

NWS Preparation for GOES-R

OCONUS Proving Ground Workshop
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Outline



- NWS Perspective of GOES-R & JPSS Program Status
- NOAA planning for future weather operations
- Preparation activities for GOES-R
- Future operations
 - Proving Ground Activities
 - Research and Development



NWS Perspective

GOES-R and JPSS Program Status



GOES-R

- Impacted by Budget Pressures (like all other NOAA activities)
- NWS working number of what-if drills and placing in context of all other proposed budget cuts

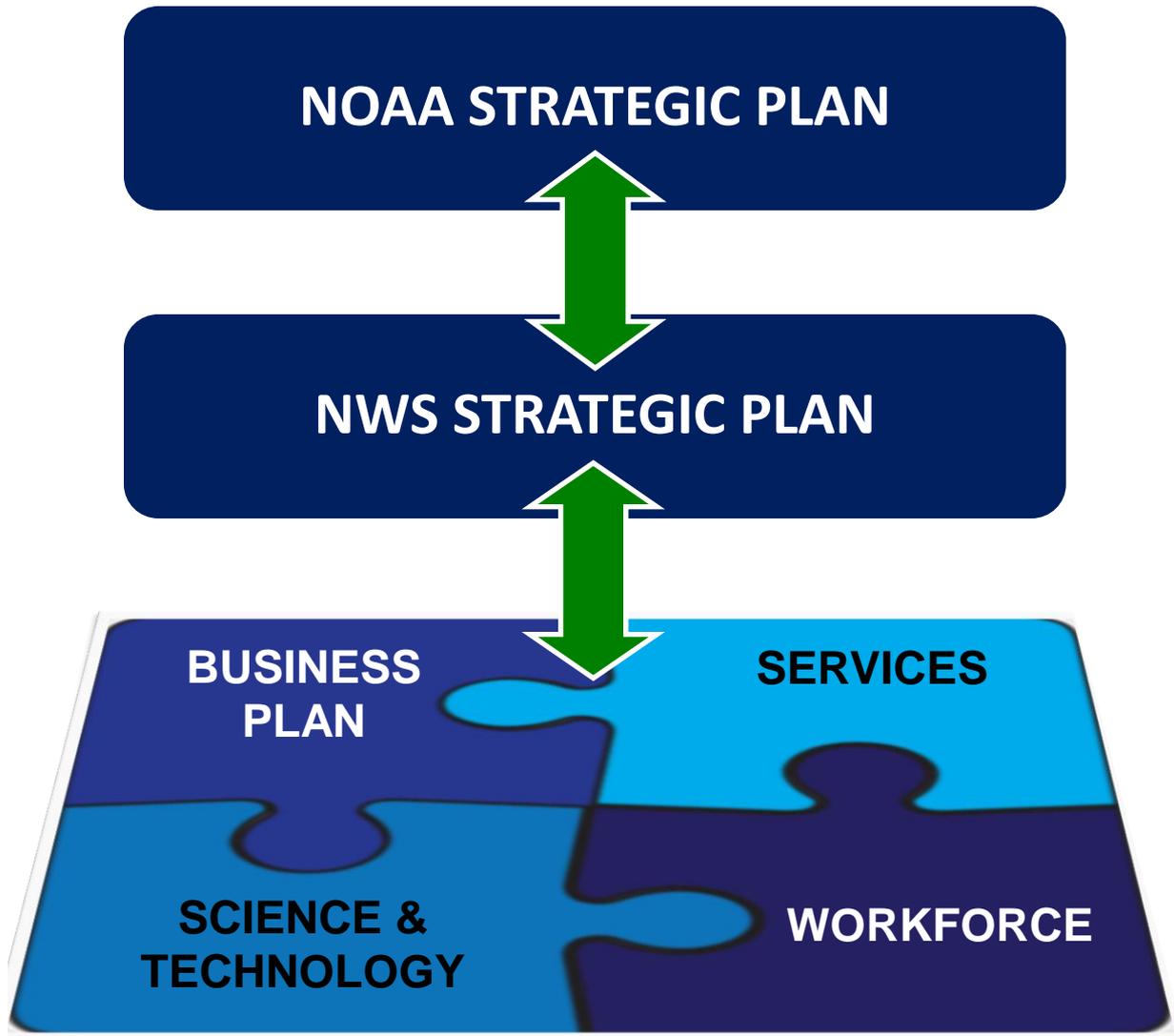
JPSS

- Major NOAA emphasis area
 - to get this program back on track given current budget pressures
- Minimizing anticipated Polar Data gap crucially dependant on FY12-FY13 funding
- Major emphasis of NWS activities in response
 - NWP impact analysis
 - operational impact analysis
 - contingency planning



NOAA planning for future weather operations

Planning Flow Down





NOAA planning for future weather operations

SSD Capstone Document → S&T Roadmap



- The NWS is moving from a “product-based” enterprise to a “service-based” enterprise.
- Warn on Forecast requires a revamping of the supporting observation and analysis systems to better observe the boundary layer processes for the numerical modeling system.
- Integrating observations from separate systems into an integrated observing and analysis system is a key challenge.
- Integrated observation networks, advanced computers, and improved environmental modeling to produce environment information must be intelligently targeted to best meet customer needs.
- The NWS must be able to move and interrogate data packages in a manner and speed such that decision support is provided to the community long before an event occurs.

