Expectations for Satellite Observation Data to Contribute to GHG Inventory

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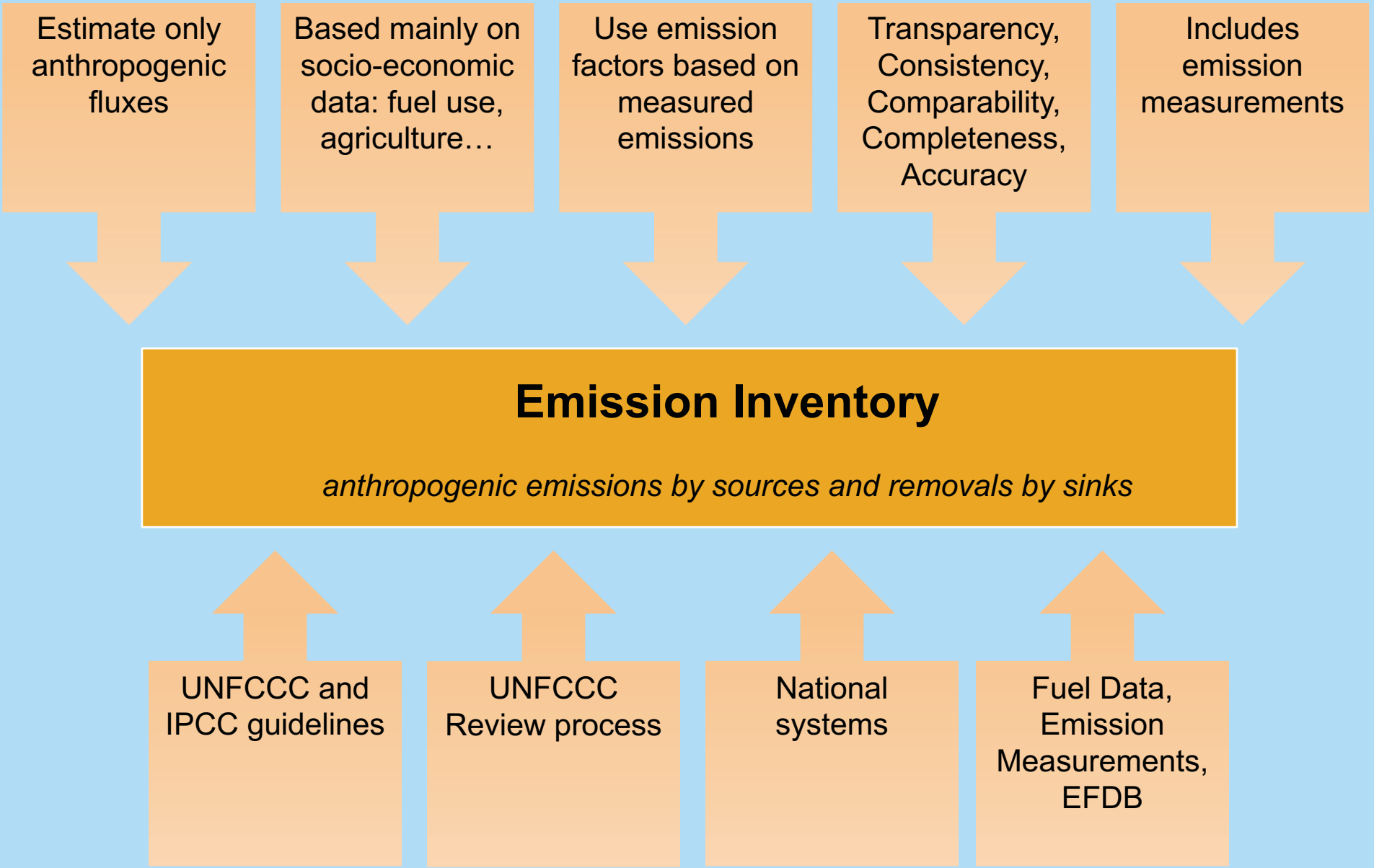
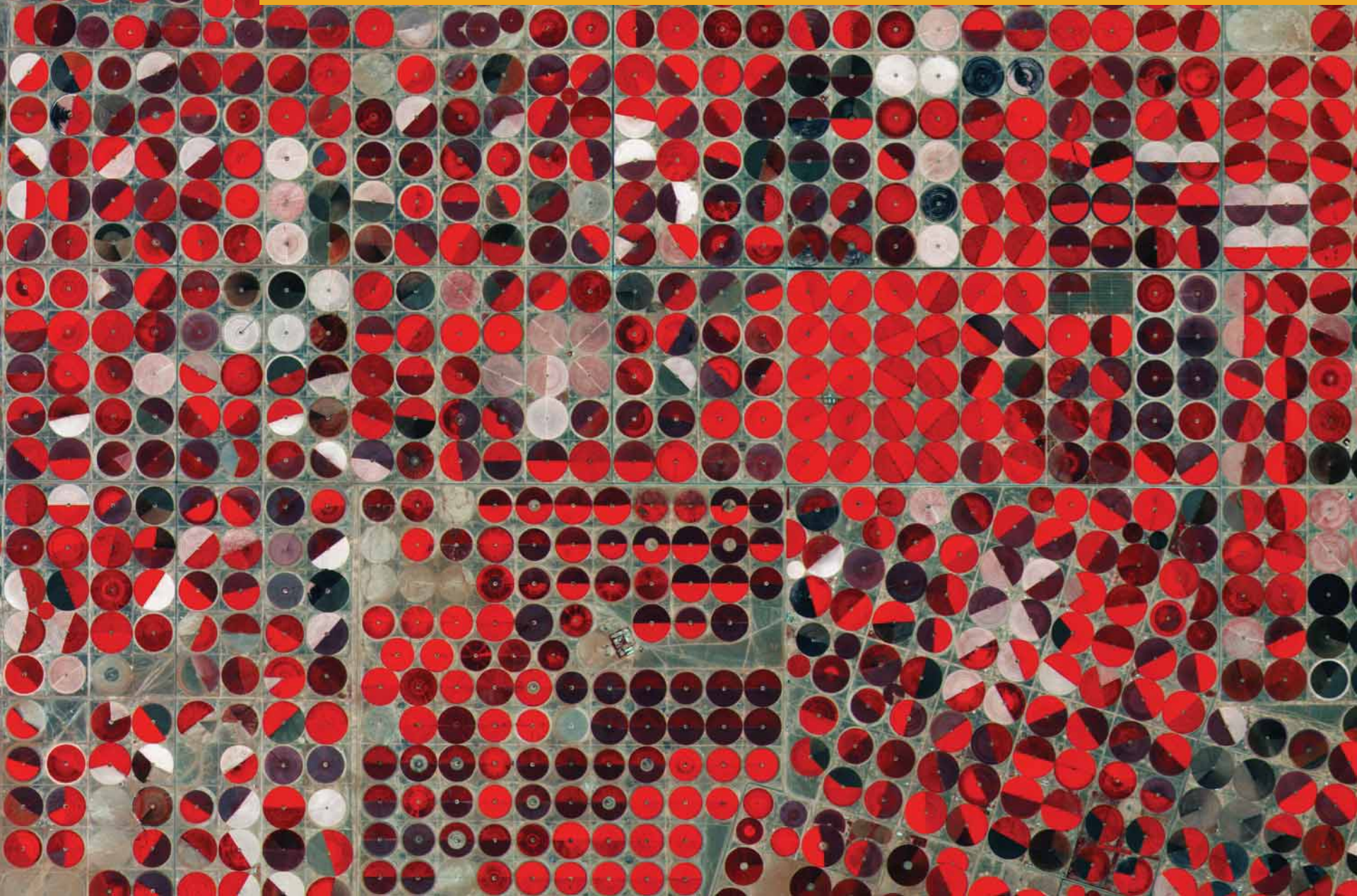
Efforts toward satellite data utilization for IPCC Guideline of GHG Inventories

