A few slides about GEOS-5

Steven Pawson
Global Modeling and Assimilation Office
NASA GSFC
These (non-orthogonal) themes span GMAO’s main focus areas. Our system is modular and encompasses much of the Earth System. Strong emphasis on NASA’s Earth Observations.
The Evolution of GEOS-FP

This system is GMAO’s forefront operational system, supporting NASA Field Missions, using data from NASA’s Space Missions.

- **Last week**: C360L72 3DVar
  - Changes to assimilation methodology
    - ISS-Rapidscat

- **This week**: C360L72 3D-EnVar
  - Changes to assimilation methodology

- **This Aug.**: C360L72 4D-EnVar
  - Ocean skin T

- **Next Year**: C720L137 4D-EnVar
  - Changes to GEOS-5 GCM
    - New filespec
  - GPM All-Sky Radiances
Chemical components in GEOS-5

Forward processing and reanalyses now include aerosols – will bring them into seasonal forecasts as we re-vamp that system

Interactive ozone can also be important on weeks-seasonal forecasts

Ozone at 400hPa in a test simulation of GEOS-5, with GMAI Chemistry, run at C720L72 resolution (near 12.5 km). Note the rich spectrum of the distribution!

By Eric Nielsen

Also working on GEOS-Chem
## Reanalysis (1)

<table>
<thead>
<tr>
<th></th>
<th>MERRA</th>
<th>MERRA-2</th>
<th>Next Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System vintage</strong></td>
<td>2008</td>
<td>2014</td>
<td>2017</td>
</tr>
<tr>
<td><strong>Release</strong></td>
<td>2011</td>
<td>mid 2015</td>
<td>late 2018</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>Atmosphere</td>
<td>Atmosphere, including aerosols and land correction</td>
<td>Atmosphere-ocean-ice-land</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.5°×0.66° L72</td>
<td>0.5°×0.625° L72 (C180 cubed sphere)</td>
<td>0.25°×0.3125° L137 (C360 cubed sphere) + 25-km ocean</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>3D-Var atmos</td>
<td>3D-Var atmos</td>
<td>4D EnsVar atmos + EnKF land + EnOI ocean</td>
</tr>
</tbody>
</table>
MW data sources with large impact on MERRA have much less impact on MERRA-2
GEOS-5: Summary

- Very exciting changes coming from GMAO
- New reanalysis and a concerted effort towards IESA
- New series of FP systems
- Aerosol included: MODIS & AVHRR/GOCART so far
- Collaborative work is engaging GEOS-Chem community

Steven.Pawson@nasa.gov