Talk Structure

- **NOAA Atmospheric Motion Vector (AMV)**
  - Constellation Status and launch Schedule
  - NOAA Satellite Data Flow
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  - Near-Term Updates of NOAA AMV

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Current GOES Constellation

• GOES I-M (8-12) series operational since 1994
  *GOES-12 providing coverage of South America at 60°W - May 10, 2010

• GOES N/O/P (13/14/15)
  *GOES-13 operational as GOES-East at 75° W – April 14, 2010
  *GOES-14 in Z-axis storage at 105° W – launched June 27, 2009
  *GOES-15 operational as GOES-West at 135°W – December 6, 2011

* = new since last workshop
http://www.nesdis.noaa.gov/FlyoutSchedules.html
Current POES Constellation

- **NOAA POES**
  - NOAA 19 PM Primary – June 2, 2009
  - NOAA 18 AM Secondary – August 20, 2005
  - NOAA 17 AM Backup – October 15, 2002
  - NOAA 16 PM Secondary – March 20, 2001

- **EUMETSAT POES**
  - METOP-A AM Primary – May 21, 2007
Continuity of NOAA’s Polar (Primary) Operational Satellite Programs

Fiscal Year

| Year | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| DoD  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      | DMSP 17 | DMSP 19 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      | Morning Orbit |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| DoDEUMETSAT |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      | DMSP 16 | DMSP 18 | DMSP 20 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |    |    |    |    |    |    |    |    |    |    |    |    | EPS - SG (Follow-on) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| NOAA |    |    |    |    |    |    |    |    |    |    |    |    |    | NOAA - 19 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |    |    |    |    |    |    |    |    |    |    |    |    |    | NASA NPP |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
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| Approved: |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

http://www.nesdis.noaa.gov/FlyoutSchedules.html

NOAA Satellite and Information Service: National Environmental Satellite, Data, and Information Service (NESDIS)
NOAA Satellite and Information Service: National Environmental Satellite, Data, and Information Service (NESDIS)

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Satellite Data Flow

Fairbanks Ground Station - POES
GOES 15 (West)
GOES 13 (East)
POES NOAA 19 (PM)
METOP-A (AM)

Command and Control

Process and Distribute

Environmental Satellite Processing Center

Data Products

Archive and Access (CLASS)

Users

Non-NOAA

Environmental Satellite Processing Center

NOAA Satellite and Information Service: National Environmental Satellite, Data, and Information Service (NESDIS)
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## Operational AMV Products

<table>
<thead>
<tr>
<th>AMV Product</th>
<th>Frequency (Hours)</th>
<th>Image Sector (s)</th>
<th>Image Interval (min)</th>
<th>GTS WMO Header</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GOES IMAGER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LWIR (11um) Cloud-drift</td>
<td>3</td>
<td>NH and SH CONUS and PACUS</td>
<td>30 15</td>
<td>JACX11- GOES-E JCCX11-GOES-W</td>
</tr>
<tr>
<td>SWIR (3.9um) Cloud-drift</td>
<td>3 (Night-time)</td>
<td>NH and SH CONUS and PACUS</td>
<td>30 15</td>
<td>JQCX11- GOES-E JRCX11- GOES-W</td>
</tr>
<tr>
<td>Water Vapor (6.7um)</td>
<td>3</td>
<td>NH and SH</td>
<td>30</td>
<td>JECX11- GOES-E JGCX11- GOES-W</td>
</tr>
<tr>
<td>Vis Cloud-drift (0.65um)</td>
<td>3 (Daytime)</td>
<td>NH and SH CONUS and PACUS</td>
<td>30 15</td>
<td>JHCX11- GOES-E JJCX11- GOES-W</td>
</tr>
<tr>
<td><strong>GOES SOUNDER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sounder WV (7.4um)</td>
<td>3,6</td>
<td>CONUS/Tropical</td>
<td>60</td>
<td>JKCX11- GOES-E JMCX11-GOES-W</td>
</tr>
<tr>
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<tr>
<td><strong>MTSAT-2</strong></td>
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</tr>
<tr>
<td>LWIR Cloud-drift*</td>
<td>3</td>
<td>NH and SH</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>SWIR Cloud-drift*</td>
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<tr>
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* = Only distributed to NOAA AWIPS
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<tr>
<td><strong>AQUA/TERRA MODIS</strong></td>
<td></td>
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</tr>
<tr>
<td>LWIR Cloud-drift</td>
<td>2</td>
<td>NHEM; SHEM (poleward 65° Lat)</td>
<td>100</td>
<td>JBCX11- Terra JICX11- Aqua</td>
</tr>
<tr>
<td>Water Vapor</td>
<td>2</td>
<td>NHEM; SHEM (poleward 65° Lat)</td>
<td>100</td>
<td>JFCX11- Terra JLCX11- Aqua</td>
</tr>
<tr>
<td><strong>AVHRR POES</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LWIR Cloud-drift</td>
<td>2</td>
<td>NHEM; SHEM (poleward 65° Lat)</td>
<td>100</td>
<td>JCVX91- NOAA15 JCVX92- NOAA16 JCVX94- NOAA18 JCVX95- NOAA19 JCVX97-METOP-A</td>
</tr>
</tbody>
</table>
AMV Products Web Pages

