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What is the relationship between water storage change and NDVI?

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The fluctuation in vegetation is affected by water availability, while on the same hand vegetation also influences regional water balance. A better understanding of the relationship between variation in vegetation state and water storage change would help explain the complicated interactions between vegetation dynamics and regional water balance. We use total water storage change from the Gravity Recovery and Climate Experiment (GRACE) and its successor mission GRACE Follow-On (GRACE-FO) and Normalised Difference Vegetation Index (NDVI) data from Advanced Very High Resolution Radiometer (AVHRR). First, we bring the two datasets to a comparable resolution and then we aggregate the two datasets over the 37 sub-catchments of the Ganga basin. The Pearson correlation coefficient was very high ($R > 0.5$) for 35 of the 37 sub-catchments when the full signals were used, indicating that the seasonality signals have a high correlation. Once the seasonal signal was removed, the Pearson correlation coefficient became insignificant. We will look into the causes of the lack of correlation between the two residual signals and also perform an autocorrelation analysis to identify the lag between the two variables.