

Jeanette M. Reyes, PhD

Health Scientist

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Office of Air and Radiation, United States Environmental Protection Agency

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Research Interests

- **Expanding exposure assessment methodologies of air quality modeling to understand population-based health in an environmental epidemiology context:** innovative and multidisciplinary approaches of evaluating human exposures to ambient air pollutants in epidemiologic health studies, with an emphasis on incorporating demographic and non-chemical modifiers to adverse health outcomes.
- **Investigating population-wide internal chemical mixtures of phthalates from biomonitoring data:** Population Based Human Biomonitoring, Public Health, Chemical Mixtures, Phthalates, NHANES, Consumer Products, Risk by Demographics
- **Space/time data modeler utilizing big geospatial data for public health and environmental applications:** Space/time Geostatistics, Big Data, Exposure Assessment, Land Use Regression, Environmental Epidemiology, Air Quality Modeling

Work Experience

Health Scientist, US EPA, RTP

Sept 2019 – current

- Investigating air toxics
- Developing real-time data fusion methods of ambient air quality data across the contiguous US

ORISE Postdoctoral Participant, US EPA, RTP

Aug 2016 – Sept 2019

- Ongoing study design, analysis, interpretation, and evaluation of the social determinates of health for multiple environmental pollutants from sources in and around Philadelphia using tools to support an epidemiologic analysis using community data sources while interfacing with local community members evaluating lead levels within children.
- Evaluate, interpret, and analyze the scientific literature by writing and editing the Exposure appendix of the draft Integrated Science Assessment (ISA) for human health and environmental assessments for the environmental air pollutant ozone.
- Develop, plan, and implement innovative systematic review methods including literature search strategies, rigorous literature scoping, determination and judgement of study quality, publication-specific scientific data extraction, table designs for data extraction, summarizing, and synthesizing literature that improve and increase transparency and reproducibility of the health assessment process.
- Lead efforts to research and develop methods for evaluating hazards from internal doses of phthalate mixtures connected with the “phthalate syndrome” where I quantify doses of urinary biomonitoring data from the National Health and Nutrition Examination Survey (NHANES). Determine temporal trends in the most problematic component of a chemical mixture with associated toxicities from known risk measures. Present quantitative temporal differences of health hazards by varying demographic groups including age, race/ethnicity, and gender resulting 2 first author peer-reviewed publications.

Student Services Contractor, US EPA, Chapel Hill (NHEERL)

Sept 2014 – July 2016

- Developed techniques and performed data analysis to investigate health disparities due to smoke exposure from wildfires between 2008-2012 across the continental US using particulate matter estimates from the Community Multiscale Air Quality model with Dr. Ana Rappold from the National Health and Environmental Effects Research Laboratory resulting in 2 co-author peer-reviewed publications.

Student Services Contractor, US EPA, RTP (NERL)

Oct 2012 – Aug 2014

- Entered and extracted scientific data to compute, compile, summarize, and present in tabular, graphic, and narrative form long-term ambient concentrations of environmental air pollutants over several different metropolitan areas with Dr. Lisa Baxter of

the National Exposure Research Laboratory on the Multicity/Multipollutant project resulting in a co-author peer-reviewed publication.

Graduate Researcher in the Bayesian Maximum Entropy Laboratory, UNC-CH

Aug 2008 – Aug 2016

- Led efforts to develop techniques for innovative geostatistical, spatiotemporal methods including land use regression models and data fusion models that compute, compile, summarize, and present data for the exposure assessment of ambient levels of several different air pollutants for the application of epidemiologic studies investigating adverse health outcomes.
- Developed quantitative assessments of a geostatistical data fusion exposure model's performance related to air pollution using a 10-fold cross validation and comparison to other methodologies (e.g., kriging). Analyzed geostatistical exposure modeling estimates of ambient concentrations of air pollutants (e.g., particulate matter and polycyclic aromatic hydrocarbons) using localized, fine-scale spatiotemporal-specific information in the US over a multi-year period.

