

# **INTER-REGIONAL INTEGRATED SERVICES (IRIS)**

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# Outline

- Intro to IRIS
- The stovepipe syndrome
- Motivation – build compatibility for DSS solutions
- IRIS technologies
- Short-term goals and functionality
- Long-term goals
- The Future of DSS
- What is needed

# The Stovepipe Syndrome

- Databases are typically designed/developed for a particular application
  - Data sharing is limited
  - Each application requires its own new data source and product decoders
  - Duplication of effort
- Examples
  - Separate databases for NWSChat, Web, and StormData -> they all require a database of NWS products

# Why Now?

- Contact management
  - Display contacts on a map
- Situational Awareness during weather events
  - WWA
  - Which are in effect
  - When do they expire
  - Coverage
  - Types of warnings
- Storm Reports
  - Where are they
  - Amount and type
  - Where do we need to call
- Communications
  - Have we contacted needed parties
  - Looking up people who maybe in the path, or have been impacted already



# Building Compatibility – Building DSS Solutions

## IRIS Project:

- Break out of stovepipe syndrome
- Central collection and distribution point for many types of information (contacts, outreach, weather events and products, verification, and geospatial information)
- Replaces a multitude of programs, databases, and data formats with a single structure and location where this information is stored
- Easily facilitates sharing of information between offices, programs, regional and national headquarters (Provides the other side of the equation to support back-up operations/DSS)
- Functionality will improve situational awareness of forecasters and management by including enhanced mapping capabilities to increase the accuracy of event reports, preliminary verification, simple product generation in multiple formats, and a greatly increased customer service interface from which forecasters can easily determine if forecast weather will have an impact on particular NWS stakeholders.

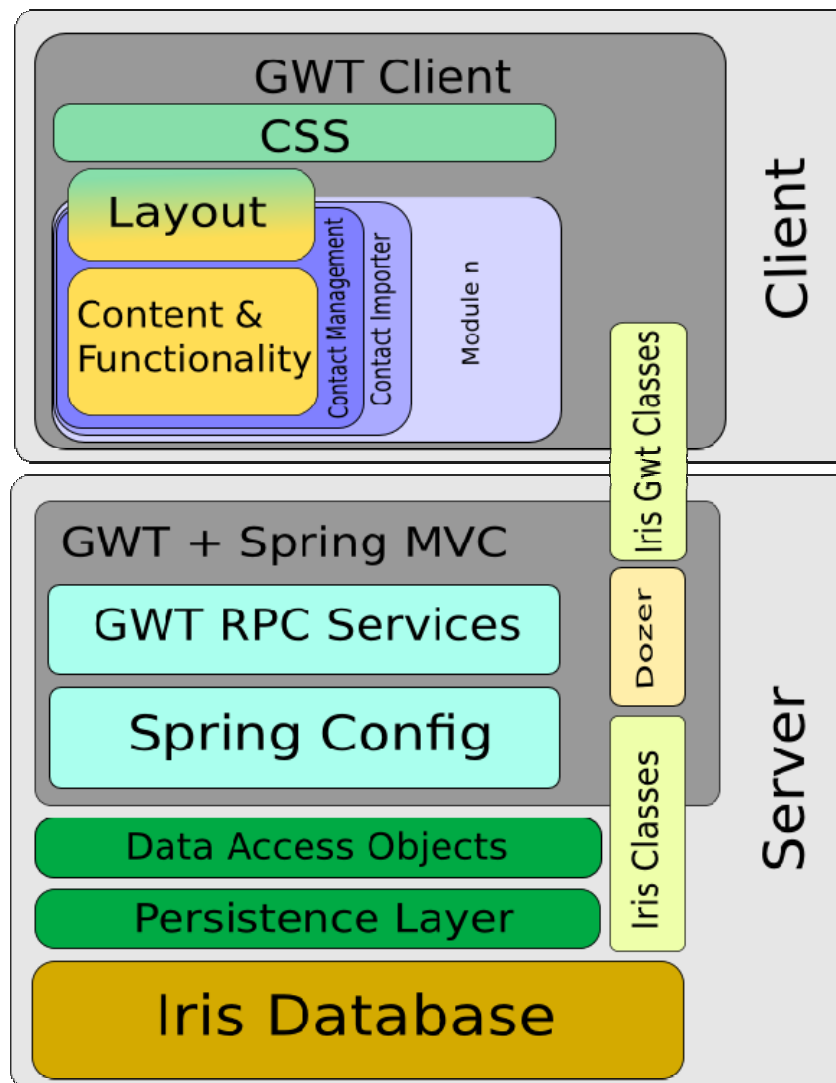
## From NOAA/NextGen Project:

*“Achieving the NextGen weather vision will require increased compatibility among NOAA systems (e.g., through common data standards and formats), the enterprise infrastructure to link the systems to one another, and intensified cooperation among the NOAA system owners.”*

