

Montpellier, October 2016

**Postdoctoral Research Opportunity
Modelling of landscape functioning**

Laboratoire d'étude des Interactions Sol-Agrosystème-Hydrosystème (LISAH), Montpellier, France

Starting date: as soon as possible (before January 2017)

We have one open postdoctoral position (18 months) within the ANR ALMIRA project (2014-2018): “*Adapting Landscape Mosaics of mediterranean Rainfed Agrosystems for a sustainable management of crop production, water and soil resources*”. Applications will be conducted on the La Peyne basin southern France. The selected candidate will be in charge of the following points:

- To analyse the hydrological behaviour (runoff, erosion, vegetation functioning) of the La Peyne basin (80 km²; hydrological database 2007-2012 and on-going 2016-2017 hydrological spatial measurements).
- To carry out the modelling of landscape functioning using the SWAT model (daily time step) on the La Peyne basin in order to simulate the impact of future scenarios of landscape mosaics and climate change (scenarios obtained from the other Work Packages of ALMIRA) on runoff, erosion and vegetation functioning considering multi-criteria approaches. The objective is to synthesize the related eco-systemic services for each landscape mosaics through indicators and finally derive recommendations on the best landscape mosaic.
- Depending on the progress of the work, to carry out an application of the available version of the Integrated Hydrological Processes Model under development at LISAH, that couples runoff, erosion and vegetation functioning at finer time steps (15 minutes) under the OpenFLUID platform. Applications will be conducted on the La Peyne basin or benchmarks, for few reference scenarios, and the results compared to those obtained previously with SWAT.
- To publish the results in 2 scientific articles.

This position requires a PhD by the start date of employment in hydrology, environmental engineering or related field. Preferred research skills and interests include demonstrated knowledge of modelling, geospatial analysis and time series analysis. Good computer programming skills (e.g. GIS, R and/or Matlab) are required. A record of publications and knowledge of catchment science is desired.

We will begin reviewing applications on Nr 2016, and the search will remain open until suitable candidates are found. To apply, please send letter of application detailing research interest and experiences, curriculum vitae, and names of 3 references (with telephone numbers and email addresses). Please direct questions about the positions to Dr Armand Crabit (armand.crabit@supagro.fr). The candidate will work in collaboration with François Colin, David Crevoisier, Jean-Christophe Fabre, Roger Moussa, Laurent Prévot, Damien Raclot and the other scientists in the remaining Work Packages of the ALMIRA project. For more information on the research group, please visit <http://www.umr-lisah.fr/>.

References related to the position

Aloui A., M. Masmoudi, F. Jacob, N. Ben Mechlia, 2012. Use of the Aquacrop model for the simulation of wheat evapotranspiration in north-eastern Tunisia. Geophysical Research Abstracts, Vol. 14, EGU 2012-11842.

Fabre J. C., X. Louchart, R. Moussa, C. Dagès, F. Colin, M. Rabotin, D. Raclot, P. Lagacherie, M. Voltz, 2010. OpenFLUID: a software environment for modelling fluxes in landscapes, LANDMOD2010, Montpellier, France (<http://www.symposcience.org/exlphp/articles/632-article.htm>).

Gumiere S.J., D. Raclot, B. Cheviron, G. Davy, X. Louchart, J.-C. Fabre, R. Moussa, Y. Bissonnais, 2011. MHYDAS-Erosion: a distributed single-storm water erosion model for agricultural catchments. Hydrological Processes, 25: 1717–1728. doi: 10.1002/hyp.7931.

Lagacherie P., M. Rabotin, F. Colin, R. Moussa, M. Voltz, 2010. Geo-MHYDAS: A landscape discretization tool for distributed hydrological modeling of cultivated areas. Computers & Geosciences, 36, 1021-1032.

Moussa R., M. Voltz, P. Andrieux, 2002. Effects of the spatial organization of agricultural management on the hydrological behaviour of farmed catchment during flood events. Hydrological Processes, 16, 393-412.