FACETs: A Next-Gen Forecasting Paradigm for High-Impact Weather

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FACETs Facets

1	2	3	4	5	6	7
GRID-BASED THREAT PROBABILITIES	OBSERVATIONS & GUIDANCE	THE FORECASTER	THREAT GRID TOOLS	USABLE OUTPUT	EFFECTIVE RESPONSE	VERIFICATION

FACETs Is...

- A modernization of NOAA's current teletype-era, deterministic (binary), product-centric paradigm.

- Focused on entire forecast/warning process.

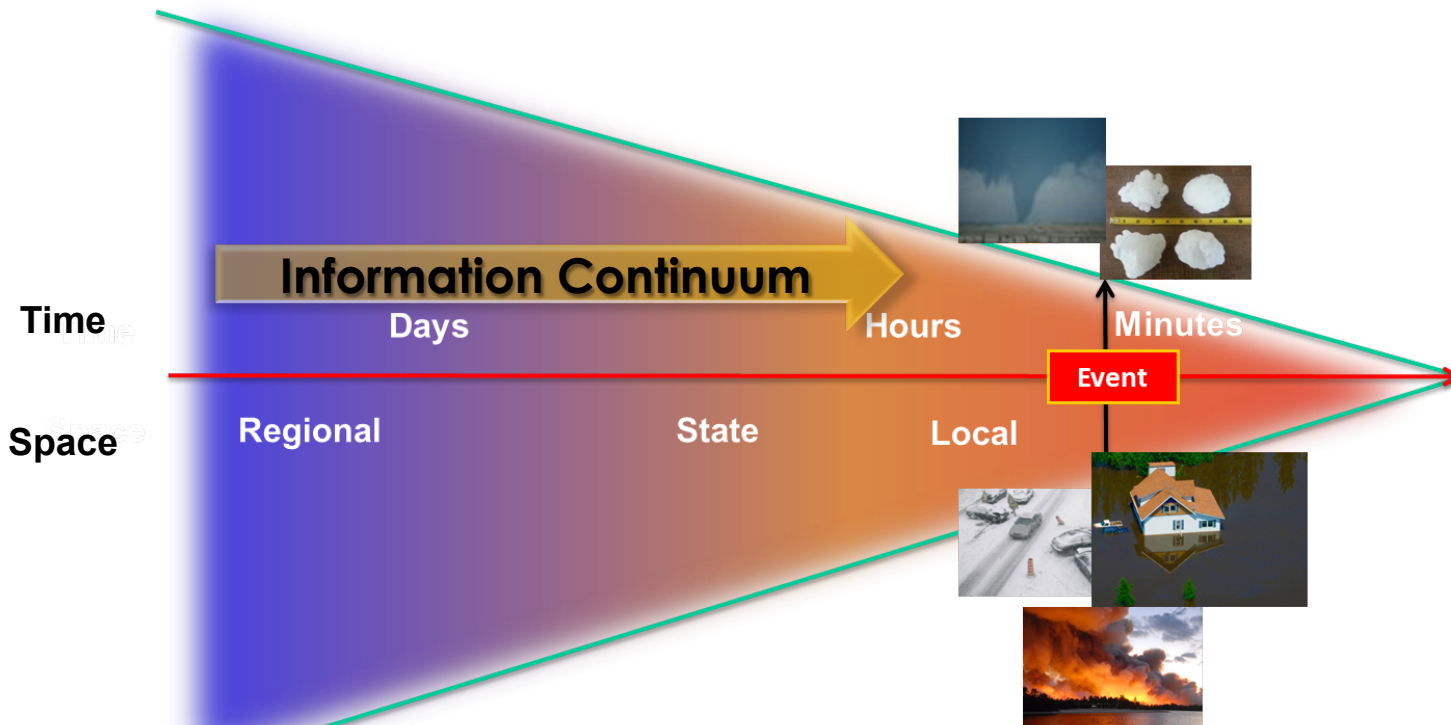| Grid-Based Threat Probabilities | Observations & Guidance | The Forecaster | Threat Grid Tools | Usable Output | Effective Response | Verification |

FACETs Is...

