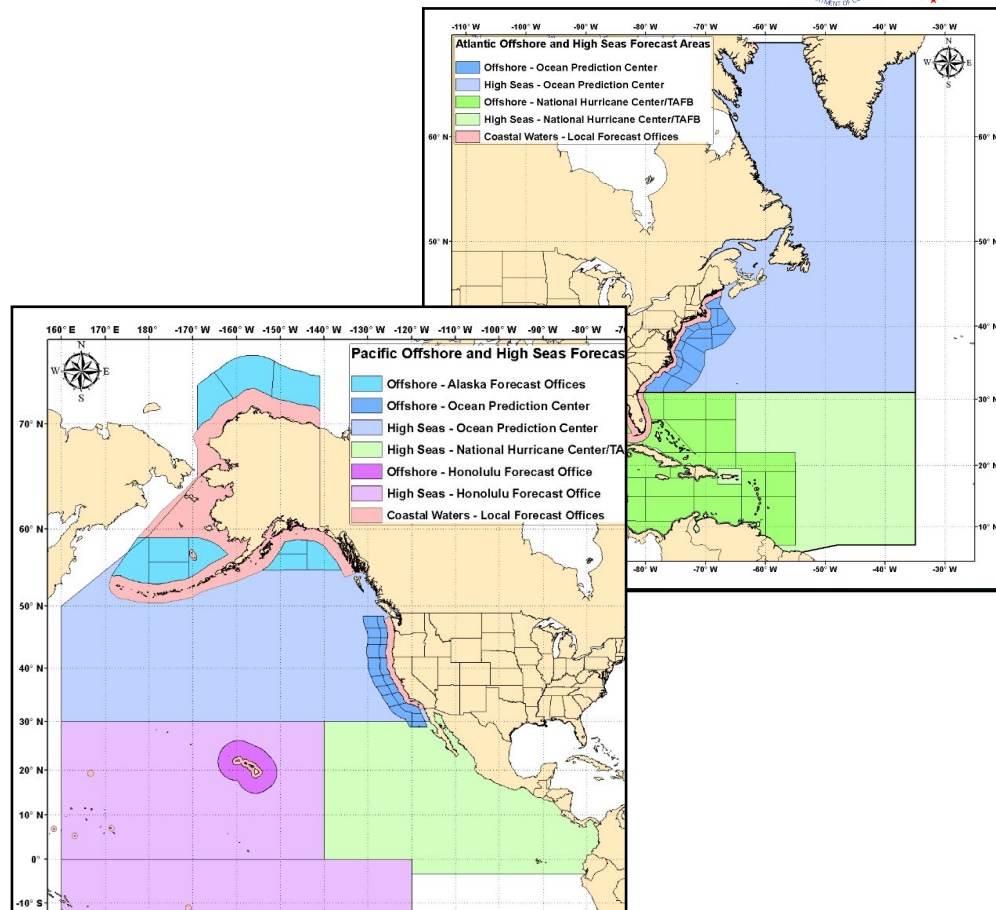
- FY 19-21: High Seas Workflow
- FY 20-22: Storm Surge Watch/Warning
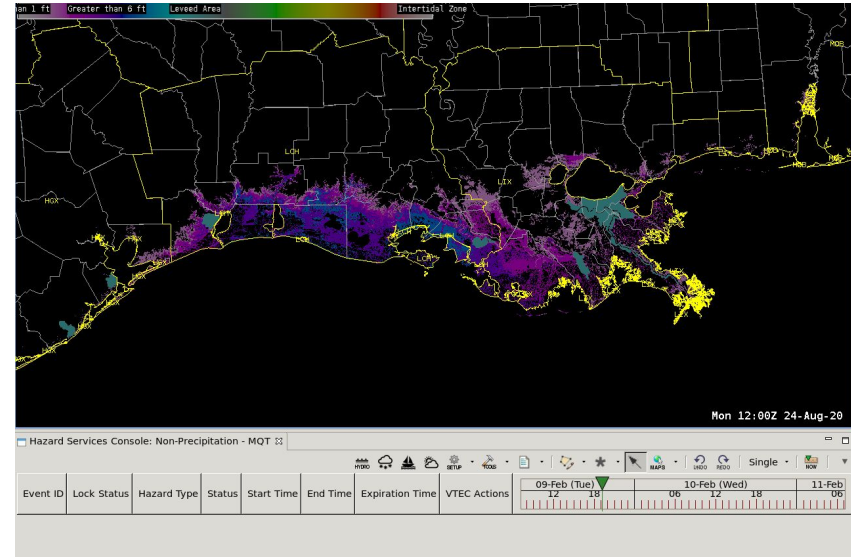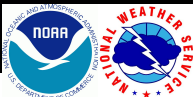
- Background/Purpose
  - Generate S-412 compliant polygons for ship navigation display (International Hydrographic Organization requirement)
  - Existing NAWIPS functionality does not meet this requirement
  - Establish common framework for NHC, OPC, and HFO
  - Modernize text formatters

