RITT Forum
Nov 16, 2011
Overview

• Introduction
• History of IHIS
• Demo
• Design for National Database
• Requirements
• Next Steps and Future work
Funding and Resources

- National Weather Service – OS&T (Office of Science and Technology)
- GSD DDF (Global Systems Division Discretionary Director) and Base Funds
- CWB (Central Weather Bureau) Taiwan
- COMET – University of Southern Florida
- Southern Region -- NWSWarn
Collaborations

NWS National Centers
NCEP Development Team

AWIPS II
Extended
Collaboration
Data Delivery
Thin Client
Verification

Raytheon
MDL
Meteorological Development Lab

NSSSL
National Severe Storms Lab

NWS Partners
BOU Office

NWSWarn

Central Weather Bureau
Taiwan

RENCI
SSWIM
Social Science Woven Into Meteorology

Iris / iNWS
University of Wisconsin

COMET
Social Science Partner Research

Social Science Woven into Meteorology (SSWIM)

SSWIM brought on board 2009

Preliminary Results from Current Research shared at AMS 2011

Today, provide a brief overview of the social science component and share several **practical applications for the IHIS prototype design.**
Purpose -- Integrate Hazard Tools
Phase 1

WARNGEN
(< 1 hour)

GHG
(Hours-Days)

RiverPro
(Days)

IHIS
Purpose -- Integrate Hazard Tools Phase 2

WARNGEN  
(< 1 hour)

GHG  
(Hours-Days)

RiverPro  
(Days)

IHIS

NMAP  
(National)
Purpose -- Two-way Communication Phase 3

AWIPS II CAVE -- Forecasters

Web -- Partners: EM's, Broadcasters, Spotters, Publics

Hazards

Impacts
Purpose -- Two-way Communication Phase 3

AWIPS II CAVE -- Forecasters

Web -- Partners: EM's, Broadcasters, Spotters, Publics

National “Cloud”
Iterative Feedback Process
“Build a little / Test a little”

Prototype

Demo Sessions

Feedback
Incorporated into next iteration

User
IHIS Project Portal:
integratedhazards.noaa.gov

**EXPERIMENTAL PROTOTYPES (Best viewed in Firefox) - NOT OPERATIONAL!**

- Comprehensive services for --
  - Issuing timely and accurate hazard information
  - Enabling two-way communication among all decision-makers

- Integrates National Weather Service (NWS) hazard tools
  - One common interface and process
  - Preserves efficiency of existing applications
  - Minimizes training

- Fosters collaboration among all stakeholders
  - All decision makers seeing the same picture
  - Emergency managers and other partners can provide ground truth (flooding, storm observations, impacts)
History

- **2004 OSIP Project / Next Generation Warning Tool team**
  - Telecons for Concept and Requirements discussions

- **2008 Workshop Norman OK, 130 attendees**
  [http://www.weather.gov/warningworkshop](http://www.weather.gov/warningworkshop)
  - 50% forecasters / program managers
  - 50% partners / FEMA / EM / Accuweather

- **2009 Integrated Hazard Information Services Workshop**
  hosted by GSD, 70 attendees
  [http://fxa.noaa.gov/NGWT/NGWT_Workshop.html](http://fxa.noaa.gov/NGWT/NGWT_Workshop.html)
  - Forecasters / partners / developers / social scientists
  - 35-page report and set of requirements
  - Initial User Interface designed for prototyping
  - Listserver established
History

• **2010 Prototyping**
  – Web-based short-fused TOR
  – Allowed for quick and broad forecaster feedback to refine requirements and user interface
  – Looking ahead to two-way communication
  – Developed capabilities and algorithms for AWIPS II CAVE
2011 Prototyping – Jan - Sept

- AWIPS II CAVE Long and Short-fused
- Utilization of PGEN drawing tools
- GIS data – hospitals, Iris spotter reports, Census
- Design and some development for “Live Data” and storage in Iris database
- Preliminary Hydro requirements
- Web-based prototype (prior to May)
- IWT Workshop – Hydro/Partners – (June, Fargo, ND)
Demo
**Hazard Type**

**Hazard Category:** Hydrology

**Hazard Type:** FA W (AREAL FLOOD WARNING)

**Time Range**

**Start Time:** 19:15 Mon 07-Feb-2011

**End Time:** 06:00 Sun 13-Feb-2011

**Area Details**

Include:
- Small streams
- Urban areas and small streams

If either “include small streams” or “include urban areas and small streams” above was selected, “floodgate opening” in primary cause below should not be selected. If “floodgate opening” is the desired option, do not select “include small streams” or “include urban areas and small streams”.

