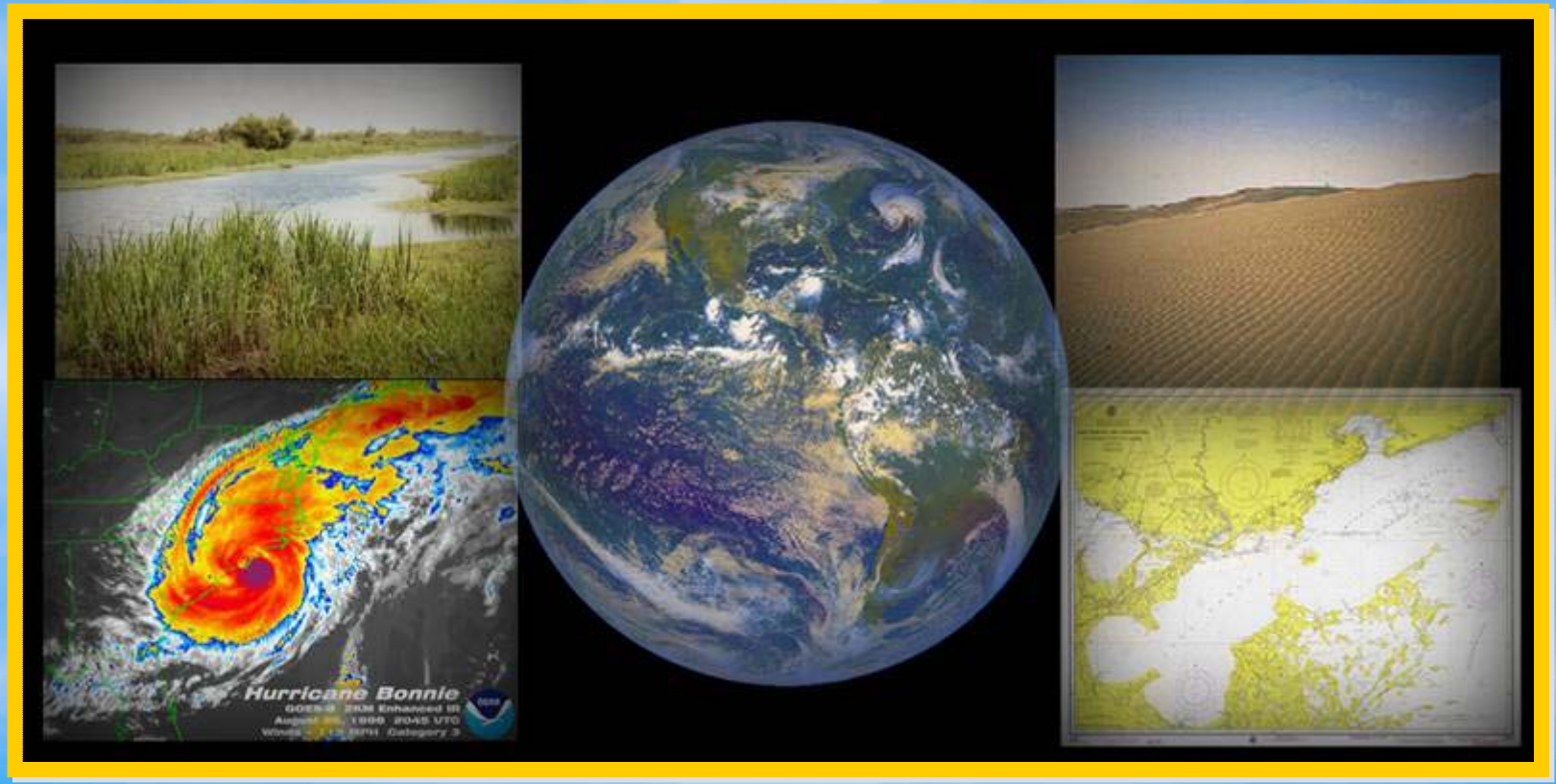
2004
Satellite Direct Readout Conference



Dr. Colleen N. Hartman
Deputy Assistant Administrator for
Satellite and Information Services

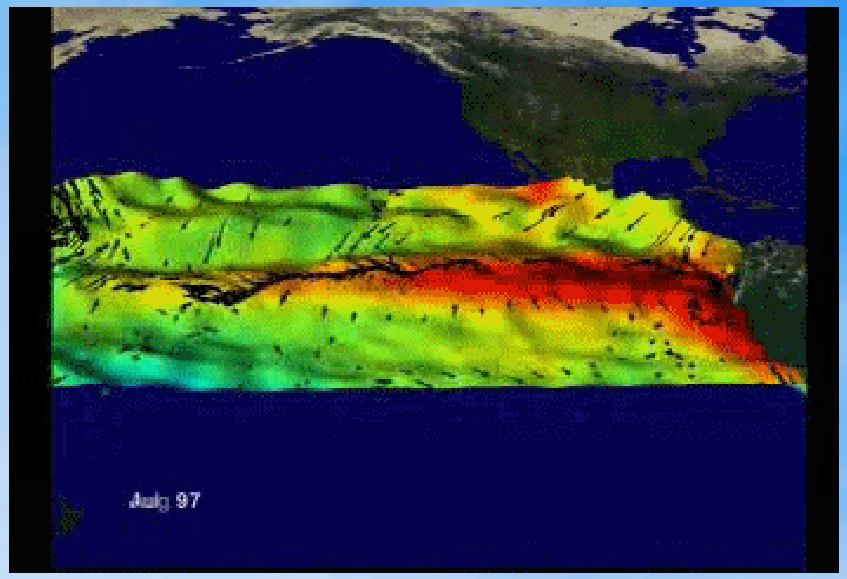
Coastal and Marine Waters Generate Over $54 Billion Annually to Goods and Services

17 Million Americans Spend $25 Billion A Year On Recreational Marine Fishing Activities

180 Million Tourist Visit America's Coastal Communities

Coastal And Marine Waters Support Over 28 Million Jobs

Localized changes in ocean temperatures
(El Niño) have a major impact on climate and weather

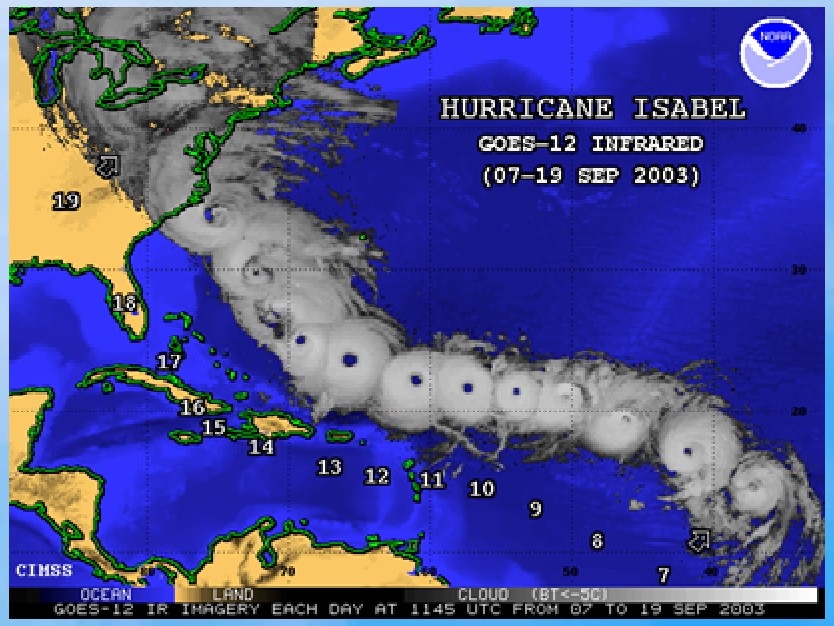


Improved El Niño forecasts benefit U.S. agriculture an estimated $265 - $300 Million annually

