EPP Overview

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Hydrologic Science and Modeling Branch
Hydrology Laboratory
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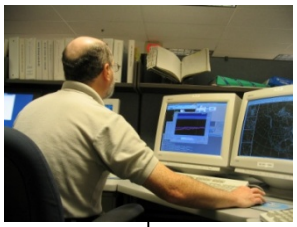
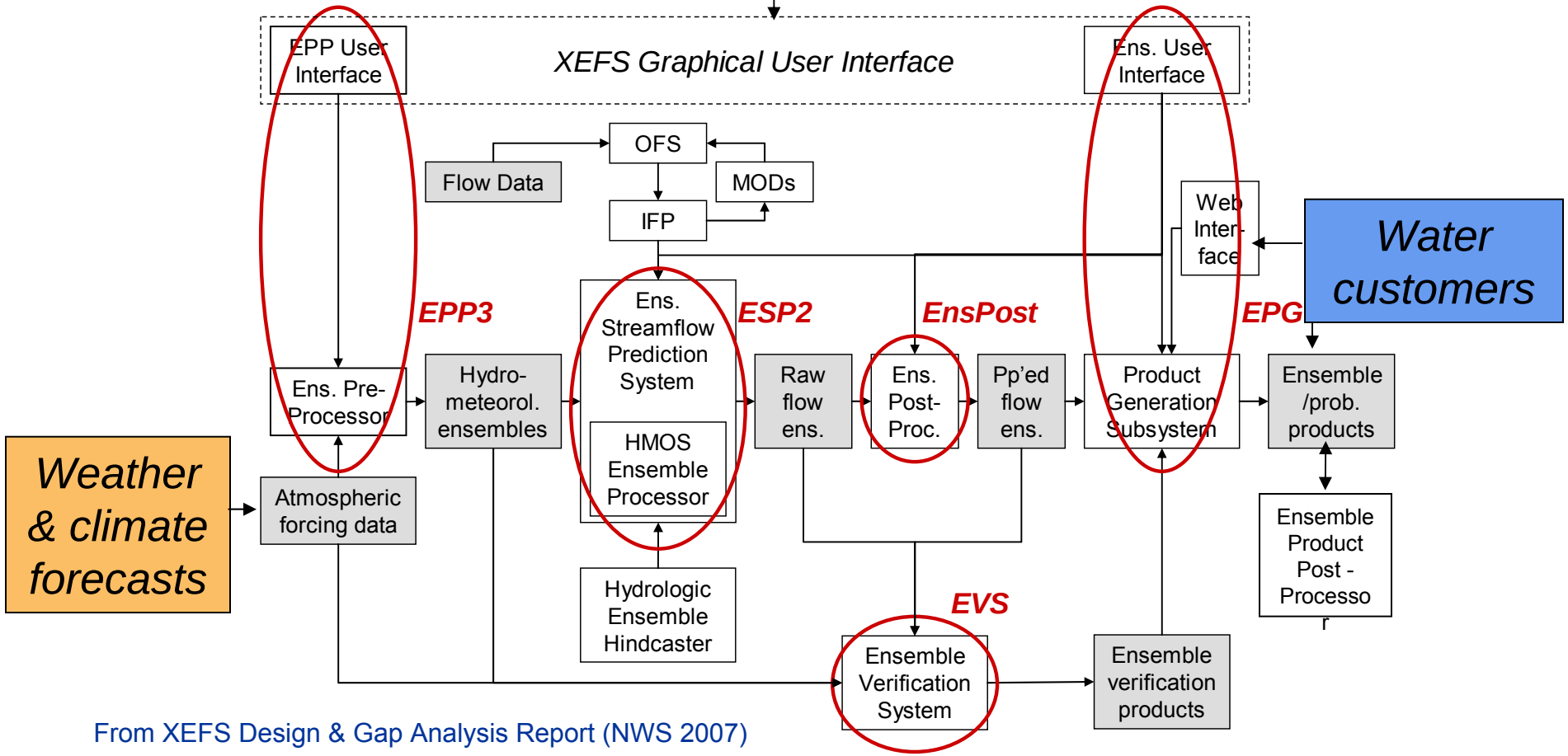
NOAA/National Weather Service