# What is IRIS Today?

- Database designed to manage many types of NWS data:
  - customer contact information, criteria and thresholds, spotter information, communication logs, equipment status, office events and meetings, weather events and storm reports, NWS products, and verification
- Framework
  - Java object model – represents NWS data in object oriented code
  - Data access classes to write/retrieve objects to/from the database
- Initial IRIS framework applications
  - Product decoder to break down and store NWS products
    - Products broken down and stored in their atomic parts
  - Web application front-end (being developed)

# IRIS Components





# IRIS Back-end

## Java EE & Postgis

- Java Enterprise Edition (J2EE) - Supports development of applications for enterprise-wide sharing of information
  - Uses existing open source frameworks
    - Spring Framework
    - Hibernate
    - Tomcat web server
    - Java Messaging Service (JMS)
- PostgreSQL + Postgis
  - Relational database with a spatial data extension
  - Spatial data stored along with attribute data whenever possible
  - Provides traditional SQL data querying plus powerful GIS analysis
  - Provides a standard data source for many GIS clients (ArcGIS, Udig, GeoServer, etc.)
- **These are the similar technologies that are being implemented in AWIPS 2**



# IRIS Front-end

- Client applications can be web-based or desktop
- Team's initial client is web-based (internal) – IRIS Web
  - Google Web Toolkit
    - Builds highly interactive and responsive (desktop-like) AJAX web applications
    - Allows web developers to create and maintain complex JavaScript front-end applications in Java
      - Use your favorite development software (NetBeans, Eclipse, etc.)
      - Java debugging and profiling
      - Resultant JavaScript runs well in popular browsers

# IRIS Web Functionality

- Web based GIS, all data is geo-referenced
  - Contact management
    - Add, edit, display
  - Weather concerns
    - Define weather impacts/thresholds for geographic areas
      - Integrates societal impacts into the warning process
  - Existing WWA product integration
    - Storage and display
  - Storm reports
    - Log reports from contacts
    - Relate reports to WWA products
    - Product generation (LSR,PNS, SPS)
    - Storm surveys (geo-referenced damage points, photos/videos, meta-data)
    - Store/relate weather information from social networking (information networking)
  - Situational awareness display
    - Queryable mashup of all data using a map display (live and archived)

# Long-Term Goals – Full NWS Use of IRIS

- Be the standard database framework for all NWS weather operations (consolidate systems/databases)
  - How many database systems could this replace (national, regional, local)?
  - How much money could be saved (hardware, software, administration)?
  - Increased security posture
- Internet services
  - Allow customers to query data, manage individual thresholds, and mashup through Web 2.0 technologies
- Provide well documented framework for additional NWS application development



