

## [NOAA Air Resources Laboratory](#)

Quarterly Activity Report

FY2014 Quarter 3

(April - June, 2014)

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## **DISPERSION AND BOUNDARY LAYER**

### **1. HYSPLIT Modeling Nuclear Fallout**

Glenn Rolph presented his HYSPLIT modeling work on nuclear fallout from several Nevada tests in the 1950s at a meeting of the Department of Energy Meteorological Coordinating Council (DOE DMCC). The DMCC met in Shepherdstown, WV in April during the Emergency Managers Issues Special Interest Group annual meeting. A manuscript on this HYSPLIT modeling work entitled, "[Modeling the Fallout from Stabilized Nuclear Clouds using the HYSPLIT Atmospheric Dispersion Model](#)" was accepted for publication in the Journal of Environmental Radioactivity. The paper describes how the HYSPLIT dispersion model was configured to simulate the dispersion and deposition of nuclear material from a surface-based nuclear detonation using publicly available information on nuclear explosions. The model was then run for six nuclear tests conducted in the 1950's using both coarse resolution (NCEP/NCAR Reanalysis Project - NNRP) and fine resolution (Weather Research and Forecasting - WRF) meteorological data and the predicted dose rates were compared with measured dose rates. Using meteorological data at the resolution of current operational meteorological models, HYSPLIT can produce a realistic estimate of the location and magnitude of a radiological plume from a nuclear explosion. This gives forecasters a tool to provide local emergency responders with model products for use in emergency exercises. [glenn.rolph@noaa.gov](mailto:glenn.rolph@noaa.gov)

### **2. HYSPLIT Training**

Glenn Rolph and Roland Draxler gave a 2-day HYSPLIT training workshop to representatives from the New York State Department of Environmental Conservation, the New York State Department of Health, and the New York State Division of Homeland Security and Emergency Services in Albany, NY. The first day of training was a condensed version of a 3-day HYSPLIT workshop, which ARL hosts in Maryland each year on the use of the PC version and how to interpret the results. The second day focused on the web-based HYSPLIT model and its use for emergency response applications, such as smoke from large industrial and wild fires. Glenn and Roland also gave a demonstration of the enhanced version of HYSPLIT designed for the National Weather Service forecast offices that includes the chemical and nuclear dispersion modules. A representative from the Albany NWS forecast office, Kevin Lipton, gave a short presentation on the use of HYSPLIT during a major fire in Albany in 2012, and discussed the office's capabilities for providing support during major incidents. [glenn.rolph@noaa.gov](mailto:glenn.rolph@noaa.gov)

### **3. HYSPLIT Workshop**

The annual 3-day HYSPLIT workshop was given to 25 attendees from June 17-19, 2014, at the NOAA Center for Climate and Weather Prediction in College Park, Maryland. The workshop focused on the use of the March 2014 release of the PC model and its Graphical User Interface. Participants included researchers and operational dispersion modelers from as far as India, Pakistan, and China as well as participants from the U.S. Forest Service, the National Weather Service, the Army Corps of Engineers, the Department of Homeland Security, and the Defense Threat

Reduction Agency. [glenn.rolph@noaa.gov](mailto:glenn.rolph@noaa.gov)

#### **4. Best Aircraft Turbulence Probe**

An amended version of NOAA Technical Memorandum ARL-267 was published in May to address some minor data errors in the original publication. The amended version provides details of the instruments on the Best Aircraft Turbulence (BAT) probe and their use in the greenhouse gas study in Prudhoe Bay, Alaska in August, 2013. One of the instruments on the probe, the OpSens fiber-optic temperature sensor firmware, was modified to operate by default without the “Adaptive” filter enabled. This modification will ensure the frequency response of the sensor is more appropriate for the flight conditions. [ed.dumas@noaa.gov](mailto:ed.dumas@noaa.gov), R. Dobosy, B. Baker.

#### **5. Convective Initiation Project**

The Atmospheric Turbulence and Diffusion Division (ATDD) began the first of two field experiments for the Convective Initiation Project. Five tower systems were deployed in northern Alabama, near Huntsville. The stations are collecting data on the surface energy fluxes and mean state variables over various land-use types. The field site location is the Tennessee Valley Research and Extension Center (TVREC) operated by Auburn University. The nearly 800 acre TVREC is near Belle Mina, Alabama, located just north of the Tennessee River, and just east of Interstate 65.

