

RECCAP

REgional Carbon Cycle Assessment and Processes

Version: 6 October 2010



Scope

- To establish the mean carbon balance of large regions of the globe at the scale of continents and large ocean basins, including their component fluxes.
- To do it by comparing and reconciling multiple bottom-up estimates with the results of regional top-down atmospheric inversions, with attribution to main flux components.
- To evaluate the regional 'hot-spots' of interannual variability and possibly the trends and underlying processes over the past two (or more) decades by combining available long-term observations and modeling.

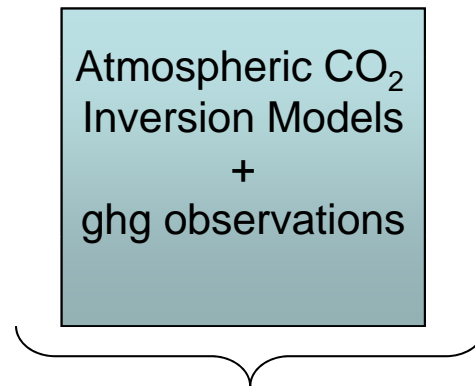
Why RECCAP?

- To provide higher spatial resolution of the global carbon balance with the aim to improve attribution to processes and hot-spots regions essential to understand the future evolution of the carbon-climate feedback.
- To address a growing demand for a capacity to Measure, Report, and Verify (MRV) the evolution of regional fluxes and the outcomes of climate mitigation policies.
- To develop the technical capacity in regions with regional carbon balances of global significance but with little or not technical capabilities.
- To respond to the Group on Earth Observations (EOS) in establishing a global carbon observatory to track the evolution of natural and anthropogenic carbon sources and sinks.

RECCAP Principle

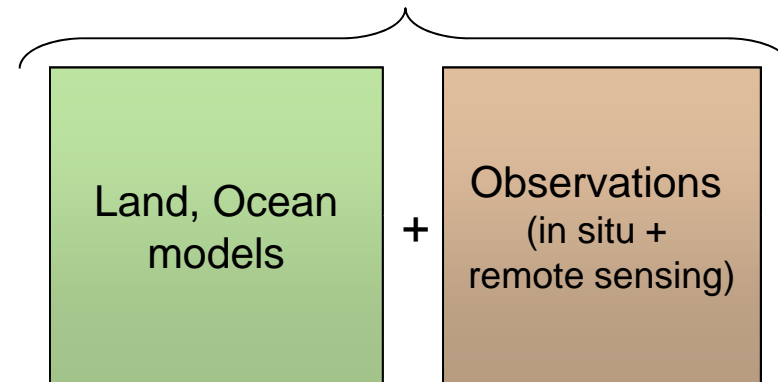
Multiple Constraints to Understand One Carbon Budget

