

COMPANY

Neiker

RESEARCH CENTRE

Basque Center for Applied Mathematics (BCAM)

PRODUCTIVE SECTOR

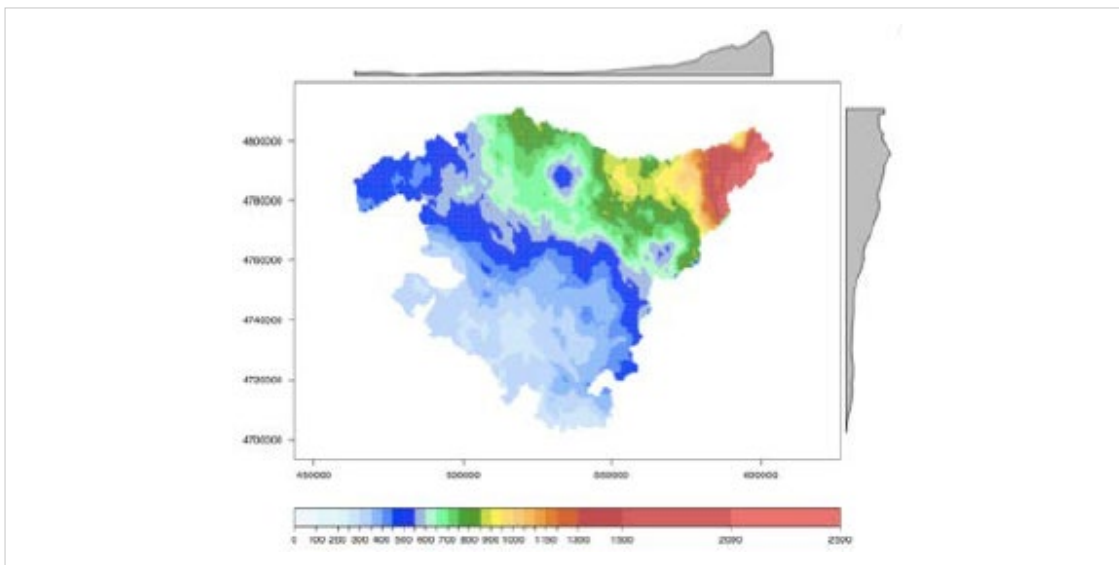
Agriculture and Fishing

[More info](#)

SS_027_2020

NEIKER

Mapping high-resolution soil properties with geoaddivitive models.



Predicted R-factor Map.

PROBLEM DESCRIPTION

Neiker was interested in elaborating high-resolution maps of carbon stocks and soil texture properties in different land use at 0-30cm depth in the Basque Country.

CHALLENGES AND GOALS

The goals of the project were to compute the soil erosivity factor (R-factor) in $\text{MJ mm ha}^{-1} \text{h}^{-1} \text{yr}^{-1}$, to identify areas of susceptible erosion, to relate with climate and environmental variables, to predict organic carbon stock (Mg C/ha) and to predict soil texture properties (%sand, %clay and %silt).

MATHEMATICAL AND COMPUTATIONAL METHODS

- ✓ Geoadditive models are used as a unified framework for spatial prediction with smooth effects of climate variables such as average temperature, min/max temperature and precipitation.
- ✓ Carbon stocks are predicted using pedotransfer functions.
- ✓ Soil texture data are estimated using a compositional data approach using an additive log-ratio transformation and a multivariate Gaussian distribution.

COMPANY

Neiker

RESEARCH CENTRE

Basque Center for Applied Mathematics (BCAM)

PRODUCTIVE SECTOR

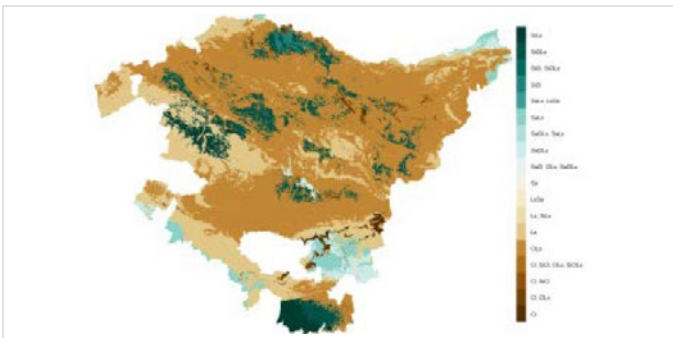
Agriculture and Fishing

[More info](#)

SS_027_2020

NEIKER

Mapping high-resolution soil properties with geoaddivitive models.



Predicted soil texture map using USDA classification.



Predicted carbon stock map available at GeoEuskadi.

RESULTS AND BENEFITS

An unified mathematical framework for spatial prediction of rain erosivity factor and soil properties at high-resolution is developed.

These maps contribute to agricultural planning of crops, forest management and environmental protection.

Stock carbon and soil texture maps are publicly available at GeoEuskadi.

High-resolution maps of soil provide valuable information for the agricultural and forestry industry.

