

Mapping leaf nitrogen and leaf area index in European landscapes using high spatial resolution satellite

Boegh, Eva

Publication date:
2011

Document Version
Early version, also known as pre-print

Citation for published version (APA):
Boegh, E. (2011). *Mapping leaf nitrogen and leaf area index in European landscapes using high spatial resolution satellite*. Abstract from European Geosciences Union General Assembly 2011, Vienna, Austria.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

Take down policy

If you believe that this document breaches copyright please contact rucforsk@ruc.dk providing details, and we will remove access to the work immediately and investigate your claim.



Mapping leaf nitrogen and leaf area index in European landscapes using high spatial resolution satellite data and the REGularized canopy reFLEctance (REGFLEC) model

Eva Boegh and the NEU_C4 Team

Roskilde University, Department of Geography, Roskilde, Denmark (eboegh@ruc.dk, +45 4674 3031)

Leaf biochemistry and biophysical parameters are important for simulating soil-vegetation-atmosphere exchanges of energy, water, CO₂ and ammonia. The accumulation of leaf nitrogen (N) in vegetation canopies is a major component of the ecosystem N balance, and leaf N concentration and leaf area index (LAI) are important determinants of the maximum CO₂ uptake by plants and trees. In the EU project NitroEurope, high spatial resolution (10-20 m) remote sensing data from the HRG and HRVIR sensors onboard the PSOT satellites were acquired to derive maps of leaf N and LAI for 5 European landscapes. Mapping was conducted using the REGFLEC model which is an automatic and image-based methodology developed for regional chlorophyll (Cab) and LAI estimation (i.e. Houborg and Andersen, JARS 3, 2009). REGFLEC combines models for atmospheric correction (6S), canopy reflectance (ACRM) and leaf optics (PROSPECT). Model performance previously proved promising in Denmark and in Maryland, USA. In this study, REGFLEC performance is evaluated and discussed using field measurements of leaf N, SPAD meter data and LAI in Denmark, Poland, Scotland, the Netherlands and Italy. SPAD meter data were calibrated to assess Cab and leaf N of different crop types and used to build species specific Cab-leaf N relationships. The estimations of leaf N, Cab and LAI soil reflectance parameters and canopy parameters are discussed in relation to the prevailing soil types and vegetation characteristics of land cover classes across the 5 European landscapes.