Top-down

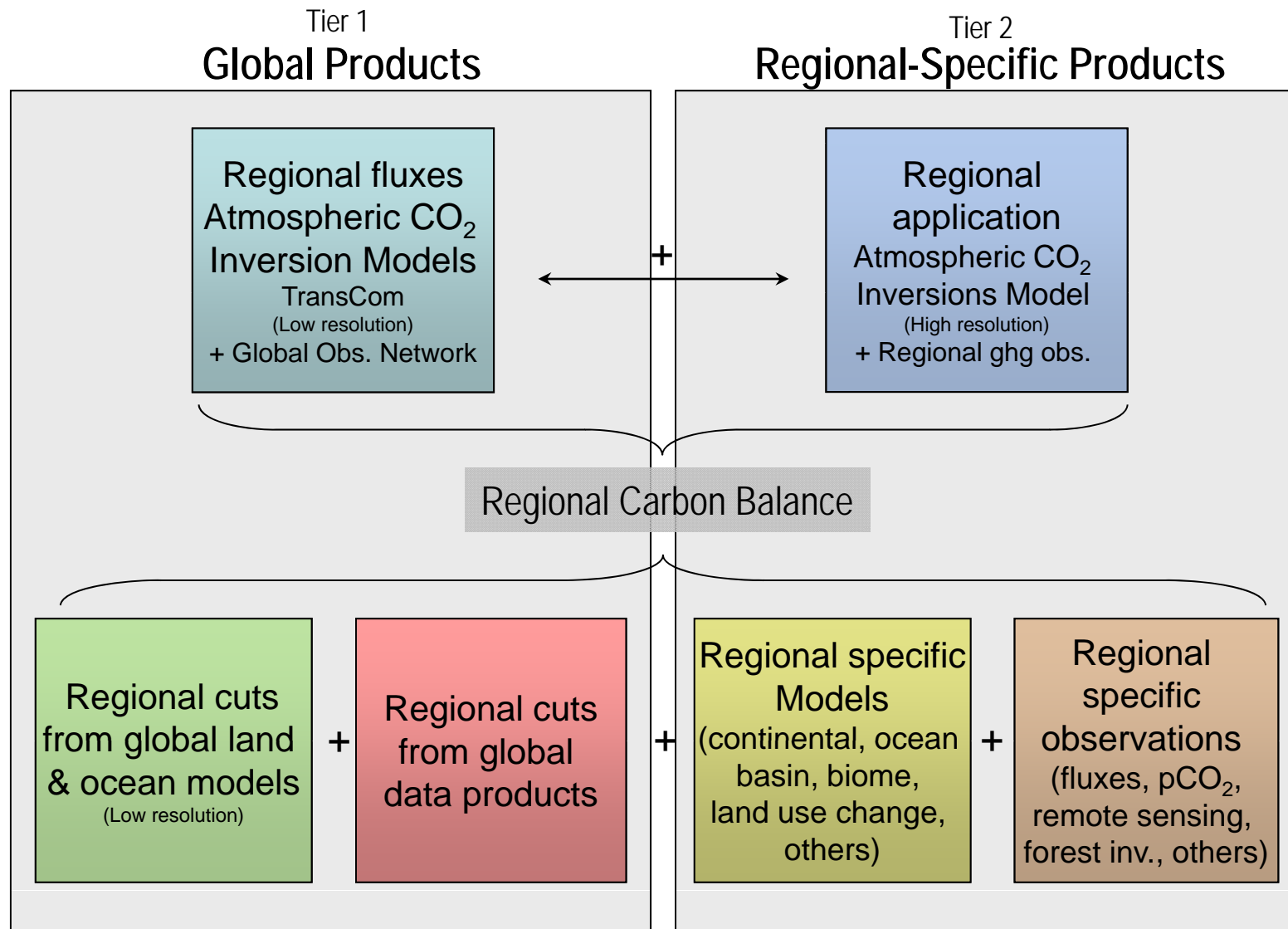


Regional Carbon Balance

Bottom-up



Components of Regional Synthesis



Tier 1 model outputs are coordinated by RECCAP

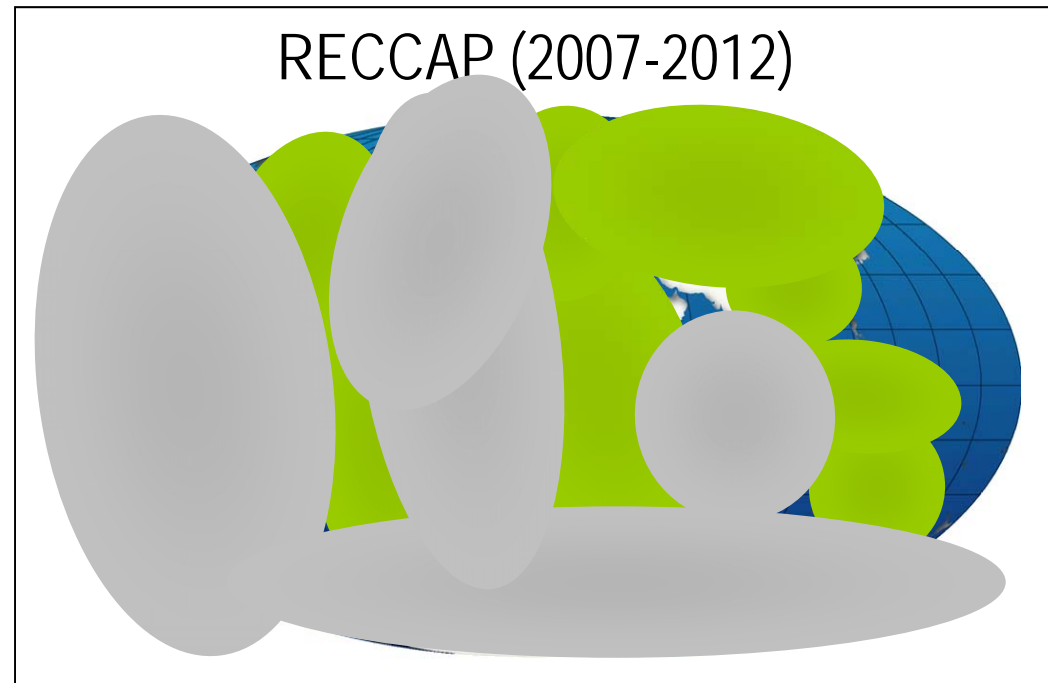
Synthesis Approach

(top-down and bottom-up)

- *Reconciliation of flux estimates* (independently assessed and often partially overlapping) as a means to build confidence in our understanding of the component fluxes, mean estimates, and inter-annual variability.
- Although we are ultimately interested in building a mathematically-formalized multiple constraint approach, model data fusion or data assimilation, RECCAP is not pursuing this approach in its first phase with a completion date 2012.
- Uncertainties need to be quantitatively estimated.