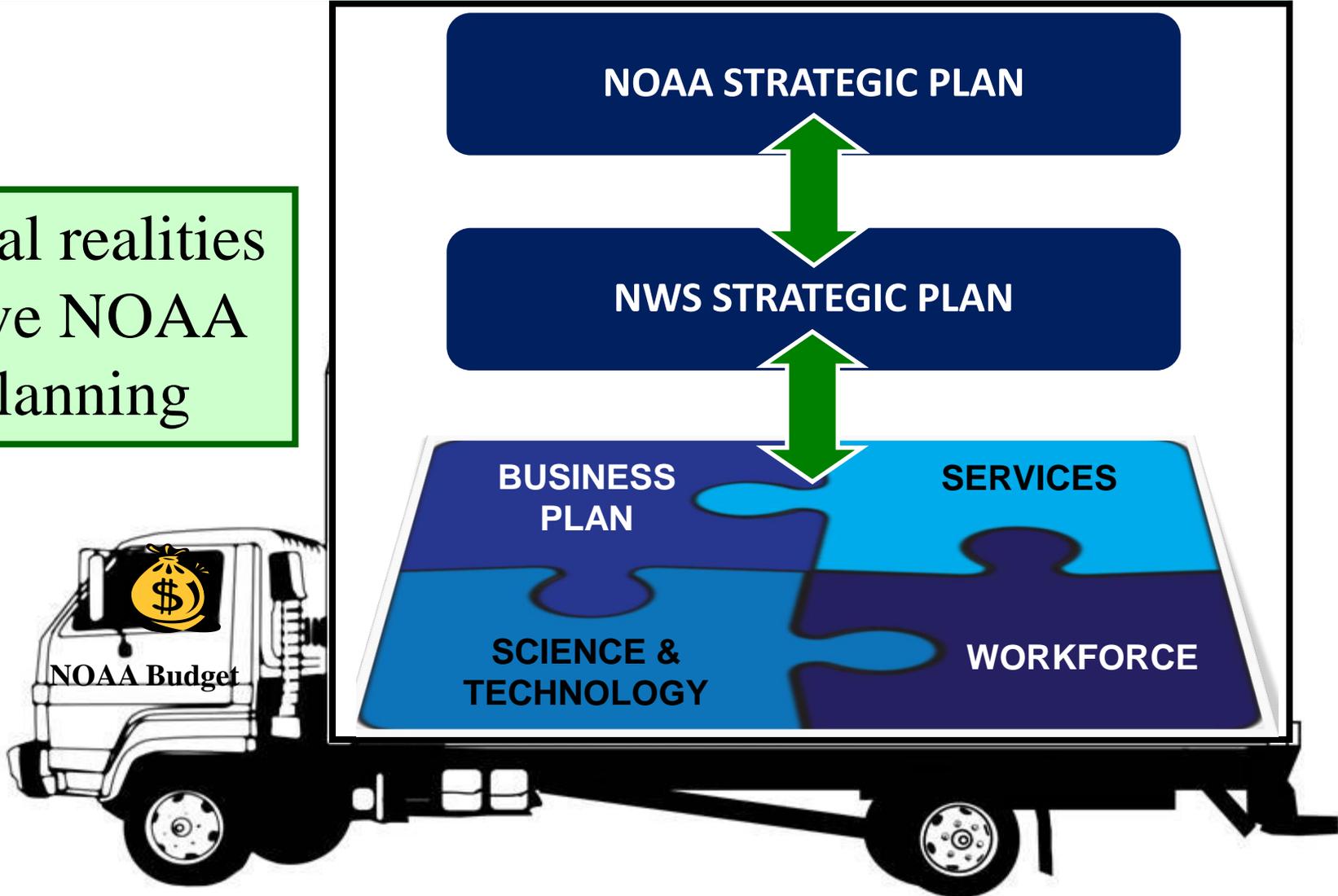


NOAA planning for future weather operations

