NOAA Global Systems Laboratory

User-Driven Decision Support

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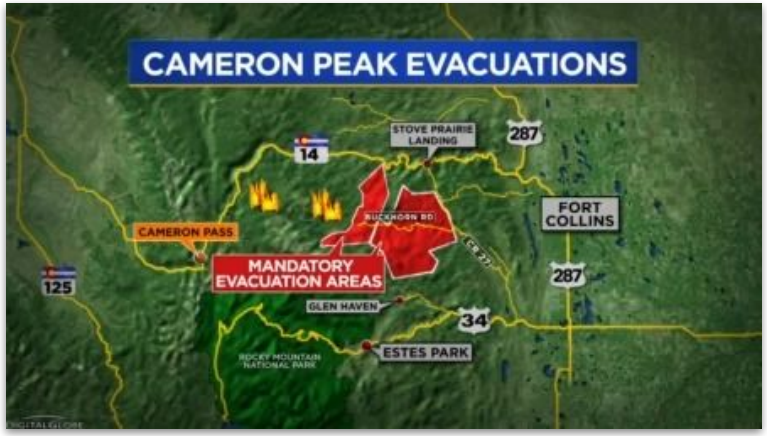
Decision Support

What does Decision Support Look Like?

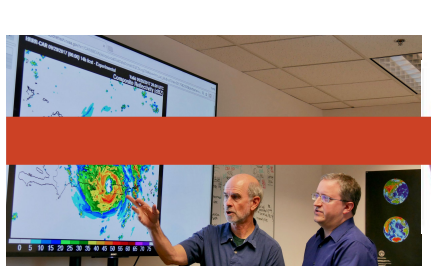


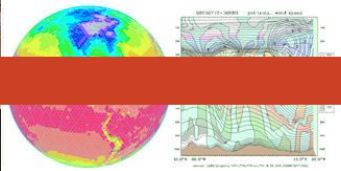
Meaningful Forecast Information

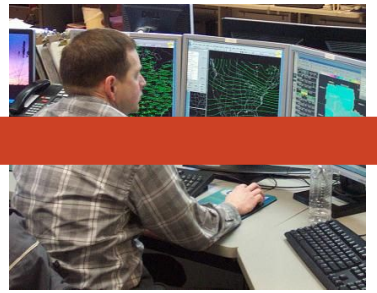
Model development producing forecast output

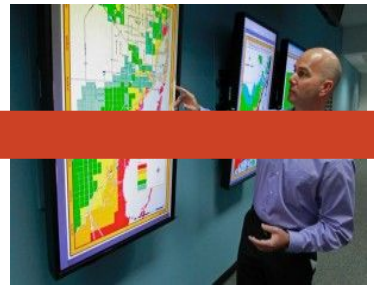
Operational Forecasters using and communicating the forecast model output

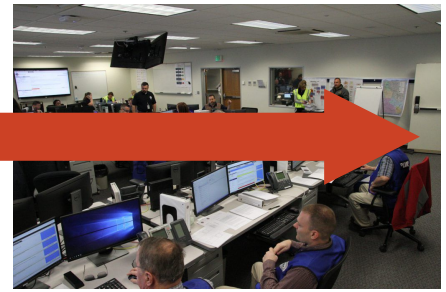
Core Partners making decisions based on the weather information provided





