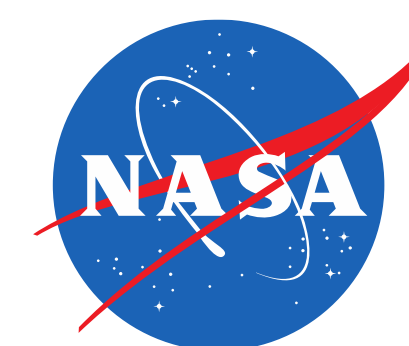


Supporting health impact assessment using satellite-derived emission and air quality data

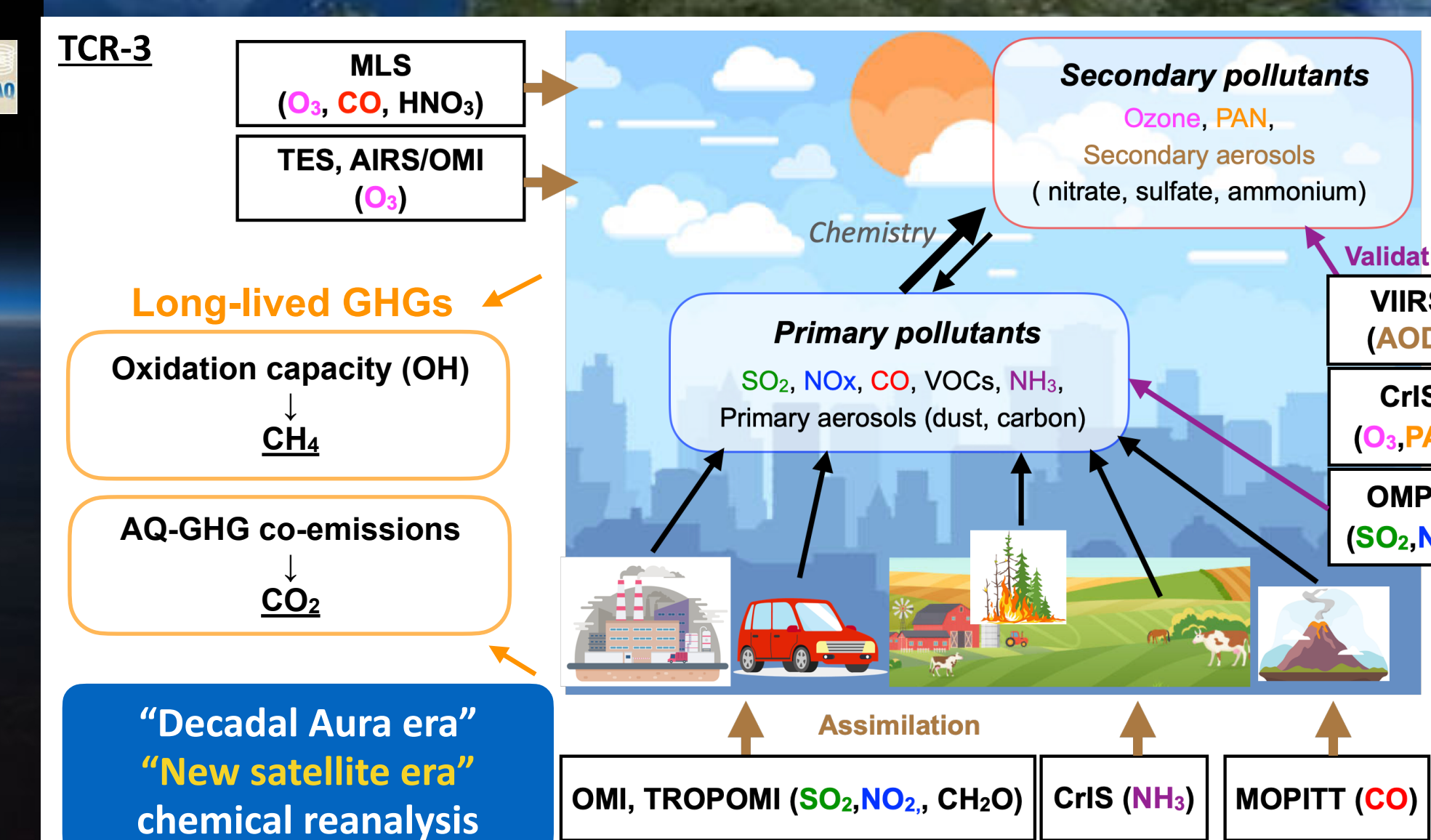
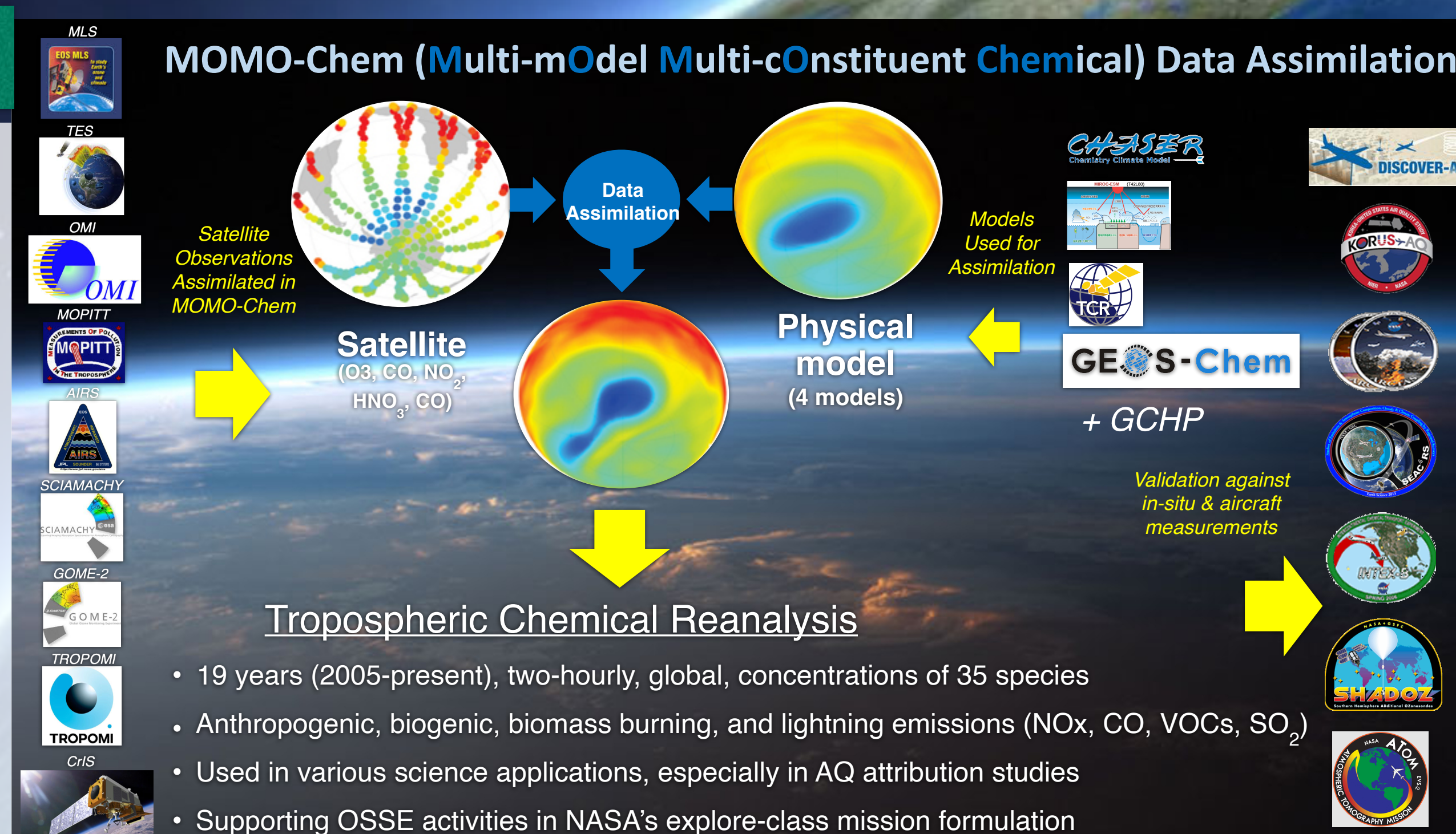
National Aeronautics and Space Administration