EXperimental Ensemble Forecast System (XEFS)



Forecasters add value



From XEFS Design & Gap Analysis Report (NWS 2007)

XEFS will enable seamless hydrologic ensemble prediction from weather to climate scales and translate weather and climate prediction into uncertainty-quantified water information

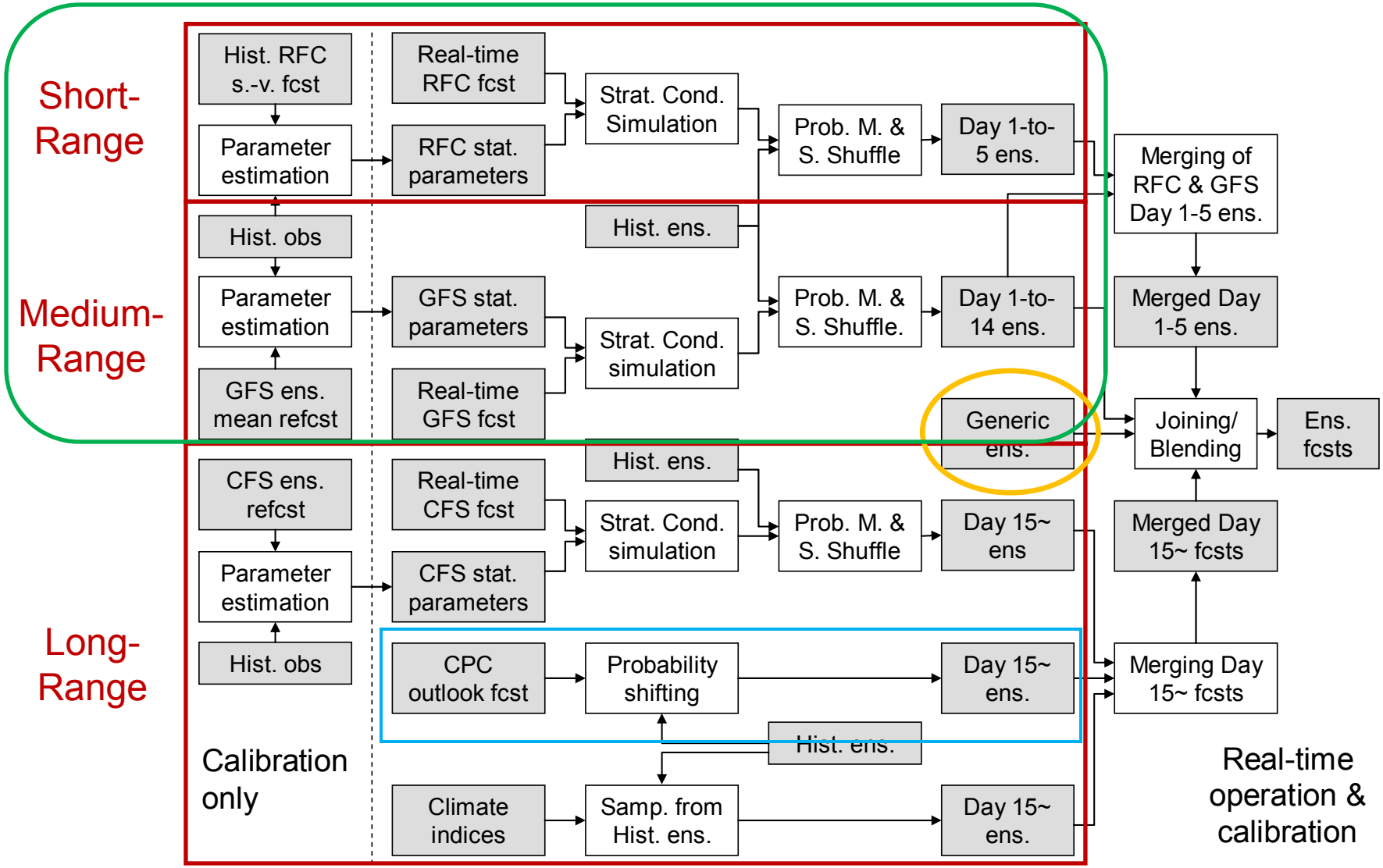
Goal

- Produce reliable and skilful forcing ensembles for lead times from 1 hr to 2 yrs at spatial scales from $O(10^1) \sim O(10^7)$ km^2
  - Requisite for producing reliable and skillful hydrologic ensembles

Status

- The short- and mid-range components of EPP3 have been developed
