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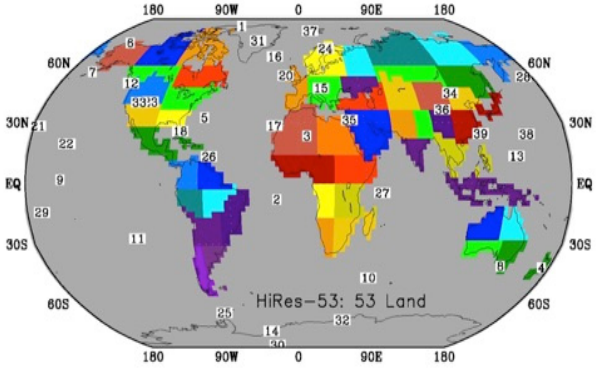
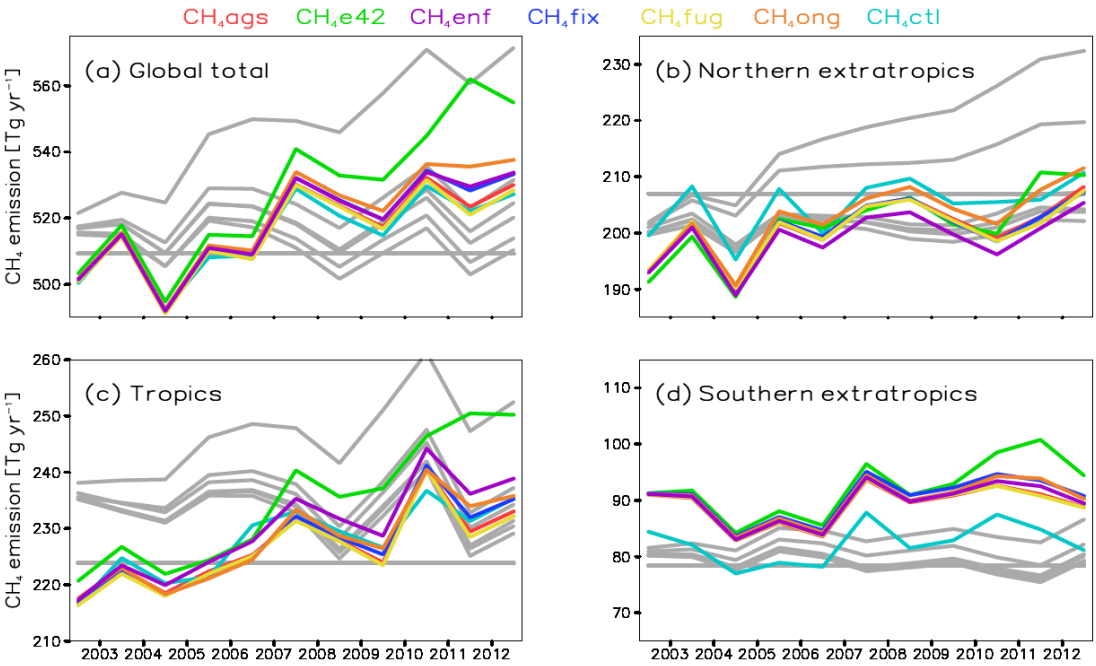


←
Figure 1. 53 land regions of CH_4 emission inversion (colour shaded), and locations of 39 measurement stations identified by numbers.



↓Figure 2. Annual mean terrestrial CH_4 emissions as estimated by 7 different inversion cases (coloured lines), in comparison with the a priori (inventory) emissions (grey lines).

- Methane (CH_4) participated prominently in global warming and air pollution chemistry over the past one century. However, anthropogenic emission inventories of CH_4 suffer from large uncertainties, due to the lack of country-specific sectorial emission factors, timing of new technology implementation and the underlying statistics, especially for the developing countries.
- We have developed a new inverse modeling system for estimating CH_4 emissions from 53 regions of global land for the period of 2002-2012, using the JAMSTEC's atmospheric chemistry-transport model (ACTM) and observations of atmospheric CH_4 at 39 sites (Fig. 1).
- Our results suggest that CH_4 emission level and the rate of emission increase have very likely been overestimated for the East Asia region by the inventory estimates. The rate of CH_4 emission increase in the tropics is found to be in good agreement with that obtained from the inventory estimates, and can be attributed mainly to an increase in livestock population (Fig. 2).