

Greenhouse Gas Subproject

Objective

Develop an operational system to monitor the concentrations of greenhouse gases (CO_2 , CO , N_2O , CH_4), and their associated surface sources and sinks.

GHG Work Packages

WP_GHG_1 CO₂ estimates from satellite instruments using 4D-Var data assimilation

WP_GHG_2 Stand alone CO₂ retrieval for AIRS and IASI

WP_GHG_3 Independent assessment of CO₂ concentrations and fluxes

WP_GHG_4 Estimates of CO₂ sources and sinks using existing atmospheric inversion models

WP_GHG_5 Development and testing of an off-line transport model based on IFS

WP_GHG_6 Attribution of the inferred CO₂ sources and sinks to causes

WP_GHG_7 Prototype system to estimate atmospheric CH₄, N₂O and CO concentrations

WP_GHG_8 Estimates of CH₄ sources using existing atmospheric models

Paraphrase tasks

- Find 4-d distributions of GHG: WP₁, WP₂ and WP₇.
- Validate these distributions: WP₃.
- Derive surface sources: WP₄, WP₅, WP₈.
- Improve knowledge of controlling processes: WP₆.

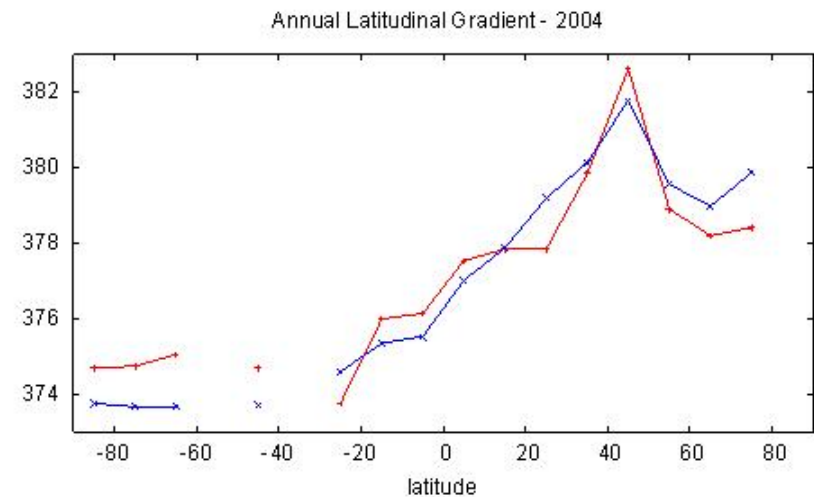
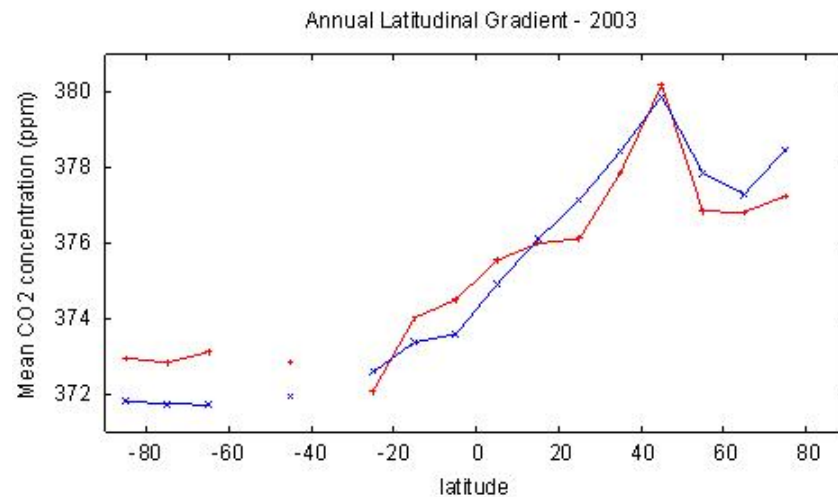
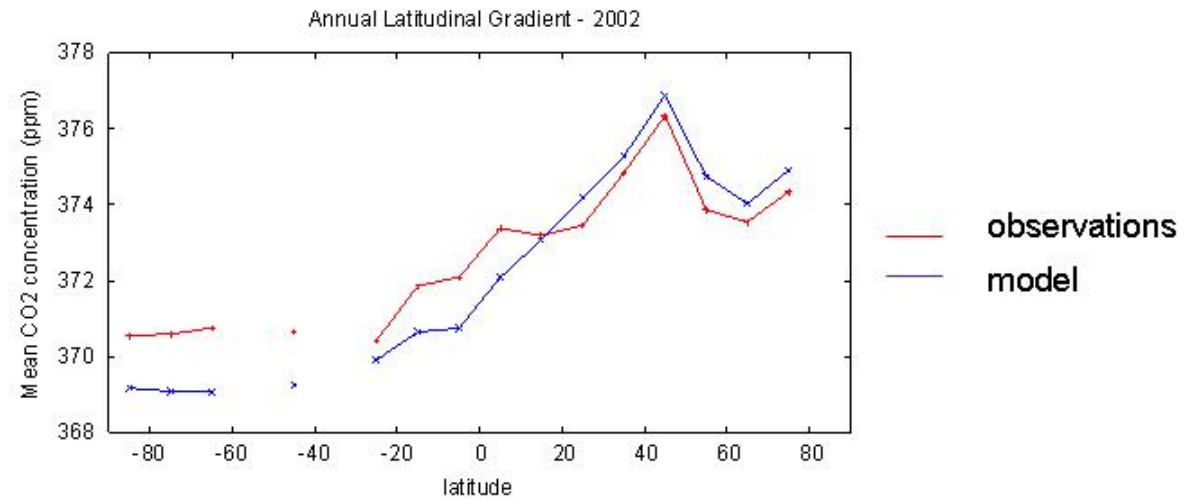
Highlights of Progress

