Subseasonal to Seasonal Prediction

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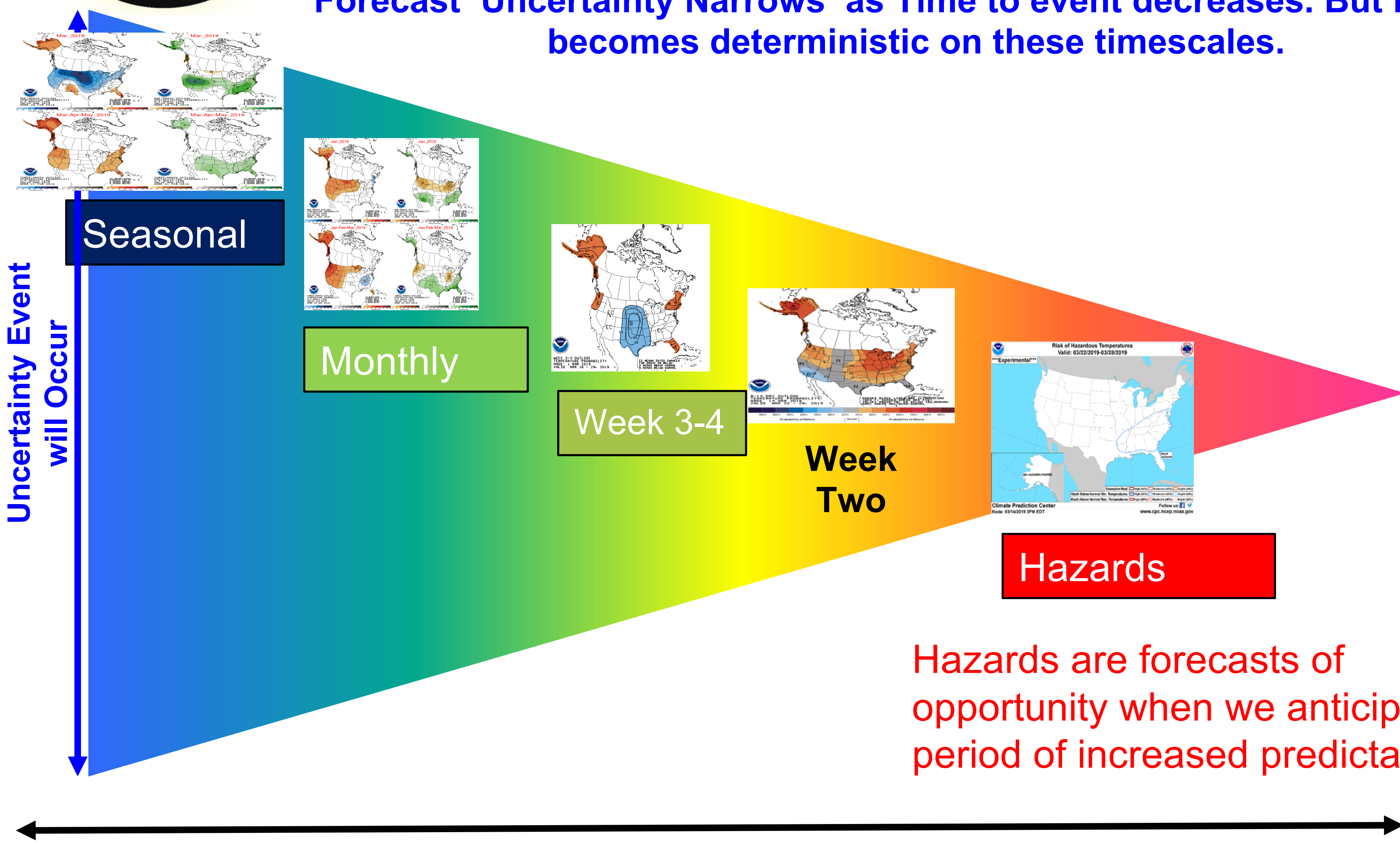
Outline

- CPC Products/Tools for Water Resources/Agriculture
- Decision Support Services
- Weather Bill Report