- A continuous stream of calibrated, high-res, probabilistic hazard information (PHI) extending from days to within minutes of event - for all Environmental Threats.
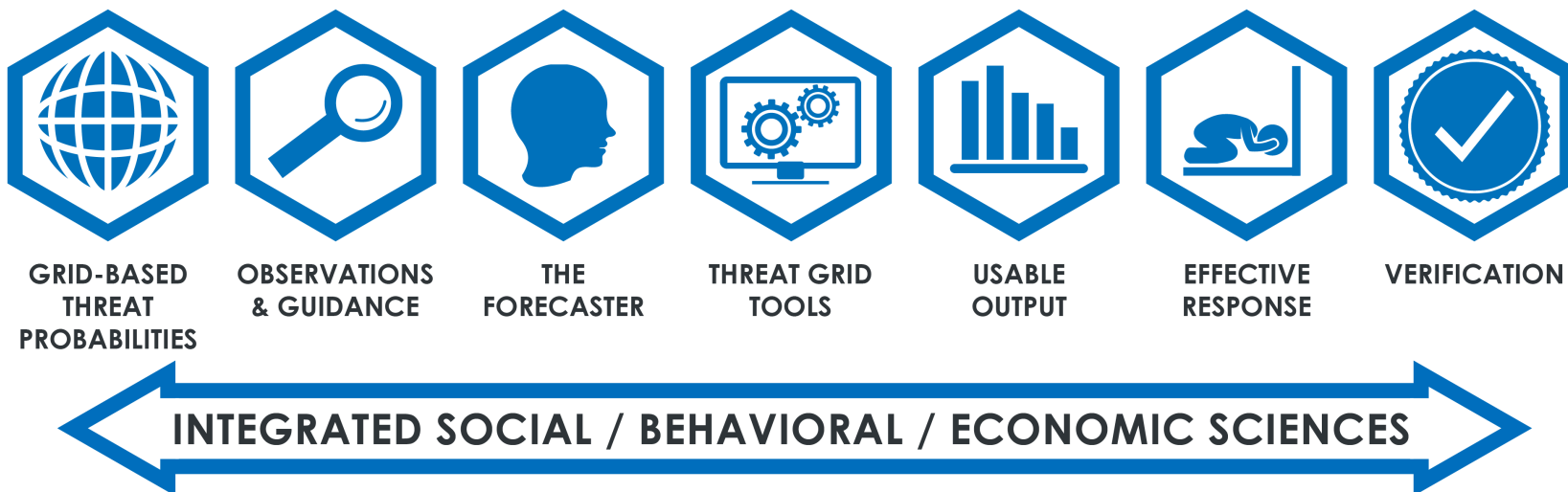

Time

Information Continuum

Days   Hours   Minutes

Event

Space

Regional   State   Local

FACETs Is...

- Optimized for user-specific decision-making through comprehensive integration of social/behavioral/economic sciences.
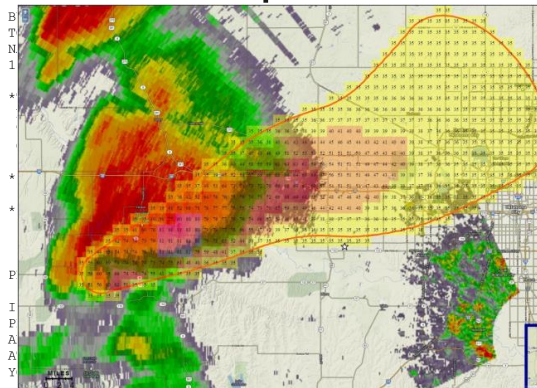
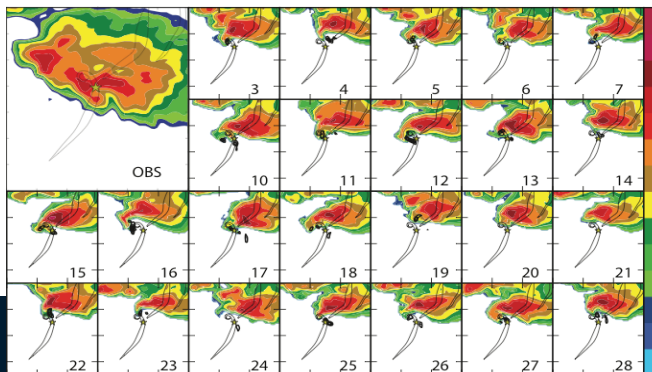- A framework to focus R&D activities.

