

# Hazard Services

## Phase 1

### *Augmenting NWS Hazard Operations in AWIPS II*

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# Hazard Services



## Integrated Hazard Information Services

*To Support the NWS Mission of Providing Weather and Hydrologic Warnings for the Protection of Life and Property*

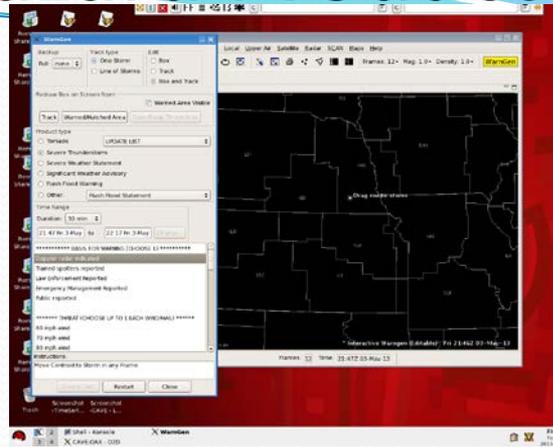
*A Cornerstone of a Weather-Ready Nation, Sustaining the Ability to Communicate Hazard Information Effectively in a Digital World*

# A Typical Day at the Forecast Office...



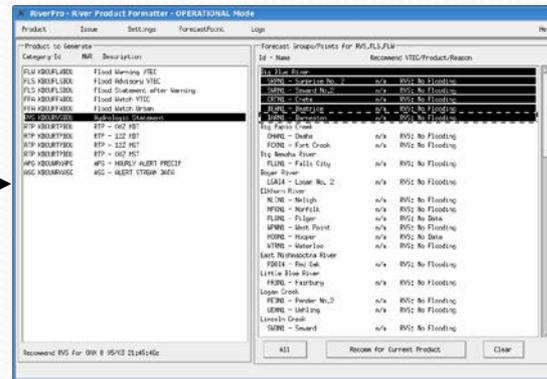
# To Issue a Hazard Product Now...

The forecaster needs to use one of three separate programs depending on the type of hazard a watch, warning or advisory is being issued for.



**WarnGen**  
(short-fused)

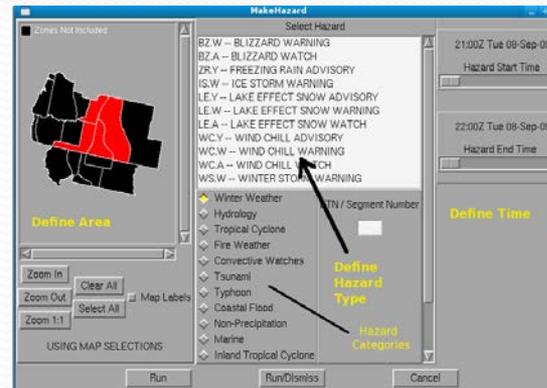
**TOR**



**RiverPro**  
(hydrologic)

**FLW**

Each program presents a different interface and workflow.



**GHG**  
(long-fused)

**WSW**

# Hazard Services Combines the Three Legacy Warning Programs into One Application

The screenshot displays the CAVE:OAX - Hydro application interface. The main window is titled "CAVE:OAX - Hydro" and includes a menu bar (CAVE, File, Tools, Projections, Overlays, MapData, LiveData, ReferenceData, Product, HydroApps, Help) and a toolbar with navigation and search icons. A "Hazards" button is highlighted in yellow.

On the left, the "Hazard Information" panel shows details for a selected hazard: "216 HW.W (HIGH WIND WARNING)". It includes fields for "Hazard Category" (Non Precip), "Hazard Type" (HW.W (HIGH WIND WARNING)), and "Time Range" (Start Time: 04:00 Tue 08-Feb-2011, End Time: 12:00 Tue 08-Feb-2011).