[tilden.meyers@noaa.gov](mailto:tilden.meyers@noaa.gov), W. Pendergrass, R. White, C. Vogel, D. Senn, T. Wood

ATDD began to develop software to read data files from the University of Tennessee Space Institute’s (UTSI) Navajo aircraft, as well as thermal images made from a FLIR T420 infrared camera and perform comparative analysis of the various temperature signals. The goal is to use the FLIR images to create a mosaic temperature map of the surface of the Earth directly underneath the aircraft, as well as to have surface temperatures measured by the co-located NIST-traceable Heitronics infrared temperature sensor available for direct comparison. Test flights of the aircraft over the runway at Tullahoma, Tennessee provided test data to develop the software and data analysis procedures.

Some problems were encountered in merging test data from the FLIR and Heitronics because of inadequate time synchronization between the data system and the FLIR camera system. These problems are being addressed and the system is expected to be operational in time for the intensive flight period in late July / early August near Belle Mina, Alabama. Flight plans for operation of the UTSI aircraft over the Belle Mina test site are also being developed to allow measurement of the overall temperature field from an altitude of 7500 feet AGL over a 10 km x 12 km grid that will encompass the entire test site, as well as more detailed observations from 2000 feet AGL over the four flux towers at each of the agricultural sites within the Belle Mina test area. These flights will be timed to coincide with MODIS satellite overpass times, as well as other observation systems in use over the Belle Mina test site. [ed.dumas@noaa.gov](mailto:ed.dumas@noaa.gov), B. Baker

A search for a post-doctoral associate who will assist with the numerical modeling of

convective initiation began earlier in the year. By March, ARL had received eleven applications, but, for various reasons, no one was hired. ARL re-advertised the post-doctoral position, limiting the position location to ATDD in Oak Ridge, TN and FRD in Idaho Falls. Eleven new applications were received and interviews will start in July. Modeling of convective initiation is being led by FRD within ARL. FRD will use data obtained from ATDD's field campaigns to evaluate weaknesses in the current parameterizations of boundary layer processes.

FRD is archiving output from the High Resolution Rapid Refresh (HRRR) model to support the intensive field campaigns. The output from the full HRRR domain is too large to download, so the archiving is limited to a sub-domain approximately 275 x 275 km over northern Alabama. A new HRRR forecast is generated hourly, so twenty-four forecasts of 15 hours duration each are archived every day. The archiving software also generates various convection-related parameters from the forecasts. These parameters are based on a relatively new convection concept called the Heated Condensation Framework. [richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov)

## **6. Project Sagebrush**

Major progress was made on putting together a comprehensive data report for Phase 1 of Project Sagebrush, designated SAGE13. The report will provide a detailed description covering all aspects of experimental design, instrumentation, measurements, quality control procedures, and the final database for the project. The largest gap in the data report is related to the availability of meteorological measurements from Washington State University (WSU). When those become available in July FRD will be able to complete the report.

Measurements continue on the Grid 3 tall tower in collaboration with WSU. These were begun as part of Project Sagebrush in late September and will continue into at least August. The combination of measurements provided by WSU and FRD will provide a very detailed look at the vertical profiles of turbulence. Ultimately the Grid 3 tower measurements will provide data for the Project Sagebrush tracer tests as well as a rich database for separate comprehensive analyses of vertical turbulence structures over a broad range of conditions. Bruce Hicks has been provided with data collected by FRD from September, 2013 through April, 2014 to assist with his turbulence research. Receipt of the WSU portion of the data is pending.