- Assimilation of CO₂ at ECMWF
- Two years of AIRS standalone retrieval performed.
- Inversions performed on satellite data.
- Consolidated airborne dataset prepared.

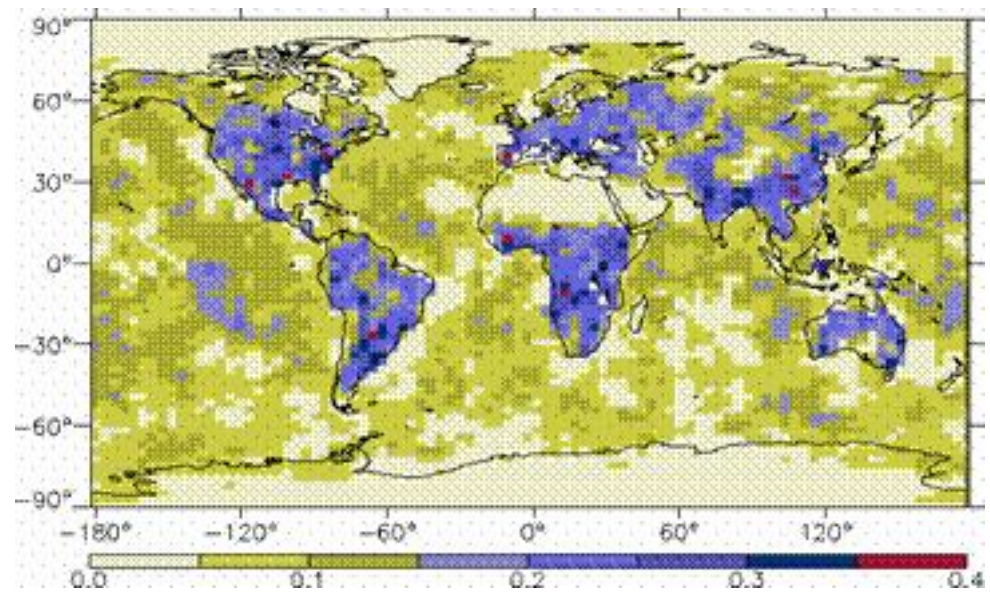
Comparisons to in situ measurements at the surface

