NAAPS Aerosol Forecast Model

The Navy Aerosol Analysis and Prediction System (NAAPS) is a global forecast model that predicts the concentrations of sulfate, dust, and smoke aerosols in the troposphere. NAAPS is run by the U.S. Naval Research Laboratory (NRL) in Monterey, California. NAAPS is a combination of several individual forecast models. Meteorological information is provided by the Navy Operational Global Atmospheric Prediction System (NOGAPS) numerical forecast model, and information on aerosols is provided by individual sulfate, smoke, and dust emissions models. Model aerosol forecasts are provided on a 1°× 1° grid, at 6-hour intervals out to 120 hours (5 days).

When using NAAPS for air quality analysis, it is important to remember that NAAPS is a prediction of future aerosol concentrations – it is not an observation of past or current particulate concentrations! NAAPS model data should not be confused with measured values of AOD or surface $PM_{2.5}$ concentrations. Interpret NAAPS forecasts with caution, and use them to help predict what future particulate concentrations will be in an area of interest.

As shown in Figure 1, NAAPS model output is available as a:

- Current day forecast (C)
- 5-day forecast (F)
- 5-day forecast loop in 6 hour intervals (L)

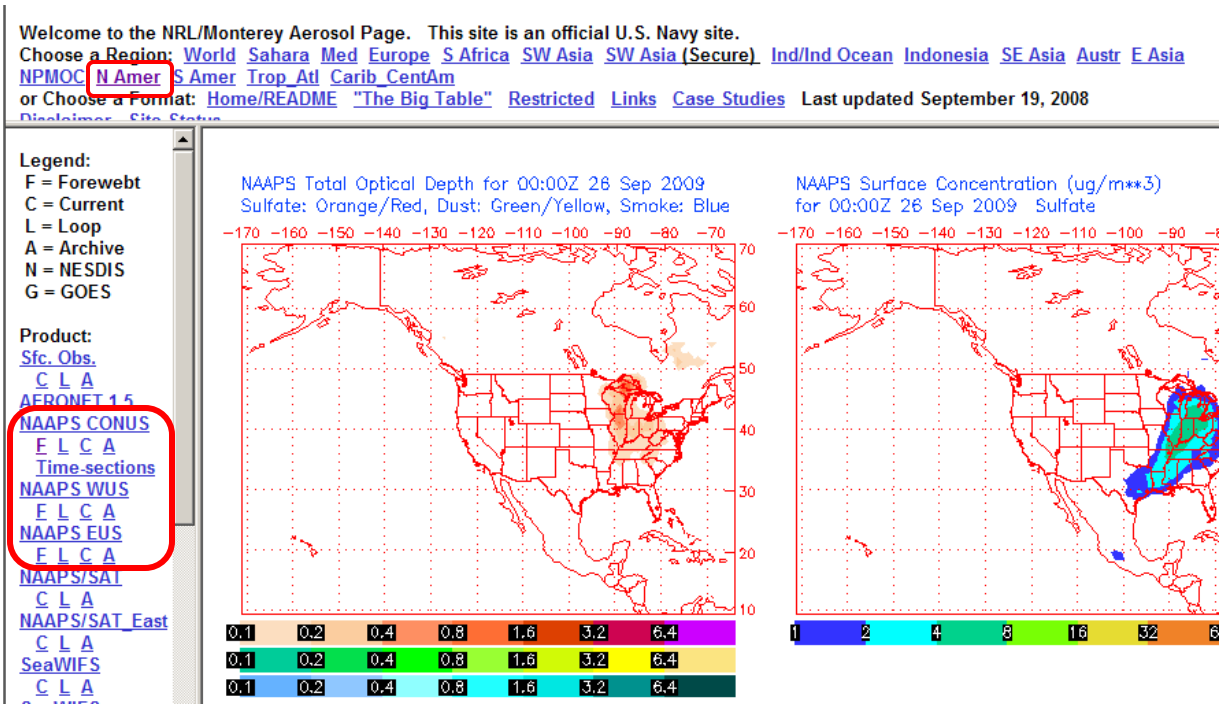

Figure 1. Screen shot of the NAAPS forecast products available on the NRL/Monterey Aerosol Page.

NAAPS model forecasts are given as a 4-panel graphic, shown in Figure 2. Be sure to check the valid date of the forecast (given in UTC*)! For example, the valid date of the NAAPS forecast in Figure 2 is 06:00 UTC, September 21, 2009.

Upper left: total optical depth of sulfate, dust, and smoke aerosols. This panel shows a prediction of the total optical depth of aerosols in entire troposphere. The height of the troposphere varies by season and location, but is typically 10-15 km. The types of aerosols are color-coded for easy interpretation. Since this panel is a prediction of aerosol concentrations for the entire height of the troposphere, it is not applicable for air quality analysis at the surface.