Floods account for $5.2 Billion in damages

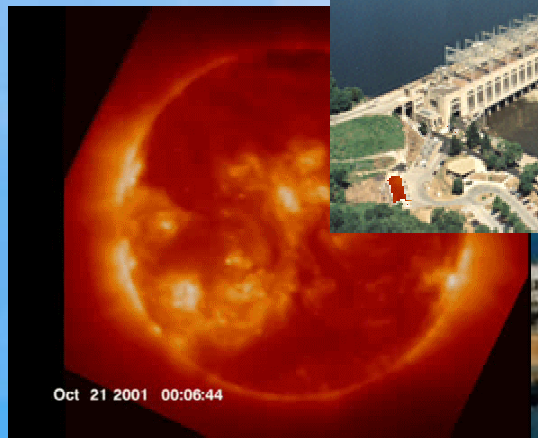
Hurricanes cause an average of $5.1 Billion in damages

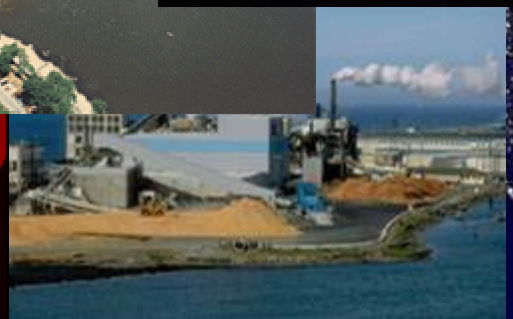
Hurricane Isabel left 27 dead In US



The 2003 Northeast U.S. Power Outage Cost An Estimated $4 To $6 Billion

Reliable Warnings Of Geomagnetic Storms To Electric Companies Alone Would Save About $450 Million Over 3 Years





Waterborne cargo alone contributes more than $740 Billion to U.S. GDP & creates employment for > 13 million Americans

NOAA Satellite and Information Services

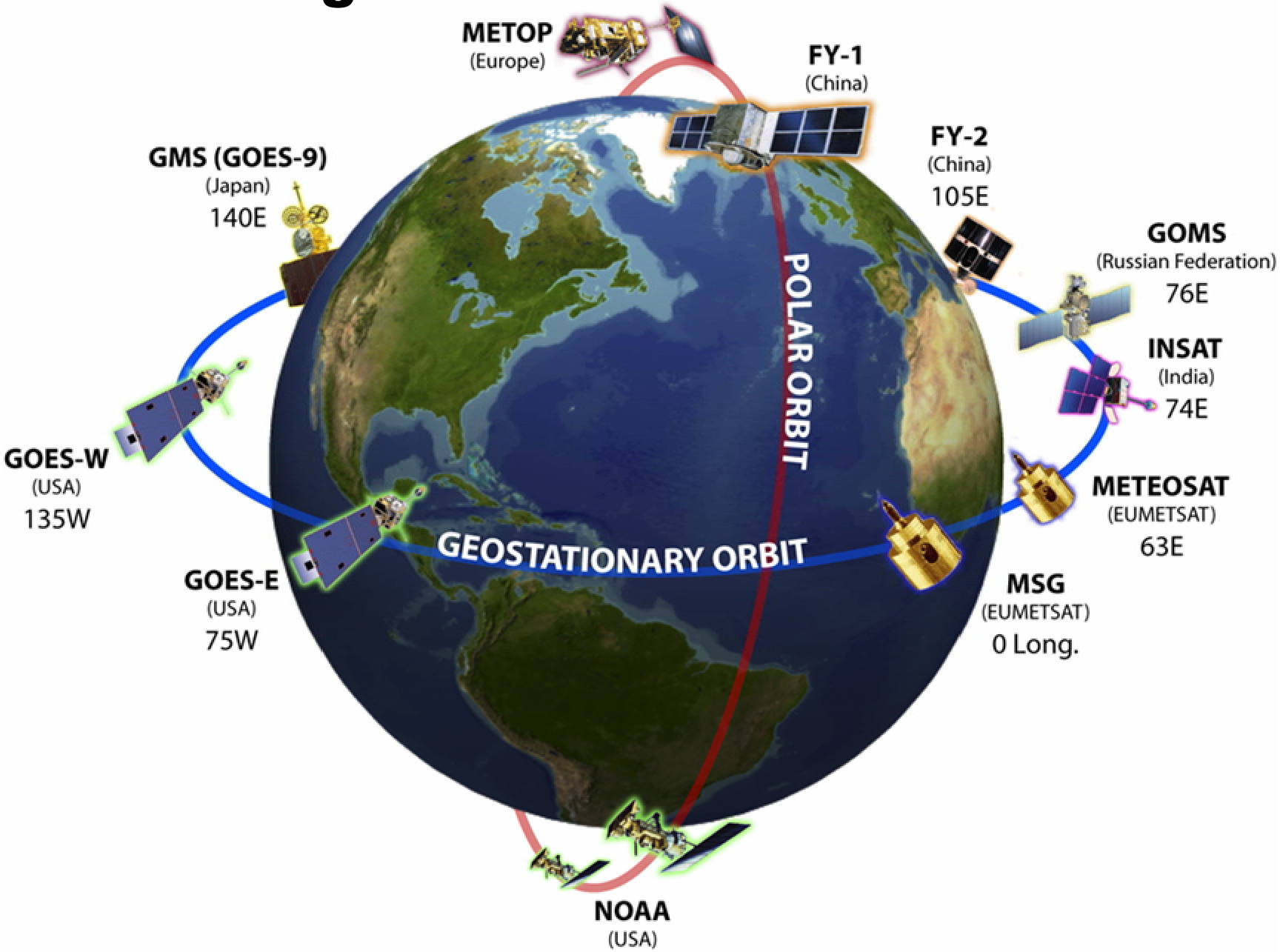
OUR VISION

To be the world's premiere source of comprehensive environmental data and information

OUR MISSION

To deliver accurate, timely, and reliable satellite observations and integrated products and to provide long-term stewardship for global environmental data in support of the NOAA mission.