- ## Current Status
  - ### Individual text and S-412 compliant GML

  - ### Updated legacy collaborative product (e.g. EPi)

  - ### Winds and Waves Recommender from NDFD and Model output

- ## Future Tasks
  - Smoothing and Simplification
  - Test, Test, Test!
  - Demo, Feedback, Iterate
  - Forecaster evaluation late summer 2021
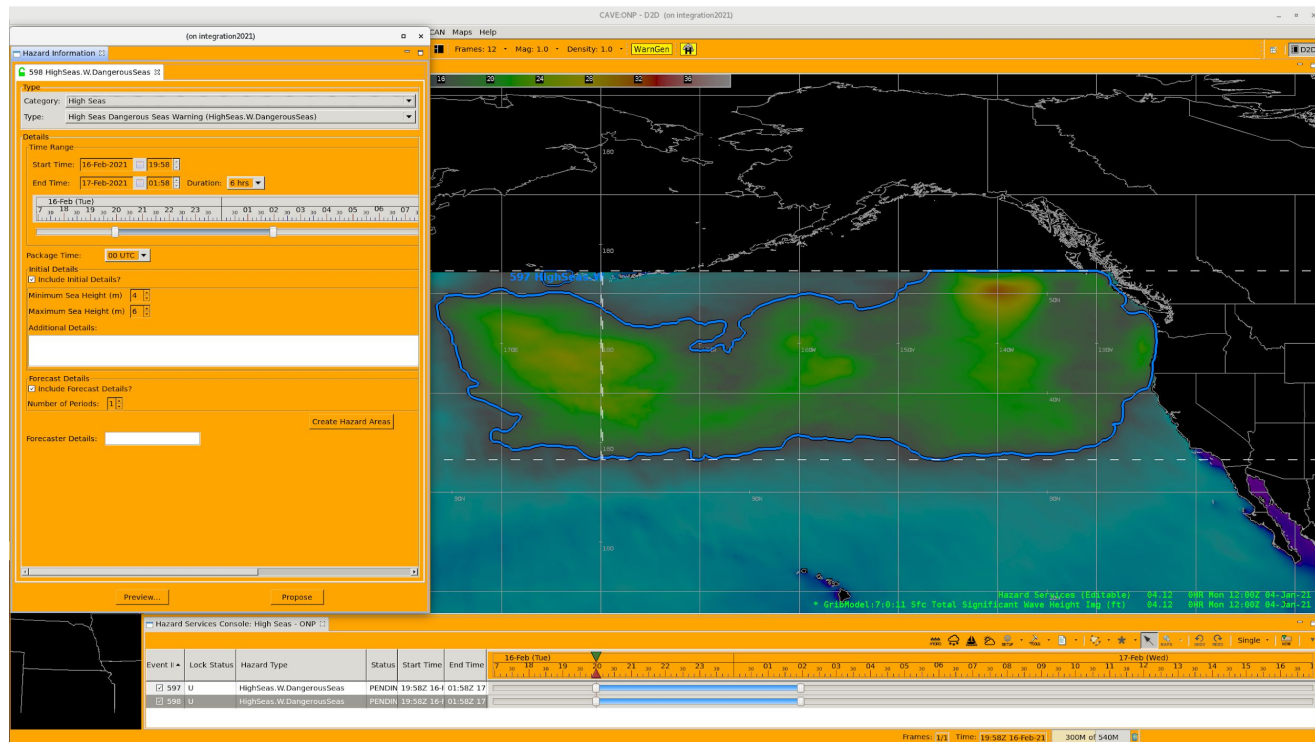
- ## Background/Purpose