Some preliminary analyses of the tracer data sets have been conducted leading to some unexpected results with regard to the plume dispersion parameters  $\sigma_y$  and  $\sigma_z$ . We are presently attempting to identify the source(s) of the differences between our observations and those from decades old studies that have provided the basis for much of the accepted dispersion science. [dennis.finn@noaa.gov](mailto:dennis.finn@noaa.gov), Rick Eckman

## **7. Birch Creek Valley Wind Flow Study**

The draft manuscript "Diurnal Late Spring and Summertime Wind Patterns on the Snake River Plain and the Influence of Complex Terrain Factors" was prepared. It summarizes results from the first phase of the Birch Creek Valley measurements. Follow up work on

the second phase is stalled pending availability of data from the U.S. Forest Service Fire Sciences Laboratory. [dennis.finn@noaa.gov](mailto:dennis.finn@noaa.gov)

## **8. HYRad**

At the request of the Department of Energy (DOE) Emergency Operations Center (EOC) FRD began implementing the use of multiple sources for plume modeling in HYRad. It was successfully accomplished in limited testing that identified the requisite file formats, however, further work is necessary to implement it through the user interface. [dennis.finn@noaa.gov](mailto:dennis.finn@noaa.gov), Brad Reese

FRD received three unrelated inquiries from different parties concerning the implementation of HYRad on local systems. One inquiry was from the DOE EOC. A second inquiry was from an Idaho State University research group working on probabilistic dose modeling assessments. The third inquiry was from Cliff Glantz, Chairman of the DOE Emergency Management Issues Special Interest Group Subcommittee on Consequence Assessment and Protective Actions. Dr. Glantz's request concerned the desire to work toward a wider usage of HYRad at other DOE facilities. While this demonstrates high regard for HYRad, FRD has difficulty complying with the request. The HYRad code that provides the actual plume dispersion, dose calculation, and plume file generation could be readily exported for wider usage, however, much of what is regarded as HYRad is actually the user interface that generates the appropriate input files, displays the plume(s) and other output, and handles a multitude of other tasks. The user interface is highly customized to the FRD system and to Idaho National Laboratory EOC applications. It would be complicated to export appropriate code to other users and facilities. FRD is evaluating how to most effectively respond to these inquiries. [brad.reese@noaa.gov](mailto:brad.reese@noaa.gov)

## **9. Wind Forecast Improvement Project 2**

Plans continue to be made for the NOAA-Department of Energy Wind Forecast Improvement Project 2 (WFIP2) that will extend the research into complex terrain. FRD visited one of the wind farms owned by British Petroleum and discussed with the on-site team the possibility of deploying instruments for the WFIP2. The farm has three 80 meter high meteorological towers. The most difficult issue will be finding a good location for a 915 MHz radar wind profiler. Locations with AC power also tend to have nearby turbines that can interfere with the radar signal. For the surface-based flux instrumentation, the southernmost meteorological tower on the farm appears to be a promising location. In order to move forward, FRD is waiting for approval of the final NOAA WFIP2 budget. [kirk.clawson@noaa.gov](mailto:kirk.clawson@noaa.gov), Rick Eckman

## **10. Consequence Assessment for the Nevada National Security Site**

The Special Operations and Research Division (SOR) participated in an emergency response practice drill and major exercise as the Consequence Assessment Team for the NNSA Nevada Field Office. The exercise was conducted on the Nevada National Security Site (NNSS). In this exercise, SORD provided exercise specific weather data and weather forecasts, and generated dispersion products based on the worst case event scenario information provided for the facility involved. The exercise event was an

earthquake on the NNSS that cause widespread damage and triggered several incidents including two chemical and two radiological hazard events. Consequence Assessment models were run for all four scenarios and emergency managers were briefed on the results. This exercise involved the DOE/NNSA/NFO Emergency Response Organization, as well as emergency responders from the City of Las Vegas, Nellis Air Force Base, City of North Las Vegas, Clark County, Nye County, and the State of Nevada. Walt Schalk participated in the exercise as the Controller/Evaluator for the Consequence Assessment Team. [Kip.smith@noaa.gov](mailto:Kip.smith@noaa.gov), James Wood, Walt Schalk

