



GOES-R Proving Ground Introduction

Steven Goodman, James Gurka
GOES-R Program Senior (Chief) Scientist Office
NOAA/NESDIS/ GOES-R Program
<http://www.goes-r.gov>

GOES-R OCONUS Proving Ground Meeting
Honolulu, Hawaii
July 28, 2010

GOES-R Algorithm/Product Readiness

<p>Underpinning Research & Development (new applications & Day 2 Products)</p> <p>Risk Reduction</p>	<p>Pre & Post Launch Sensor Calibration and Validation</p> <p>Calibration Working Group</p>	<p>Operational Algorithm Readiness Development and Transition to Operations</p> <p><i>Algorithm Working Group</i></p>	<p>Sustained Post Launch Validation and Reactive Science Maintenance</p> <p><i>Algorithm Working Group</i></p>	<p>Proving Grounds and User Readiness</p> <p>Proving Ground & Risk Reduction</p>
--	---	---	--	--

Key components of a successful satellite program

Established GOES-R programs/activities and working groups that directly support these components

GOES-R OPERATIONAL PRODUCTS

BASELINE (25)

- Clouds and Moisture Imagery
- Clear Sky Mask
- Temperature and Moisture Profiles
- Total Precipitable Water
- Stability Parameters (Lifted Index)
- Cloud Top Pressure and Height
- Cloud Top Phase
- Cloud Particle Size Distribution
- Cloud Optical Path
- Rainfall Rate
- Aerosols Optical Depth
- Derived Motion Winds
- Hurricane Intensity
- Volcanic Ash
- Fire/Hot Spot Characterization
- Land and Sea Surface Temperature
- Snow Cover
- Downward Surface Insolation

- Lightning Detection

Advanced Baseline Imager (ABI)

GLM

OPTION 2 (34)

- Cloud Layer/Heights
- Cloud Ice Water Path
- Cloud Liquid Water
- Cloud Type
- Convective Initiation
- Turbulence
- Low Cloud and Fog
- Visibility
- Surface Albedo
- Upward and Downward Longwave Radiation
- Reflected and Absorbed Shortwave Radiation
- Total Ozone
- SO₂ Detections (Volcanoes)
- Surface Emissivity
- Aerosol Particle Size
- Vegetation Index
- Vegetation Fraction
- Snow Depth
- Flood Standing Water
- Rainfall probability and potential
- Enhanced "V"/Overshooting Top
- Aircraft Icing Threat
- Ice Cover
- Sea & Lake Ice Concentration, Age, Extent, Motion
- Ocean Currents.

Advanced Baseline Imager (ABI)

WARNING RELATED UTILITY PRODUCTS

Baseline Products:

Volcanic Ash: detection & Height
Cloud and Moisture Imagery
Hurricane Intensity
Lightning Detection: Events, Groups & Flashes
Rainfall Rate / QPE
Total Precipitable Water
Fire/Hot Spot Characterization

Option 2 Products:

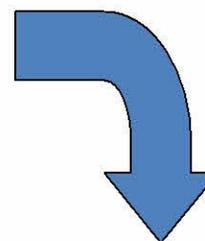
Aircraft Icing Threat
Convective Initiation
Enhanced “V” / Overshooting Top Detection
Low Cloud and Fog
SO₂ Detection

Application Teams

GOES-R Products Mapped to Algorithm Application Teams

- Imagery (Tim Schmit)
- Soundings (Chris Barnet, Tim Schmit)
- Winds (Jaime Daniels)
- Clouds (Andy Heidinger)
- Aviation (Ken Pryor, Wayne Feltz)
- Aerosols / Air Quality / Atmospheric Chemistry (Shobha Kondragunta)
- Hydrology (Robert Kuligowski)
- Land Surface (Bob Yu)
- SST and Ocean Dynamics (Alexander Ignatov)
- Cryosphere (Jeff Key)
- Radiation Budget (Istvan Laszlo)
- Lightning (Steve Goodman)
- Space Environment (Steven Hill)

- Proxy Data (Fuzhong Weng)
- Cal/Val (Changyong Cao)
- Algorithm Integration (Walter Wolf)
 - Product System Integration
 - KPP/Imagery/Visualization
 - Product Tailoring