Current Operational Meteorological/Environmental Satellites



Geostationary Satellites

Provides 24-hour observation of weather and Earth's environment to support storm-scale weather forecasting by forecasters and numerical models

- Warnings to U.S. public -- Detect, track, characterize
  - Hurricanes
  - Severe or tornadic storms
  - Flash flood producing weather systems
- Imagery for weather forecasting
- Sea Surface Temperature monitoring
- Winds for aviation and NWS numerical models
- Environmental data collection – platforms including buoys, rain gauge, etc.
- Search and Rescue

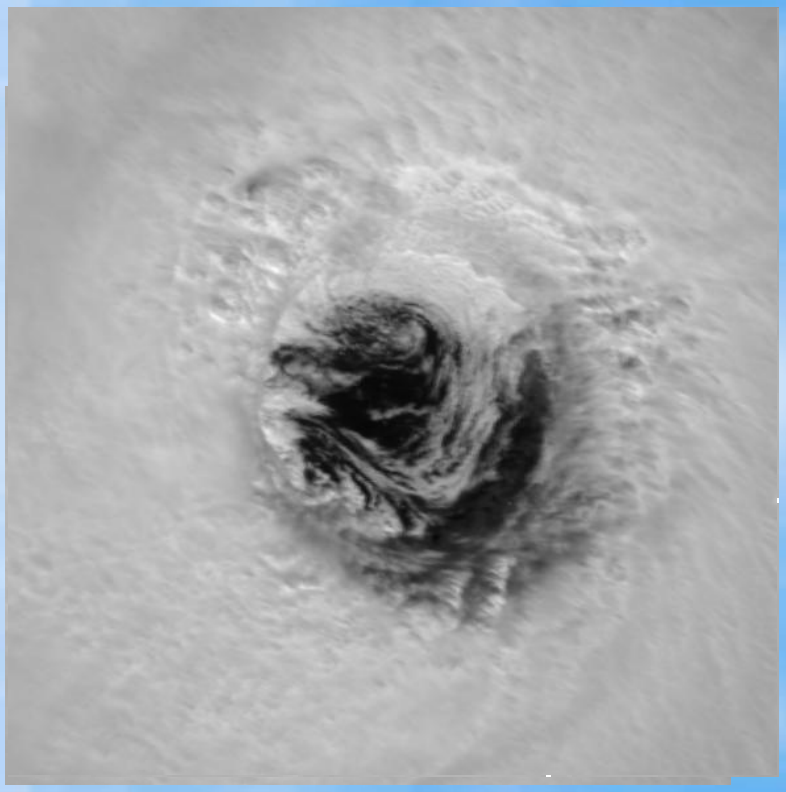