1:00.p.m.- 2:30 p.m., November 14 (Mon), 2016


Estimate only anthropogenic fluxes
Based mainly on socio-economic data: fuel use, agriculture…
Use emission factors based on measured emissions
Transparency, Consistency, Comparability, Completeness, Accuracy
Includes emission measurements
Emission Inventory
anthropogenic emissions by sources and removals by sinks
UNFCCC and IPCC guidelines
UNFCCC Review process
National systems
Fuel Data, Emission Measurements, EFDB

Emission Measurements: both in-situ and remote

Land Use from Satellites needs to give the 6 IPCC land categories (and their sub-categories)



Advantages of Emission Inventories

All countries can complete emission inventories themselves (with Capacity Building and financial support)

Approach agreed by UNFCCC, following the IPCC, with approaches to review and verification.

Estimates anthropogenic emissions and removals as required by UNFCCC

The approach based on statistics with international data from other countries filling gaps.

The method is easy to understand by non-technical observers. It is transparent.

For land use and forestry adequate satellite data is available for free.

Individual economic sectors can be monitored

Accuracy varies from gas to gas and between source types, but can be estimated

No Independent Validation

Compound:CO2; emissions_ds_name:v4.2_FT2010_CO2_GWP100(grmnht) ; Year:2010
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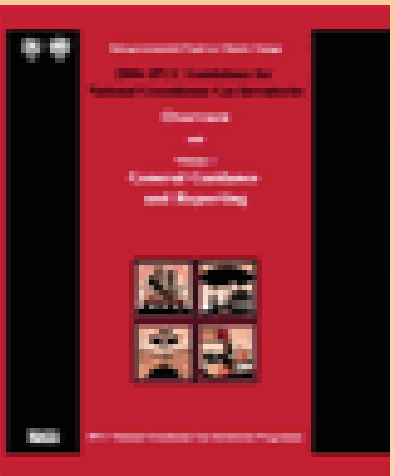
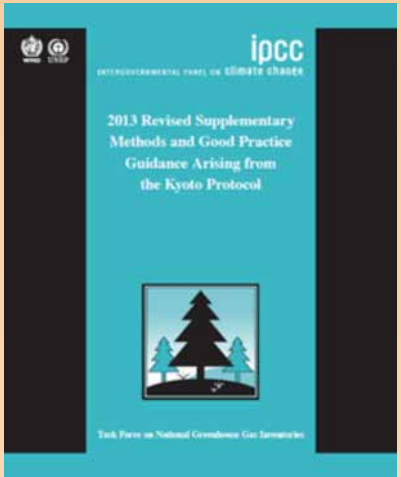
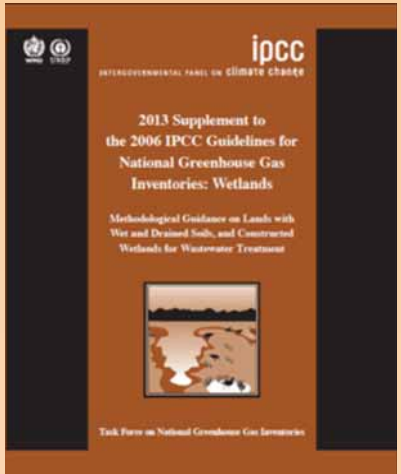
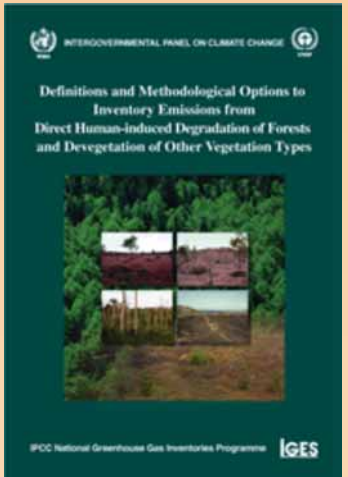
EDGAR