# Already on the Road

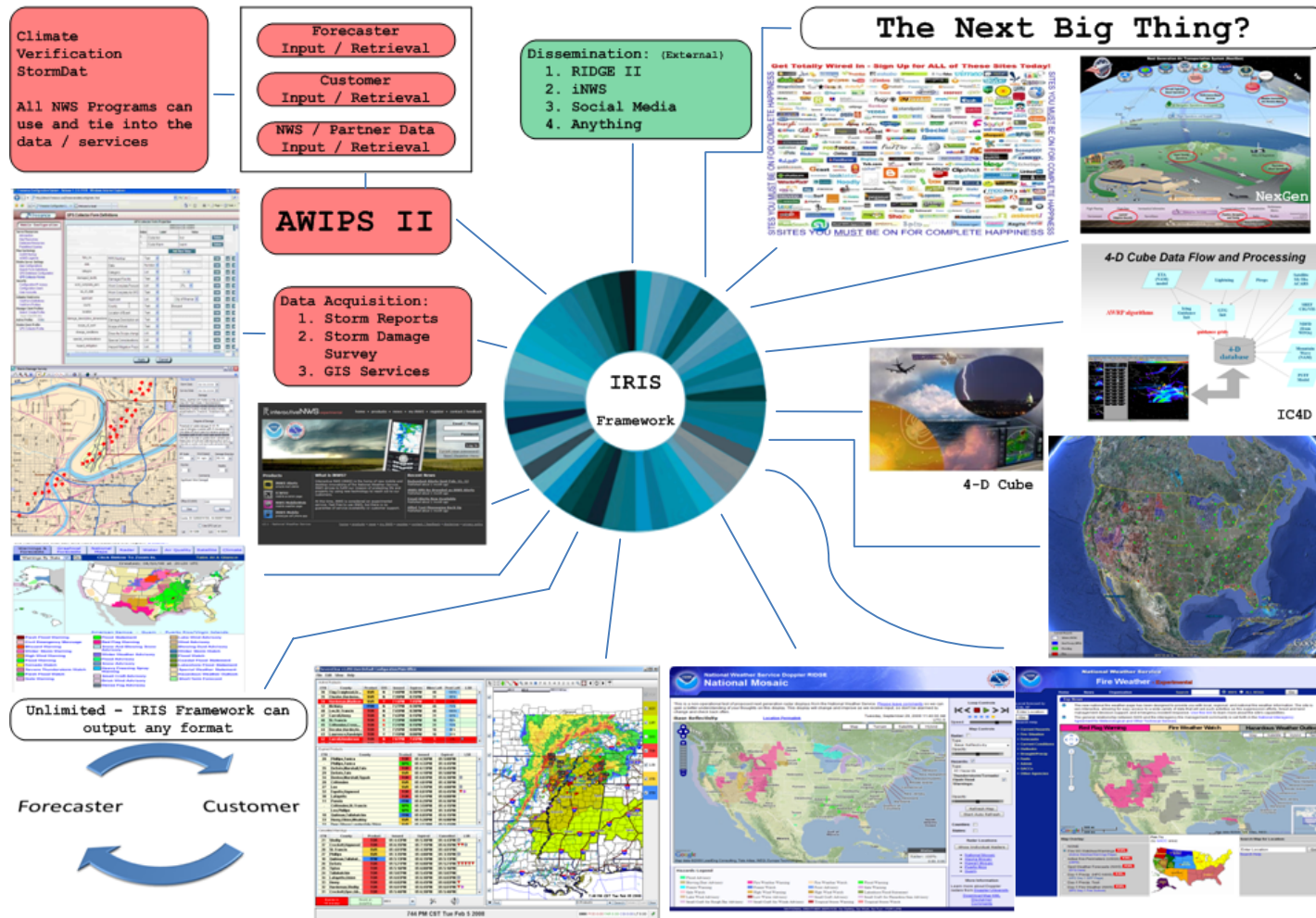
## Current Apps using IRIS Framework

- RIDGE2
- National Fire Page (warning layer)
- CR KML Google Earth display
- iNWS
- SevereClear
- NWSChat – integrating soon

**Projects have migrated to IRIS framework because they want to build compatibility**

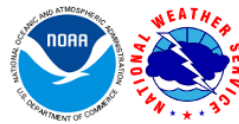
# Long-Term Goals – NWS Use of IRIS

Be the standard database framework for all NWS weather operations (consolidate systems/databases)



“Achieving the NextGen weather vision will require increased compatibility among NOAA systems (e.g., through common data standards and formats), the enterprise infrastructure to link the systems to one another, and intensified cooperation among the NOAA system owners.”

**Build compatibility**



# IRIS Web

## The Future of DSS

- Current Warning support scenario:
  - Forecaster determines snowfall amounts, meteorological situation, areas affected
  - Based on NWS warning criteria, creates TEXT WARNING PRODUCT – ONE PRODUCT FOR ALL USERS, REGARDLESS OF NEED...ALL CAPS
  - Zone/County based – warns entire zone, regardless of threat
  - Specific user needs not addressed (or even known for the most part)
  - User searches through TEXT PRODUCT TO DETERMINE IF THREAT EXISTS FOR HIS/HER AREA
    - If local needs are for lesser amounts, too bad



# IRIS Web

## The Future of DSS

- IRIS Web DSS scenario:
  - Forecaster determines snowfall amounts, meteorological situation, areas affected
  - Using IRIS web, queries database to see which primary customers are affected by certain snowfall amounts
    - This info gathered through customer meetings/forums/user groups
    - We learn what weather info helps them meet their mission
  - IRIS web prepares short text/graphic message for each affected group
    - Info is tailored to their needs (one might be interested in 3" of snow for their area, another for 5", etc)
  - Info is disseminated through traditional and emerging systems
    - Web displays main hazard, only for affected area
    - Mobile devices alerted with text, graphic link, radar, forecast grid and threat area
  - User determines what they are alerted for
  - NWS moves from "one warning for all" to true Decision Support

# IRIS Framework

## NWS Today and Tomorrow

### Today

- Rigid locally defined criteria
- Zone based
- TEXT...IN ALL CAPS, full product
- Have to search out info
- Forecaster has limited knowledge of user concerns/impacts

### Tomorrow

- User defined impacts
- User defined areas/location
- Graphical, filtered user defined information
- User defined alerts delivered to them (text, email, Web 2.0 service)
- Forecaster can query user defined concerns/impacts – monitor trends (keep the pulse)



# What is Needed

- HQ shared vision and leadership for the IRIS Framework
- Support for key tangible prototype projects (development/deployment)
  - Societal Impacts/DSS integrated tools – IRIS Web
  - User-based dissemination - Web 2.0/mobile apps
- Ensure integration into Next Generation Forecast Systems (4-D Cube, AWIPS2)

**Build compatibility**



- Today's IRIS Core Programmers
  - Aaron Sutula (WR)
  - Paul Flatt (WR)
  - Jason Burks (SR)
  - Greg Machala (SR)
  - Paul Kirkwood (SR)
  - Eric Lenning (CR)
  - Brian Walawender (CR)



**QUESTIONS?**