GOES-R Will Lead To Improvements

Observe Phenomena At

Higher Spatial

Resolution

Today GOES-R

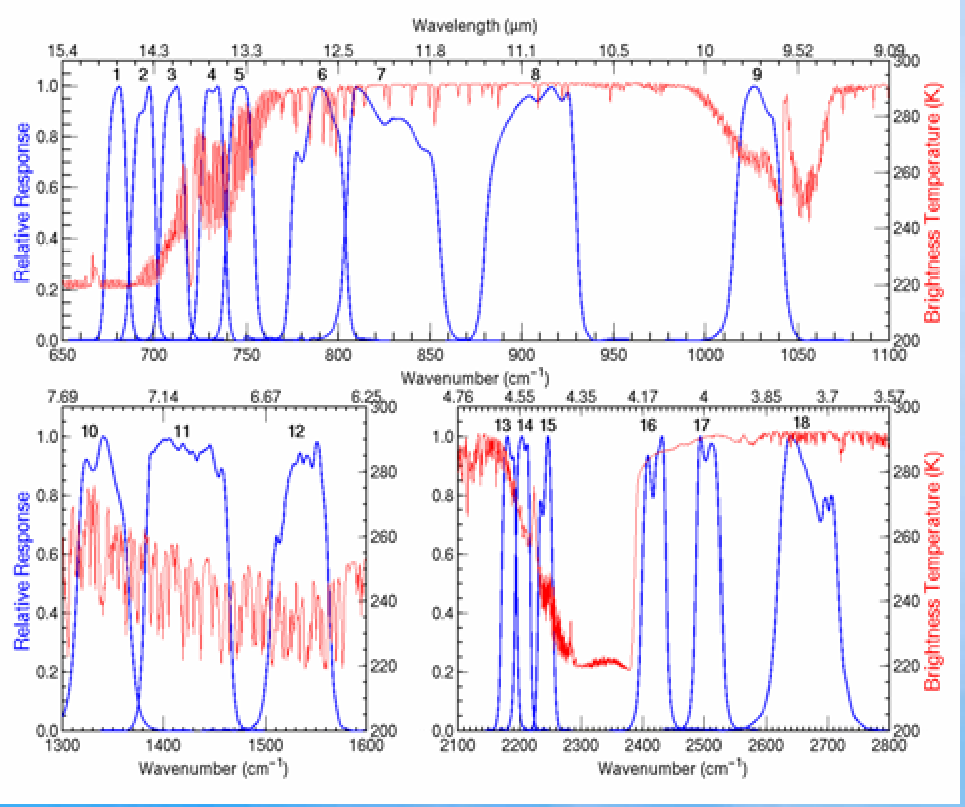


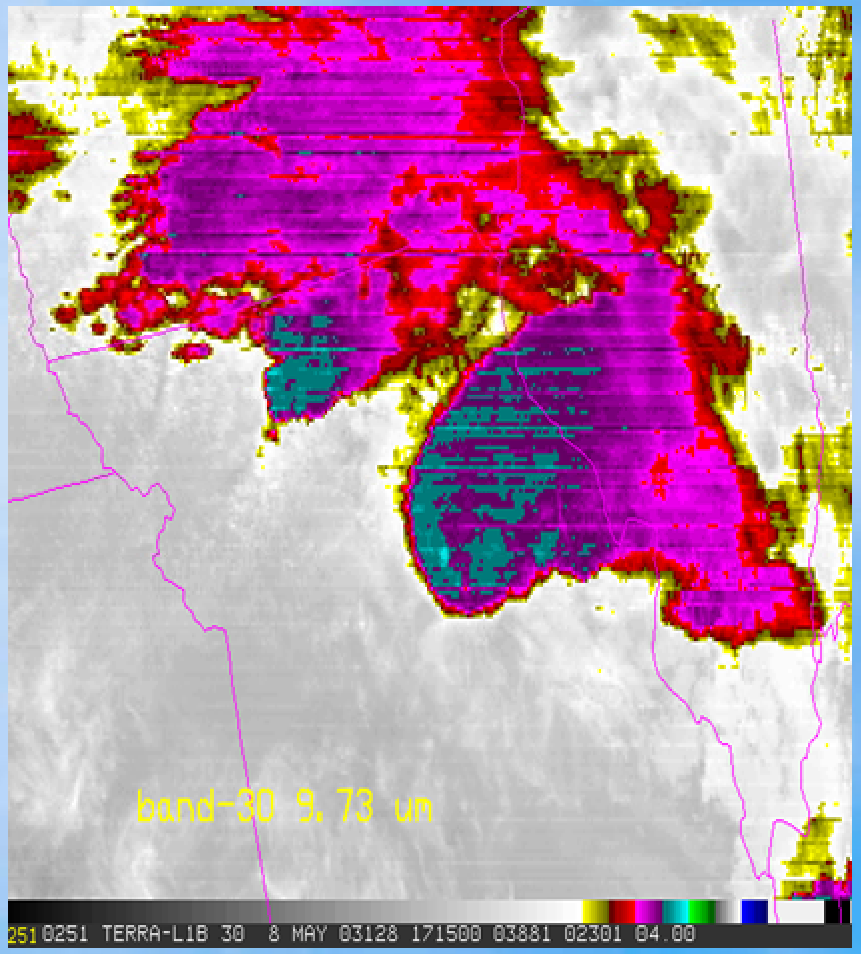
Mesoscale Vortices

GOES-R Will Lead To Improvements

Observe Phenomena With

<u>Greater Information Content</u>



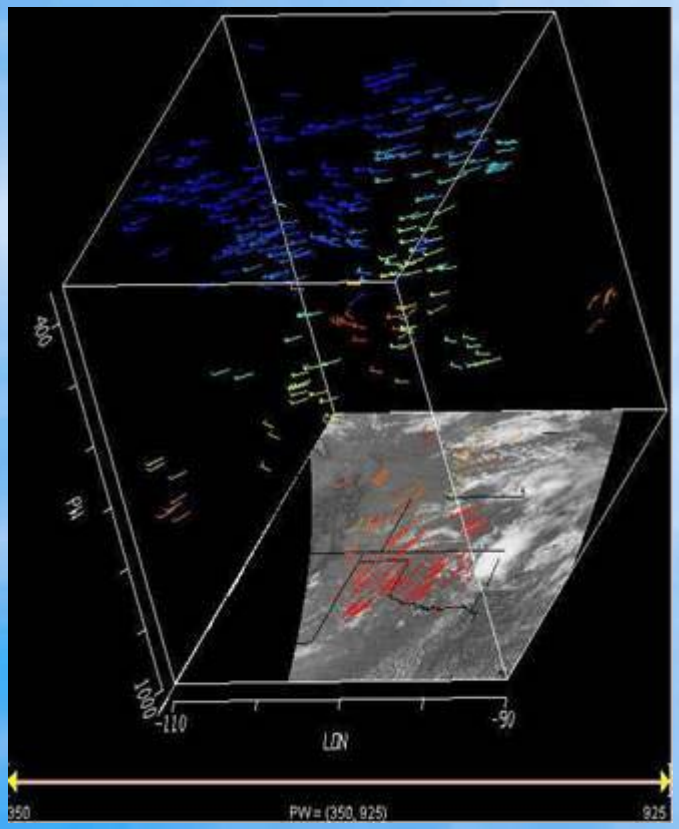


Simulated GOES-R Imagery

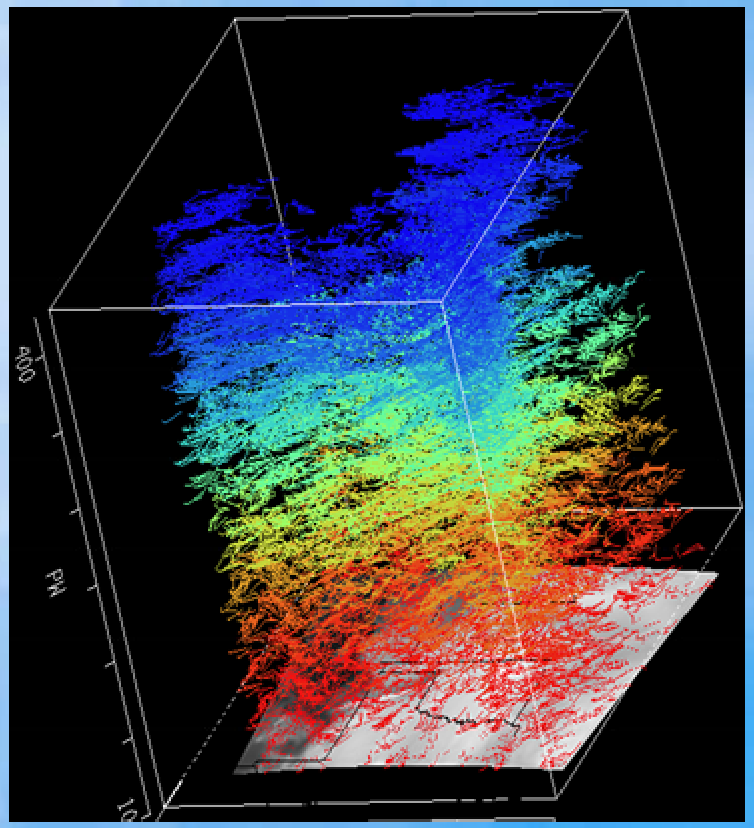
GOES-R Will Lead To Improvements

Greatly Improved Atmospheric Motion Determination

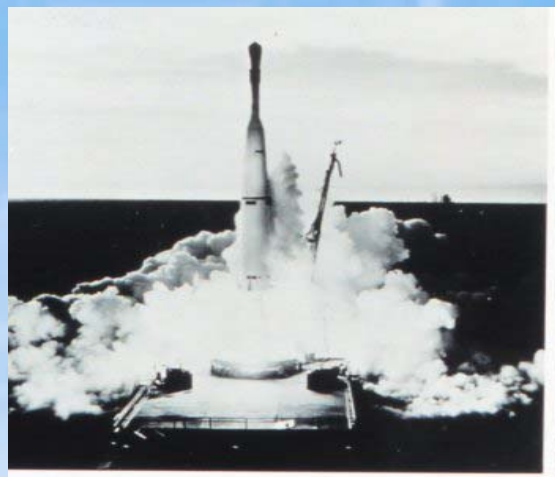
GOES-I/P

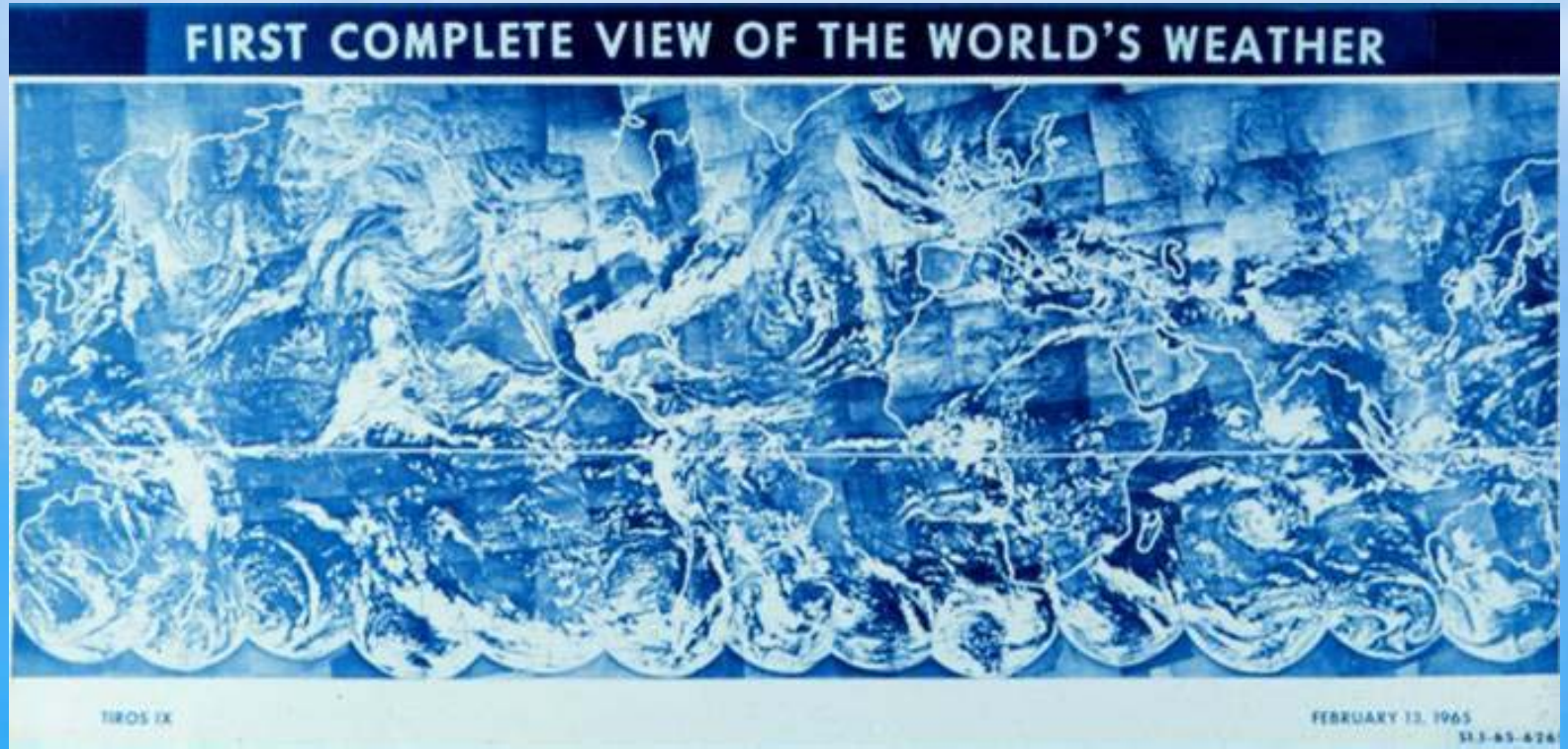


GOES-R



TIROS

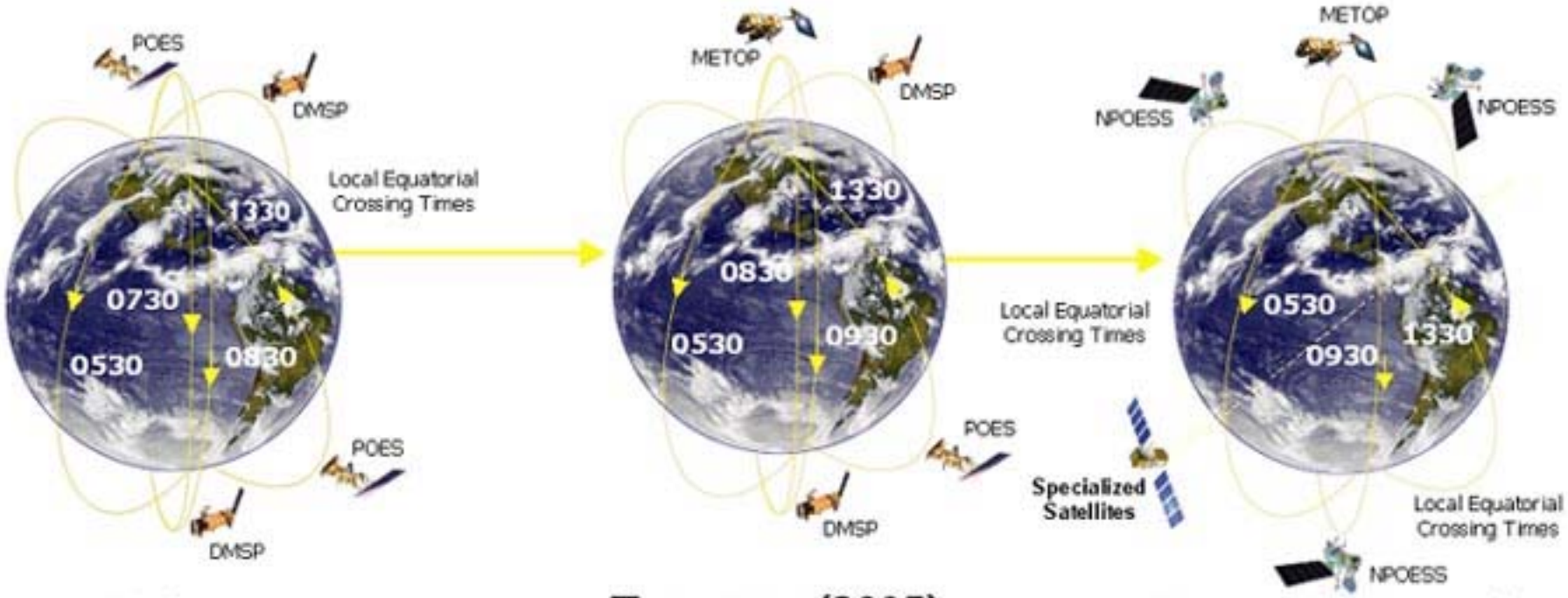



FIRST COMPLETE VIEW OF THE WORLD'S WEATHER
TIROS IX
FEBRUARY 13, 1965

Current NOAA POES

Satellite	Launch Date	Status
NOAA-N	**March 10, 2005**	Next Launch
NOAA-17	June 24, 2002	Primary AM
NOAA-16	September 21, 2000	Primary PM
NOAA-15	May 13, 1998	Backup AM
NOAA-14	December 30, 1994	Standby: Direct Readout Only
NOAA-12	May 14, 1991	Standby: Direct Readout Only
NOAA-11	September 24, 1988	Deactivated 16 June 2004

Polar Transition



Today

- 4-Orbit System
  - 2 US Military
  - 2 US Civilian

Tomorrow (2005)

- 4-Orbit System
  - 2 US Military
  - 1 US Civilian
  - 1 EUMETSAT/METOP

Future (2008-2018)