## **AIR QUALITY**

### **11. Great Lakes Restoration Initiative**

The 3rd year of the atmospheric mercury modeling work under the Great Lakes Restoration Initiative has continued, examining the consequences of alternative future mercury emissions scenarios. Extensive, additional analyses were carried out on the IPCC-based emissions scenarios obtained from the Lei et al. work (*Atmos. Chem. Phys.* 14, 783-795, 2014), and a number of inconsistencies were found. New methods of interpolation and estimation were developed, tested, and implemented to create a more accurate input dataset for the HYSPLIT-Hg model. Using these refined emissions scenarios, a new set of HYSPLIT-Hg simulations were carried out. Analysis of the results of these new simulations has begun. Further, in order to document the impacts of recent model changes -- e.g., involving atmospheric chemistry and the length of the model spin-up period -- a series of benchmark simulations were carried out, in which each significant change was implemented in a successive run. The results of these "incremental-change" simulations will be described in the Final Report for this phase of the project. Preparation of the Final Report has begun and is expected to be completed in the coming quarter. [mark.cohen@noaa.gov](mailto:mark.cohen@noaa.gov)

### **12. Atmospheric Mercury Network-Mauna Loa Observatory**

Winston Luke and Paul Kelley traveled to the Mauna Loa Observatory (MLO) to conduct annual maintenance, inspections, calibrations, and repairs to the ARL trace gas and aerosol instrumentation. The MLO location is one of three ARL sites that are part of the National Atmospheric Deposition Program's Atmospheric Mercury Network.

Measurements collected at MLO include speciated mercury, ozone, sulfur dioxide, and carbon monoxide. In addition, a humidification system, built in the NCWCP laboratory, was installed. The system is designed to mitigate the problem of particulate mercury measurement artifacts, which are often observed in dry air at MLO. Initial testing proved promising, and additional measurements will be collected in the coming months.

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### **13. NCWCP –ARL Chemical Laboratory**

Winston Luke, Paul Kelley, and Xinrong Ren supervised the efforts of a summer intern, Mr. Joaquin Alzola, a chemistry major at Cornell University. Mr. Alzola calibrated instrumentation and support equipment in the chemical laboratory. In particular, he performed a useful series of tests to assess the suitability of reusing spent analytical



gold cartridges in a Tekran mercury detector. Being able to reuse the cartridges could result in substantial cost savings. Mr. Alzola also assisted Dr. Ren in the installation and calibration of trace gas instrumentation aboard a light aircraft leased by the University of Maryland for local and regional air quality studies.

#### **14. Aircraft Observations of Air Pollutants Support Satellite Observations**

Xinrong Ren collaborated with researchers from the University of Maryland's Department of Atmospheric and Oceanic Science to conduct aircraft observations of aerosol and trace air pollutants over the Eastern Shore of Maryland. The aerial measurements collected will support the calibration and validation of the GOES EAST Aerosol/Smoke Product (which is a retrieval of the Aerosol Optical Depth (AOD) made from the current GOES East visible imagery), and the Suomi National Polar-orbiting Partnership Visible Infrared Imaging Radiometer Suite (VIIRS). The VIIRS is a scanning radiometer that collects visible and infrared imagery and radiometric measurements of the land, atmosphere, cryosphere, and oceans. VIIRS data are used to measure cloud and aerosol properties, ocean color, sea and land surface temperature, ice motion and temperature, fires, and Earth's albedo. Initial analysis of data collected from the aircraft last year showed that the AOD within the aerosol layer observed by the aircraft is highly correlated with the particulate matter (PM<sub>2.5</sub>) concentrations observed at the surface. The new aircraft observations are being further analyzed to compare to the concurrent satellite observations and surface PM<sub>2.5</sub> measurements in order to link the satellite-observed AOD to the surface PM<sub>2.5</sub>. This project was sponsored by NOAA through the Cooperative Institute for Climate and Satellites-Maryland.

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#### **15. National Air Quality Forecasting Capability**

The National Weather Service assigned ARL to lead and deliver a major upgrade to its National Air Quality Forecasting Capability (NAQFC). The upgrade includes a distribution of surface particulate matter (PM) concentrations for a pre-operational implementation evaluation by a select group of local and state air quality forecasters and managers. PM forecasting will fill an important gap in the NAQFC. Since 2009, the NAQFC has been distributing only nation-wide surface ozone concentrations to the general public. Epidemiology studies confirm PM could be hundreds of times more detrimental to the human respiratory system. The new upgrade accounts for PM from wild fire smoke and from wind-blown dust. These are two important sources of PM that appear to be on the rise. Stringent tests show the PM forecasts do not degrade the performance of the ozone forecasts. The new upgrade is slated to be made operational in early FY15. [pilus.lee@noaa.gov](mailto:pilus.lee@noaa.gov)