The central "Map" window displays a map of Florida with various hazard zones overlaid in different colors: blue (213 WS.W), purple (214 FA.A), green (216 HW.W), and pink (217 TO.W). The map also shows "River - Primary PE - latest value within last 24 hours", "Forecast Zones", and "State County Boundaries".

At the bottom, the "Hazard Services Console: Canned Flood" window contains a table of active hazards and their status over time.

Event ID	Hazard Type	State	Start Time	End Time	7-Feb 18	8-Feb 06	8-Feb 12	8-Feb 18	9-Feb 06	9-Feb 12
<input checked="" type="checkbox"/>	218 FL.W	pending	Tue 08-Feb 04:00	Tue 08-Feb 12:00						
<input checked="" type="checkbox"/>	214 FA.A	pending	Tue 08-Feb 04:00	Tue 08-Feb 12:00						
<input checked="" type="checkbox"/>	216 HW.W	pending	Tue 08-Feb 04:00	Tue 08-Feb 12:00						
<input checked="" type="checkbox"/>	217 TO.W	pending	Tue 08-Feb 04:00	Tue 08-Feb 12:00						
<input checked="" type="checkbox"/>	213 WS.W	pending	Tue 08-Feb 04:00	Tue 08-Feb 12:00						

Buttons at the bottom left include "Preview...", "Propose", and "Issue...". The status bar at the bottom right shows the current time: "Time: 04:00Z 08-Feb-11".

