MRMS & Hydro-Meteorological Research

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### Results from 2009 Review

<table>
<thead>
<tr>
<th></th>
<th>QUALITY</th>
<th>RELEVANCE</th>
<th>PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RADAR R&amp;D</td>
<td>HIGH</td>
<td>HIGH</td>
<td>VERY HIGH</td>
</tr>
<tr>
<td>FORECAST AND WARNING R&amp;D</td>
<td>VERY HIGH</td>
<td>EXTREMELY HIGH</td>
<td>VERY GOOD</td>
</tr>
<tr>
<td>HYDROMET R&amp;D</td>
<td>HIGH FOR QPE ONLY</td>
<td>HIGH</td>
<td>UNKNOWN AT THIS TIME</td>
</tr>
</tbody>
</table>

- Worked to improve
## Performance

<table>
<thead>
<tr>
<th></th>
<th>2003-2008</th>
<th>2009-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal Articles</td>
<td>18</td>
<td>77</td>
</tr>
<tr>
<td>NWS/FLASH 2014 watch skill(^1)</td>
<td>0.2</td>
<td>0.23/0.31</td>
</tr>
<tr>
<td>External Users of MRMS-Hydro</td>
<td>~20</td>
<td>&gt;70(^2)</td>
</tr>
<tr>
<td>Grants</td>
<td>~$1M</td>
<td>$2.173M (2014)</td>
</tr>
<tr>
<td>Gap filling radar deployments(^3)</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>


\(^2\)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.


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

  - 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 | 4. Lightning warnings |
| 2. Enhanced radar technology       | 5. Observing systems for CI |
| 3. Improved flash flood prediction | 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