Kazuyuki Miyazaki (Jet Propulsion Laboratory, California Institute of Technology, USA)

MOMO-Chem satellite data assimilation

- The impact of air quality (AQ) on human health is dynamic through rapid changes in population, emissions, climate, and human exposure.
- Recent advances in satellite remote sensing and DA have greatly improved the ability to quantify these factors.
- MOMO-Chem is a powerful capability that harnesses NASA's satellites to quantify AQ changes and provides information for decision-making, such as the relationship between AQ and human activities as represented by emissions.

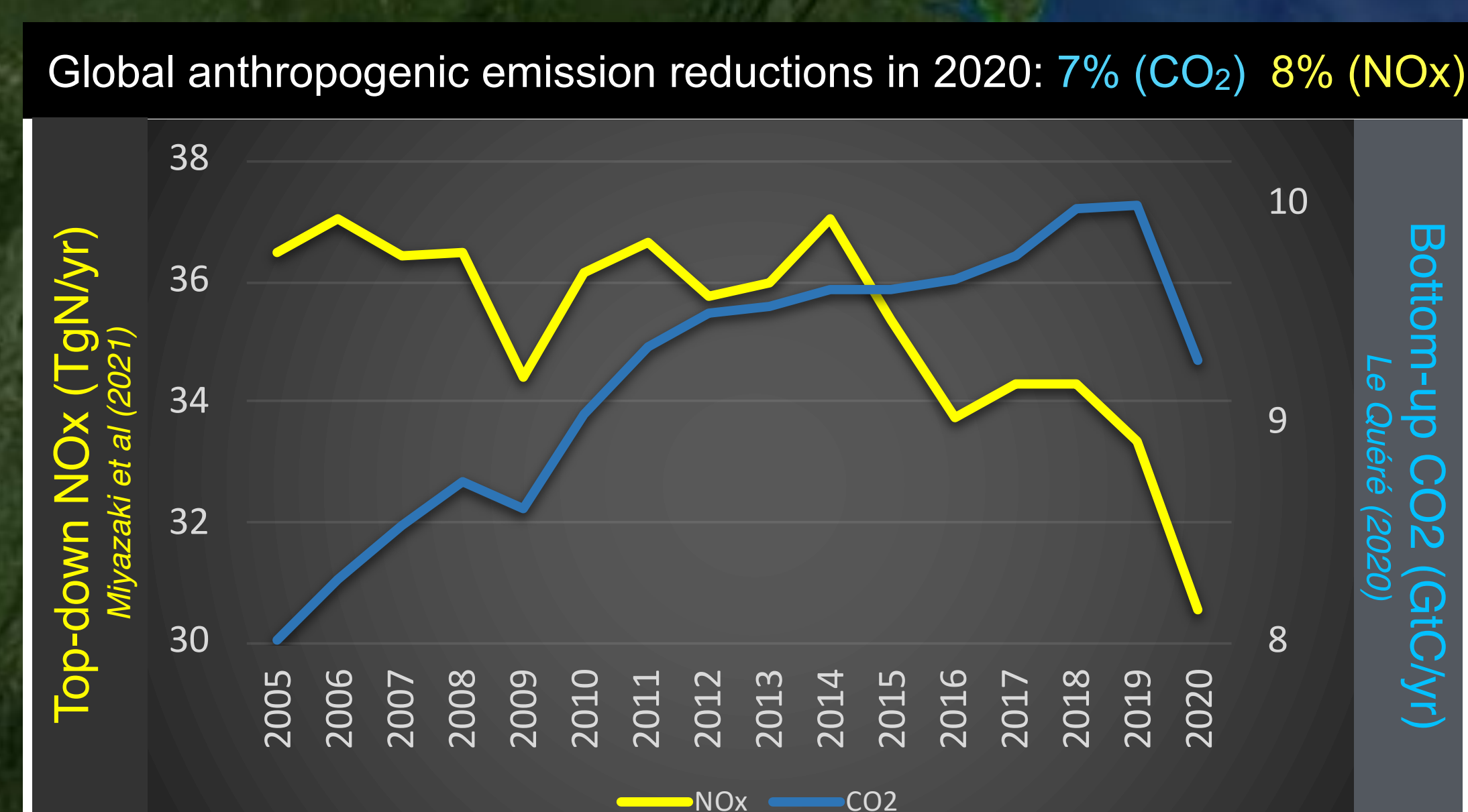
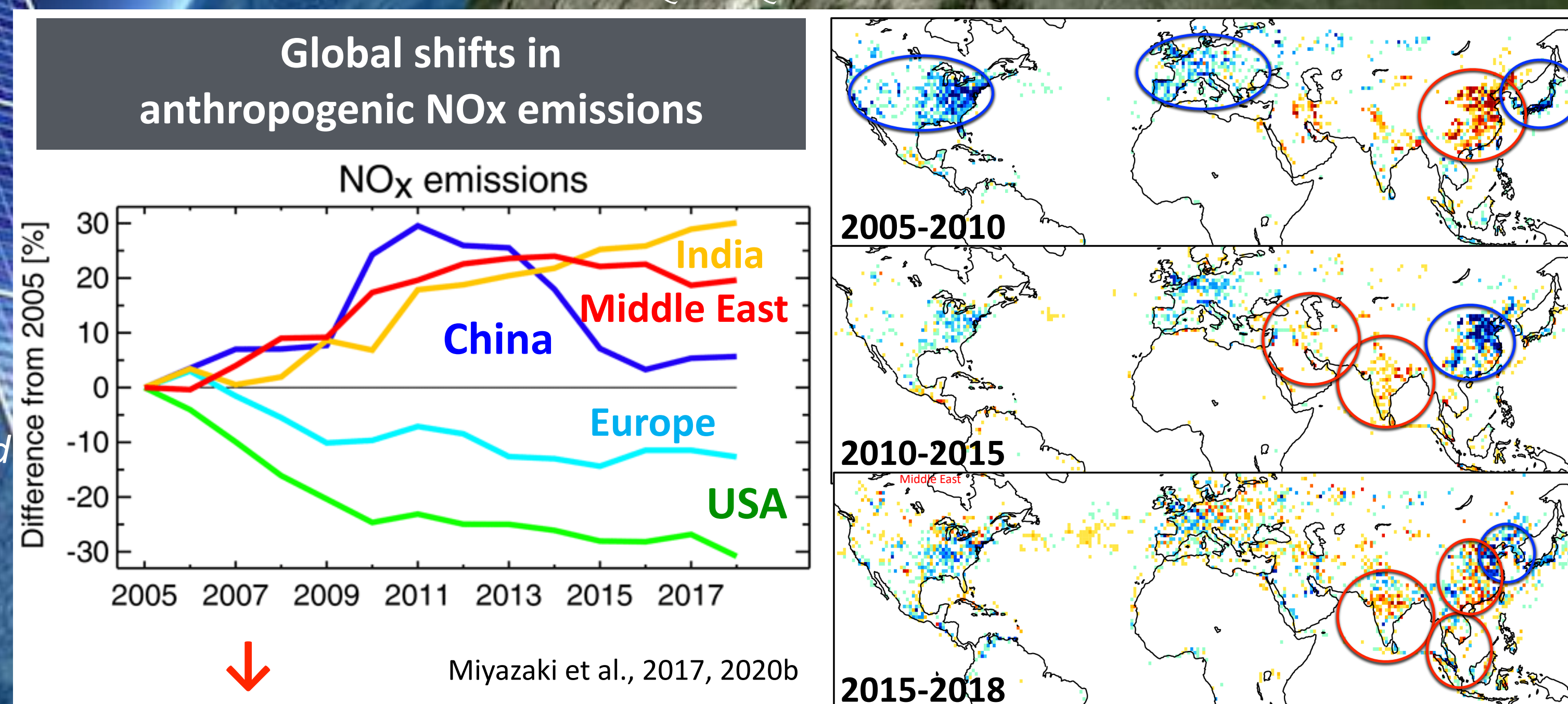