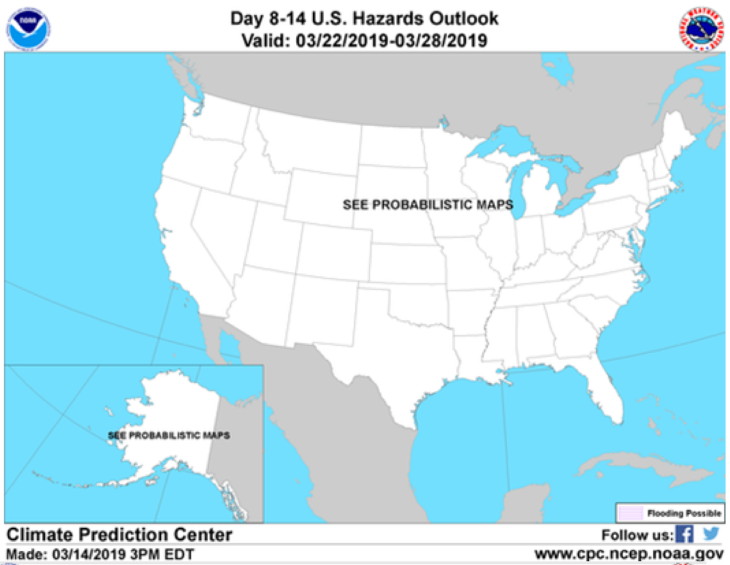
The S2S Threat Vector

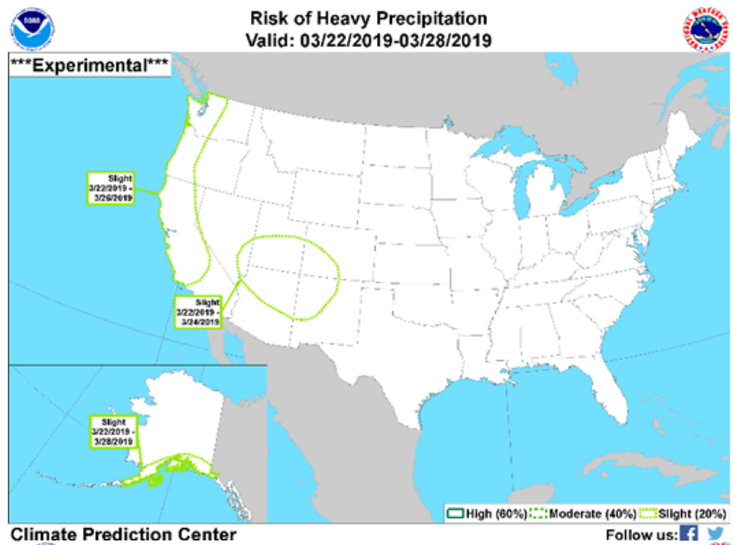
Forecast Uncertainty Narrows as Time to event decreases. But it never becomes deterministic on these timescales.