# From Product-Centric to Information-Centric



## “Hazard-Specific” Information

Hazard Type,  
Area, Time,  
Meta-  
Information

Legacy Text  
Product

XML Format

CAP Format

Graphics

Cell Phones /  
Social Media

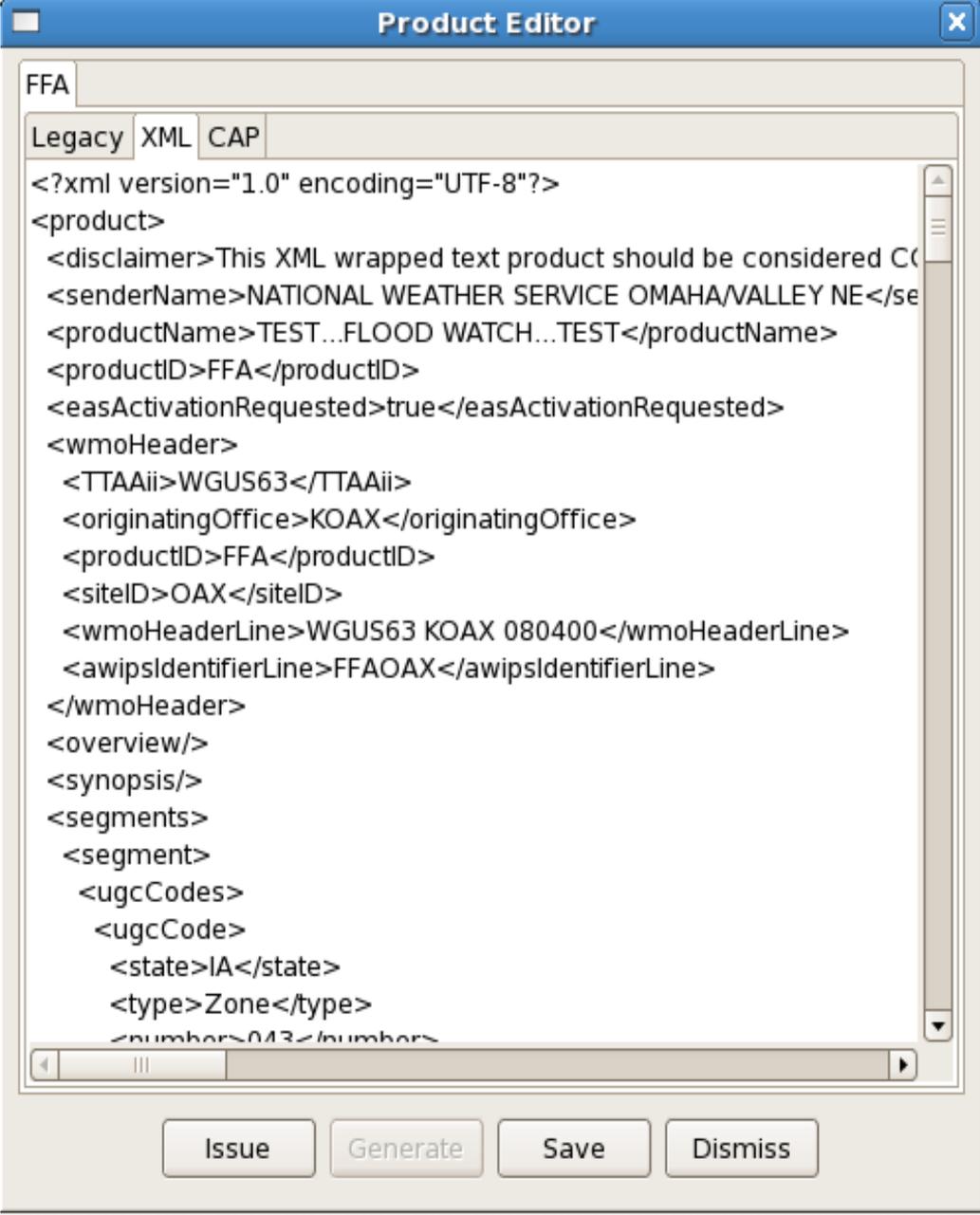
New / Local  
Products

Raw Information  
for External  
Partners



# Partner XML

- XML “reflection” of the Legacy Product
- 1 Partner XML per Legacy Text Product
- Makes ingest of the Legacy Text Product easier for partners
- Schema developed with help from NWS partners with their needs in mind
- Easily extended to include specialized XML grammars such as GML
- Simple to programmatically validate and parse