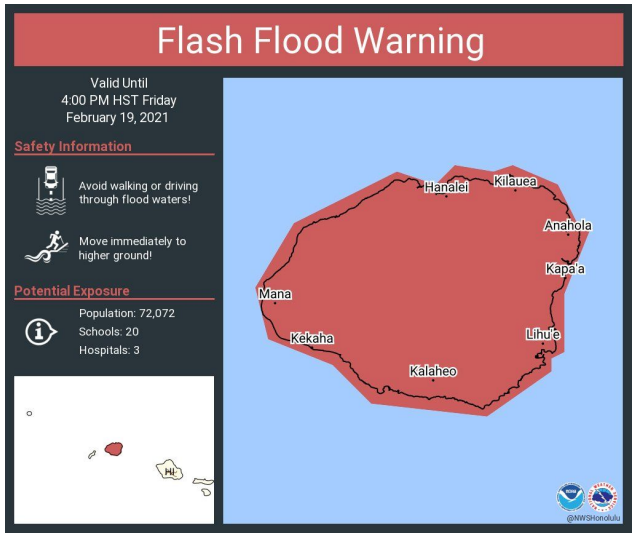


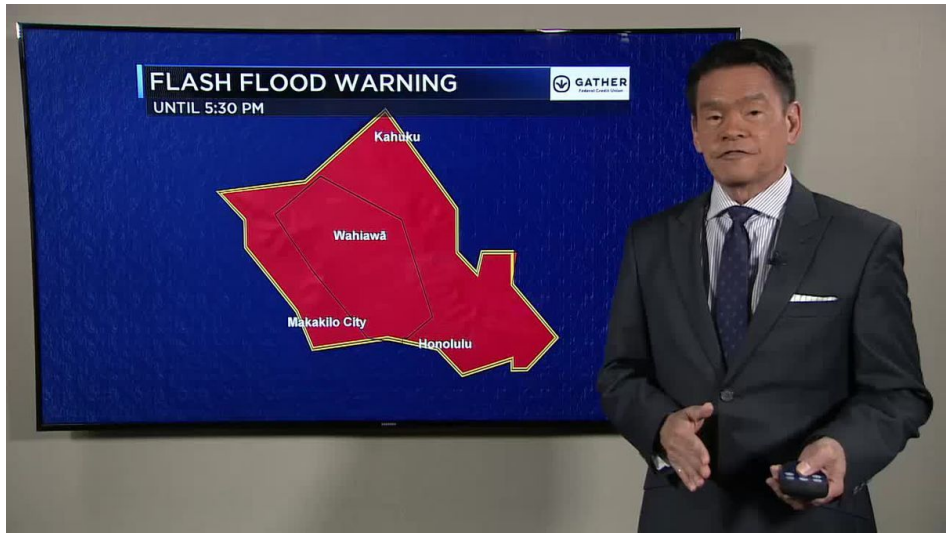




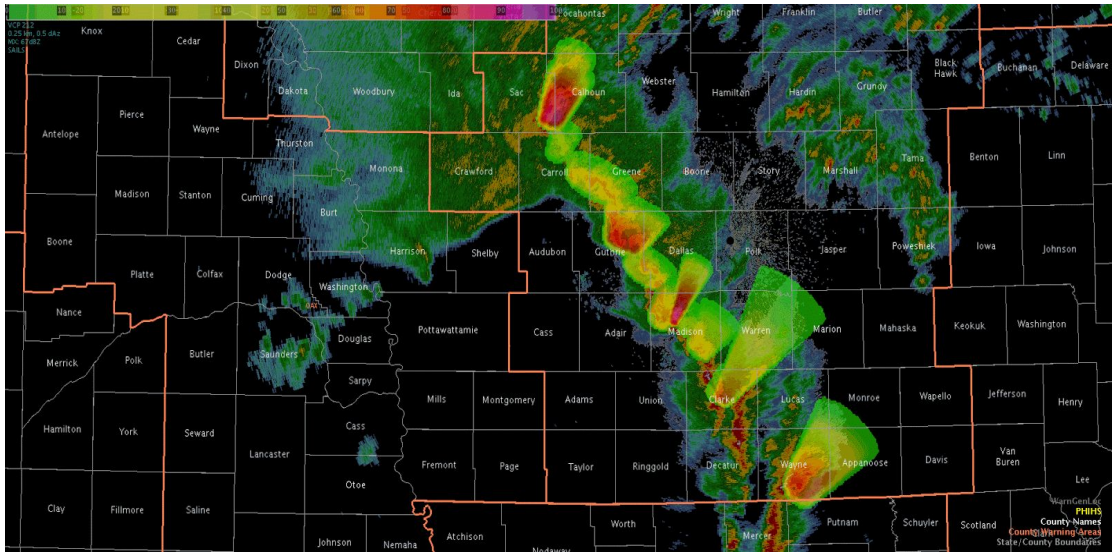
GSL Grand Scientific Challenge: *"Providing actionable environmental information through the delivery of global to storm-scale predictions and innovative decision support capabilities to serve society"*

