

## Long-term monitoring of land surface phenological changes

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Land surface phenology (LSP) is associated with climate over space and time, and the monitoring of LSP help understandings of the terrestrial environmental changes. The LSP is often inferred by satellite observation, and long-term and regularly composite satellite imagery is now freely available. In this study, we demonstrate how LSP changes over space and time at the global scale over the last three decades by using GIMMS3g datasets. We focus on the magnitude and the timing of the peak of yearly phenological activity, estimated from a harmonic analysis. The first harmonic curve is regarded as a proxy of the overall productivity of vegetation and the second one is interpreted as a sensitive bimodal system changes. Results show the long-term trend of LSP changes; for example the peak of phenological activity tend to be earlier in high-latitude regions.

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