Decadal changes

COVID lockdown

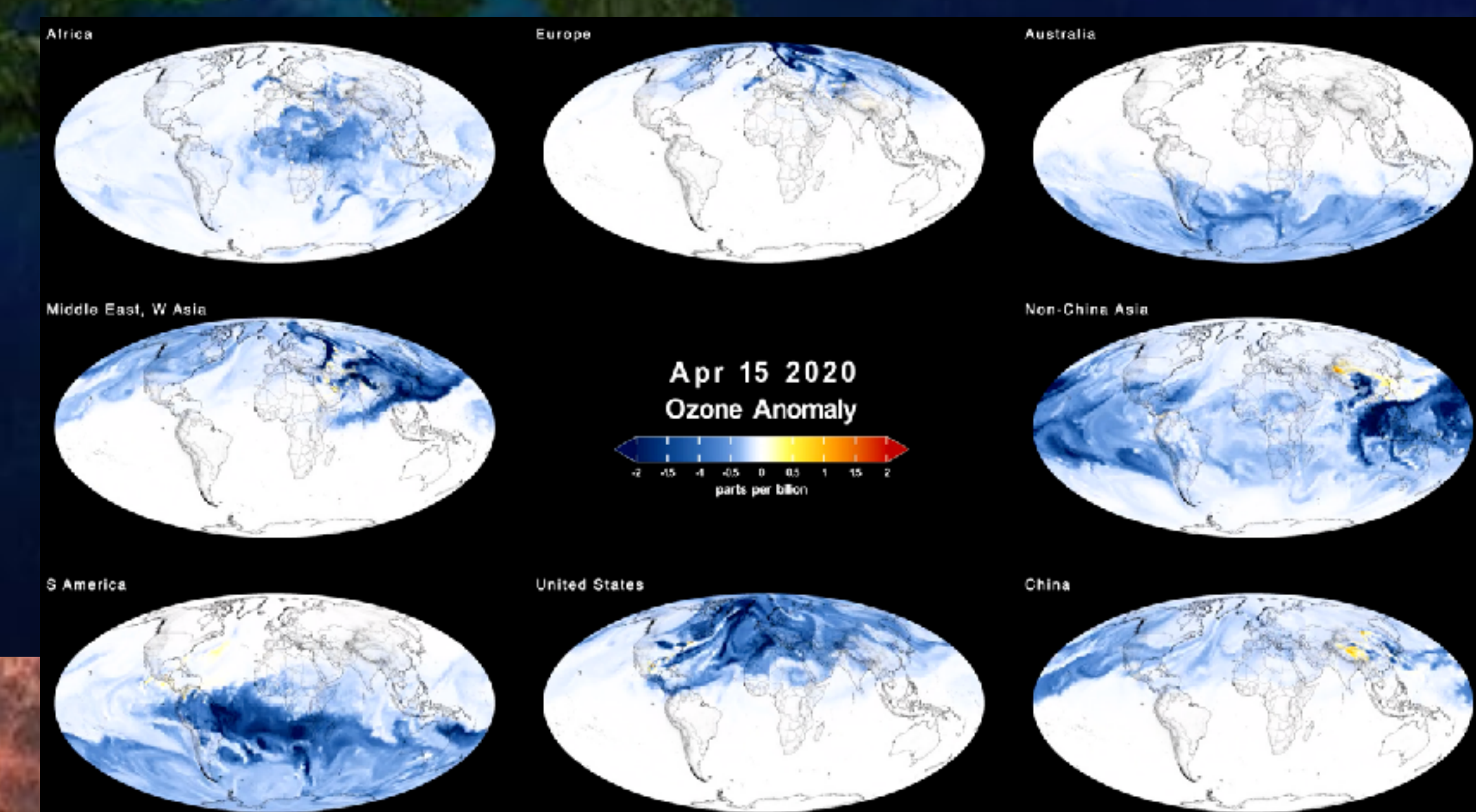
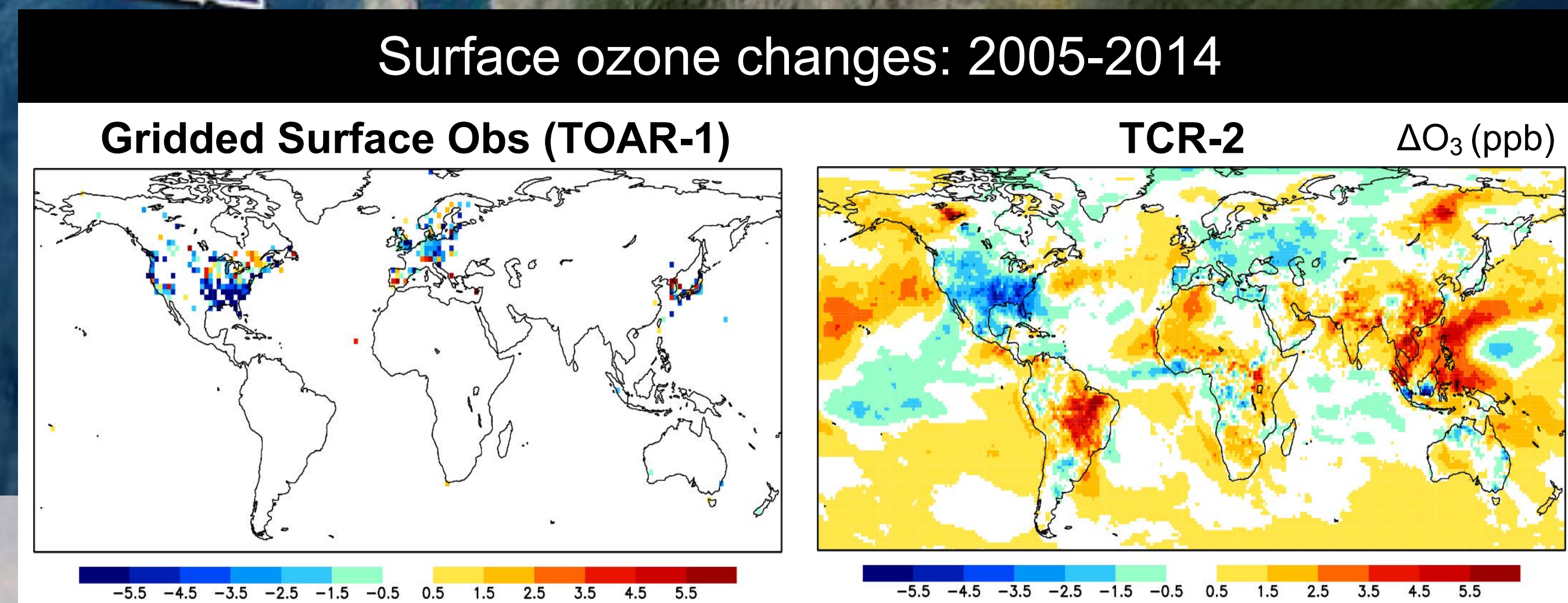
1. Air Pollutant Emissions