Modernizing Warnings and Watches



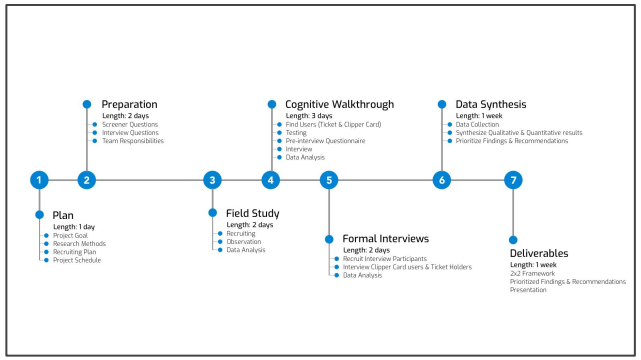


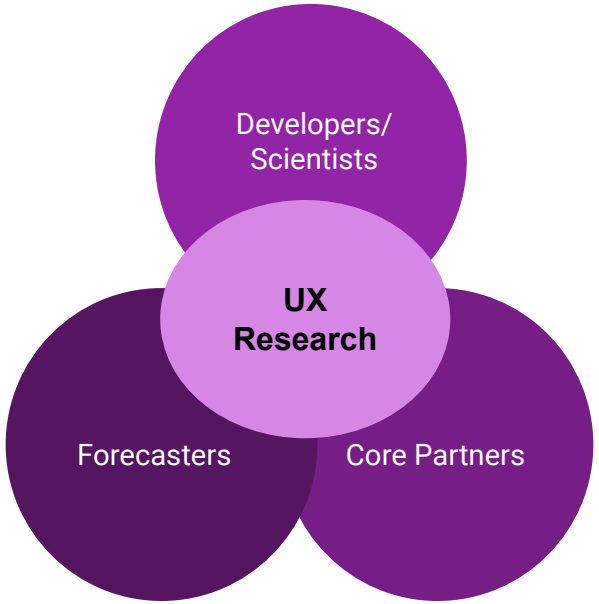
Hazard Services



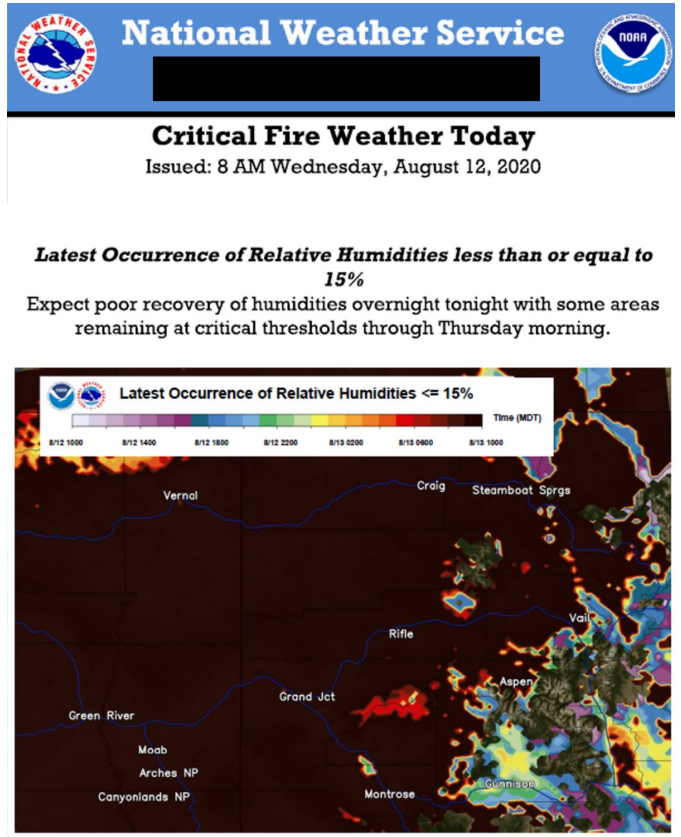
User Experience (UX) Research