Upper right: concentration of sulfate aerosol at the surface in $\mu g/m^3$. This panel shows a prediction of the concentration of sulfate aerosols at the surface. The concentration values are color-coded for easy interpretation, with reds and oranges indicating high concentrations, and blues indicating low concentrations. Sulfate aerosols are important for air quality analysis because they are one of the main components in urban haze.

Lower left: concentration of dust at the surface in $\mu g/m^3$. This panel shows a prediction of the concentration of dust at the surface. The concentration values are color-coded for easy interpretation, with reds and oranges indicating high concentrations, and blues indicating low concentrations. Dust can be transported across the Atlantic from the Sahara Desert in Africa and impact the East Coast or Gulf Coast; dust can also be generated locally in Texas, the Southwest, and Western states.

Lower right: concentration of smoke at the surface in $\mu g/m^3$. This panel shows a prediction of the concentration of smoke at the surface. The concentration values are color-coded for easy interpretation, with reds and oranges indicating high concentrations, and blues indicating low concentrations. Smoke is a major issue in the region during the fire season.

*For more information on Universal Coordinated Time (UTC), see the **UTC Help File**.

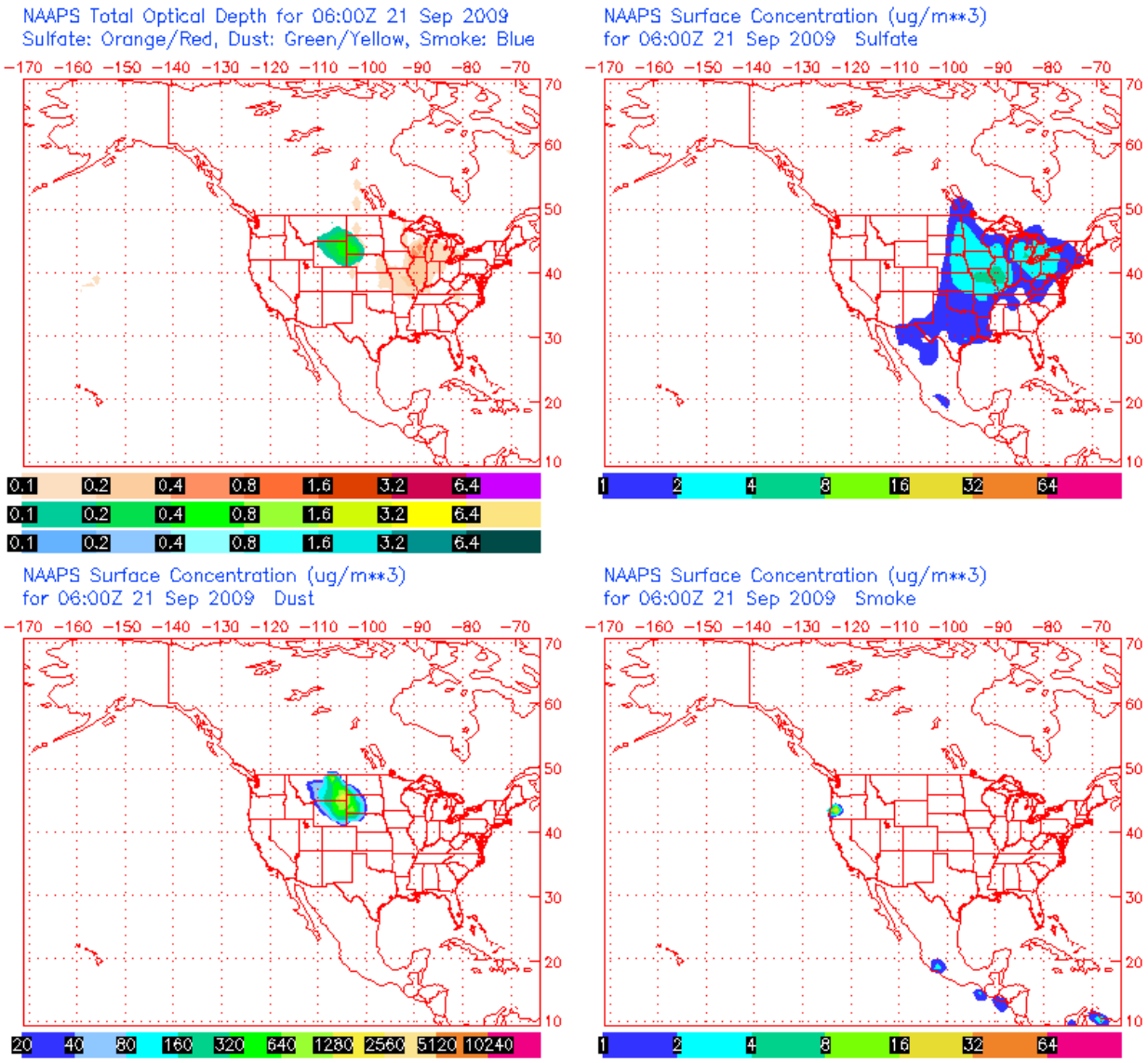

Figure 2. Example of the NAAPS 4-panel forecast graphic for North America.