

National Air Quality Forecast Capability: June 2007 Update

National Air Quality Forecast Capability

End-to-End Operational Capability

Model Components: *Linked numerical prediction system*

Operationally integrated on NCEP's supercomputer

- NCEP mesoscale NWP: WRF-NMM
- NOAA/EPA community model for AQ: CMAQ

Observational Input:

- NWS weather observations; NESDIS fire locations
- EPA emissions inventory

Gridded forecast guidance products

- On NWS Telecommunications Gateway and EPA servers
- Updated 2x daily

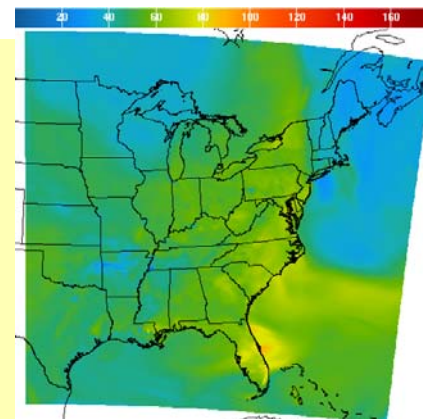
Verification basis

EPA compilation:

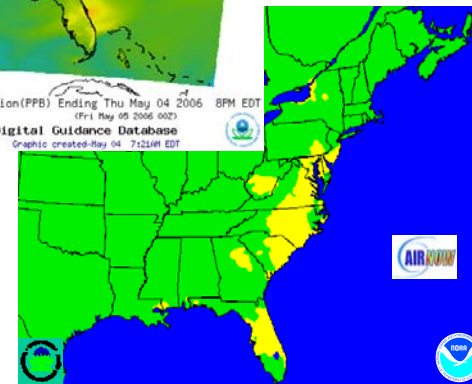
- Ground-level ozone observations

Customer outreach/feedback

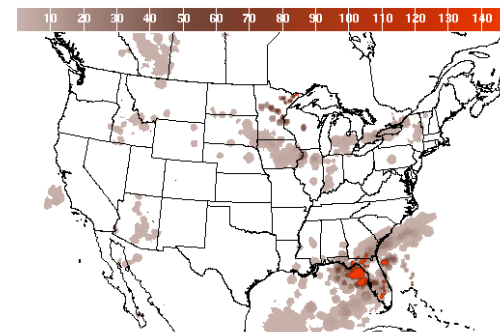
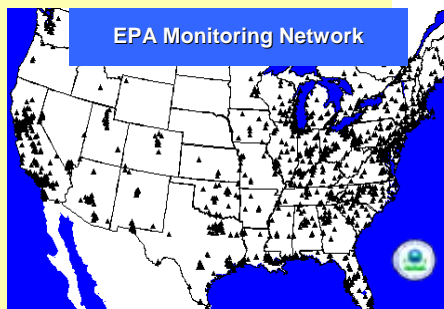
- State & Local AQ forecasters coordinated with EPA
- Public and Private Sector AQ constituents



8Hr Avg Ozone Concentration(PPB) Ending Thu May 04 2006 8PM EDT
(Fri May 05 2006 00Z)
National Digital Guidance Database
06z model run Graphic created-May 04 7:21AM EDT



AQI: Peak May 4



1Hr Surface Smoke (micrograms/m³) Fri May 11 2007 6PM EDT
(Fri May 11 2007 22Z)
National Digital Guidance Database
6z model run Graphic created-May 10 9:25AM EDT

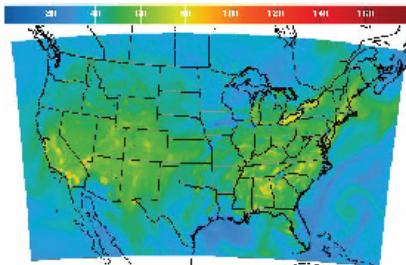


Partnership with EPA: Examples: AQ Awareness Week, AQ outlook

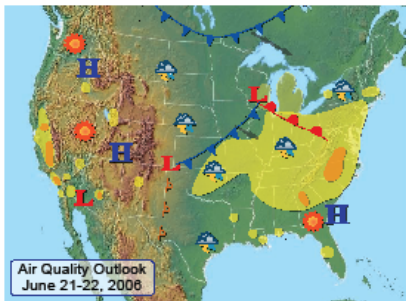
Be Air Aware Keep an Eye on the AQI

Air Quality Awareness Week
April 30 - May 4, 2007

www.airnow.gov/airaware/

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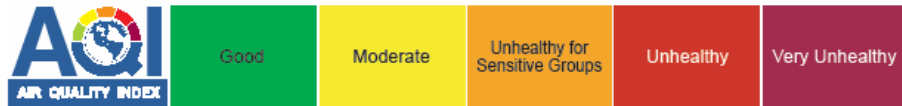