Global Tier 1 Products

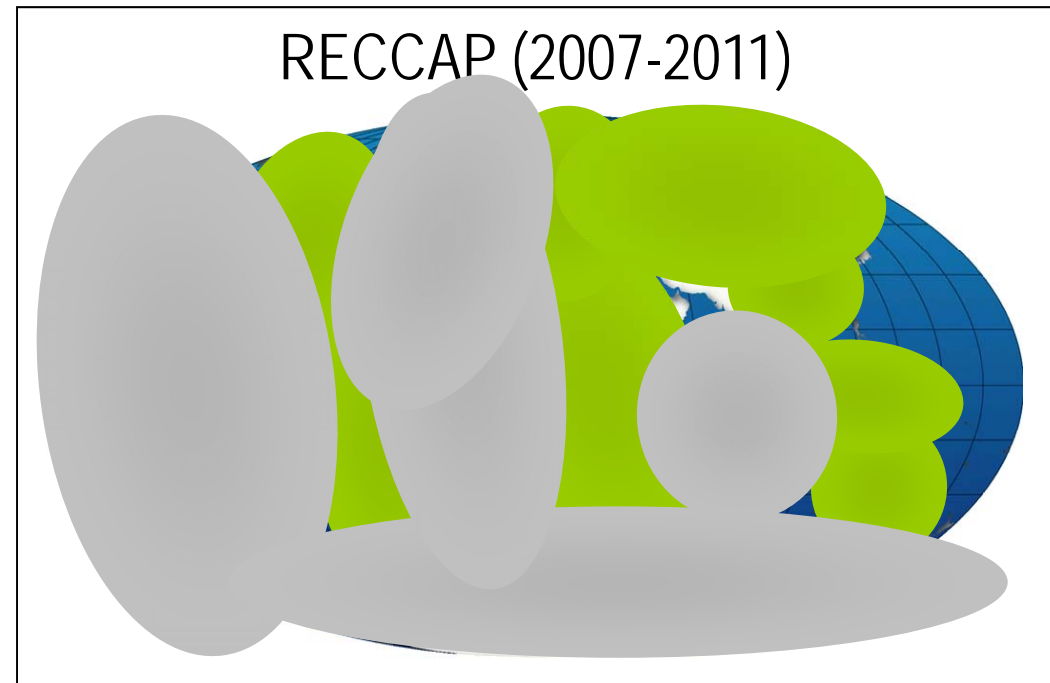
- 10 Atmospheric CO₂ inversions
- 5 Ocean forward models
- 1 Ocean inversion
- 7 Terrestrial models (DGVMs)
- 1 NEP-flux empirical model
- 1 Fire emissions product
- 1 Land use change emissions
- 1 Rivers fluxes to oceans
- 1 Embedded fluxes in international trade



