

The chemical revolution at the root of the carbon cycle concept

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The so-called carbon cycle is an essential geochemical structure, pivotal in the Earth's system chemical machinery. Its different lithospheric, atmospheric, biological components exchange carbon and regulate the evolution of the surface environment on short and long timescales. Understanding the intricacies of the carbon cycle has benefited from decades of work across the disciplinary boundaries. But that research has deeper roots.

I will show that chemists during the chemical revolution, at the turn of the 18th century, laid the ground for a quantitative understanding of air-sea-lithospheric exchanges of carbon and gas. The far-reaching, interdisciplinary and quantitative work of Lavoisier will be a focal point of my talk. His ability to combine a rigorous molecular understanding of chemical reactions, together with his ability to scale up his discoveries from the laboratory to the global scale, and his fascination for the coupling between the carbon and oxygen cycles, make him one of the major, yet highl underestimated, father of modern geochemistry.