AIRNOW Quality of Air Means Quality of Life

Air Quality Outlook
June 12-13, 2007

www.airnow.gov

- Only Moderate and above forecasts on the Air Quality Index are shown.
- For local air quality conditions and forecasts, visit www.airnow.gov.
- Surface weather based on NOAA forecasts valid 7pm EDT Jun 12.
- Outlook issued 4pm EDT Jun 11 and valid through 1pm EDT Jun 13.

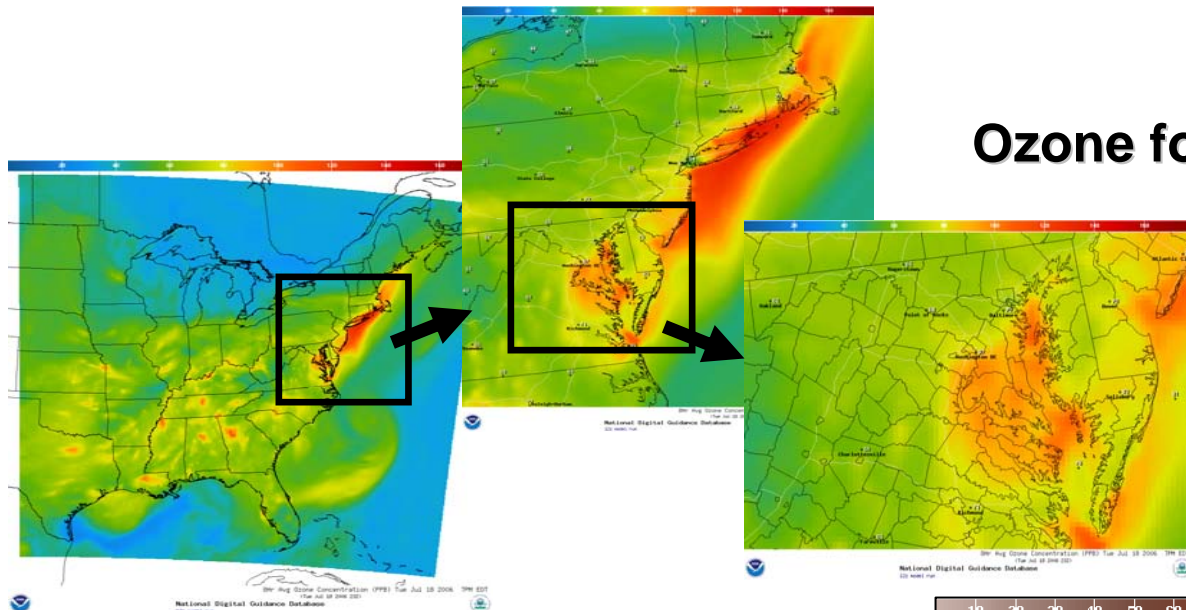


www.airnow.gov

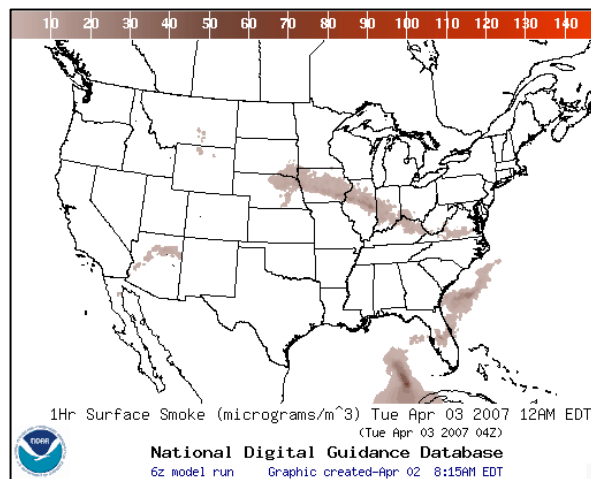
Operational AQ forecast guidance

www.weather.gov/aq

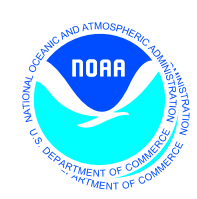
Ozone for Eastern US



**Smoke Products
Implemented March, 2007**

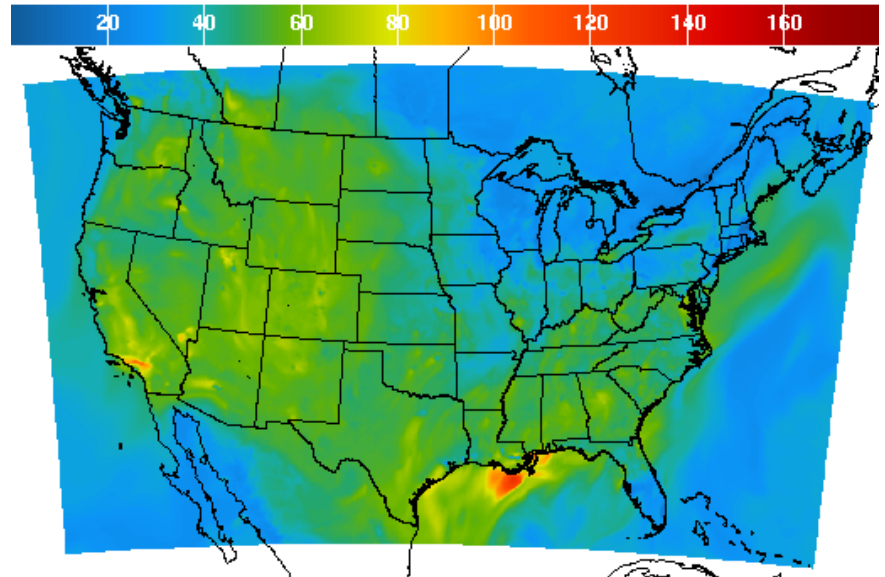


Further information: www.nws.noaa.gov/ost/air_quality



Experimental Products:

Coast-to-coast Ozone



8Hr Avg Ozone Concentration(PPB) Ending Wed Sep 06 2006 10PM EDT
Experimental (Thu Sep 07 2006 02Z)