Education

The University of North Carolina-Chapel Hill (PhD, August 2016; MS, May 2011)

Area: Environmental Sciences and Engineering, Minor: Biostatistics, Advisor: Marc Serre, PhD

Dissertation title: "Geostatistical Data Fusion Estimation Methods of Ambient PM_{2.5} and Polycyclic Aromatic Hydrocarbons"

Thesis title: "Global Land Use Regression and Bayesian Maximum Entropy Spatiotemporal Estimation of PM_{2.5} Yearly Average Concentrations Across the United States"

Hendrix College, Conway, AR (BA, May 2008)

Area: Mathematics, Minor: Physics

Publications and Assessments

Currently totaling 13 (5 first author among 12 published with 1 pending)

U.S. EPA. Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants (External Review Draft). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-19/093, 2019.

Reyes, J. M.; Xu, Y.; Vizuete, W.; Serre, M. L. Incorporating Regionalized Air Quality Model Performance evaluation in a nationwide geostatistical data integration of daily PM_{2.5}. **2019**, *To be submitted to Environment International*.

DeFlorio-Barker, S.; Crooks, J.; **Reyes, J.**; Rappold, A. G. Cardiopulmonary Effects of Fine Particulate Matter Exposure among Older Adults, during Wildfire and Non-Wildfire Periods, in the United States 2008–2010. *Environ. Health Perspect.* **2019**, *127* (3), 037006-1-9.

Reyes, J. M.; Price, P. S. Temporal Trends in Exposures to Six Phthalates from Biomonitoring Data: Implications for Cumulative Risk. *Environ. Sci. Technol.* **2018**, *52* (21), 12475–12483.

Reyes, J. M.; Hubbard, H. F.; Stiegel, M. A.; Pleil, J. D.; Serre, M. L. Predicting polycyclic aromatic hydrocarbons using a mass fraction approach in a geostatistical framework across North Carolina. *J. Expo. Sci. Environ. Epidemiol.* **2018**, *28* (4), 381–391.

Reyes, J.; Price, P. An analysis of cumulative risks based on biomonitoring data for six phthalates using the Maximum Cumulative Ratio. *Environ. Int.* **2018**, *112*, 77–84.

Xu, Y.; Serre, M. L.; **Reyes, J. M.; Vizuete, W.** Impact of temporal upscaling and chemical transport model horizontal resolution on reducing ozone exposure misclassification. *Atmos. Environ.* **2017**, *166*, 374–382.

Rappold, A.; **Reyes, J.**; Pouliot, G.; Cascio, W.; Diaz-Sanchez, D. Community vulnerability to health impacts of wildland fire smoke exposure. *Environ. Sci. Technol.* **2017**, *51* (12), 6674–6682.

Cacciottolo, M.; Wang, X.; Driscoll, I.; Woodward, N.; Saffari, A.; **Reyes, J.**; Serre, M.; Vizuete, W.; Sioutas, C.; Morgan, T.; et al. Particulate air pollutants, APOE alleles, and their contributions to cognitive impairment in older women and to amyloidogenesis in experimental models. *Transl. Psychiatry* **2017**, *7*, 1–8.

Reyes, J. M.; Xu, Y.; Vizuete, W.; Serre, M. L. Regionalized PM_{2.5} Community Multiscale Air Quality model performance evaluation across a continuous spatiotemporal domain. *Atmos. Environ.* **2017**, *148*, 258–265.

Crooks, J. L.; Cascio, W. E.; Percy, M. S.; **Reyes, J.**; Neas, L. M.; Hilborn, E. D. The Association between Dust Storms and Daily Non-Accidental Mortality in the United States, 1993–2005. *Environ. Health Perspect.* **2016**, *124* (11), 1735–1743.

