Polar-Orbiting Product Applications

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Agenda

• NOAA and SSD Mission
• Major Customers
• Current and Future POES Product Applications
Mission

- **NOAA’s Mission:**
  
  To understand and predict changes in Earth’s environment and manage coastal and marine resources to meet our Nation’s economic, social and environmental needs

- **SSD’s Mission:**
  
  To provide real-time global satellite products, interpretive analyses and other information from polar-orbiting and geostationary satellites to a diverse user community for environmental assessment, prediction and stewardship.
Major Customers

• **Numerical Weather Prediction Centers**
  – National Centers for Environmental Prediction (NCEP)
  – Joint Center for Satellite Data Assimilation (JCSDA) -- NOAA, NASA & DoD
  – FNMOC, ECMWF, UK Met Office, Meteo France, Japanese Met. Service

• **National Weather Service**
  – Forecast Field Offices (AWIPS - Advanced Weather Interactive Processing Sys)
  – River Forecast Centers (RFC)
  – Alaskan VAAC

• **NOAA Coast Watch** (six regional nodes); **Ocean Watch** (N Pacific Demo)

• **Other U.S. Federal Government Agencies**
  – Dept of Defense (Joint Typhoon Warning Center)
  – Dept of Interior
  – Dept. of Agriculture
  – Federal Aviation Administration (FAA)
  – EPA

• **Global Climate Community**
INSTRUMENTS

- **AVHRR** - Imaging radiometer
- **HIRS** - Infrared sounder
- **AMSU-A** - Microwave sounder
- **AMSU-B** - Microwave humidity sounder
- **SBUV** - Ozone instrument
- **SEM** - Space environment instrument
- **DCS** - Data collection system
- **SARSAT** - Search and rescue system
DATA to PRODUCTS

Derived Product Processing

Level 1b Data

- AVHRR HRPT
- AVHRR GAC
- AVHRR LAC
- HIRS Level 1b
- AMSU-A Level 1b
- AMSU-B Level 1b
- SBUV Level 1b
- SEM Level 1b

Input Data

- Significant Event Imagery
- Atmospheric Temperature
- Atmospheric Moisture
- Snow/Ice Coverage
- Precipitation
- Aerosols
- Ozone
- CoastWatch
- Winds
- Sea Surface Temp
- Solar Environment Monitoring
- Radiation Budget
- Vegetation Index
- Sea Ice Monitoring
- Cloud Imagery

Processing Steps
Current Products

Satellite Products (SATPROD)
http://satprod.osd.noaa.gov/satprod/controlcenter.cfm
Current Products
SATPROD Website

24 Satellites

Sensors

Product Groups
1. Products

- Snow Depth Measured (SSMI)
- Snow Depth Orbital (MSFPS)
- Snow Water Equivalent (MSFPS)
- Snow Water Equivalent (SSMI)
- Soil Moisture Measured (SSMI)
- Soil Moisture Orbital (SSMI)
- Soil Wetness Index Daily (SSMI)
- Soil Wetness Index Forecast (SSMI)
- SPAROS (SIMS)
- SSM/Tb1b (DPD)
- SSM/Tb21b (POF)
- SST Anomalies Daily (POES)
- SST Anomalies Monthly (POES)
- SST Full Disk (GOES)
- SST Global Observations (NAVCEANS)
- SST Global Observations (NOAA)
- SST Global Scale Analysis 100 km (POES)
- SST Global Scale Analysis 50 km (POES)

Filter by Measurement Category
- All Measurement Categories

See Related Web Site

http://www.osdpd.noaa.gov/PSB/PSB.html

Welcome to the Environmental Product System's Ocean Page

Top Sites

- Sea Surface Temperature Contour Charts
  (14-100 km resolution)
- Sea Surface Temperature Analyzed Fields
  (14-100 km resolution)
- Sea Surface Temperature Anomaly Imagery
  (get the latest El Nino/La Nina information)
Sea Surface Temperature
Coral Reef Early Warning System

Satellite Cal/Val - In situ towers

Bleaching Event: Great Barrier Reef

12/4/2001
Ocean Color

Chlorophyll-a from MODIS
Sep 30, 2004

Harmful Algal Bloom
22 Aug 2001
Operational Significant Event Imagery (OSEI)

Hurricane Isabelle (Sept 15, 2003) N-15 AVHRR CH’s 1,2,4
TEMPERATURE FIELDS
HIRS-3/AMSU-A

850mb – 1500m

700mb – 3000m

500mb – 5500m
Aerosols
Total Ozone
Green Vegetation Faction
(Derived from AVHRR NDVI Product)
Drought/Vegetation Health

Time Series of US and State Drought-affected Area

Intensive vegetation stress 2000-2003
HORN of AFRICA

Percent of area under stress
Snow/ Ice Program

- Interactive Multisensor Snow and Ice Mapping System (IMS)
- Produced once per day (approximately 4 km)
- Used daily as a primary input to several NCEP forecast models
Hazards Support

Fire Products

- Geo-referenced images distributed on Fire Web-GIS page.

Mt Saint Helens 4 Oct 2004
NOAA-17 Image
Tropical Rainfall Potential (TRaP)

- Generated whenever a new tropical storm forecast bulletin or new microwave rain rate data becomes available for a given numbered or named storm.

24 hour forecast of rainfall potential
Monthly Average Rain Rate

N15 RR (mm/hr) 1-Deg Monthly Average 2001–12

Longitude

Latitude

0.00 0.40 0.80 1.20 1.60 2.00
Polar Winds

- Assimilation into numerical weather prediction
  - ECMWF, JMA, CMC, UK Met, FNMOC, NCEP, & others

- Impact: ECMWF reported a fairly large forecast improvement for the northern hemisphere
Future Operational Satellites
Improved Product Support

• Initial Joint Polar System (IJPS) Readiness
  - NOAA-N HIRS-4 and MHS Instruments
  - METOP Instruments (IASI, ASCAT, GRAS, GOME) and global 1 km AVHRR data

• NPP/NPOESS Planning
  - 146 NPOESS product requirements supporting 628 NOAA mission needs
Questions
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