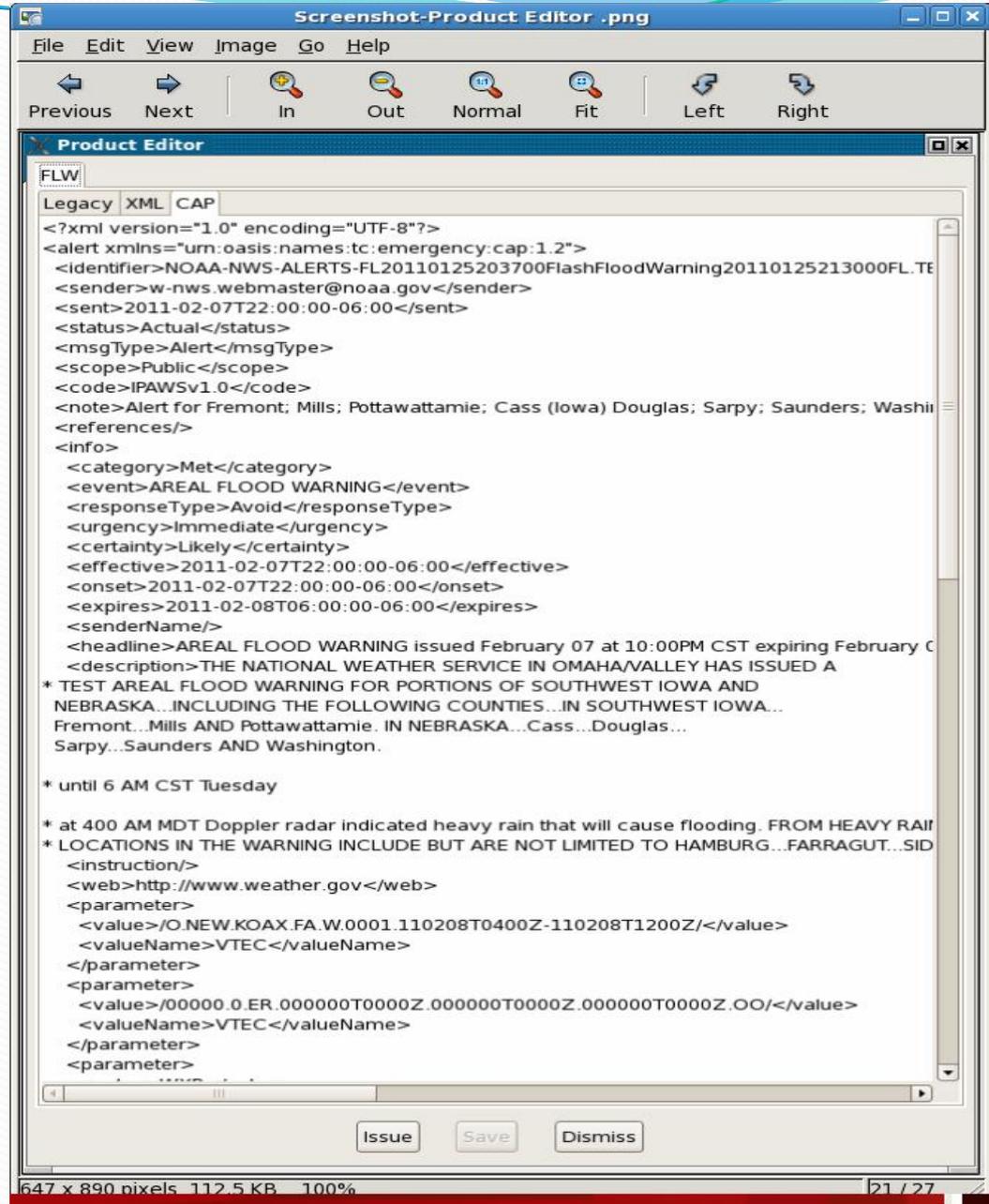
The screenshot shows a software window titled "Product Editor" with a tab labeled "FFA". The window contains an XML document with the following content:

```
<?xml version="1.0" encoding="UTF-8"?>
<product>
  <disclaimer>This XML wrapped text product should be considered C
  <senderName>NATIONAL WEATHER SERVICE OMAHA/VALLEY NE</se
  <productName>TEST...FLOOD WATCH...TEST</productName>
  <productID>FFA</productID>
  <easActivationRequested>>true</easActivationRequested>
  <wmoHeader>
    <TTAAii>WGUS63</TTAAii>
    <originatingOffice>KOAX</originatingOffice>
    <productID>FFA</productID>
    <siteID>OAX</siteID>
    <wmoHeaderLine>WGUS63 KOAX 080400</wmoHeaderLine>
    <awipsIdentifierLine>FFAOAX</awipsIdentifierLine>
  </wmoHeader>
  <overview/>
  <synopsis/>
  <segments>
    <segment>
      <ugcCodes>
        <ugcCode>
          <state>IA</state>
          <type>Zone</type>
          <number>043</number>
```

At the bottom of the window, there are four buttons: "Issue", "Generate", "Save", and "Dismiss".

