



Long-Term Observation of Greenhouse Gases and Reactive Gases

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Message from the Guest Editor

The steady rise in atmospheric long-lived greenhouse gas (GHG) concentrations is the main driver of contemporary climate change. Many GHGs occur naturally in the atmosphere (i.e., carbon dioxide, methane, and nitrous oxide), while others are anthropogenic. The latter include, for example, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs), as well as sulfur hexafluoride (SF₆). Human activities increase atmospheric concentrations of both natural and synthetic GHGs. GHGs remain in the atmosphere for different amounts of time and some of them are more effective than others at warming the atmosphere. Long-term, high-quality, atmospheric measurements are crucial for quantifying trends in greenhouse gas fluxes and attributing them to fossil fuel emissions, changes in land use and management, or the response of natural land and ocean ecosystems to climate change. In this Special Issue, we seek to publish innovative papers which investigate long-term observations of GHGs, the influence of atmospheric transport patterns, and the key processes driving measured concentration levels.





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Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

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