Driving Elements

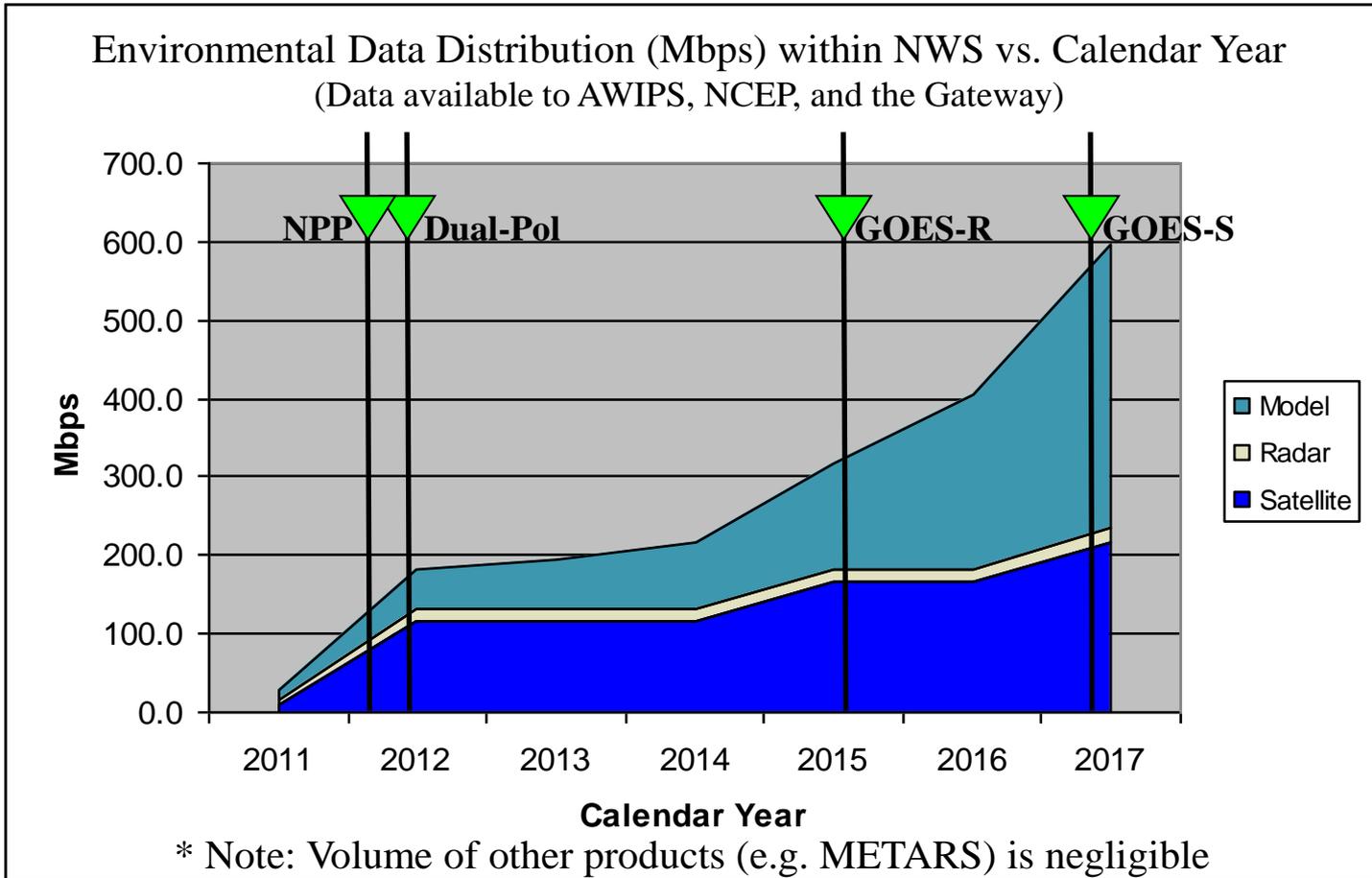


Fiscal realities drive NOAA planning