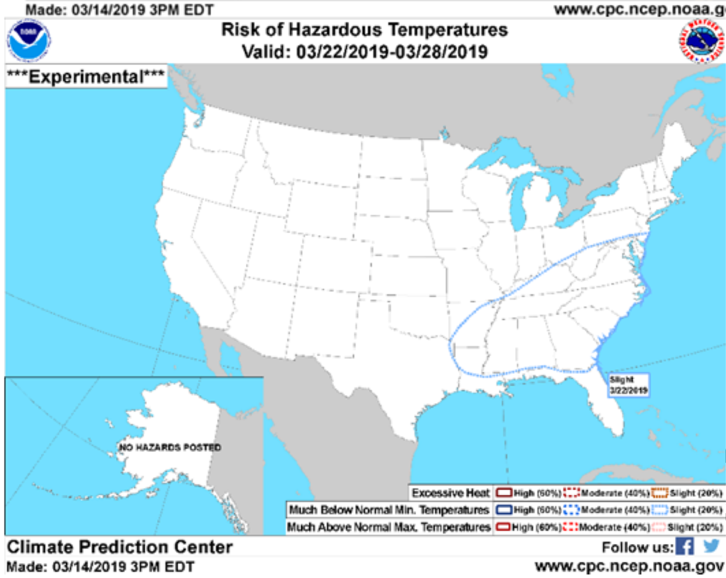


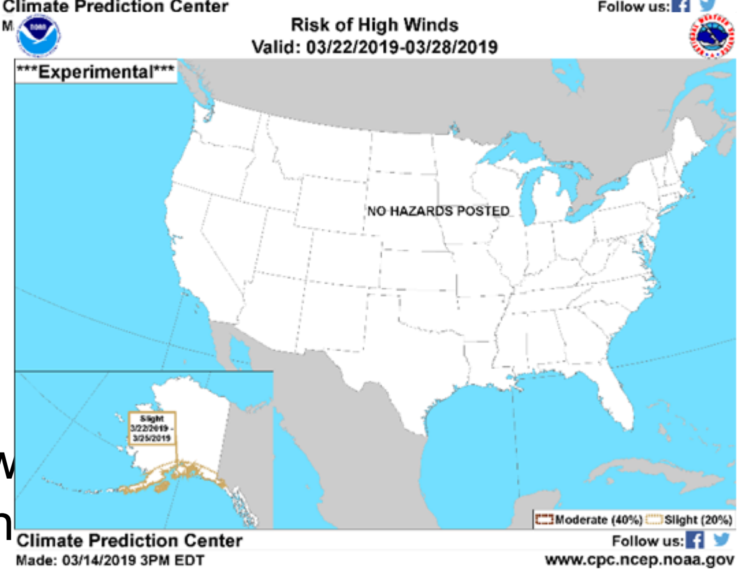
Hazards are forecasts of opportunity when we anticipate a period of increased predictability.

Week Two Probabilistic Hazards Outlook Designed to Forecast Probability of Extreme Events









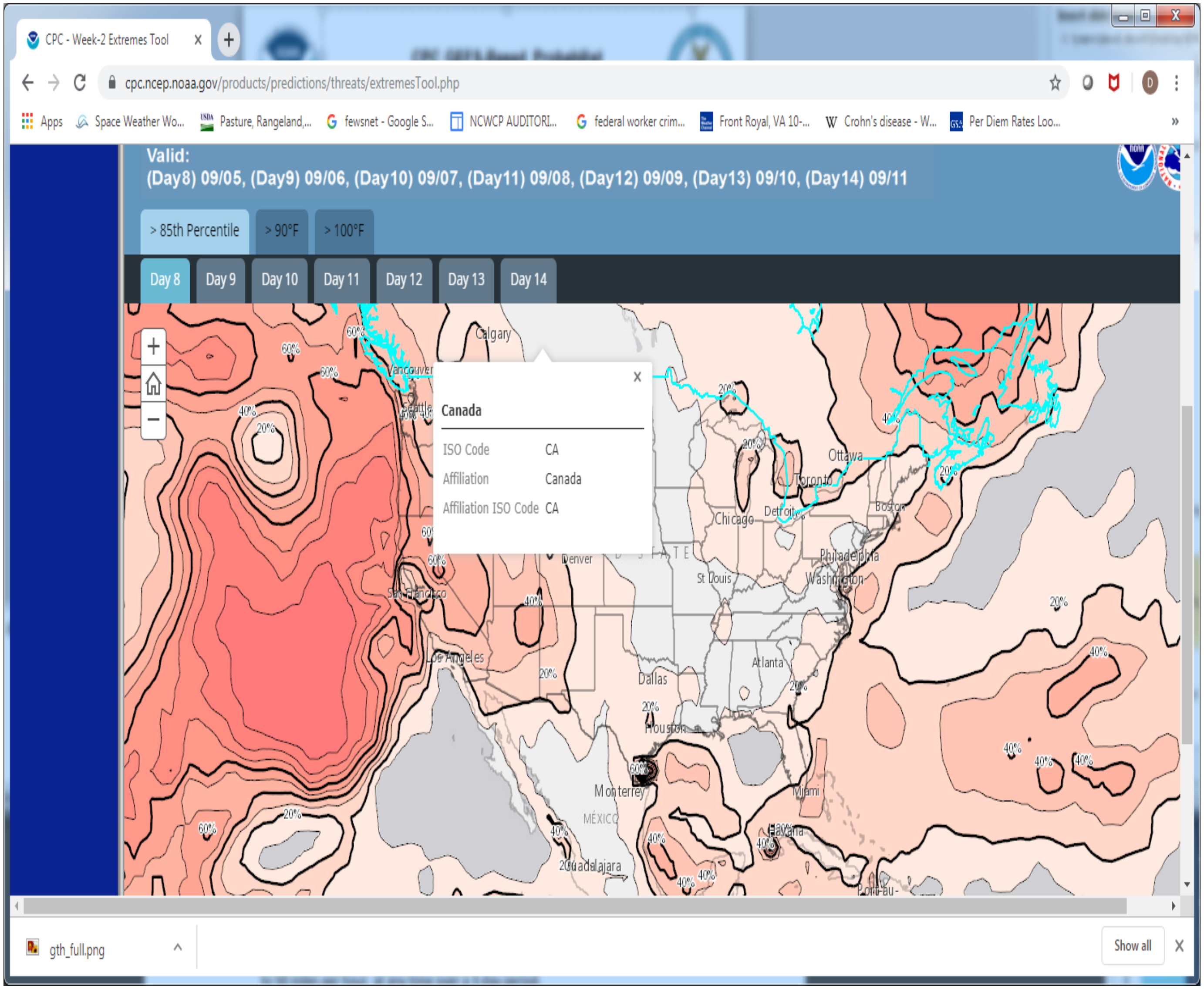
Slight (20-40%), Moderate (40-60%), Or High (GT 60%) Probability of:

