

WEFES - Web-Explorer of Forest Ecosystems Services under Climate Change

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Introduction

Climate change will modify the dynamics of forest environmental services. All the change complexity involved is difficult to visualize under an easy and accessible information tool capable to integrate several services that forests can provide.

Under the umbrella of the EU Exchange Programme TRANZFOR (Transferring Research between EU and Australia and New Zealand on Forestry and Climate Change, www.tranzfor.eu), a preliminary Web-Explorer of Forest Ecosystems Services (Fig 1) was developed for New Zealand where forest managers and the general public can observe what are the predictions of the different forest environmental services under current and future climate for each location in the territory, where carbon storage, soil erosion, biodiversity, nitrate leaching, water balance are the preliminary forest environmental services envisaged.

Methodology

Technically, the tool uses a mix of programming languages to manage server and client-side requests (HTML, Javascript, PHP, and Ajax) as well as the GoogleMaps[®] application programming interface to interact with New Zealand online-stored geographical information to supply different models' needs.

Scientifically, at this preliminary stage, only tree carbon storage is calculated using the model of the mean annual increment 300 index (MAI 300 dataset) for *Pinus radiata* productivity. The model uses several variables which are accessed in a geographical database (Fig. 3). Among the variables, there is average temperature, which is allowed to change in the algorithm by using the "Future Climate" tool in the client-side(Fig 2), providing an indication of climate change impact in the productivity. A score system is calculated (using minimum and maximum MAIs as reference) enabling the user to observe tradeoffs by changing the climate variables in the models.

Forthcomings

The tool is under development and receiving "expressions of interest" for further improvement to be accomplished in additional project missions. Nevertheless, the tool already enabled a good interaction between different scientific backgrounds as well as interest from forest owners and private forest organizations.

Front-End www.isa.utl.pt/~joaopalma/projects/tranzfor/wefes

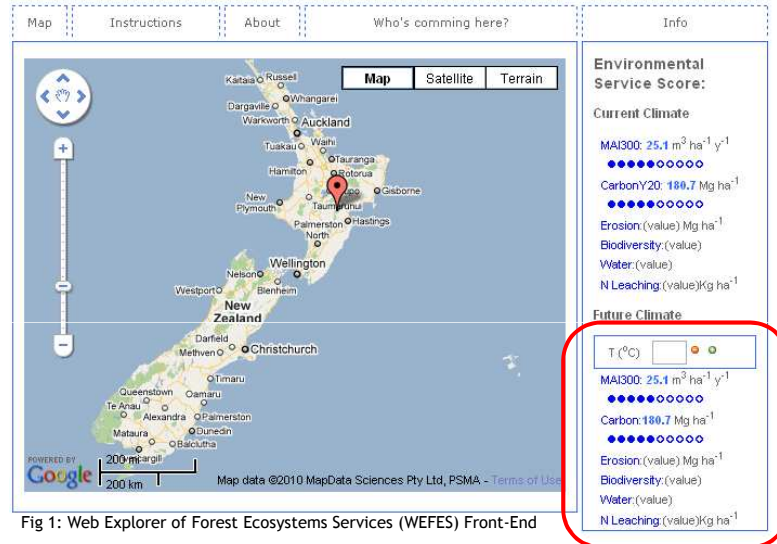


Fig 1: Web Explorer of Forest Ecosystems Services (WEFES) Front-End

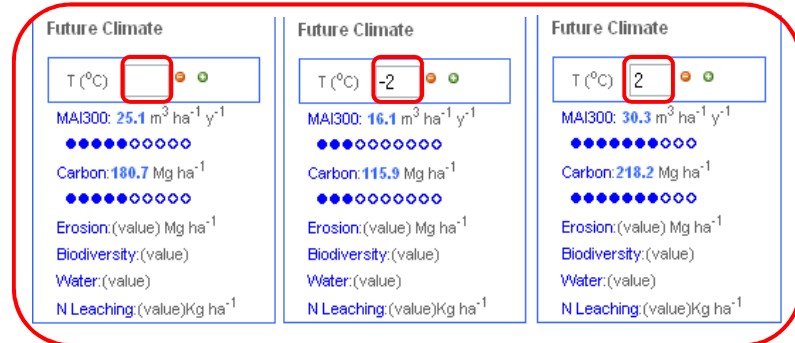


Fig 2: "Future Climate" tool to increase/decrease future temperature with dynamic estimations of the environmental services (only Carbon is enabled)

Back-End

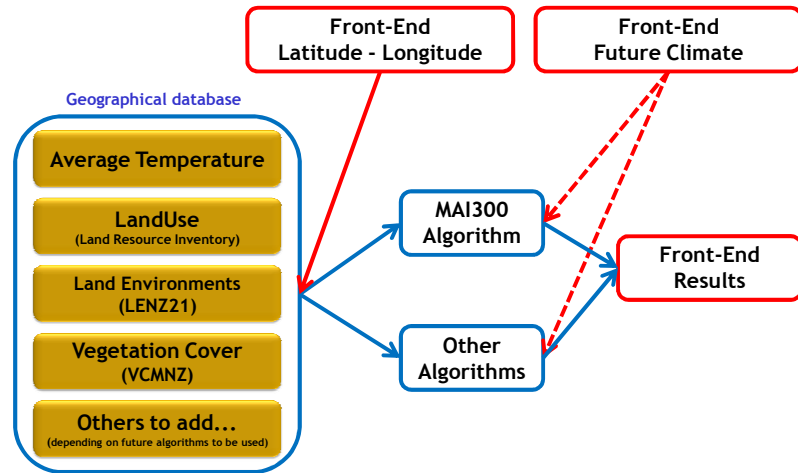


Fig 3: Back-End architecture to feed Environmental Services Algorithms with geographical data

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