High Density Winds

- GOES East
  - Infrared
    - Northern Hemisphere
      - Loop
    - Southern Hemisphere
      - Loop
  - Water Vapor
    - Northern Hemisphere
      - Loop
    - Southern Hemisphere
      - Loop

- GOES West
  - Infrared
    - Northern Hemisphere
      - Loop
    - Southern Hemisphere
      - Loop
  - Water Vapor
    - Northern Hemisphere
      - Loop
    - Southern Hemisphere
      - Loop

http://www.goes.noaa.gov/WINDS/index.html
AMV Product Web Pages

High Density Winds

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    - Southern Hemisphere
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    - Northern Hemisphere
    - Southern Hemisphere
- GOES West
  - Infrared
    - Northern Hemisphere
    - Southern Hemisphere
  - Water Vapor
    - Northern Hemisphere
    - Southern Hemisphere

Statistics

Wind data available in
MetDAS MD file and
ASCII formats via FTP

http://www.goes.noaa.gov/WINDS/index.html

NOAA Satellite and Information Service: National Environmental Satellite, Data, and Information Service (NESDIS)
AMV Product Process Monitor

For Geo Winds...
AMV Product Process Monitor

For AVHRR Winds...

Monitor of MODIS Aqua/Terra/Mixed...

Cloud Drift Winds of Aqua (CDAQ)

METOP High Density Winds

NOAA-19 High Density Winds
AMV Product Quality Monitor

- Daily Comparisons of AMVs with Radiosonde Observations

http://www.goes.noaa.gov/WINDS/statistics.html
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Near-Term Updates of AMV

- **Recent enhancement to all AMVs (April 2012)**
  - Increase number of vertical levels for forecast data
  - Improved height assignment of low level AMVs over ocean when a low level temperature inversion is detected
  - Schema upgrades

- **GOES Hourly Winds (June 2012)**
  - GOES-E/W hourly winds are available for testing at NESDIS/STAR now
    - Improved height assignment of low level AMVs over ocean when a low level temperature inversion is detected
    - Actual scan line time to each satellite wind observation
    - BUFR files (with EE quality indicator)
    - More timely
  - First will generate the products on a parallel server and make AMVs available for users’ testing *(As early as April 2012)*
  - Then will replace current 3-hour winds at operational site once getting users’ agreement
Near-Term Updates of AMV

- **NPP VIIRS Polar Winds (Oct 2012)**
  - NPP was successfully launched on Oct 23, 2011
  - NPP VIIRS Polar Winds will be run on NPOESS Data Exploitation (NDE) system which will handle observations of the Earth and atmosphere from NPP and JPSS satellites
  - AMVs generated from Band M15 (10.7μm)
  - Product will be available in BUFR and NETCDF4

*First NPP Visible Global Image from NDE*
Near-Term Updates of AMV

- **Mixed (Aqua+Terra) Modis Polar Winds (Jan 2013)**
  - Finalize the improvements (time-tagging) to the product and quantify the impact through comparisons to single satellite

- **METOP-B AVHRR Polar Winds (Feb 2013)**
  - METOP-B will be operational at NOAA 9-month after launch
  - Decision on receiving both METOP-A and B streams or single stream at NOAA will be made in the end of year 2012
Near-Term Updates of AMV

- **New GOES Winds Process System (Mar 2013*)**
  - GOES-R wind algorithm will be used to generate GOES winds from current GOES satellites (GOES-13 and GOES-15)
  - Provide continuity between wind products generated from the operational constellation GOES satellites that will at some point include a current GOES series satellite and the new GOES-R satellite
  - Product accuracy and precision that will be as good or better than the current operational product algorithm
  - Planning to allow users to do enough testing before retiring current GOES winds system and promoting new GOES winds system into the operation

* Date reflects when these AMVs available in Pre-operational Environment at NESDIS operations
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Operational ASCAT Wind Products

Utilize the measurements from ASCAT aboard the EUMETSAT METOP satellite

Main ASCAT wind products include

- ASCAT Ocean Surface Wind Vectors data of 50km resolution
- ASCAT Ocean Surface Wind Vectors data of 25km resolution
- ASCAT Ultra High Resolution Winds (Based on storms)
ASCAT Global Wind Product
ASCAT UHR Wind Product
ASCAT Wind Product Monitor
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Future Plan of Scatterometer Wind Products

- NOAA OSCAT Winds from India OceanSat-2 (Jan 2014)
  - Based on Ku-band radar cross-section measurement and the measurement methodology similar to QuikSCAT
  - OSCAT wind products will largely mitigate the loss of QuikSCAT
  - NOAA will develop the own OSCAT scatterometer data process system
SWDP would be designed for OSCAT, yet be expandable to process scatterometer wind measurements from both single and double frequency scatterometers, as well as rotating and stick antenna designs.

- NOAA SWDP will satisfy unique NOAA user’s operational product requirements and quality monitoring.
Other Future Scatterometer Wind Products

- METOP-B ASCAT Wind Products (2012)
- Oceansat-3 Ocean Surface Wind Products (2014 proposed)
- GCOM-W2 Ocean Surface Wind Products (2016 proposed)