Land and Ocean Regional Syntheses

Land

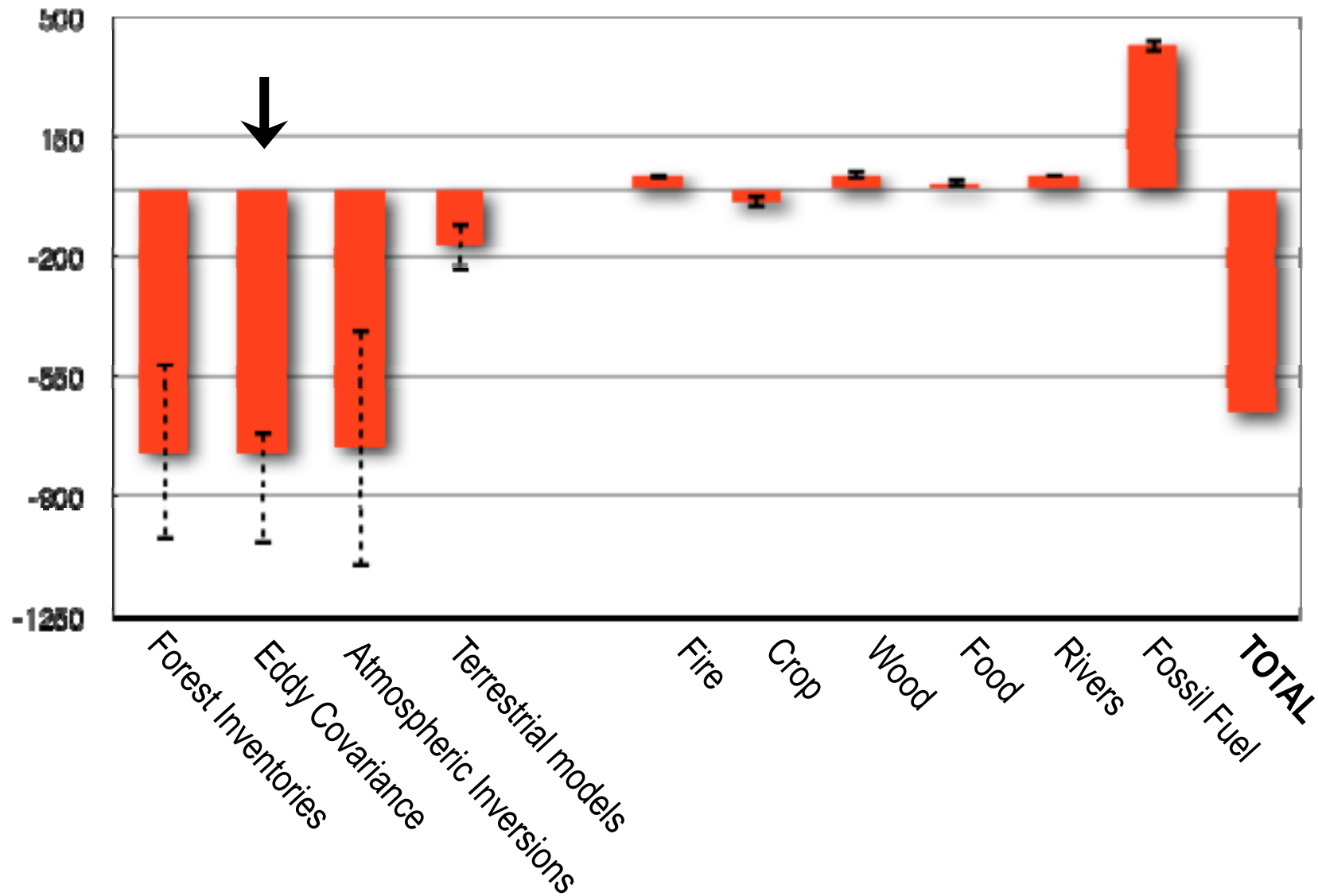
- L1 Africa
- L2 Arctic tundra
- L3 **Australia**
- L4 Europe
- L5 North America
- L6 Russia
- L7 South America
- L8 East Asia
- L9 Southeast Asia
- 10 South Asia




Oceans

- O2 Pacific
- O3 Atlantic and Arctic
- O4 Southern Ocean
- O5 Indian

Mean Carbon Budget of Russia (1990-2009)



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RECCAP

RECCAP REgional Carbon Cycle Assessment and Processes

What is RECCAP?
[Overview](#)

Regional Syntheses Land and Ocean regions	Global Syntheses Various and overall global fluxes	Soft Protocol Methodology and minimum requirements
Global Products Global modelling products	Implementation Meeting, committees, how to get involved	Sponsorship Partners who are making RECCAP possible

Downloads



[Scoping paper](#)
Overview paper on RECCAP principles and regions

[Soft Protocol](#)
Methodological principles for top-down and bottom-up synthesis.