# CAP

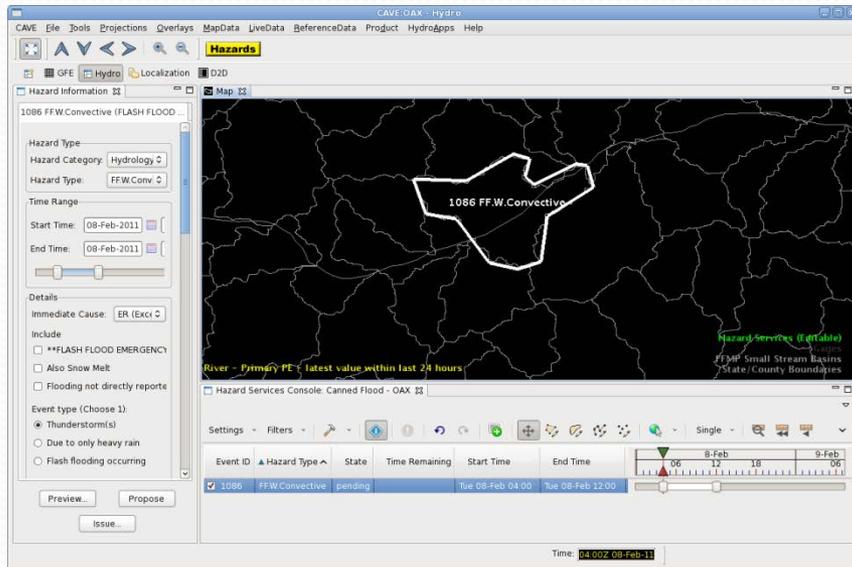
- Common Alerting Protocol
- International standard XML-based data format for exchanging public warnings and emergency messages
- Increases warning effectiveness
- Simplifies task of activating a warning
- Backward compatible with SAME and EAS
- CAP-formatted messages include non-Legacy information such as Urgency, Severity, Certainty
- Multiple CAP messages per Legacy Text Product



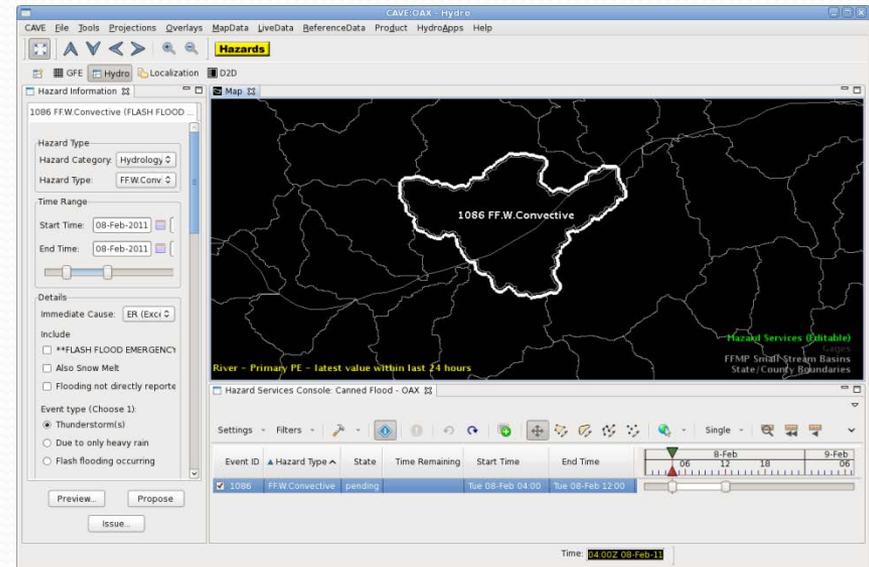
# XML/CAP Comparison

- Segmentation:
  - Partner XML includes all segments of a Legacy Product
  - CAP has only one segment per message, e.g. NEW, CON, CAN
- Polygons:
  - Partner XML includes the full hazard event polygon
  - CAP message includes the intersection of the full hazard event polygon with segment UGC areas