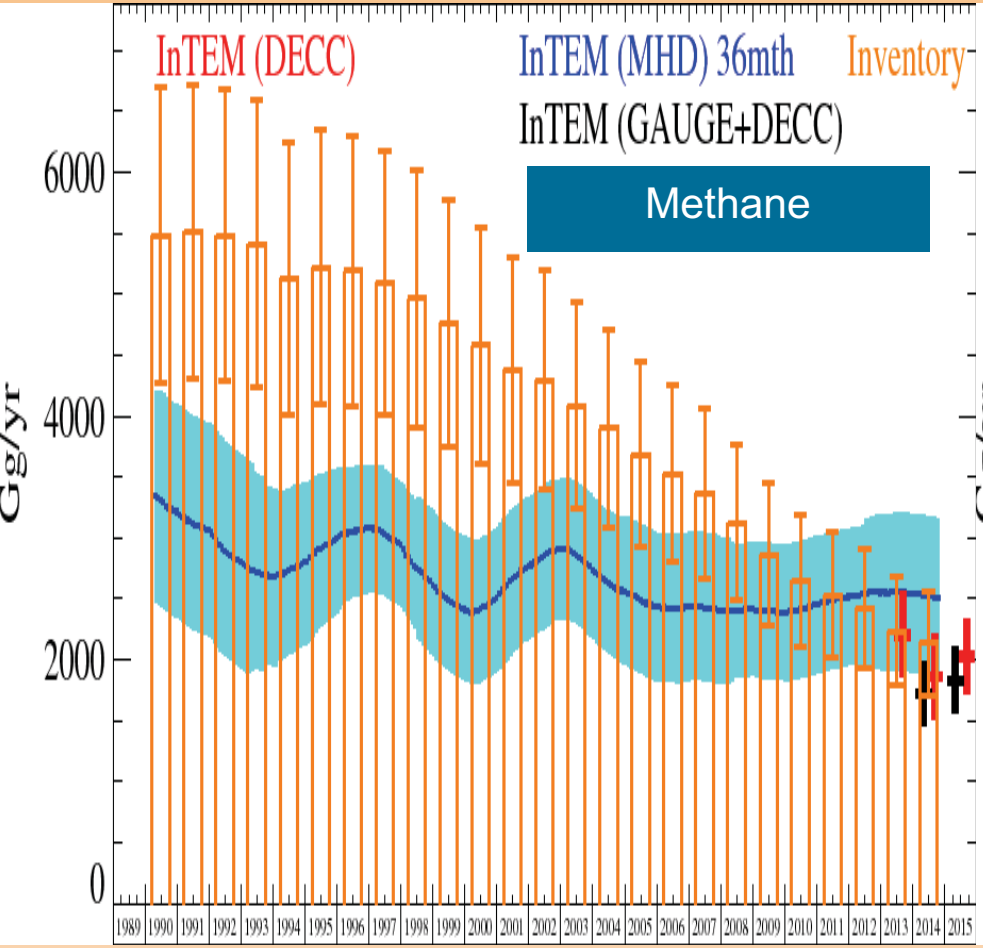


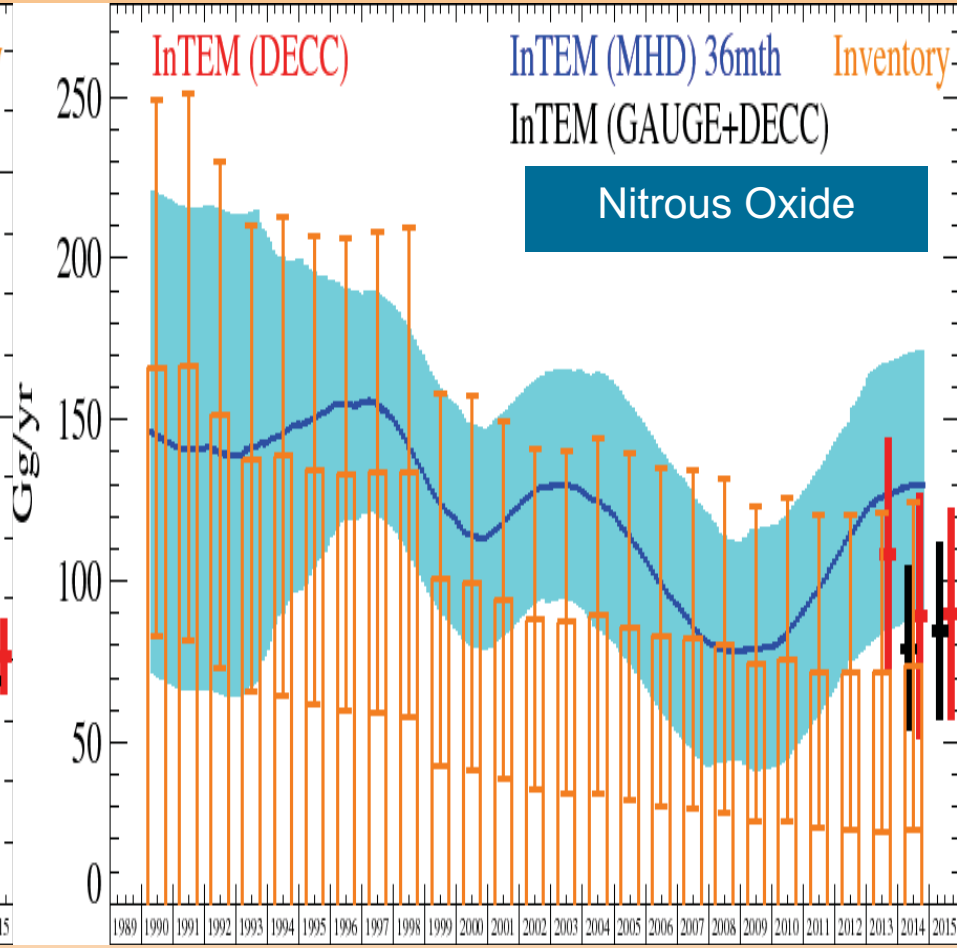






