Carbon Climate Interactions in India

Yogesh Tiwari, Indian Institute of Tropical Meterology

The association between atmospheric CO_2 and rainfall and vegetation over India is a critical question. Indian subcontinent is a portion of monsoon Asia where a significant seasonal shift of wind patterns occurs throughout the entire area and is covered by a range of ecosystems including tropical forests and tundra in Himalayan Mountains. These ecosystems contribute significantly in global terrestrial net primary productivity. On the other hand, India is supporting a population of around 1.2 billon and experiencing a steep rise in energy demand. Therefore Indian subcontinent is of critical importance to the understanding of how climate drivers and elevated atmospheric CO_2 interacts to influence the functioning of ecosystem and biosphere. Given the dependence of large populations on monsoon rainfall, the response of Indian summer monsoon dynamics to elevated atmospheric greenhouse gas concentrations is an issue of both scientific and societal importance. More information on how the biosphere associates with atmospheric CO_2 is needed to understand the Earth's carbon cycle. Consequently studies should be undertaken to delineate the relations between atmospheric CO_2 concentrations and changes in climate drivers such as rainfall and vegetation. In this study we investigate with available data sets to examine how variations in atmospheric CO_2 observations are associated with rainfall and vegetation over India.