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Supplement of

Tree–grass phenology information improves light use efficiency modelling of gross primary productivity for an Australian tropical savanna

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Supplementary Material for bg-2016-187

Sky ROI analysis

In response to the suggestion from reviewer #2, we calculated chromatic coordinates and excess indices for a separate sky region of interest for each of the three overstory cameras. When plotted against the original GCC time series, we could see that the sky GCC was consistently lower than the larger GCC ROI time series (Figure a). Therefore, we recalculated GCC to exclude pixels where the GCC (or RCC and BCC) values were <= the mean sky ROI value. This produced GCC_new, depicted in Figure a, which is more reflective of overstory greenness change than the original variable.

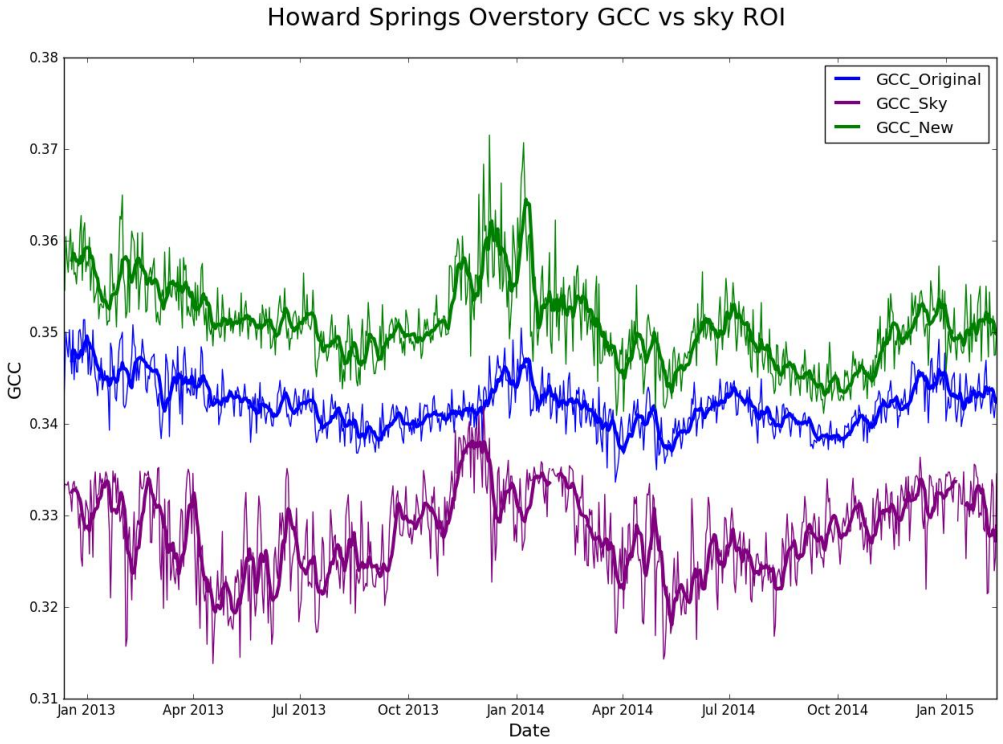

Figure a: Original GCC, sky-only GCC and a new GCC variable calculated by omitting sky-pixels from the calculation.

GCC comparison with fPAR and APAR

Another piece of analysis suggested by reviewer 2 was to compare the GCC indices with changes in fPAR and/or APAR. These are plotted in Figure b and demonstrate that the APAR and fPAR time series do not capture the same degree of seasonality as does GCC. For the overstory, this is particularly evident in the dry season, where fPAR and APAR remain comparatively higher than GCC. Overstory GPP shows distinct seasonality, which is reflected more by the GCC data than fPAR or APAR. In the understory, it is revealed that fPAR and APAR seem to lag GCC and are more variable through the dry season. Understory GPP in the dry season is not as variable as the fPAR and APAR

data suggest, being represented better by the GCC time series (see main text for overstory and understory GPP time series).

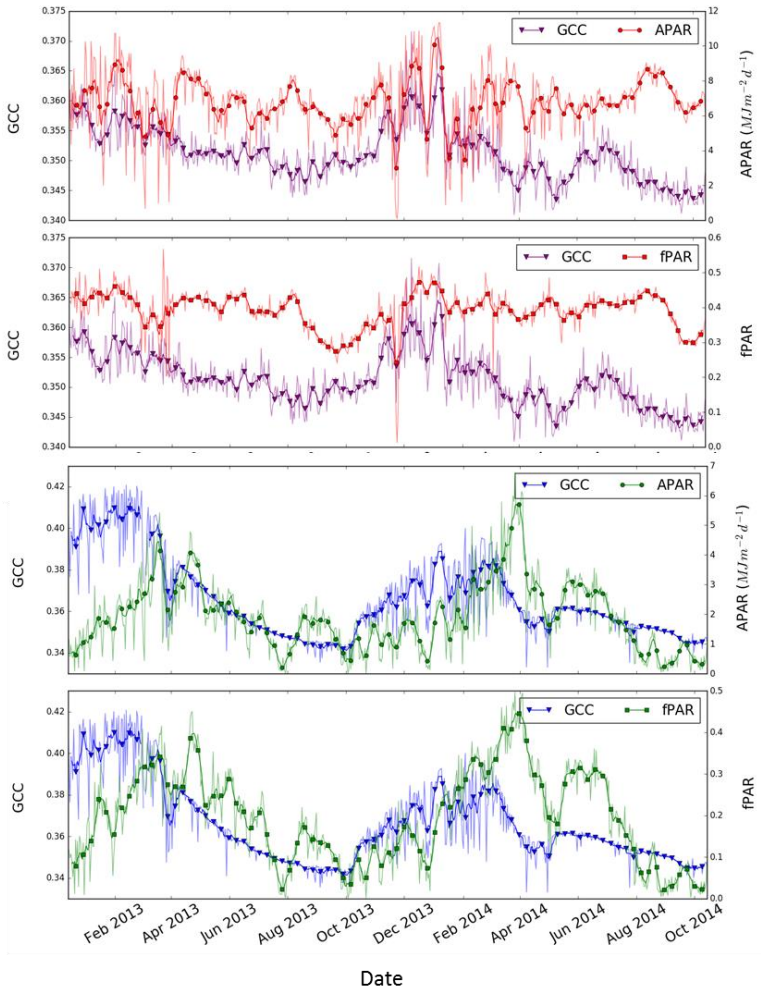

Figure b: Overstory (purple) and understory (blue) GCC indices compared with their respective fPAR and APAR timeseries.