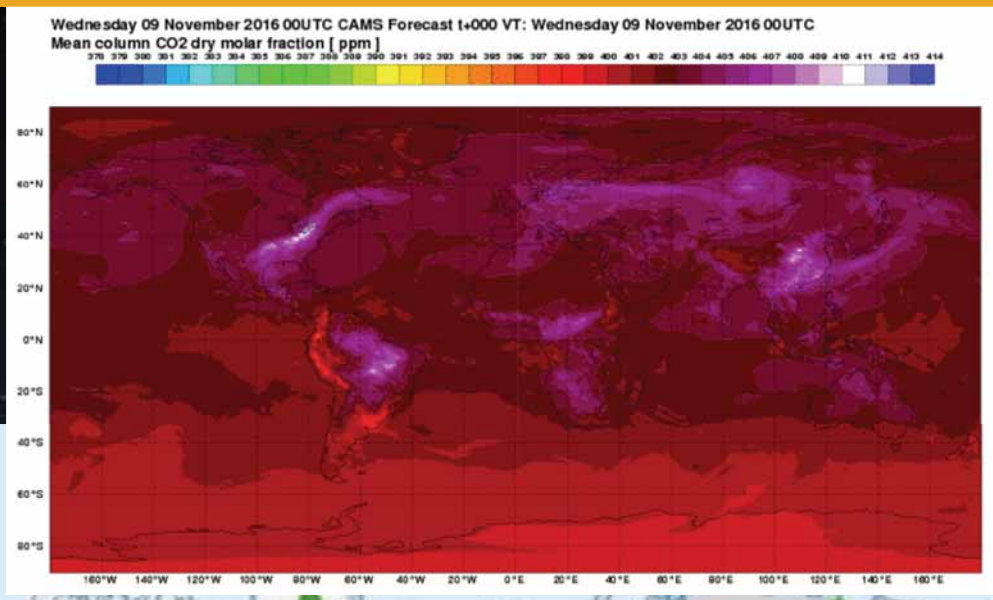
Atmospheric composition measurements have been used to validate emission inventories

