

Measuring Fluxes of Ammonia and Other Trace Gases Using Eddy Covariance and Relaxed Eddy Accumulation

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“when you cannot measure it, ..., your knowledge is of a meagre and unsatisfactory kind”

- William Thomson Kelvin, 1883

Measurement of energy and mass exchange in the surface boundary layer is fundamental to many research projects in atmospheric science. Eddy covariance (EC) and conditional sampling techniques (e.g., Relaxed Eddy Accumulation, REA) can obtain near continuous flux data from relatively small sampling footprints across the landscape. While these micrometeorological techniques are widely used to measure CO₂ and H₂O fluxes, new technologies are allowing flux measurement of many different compounds. At CSU, research is underway to develop tower-based systems for measuring ammonia and methane emissions from strong agricultural sources along Colorado’s Front Range, specifically cattle feedlots. Results will compliment ongoing transport modeling and air quality research that examines how ammonia from livestock operations may be affecting nitrogen deposition in Rocky Mountain National Park and the Eastern Slope. Methane data will help quantify the role of beef production in the greenhouse gas emissions inventory.