DEMMIN – A Test Site for Demonstrating the Estimation of Biomass Potential using Modelling and Remote Sensing Data

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Related to session 2

Abstract:

With the "Global Monitoring for Environment and Security (GMES)" initiative the European Union (EU) and the European Space Agency (ESA) have established an ambitious program for using space borne remote sensing together with additional data sources and monitoring systems to provide innovative services for various environmental, economic and security aspects in the context to European market.
To realize this objective, an automated real-time and near real-time infrastructure has to be implemented for automated data processing of remote sensing data. The necessary development and implementation of the space segment and the ground segment is already advanced. The development of automated processing chains and processors for deriving value added products and especially the development of test sites for calibration and validation of remote sensing missions will be developed.
The poster presents the DLR test site DEMMIN (Durable Environmental Multidisciplinary Monitoring Information Network) as a prerequisite for calibration and validation of value added data products for biomass and bio-energy, biomass models on regional scale, such as BETHY/DLR, as well as to demonstrate the possibilities for deriving biomass potentials using remote sensing data and products in practice. Considering this background, the presentation gives an introduction to DLR's test site DEMMIN with its specific regional characteristics, its in-situ measuring instrumentation and existing data base.
The test site DEMMIN is an intensively used agricultural area located near the town Demmin in Mecklenburg-Western Pomerania in North-East Germany (approximately 180 km in the north of Berlin). A close cooperation of DLR with Interest Group Demmin (IG Demmin) exists since 1999. DEMMIN extends from 54°2′54.29″ N, 12°52′17.98″ E to 53°45′40.42″ N, 13°27′49.45″ E. The IG Demmin consists of 5 limited and joint stock agricultural companies covering approximately 25.000 ha of agricultural fields.
The landscape belongs to the north German lowlands formed during the last Pleistocene period (Pommersches stadium). It is characterized by glaci-fluvial and glaci-limnic deposits, and moraines which are reflected in a slightly undulating relief. Soil substrates are dominated by loamy sands and sandy loams alternating with pure sand patches or clayey areas.
The altitudinal range within the test site is around 50 m with some slopes of considerable gradients (12°) along the River Tollense in the south eastern part of the test site. Mean annual temperatures vary from 7.6 to 8.2°C. Precipitation ranges from about 500 to 650 mm. Due to micro-relief, climate conditions may vary significantly on a local scale.
The field sizes in this area are large, averaging 80 - 100 ha. The main crops grown are winter crops covering almost 60 % of the fields in the area. Maize, sugar beet and potatoes make up about 13 %.
Due to the cooperation of DLR with IG Demmin, the scientists receive support by the farmers and important information for their investigations. These are e.g. digital quasi-static data as soil maps, land parcel maps or digital dynamic data as yield maps, and application maps. Additional to the data base, an agro-meteorological weather network is implemented in DEMMIN, which allows the automated measurement of all agro-meteorological parameters affecting the imaging process parallel to space borne or airborne remote sensing.