Building a Regional Climate Program: Collaborations and Partnerships (4.2)

Alice Gilliland, Christopher Nolte, Robert Gilliam, William Benjey, Kristen Foley, Steven Howard, Ellen Cooter, Jerold Herwehe, and Tanya Otte

Collaborators: Chris Weaver, Brooke Hemming, and Anne Grambsch (National Center for Environmental Assessment, USEPA/ORD); Darrell Winner (National Center for Environmental Research, USEPA/ORD); Drew Shindell (NASA Goddard Institute for Space Studies); Hiram Levy (NOAA Geophysical Fluid Dynamics Laboratory [GFDL]); North American Regional Climate Change Assessment Program (NARCCAP) Team: Isaac Held and Bruce Wyman (NOAA GFDL), Seth McGinnis (National Center for Atmospheric Research)

Future climate change is broadly recognized by the scientific community as a risk of national and international importance. As climate protection becomes more integral to EPA's mission to protect human health and the environment, modeling tools are needed to assess the effectiveness of programs and the potential climate impacts on health and ecosystems. The Division's Climate Impact on Regional Air Quality (CIRAQ) project provided an opportunity to test the linkages between regional air quality modeling tools and global climate and chemistry models. Through this experience, collaborations have developed with global climate modeling experts. Establishing these partnerships and working across EPA/ORD, other government agencies, and academia is critical to a program that depends on expertise in both climate and air quality modeling. With these partners, efforts continue to develop advanced modeling tools that link global climate trends to regional meteorology and air quality models, and to provide modeling tools for EPA assessment of climate impacts on air quality, human health, water availability, and ecosystem stress. Two key products produced from these collaborations are summarized in this poster: the USEPA ORD report on the impacts of global change on regional U.S. air quality (NCEA, 2007; Weaver et al., in review), and the U.S. Climate Change Science Program (CCSP) Synthesis and Assessment Product 3.2 (Levy et al., 2008).

From our ongoing collaborations with groups outside of AMAD on air quality and global climate linkages, we have learned a number of important lessons that will help guide our further research and interactions on this topic. Our partnerships have demonstrated that careful coordination and linkage between global-scale climate/chemistry models and regional-scale models is required to assess potential climate change impacts on regional air quality. In addition, effective partnerships among global and regional modeling groups can lead to the most efficient use of expertise and resources in studying global-to-regional downscaling issues. Large uncertainties exist in global climate model (GCM) predictions of future climate, and these can lead to significant differences among models. Therefore, regional downscaling for air quality projections can benefit from using GCM projections from several different models.