  - ### Consistency between operational products

  - ### Improved resolution and flexible output formats (e.g. CAP)

  - ### Same warning software as WFOs for collaboration

Hurricane Nate: Mobile Bay

Existing Workflow (GFE)
2.5 km Resolution

New Workflow (HS)
~300 m Resolution
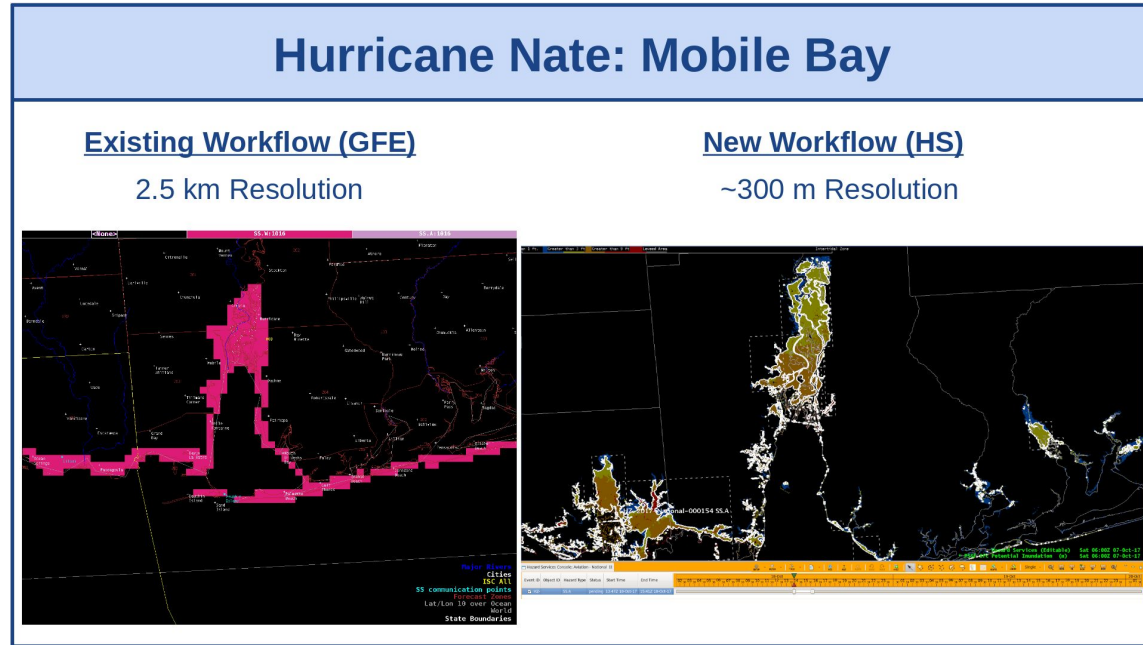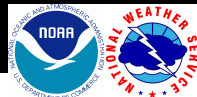
- Current Status

