

EGU21-16162

<https://doi.org/10.5194/egusphere-egu21-16162>

EGU General Assembly 2021

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Assessment of the dissolved inorganic and organic carbon flux in Cauvery, a tropical river of Southern India.

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The carbon fluxes in rivers plays a critical role in the global carbon cycle but its role is always understated. The tropical rivers alone accounts for about 70% of global riverine carbon fluxes due to their large areal extent, varying climatic conditions and land use. Studies on the dissolved carbon fluxes in non-perennial tropical rivers are limited, but it holds much importance as that of perennial rivers. Hence, the present study was carried out with an objective to understand about the inorganic and organic carbon fluxes in a large non-perennial tropical river of Southern India. The samples were collected from 28 locations along the river thrice in a year from 2013-2020 and were analysed for major ions, DIC and DOC. The concentration of DIC in the river water in most of the locations is greater than that of DOC. The DOC concentration is greater at pristine locations thereby decreasing along the flow direction of the river, whereas the DIC concentration increases along the flow direction. The spatial and temporal variability in DOC and DIC concentrations is attributed due to the changes in the rainfall, river flow, climate, lithology, land use patterns, in the catchment. The DIC concentration was found to be majorly governed by silicate and carbonate weathering along with biogenic process, mineralisation and other river process, whereas the primary production, microbial process along with soil organic carbon influences the DOC concentration in the rivers. Thus, this study identifies the sources of DIC and DOC in rivers and the processes which influences the carbon export to the sea.