Understanding information needs to influence designs





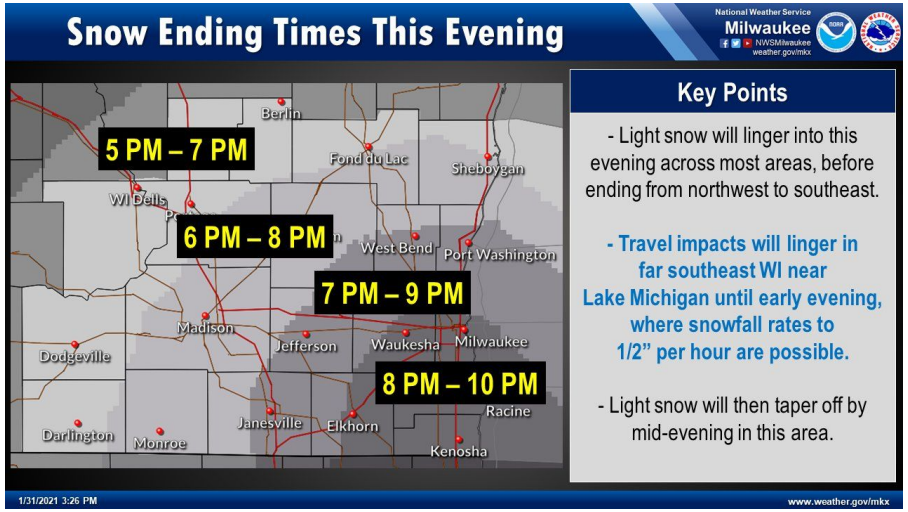
Social Science Research

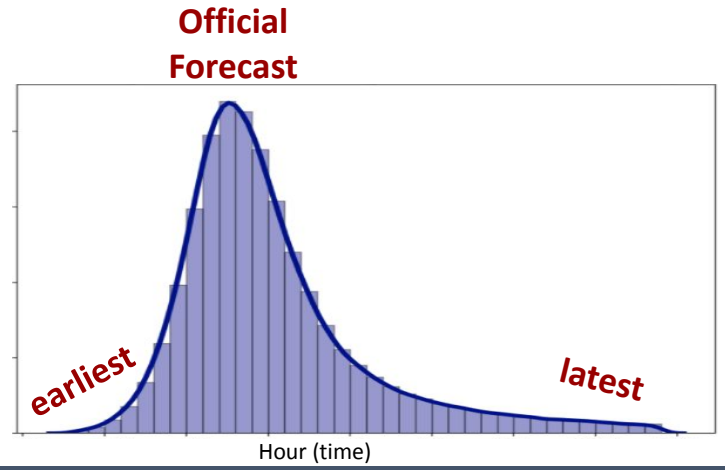


Actual NWS Fire Weather Briefing Graphic derived from timing uncertainty research

