

Poster #94

Solar-Induced Fluorescence Reveals the Water Stress in the Amazon Basin

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Water stress may cause the downregulation of vegetation photosynthesis in the Amazon. To understand the broad spatial pattern of photosynthesis decline on a daily scale across the entire Amazon Basin, we used the solar-induced fluorescence (SIF) measurements from two satellites that have different local overpass time (GOME2 – Global Ozone Monitoring Experiment-2: 09:30 am; GOSAT – Greenhouse gases Observing SATellite: 1:30 pm). We first compared SIF data with ground-based eddy covariance (EC) estimations of GPP. We found that SIF signal is linearly correlated with GPP on the inter-annual scale across the basin. The slope of the SIF-GPP relationship differs between the morning and mid-day. This finding provides us the basis to use SIF as a proxy for GPP. We then compared the morning SIF with the mid-day SIF along a water gradient (North-to-South), and the results suggest that there is mild mid-day depression of photosynthesis on the north, while the mid-day depression becomes significant on the south. We suggest that satellite SIF can reveal spatial and temporal patterns of vegetation water stress across Amazon.