Much below minimum or much above maximum temperature

Heavy Precipitation

High Winds

CPC GEFS-Based Probabilities of Extremes Tool



GEFS-based daily day 8 to 14 global probabilities of:

Temperature:
-Upper or lower 15%
-Over 90 or 100F
-Less than 28, 32, or 40 F

Precipitation:
-Upper 15%
-Over 1, 2, or 4 inches

Winds:
Upper 15%
Over 25, 40, 50 MPH

NWS New Service Paradigm: Enhanced Impact-Based Decision Support Service for Deep-Relationship Core Partners

- NWS service paradigm is for different level of services for different stakeholders. The highest service level is for increased impact-based decision support services for Deep Relationship Core Partners. Examples of Deep Relationship Core Partners are:
  - Federal agencies such as USDA, USAID, FEMA, DoD, NIDIS, DOI
  - State and local emergency managers
  - State and local water resource managers (new)
- The scope of services for the Deep Relationship Core Partners is still being defined but can include custom products and services.
- CPC Deep-Relationship Core Partners include NWS WFO/RFC/ROC, RCSD, RCC, and State Climatologists.
  - CPC is interested in working with these partners to support their climate-related decision making.

CPC Stakeholder Meeting for Government Partners September 24-26, 2019 in College Park, MD

- Foci of the meeting are:
  - -Recent performance of CPC operational products
  - New products to be released for the upcoming year
  - New and improved products currently under development
  - Feedback from stakeholders on recent product performance
  - Feedback from stakeholders on their requirements for improved and new products and the products CPC currently has under development
- Remote participation is available. If you are interested in participating (either in person or remotely) please send me an e-mail ASAP: david.dewitt@noaa.gov

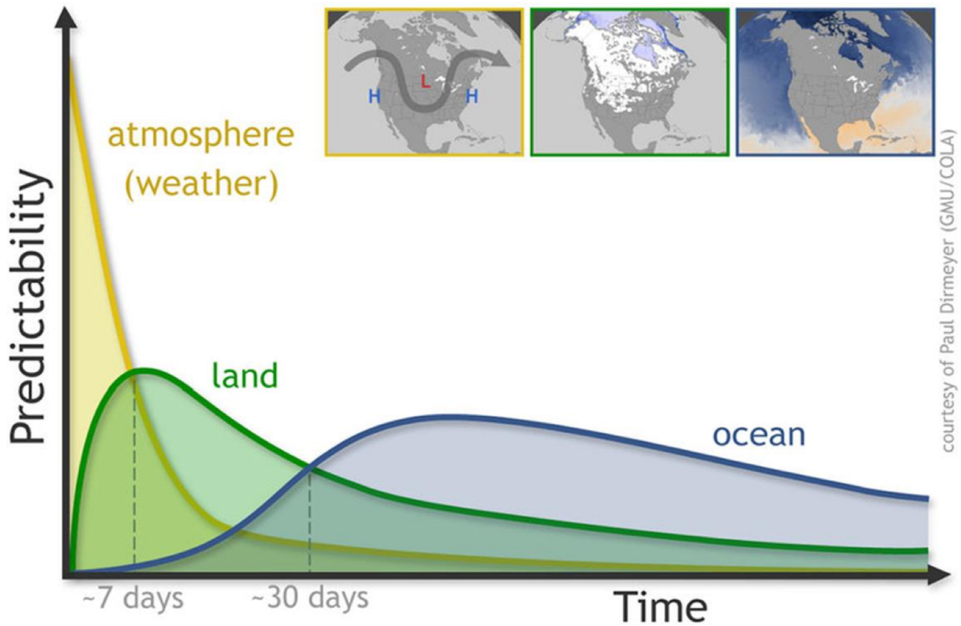
NOAA's S2S Report to Congress

"Subseasonal and Seasonal Forecasting Innovation: Plans for the Twenty-First Century"

