

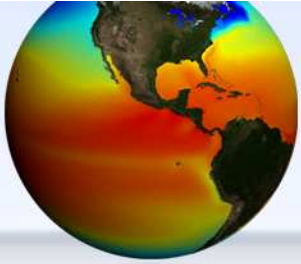
NOAA

NWS Support for a National Mesonet

Network of Weather & Climate Observing Networks (NOWCON)

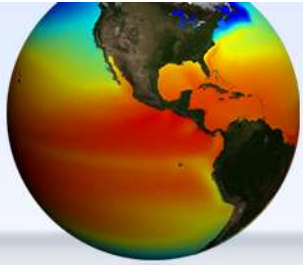
Don Berchoff

Director, Office of Science and Technology
NOAA National Weather Service
don.berchoff@noaa.gov

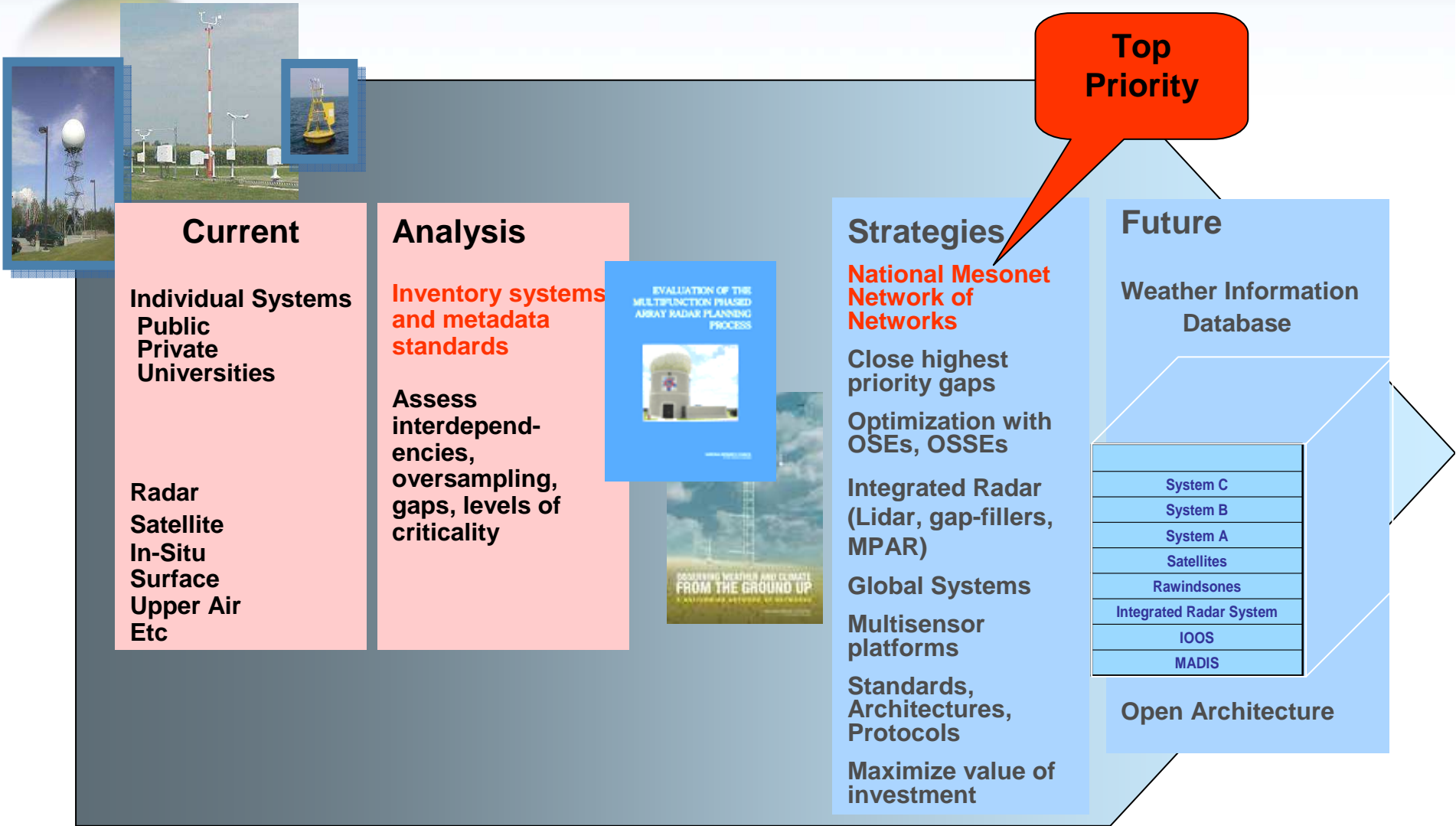


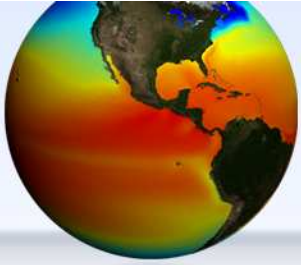
Overview

- **NOAA/NWS Support for National Mesonet**
 - **Integrated Observation/Analysis System Roadmap**
 - **Observation Gaps**
- **Network of Weather and Climate Observing Networks**
Way Ahead Strategy/Opportunities



NWS Integrated Observation/Analysis System Roadmap





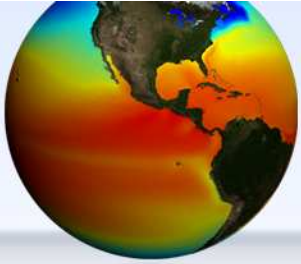
NWS Observation Gaps

NWS Stretch Goal Matrix (2025)

Service Area	Product	Objective	Moisture Profiles	Boundary Layer Obs	Solar Obs from L1 Orbit	Land Surface Obs	3-D AQ Obs	Climate Obs	Enhanced Obs Metadata
Fire	Red Flag Warning	>24hr Lead Time	X	X		X			X
Hydrology	Inundation Forecasts	Probabilistic Warnings	X	X		X			X
Aviation	4-D Database	Inter-operable Obs Formats						X	X
Severe Thunderstorms	Tornado Warning	Warn of Fcst (Prob), LT >1hr	X	X		X			X
Winter Weather	Winter Hazards	High Resolution, User Defined Fcst Queries	X	X		X			X
Marine	Storm Warnings	Prob Warnings, LT >5 days						X	X
Hurricanes	Hurricane Warning	Track and Intensity Error Reduced by 50%	X	X					X
Climate	Climate Observations	Reliable Products	X	X		X	X	X	X
Air Quality	Forecast	Day 5 fcst accuracy improved	X	X		X	X	X	X
Space Weather	Warnings	> 90% accuracy, LT > 24 hrs			X				
