

Patrick C. Campbell

Dr. Patrick Campbell is an Earth systems scientist and Research Associate Professor at the [George Mason University](#) (GMU) Center for Spatial Information Science and Systems, and is the associate director of GMU's [Satellite and Earth System Studies \(SESS\) Program](#). Dr. Campbell is also a [National Oceanic and Atmospheric Administration - Air Resources Laboratory \(NOAA-ARL\) Affiliate](#) under the Cooperative Institute for Satellite Earth System Studies (CISESS). Dr. Campbell is working closely with the NOAA-Air Resources Laboratory Chemical Modeling and Emissions Group on scientific research, development, and application of next-generation atmospheric composition and air quality forecasting models that help protect human and ecosystem health. Since completion of doctorate in 2013, he has [authored or co-authored over 35 scientific publications](#), has received awards for high paper citations and top paper reads, and received a NOAA Certificate of Accommodation for leading developments of [NOAA's current operational air quality forecasting system](#) that directly improves the lives of Americans and saves billions of dollars per year.

The focus of Dr. Campbell's interdisciplinary research over the past 10 years has been on cross-cutting topics spanning multi-platform observations, modeling, and related applications, with a focus on surface-atmosphere exchange processes, [atmosphere-biosphere-chemical interactions](#), and multimedia surface fluxes. Dr. Campbell has extensive experience in synthesizing multi-platform Earth system measurements using novel data analysis techniques and modeling methods for many [pressing environmental and climate issues today](#). Dr. Campbell's approach tends not to follow the linear models of basic or applied research. Rather, Dr. Campbell strives for a “*use-inspired basic research*” approach as described by the “*Quadrant Model of Scientific Research*” ([see D. Stokes book on Pasteur's Quadrant: Basic Science and Technological Innovation](#)). In this way, Dr. Campbell provides meaningful research that contributes to overall scientific understanding and progress, while at the same time producing products and technologies that more immediately serve society and public life. This is on display at the [NOAA-ARL developed tools and products page for surface-atmosphere exchange](#), which are used for standalone research purposes, and are applied as advancements to the suite of operational NOAA forecast models that impact our daily lives.

As associate director of GMU's SESS Program, Dr. Campbell has spearheaded coordination, training, education, and outreach, including taking the lead on the newly formed Air Quality Research and Development Consortium (AIRDC). Dr. Campbell coordinated the inaugural, multi-institute [AIRDC workshop](#) at GMU. This workshop intended to foster increased communication and collaboration on atmospheric science and air quality topics in the greater Washington D.C. area and beyond. Dr. Campbell has since continued to organize and implement the AIRDC, including forming the executive team, steering committee, workshop feedback and responses, [website development](#), forums and communication channels, and regular meetings/seminars for improved engagement across the network.

Dr. Campbell is a [Certified Consulting Meteorologist \(CCM\) with the American Meteorological Society](#), where he has worked on [consulting, outreach, and education](#), including environmental impact cases for expert witness testimony in federal court. As a CCM, Dr. Campbell has been active in education and outreach as a guest speaker on topics including climate change, atmospheric composition, and air quality. He was a keynote speaker for the [Books Motivate Foundation's Climate Outreach Program's](#) 2019 Breakfast of Champions event held in Washington, D.C, as well as [guest speaker by the New York State Master Teacher Program](#)

[\(NYSMTP\)](#) where he presented on "*The Climate-Composition Connection: How Changes in Human and Natural Emissions Affect Climate and Air Quality*".

It is the emphasis of Dr. Campbell's work to provide the highest quality, use-inspired basic research at GMU and NOAA, while continuing to engage a wide range of communities including science, industry, and the greater public to expand the impact of his research in today's world.