- Will serve as a guidepost for NOAA planning and execution, as well as to inform the public and NOAA's stakeholders on its efforts on subseasonal and seasonal forecasting
- This document traces the continuum of effort from S2S products and services to the innovations needed to enable and improve them
- Two main goals: (i) improving the skill of the S2S forecasts, and (ii) enhancing the value of S2S products for stakeholders

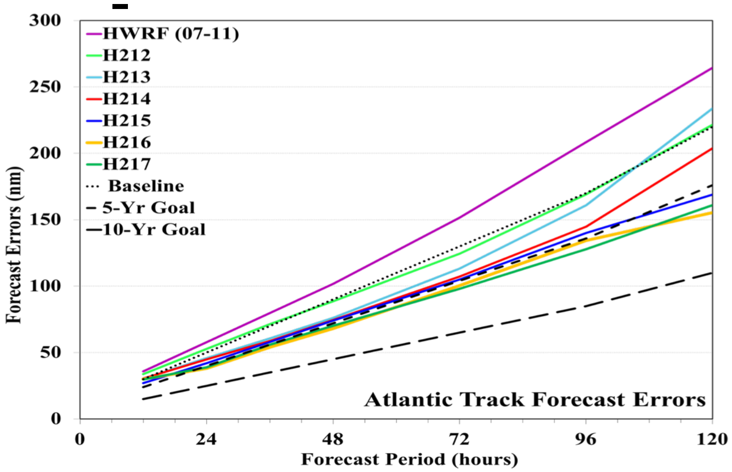
Draft Report

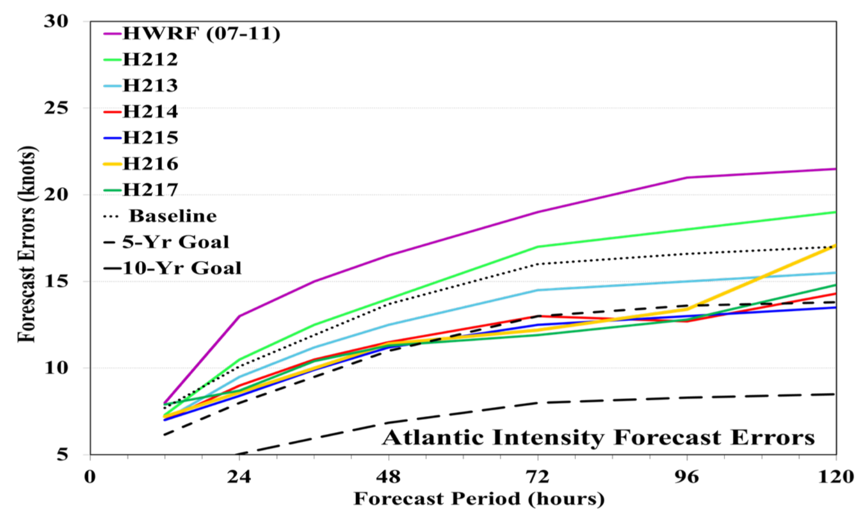
- Section 4.0 Requirements for Improving S2S Products and Services
  - 4.1 Background
  - 4.2 Forecast Requirements
  - 4.3 Research Requirements
  - 4.4 Observational Requirements
  - 4.5 Monitoring Requirements
  - 4.6 Towards Improving S2S Capabilities, Usage, and Value
  - 4.7 Pilot Projects



Pilot Project/Grand Challenge Science

- NOAA has shown that focused, end to end problem-oriented projects can be used to accelerate improvements in forecast skill for “weather phenomena”. Best example of this is the Hurricane Forecast Improvement Program (HFIP).





Elements that Made HFIP Successful

- Recognition of the difficulty of the problem and the fact that there is no single activity that will solve the problem. Rather, compounding incremental improvement will lead to long-term measurable gains in forecast skill. HFIP sought to accelerate this improvement.

- Well-defined metrics and timelines for evaluating success that are co-developed with the relevant stakeholder communities.

- Recognition of the need to focus on operational outcomes, i.e. not research for research's sake.

- **Sufficient sustained investment in all required aspects of the problem, including human resources, high-performance computing, observing systems, and transition of research innovations to operations.**

Elements that Made HFIP Successful (Continued)

- Leveraging the talents of all parts of the weather enterprise, including NOAA labs, other federal agencies, the research community, and relevant NWS operational centers.

- **Recognition that making progress on this problem will require allowing some higher-risk, higher-reward research, i.e. allowing scientists to be more creative but still focused on operational outcomes.**

  "Managing the tension between research push and operational pull."

- Tying science priorities to key decision points for the relevant stakeholder communities.