Evaluating the provisioning potential of ecosystem services at contrasted forested landscapes in Finland.

A Data Management Plan created using DMPTuuli

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Project abstract:

The use of remote sensing (RS) data such as airborne laser scanning (LiDAR) data and unmanned aerial vehicle (UAV) images for forest resource planning has been increased in the last decades. Even though RS-based data often describe the forest ecosystem services (ESs i.e. timber, carbon, biodiversity, and recreation) as indirect proxies, such maps may allow to spatially identify areas that vary with respect to the provision of the ESs and thus involve different forest management. Applying the RS-based proxies of the ESs in multi-objective forest management of different forested landscapes produces specific, unsolved research questions, in addition to those generally present in integrating ESs in landscape planning. Despite the high potential of RS-forest resource planning, RS-based information may yield a high degree of uncertainties, if applied in expert models formulated according to conventionally measured field attributes. The following essential research questions also remained unsolved i.e. (i) can LiDAR/UAV features able to explain the variation of ecosystem services proxies? (ii) to what degree do the alternative ESs overlap in the same area? (iii) what the trade-offs for selecting one ES over another? (iv) how much uncertainty associated with the ecosystem services decision making when there are multiple preferences? (v) how to guide management decision related to the provision of several forest ESs emphasizing the trade-off and suitability analysis? To resolve the above questions, the proposed study will assess in three forested landscapes such as private-owned, state-owned and urban forests in Finland. The study materials include LiDAR, UAV image, national forest inventory (NFI) and field data. The methodology consists of ESs proxy computation, scaling and normalization of the ESs proxies' values, trade-off and uncertainty in decision making. The provisioning potential of ESs must be numerically defined, weighed on the same scale and mapped according to measurable forest attributes for successful integration of multiple ESs in forest management planning. This novel study will be represented an important development towards the operational decision making in forest resource planning at different forested landscapes, and as a tool to raise public awareness on the ecosystem service change. The multidisciplinary nature of the project is strong, involving a combination of forestry, remote sensing, and conservation biology.

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Date of the Plan

Date of the DMP

20.09.2019

1. General Description of Data

1.1 What kinds of data are collected or reused?

Remote sensing data such as LiDAR, UAV image, MS-NFI and field data.

1.2 What file formats will the data be in?

Geospatial data format such as GeoTiff, Img. LAS 1.4

2. Documentation and Quality

2.1 How will the data be documented?

Standardised data documentatiion will be employed.

2.2 How will the consistency and quality of data be controlled and documented?

Good consistency and quality of data will be controlled and documented.

3. Storage and Backup

3.1 How will the data be stored and backed up?

External harddrive will be used for data storage and back up.

3.2 How will you control access to keep the data secure?

Open source policy will apply for data security.

4. Ethics and Legal Compliance

4.1 How will ethical issues be managed?

No ethical issue.

4.2 How will ownership, copyright and Intellectual Property Right (IPR) issues be managed?

Open source policy will follow here.

5. Data Sharing and Long-Term Preservation

5.1 How, when, where and to whom will the data be made available?

Open source policy will follow.

5.2 How and where will the data with long-term value be made available?

A geodatabase will be employed.

5.3 Have you estimated costs in time and effort to prepare the data for preservation and sharing?

Open publication fee is included in the budget.