**Primary Cause other than rain:**
- Snow melt
- Rain and Snow Melt
- Dam break
- Flood gate opening
- Ice Jam
- Ice Jam/Rain/Snow melt
- Glacial Lake Outburst
- Multiple Causes
- Unknown Cause

**Calls to Action (1 or more):**
- No call to action
- Automated list of drainages
- Additional rainfall expected
- Turn around...don't drown
- Urban flooding

[Map and temporal display interface]

[Buttons: Preview, Propose, Issue, Dismiss, Step Forward, Step Backward]
BULLETIN - EAS ACTIVATION REQUESTED
FLOOD WARNING
NATIONAL WEATHER SERVICE DENVER CO
451 PM GMT TUE NOV 15 2011

THE NATIONAL WEATHER SERVICE IN DENVER HAS ISSUED A FLOOD WARNING FOR

MILLS-WOODBURY-MONONA-HARRISON-POTAWATTAMIE-
DOUGLAS-WASHINGTON-SARPY-CASS-SAUNDERS-BURT-THURSTON-
DAKOTA.

* UNTIL 600 AM GMT SUN FEB 13 2011

PRECAUTIONARY/PREPAREDNESS ACTIONS...

FLOODING IS OCCURRING OR IS IMMINENT. IT IS IMPORTANT TO KNOW WHERE YOU ARE RELATIVE TO STREAMS..RIVERS..OR CREEKS WHICH CAN BECOME KILLERS IN HEAVY RAINS. CAMPERS AND HIKERS SHOULD AVOID STREAMS OR CREEKS.

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BULLETIN - EAS ACTIVATION REQUESTED
FLOOD WARNING
NATIONAL WEATHER SERVICE DENVER CO
451 PM GMT TUE NOV 15 2011

THE NATIONAL WEATHER SERVICE IN DENVER HAS ISSUED A FLOOD WARNING FOR BLAIR

* FROM 7:15 PM MONDAY TO 6:00 PM TUESDAY

* AT 4:51 PM GMT TUESDAY THE STAGE WAS AT 30.76 FEET.

* MODERATE FLOODING IS OCCURRING AND MODERATE FLOODING IS FORECAST.

* FLOOD STAGE IS 29.0 FEET.

FORECAST...BLAIR WILL RISE ABOVE FLOOD STAGE 7:15 PM MONDAY AND CREST NEAR 31.94 FEET 2:46 AM TUESDAY. BLAIR WILL FALL BELOW FLOOD STAGE BY 6:00 PM TUESDAY. MODERATE FLOODING IS FORECAST.

PEOPLE IN FLOOD PRONE AREAS SHOULD ACT NOW TO EVACUATE AND MOVE TO HIGHER GROUND. DO NOT ENTER ALREADY FLOODED AREAS OR ATTEMPT TO CROSS ROADWAYS COVERED BY HIGH WATER. STAY TUNED FOR FURTHER INFORMATION BY LISTENING TO WEATHER RADIO OR LOCAL MEDIA SOURCES.

