Evaluation of AQ models: what we miss with limited information

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Two major field campaigns - the NSF/NCAR and State of Colorado Front Range Air Pollution and Photochemistry Éxperiment (FRAPPÉ) and the NASA DISCOVER-AQ – took place jointly in summer 2014 to study the drivers of summertime ozone pollution in the Northern Colorado Front Range (NFR). A comprehensive suite of chemical and meteorological measurements was collected from four research aircraft, six instrumented ground sites with in-situ and remote sensing instruments, additional surface ozone monitoring sites, six mobile labs as well as tethered balloons and ozone sondes to provide a 3D picture of the chemical and meteorological characteristics of the area. In comparison, only about a dozen operational surface ozone monitoring sites in the NFR, even fewer surface sites with CO or NOx measurements and very infrequent canister samples at two locations are typically available operationally for evaluating air quality models. Using the WRF-Chem model, we demonstrate how the additional information from the field campaign changes the conclusions drawn about model performance compared to findings based on evaluation with operationally available data alone. We will not only demonstrate the importance of available information above the surface but also the additional benefit from information on meteorological information other that standard wind and temperature data such as solar radiation and boundary layer heights.