



## **Wood stakes as an index of soil organic matter decomposition in a climatic gradient along the Spanish Mediterranean Coast**

Martin F. Jurgensen (1), Deborah S. Page-Dumroese (2), Artemio Cerdà (3) Xavier Úbeda (4) María M-Mena (5), Ana Rey (6), Emiliano Pegoraro (6), Lluís Outeiro (4), María Almagro (5), Merche B. Bodí (3)

(1) School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan USA ([mfjurg@mtu.edu](mailto:mfjurg@mtu.edu)), (2) U.S. Forest Service, Rocky Mountain Research Station, Moscow Idaho, USA, (3) Departament de Geografia, Universitat de Valencia, Spain, (4) Departament de Geografia Física i AGR, Universitat de Barcelona, Barcelona, Spain, (5) Centro de Edafología y Biología Aplicada del Segura. Consejo Superior de Investigaciones Científicas, Murcia, Spain, (6) Estación Experimental de Zonas Áridas, Consejo Superior de Investigaciones Científicas, Almería, Spain.

Organic matter (OM) decomposition is a critical factor in assessing the possible impacts of future climate change and management on soil carbon cycling and sequestration. Most decomposition studies have used native OM to give site-specific information on carbon and nutrient turnover rates, but differences in OM quality (lignin content, C:N ratio, etc.) make it difficult to compare results among different sites. By using “standard” OM, substrate quality is held constant, and decomposition becomes a function of local abiotic (*e.g.* temperature, moisture, O<sub>2</sub>, pH,) and biotic (*e.g.* microbial biomass, functional diversity) conditions. We used wood stakes of four tree species (*Populus alba*, *Populus tremuloides*, *Pinus halepensis*, *Pinus taeda*) as standard indices of OM decomposition rates on the soil surface and in the mineral soil of four sites along the Spanish Mediterranean Coast with different land use and climatic conditions: 1) *Quercus suber* forest – 700 mm rainfall yr<sup>-1</sup>, 2) *Quercus coccifera* scrubland (*matorral*) forest under 500 mm rainfall year<sup>-1</sup>, 3) *Rosmarinus officinalis* dwarf scrubland under 350 mm rainfall yr<sup>-1</sup>, and 4) tussock (*Stipa tenacissima*)

grasses with 150 mm rainfall  $\text{yr}^{-1}$ . Preliminary results show significant differences in wood stake decomposition as a function of location in the soil and the wood stake species.