**Project Kick-Off Meeting Agenda**


**Ensemble Modeling of Global Change and the Effects on US Air Quality**

**JISAO Conference Room**

**Friday, October 5, 2007**


**9:00 am**      **Introductions and Project Review**—what did we propose, do we need to modify our direction?  Brian Lamb

**9:15 am**      Current Status and future plans—what is the current status of our modeling systems, what's current in our research?
Global models and WRF—Cliff Mass and Eric Salathe
Air Quality modeling—Jeremy Avise and Brian Lamb
Fire modeling—Don McKenzie
Emissions modeling—Jeremy Avise and Serena Chung
Related health impact research—Catherine Karr

**10:30 am**      **break**

**10:45 am**      Biogenic emission and landuse change—Alex Guenther and Christine Wiedinmyer
Urban expansion modeling—David Theobald
Papers in preparation from the first grant—all

**11:15 am**      **Development of a detailed project plan**
What are the critical short term tasks?
What work will follow the near term tasks?
What is the timeline?
How are the tasks connected?
Who is taking the lead on each task and who needs to help?
How do we coordinate these activities?

**12:00 noon**      **lunch**

**1:30 pm**      **continue project plan discussions**

**2:30 pm**      **wrap-up and summary of next steps**
**3:00 pm**      **adjourn**

**EPA STAR Grant Abstract**
<u>Research Category</u>: Consequences of Global Change for Air Quality
<u>Sorting Code:</u> EPA-G2006-STAR-J1
**Ensemble Analyses of the Impact and Uncertainties of Global Change on Regional Air Quality in the U.S.**
**Investigators:** Brian Lamb blamb@wsu.edu, Clifford Mass cliff@atmos.washington.edu, Eric Salathe salathe@washington.edu, Alex Guenther guenther@acd.ucar.edu, Christine Wiedinmyer christin@acd.ucar.edu, Donald McKenzie donaldmckenzie@fs.fed.us, and David Theobald davet@nrel.colostate.edu.
**Institutions:** Washington State University, Pullman, WA, University of Washington, Seattle, WA, National Center for Atmospheric Research, Boulder, CO, USDA Forest Service, Pacific Northwest Research Station, Seattle, WA, Colorado State University, Fort Collins, CO.
**Project period:** October 1, 2006 through September 30, 2009 **Project cost:** $899,897.
**Objectives**: This proposal builds on results from a current EPA global change project (RD83830962010). Our overall goal is to answer questions, as posed from our current project, related to the effects of global change on continental and regional air quality *AND* to include quantitative estimates of uncertainties as part of the answers to our research questions. We will employ an ensemble modeling approach with three specific objectives: 1) to develop a quantitative measure of the uncertainty in our modeling framework using ensemble modeling methods in comparison to current 1990-1999 observations; 2) to project these uncertainties into the future for the period 2045-2054 and quantitatively address the uncertainties that accompany projections of future emissions, both global and U.S., including changes in landcover, urbanization, biogenic emissions, and fire emissions; and 3) to continue to address our research questions that will determine the consequences of global change upon U.S. air quality.
**Approach:** Our work plan begins with Bayesian analyses of GCM/WRF/CMAQ model configurations for a base climate period (1990-1999) to produce weighted ensemble members based upon their skill in representing observed climate and air quality. This analysis will reduce the number of ensemble members for future climate runs to those that provide significant skill to the overall composite. This reduced set will be combined with a range of potential emission scenarios in a factorial design, to predict both expected values and uncertainties in future air quality. The CMAQ model will enable us to estimate future air quality conditions in terms of photochemical gas ambient concentrations, levels of fine and coarse particulates, and the deposition rates of N, S, and Hg species. Modeling analyses using WRF/CMAQ will address the continental U.S. with 36-km grid resolution and the Pacific Northwest with 12-km grid resolution. An important aspect of the latter scale will be examination of future impacts in Class 1 wilderness areas, as specified in EPA's Regional Haze Rule.
**Expected Results:** The primary products from this work will be model results for current and future decades for the U.S. and the PNW. These will encompass a number of model/emission scenarios so that quantitative estimates of the air quality impact and uncertainties associated with both modeling errors and emission scenarios will be obtained. The use of ensembles will provide a better overall understanding of the potential impact of global change on future air quality. Since we will focus on ozone and particulate matter and we will also address both ambient concentrations and deposition, our results should be of direct benefit to EPA and to our regional agency partners in the NW-AIRQUEST consortium in the Pacific Northwest.
<u>Keywords</u>: climate change, tropospheric ozone, regional haze, particulate matter, biogenic emissions, wildland fire, anthropogenic emissions