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Studying the carbon cycle with atmospheric remote sensing measurements of carbon dioxide

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The carbon cycle describes the flow of carbon, typically in the form of carbon dioxide, between the atmosphere, oceans and land. It is influenced by changes in the sources and sinks of carbon: from anthropogenic releases (fossil fuel burning), changes in land use, the respiration and photosynthesis of plants, and the uptake and release by oceans. Atmospheric measurements of carbon dioxide are required to quantify the sources and sinks and monitor their long-term trends. With the establishment of several sources of high-quality remote sensing measurements of carbon dioxide from the ground-based Total Carbon Column Observing Network (TCCON), and the space-based Greenhouse Gases Observing Satellite (GOSAT, 2009) and the Orbiting Carbon Observatory (OCO-2, 2014), we are now entering an exciting, data-rich era in carbon cycle science.

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