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Design for National Database
Integrated Hazard Information Services

- Moving from **Product-Centric to Information-Centric Hazard** Information

- Hazard information gathered across perspectives in diverse ways and then converted to and stored in a common format

- If hazard information is stored only in local EDEX, still need to ingest text products and merge hazard information from neighboring sites
IHIS Hazard Creation: Grids, Polygons, Points, Paths (Drawn or Calculated) -> SBN

SBN

VTECDecoder (VTECTableUtil)

Local Site EDEX

Local Hazard Database

HazardDict Database

Proposed VTEC Database

Issued VTEC Database

WAN

request

reply

Local Hazard Database

Neighboring AWIPS Site

Product Generation

SBN
IHIS Hazard Creation: Grids, Polygons, Points, Paths (Drawn or Calculated) -> National Distributed Database
- HazardDict Database
- Proposed VTEC Database
- Issued VTEC Database

Product Generation -> SBN
Comments

- National Distributed Database would eliminate need for Ingesting and Merging from neighboring sites
- Legacy products can still be generated, but the system is no longer product-centric.
- The “information” is the hazard and can be generated in multiple forms – text, graphics, cell phones, radio, etc.
- Even longer-term solution would alter VTEC from being product-centric to being information-centric
- Many challenges with Performance and Security that need to be explored.
Requirements Analysis
Where are we now?
Requirements Analysis

• Overview and rough estimates:
  – Many features have been identified and are described
    • on the Wiki “Design Concepts” page
  – Prototyping has
    • “Touched on” ~60% of requirements
    • Provided a good launching point for gathering functional requirements and IOC design
    • Yet only covers ~20% of the functionality
  – Some additional features would benefit from prototyping...
Next Steps and Future Work
Current Work - 2011

- 2011 Prototyping
  - Hydro Prototype Pathway
  - “Live Data” VTEC processing and local storage

- IHIS Workshop – Sept 27-29
  - Focused on Phase 1 – AWIPS II Forecaster Tools
  - Engaged User community in gathering requirements and define user interfaces
  - Focused on Hydro plus advancements in Short-fused, Long-fused
  - Defining Initial Operating Capabilities
Future Work Ideas

-- Consulting with RTS on production development
-- Prototyping and requirements refining

• Phase 1
  – **Framework** for Recommenders and Text Products
  – **Short-fused** NWSWarn and NSSL PHI improved warning area definition
  – **Long-fused** Interaction with GFE grids, Hurricane Warning
  – **Iris Database** – working with Iris team on storage formats, security, authentication
  – **Common data access** for forecasters – GIS info, maps, data, models, grids

• Phase 2 – National Center requirements
Project Time Line

- RTS Production Coding in Collaboration with GSD
  - Scheduled to begin Jan 2012, but may slip if OAX not transitioned by then.
- GSD prototyping / requirements-gathering in 2012
  - Selected Phase 1 capabilities
  - Begin Phase 2?
- Phase 1 Target Completion: July 2013.
  - There may be incremental releases for evaluation before that time.
Forecaster of the Future
IHIS across perspectives
First step toward integrating AWIPS Applications

• Common Data Access
• Common Tools – iTools, Recommenders, Text Products
• Collaboration
  • Real-time
  • Data Sharing
• National Data “Cloud”
Wiki Tour

- **Common Interface / IhisProject:**
  https://collaborate.nws.noaa.gov/trac/ci/wiki/IhisProject

- **Requirements and Design Concepts**
  - Summary of operational requirements from OSIP document
  - Technical and Functional requirements corresponding to operational requirements
    - Being continually refined through prototyping
  - Architecture and Design Options
  - Hydro Requirements
Wiki Tour

- **Feature Requests**
  - Instructions on joining the listserver
  - Notes from forecaster feedback sessions and resulting tasks completed

- **Task Tracking**

- **Developer's Page**
  - Software set-up and maintenance notes
PGEN Drawing Tools in IHIS
What is PGEN?

- AWIPS II NCEP Product Generator CAVE Plug-in
- Integrates NAWIPS drawing capabilities into CAVE.
- Supports NCEP drawing requirements for outlooks, surface analysis, and general annotation
- Provides a rich palette of drawing tools
- Plug-in being refactored for extensibility and reusability
Abstract

Container

AttrDlg

Product

PGEN Classes Used By Both PGEN and IHIS

Abstract Element Container

Display Element Factory

Layer

DECollection

Drawable Element

Drawable Element Factory

OpenGL