



## **The GEO Carbon and Greenhouse Gas Initiative**

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The budgets of carbon and other greenhouse gases (GHGs) have many uncertainties that make it difficult to evaluate the success of climate change mitigation strategies. Improvements in long-term, high quality observing systems within and across the atmospheric, oceanic, terrestrial, and human domains are required to quantify GHG sources and sinks, to understand changes in the carbon cycle and hence the climate system, and to assess the level of effort required in order to mitigate and adapt to climate change. Current carbon observation initiatives are a mix of regional and global activities, requiring a global coordination mechanism that provides useful and comparable information to resource managers and policy makers. The aim is a cooperative effort with other regional and global initiatives to obtain a comprehensive, globally coordinated, carbon and GHG observation and analysis system.

The Carbon and GHG Initiative (GEO-C) in the framework of the Group on Earth Observations (GEO) promotes interoperability and provides integration across different parts of the intended system, particularly at domain interfaces. The intention is to build on existing initiatives and networks, ensure their continuity and coherence, and fill in the missing pieces. The initiative shall address policy agendas and will operate as a common and open platform to plan and implement strategies and joint activities at the global level from science to policy.

The work of the GEO Carbon and GHG Initiative is motivated by the long-term vision of a data-driven system to provide comprehensive knowledge on changes in the global carbon cycle and GHG emissions as a result of human activities and climate change. The services will include physical information, such as quantification of fluxes and changes of their distributions, as well as knowledge for evaluating social impacts associated with emissions reduction, land-use change, adaptation, or ocean management efforts.