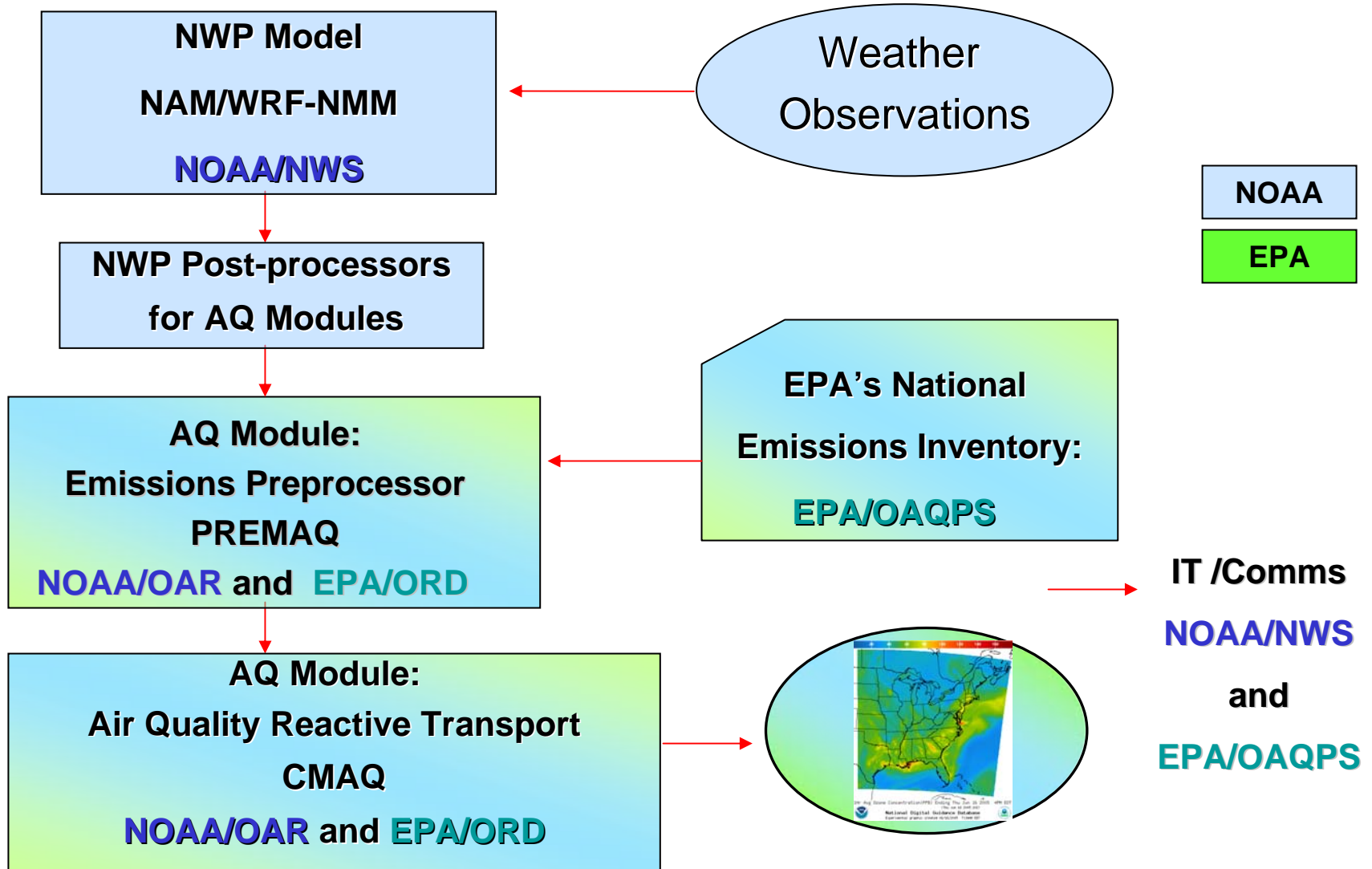
National Digital Guidance Database
12z model run Graphic created-Sep 05 2:35PM EDT