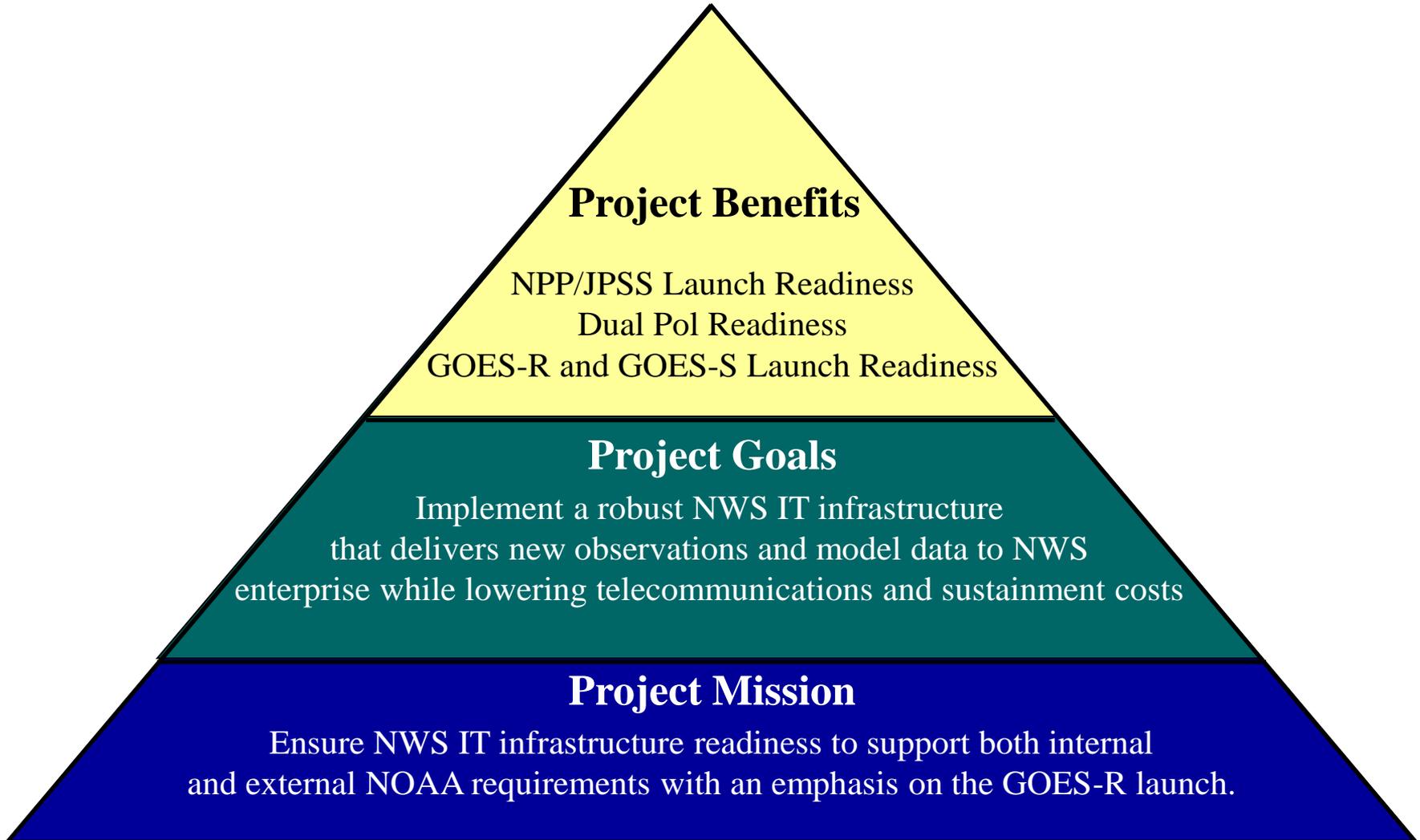
Preparing for GOES-R Notional Data Volume Assumptions



