

MCEN GRADUATE SEMINAR

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Improving Human Health by Reducing Exposures to Harmful Air Pollutants

ABSTRACT

Over the past two decades we have learned through observational epidemiological studies that increases in air pollution are associated with increases in several adverse health outcomes (asthma to heart attacks). Typically, the weak link in these observational studies is the pollution exposure characterization, as most pollutant induced health effects studies have only measured the levels at one urban site and not necessarily even continually. Pollutants originate from numerous types of sources (from brake pads to barbeques to atmospheric reaction). The ambient mixture of pollutants is incredibly chemically complex, in addition, it changes with time and location. To say that characterization of a city's air pollution is non-trivial is an immense understatement.

Dr. Hannigan's group has focused their research efforts on this weak link - improving air pollutant exposure characterization. Multiple pollutants have been linked to adverse health, and their efforts have explored several pollutant types, from ozone to particles. These efforts include projects designed to push our measurement techniques from one expensive urban ambient monitor to multiple outdoor monitors and even down to wearable monitors. The group's newest project will be pushing that even further, giving anyone interested the power to assess their own air quality exposure. In addition, improving health involves more than identifying problematic pollutants, the origin of those pollutants needs to be determined and then control technologies and strategies need to be developed and assessed. Across all of the group's projects origin determination has been a central task. An overview of these research efforts will be presented with potential graduate student opportunities highlighted.

BIOGRAPHY

Dr. Mike Hannigan is an assistant professor in the Department of Mechanical Engineering at the University of Colorado. Since he is writing this bio he is switching to first person. I received my MS and PhD in Environmental Engineering Science from Caltech. After completion of my PhD, I followed my then girlfriend, now wife, to Boulder. To recuperate from my dissertation push I built fences for 6 months prior to starting a post doctoral position at CSU in Atmospheric Science. I now live with wife and two young boys (Calder and Leo) in a newly-renovated home in Niwot. My decision to become a professor occurred shortly after I first heard a fellow undergraduate talking about getting a job. A feeling of dread washed over me - why would I ever want to leave the classroom? The alternative, graduate school followed by teaching, was instantly appealing. That naïve thinking got me to where I am today, and to be honest, I am pretty happy with it. I love to learn, teach, coach, entertain, and mentor; and I still love to solve problems, especially ones that have broad public impact.