



Can remote sensing help citizen-science based phenological studies?

Nicolas Delbart (1), Beaubien Elisabeth (2), Kergoat Laurent (3), and Le Toan Thuy (4)

(1) Université Paris Diderot Paris 7, PRODIG (UMR8586), Paris cedex 13, France (nicolas.delbart@univ-paris-diderot.fr), (2) University of Alberta, Department of Renewable Resources, Edmonton, Alberta, Canada, (3) GET (UMR5563 CNRS/INSU-CNES-IRD-UPS), Toulouse, France, (4) CESBIO (UMR5126, CNRS/INSU-CNES-IRD-UPS), Toulouse, France

Citizen science networks and remote sensing are both efficient to collect massive data related to phenology. However both differ in their advantages and drawbacks for this purpose. Contrarily to remote sensing, citizen science allows distinguishing species-specific phenological responses to climate variability. On the other hand, large portions of territory of a country like Canada are not covered by citizen science networks, and the time series are often incomplete.

The main mode of interaction between both types of data consists in validating the maps showing the ecosystem foliage transition times, such as the green-up date, obtained from remote sensing data with field observations, and in particular those collected by citizen scientists. Thus the citizen science phenology data bring confidence to remote sensing based studies. However, one can merely find studies in which remote sensing is used to improve in any way citizen science based study.

Here we present bi-directional interactions between both types of data. We first use phenological data from the PlantWatch citizen science network to show that one remote sensing method green-up date relates to the leaf-out date of woody species but also to the whole plant community phenology at the regional level, including flowering phenology. Second we use a remote sensing time series to constrain the analysis of citizen data to overcome the main drawbacks that is the incompleteness of time series. In particular we analyze the interspecies differences in phenology at the scale of so-called “pheno-regions” delineated using remote sensing green-up maps.