High resolution digital soil mapping of soil properties by synergistic use of multispectral/hyperspectral remote sensing and soil legacy data.

Context of the research

A postdoctoral position is proposed by the *Institut Agronomique et Vétérinaire* (IAV) of Rabat (Marrocco), in close collaboration with the *Laboratoire d'étude des Interactions - Sol - Agrosystème - Hydrosystème* (UMR LISAH, Montpellier, France). This research will be granted by the TRANSMED project "ALMIRA - Adapting Landscape Mosaics of medIterranean Rainfed Agrosystems for a sustainable management of crop production, water and soil resources" (2014-2017).

Job description

The successful candidate will develop new procedures of high resolution mapping of the surface and deep soil properties that are required by the parametrizations of SWAT (Soil and Water Assessment Tool) model and by the Integrated Hydrological Processes Model developed in the ALMIRA project. The methodology will include two steps:

i) extending the successful mapping of some topsoil properties obtained by using airborne hyperspectral images to larger areas by using remote sensing data at coarser spatial and spectral resolutions that are available at lower costs from spaceborne sensors (Ex: Advanced Land Imager (ALI), ASTER and LANDSAT sensors)

ii) merging the outputs of the previous step with legacy soil measured profiles to infer deep soil properties by means of spatial statistic procedures.

Methodologies will be developed in La Peyne and Lebna catchments where soil datasets have been already collected. Validation of the entire approach will essentially take place in the Tleta catchment (Northern Morocco) in which a validation dataset will be collected. Partial validations will also be performed in La Peyne and Lebna catchments where soil datasets have been already collected.

The fellowship is awarded for an initial period of 12 months with a possibility for a second year (starting around 1st April 2014). The fellowship will be located in IAV Rabat (Morocco) with large visiting periods in LISAH (Montpellier). The salary will be around 1000€ per month, with allowances for the visiting periods in France.

Qualifications: The candidate must have skills in remote sensing and/or soil sciences, scientific programmation (Matlab, R or IDL), with notions of statistics and/or chemometrics and geostatistics.

Applications: Candidates should submit, by email, a cover letter with a statement of research interests and a CV to Mohamed Chikhaoui (IAV, Rabat, Morocco, mchikhaoui@gmail.com) and Cécile Gomez (UMR LISAH, Montpellier, France, gomez.cecile@supagro.inra.fr).

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LISAH Laboratoire d'étude des Interactions Sol - Agrosystème - Hydrosystème

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