Surface Weather	Products	Observation use optimization	X	X		X			X
NWP/DA	Local Scale Models	100 meter resolution, on-demand guidance	X	X		X			X
NWP Post-Processing	Probabilistic Fcsts	1.5 km resolution, 5 minute time-steps	X	X		X			X
Dissemination	High-Impact Weather	Data Mining supporting Decision Support Systems							X
Decision Support	4-D Database	Protocols enabling efficient access							X
Verification	Warning Accuracy Statistics	Measure skill of high-res warnings	X	X		X			X
IT/Data Mining	End-User Data Access	Net-Centric, collaboration tools							X

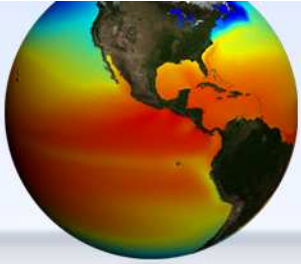
Focus Is Service Centric Outcomes (societal benefits)





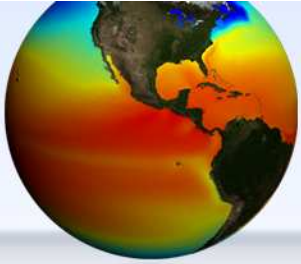
NWS Support for a National Mesonet

- Weather Service perspective —
 - ✓ OFCM-sponsored Committee for Integrated Observing Systems (CIOS) important to facilitate national cooperation and achieve NRC's vision
 - ✓ Federated group...works together to gather best practices, develop metadata standards directly related to tiers of service
 - ✓ Establish and foster partnerships to facilitate the leveraging of existing/planned capabilities and resources
 - ✓ Each agency determines level of involvement based on mission needs
 - ✓ Each agency funds (or may choose not to fund)
 - ✓ NOAA can lead in acquiring funds to facilitate CIOS execution...data standards, central data repository, GIS and XML/OGC compliance, or whatever else group desires



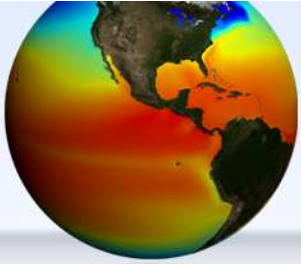
A NOWCON Strategy for Evolving Mesoscale Observing Assumptions