- Casanova, R.; Wang, X.; **Reyes**, J.; Akita, Y.; Serre, M. L.; Vizuete, W.; Chui, H. C.; Driscoll, I.; Resnick, S. M.; Espeland, M. A.; et al. A voxel-based morphometry study reveals local brain structural alterations associated with ambient fine particles in older women. *Front. Hum. Neurosci.* **2016**, *10*, 495.
- Xu, Y.; Serre, M. L.; **Reyes**, J. M.; Vizuete, W. Bayesian Maximum Entropy integration of ozone observations and model predictions: A national application. *Environ. Sci. Technol.* **2016**, *50* (8), 4393–4400.
- Reyes**, J. M.; Serre, M. L. An LUR/BME framework to estimate PM2.5 explained by on road mobile and stationary sources. *Environ. Sci. Technol.* **2014**, *48* (3), 1736–1744.

Conference Presentations and Posters

Currently totaling 19 (10 first author)

- Reyes**, J. and Paul Price, 2019. Findings from the 2015-2016 NHANES Data on Risks from Combined Exposures to Six Phthalates, Society of Toxicology, Poster Presentation. Baltimore, MD, USA. March 14.
- Hibbert, K., J. Richmond-Bryant, C. Ann Gross-Davis, J. **Reyes**, J. Essoka, J. Fry, and A. Jarabek, 2018. Health Concerns in South Philadelphia: A Community-Based Risk Assessment and Analysis of Multiple Exposures in a Historic Urban Setting, Poster Presentation. New Orleans, LA, USA. December 3. [WON BEST RESEARCH POSTER]
- Reyes**, J. and Paul Price, 2018. Temporal Trends of Cumulative Risks to Phthalate Mixtures in the United States from 2005 to 2014, Society of Toxicology, Poster Presentation. San Antonio, TX, USA. March 15.
- Reyes**, J. and Paul Price, 2017. Trends in Cumulative Exposures of Six Phthalates in the United States from 2005 to 2014, International Society of Exposure Science, Oral Presentation. RTP, NC, USA. October 19.
- Reyes**, J. and Paul Price, 2017. An Analysis of Cumulative Risks Indicated by Biomonitoring Data of Six Phthalates Using the Maximum Cumulative Ratio, Society of Toxicology, Poster Presentation. Baltimore, MD, USA. March 16.
- Wilkins, J., G. Pouliot, K. Foley, A. Rappold, J. **Reyes**, and T. Pierce, 2016. A Five-Year CMAQ PM2.5 Model Performance for Wildfires and Prescribed Fires, American Geophysical Union, Poster Presentation. San Francisco, CA, USA. December 15.
- Wilkins, J., G. Pouliot, K. Foley, A. Rappold, J. **Reyes** and T. Pierce, 2016. A Five- Year CMAQ Model Performance for Wildfires and Prescribed Fires, 2nd International Smoke Symposium, Oral Presentation. Long Beach, CA, USA. November 16.
- Alman, B., K. Rappazzo, J. **Reyes**, and L. Neas, 2016. Do factors related to combustion-based sources explain heterogeneity in PM-mortality associations across the United States? International Society for Environmental Epidemiology Annual Conference, Poster Presentation. Rome, Italy, September 1.
- Rappazzo, K., B. Alman, J. **Reyes**, and L. Neas, 2016. Factors relating to windblown dust in associations between PM2.5 and mortality across the United States. International Society for Environmental Epidemiology, Annual Conference, Poster Presentation. Rome, ITALY, September 1.
- Chen, J. C., R. Casanova, X. Wang, Y. Xu, J. **Reyes**, M. Serre, W. Vizuete, I. Driscoll, H. Chui, S. Resnick, M. Espeland, 2016. Neurotoxicity of Ambient Air Pollution on Brain Structure of Older Women. International Society for Environmental Epidemiology Annual Conference, Oral Presentation. Rome, Italy, September 3.
- Reyes**, J., Serre, M., Vizuete, W., Xu, Y., 2015. A Novel Approach of Understanding and Incorporating Error of Chemical Transport Models into a Geostatistical Framework, American Geophysical Union, Oral Presentation. San Francisco, CA, USA. December 15.
- Crooks, J., W. Cascio, M. Percy, J. **Reyes**, L. Neas, E. Hilborn, 2015. Dust Storms in the U.S. are Associated with Increased Cardiovascular Mortality, American Heart Association, Poster Presentation. Orlando, FL, USA. November 8.
- Reyes**, J. and Serre, M., 2015. Non-Linear Regionalized PM2.5 Community Multi-scale Air Quality Model Performance Evaluation, International Society of Exposure Science, Oral Presentation. Henderson, NV, USA. October 21.
- Reyes**, J. and Serre, M., 2015. Non-Linear Regionalized PM2.5 Community Multi-scale Air Quality Model Performance Evaluation, International Society of Exposure Science, Poster Presentation. Henderson, NV, USA. October 18.
- Reyes**, J., Vizuete, W., and Serre, M., 2015. A Novel Approach to Characterizing Regionalized PM2.5 Community Multi-scale Air Quality Model Performance, Community Modeling and Analysis, Poster Presentation. Chapel Hill, NC, USA. October 6.
- G. Pouliot, Ana Rappold, Jeanette **Reyes**, Kristen Foley, Tom Pierce, 2015. A Five Year CMAQ Model Performance for Wildfires and Prescribed Fires, Community Modeling and Analysis, Poster Presentation. Chapel Hill, NC, USA. October 6.
- Pouliot, G., Rappold, A., **Reyes**, J., Foley, K., Pierce, P., 2015. A Five Year CMAQ Model Performance for Wildfires and Prescribed Fires, Community Modeling and Analysis, Poster Presentation. Chapel Hill, NC, USA. October 6.
- Reyes**, J., 2015. Non-Parametric Regionalized Model Performance Evaluation of PM2.5 Chemical Transport Models. Academic Research Conference, Poster Presentation. Chapel Hill, NC, USA. March 4.