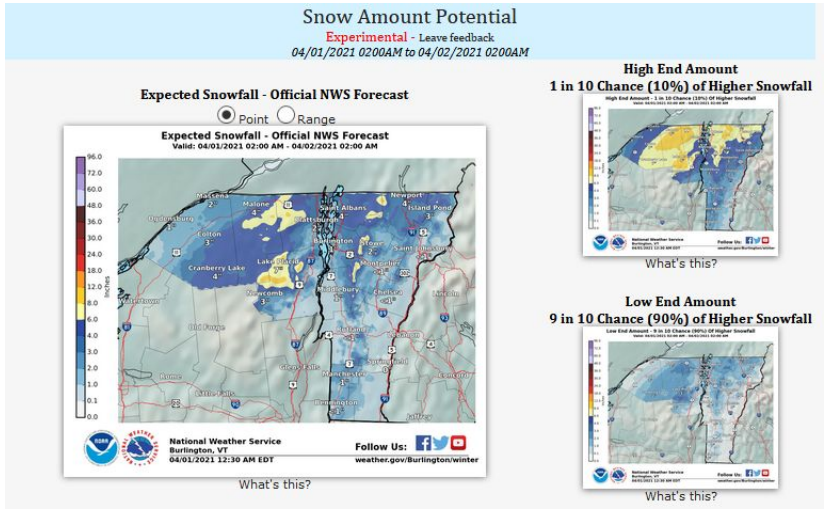
Uncertainty and Ranges of Possibilities

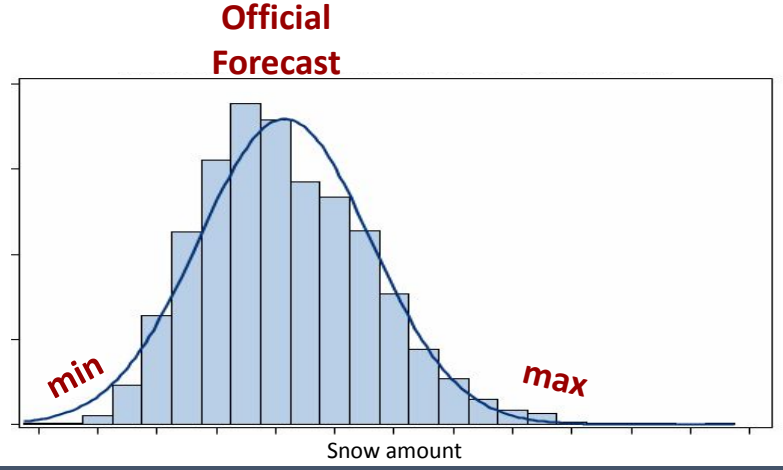
Timing Uncertainty



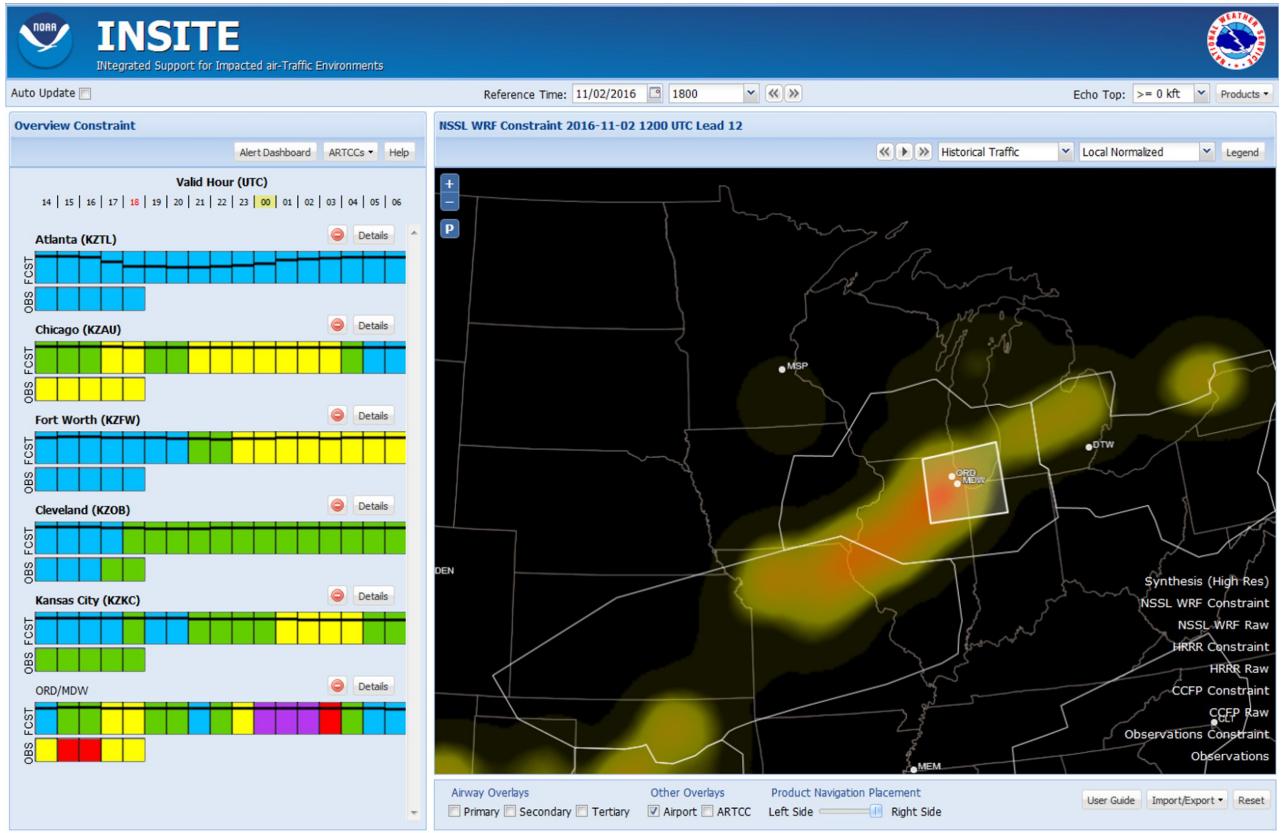


Magnitude Uncertainty





“How Confident Are You That This Will Happen?”

