

Seasonal Variation of the Global Carbon Fluxes Using CarbonTracker

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About half of CO₂ emission caused by fossil fuel combustion has been absorbed by the terrestrial ecosystem and ocean. Therefore, understanding the fundamental processes responsible for the net carbon sinks/sources and the primary control factors are remarkably important. Figure 1 shows the global distribution of annual accumulation and the seasonal cycle of zonal mean net fluxes of land ecosystem and ocean carbon over recent 10 years. The net sink area, for biosphere flux, is mainly in the northern hemisphere high latitude, especially over the east of Siberian and North America. For ocean flux, the Northern Atlantic Ocean and Pacific Ocean are the net sink area. Tropical regions are the most dominant source of both biosphere and ocean carbon fluxes. The large seasonal signal in land ecosystem flux is located in mid- and high-latitude regions where temperature influences the carbon cycle. However, although temperature has no significant variation in the tropical region, it still shows seasonal cycle of carbon fluxes. Our preliminary results suggest that this might be due to the relation between land ecosystem carbon flux and annual change of radiation and precipitation over the tropical region. Using CarbonTracker, we analyzed the seasonal cycle of land ecosystem and ocean carbon flux and will discuss how climate system, which is one of the carbon cycle control factors, effects on the terrestrial ecosystem, especially in tropical region, and ocean fluxes.

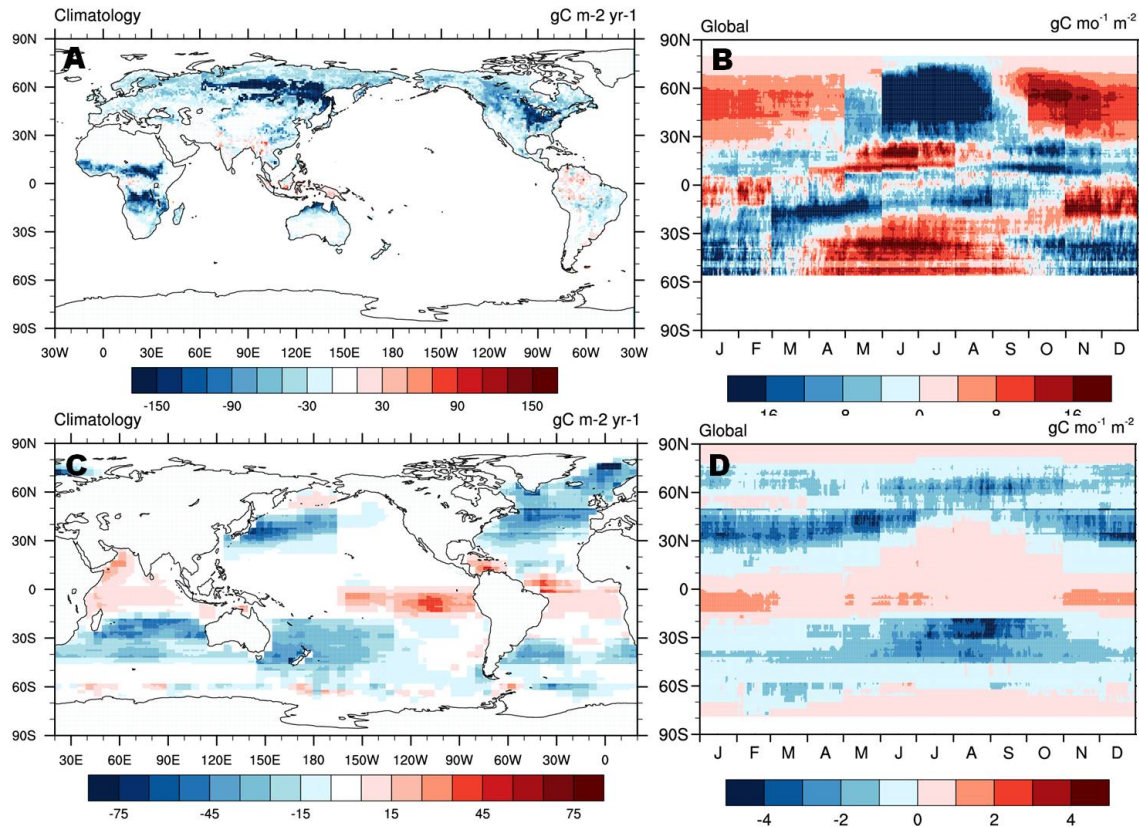


Figure 1. Ten-year (2000~2010) climatology for the global distribution of annual fluxes (A,C) and the zonal averaged seasonal cycle (B,D) for biosphere (A,B) and ocean (C,D) from CarbonTracker.