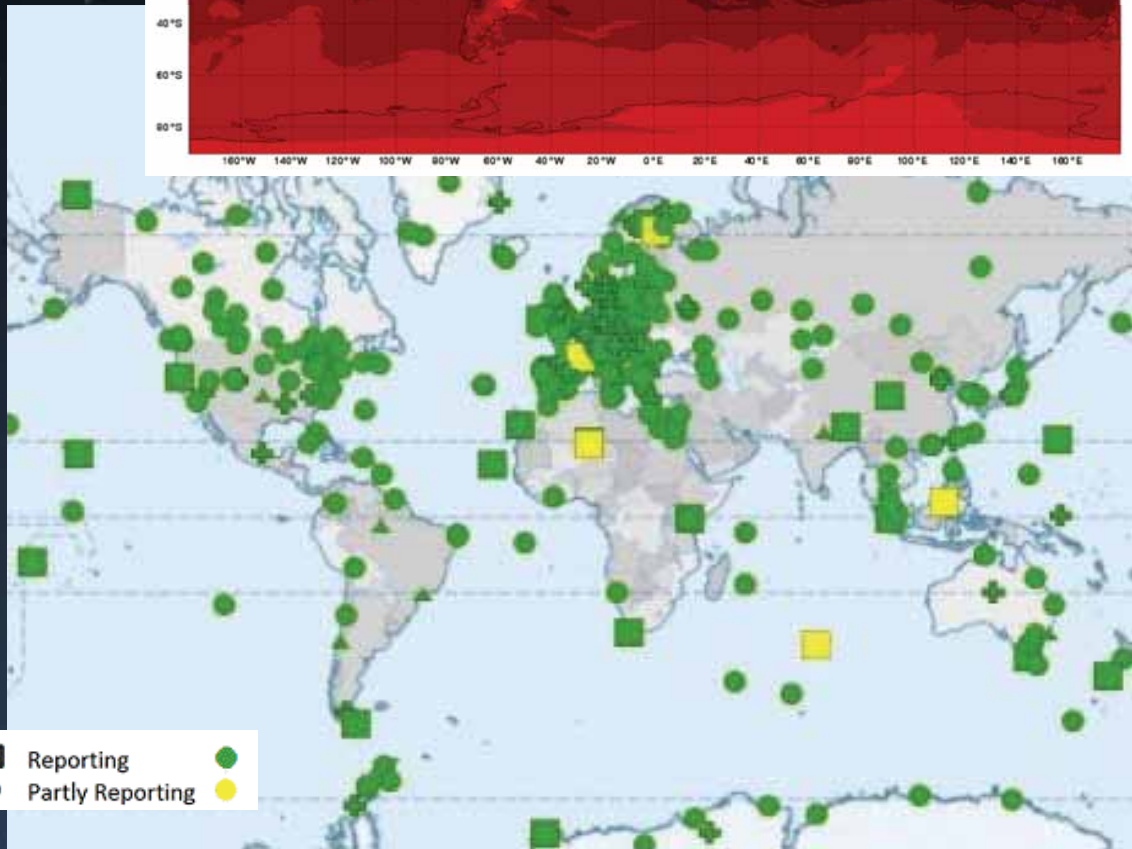




Example from UK, see UK NIR 2016

Composition Observations: Satellites and ground-based stations





Clarity is needed on when these services can be delivered

Some thoughts from Inventory Experts

Unlikely to be possible for all countries – some will rely on estimates made by others

Requires expensive equipment, expert staff and sustained funding to maintain adequate observational standards.

Requires well trained scientific staff.

Can separate biogenic and fossil carbon – not anthropogenic

Not easy to separate economic sectors.

Unlikely to be a comprehensive global system for decades

Accuracy is lower that for emission inventories

Extract from GCOS Terrestrial ECV Product Requirements				
ECV	**Products**	**Frequency**	**Resolution**	**Required measurement uncertainty**
Anthropogenic Greenhouse Gas Fluxes	Emissions from fossil fuel use, industry, agriculture and waste sectors.	Annual	By country and sector	Globally 5% Nationally 10%
	Emissions/ removals by IPCC land categories	Annual	By country/ region	Globally 15% Nationally 20%
	Estimated fluxes by inversions of observed atmospheric composition - continental	Annual	1000 - 10,000 km	10%
	Estimated fluxes by inversions of observed atmospheric composition - national	Annual	100-1000 km	30%
	Hi-res CO2 column concentrations to monitor point sources	4 hourly	1 km	1ppm

Thank-you

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