Reyes, J., 2014. Combining Observed PM2.5 with Regionalized Bias-Corrected Chemical Transport Models, International Society of Environmental Epidemiology Conference, Oral Presentation. Seattle, WA, USA. August 26.

Professional Presentations

Currently totaling 12 (11 first author with 1 co-presented)

- Reyes, J., 2019. Using SR tools in development of the ISA exposure assessment review, Systematic Review in Exposure Science Summit, Presentation. Arlington, VA, USA. April 25.
- Reyes, J., 2019. Temporal trends of cumulative risks from six phthalates in biomonitoring data, Risk Assessment and Mixtures Specialty Section Webinar Series, Society of Toxicology, Webinar Presentation, January 9.
- Reyes, J., 2017. Chemical mixtures in biomonitoring data: a phthalates application, Lunch & Learn: National Center for Environmental Assessment, US EPA, Presentation. Research Triangle Park, NC, USA. July 24.
- Carlson, L. and Jeanette Reyes, 2017. An overview of chemical exposures in your environment, Lunch & Learn: EPA Finance Center, NCEA, US EPA, Presentation. Research Triangle Park, NC, USA. May 18.
- Reyes, J. and Paul Price, 2017. An Analysis of Cumulative Risks Indicated by Biomonitoring Data of Six Phthalates Using the Maximum Cumulative Ratio, Rapid Exposure and Dosimetry group, ORD, US EPA, Presentation. Research Triangle Park, NC, USA. January 19.
- Reyes, J., 2015. Incorporating Model Performance Evaluation of PM2.5 Chemical Transport Models into a Geostatistical Framework. Spotlight on Student Research Poster Event, Poster Presentation. Chapel Hill, NC, US. April 16.
- Reyes, J., ML Serre, W. Vizuete, Y. Xu, 2016. Applications performance evaluation for the Community Multiscale Air Quality model, Group on Atmospheric Science and Pollution seminar series, UNC-GASP. Chapel Hill, NC, USA. February 5.
- Reyes, J., 2014. Evaluation and Blending of Regionalized CMAQ and Observed Data for Ambient PM2.5 Concentration, EPA-RTP Environmental Public Health Division Work in Progress Seminar. RTP, NC, USA. April 2.
- Reyes, J., 2013. Two sources are better than one. Estimating PM2.5 from observed and modeled outputs, UNC ENVR 400: In-house Seminar Series – Fall 2013, Chapel Hill, NC, USA. October 2.
- Reyes, J., 2012. Incorporating Mobile and Point Sources with General Knowledge to Estimate Yearly PM2.5, UNC-BMElab Seminar Series – Spring 2012, Chapel Hill, NC, USA. February 29.
- Reyes, J., 2011. Using Land Use Regression as a Mean Trend in the Estimation of Yearly PM2.5 Across the United States, Interdisciplinary Environmental Health Research Symposia hosted by the UNC-CH Center for Environmental Health and Susceptibility, Poster Presentation, Chapel Hill, NC, USA. November 14.
- Reyes, J., 2007. Using Density Functional Theory Calculations to Estimate Radiative Forcing and Heat Capacity of CH₃OCHF₂CF₃, REU Summer Program, hosted by The University of Arizona Department of Chemical and Environmental Engineering, Tucson, AZ, USA. July 27.