  - RFC Subsystem
  - GFS Subsystem
- Developed and implemented a series of improvements in the Subsystems
  - Better-capture the HPC/RFC-added skill at short range
  - Capture the skill in the GFS ensemble-mean forecast at mid-range
- Tested and validated the components
  - Dependent validation completed
    - ABRFC - short-range only
    - CN-, MARFCs – short- and mid-ranges
  - Independent validation ongoing
    - AB-, CN-, MARFCs

XEFS/Ensemble Pre-Processor III (EPP3)



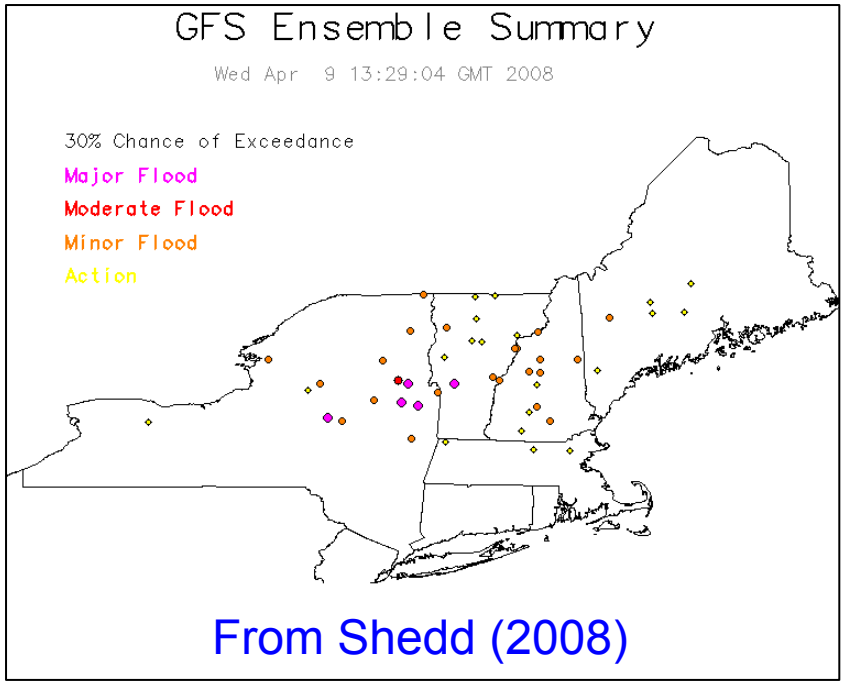
From XEFS Design & Gap Analysis Report (NWS 2007)