Global grid-scale surface emissions are derived from satellite and other observations.



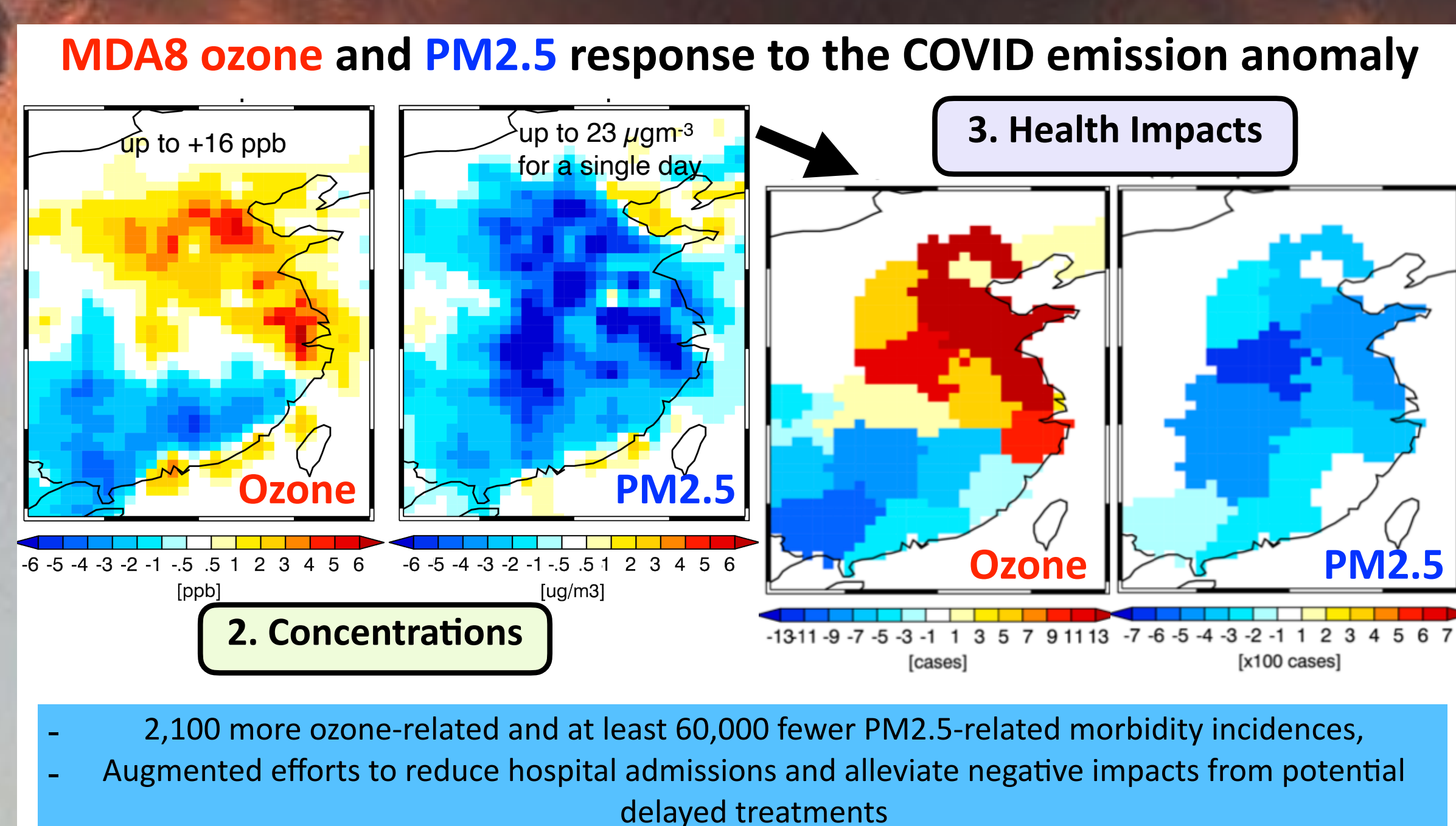
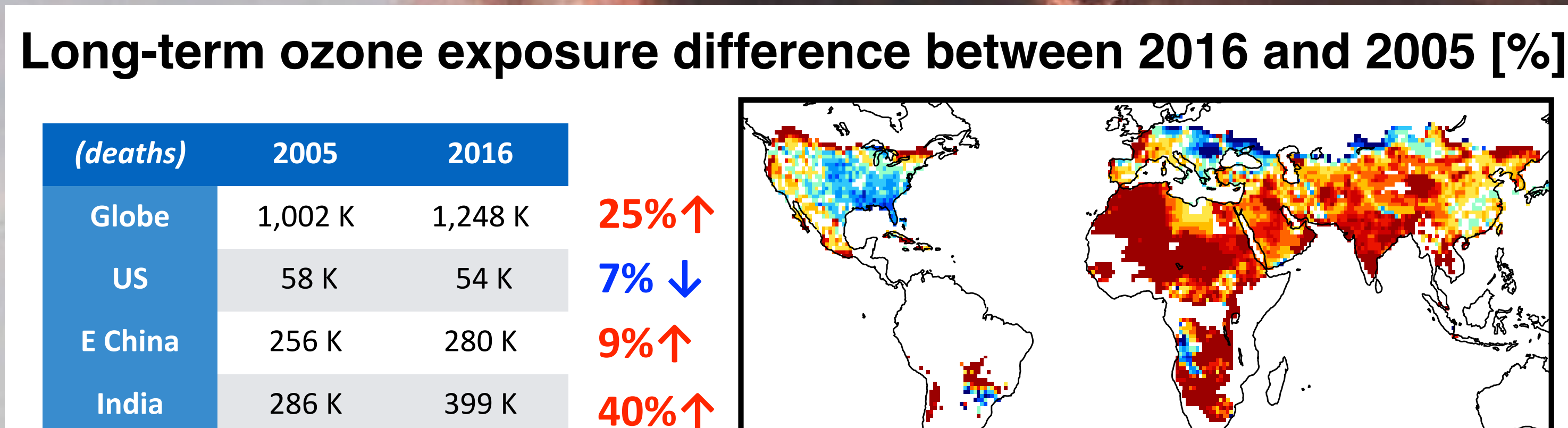
2. Atmospheric Concentrations

The model determines global atmospheric concentrations consistent with the observations.

