# Forest residual biomass: renewable resource assessment in a Mediterranean area with satellite data

**A. García-Martín** (1), J. de la Riva-Fernández (1), F. Pérez-Cabello (1), J. Pascual-Puigdevall (2), D. García-Galindo (2)

(1) Department of Geography, University of Zaragoza, Spain (2) CIRCE - Centre of Research for Energy Resources Consumption, University of Zaragoza, Spain (algarcia@unizar.es / Phone: +34-976.76.10.00 ext. 3909)

Forest residual biomass refers to leaves and branches not used in timber exploitation. Several advantages of this resource, used to generate energy, can be foreseen like reduction of the use of non-renewable fossil fuel sources, decreasing of atmospheric pollution, mitigation of forest fire risk and development of rural areas. In order to install power stations that use residual biomass, it is necessary to assess the localization and the quantity of available resource. One of the objectives of the Lignostrum project is to develop methods to estimate forest residual biomass to increase the use of this green source of energy in Spain.

There is a lack of remote sensing studies which focus on the estimation of residual biomass. In this study, we present a methodology to estimate and map residual biomass in a large Mediterranean area (Teruel province, Spain) using the Spanish Forest Inventory and a Landsat TM image. Correlations between residual biomass and spectral data at two different scales are performed in order to know which method shows better results: (i) 3 x 3 pixel window and (ii) larger homogeneous areas (defined in a 1 m spatial resolution digital air photograph composition). Field measurements of pine residual biomass and regressions established with DBH (diameter at breast height) and height were obtained from previous works. These regressions have been applied to forest inventory data to calculate the residual biomass in each plot. Although both analysis show statistically significant correlations, the homogeneous area level presents the highest coefficients with higher number of samples. Finally, a forest residual biomass map is created from a regression analysis ($R^2 = 0,651$) performed using homogeneous areas data and a spectral variable (MID57).