

# Atmospheric Composition Products

(How to be a Climate and Atmospheric Composition Project in an Operational Weather Satellite Program.)

L. Flynn

May 15, 2014

NOAA STAR JPSS Science Meeting

# Total Ozone Products

- OMPS Nadir Mapper Total Ozone
  - NCEP requests V8TOz content in NRT BUFR products
    - NRT products are performing well and will move to validated status with known SDR and EDR improvements. Speed of progress for V8TOz implementation is resource limited.
  - Ozone Watch: Long-term ozone monitoring at NCEP requires ozone CDRs. We need funding for J1 Ozone CDR creation.
  - S-NPP RDRs are capable of producing CDRs; because of changes in NOAA operational SDRS, the data files at CLASS do not provide a consistent set for this purpose. NASA PEATE S-NPP SDRs/EDRs have been reprocessed.
  - Higher spatial resolution is needed but is not an immediate priority.
  - The Legacy Version 8 algorithm is being implemented. It will allow required performance for J1 when SO<sub>2</sub> exclusions end.

# CrIS NUCAPS Total Ozone

- Products are planned for use to follow EOS AIRS products in OPC for detection of stratospheric folds. (SPORT)
- Products are a component of the operational TOAST/TACO daily maps. Orbital updates are possible to improve latency of this product. TOAST products are frequently accessed.

# Nadir Ozone Profile Products

- OMPS Nadir Mapper Total Ozone
  - NCEP is waiting for Version 8Pro BUFR products which will match existing SBUV/2 assimilated products.
  - Ozone Watch: Long-term ozone monitoring at NCEP requires ozone CDRs. We need funding for J1 Ozone CDR creation/reprocessing.
  - The S-NPP SDR data files at CLASS do not provide a consistent set for creating CDRs. NASA PEATE S-NPP SDRs/EDRs have been reprocessed.
  - Higher spatial resolution is desired for regional air quality.

# OMPS Limb Profiler Products

- OMPS Limb Profiler Ozone Profile
  - OMPS Limb Profiler ozone products can provide continuity for EOS Aura MLS products.
  - We are proceeding with R2O for a high vertical resolution product in NDE. We will have to work with the users on the BUFR content for use in The GFS.
- OMPS Limb Profiler Aerosol Profile
  - This is a very important product but has minimal operational uses until the next major volcanic eruption perturbs the stratosphere. It may remain a NASA product.

# SO<sub>2</sub> Users

- **VAACs:** The SO<sub>2</sub> products are used to track volcanic eruptions for aviation hazards. This is the most important NRT application.
- **EPA & ARL:** Air Quality forecasts and monitoring (SO<sub>2</sub> & NO<sub>2</sub> amounts, aerosol classification)
- **USGS/AID:** Passive volcanic outgassing
- **Atmospheric chemistry and climate change research**
- **MACC II ECMWF**

