Unidata Policy Committee
NOAA/NWS Update
May 12, 2009
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Office of Climate, Water, and Weather Services
NOAA’s National Weather Service

Outline
• AWIPS I Update
• NWS Strategic Plan development
• NPOESS Update
• NOAA’s role in Renewable Energy

AWIPS I Update
• AWIPS I – final release being extended to fix software problems
• Last release before AWIPS Migration
• Regions have identified a series of Discrepancy Reports which affect Operations and require fixing before AWIPS Migration
• Last AWIPS I Build 9.3 released delayed from Sept 09 to Jan 10 – suggests potential delay to AWIPS Migration schedule

National Weather Service
Customer/Partner
Strategic Plan Input

Timeline
Phase 1
• March 8 – 26, 2009
  • Solicit initial internal input
• March 24 – May 1, 2009
  • Solicit initial Customers/Partners/Individuals input
Phase 2
• June 1 – September 15, 2009
  • Invite internal/external review & feedback of first draft; Conduct constituent workshops and town hall

NWS’s Initial Analysis:
Drivers for Change
• High interest in climate issues
  • Increasing demands for relevant, science-based climate information to aid decisions and policy making
• Greater environmental awareness and how it affects standard of living and well-being
  • Increased need for accurate and timely weather, water and climate information integrated into decision-making
• Growing national energy concerns create opportunities for implementing renewable energy
  • Increasing demand for wind, solar, tidal forecasts, etc.
NWS’s Initial Analysis: Drivers for Change

- Extraordinary water resource challenges associated with rapid development, population shifts, and climate change, especially in coastal areas
  - Need for science-based water information at the right temporal and spatial scales
- Increasing globalization and standardization of information systems
  - Allows for greater collaboration, information sharing and data exchange among nations with the goal of improving accuracy of forecasters and warnings

NWS’s Initial Analysis: Drivers for Change

- America’s weather and climate industry growing in size and sophistication creates opportunities for collaboration and partnership to:
  - Address decision support needs of commercial interests and other clients
  - Leverage private investment in observing systems and other weather infrastructure
- Continuous advances in science, technology and computing power
  - Creates more comprehensive, accurate, and precise representation of earth system
  - Allows for more robust, accurate estimates of risk, uncertainty, and confidence
- Increasingly mobile and tech-savvy customers
  - Expectation for information delivered on time, real time, any time and anywhere

NPP/NPOESS plans

- NPP
  - PM orbit
    - Payload: Visible/Infrared Imager Radiometer Suite (VIIRS), Cross-track Infrared and Advanced Technology Microwave Sounder (CrIS/ATMS), Cloud and Earth Radiant Energy System (CERES)
- NPOESS C1 and C3 PM orbit
  - Payload: Same as NPP, plus Total Solar Irradiance Sensor (TSIS), Space Environment Monitor (SEM), and communications packages SafetyNet and A-DCS/SARSAT, OMPS is Nadir only
- NPOESS C2 and C4 AM orbit
  - Payload: VIIRS and Microwave/Imager Sounder (MIS), plus communications packages for SafetyNet and A-DCS/SARSAT

Polar Satellite Flyout (12-4-08)

Assessment of NPP /NPOESS User Impacts

- NPP has experienced significant schedule overruns that has delayed its June 2010 launch date. VIIRS is experiencing technical problems, necessitating a mid-term correction in strategy
  - A Tri-Agency team has assembled options to maintain continuity for the NPP/NPOESS mission
  - User impacts of these options are being sought across the three agencies, and within each impacted goal and LO.

NOAA’s Opportunities to Help Solve the Nation’s Energy Challenge

Research Program Office, Office of Director, ESRL
Outline

- Current versus Future U.S. Energy System
- NOAA’s Capabilities to Advance Renewable Energy (RE)
  - Measurement Systems
  - Observations Networks
  - Weather Forecasts, improved models, data assimilation
  - Climate Models
  - Data Collection, Verification, and Distribution
  - Data Visualization Systems
- NOAA’s Crucial Role

U.S. and Global Energy Demands Continue to Rise

Growth in U.S Energy Demand

Growth in Global Energy Demand

Cooperative Agreement between NOAA ESRL and DOE’s National Renewable Energy Lab (Golden)

New, monthly seminar hosted by NOAA ESRL and DOE NREL

“Sustainable Energy and Atmospheric Sciences”

- Diverse audience, e.g.,CU, private industry, public
- Jan. seminar drew people, including many private companies from around the U.S.
- March seminar addressed systems integration

Currently developing an MOU with NREL

Letter of intent signing with Sandy MacDonald, Director of NOAA ESRL; Andy Karsner, DOE DUS for Renewable Energy; and Dan Arvizu, CEO of NREL. July 31, 2008.

www.esrl.noaa.gov/research/events/seas

NOAA has Specialized Instruments for Studying Wind

Scanning wind-sensing instrument to study LLJ, turbulence, and wind resources built and operated by NOAA/ESRL.

- Images of the flow
- Profiles and time series
- Turbulence intensity
- Could damage turbine hardware
- Shear across the rotor layer
- Power curve validation
- Low-level Jet – nocturnal
- Major warm-season wind resource in the U.S. (Great Plains)
- LLJ climatology–frequency, U_max, D_max, Z_max
- Shear & turbulence – cause rotor vibrations
- Representation in models

Turbine blades at this height

Superb

Good

United States - Wind Resource Map

DOE’s Vision: 20% Wind Energy by 2030

http://www.20percentwind.org/
20% Wind Energy by 2030: Economic Benefits

- Report finds that, during the decade preceding 2030, the U.S. wind industry would create many good jobs.
- Support ~ 500,000 jobs in the U.S.
  - >150,000 jobs in associated industries, e.g., accountants, lawyers, steel workers, electrical manufacturing
  - >200,000 jobs through economic expansion based on local spending.
  - Increase annual property tax revenues to more than $1.5 billion by 2030.
  - Increase annual payments to rural landowners to > $600 million in 2030.

Examples Targets for Support NOAA Could Offer for Solar Energy

- Acquire enhanced solar observational database to help evaluate current and future solar resource for spatial and temporal variability.
- Enhance ability to infer direct solar radiation at the surface from satellite data using these validation datasets.
- Improve cloud forecasts in models and fundamental understanding of clouds, including improved assimilation of cloud observations in NWP models.
- Develop and validate surface solar radiation forecast products (direct and total).
- Assist in current aerosol and albedo data into forecast models.
- Develop seasonal forecast products that address regional solar energy potential in the U.S.
- Develop data distribution and visualization tools.

U.S. Renewable Electricity Generation in 2030

<table>
<thead>
<tr>
<th>Technology</th>
<th>Percent of Grid Energy in 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentrating Solar Power*</td>
<td>7</td>
</tr>
<tr>
<td>Photovoltaics</td>
<td>7</td>
</tr>
<tr>
<td>Wind</td>
<td>20</td>
</tr>
<tr>
<td>Biomass*</td>
<td>8</td>
</tr>
<tr>
<td>Geothermal*</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
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- Can provide baseload or near-baseload power
- These are conservative estimates of what could be practically done with existing technology. The DOE is currently developing a plan whereby the U.S. could achieve 30% of its electricity from renewable sources by 2030.

NOAA’s Capabilities to Advance Renewable Energy

- Advance measurement systems
- Deploy observing networks
- Improve weather forecasts (improved models and data assimilation)
- Improve climate models and diagnosis (understanding climate processes)
- Enhance environmental data visualization systems
- Enhance data collection, verification & distribution system