

Model Diagnostics and Evaluation with ADF

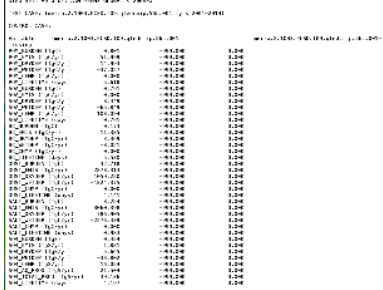
The Atmosphere Model Working Group (AMWG) Diagnostics Framework (ADF) is an automated diagnostic package written in Python, aimed to be used to evaluate and benchmark simulation output from CESM. Here, we describe diagnostics associated with atmospheric chemistry.

The ADF package can be downloaded at <https://github.com/NCAR/ADF>

Detailed instructions on how to use it can be found here: <https://github.com/NCAR/ADF/wiki>

To use the chemistry evaluation, you will need to checkout the branch: **TBD**

Our current atmospheric chemistry diagnostic development plans/wishlist (view on GitHub: <https://github.com/NCAR/ADF/issues/237>) are:

Diagnostic	Example Plot/Result	Github Issue
1. Chemistry/Aerosol budget Tables Tables / Chemistry of ANN global budgets	blocked URL 	https://github.com/NCAR/ADF/issues/236
2. Zonal Average comparisons between model runs. Vertical Contour Plots contour plots of DJF, MAM, JJA, SON and ANN zonal means List of species to evaluate: TBD		
3. Ozone climatology comparison to observations Profiles, seasonal cycles and Taylor diagrams	blocked URL blocked URL blocked URL	https://github.com/NCAR/ADF/issues/281 - pull request initiated for integration into ADF.
4. Column comparison to satellite observations Lat/lon comparisons for (a) MOPITT carbon monoxide (b) OMI/MLS ozone	blocked URL	(a) CO: https://github.com/NCAR/ADF/issues/235 (b) O ₃ : https://github.com/NCAR/ADF/issues/242 (c) AOD: https://github.com/NCAR/ADF/issues/302
5. Vertical profile comparisons to observations (a) NOAA aircraft campaigns	blocked URL	
6. Surface comparisons to observations (a) IMPROVE network	blocked URL	

WACCM ADF Goals (based on these comparisons https://github.com/NCAR/wawg_dev/issues/2):

1. QBO
2. Zonal Mean U winds and Transform Eulerian Mean (TEM) of winds
3. Water Vapor (tape recorder) and temperature time series at 100 hPa in the tropics (compare with MLS)
4. Temperature: NH Polar
5. Temperature: SH Polar
6. Temperature: Dec Zonal Mean (against MERRA and SABER)
7. Temperature: June Zonal Mean (against MERRA and SABER)
8. Ozone diagnostics for lower stratosphere (ozone hole)