#### **16. Air Quality Observing System Simulation Experiment**

Dr. Robert Atlas, Director of Atlantic Oceanographic and Meteorological Laboratory, visited ARL HQ in mid-June to discuss the potential to apply an Observing System Simulation Experiment (OSSE) Testbed to ARL's Air Quality Analysis Project. Dr. Atlas and Pius Lee gave two back-to-back ARL-wide seminars to report on the current status of their respective projects in OSSE and Air Quality Reanalysis. The next step in the study will be for ARL to generate a "nature" run over an extended period that includes

representative seasonal and chemical variability of a broad range of Air Quality regimes. The “nature” run would become the base-line for evaluation of viability of the OSSE for Air Quality applications. [pius.lee@noaa.gov](mailto:pius.lee@noaa.gov)

### **17. ACAST Meeting**

The 7th NASA sponsored Air Quality Applied Science Team (ACAST) meeting was hosted by Dr. Daniel Jacob of Harvard University, leader of the ACAST program, at Harvard in June. PIs Greg Carmichael and Pius Lee shared a talk concerning one of the six so-called Tiger Team projects selected FY14-15 entitled “Building a prototype Chemical Data Assimilation System to serve State Implementation modelers as well as the international Hemispheric Transport of Air Pollutant Project”. The project leveraged many state-of-the-science developments recently achieved by the members of their team which included researchers from U Iowa, George Tech, U Alabama, NCAR, Naval Research Lab. and NESDIS. [pius.lee@noaa.gov](mailto:pius.lee@noaa.gov)

### **18. Ammonia Air-Surface Exchange Study**

ATDD began the atmospheric ammonia exchange study in an intensively managed agricultural system at the University of Illinois, Urbana-Champaign (UIUC) Energy Biosciences Institute. The Institute is a 320-acre farm and the world's largest outdoor research center devoted to bioenergy crops. The study is being conducted in collaboration with UIUC. Two systems, ATDD's flux gradient system and UIUC's relaxed eddy accumulation system, are measuring ammonia fluxes over a maturing corn field. Mark Heuer, Jason Caldwell, and Daryl Sibble conducted maintenance visits to resolve issues associated with the heated sample line for the cavity ring-down spectrometer. Due to the failure of a thermocouple that measured temperature along the sample line, a new sample line was constructed and installed. The sampling heights were also adjusted in relation to crop height. Simone Klemenz analyzed filters from the UIUC relaxed eddy accumulation (REA) system using ion chromatography, which will provide information on ammonium (NH<sub>4</sub><sup>+</sup>) concentrations. In late July, in-canopy ammonia measurements will be collected at eight heights-seven within the maize canopy and one above the canopy- using the two systems. Also, Thomas Caillaud completed his internship with LaToya Myles at ATDD. He is a graduate student studying with Erwan Personne at AgroParisTech. He collaborated with Rick Saylor and Daryl Sibble on using data collected from the ammonia exchange study to run the SURFATM-NH<sub>3</sub> model. He also translated the protocols and associated model documentation from French to English. The data from the study also will be used in the ACCESS-NH<sub>3</sub> model. [latoya.myles@noaa.gov](mailto:latoya.myles@noaa.gov)

### **19. ACCESS Ammonia Modeling**

Modeling activities associated with the ammonia air-surface exchange study were performed. Rick Saylor and Alex Hurns explored process modeling of ammonia evasion from the corn field using the ACCESS-NH<sub>3</sub> model. Ms. Hurns is a rising senior at Mississippi Valley State University and a 2014 NOAA Hollings Scholar. The modeling carried out by Ms. Hurns is being used to assist in the analysis of ammonia flux data obtained this summer from LaToya Myles' field measurement campaign in Illinois. Additional field data collected in late July will also be used in the ACCESS-NH<sub>3</sub> modeling. [rick.saylor@noaa.gov](mailto:rick.saylor@noaa.gov)