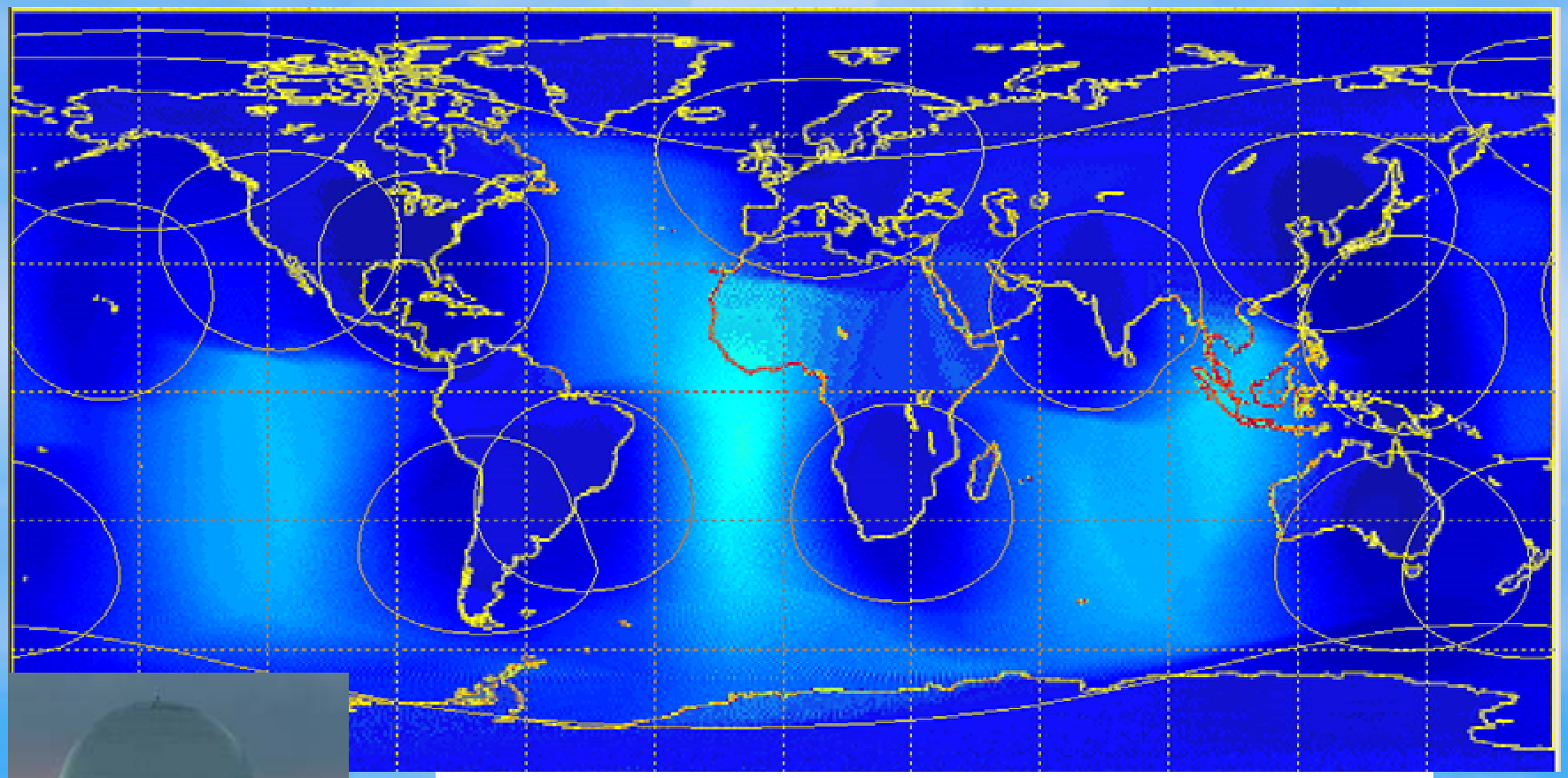
- 3-Orbit System
  - 3 US Converged
  - 1 EUMETSAT/METOP
  - Specialized Satellites

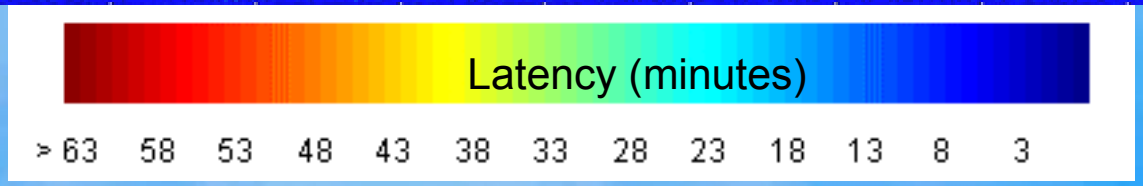
NPOESS Program Status

Program within cost, schedule, and performance specs

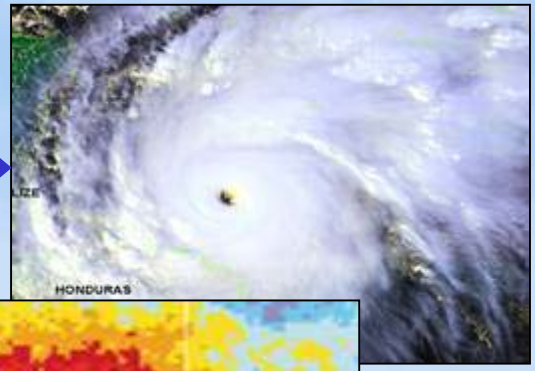
- CrIS
  - Successfully completed 1st phase of environmental qualification
  - Sensor meets or exceeds every specification
- VIIRS
  - Technical problems with optical module resolved
  - VIIRS is critical path for NPP schedule
- OMPS
  - Detector problems – fixed and on schedule
- Data processing system (IDPS) – 6 weeks behind schedule
  - Will meet delivery date for NPP

NPOESS Average Data Latency

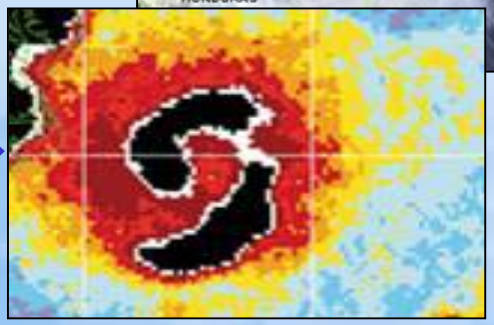




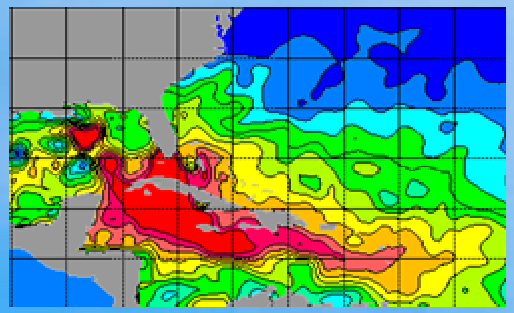
Example of NPOESS Use



Multispectral Imagery
From VIRRS…



combined with ATMS/CMIS
Microwave EDRs…



and Altimeter-Derived
Ocean Heat Content…

Supports Improved Tropical Cyclone Forecast Accuracy

N-Prime Update

- Will rebuild NOAA N-Prime satellite for December 2007 launch date
- Ensures continuity of NOAA satellite data that feeds our prediction and warning capability for weather, oceans, and climate.
- Additional rigor in quality control enforced at all levels of assembly

Satellite Operations Control

24-hour Operations for GOES and Polar Systems

- Command and Data Acquisition Stations at Wallops, Virginia, and Fairbanks, Alaska

- Functions include:
  - Data Acquisition
  - Spacecraft Navigation
  - Commanding GOES to perform special image acquisition (rapid image scan operations)
  - Orbit Determination
  - Onboard Tape Recorder Scheduling
  - 24-hour mission control center for search and rescue

Unique Role of NOAA's National Data Centers

- Acquire environmental data from U.S. and foreign sources
- Preserve the Nation's environmental data assets
- Assemble data into easy to use long-term data sets
- Provide access to environmental data for business, federal, and science users
- Describe the environment; NOAA scientists play key roles in the Intergovernmental Panel for Climate Change