# Greater Hazard Detail is Possible in New Product Formats



Point-reduced polygon for inclusion in Legacy Product

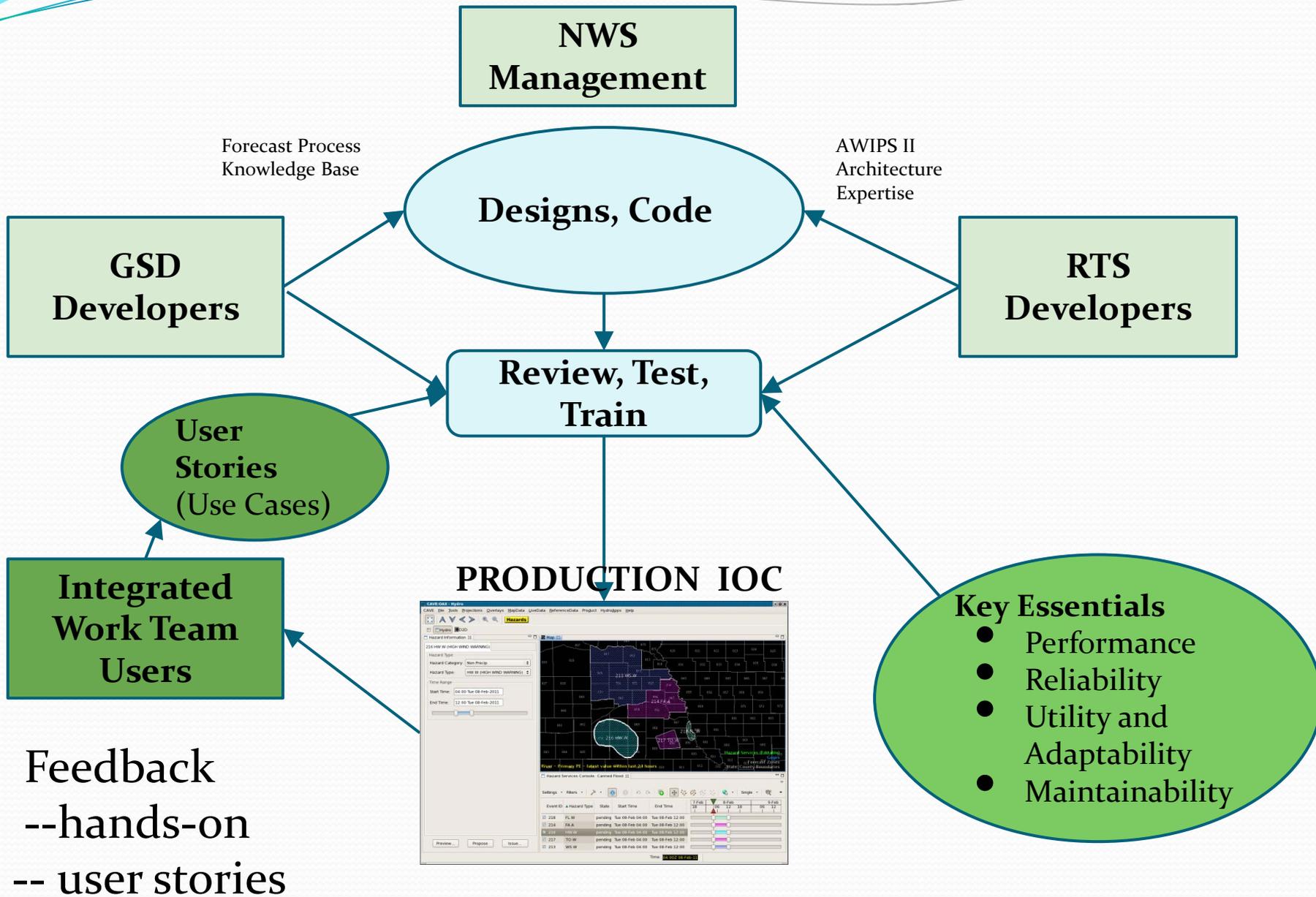


Highly detailed flash flood warning polygon, possibly included in Partner XML and other new product formats

# Sustaining the Ability to Effectively Communicate Hazard Information

- Hazard Services is designed to evolve as NWS Policy evolves
- It will:
  - support the requirements of legacy products
  - provide a framework to support the dissemination of hazard information in formats required by a rapidly changing digital world and emerging partner standards