## **CLIMATE**

### **20. 2015 Chapman Conference on the Width of the Tropics**

Dian Seidel, along with three colleagues (including Sean Davis, NOAA/ESRL), began to lay plans for an American Geophysical Union Chapman Conference in summer 2015 on "The Width of the Tropics: Climate Variations and their Impact." The interdisciplinary conference will explore a range of questions related to tropical belt width and climate. A growing body of literature addresses the possibility of changes in the position and strength of the Hadley cell, jet streams, and zonal-mean atmospheric circulation. These changes could manifest as changes in surface climate, particularly precipitation, and have important societal and ecological consequences. A number of studies have identified poleward movement in the boundary between tropical and extratropical zones; this phenomenon has been referred to as "tropical widening" or "expansion of the tropical belt." However, there are many open observational and theoretical questions regarding tropical widening, and, although the topic is inherently multi-disciplinary, there has been little interaction among scientists addressing different aspects of the problem. The Chapman Conference will welcome researchers studying mechanisms, observations, and modeling of the tropical belt width; its changes on seasonal to paleoclimatic time scales; and the associated societal and ecosystem impacts and feedbacks. [dian.seidel@noaa.gov](mailto:dian.seidel@noaa.gov)

### **21. Climate engineering seminars**

Dian Seidel gave seminars in College Park, Maryland, on "Perspectives on Climate Engineering" at the University of Maryland, Dept. of Atmospheric and Oceanic Sciences (April 17) and at the Earth Systems Science Interdisciplinary Center (May 5). The talks summarized results of two recent publications on climate engineering. An image from a recent paper on detection of albedo changes associated with climate engineering by Dian Seidel and co-authors was featured in the article, [Natural variability in Earth's reflectiveness would limit our ability to detect effects of climate engineering](#), on the [climate.gov](http://climate.gov) website. [dian.seidel@noaa.gov](mailto:dian.seidel@noaa.gov)

### **22. GPS Radio Occultation Observations in Climate Research**

Dian Seidel gave an invited presentation at a Workshop on Applications of GPS Radio Occultation measurements, 16-18 June 2014. GPS radio occultation (GPS-RO) measurements are now an important component of the global observing system, because they complement the information provided by satellite radiances. This workshop, jointly organized by the European Centre for Medium-Range Weather Forecasts and the European Organisation for the Exploitation of Meteorological Satellites, Radio Occultation Meteorology Satellite Application Facility, reviewed the use of the GPS-RO data at the major numerical weather prediction centers. Dian contributed to a workshop evaluation of the utility of GPS-RO observations in climate monitoring and research, which is becoming more feasible as the data record gets longer. [dian.seidel@noaa.gov](mailto:dian.seidel@noaa.gov)

### **23. Climate-Weather Research and Forecast Model**

Using the Climate-Weather Research and Forecast (CWRF) model, a series of downscaling/nesting experiments were performed and analyzed. Two manuscripts were subsequently prepared and will be submitted for internal ARL review.

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#### **24. Climate Reference Network**

Two Climate Reference Network sites were installed in Alaska, Deadhorse and Ivotuk sites. Annual maintenance visits were made throughout the country.

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#### **ARL 3rd Quarter Publications**

Chai, T. and **R. R. Draxler**. (2014) Root mean square error (RMSE) or mean absolute error (MAE)? – Arguments against avoiding RMSE in the literature, Geoscientific Model Development. 7, 1247-1250. [doi:10.5194/gmd-7-1247-2014](https://doi.org/10.5194/gmd-7-1247-2014)

Hicks, B. B., **W. R. Pendergrass III**, C. A. Vogel, R. N. Keener Jr., and S. M. Leyton (2014). On the Micrometeorology of the Southern Great Plains 1: Legacy Relationships Revisited. Boundary-Layer Meteorology. 151 (3): 389-405. [doi:10.1007/s10546-013-9902-2](https://doi.org/10.1007/s10546-013-9902-2).