CAP Formatter

```xml
<?xml version="1.0" encoding="UTF-8"?><alert
xmlns="urn:oasis:names:tc:emergency:cap:1.2">
<identifier>NWS-HZ-2019-OKX-OKX-63-1-1576718142541</identifier>
<sender>w-nws.webmaster@noaa.gov</sender>
<sent>2019-12-18T20:15:00-05:00</sent>
<status>Actual</status>
<msgType>Alert</msgType>
<scope>Public</scope>
<code>IPAWSv1.0</code>
<note/>
<info>
<language>en-US</language>
<category>Met</category>
<event>STORM SURGE WARNING</event>
<responseType>Execute</responseType>
<urgency>Expected</urgency>
<severity>Extreme</severity>
<certainty>Likely</certainty>
<eventCode>
<valueName>SAME</valueName>
<value>SS</value>
</eventCode>
<eventCode>
<valueName>NationalWeatherService</valueName>
<value>SSW</value>
</eventCode>
<effective>2019-12-18T20:15:00-05:00</effective>
<onset>2019-12-18T20:15:00-05:00</onset>
<expires>2019-12-19T04:15:00-05:00</expires>
<senderName>NWS New York NY</senderName>
<headline>STORM SURGE WARNING issued December 18 at 08:15PM EST expiring December 19 at
08:00AM EST by NWS Upton</headline>
<description/>
<instruction>Life-threatening storm surge is likely within the warning area.
</instruction>
<web>http://www.weather.gov</web>
<parameter>
<valueName>VTEC</valueName>
<value>/O.NEW.KOKX.SS.W.0001.191219T0115Z-191219T1300Z/</value>
</parameter>
<parameter>
<valueName>EAS-ORG</valueName>
<value>WXR</value>
</parameter>
<parameter>
<valueName>PIL</valueName>
<value>SS</value>
</parameter>
<parameter>
<valueName>eventEndingTime</valueName>
<value>2019-12-19T08:00:00-05:00</value>
</parameter>
```

- Future Tasks

  - Refine CAP message generation
  - TCV/text formatter
  - KML output
  - Demonstrate capability of user-defined severity to inform WEA issuances
  - Idealize balance between computational time and hazard resolution

Milestone	Start Date	Stop Date	Metric
Gather requirements	1 Sept 2020	1 Jan 2021	Google document delivered to NHC and CP
Write design	1 Jan 2021	1 Apr 2021	Google document delivered to NHC and CP
Design review	1 Apr 2021	30 Apr 2021	Design approved by ARB
Deliver Design	1 May 2021	1 May 2021	Design presented to NHC.
Configure new hazard type	1 May 2021	15 May 2021	New Storm Surge Hazard Type
Product Generation for SSWW	15 May 2021	15 Jul 2021	Functional text and CAP formatted products
Develop Recommender to create first guess hazard extent	15 Jul 2021	15 Oct 2021	Successfully run recommender that uses Potential Storm Surge Flooding Map output as input for first guess field
Demonstrate initial workflow to NHC for evaluation and feedback	15 Oct 2021	30 Oct 2021	Prototype demonstration via webex
Iterative development following feedback	30 Oct 2021	1 Feb 2022	Updates to software based on evaluation by SSU forecasters
Finalize code and code check in	1 Feb 2022	1 Mar 2022	Check in code for review using VLAB Hazard Services repository
Code Review	1 Mar 2022	1 May 2022	Code review approved by ARB merged into Hazard Services integrated version
Deliver code for evaluation	1 May 2022	15 May 2022	Laptop staged with AWIPS-II docker container containing

- By design, JTTI ends at RL7
- Code in VLAB, designs approved, and code reviews merged
- Transition Plans signed by receiving office directors and presented to NWS leadership
- Office of Central Processing (OCP) would need to support official transition into AWIPS baseline

Contact, Demos, and Updates

Nate Hardin:nathan.hardin@noaa.gov
(Program Manager for National and International Centers)

Taylor Trogdon: taylor.trogdon@noaa.gov
(Project Manager for National Centers)

Daniel Nietfeld: dan.nietfeld@noaa.gov
(Branch Chief - Weather Information Systems Evolution)

Darrel Kingfield: darrel.kingfield@noaa.gov
(Program Manager for Hazard Services)