Russell Bullock, Research Physical Scientist, in EPA's National Exposure Research Laboratory

Computational Exposure Division
Mailing Address

bullock.russell@epa.gov

Area of Expertise: My expertise is the development and application of numerical models to simulate physical meteorology and its effects on the emission, transport, transformation and deposition of various air pollutants. Until 2011, my work was focused on atmospheric mercury deposition to sensitive aquatic ecosystems. From 2011 to 2015, I worked primarily on the development of methods for dynamical downscaling to estimate local and regional effects of future climate change. In late 2015, my duties shifted again and I am now focused on improving the meteorological models used to support all air-quality modeling based on the CMAQ model. I have been directly involved with the development of a number of Agency regulatory actions by assessing the potential impacts of proposed controls on air pollutant emissions.

Select Publications:

Bullock, R. Adding Four- Dimensional Data Assimilation (a.k.a. grid nudging) to MPAS. 17th Annual WRF Users' Workshop, Boulder, CO, June 27 - July 01, 2016.

Bullock, R. AND E. Salmon. Refinement of horizontal resolution in dynamical downscaling of climate information using WRF: Costs, benefits, and lessons learned. American Meteorological Society, Louisiana, NO, January 11 - 12, 2016.

Bullock, R., Kiran Alapaty, J. Herwehe, AND J. Kain. A Dynamically Computed Convective Time Scale for the Kain–Fritsch Convective Parameterization Scheme. American Meteorological Society Monthly Weather Review. American Meteorological Society, Boston, MA, 143(6):2105-2120, (2015).

View more research publications by Russell Bullock.

Education:

- M.S. Meteorology, North Carolina State University, 1984
- B.S. Meteorology, *magna cum laude*, North Carolina State University, 1980

Professional Experience:

- Research Physical Scientist, Computational Exposure Division, NERL/EPA, R.T.P., NC, 2015-present

- Research Physical Scientist, Atmospheric Modeling and Analysis Division, NERL/EPA, R.T.P., NC, 2008–2015
- Research Meteorologist, Atmospheric Sciences Modeling Division, ARL/NOAA, R.T.P., NC, 1989-2008
- Computer Programmer/Analyst, Atmospheric Sciences Modeling Division, ARL/NOAA, R.T.P., NC, 1987-1989
- Senior Scientific Specialist, Program Resources, Inc. and Computer Sciences Corporation, R.T.P., NC, 1984-1987
- Senior Member of the Technical Staff, Computer Data Systems, Inc., R.T.P., NC, 1983–1984
- Meteorologist, Meteorology Laboratory, ARL/NOAA, R.T.P., NC, 1981–1983
- Physical Science Aid, Meteorology Laboratory, ARL/NOAA, R.T.P., NC, 1980–1981

Honors and Awards:

- EPA Bronze Medal: For broad, interagency cooperation in creating advanced modeling systems for characterizing and assessing air pollution impacts on federally protected (Class I) areas (1996)
- EPA Silver Medal: For exemplary contributions and dedication in producing the EPA Mercury Study – A Report to Congress (1998)
- EPA Bronze Medal: For the development and application of the Nation's premier air quality simulation model (2006)
- NERL Special Achievement Award: Multipollutant Model Development Team – For their efforts in successfully combining and harmonizing the various capabilities in EPA's base CMAQ model for ozone, acid/nutrient deposition, and PM2.5, with that of the CMAQ-Tox model for air toxics and CMAQ-Hg model for atmospheric mercury. (2007)
- EPA Bronze Medal: For informing Nitrogen and Mercury Watershed TMDL Assessments through Access to Airshed Model Outputs (2008)
- EPA Bronze Medal: For exceptional accomplishments in developing, applying, and evaluating the CMAQ multipollutant air quality model for assessing co-benefits of potential emissions management strategies (2008)
- EPA Award for Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices: For developing and implementing numerous scientific upgrades to the CMAQ Model system (2009)
- EPA Scientific and Technological Achievement Award (level III): For two scientific papers describing the North American Mercury Model Intercomparison Study (2010)
- EPA Bronze Medal: In recognition of Dynamical Downscaling Team special contributions addressing Agency's critical issues, developing multi-decadal credible climate data for use with human and ecosystem exposure research (2012)