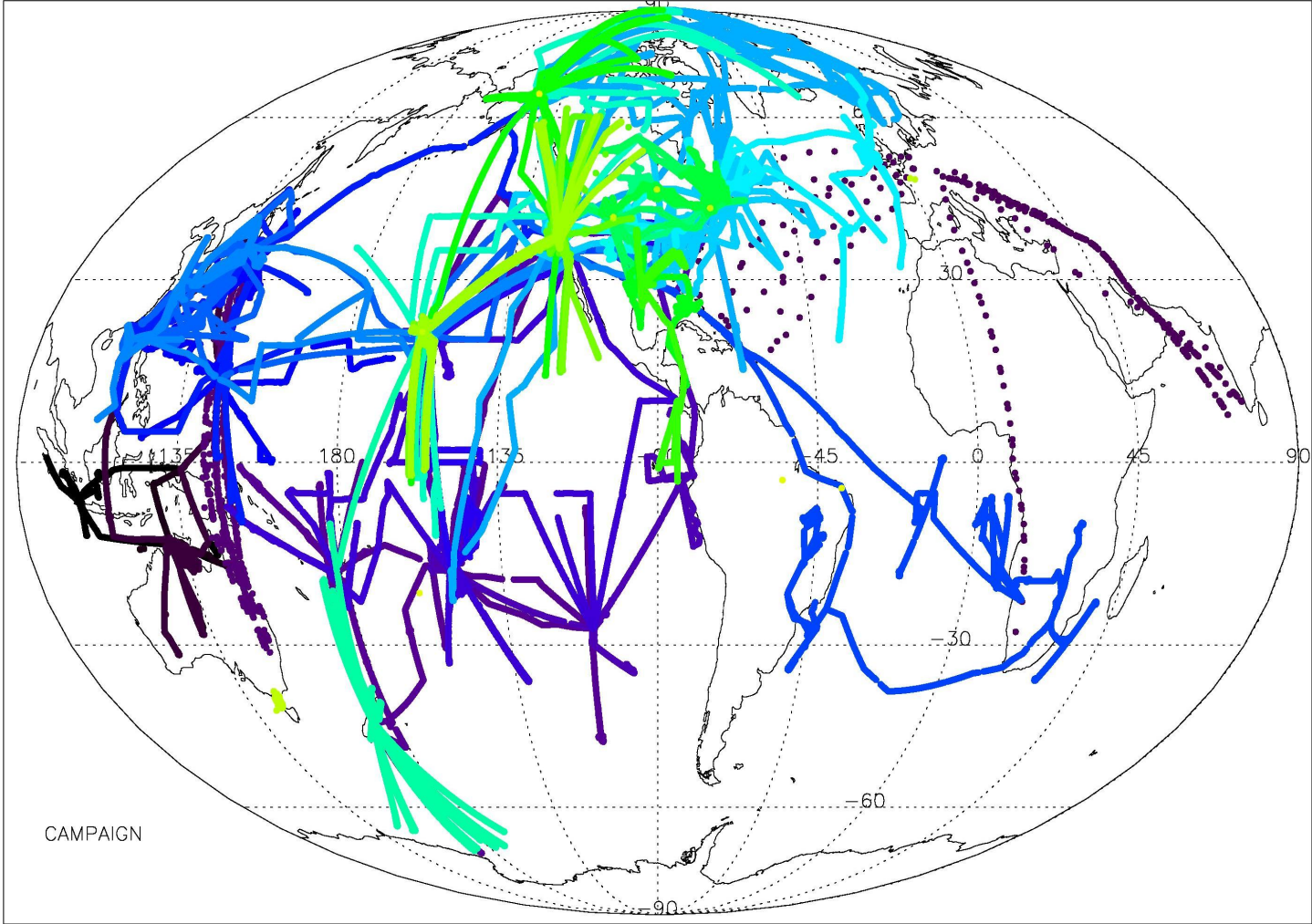
Meridional profiles of annual means

Same fluxes are used for 2002, 2003 and 2004 but different meteorology



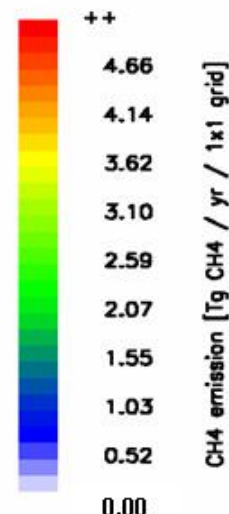
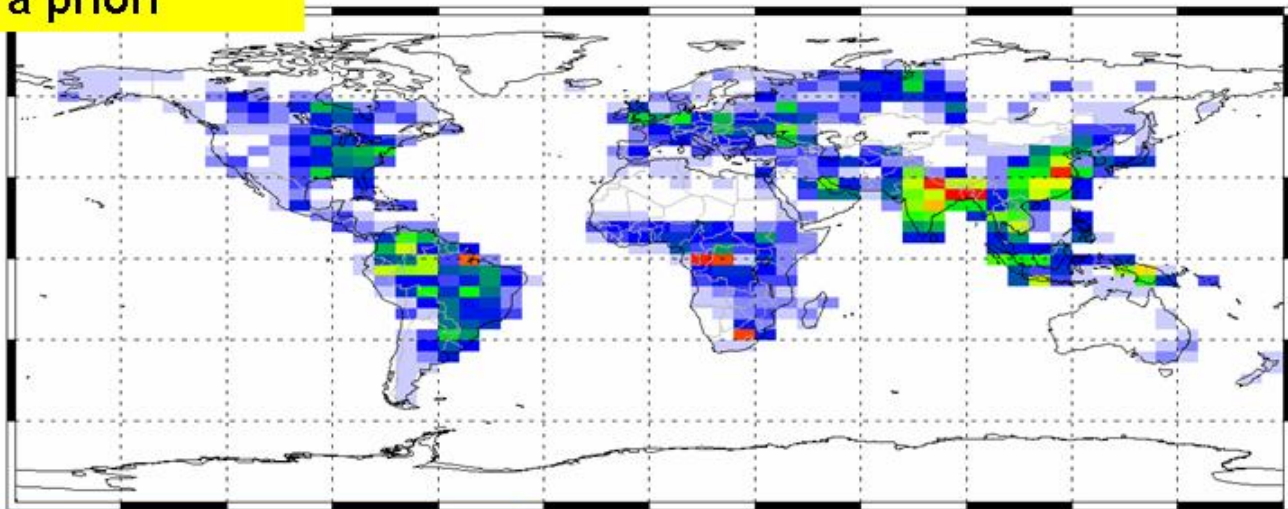
Observations show lower IHD for 2002



