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*Climate dynamics: the scale of uncertainty.*

In an effort to track carbon flows, researchers have pushed to create higher and higher resolution maps of carbon fluxes, from emission to sequestration. These highly detailed maps may assist in attributing emissions to various parties, verifying treaty agreements, and increasing our understanding of the global carbon cycle. Multiple attempts to estimate emissions at various spatial scales use various approaches and proxy data sets to derive their estimates. This presentation investigates and characterizes uncertainties in global emissions data, the implications on issues of scale and resolution, and initial approaches for reducing uncertainty. We examine widely-used estimates in a detailed comparison, revealing marked differences at smaller spatial scales. Since over half of the emissions from some countries come from large point sources such as power plants, we also analyze the uncertainty in emissions from these large sources of emissions and outline approaches to characterizing and reducing that uncertainty. The result is an analysis that suggests that the useful working resolution of an emissions data set is closely tied to the spatial uncertainty in large point sources and the nature of the proxy data used in the estimates. (Received August 28, 2014)