

EDUCATION

Harvard University, Department of Earth and Planetary Science

PhD student under advisor Daniel Jacob

University of California, Los Angeles, Bachelor of Science, *Magna Cum Laude*

Major: Environmental Science

Minor: Atmospheric and Oceanic Science

Awards and Honors

- National Science Foundation Graduate Research Research Fellow
 - National Oceanic and Atmospheric Administration Earnest F. Hollings Scholarship
 - American Meteorological Society Outstanding Student Presentation
 - Thompson Tansky Scholarship
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RESEARCH EXPERIENCE

NASA Jet Propulsion Laboratory Year-Round Student Intern (March 2019-August 2019)

Principal Investigator: Dr. Kevin Bowman

- Intern with the Tropospheric Composition group. My work combined the Aura TES/OMI joint satellite retrieval of tropospheric ozone with a chemical reanalysis product to infer global surface ozone. I examined the potential of TES/OMI to infer surface ozone in developing countries such as India, where few monitoring stations exist.

Undergraduate Researcher, Natural Resources Defense Council (October 2018-June 2019)

Advisor: Professor Karen McKinnon, UCLA Institute of Environment and Sustainability

- Completed a project for the NRDC which seeks to reduce the impact of toxic air pollutants on public health.
- Used a hyperlocal air pollution model (AERMOD) to quantify dynamics in particulate matter (PM_{2.5}) and nitrogen oxides (NO_x) emitted from the Port of Los Angeles into nearby neighborhoods.

Hollings Scholar, NOAA Earth Systems Research Lab (June 2018-August 2018)

Principal Investigator: Dr. Jessie Creamean

- Worked on a project which studies Arctic-aerosol cloud processes.
- Used a drop-freeze assay technique to determine freezing temperatures of ice-nucleating particles (INP) collected on the north slope of Alaska. Identified potential sources of INP's within the study region using an air mass trajectory model.
- Participated in a 3 week field campaign aboard the USCG Healy, collecting air and water samples for potential INP's over the Chukchi Sea.

NASA Jet Propulsion Laboratory Year-Round Student Intern (October 2017-June 2018)

Principal Investigator: Riley Duren, Chief Systems Engineer

- Worked on the California Methane Survey project in an effort to calculate emissions rates of methane point sources across the state of California found through surveys utilizing the Airborne Visible/Near-Infrared Spectrometer (AVIRIS).
- Developed a protocol for identifying methane plumes from a variety of sources including landfills, oil and gas facilities, dairies, and powerplants.
- Identified over 300 methane plumes from various field campaigns. In some cases these observations led to mitigation, including for natural gas pipeline leaks.
- Identified key differences in spatial and temporal variability of plumes emanating from different sources.

Undergraduate Researcher, UCLA Department of Geography (September 2016-June 2019)

Principal Investigator: Professor Dennis Lettenmaier, Department of Civil Engineering/Department of Geography

- Utilized the Google Earth Engine API, along with Landsat in order to create a vegetation cover change map for the Los Angeles Basin (LAB) and mapped both forest extent and NDVI over a 30 year period. This data was used as an input to an urban land surface hydrology model in order to quantify the water use implications of alternative urban ecosystem management policies for LAB.
- Worked on development of a convolutional neural network to predict the percent composition of land cover types within the Los Angeles Basin.

Leadership Alliance Intern (June 2017-August 2017)

Principal Investigator: Professor Meredith Hastings, Brown University Department of Earth, Environmental, and Planetary Sciences

- Worked on a project which seeks to characterize the stable isotopic composition of ammonia emitted through fuel combustion in Providence, Rhode Island.
- Used a novel technique to determine the isotopic fingerprint of urban ammonia. Examined the relationship between stable isotopic composition and concentrations of ammonia to various parameters, including the time of day, temperature, and precipitation during the sampling period.

Grand Challenges Undergraduate Research Scholar (September 2016-June 2017)

Advisor: Professor Rebecca Shipe, UCLA Institute of Environment and Sustainability

- Member of the Grand Challenges Research Scholars Program at UCLA, for the Grand Challenge project: "Thriving in a Hotter Los Angeles: Achieving 100% Sustainability in Water, Energy, and Biodiversity by 2050."
- Worked in a research group consisting of five undergraduates with varying academic majors.
- Working alongside the River Revitalization Project, we used ENVI software to monitor the health of vegetation along the L.A River.

Summer Research Assistant, Arizona State University (June 2016-September 2016)

Principal Investigator: Professor Rebecca Ball, School of Mathematical and Natural Sciences

- Worked in a lab which studies soil biogeochemical processes, specifically Carbon, Nitrogen, and Phosphorus cycling in soil, to improve predictions of the impact of human-induced environmental change
- Tested for cellulose, hemicellulose, and lignin in leaf litter samples using the Ankom200 Fiber Analyzer coupled with Sodium Sulphite, Alpha-Amylase, and a neutral detergent.

