MRMS & Hydro-Meteorological Research

Dr. David P. Jorgensen (*Chief*, Warnings R&D Division/NSSL)

February 25–27, 2015

National Weather Center

Norman, Oklahoma

Results from 2009 Review

	QUALITY	RELEVANCE	PERFORMANCE
RADAR R&D	**HIGH**	**HIGH**	**VERY HIGH**
FORECAST AND WARNING R&D	**VERY HIGH**	**EXTREMELY HIGH**	**VERY GOOD**
HYDROMET R&D	**HIGH FOR QPE ONLY**	**HIGH**	***UNKNOWN AT THIS TIME***

Worked to improve

Performance

	2003-2008	2009-2014
Journal Articles	18	77
NWS/FLASH 2014 watch skill[1]	0.2	0.23/0.31
External Users of MRMS-Hydro	~20	>70[2]
Grants	~$1M	$2.173M (2014)
Gap filling radar deployments[3]	5	6

[1]Critical Success Index (CSI) watch skill score (higher CSI scores show a combined higher probability of detection and reduced number of false alarms). See Clark, R. A., J. J. Gourley, Z. L. Flamig, Y. Hong, and E. Clark, 2014: CONUS-wide evaluation of national weather service flash flood guidance products. *Wea. Forecasting*, **29**, 377–392.

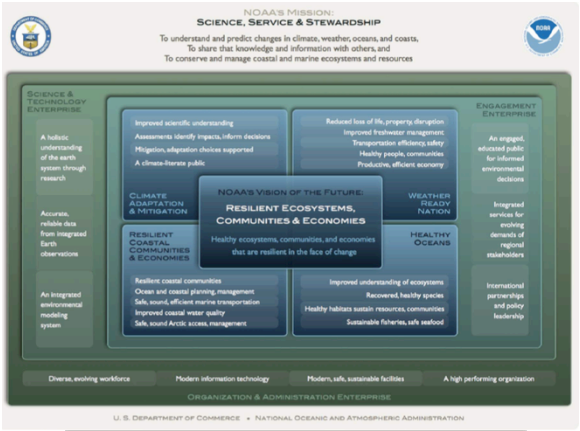
[2]Users of MRMS products include the HRRR model, many River Forecast Centers, the Great Lakes Environmental Research Laboratory, a few Weather Service Forecast Offices, Air Force Weather Center, & NOAA's Weather and Climate Operational Supercomputing System.

[3]Gap filing radar experiments: Salt River Project (2012-2014), HMT (2005-2006), Debris Flow (2006-2010), Colorado River Water (2014), IPHEX (2014)

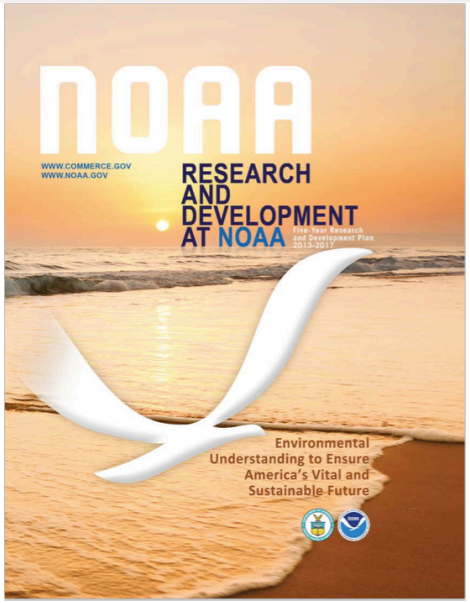
CI-FLOW has achieved its goal of demonstrating the usefulness of coupling streamflow forecasts with storm surge forecasts in producing skillful inundation estimates.

Relevance (HydroMet & MRMS)

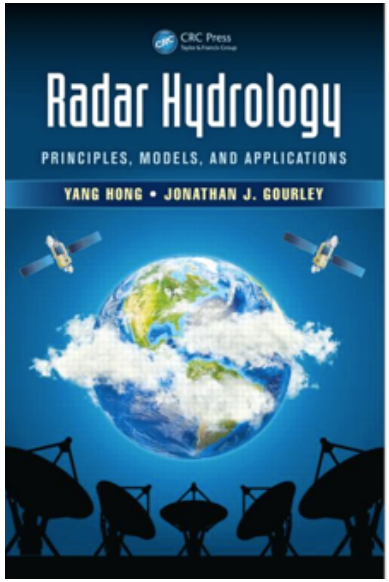
- **NOAA Next Generation Strategic Plan**
  - Overarching NOAA Goal: *Weather Ready Nation*
    - ✓ **Objective**: Reduced loss of life, property, and disruption from high-impact events.
    - ✓ **Objective**: Improved freshwater resource management



- **NOAA/OAR 5-year Research Plan (2013-2017)**
  - R&D supporting improved prediction of high-impact events (improved observations, predictive guidance, decision support tools)
  - Increased hydrologic forecast skill



Quality



- Publications (77 + book since 2009)
- Awards (since 2009)
  - ✓ NOAA Bronze Medal (2011)
  - ✓ AMS Editor's Award (2013)
  - ✓ Dept. of Interior Cooperative Conservation Award (2009)
  - ✓ NASA Robert H. Goddard Award for Exceptional Achievement in Science (2014)

NSSL Grand Scientific Challenges

Hydro Warnings R&D Contribution

1. Probabilistic guidance products
2. Enhanced radar technology
3. Improved flash flood prediction
4. Lightning warnings
5. Observing systems for CI
6. Probabilistic warning uncertainties

GOAL 6: Provide grid-based probabilistic uncertainty information for high-impact weather to reduce warning false alarms

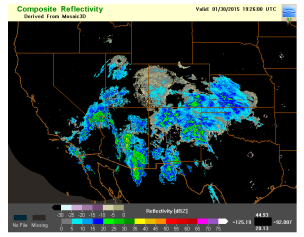
FLASH through FACETS

NOAA Priorities

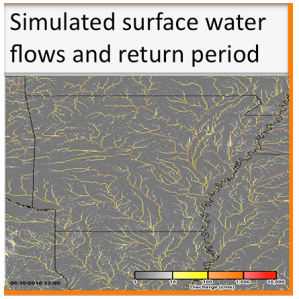
- Provide information and services to make communities more resilient
  - MRMS, CI-FLOW, FLASH, PARISE
- Evolve the Weather Service
  - MRMS, FLASH
- Invest in observational infrastructure
  - Gap filling radar studies
- Achieve organizational excellence
  - MRMS transition to operations example

Performance, Quality, Relevance

- The R2O Process: MRMS Transition – *Howard*
- MRMS-Hydro – *Zhang*



- Flooded Locations And Simulated Hydrographs Project (FLASH) – *Gourley*



- MRMS-Severe – *Smith*
- MRMS & Hydro-meteorological Research Q&A

See also electronic posters

Summary

Successes

- MRMS & FLASH proven technologies for hydroMet
- Successful MRMS transition to NWS operations
- Gap filling radar technology useful in the west

Remaining Challenges

- Dual-Pol application to winter/snow amounts
- Continue to improve QPE nationally in all seasons