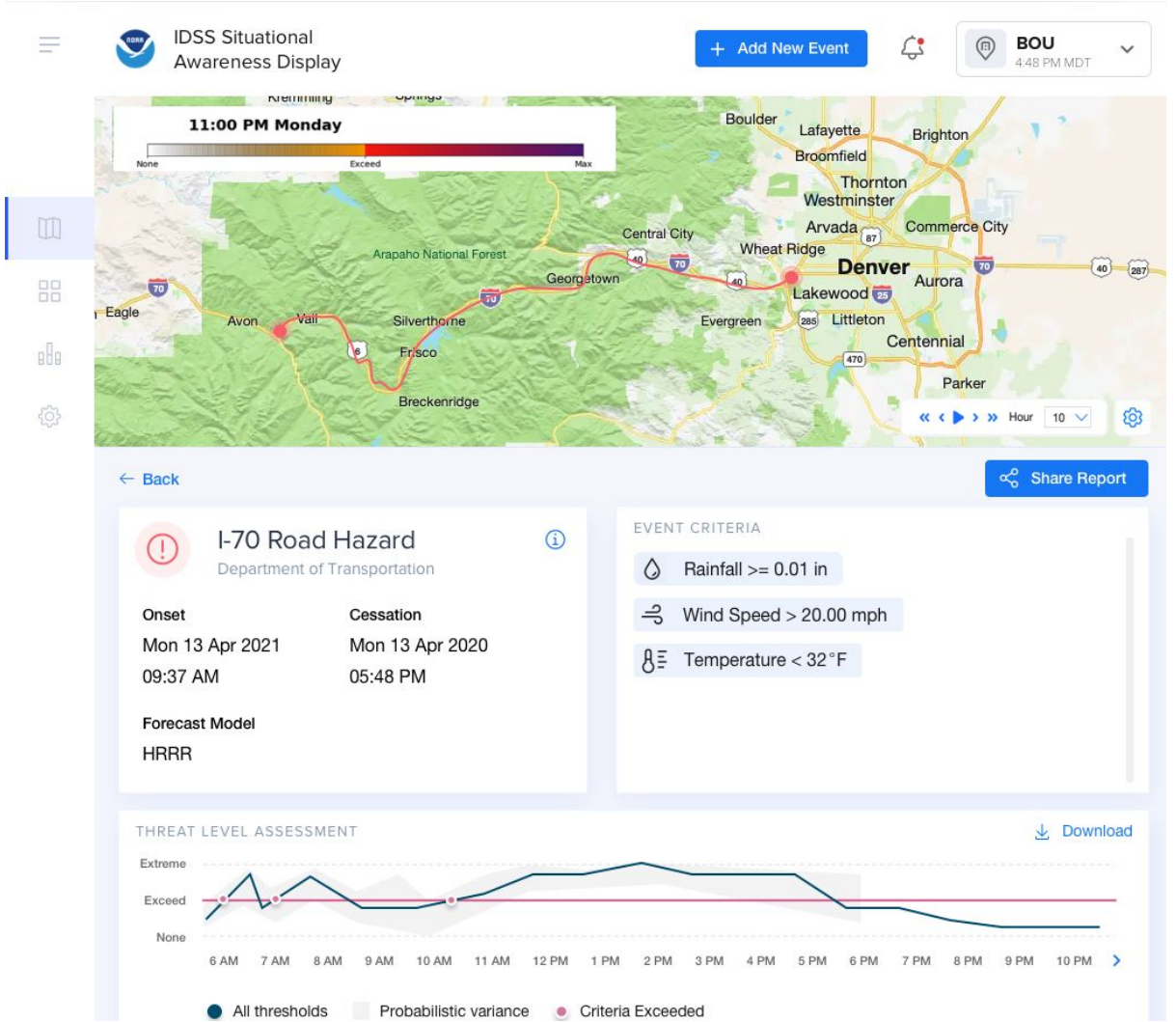


- Automated verification for forecast calibration and confidence
- Verification can influence forecasters’ confidence!

One of the first applications to quantify confidence based on past performance of forecast sources.

The IDSS Engine Project

- User Information Needs
  - Forecasters
  - Decision-Making Partners
- Ranges of solutions
  - Timing
  - Magnitude
  - Worst Case Scenarios
- Confidence
- Probabilities
- Data Mining
- Verification

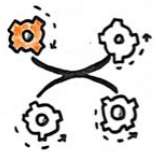


Extensible, Scalable, Flexible Development

IDSS Engine

Informing decision makers and forecasters by automating event-based risk monitoring

MICROSERVICE ARCHITECTURE



- Extensible and scalable
- Platform agnostic
- Easy maintenance and upgrades

USER-CENTERED DESIGN

- Prioritizes clear graphics and usability
- User feedback early and often
- Focus on accessibility and inclusive design