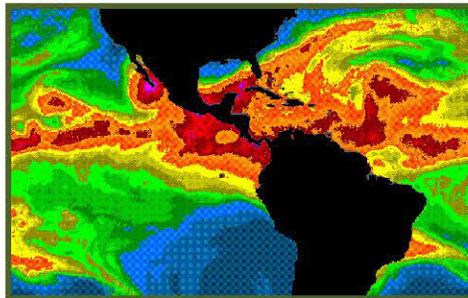
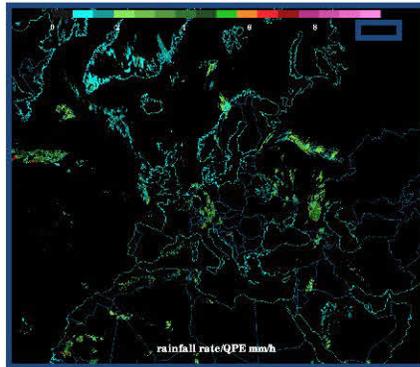


Example: AAA Application Team Make-up

Kondragunta, Shobha (STAR), Chair
Ackerman, Steven (CIMSS)
Hoff, Raymond (UMBC)
Pierce, Brad (NASA -> STAR)
Szykman, James (EPA)
Laszlo, Istvan (STAR)
Lyapustin, Alexie (NASA)
Li, Zhanqing (CICS))
Schmidt, Chris (CIMSS)

GOES-R Program requested the AWG to establish broad and cross-cutting support for the algorithms and products

Algorithm Working Group

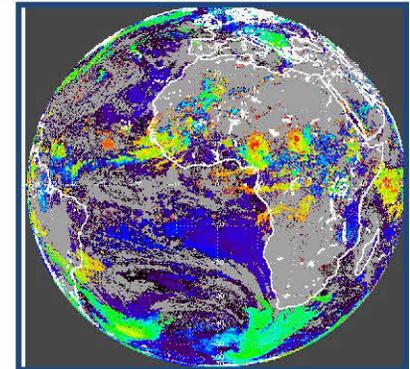
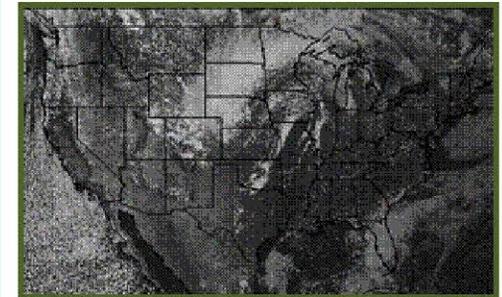


AWG Achievements:

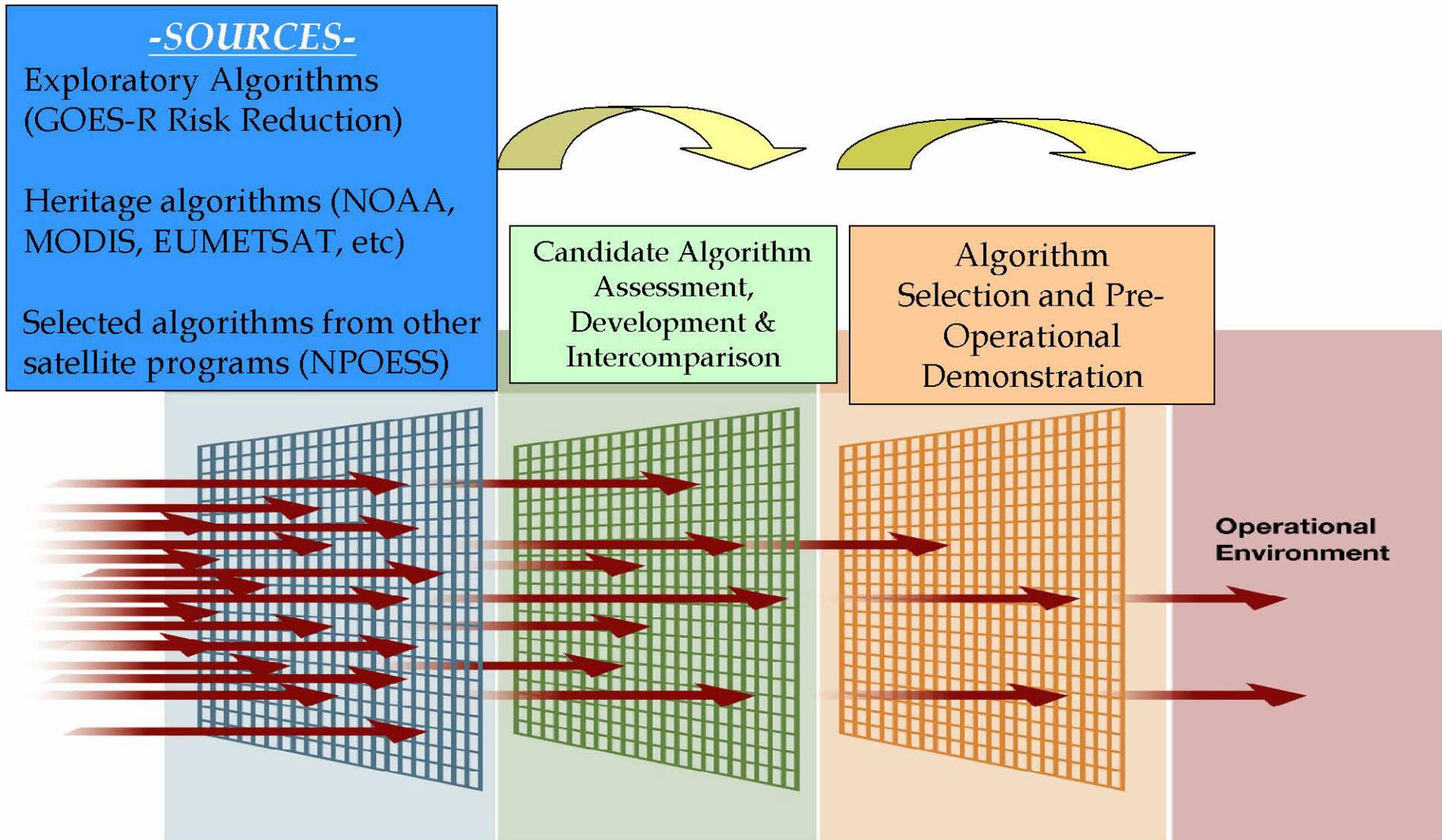
- 80% Algorithm Packages for Baseline Products completed Sept 2009