Leadership and Awards

Society of Toxicology Risk Assessment Specialty Section Postdoctoral Representative	May 2018 – April 2019
UNC ESE Mini MentNet, Mentoring Event, Chapel Hill, NC	January 2019
Visiting Scholar, The University of North Carolina – Chapel Hill	March 2017 – Aug 2018
UNC ESE MentNet, Panel Discussion member and moderator, Chapel Hill, NC	April 2018
Best Postdoctoral Award of the Mixtures Specialty Section at SOT, San Antonio, TX	March 2018
UNC ESE MentNet, Panel Discussion member, Chapel Hill, NC	April 2017
Top 5 Abstracts of the Mixtures Specialty Section at the Society of Toxicology, Baltimore, MD	March 2017
NIOSH Graduate Trainee, The University of North Carolina – Chapel Hill	Jan – May 2016
Koch Travel Award, Gillings School of Global Public Health, UNC-CH	September 2015
Hispanic Scholarship Fund	August 2015
Anne Cynthia Price Travel Award, Gillings School of Global Public Health, UNC-CH	August 2014
NIEHS Graduate Trainee, The University of North Carolina – Chapel Hill	Aug 2008 – July 2013

Memberships

Society of Toxicology (Postdoctoral Membership)	2018
American Geophysical Union	2015

Editorial and Peer-reviewing Services

Reviewer for: Environmental Science & Technology (four times)
International Journal of Environmental Research and Public Health (four times)
Atmosphere (twice)
Technical reviewer for internal EPA reviewing process

Teaching

Teaching Assistant

Fall 2015

- Taught 4 lectures for the graduate-level course entitled “Advanced Functions of Temporal GIS” (ENVR 468) in the Environmental Sciences and Engineering department with an enrollment of 13 students.
- Graded all (7) students’ assignments and final projects throughout the course (ENVR 468).

Skills

Programming: R, MATLAB, UNIX shell scripting for batch computing

Geographic Information Systems: ArcGIS

Microsoft Office: Access, Excel, PowerPoint, Word

Relevant Graduate Coursework

Biostatistics: Principles of Experimental Analysis, Basic Elements of Probability and Statistical Inference I, Probability and Statistical Inference I, Probability and Statistical Inference II, Intermediate Statistical Methods; **Statistics:** Applied Statistics I, Modern Bayesian Statistics; **Computer Science:** Introduction to Scientific Programming; **Environmental Sciences and Engineering:** Process Dynamics in Environmental Systems, Environmental Systems Modeling, Advanced Functions of Temporal GIS, Model-Based Exposure Mapping and Risk Assessment, Health Hazards of Industrial Operations, Environmental Exposure Assessment, Exposure Analysis; **Epidemiology:** Fundamentals of Epidemiology

Training

- CITI Collaborative Institutional Training Initiative. January 2015. Human Research: Biomedical Research (Basic Course), Social and Behavioral Research (Basic Course), Research Involving Data and Specimens Only (Basic Course)
- EPA AQS Conference, Colorado Springs, Colorado, USA. June 9-11 2010.

Graduate Grade Point Average

3.50 (with H=4.0, P=3.0, and L=2.0). For more information regarding the UNC graduate grading system, see the following site: <http://handbook.unc.edu/grading.html>.