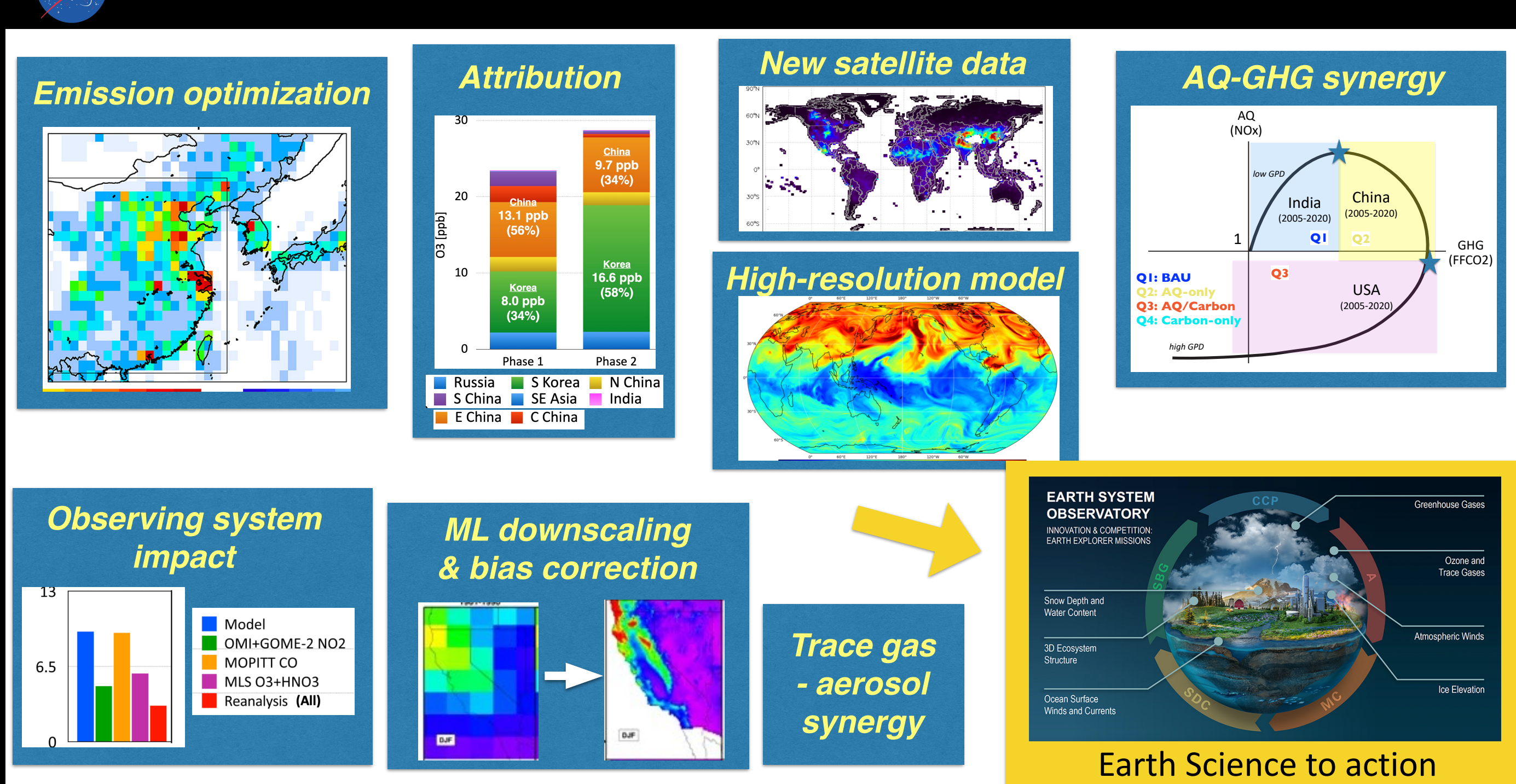


3. Health and Climate Impacts

Impacts on human health, radiative forcing, and atmospheric chemistry are assessed.

