

1.2.3. Does Global Carbon Research Address Verification?

Verification priorities of global carbon research differ from those under the Kyoto Protocol. Global carbon research focuses primarily on the global and sub-global (regional) quantification of carbon sources and sinks and their combination in a closed budget, as well as understanding how the budget changes with time as a function of natural and anthropogenic perturbations. A number of measurements, including those of carbon isotopes and atmospheric oxygen as well as eddy covariance measurements, are combined for ferreting out the different fluxes that result from the use of fossil fuels or are exchanged between land or ocean and the atmosphere (e.g., Heimann, 1996; Heimann *et al.*, 1999; Battle *et al.*, 2000; Falkowski *et al.*, 2000; Canadell and Noble, 2001; IGBP, 2001; Prentice *et al.*, 2001; Wofsy and Harriss, 2002).¹ In principle, this community chases the footsteps of bottom up–top down verification on global and sub-global scales.

By way of contrast, the Kyoto Protocol requires that net emissions of specified GHG sources and sinks, including those of the *Kyoto biosphere* but excluding those of the *non-Kyoto biosphere*, be verified on the spatial scale of countries by the time of commitment, relative to the emissions in a specified base year (FCCC, 1998; FCCC, 2001a: Annex; FCCC, 2001b: Draft decision -/CMP.1; WBGU, 1998: Chapter 3; IPCC, 2000a: Chapters 6 and 7; IPCC, 2000b: Sections 2.3.7 and 2.4.1); Jonas *et al.*, 1999, 2000; Jonas and Nilsson, 2001: Section 3.1.2).² The relevant question is then whether these changes outstrip uncertainty and can be verified — temporally.

Although we take a discordant view here as to how the global carbon research community can contribute specifically to the issue of country-scale verification under the Kyoto Protocol, there is not the slightest doubt about the future need of their guiding work on global and sub-global scales and related to other Kyoto relevant issues (see, e.g., Steffen *et al.*, 1998; Schulze *et al.*, 2000; IGBP, 2001).

¹ IGBP (2001). *The Carbon Challenge. An IGBP-IHDP-WCRP Joint Project*. International Geosphere-Biosphere Program (IGBP), Stockholm, Sweden. Available on the Internet: <http://www.globalcarbonproject.org/carbonprospectus.pdf>.

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Wofsy, S.C. and R.C. Harriss (2002). The North American Carbon Program (NACP). Report of the NACP Committee of the U.S. Interagency Carbon Cycle Science Program, U.S. Global Change Research Program, Washington, DC, United States of America. Available on the Internet: <http://www.carboncyclescience.gov/nacp.pdf>.

² FCCC (2001a). *Implementation of the Buenos Aires Plan of Action: Adoption of the Decisions Giving Effect to the Bonn Agreements. Draft Decisions Forwarded for Elaboration, Completion and Adoption. National Systems, Adjustments and Guidelines Under Articles 5, 7 and 8 of the Kyoto Protocol*. Document FCCC/CP/2001/L.18. United Nations Framework Convention on Climate Change (FCCC). Available on the Internet: <http://www.unfccc.de/>.

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