- Data from all types of sensors can be useful for some purpose
- Initial focus on acquiring data from existing networks and independent sensors
- NOWCON infrastructure development requires federal leadership
 - Development of standards, decisions on architecture, specification of protocols, repository determinations, etc.
- Initial focus on CONUS, Alaska, Hawaii and adjacent coastal waters



A NOWCON Strategy for Evolving Mesoscale Observing Principles

- Leverage all environmental data from existing sensors as is
 - Append metadata to allow users to select appropriate data for applications
- Future sensor/network managers retain system configuration and control
 - However, long term NOWCON success depends on the owners' willingness to implement agreed upon metadata standards and protocols
- Leverage existing standards and best practices to greatest extent possible

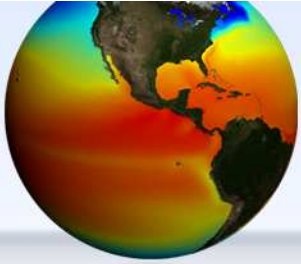


A NOWCON Strategy for Evolving Mesoscale Observing Near-Term (FY 10-11) Opportunities

Network what is out there

- Inventory existing weather networks and stations
 - Leverage existing studies (NRC NoN Report, USGEO, IOOS, etc.)
- Identify multi-level instrument standards*
- Address siting standards and issues*
- Derive metadata requirements*
 - Explore cost-effective implementation
- Determine data repository concept
 - Single database, distributed (virtual) database, hybrid
- Define communications infrastructure (connectivity, data exchange)

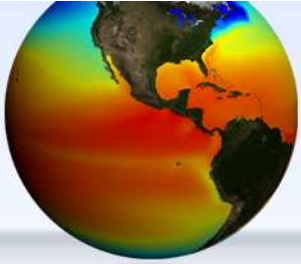
* *Approach should work with existing sensors & have flexibility to evolve to more rigorous, prescriptive standards*



A NOWCON Strategy for Evolving Mesoscale Observing Near-Term (FY 10-11) Opportunities (cont'd)

- Develop approach to quality assurance of diverse observations
- Begin addressing non-technical issues
 - Policy
 - Politics
 - Economics (funding, incentives, budgetary aspects)*
 - Legal (proprietary, liability issues)*
- Consider pilot project
- Explore opportunities for interoperability/integration (e.g., NextGen)

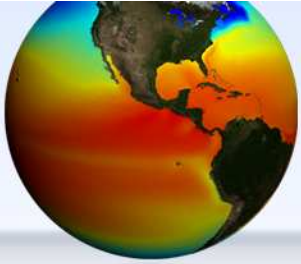
* *AMS involvement is key to these issues*



A NOWCON Strategy for Evolving Mesoscale Observing Mid-Term (FY 12-16) Opportunities

Complete the plumbing and close
highest priority gaps

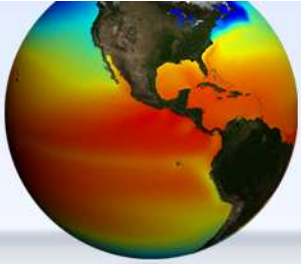
- Apply near-term results to networking of existing stations and networks
- Implement opportunities for interoperability/integration
- Perform gap analysis and document results
- Plan, program, and implement new opportunities for enhancements to existing networks and new observing capabilities



A NOWCON Strategy for Evolving Mesoscale Observing Long-Term (FY 17 and Beyond) Opportunities

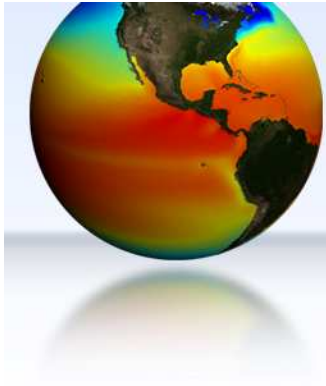
Develop robust national network and sensing capability

- Continue implementing new opportunities
 - Close boundary layer observation gaps to enable all service areas (e.g., urban, hydro, etc)
 - Infrastructure sharing and multi-functionality
- Encourage broader application of standards consistent with new network/sensor missions
- Expand infrastructure
 - Observation-based products (visualization, etc.)
 - Service providers
 - Software tools (data mining, bulk data transfer)



Summary

- We have momentum...
 - NRC report as catalyst
 - Congressional interest
 - Readily available technology
- All Participants (federal, academia and private sector)
 - ...will benefit from access
 - ...will benefit from improved weather services
 - ...and their networks are critical to building a fully integrated, national capability



Questions?