Regional Earth System Data Lab 4D (Ion., lat., time, var.) Vegetation data subset **GPP NDVI EVI FPAR Analysis Ready Data Cubes (ARDs)** dimmensions A. Pixel wise **Data** Gap analysis **PCA** standardization filling **Mean Seasonal** PC 1 Cycle (Fig.3) Day of year Absolute value of annual oscillation Ratio of Fast annual and **Fourier Power** semiannual **Absolute value of Spectrum** oscillation semiannual (Fig.5) oscillation **B.** Biotic units analysis **Spatio-temporal Frequency** analysis data aggregation **Driest month** precipitation layer **Seasonality ratio Mean Seasonal** by biotic untis in **Cycle by biotic** the climate space units **Biotic** (Fig.7) (Fig.6) units map