[Overview PPT](#)
Summary overview of RECCAP for meeting presentations

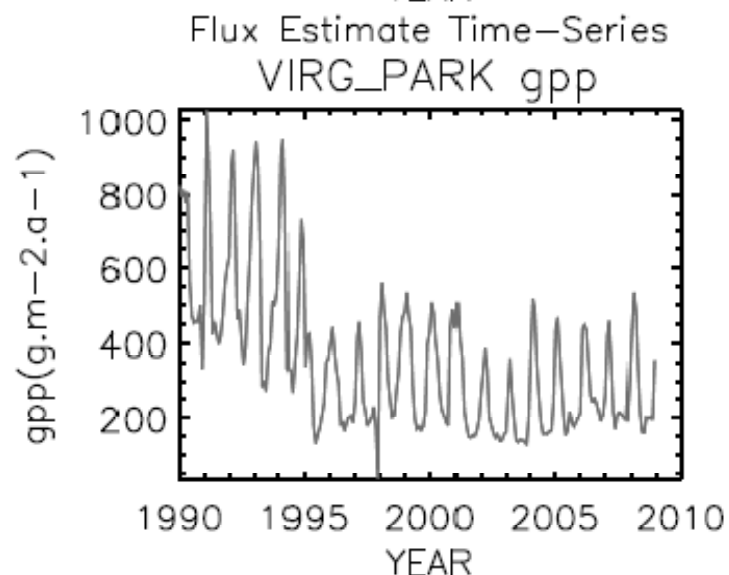
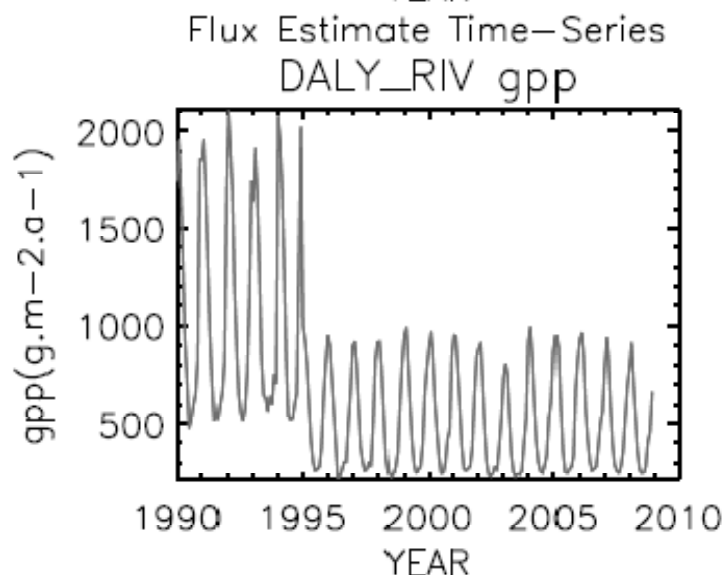
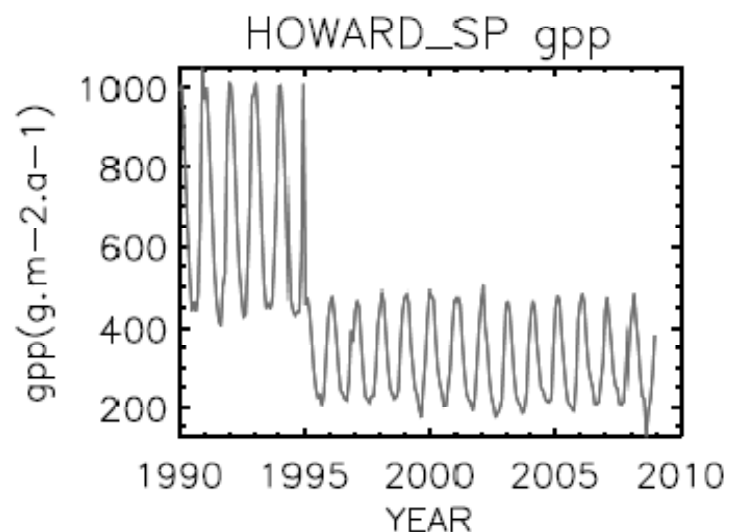
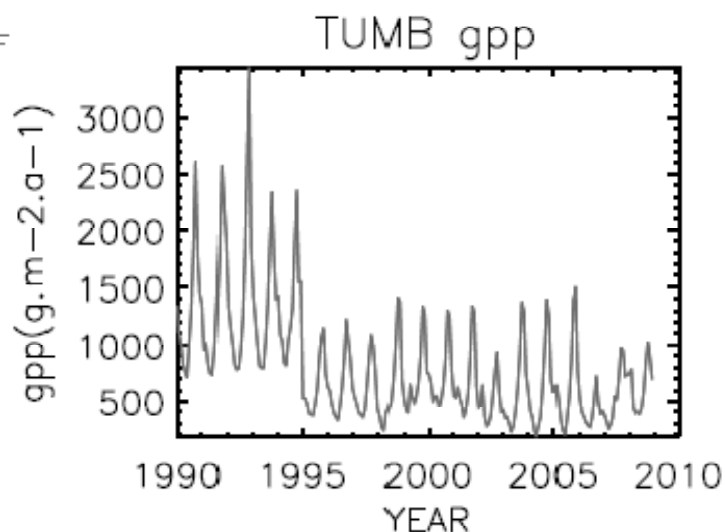
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www.globalcarbonproject.org/RECCAP

Jena Fluxnet Product

Beer et al. Science 2010

Jena_GTCF



Flux Estimate Time-Series

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