

Regional budgets of 3 major greenhouse gases using inverse modelling of atmospheric data

*Prabir Patra¹, Naveen Chandra¹, Jagat Bisht¹

1. Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Atmospheric observations of greenhouse gases provide accurate record the changes in their abundance in the Earth's environments, and it has now been well established that the increase in greenhouse gases concentrations is causing the rise in the mean surface air temperature. Using atmospheric chemistry-transport models (ACTM), along with the concentration measurements, we can estimate the sources and sinks of the chemical species. Using MIROC4-ACTM at JAMSTEC, we estimated regional sources and sinks of carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) over the period of 1996 to 2016. This will help global stocktake every 5 years, as a independent estimate, when the countries report their progress on nationally determined contributions (NDCs) under the Paris Agreement and their ammendments, overseen by the UNFCCC.

Keywords: Inverse modelling, Greenhouse gases sources and sinks, Paris Agreement and NDCs