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INTEGRATED SOCIAL / BEHAVIORAL / ECONOMIC SCIENCES

FACETs Is…

- The "delivery mechanism" for emerging probabilistic guidance capabilities…
    - Warn on Forecast (see Wicker presentation)
    - FLASH (see Gourley presentation)
    - MYRORSS (see T. Smith e-poster)

- Part of NSSL troika…
    - Rapid radar updates (e.g., MPAR) improve Warn-on-Forecast ensemble performance which improves FACETs.

> **See Karstens e-poster on PHI Tool**

Drivers (Relevance)

- Borne out of NOAA's Weather-Ready Nation (WRN) initiative.
  - Initiated by OAR Special Early-Stage Experimental or Development (SEED) grant.
  - Part of the new (draft) NWS WRN Action Plan.

- NOAA's 5-Year R&D Plan:
  - "Next-generation warning concepts will be developed and tested to improve desired societal responses through the delivery of quantitative and user-specific information."

- NIST Recommendation #16 from the Joplin, MO tornado:
  - "…tornado threat information be provided to emergency managers, policy officials, and the media on a spatially-resolved, real-time basis by frequently updating gridded probabilistic hazard information..."

- NSSL Strategic Plan (Grand Scientific Challenge #6):
  - "Provide grid-based probabilistic uncertainty information for high impact weather to reduce warning false alarms."

There is a Plan... (Performance)

- FACETs Science and Strategic Implementation Plan (SSIP) created in conjunction with NWS & stakeholders.
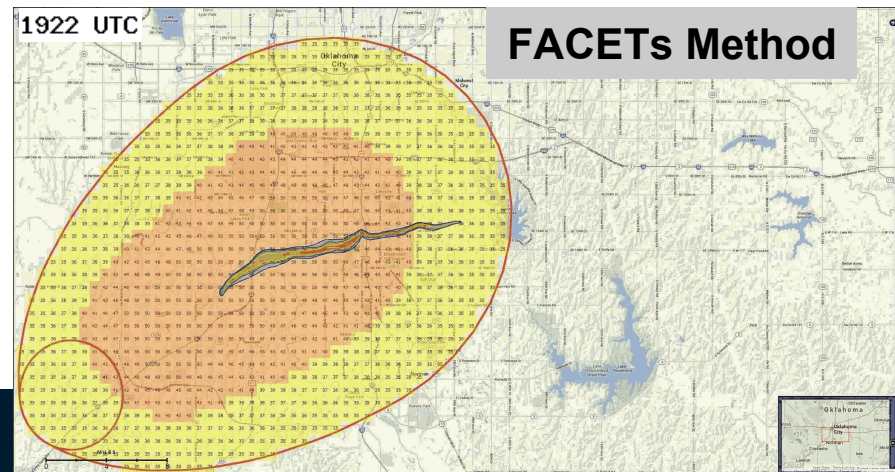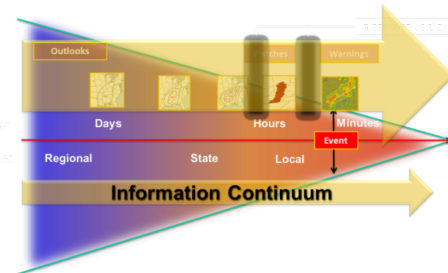
- Workshop: How do we get from current system to FACETs?
- 46 distinct projects identified – a heavy lift!
    - 16 physical science
    - 14 software development
    - 23 social/behavioral/economic science
- Extensible to hydro, tropical (coastal surge), winter weather, aviation, etc.

Expected Benefits

- A fully-integrated continuum of weather threat information;

- Reduction in size of "warned" areas;

- Data-mining opportunities for private sector;

- More useful, actionable, and recipient-specific information.

- A Weather-Ready Nation.

Information Continuum

1922 UTC

FACETs Method

Summary

- FACETs: An over-arching vision to modernize NOAA's hazardous weather forecasting paradigm.
  - A "master plan" exists – much work to do!
  - NWS and partners are on board (part of WRN).
  - Connected to major NSSL activities (MPAR, WoF, FLASH, etc.)
  - Considerable benefits to society expected.

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