**ScienceHub – “Nudging Sensitivities in WRF for Regional Climate Modeling”
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**Supplement – 16 May 2018**

This entry into ScienceHub covers the following article:

Spero, T. L., C. G. Nolte, M. S. Mallard, and J. H. Bowden, 2018: A maieutic exploration of nudging strategies for regional climate applications using the WRF model. *J. Appl. Meteor. Climatol.*, in press. (Accepted 5 May 2018)

This research effort primarily supports ACE 155 (under MDST-4) in the FY12-15 RAP, and ACE AIMS-2.3 (ACE 6.02) in the FY16-19 StRAP. This is the Dynamical Downscaling task.

This research effort was conducted on the EPA HPC platforms.

The NCEP/DOE Reanalysis II (a.k.a., R2) data used for downscaling were obtained from NCEP. The years 1988-2010 were used, plus December 1987 for spin-up. The data are stored locally in:

atmos:/asm/MAQSEA/ncep/reanalysis-2

The downscaled WRF model runs created for this research effort and used in the published journal article were conducted using WRFv3.2.1. The WRF Model was obtained from the National Center for Atmospheric Research (<http://www.wrf-model.org>). The versions of WRF that were used for this work are in:

atmos:/home/tspero/wrf/WRFV3.2.1/WRFV3
atmos:/home/tspero/wrf/WRFV3.2.1/WRFV3\_snq
atmos:/home/tspero/wrf/WRFV3.2.1/WRFV3\_snq\_trop
atmos:/home/tspero/wrf/WRFV3.2.1/WRFV3\_snq\_tropqt

The paper examines 45 nudging strategies described in Table 1 in the paper. The WRF runs were conducted by Tanya Spero and via contract to CSRA. The raw WRF output were not saved.

Post-processing codes and scripts used in this research are in:

atmos:/home/tspero/myprog/wrfextr/wrfextr4

atmos:/home/tspero/myprog/monthly/monthly

atmos:/home/tspero/myprog/annual

atmos:/home/tspero/myprog/tsmon/tsmon\_ncdc.usland\_stats

atmos:/home/tspero/myprog/tsann

Post-processed output is archived in:

atmos:/asm/MAQSEA/downscale/nudsens

Figures were created using R. The scripts and figures are stored in:

atmos:/home/tspero/myprog/Rscripts/\_for\_nudsens

The manuscript was developed by Tanya Spero. Drafts of the manuscript and other supporting documentation are stored on her EPA laptop in:

Documents/articles/downscale\_nudsens

Acronyms:

ACE Air, Climate, and Energy (one of the EPA’s National Research Programs)

EPA Environmental Protection Agency

CCSM4 Community Climate System Model, version 4

CESM Community Earth System Model

CLM Community Land Model (a component of CESM)

CMIP5 Fifth Coupled Model Intercomparison Project

HPC High Performance Computing

NCAR National Center for Atmospheric Research

NOAA National Oceanic and Atmospheric Administration

RAP Research Action Plan

StRAP Strategic Research Action Plan

WRF Weather Research and Forecasting Model