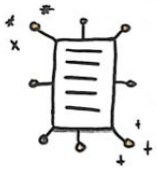
DATA ACCESS

- Easily add new data streams
- Separates data acquisition from processing
- Extensible and supports multiple formats

RISK PROCESSOR

- Supports compound events
- Weather and non-weather inputs
- Approximates onset and cessation ranges

CONTENT RECOMMENDATIONS



- Enables multiple communication channels
- Customizable templates
- Suggests data-based content and graphics

VERIFICATION

- Builds historical baselines of performance
- Quantifies confidence
- Stratifies by location, timing, and criteria

Importance of GSL's Decision Support Activities

Decision Support is what gives **meaning** to forecasts.

Forecasters "***connect forecasts and warnings to decisions made***," and they "***emphasize expert interpretation, consultation, and communication of forecasts and their impacts***"

(NWS Strategic Plan 2019, Objectives 1.1 & 1.2, p. 7)

Summary of Decision Support Activities

Performance

- Weekly Program Mgmt activities with internal teams, end users, and funding entities
- Ingenuity to utilize cloud resources for development and evaluation activities
- Steady growth trend in funding and associated team development/ hiring activities

Quality

- NOAA's NWS relies on GSL's software for it's highest priority, mission-critical warning products and services
- NWS has shifted these development efforts more towards GSL recently
- Numerous other entities seek GSL's applications

Relevance

- Embracing and inclusion of social science research to foster societal benefits
- Focus on DSS as aligned with NWS's focus on DSS
- Engagement with forecasters, end users, and broader DSS community

NOAA Global Systems Laboratory

Summary: Decision Support

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Global Systems Laboratory

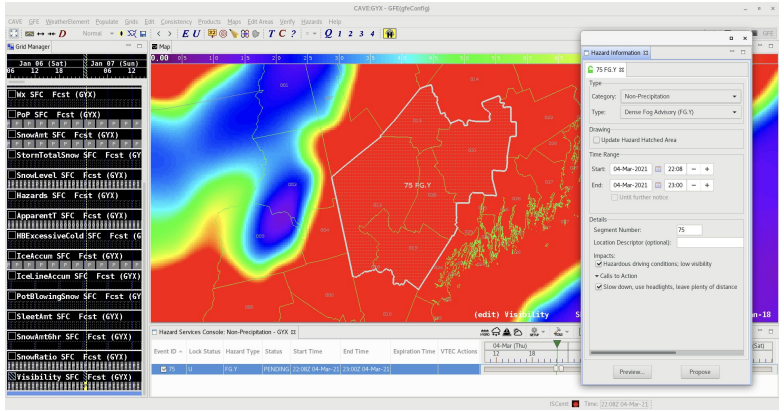
Decision Support

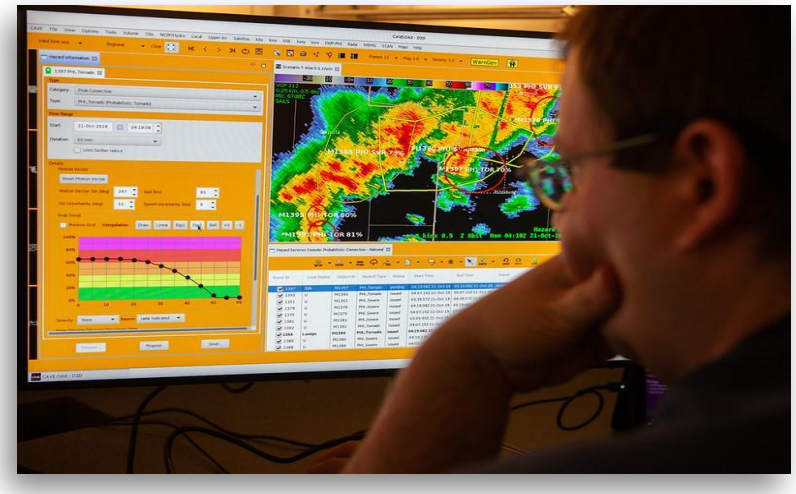
Thank you!


Global Systems Laboratory
Cherokee FEDERAL
CIRES
CIRA
FedWriters

Revolutionizing Decision Support

New Hazardous Weather Warning Tools





Decision Support Research

Delivering Information to Decision Makers with Cutting Edge Science and Technologies