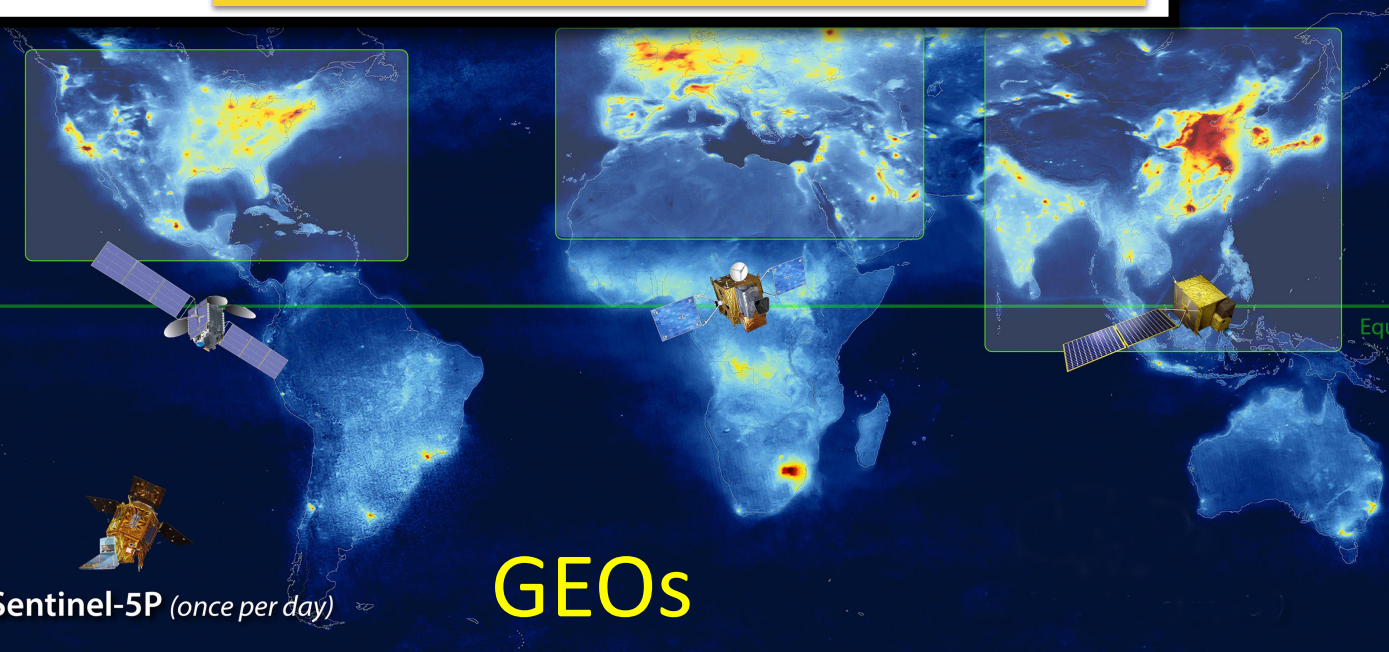
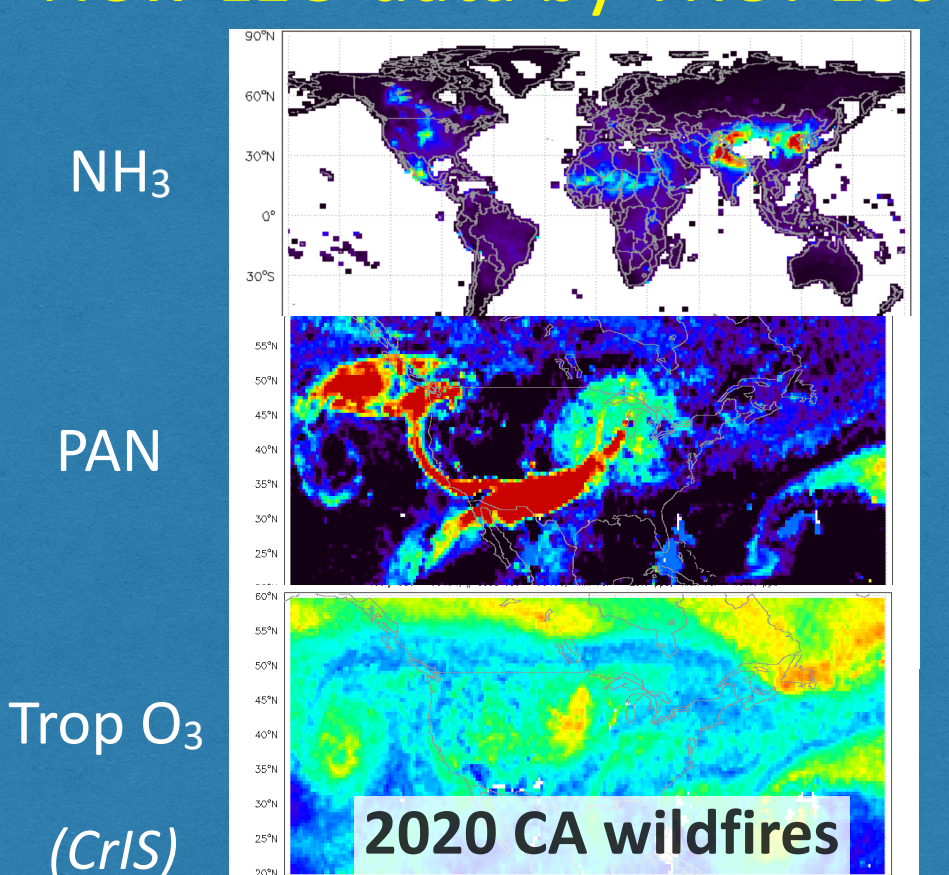


MOMO-Chem will contribute to the future missions



New satellite products by JPL
TROPESS (flash talk by David Moroni)

New LEO data by TROPESS



MOMO-Chem can relate multi-platform observation information and comprehend the understanding of attributions for both trace gases and aerosols globally

Remarks

- The chemical reanalysis data, combined with suborbital and ground-based measurements, has been used to improve our understanding of atmospheric composition.
- New LEO and GEO measurements provide much-improved spatial and temporal resolution and coverage in conjunction with the chemical reanalysis. They should lead to greater usefulness of satellite measurements for climate and AQ applications.
- Future applications: New satellites (GOSAT-GW, CO2M, GEMS, TEMPO, GEO-XO, S4), aircraft missions (ASIA-AQ), new focuses (trace gas & aerosol interactions, OH, wildfires, biogenic), new techniques (ML).