Terrestrial ecosystem productivity and phenology response to global change during the satellite era

Abstract
Climate control on global vegetation productivity and seasonality has intensified in response to recent global warming. With increasing threats and pressure exerted on Earth’s terrestrial ecosystems, there are now greater demands for more quantitative, timely, and accurate information on their state, functioning, and responses to climate variability and change. Challenges remain in separating the long-term relative roles of natural climatic variation and anthropogenic forcing on vegetation productivity, and Earth system models do not always capture the observed impact of climate change. Satellite remote sensing offers an effective way of measuring and monitoring vast vegetated areas in a consistent manner. Therefore, integration of close-range, air-borne, and space-borne observations with statistical and physical models is essential for the retrieval of useful land surface variables at various spatial and temporal scales to attribute the observed impacts. In this talk, I will present the development and application of improved land remote sensing variables for global change studies. The particular focus will be on the remote sensing of plant productivity, and seasonality at regional and global scales. I will also address circumpolar vegetation dynamics in relation to climate variability and change, and their impacts on atmospheric CO₂ seasonality using an improved satellite data product.