

Integrating Observations and Inventories to Improve Emission Estimates: A Framework for Global Synthesis

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Currently, accounting for greenhouse gas emissions is accomplished by two distinct methods: bottom-up inventories and top-down inverse modeling of fluxes based on observed airborne fractions. The degree of intercomparison and reconciliation between the two methods is currently limited to periodic research-driven campaigns in well-surveyed regions such as the United States and the European Union. This talk will describe a notional framework for a global synthesis of top-down and bottom-up methods with a goal of consistency testing to improve constraints on the underpinning models for both methods as well the complementary roles of the two methods in verifying specific policy actions and validating the efficacy of those actions. The 3 principal barriers to practical implementation: flux uncertainties, relative scope, and the attribution challenge, will be discussed, along with suggestions on how existing and planned assets might be leveraged over the coming years to address these issues.

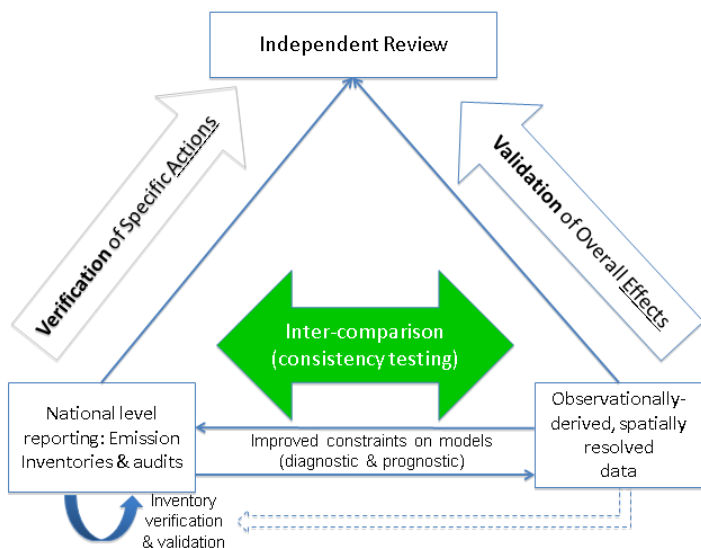


Figure 1. Complementary roles of inventories & observations (and different levels of “V&V”).

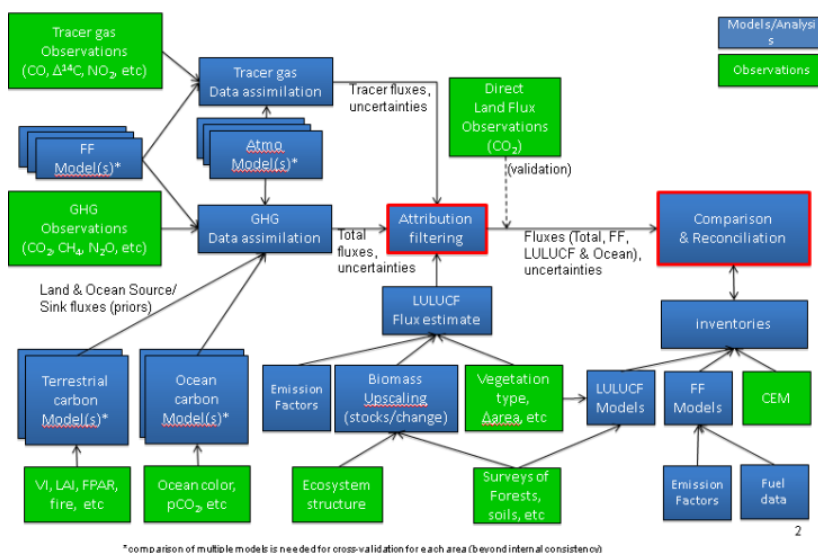


Figure 2. Putting it all together: a notional synthesis framework.