# Atmospheric SO<sub>2</sub> Products

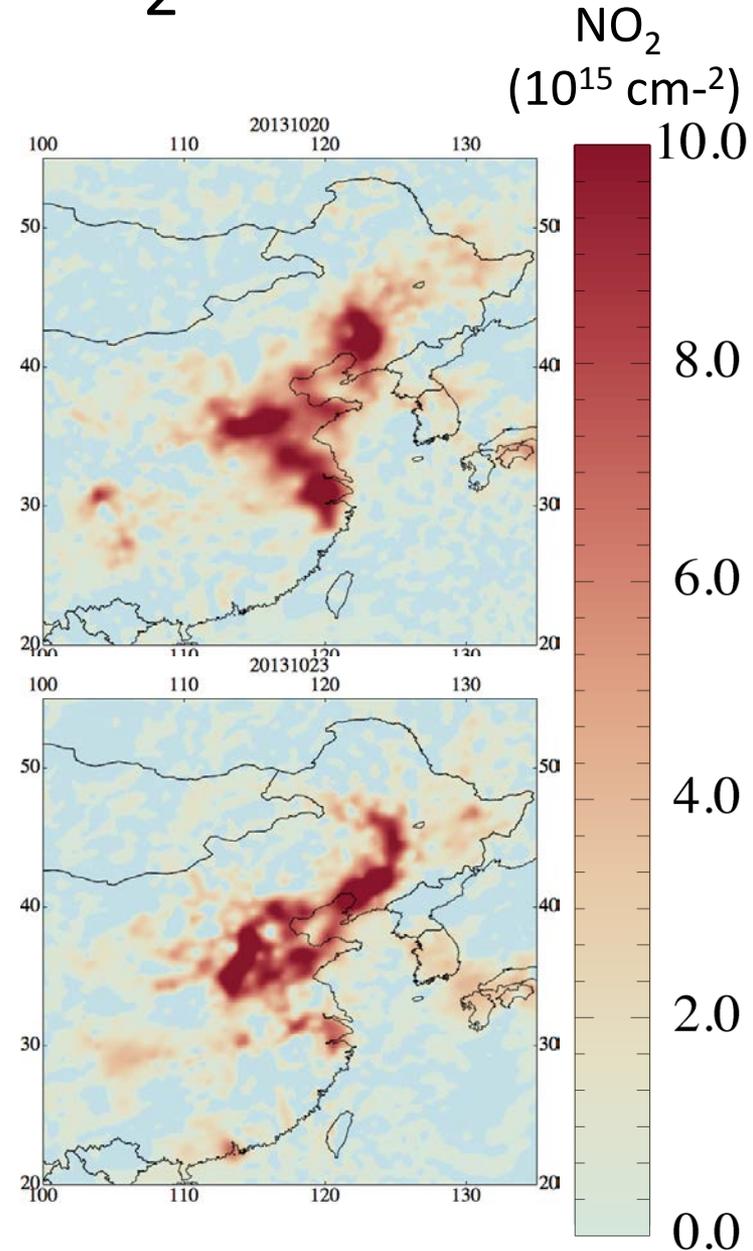
- The Linear Fit SO<sub>2</sub> algorithm will be implemented as a module of the Version 8 total ozone operational upgrade.
- SO<sub>2</sub> applications can make good use of higher spatial resolution. A minimum of a factor of 3x3 improvement is base-lined for J1.
- The requirements for SO<sub>2</sub> in the Suspended Matter products were removed. The OMPS and CrIS measurements can provide this information on atmospheric SO<sub>2</sub>.

# UV Aerosol Products

- The UV Absorbing Aerosol Index (a by-product of the total ozone retrieval) is useful for identifying/classifying aerosols even in cloudy conditions.
- Quantitative information on aerosols (optical depth and single scattering albedo) can be obtained independently but work even better when combined with visible measurements.
- The HySplit model forecasts are a user for this and the SO<sub>2</sub> products.
- Higher spatial resolution products are needed to match the model capabilities.

# Atmospheric NO<sub>2</sub>

- ARL is improving models and working with existing OMI data.
- OMPS products can provide continuity for EOS Aura OMI products.
- ARL has a requirement to update forecast emissions. Products are available from GOME-2 but for the 9:30 orbit. The 13:30 orbit is preferred as the NO<sub>2</sub> production is high at that time.



# Charge

# Basic questions

- Describe how SNPP/JPSS products provide continuity from legacy POES, METOP, DMSP, EOS?
  - Or is SNPP/JPSS a new capability for our application?
- What benefits or improvements do you expect from SNPP/JPSS?
  - Expected impact (low, medium, high) and why?
- Provide Details on:
  - when do you plan to use the SNPP/JPSS Product?

# Is there an actionable plan?

- Is it funded?
  - What is the priority?
  - Have you thought about how you will get the data and have you identified the issues with your operational use of SNPP/JPSS ?
- Are the current legacy products well utilized?
  - Is the SNPP/JPSS product part of a blended product?
  - What additional work needs to be done to ensure that the SNPP/JPSS product is/will be well utilized?

# Are enhancements needed for:

- Accessibility (data flow, latency, format)
- Product performance (accuracy, precision)
- User applications (modifications to modeling , decision tools, visualization to use the new products)