NWS/Eastern Region (ER) Short-term Hydro Ensembles

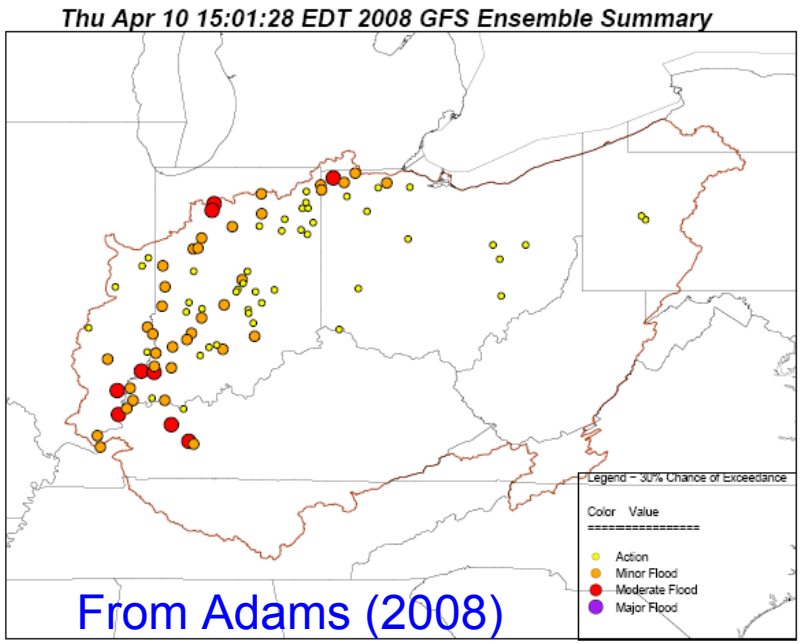
- AWIPS GEFS ensembles (12 members)
  - 00Z and 12Z forecast cycles
- Incorporate additional ensemble model data (outside AWIPS)
  - NCEP GEFS (21 members)
  - Canadian model out for 7 days (GEFS grid resolution, 21 members)
  - SREF out for 84 hours (21 members)
  - WRF/MM5 data from SUNY-Stonybrook for 48 hours (12 members)

From Ostrowski et al. (2008)

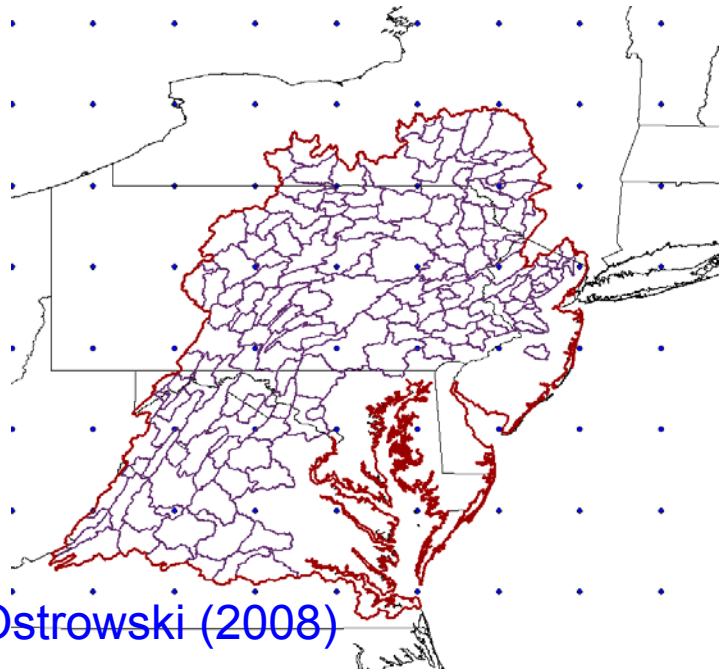
MARFC ~ 165 basins
NERFC ~ 185 basins
OHRFC ~ 690 basins



From Shedd (2008)



From Adams (2008)



From Ostrowski (2008)

Next Steps

1) Continue development of EPP3
   - Integrate selected modules from the RFC Subsystem (distribution modeling, intermittency modeling, parameter optimization, ensemble generation) with the GFS Subsystem
2) Continue development of the EPP3 User Interface
3) Develop and integrate the climate forecast component

From “EPP3 Phase 1 Gap-Closing Works” (XEFS Design & Gap Analysis Report, NWS 2007)

End of slides