Looking forward to:

- 100% Algorithm Packages for Baseline Products due Sept 2010
- 80% Algorithm Packages for Option Products due Sept 2010



Algorithm Selection Process



Algorithm Testing and Validation

A wide variety of instrument proxy and simulated datasets are being used...

PROXY Data Sources

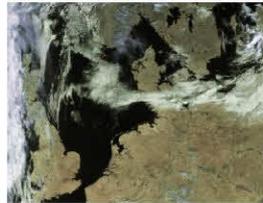
Current GOES



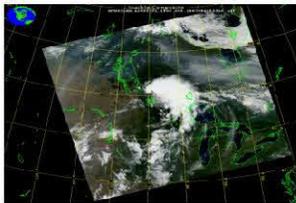
Meteosat/
SEVERI



AVHRR



MODIS

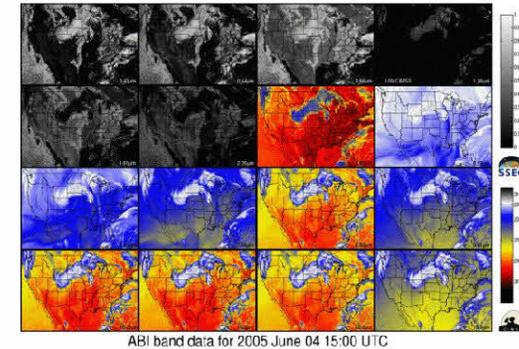


TRMM/LIS



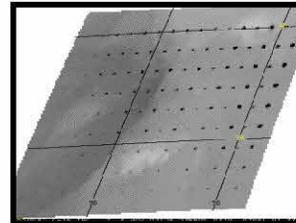
Simulated Data Sources

Simulated GOES-R ABI

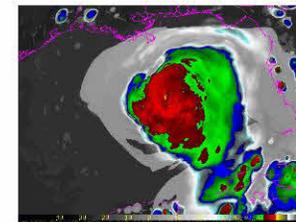


Simulated GOES-R ABI Imagery (Case Studies)

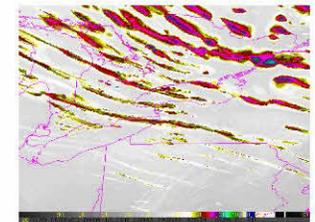
3.9um (for fires)



10.35um (Hurricane Lili)



10.35um (Lake Effect Snow)



AWG Proxy and Product Application Teams have assembled a wide variety of instrument proxy and simulated datasets to use for algorithm development, testing, and validation activities