Observing Systems and Models are driving bandwidth growth and we expect enormous growth over the next decade



Preparing for GOES-R Ground Readiness Project





Preparing Forecasters for GOES-R



- **Proving Ground**

- GOES-R Proving Ground Program is growing rapidly demonstrating GOES-R capabilities in NWS-NCEP-Centers, -WFOs, -RFCs including ARH, AFC, AJK, AFG, AAWU, AK-PAC RFC, PRH, and HNL.
- Low Cloud/Fog, Cloud Type, Volcanic Ash, and SO2 products are being provided to AK offices where forecasters are using the products and providing feedback.
- PAC developing plans for tropical cyclone, heavy rainfall, and aviation product demonstrations.

- **Training**

- Weather Event Simulator (WES) cases on GOES-R capabilities have been developed and continue to be developed and are available to forecasters
- Cooperative Program for Operational Meteorology, Education and Training (COMET) provides virtual and distant learning courses, as well as outreach programs and international projects
- Virtual Institute for Satellite Integration Training (VISIT) uses distance education techniques to train NWS forecasters how to integrate remote sensing data
- Satellite Hydrology and Meteorology (SHyMet) is a series of courses dedicated to operational satellite meteorology.
- The Environmental Satellite Resource Center (ESRC) is a searchable database-driven portal that provides easy access to a wide range of information and training materials on environmental satellites



Future Operations Proving Ground



2009-2013

Focus on Products

- Day 1
- GOES-R Risk Reduction

2011-2019

Prepare & Implement Fusion

- Evolve fusion concepts
- Implement NWS Roadmaps
- Test concepts operationally
- Transition to service focus

2020&Beyond

Focus on Services

- Improve fusion support
- Fully Implement service focus

Developers ↔ Forecasters

Future Operations Research and Development

- Moving from product centric approach to a more integrated approach
- Data fusion definition¹ and example

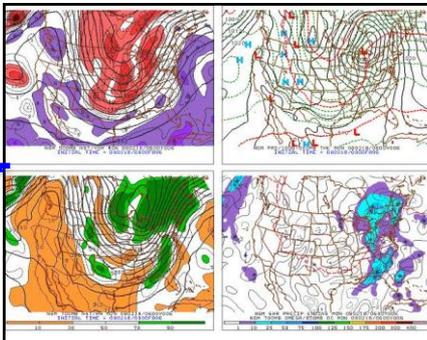
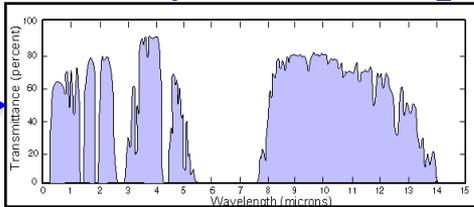
The use of techniques that combine data from multiple sources and gather that information in order to achieve inferences, which will be more efficient and potentially more accurate than if they were achieved by means of a single source.