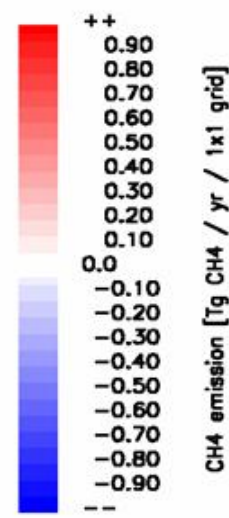
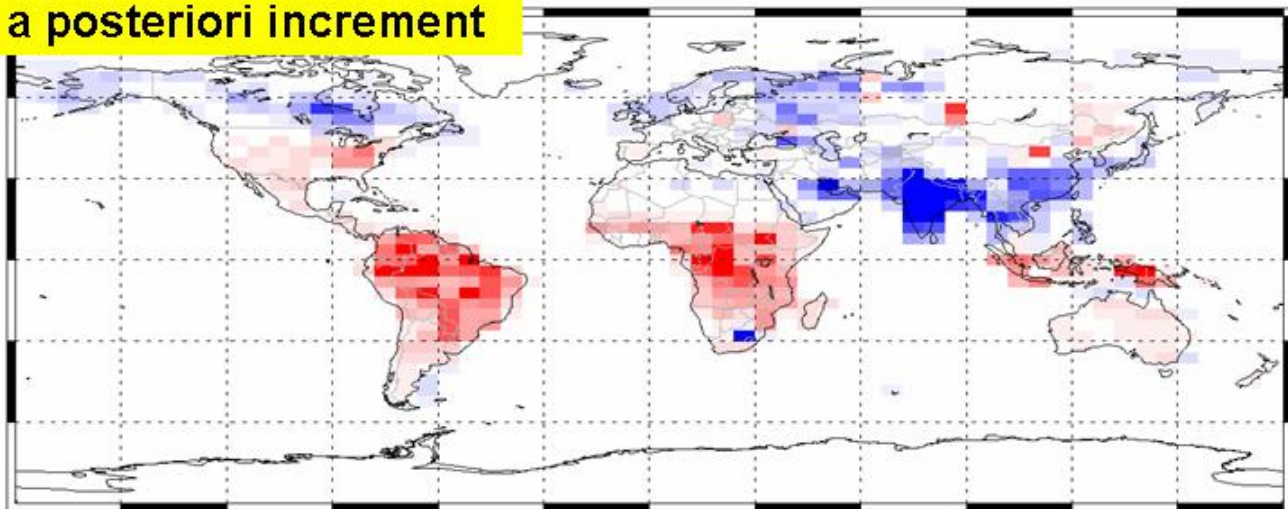


a priori emissions / a posteriori increment (S2)

a priori



a posteriori increment



Discussions for the week

- Planning the first reanalysis
- Improving background emissions
- Transport validation
- External links