# Integrated Production Team

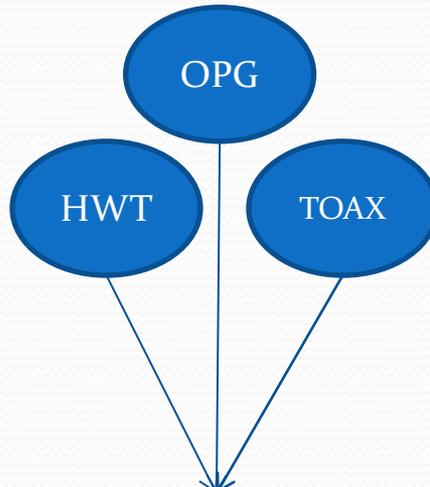


# Path to Hazard Services Phase 1 IOC

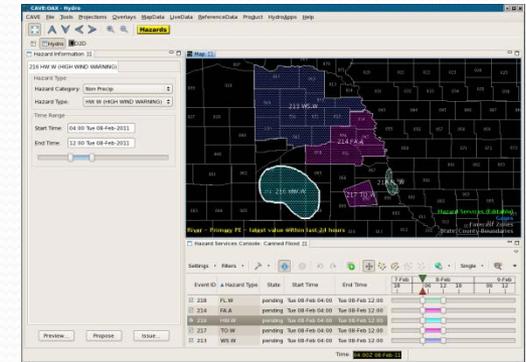


Site Visits & Evaluations

Fall 2013  
“Hazard Services Road Show”



Testing & Training  
Spring/Summer 2014



Integration into AWIPS II Baseline

Fall 2014

Phase 1 Software Development Continues Beyond IOC

# Incremental Approach to Supporting NWS Hazards



NWS Hydrologic Hazards Supported for IOC

**Supported Hazard Types:**  
FL.W, FL.A, FL.Y, FFA, FA.A,  
FF.W, FA.W, FA.Y, HY.S, HY.O  
**Supported Products:** FFA,  
FLW, FLS, FFW, FFS, ESF

Remainder of NWS  
Short-fused and  
Long-fused Hazards  
Implemented for  
Hazard Services  
Phase 1 FOC



**Focusing on Hydrology Builds a Solid Foundation for remaining Hazard Types**

# Future Work: Two-way Communication

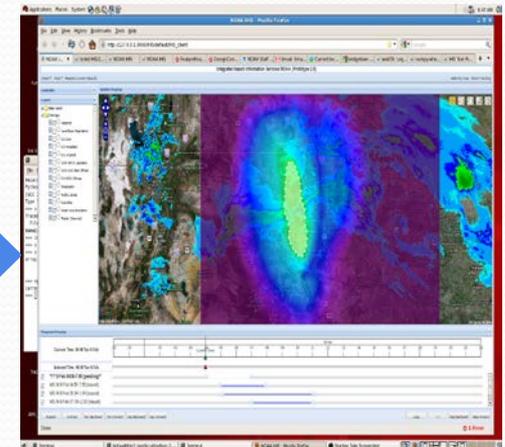
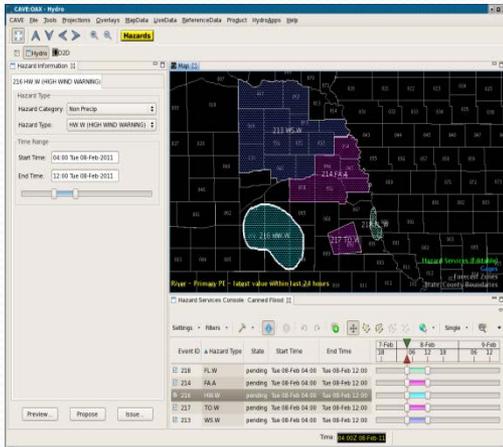
Forecasters  
*AWIPS II CAVE*

Partners:  
EMs, Broadcasters,  
Spotters, Publics  
*Web Interface*

Hazards

National  
Database

Impacts



# Check out Hazard Services!

- Stop by the NOAA Booth for a demo and a chance to try out Hazard Services
- Email [bryon.lawrence@noaa.gov](mailto:bryon.lawrence@noaa.gov) to schedule some time to discuss Hazard Services
- Read the Hazard Services overview at: [http://esrl.noaa.gov/gsd/handouts/HSP-Flyer- 8 28 12.pdf](http://esrl.noaa.gov/gsd/handouts/HSP-Flyer-8_28_12.pdf)