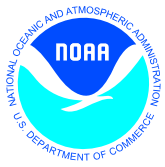


www.weather.gov/eq-expr

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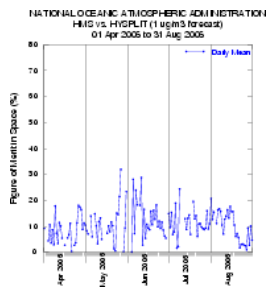
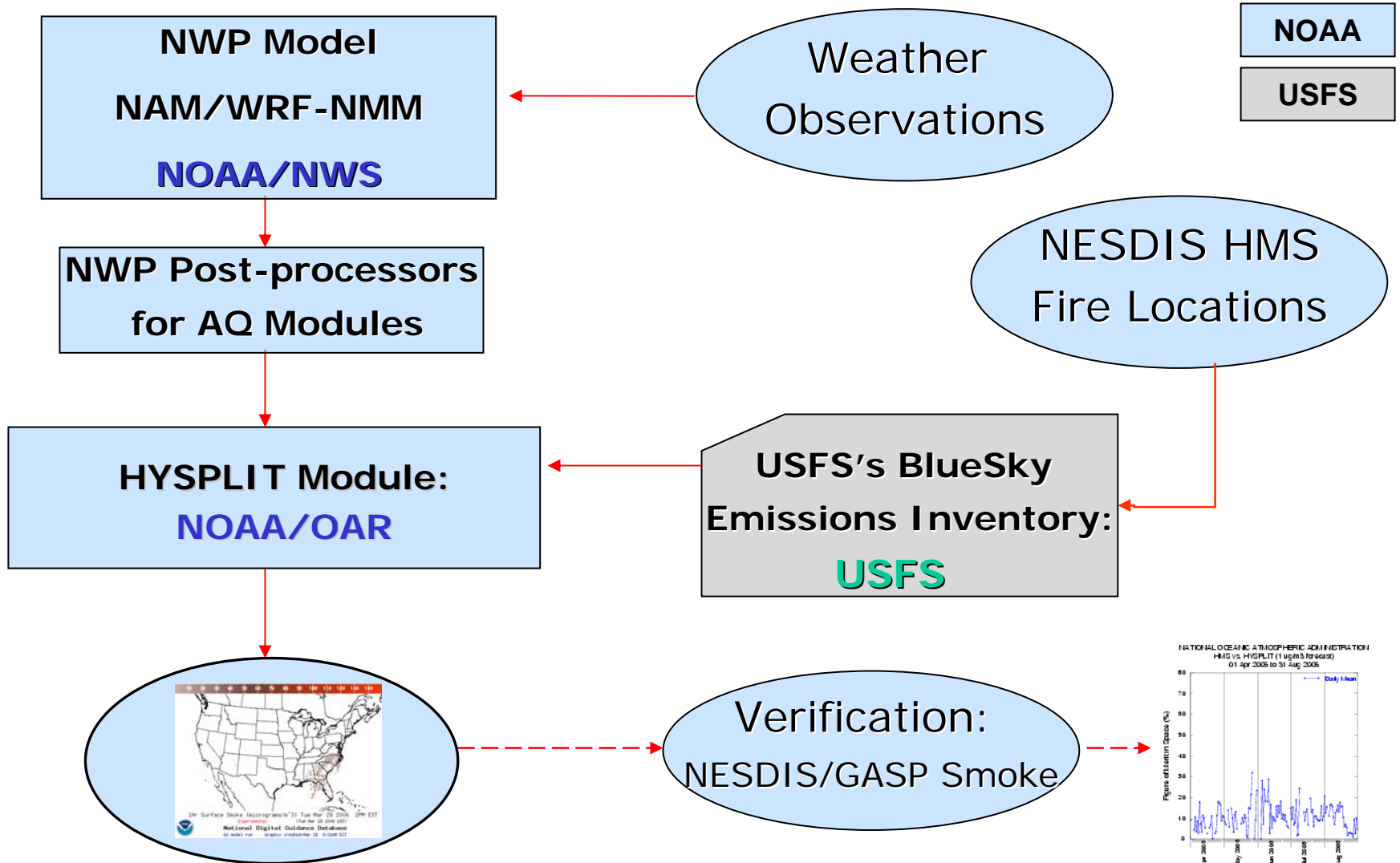
Major Model Components