PUBLICATIONS

- Riley M. Duren, Andrew K. Thorpe, Kelsey T. Foster, Talha Rafiq, Francesca M. Hopkins, Vineet Yadav, Brian D. Bue, David R. Thompson, Stephen Conley, Nadia K. Colombi, Christian Frankenberg, Ian B. McCubbin, Michael L. Eastwood, Matthias Falk, Jorn D. Herner, Bart E. Croes, Robert O. Green, Charles E. Miller, "*California's Methane Super-Emitters*", *Nature*, June 2019.
- J.M. Creamean, J.N. Cross R. Pickart, L. McRaven, P. Lin A. Pacini, R. Hanlon, D.G. Schmale, J. Cenicerros, T. Aydele, N. Colombi, E. Bolger, P.J. DeMott, "*Ice Nucleating Particles Carried From Below a Phytoplankton Bloom to the Arctic Atmosphere*", *Geophysical Research Letters*, 2019.
- Wendell Walters, Linlin Song, Jiajue Chai, Yunting Fang, Nadia K. Colombi, and Meredith Hastings, "*Constraining Ammonia Emissions in Vehicle Plumes Utilizing Nitrogen Stable Isotopes*", *ACP*, in review.
- Nadia Colombi, Kazuyuki Miyazaki, Kevin W. Bowman, Jessica L. Neu, "*Potential of Aura Tropospheric Emission Spectrometer (TES)/Aura Ozone Monitoring Instrument (OMI) Combined Ability to Infer Global Surface Ozone*", in prep.

PRESENTATIONS

- Colombi, Nadia (2019, December) Potential of Aura Tropospheric Emission Spectrometer (TES)/Aura Ozone Monitoring Instrument (OMI) Combined Ability to Infer Global Surface Ozone. Poster Presentation at the American Geophysical Union Annual Conference in San Francisco, California.
- Colombi, Nadia (2018, January) *Diverse Springtime Variability in Ice-Nucleating Particle Properties and Sources in an Alaskan Arctic Oil-Field Location*. Oral presentation I will give at the American Meteorological Society annual meeting in Phoenix, Arizona.
- Colombi, Nadia (2018, December) *Diverse Springtime Variability in Ice-Nucleating Particle Properties and Sources in an Alaskan Arctic Oil-Field Location*. Poster presentation at the American Geophysical Union Conference in Washington, D.C.
- Colombi, Nadia (2018, July) *Diverse Springtime Variability in Ice-Nucleating Particle Properties and Sources in an Alaskan Arctic Oil-Field Location*. Oral Presentation given at the Hollings Education Symposium at NOAA headquarters in Silver Spring, Maryland.
- Colombi, Nadia (2017, December) *Multidecadal Land Cover Change in the Los Angeles Basin and its Water Consumption Implications*. Oral presentation given at the American Geophysical Union Conference in New Orleans, Louisiana.

- Colombi, Nadia (July 2017) *Characterizing the Stable Isotopic Composition of Ammonia Emitted Through Fuel Combustion in Providence, Rhode Island*. Oral Presentation given at the Leadership Alliance National Symposium in Hartford, Connecticut.
- Colombi, Nadia (July 2017) *Characterizing the Stable Isotopic Composition of Ammonia Emitted Through Fuel Combustion in Providence, Rhode Island*. Poster presentation at Brown University's Research Day in Providence, Rhode Island.
- Colombi, Nadia (April 2017) *Assessing Fluctuations in Vegetation Cover Over Time Within the Los Angeles Basin Through NDVI Analysis Performed with Google Earth Engine*. Poster presented at UCLA's Research Poster Day in Los Angeles, California.

Software

- Python, R, Matlab, Google Earth Engine, ENVI, ArcGIS, AERMOD

Activities

- **Outreach Chair, Harvard Department of Earth and Planetary Sciences (Present)** Building relationships with community partners such as *Citizen Schools*, *Science Club for Girls*, and *Breakthrough Greater Boston* to encourage Harvard EPS students to share their science with K-12 students underrepresented in STEM. I am an active member of the Citizen Schools and Science Club for Girls program, where I teach climate science to children ages 7-13.
- **National Science Foundation Outreach Program (2017)** Member of a team of two professors and six undergraduates who prepare lesson plans regarding climate science and present them to high school seniors in an effort to educate the public about climate change and promote interest in the physical sciences.
- **Environmental Student Network Mentor (2017)** Mentored underclassmen interested in environmental sciences. Gave presentations on my involvement in research and helped underclassmen navigate their major, research, and career path.