

PROTEST project: multidisciplinary methodology for territorial forest analysis

Jean-Matthieu Monnet, Raphaël Aussenac, Sylvie Durrieu, Catherine Riond, Arnaud Sergent, Patrick Vallet

▶ To cite this version:

Jean-Matthieu Monnet, Raphaël Aussenac, Sylvie Durrieu, Catherine Riond, Arnaud Sergent, et al.. PROTEST project: multidisciplinary methodology for territorial forest analysis. ForestSAT, Aug 2022, Berlin, Germany. hal-03787988

HAL Id: hal-03787988 https://hal.inrae.fr/hal-03787988

Submitted on 26 Sep 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Monnet, J.-M. Aussenac, R. Durrieu, S. Riond, C. Sergent, A. Vallet, P. https://protest.inrae.fr

PROTEST project: multidisciplinary methodology for territorial forest analysis

Bibliography

Factors

identification

Scenarios

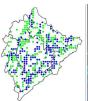
TERRITORIAL

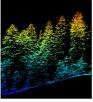
FORESIGHT

ECO. SERVICES

Forest resource mobilization is at the crossroads of local and global stakes. The PROTEST projects aims at combining remote sensing, territorial foresight and forest landscape simulation to support forest management decision. The case study is the Massif des Bauges Geopark (50 000 ha of forests, French Alps).

Forest resource

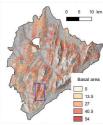




315 field plots ALS data Area-based approach: maps of basal area and mean

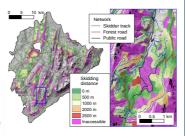
quadratic diameter @25 m





Accessibility

Map of skidder accessibility simulated with Sylvaccess model, with forest road network and topography as inputs



FOREST MAPPING Local or global factors impacting forest management:

- Politics and institutions
- Demography and territory
- Economy
- Silviculture and climate change

Interviews with Possible and contrasted stakeholders combinations of factors evolution: 5 scenarios Territory - Constrained adaptation analysis

- (subsidies to adapt to CC) - Energy (high fuel wood
- demand)
- Management fostering
- Business as usual (outdoor activities, local wood sector)
- Conservation (biodiversity, carbon storage)

Design

- Stand-level simulation for a period of 30 years
- Territory divided into 25 000 stands of approx. 3 ha
- Composition: pure stands (4 species) and mixed stands
- Silviculture : coppice / evenaged / uneven-aged / no action

Management

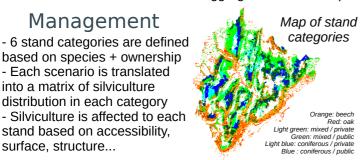
based on species + ownership - Each scenario is translated into a matrix of silviculture

- Salem simulator

EVOLUTION SIMULATIONS

Initialization

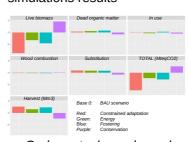
- Species-specific fertility maps
- Stand structure by aggregation of ALS maps



ASSESSMENT Carbon

accounting

CAT software is fed with simulations results

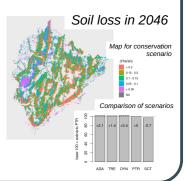


Carbon stocks and wood harvest in 2046

Ecosystem services

Linker functions are applied to compare the scenarios

- Landscape impact
- Rockfall protection
- Avalanche prevention
- Erosion control



distribution in each category - Silviculture is affected to each stand based on accessibility, surface, structure...

The case study illustrates how ownership fragmentation and accessibility issues hamper mobilization, and questions the trade-off between CC adaptation and carbon storage. The global workflow has high added value for forest stakeholders, even though a better integration of components is possible.