Satellite

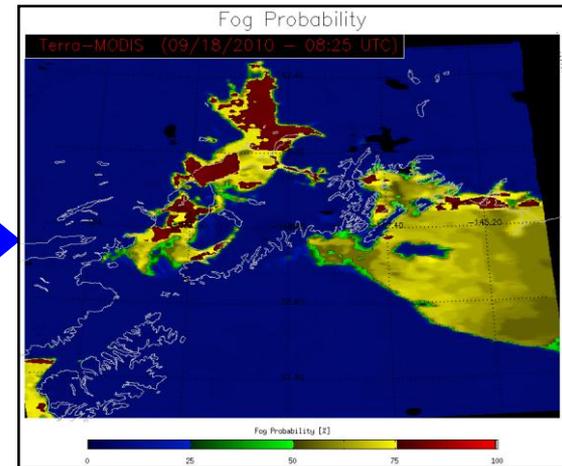
ABI channels 2, 7, 14
Cloud Mask
Cloud Phase
Solar zenith angle



Clear Sky RTM Output



Data
Integration and
Fusion



Fog Probability

NWP Data

¹Definition source: Wikipedia
http://en.wikipedia.org/wiki/Data_fusion



Wrapping Up



- **NWS Perspective on Program Changes**
 - funding changes make short term planning challenging
 - present opportunity to steer multiple efforts to better support future weather operations
- **Weather Enterprise planning activities are maturing**
 - Services Focus
 - Warn-on Forecast
- **Extrapolation of legacy operations is NOT a good design strategy for future operations**
 - Forecaster focused on service tailoring & longer lead warnings
 - Greater Dependence on NWP and rapidly updated data assimilation SA
 - With much more data coming in...
- **GOES-R Prep**
 - PG, Training, R3...Evolve to support future operations
 - IT Infrastructure Re-design



Back-up



GOES-R Baseline and Option 2 Products



GOES-R Baseline Products	GOES-R Option 2 Products
Aerosol Detection (Including Smoke and Dust)	Aerosol Particle Size
Aerosol Optical Depth: AOD & Suspended Matter	Aircraft Icing Threat
Volcanic Ash: Detection and Height	Cloud Ice Water Path
Cloud and Moisture Imagery	Cloud Layers/Heights
Cloud Optical Depth	Cloud Liquid Water
Cloud Particle Size Distribution	Cloud Type
Cloud Top Phase	Convective Initiation
Cloud Top Height	Enhanced "V" / Overshooting Top Detection
Cloud Top Pressure	Low Cloud and Fog
Cloud Top Temperature	Tropopause Folding Turbulence Prediction
Hurricane Intensity	Visibility
Lightning Detection: Events, Groups & Flashes	Probability of Rainfall
Rainfall Rate / QPE	Rainfall Potential
Legacy Vertical Moisture Profile	Absorbed Shortwave Radiation: Surface
Legacy Vertical Temperature Profile	Downward Longwave Radiation: Surface
Derived Stability Indices	Upward Longwave Radiation: Surface
Total Precipitable Water	Upward Longwave Radiation : TOA
Clear Sky Masks	Ozone Total
Downward Shortwave Radiation: Surface	SO ₂ Detection
Reflected Shortwave Radiation: TOA	Flood/Standing Water
Derived Motion Winds	Ice Cover
Fire/Hot Spot Characterization	Snow Depth (over Plains)
Land Surface (Skin) Temperature	Surface Albedo
Snow Cover	Surface Emissivity
Seas Surface Temperature (Skin)	Vegetation Fraction: Green
Radiances	Vegetation Index
	Currents
	Currents: Offshore
	Sea and Lake Ice: Age
	Sea and Lake Ice: Concentration
	Sea and Lake Ice: Motion
ABI	GLM