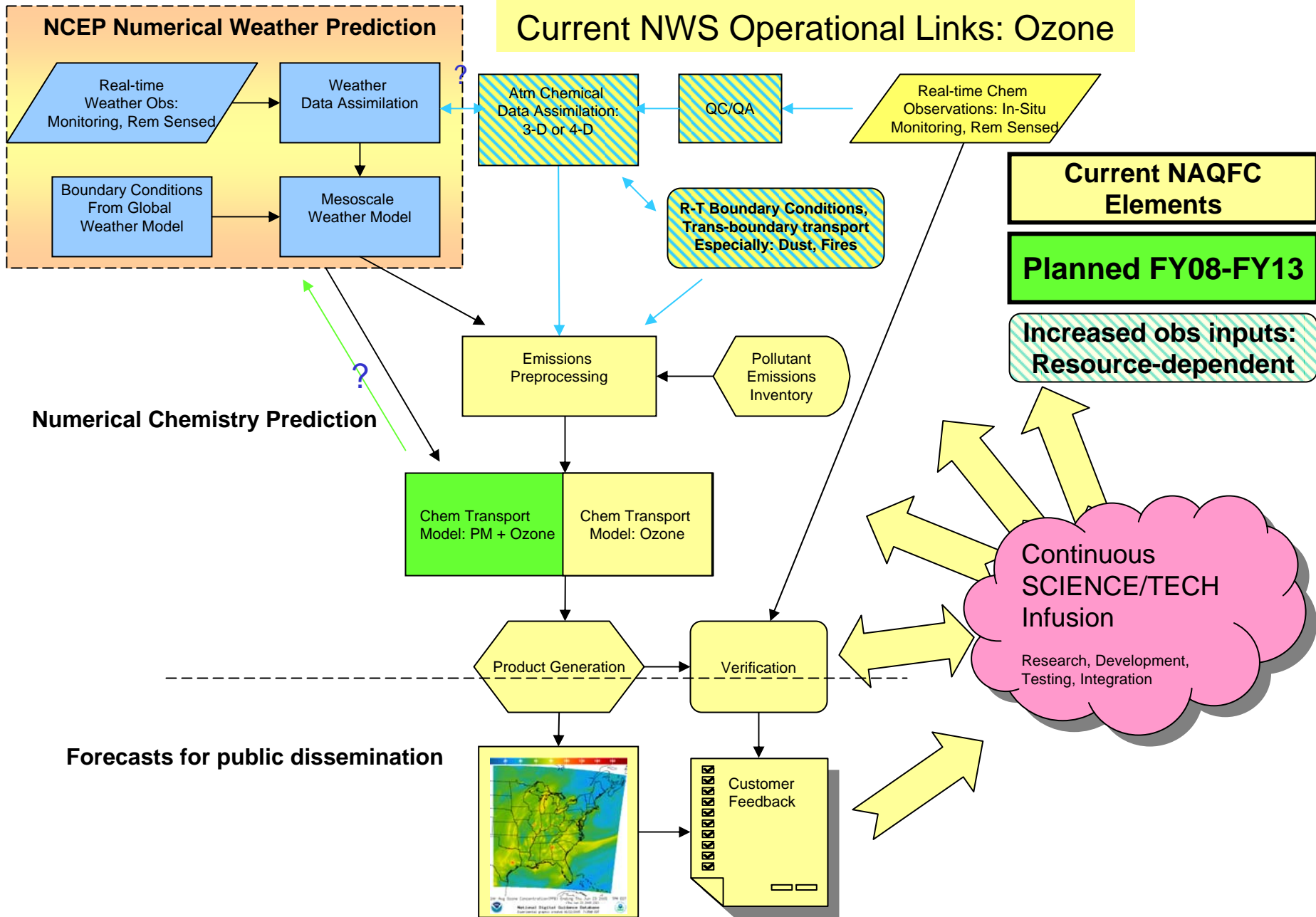


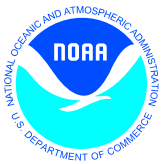
Smoke Forecast Tool

Major Components



National Air Quality Forecast Capability: Current NWS Operational Links: Ozone





FY07 Test Configurations Summary



Ozone: Experimental (5X) testing from June, 2006

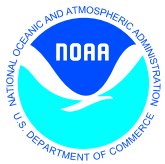
- *New WRF-CMAQ linkage, improved vertical coupling with σ -P adopted in CMAQ/WRF*
- *Updates to emissions (esp mobile and EGU sources)*
- *ACM mixing in clouds*
- *Summer 2006 test performance in CA disappointing*
- *Improvements in progress for testing in 2007: vertical mixing/ ACM2, CA off-road emissions, lateral boundary conditions*

Smoke: Implemented into Operations March, 2007 over CONUS

- *Fire Locations and verification based on satellite observations and NESDIS' Hazard Mapping System (HMS) analysis*
- *Fire emissions estimates from USFS (BlueSky)*
- *HYSPLIT/NAM transport*
- *Planning for testing over AK, HI (testing deferred to FY08)*

Aerosols: Developmental testing providing comprehensive dataset for diagnostic evaluations. (CONUS from mid-FY06)

- *CMAQ (aerosol option)*
- *Qualitative; underprediction consistent with missing source inputs*



National AQF Capability: *Targets for 2007 and Longer-Term*



Ozone forecast guidance (WRF-CMAQ)

- **Improving day-to-day performance, especially in the west**
- **Transitioning experimental CONUS predictions to operations (2007)**
- **Further development:**
 - *Closer coupling of AQ with WRF prediction; examine impacts of vertical resolution, vertical mixing treatments, horizontal boundary conditions...*
 - *Testing over all 50 states with target operational implementation in FY10*
 - *Extend forecast range to Day 2 and beyond*

Particulate matter components:

- **Smoke from large fires: implemented over CONUS in operations (3/07)**
 - *Planning for experimental testing in AK, HI*
- **Further development, quantitative PM forecast capability:**
 - *Objective satellite products for verification (on going)*
 - *Aerosols predictions from anthropogenic source emissions in inventories: continued development/testing/analysis*
 - *Further component development, chemical data assimilation, dust, speciated fire emissions, “in-line” coupling of weather and AQ simulation*
 - *Developmental and experimental testing, integrated quantitative PM capability*
 - *Target operational implementation for initial PM forecasts, NE US: FY13*