Satellite Data Processing and Distribution

24-hour Operational Support for Severe Weather & Environmental Forecasting

Operational Products

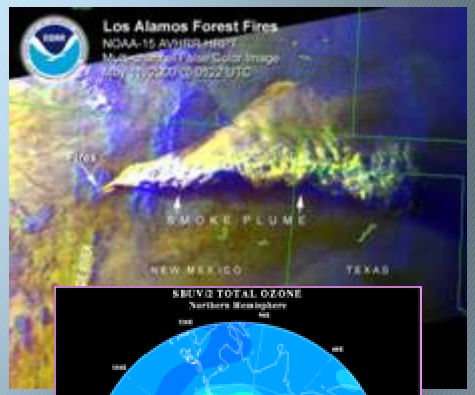
- Atmospheric Temperature & Moisture Profiles
- Gridded Earth Images
- Measure Solar Radiation
- Sea Surface Temperature
- Winds
- Fire Detection
- Vegetation Index
- Volcanic Detection
- Snow & Ice Cover

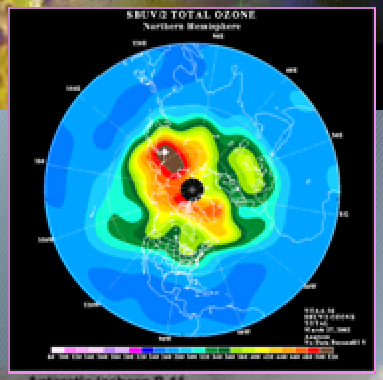
Environmental Monitoring

–Ozone Retrievals & Products

Distribution Services

–Distribution of POES, GOES, DMSP, ERS-1, GMS, and METEOSAT WEFAX





U.S. Contribution to GEOSS

Vision:
Enable a healthy public, economy, and planet through an integrated, comprehensive, and sustained Earth observation system.

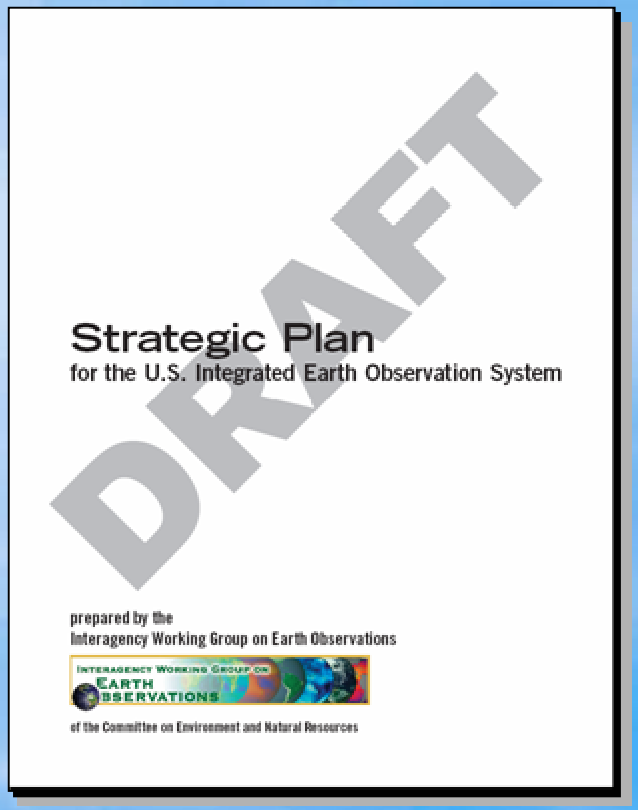
National Plan

Public comment period ended November 30, 2004

- Available at http://iwgeo.ssc.nasa.gov/
- 2005 Workshop planned

Establish formal USG mechanism

- Capable of committing necessary resources and implementing functions



CIMSS
Image Index
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3: 2004AUG10/23: 15: 00UTC
4: 2004AUG11/21: 15: 00UTC
5: 2004AUG12/19: 45: 00UTC
6: 2004AUG13/18: 15: 00UTC
7: 2004AUG14/09: 15: 00UTC
8: 2004AUG14/21: 15: 00UTC
Hurricane Charley
August 9-14, 2004
TROPICAL DEPR
TROPICAL STORM
CATEGORY 1
CATEGORY 2
CATEGORY 3
CATEGORY 4
CATEGORY 5
MONTAGE OF CHARLEY
GOES-12/INFRARED
UW-CIMSS
NOAA

CIMSS
Image Index
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Hurricane Frances
August 25 - September 7, 2004
TROPICAL DEPR
TROPICAL STORM
CATEGORY 1
CATEGORY 2
CATEGORY 3
CATEGORY 4
CATEGORY 5
MONTAGE OF FRANCES
GOES-12/INFRARED
UW-CIMSS
NOAA

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September 4-15, 2004
TROPICAL DEPR
TROPICAL STORM
CATEGORY 1
CATEGORY 2
CATEGORY 3
CATEGORY 4
CATEGORY 5
MONTAGE OF IVAN
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Hurricane Jeanne
September 13-27, 2004
TROPICAL DEPR
TROPICAL STORM
CATEGORY 1
CATEGORY 2
CATEGORY 3
CATEGORY 4
CATEGORY 5
MONTAGE OF JEANNE
GOES-12/INFRARED
UW-CIMSS
NOAA

Satellite Direct Readout Customers

- World Meteorological Organization
- Government agencies (U.S. and Foreign)
- International Meteorological Services
- Schools, Universities, Colleges, and Technical Institutes
- Commercial Venders and Equipment/Software Manufacturers
- Marine Transportation Industry
- Utility Companies (Hydroelectric Power Plants)
- Meteorological/Hydrological Services
- Radio and Television Broadcast Stations
- Private organizations and Individuals
- Military
- Other

Satellite Direct Readout Receivers

Voluntary Reporting:

Meteorological Services in the Western Hemisphere use NOAA Data

130 GOES GVAR Sites (excluding military)
3860 Data Collection Platforms
350 – 400 APT Receivers
75 -100 HRPT Receivers

Central South America and Caribbean:

58 GOES GVAR Sites
1781 Data Collection Platforms

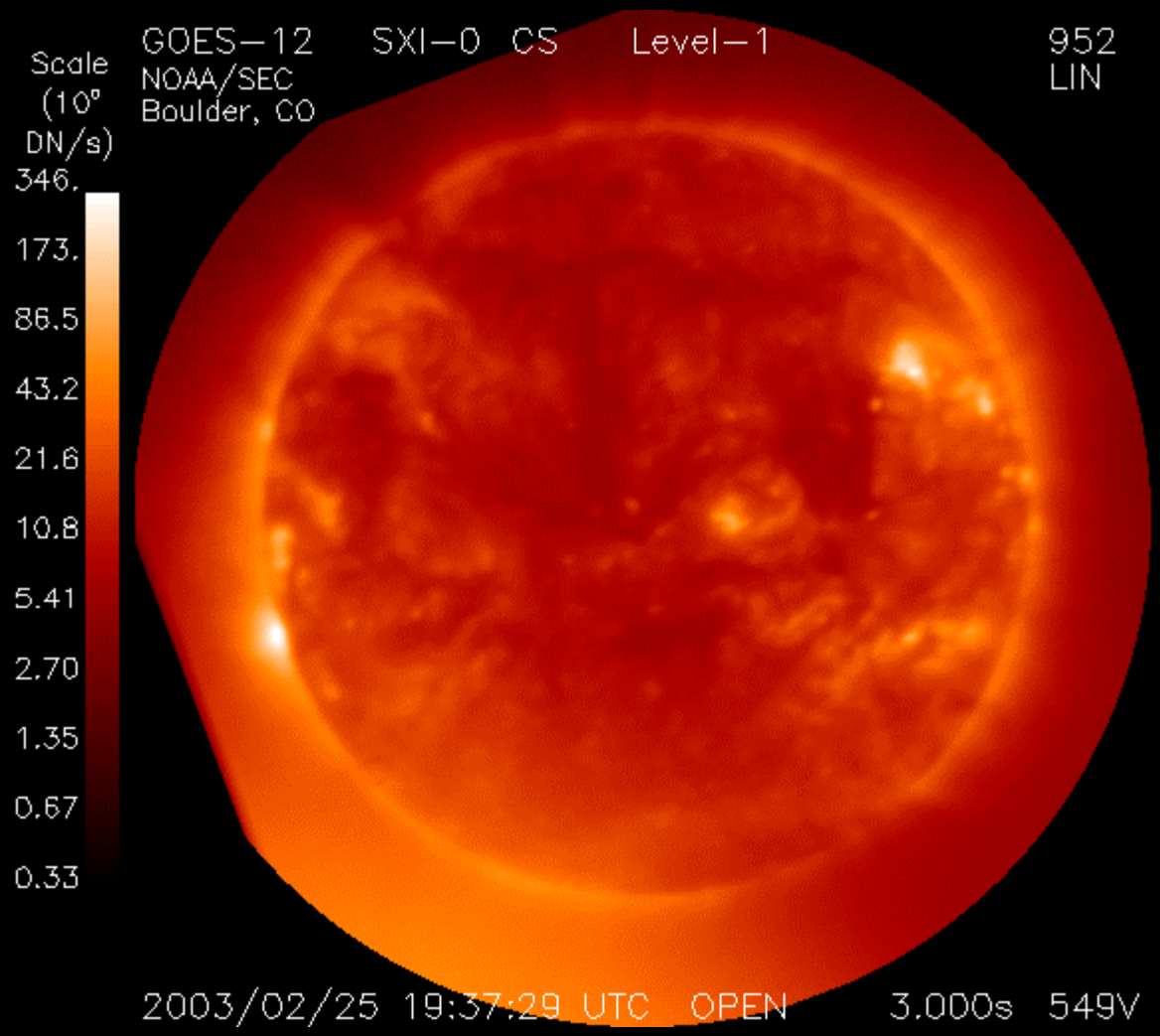
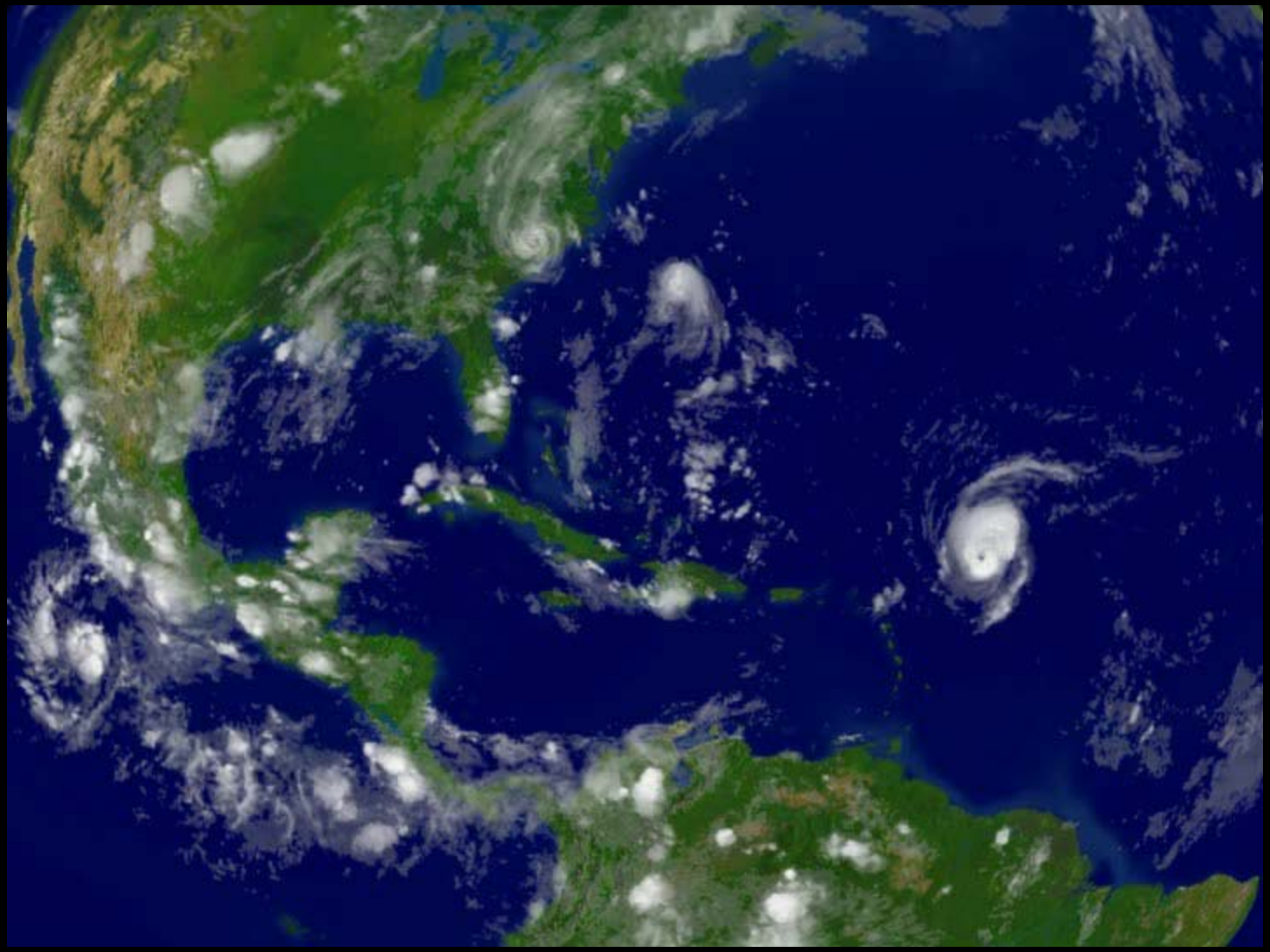
Canada:

15 GOES GVAR Sites
2079 Data Collection Platforms

World Wide Estimates:

- APT = 5,000 – 10,000
- HRPT = 1,000 – 2,000
- HR / GVAR = 1,000 – 2,000

NOAA Satellite Direct Readout Conference Goals

- A Decade in Transition:
  - Listen to users who receive data directly from NOAA's environmental satellites
  - Inform users of the innovative new changes in direct readout technologies coming within the next decade
  - Provide a forum to help users prepare for upcoming changes as NOAA transitions to new direct broadcast technologies
  - Offer users the opportunity to provide feedback on upcoming satellite changes
  - Engage in two-way communication among NOAA and the user community

GOES-12 Solar X-ray Imager