Hicks, Bruce B., **William R. Pendergrass**, Christoph A. Vogel, and **Richard S. Artz** (2014). On the Drag and Heat of Washington, D.C., and New York City. Journal of Applied Meteorology and Climatology. 53 (6), 1454–1470. <http://dx.doi.org/10.1175/JAMC-D-13-0154.1>

Mahmood, R., R.A. Pielke, K. G. Hubbard, D. Niyogi, P. A. Dirmeyer, C. McAlpine, A. M. Carletti, R. Hale, S. Gameda, A. Betran-Przekurat, **B. Baker**, R. McNider, D. R. Legates, M. Shepherd, J. Du, P. D. Blanken, O. W. Frauenfeld, U. S. Nair, and S. Fall (2014). Land cover changes and their biogeophysical effects on climate. International Journal of Climatology, 34(4), 929-953. [doi: 10.1002/joc.3736](https://doi.org/10.1002/joc.3736)

Ren X., **W.T. Luke**, P. Kelley, **M. Cohen**, F. Ngan, **R. Artz**, J. Walker, S. Brooks, C. Moore, P. Swartzendruber, D. Bauer, J. Remeika, A. Hynes, J. Dibb, J. Rolison, N. Krishnamurthy, W.M. Landing, A. Hecobian, J. Shook, and L.G. Huey. (2014) Mercury Speciation at a Coastal Site in the Northern Gulf of Mexico: Results from the Grand Bay Intensive Studies in Summer 2010 and Spring 2011. Atmosphere. 5(2):230-251. doi:10.3390/atmos5020230

#### **Conference Presentations & Invited Talks**

LaToya Myles gave a talk entitled “Linking ecosystem research, services, and management” at the 5<sup>th</sup> Annual NOAA/Northern Gulf Institute Hypoxia Research Coordination Workshop at John C. Stennis Space Center in Mississippi. She also facilitated a breakout group discussion of key science priorities to advance ecological modeling capabilities that address management needs. The workshop was a forum for strengthening coordination between physical, biological, and socioeconomic modelers

of Gulf of Mexico hypoxia and Mississippi River diversions.

Pius Lee, Rick Saylor and Barry Baker participated in the Southeastern Atmosphere Study (SAS) Data Workshop in Boulder, CO. SAS was a combined effort of several atmospheric chemistry field campaigns last summer conducted over the Southeast U. S., including NOAA's Southeast Nexus aircraft-based study and the USEPA and NSF-funded Southern Oxidant and Aerosol Study. Two posters were presented at the SAS workshop summarizing preliminary modeling results over the Southeast for last summer:

- "Comparisons of the NOAA P3 with the CAMx and CMAQ Models during the Southeastern Nexus" by Barry Baker, Rick Saylor, Pius Lee, Daniel Tong and Li Pan, and
- "PBL and surface characteristics: Tower and IMPROVE site measurements during the Southeast Atmosphere Study 2013" by Pius Lee, Rick Saylor, Barry Baker, Hyuncheol Kim, Daniel Tong and Li Pan. The very rich dataset obtained last summer during SAS will be used in a variety of air quality and atmospheric chemistry modeling studies over the next few years.

Daniel Tong presented at the 2014 Global Emission Initiative (GEIA) workshop held at the National Center for Atmospheric Research in Boulder, CO. GEIA is an international emissions community that aims to advance emissions science and enhance access to emissions data. Daniel's talk was on the "Impact of the 2008 Global Recession on NOx emissions in US megacities." NOAA and several other federal agencies were present at the workshop to provide overviews of their corresponding programs relevant to emissions of air pollutants and greenhouse gases.

Pius Lee, along with co-PI Greg Carmichael, presented on the progress on "Building a prototype Chemical Data Assimilation System to serve State Implementation modelers as well as the international Hemispheric Transport of Air Pollutant Project" at the 7<sup>th</sup> NASA-sponsored Air Quality Applied Sciences Team meeting at Harvard. The project leveraged many state-of-the-science developments recently achieved by members of the project team, which includes researchers from University of Iowa, George Tech, University of Alabama, National Center for Atmospheric Research, the Naval Research Lab. and NOAA/NESDIS.

### **Outreach**

LaToya Myles and Daryl Sibley traveled to Silver Spring on May 22 to give presentations during the orientation for NOAA EPP Undergraduate Scholars. Their presentations focused on current ammonia research activities and described future opportunities for internships.