OMERE

Observatoire Méditerranéen de l'Environnement Rural et de l'Eau

OMERE: A Long-Term Observatory of Soil and Water Resources, in Interaction with Agricultural and Land Management in Mediterranean Hilly Catchments

Jérôme Molénat [(1)], Damien Raclot[(1)], Rim Zitouna[(2)], Jean Albergel [(1)] and Marc Voltz [(1)] and the OMERE Team

(1) LISAH, Univ. Montpellier, INRAE, IRD, Institut Agro, Montpellier (FRANCE)
(2) INRGREF, Tunis (TUNISIA)

ww.obs-omere.org

OZCAR

Mediterranean region characteristics

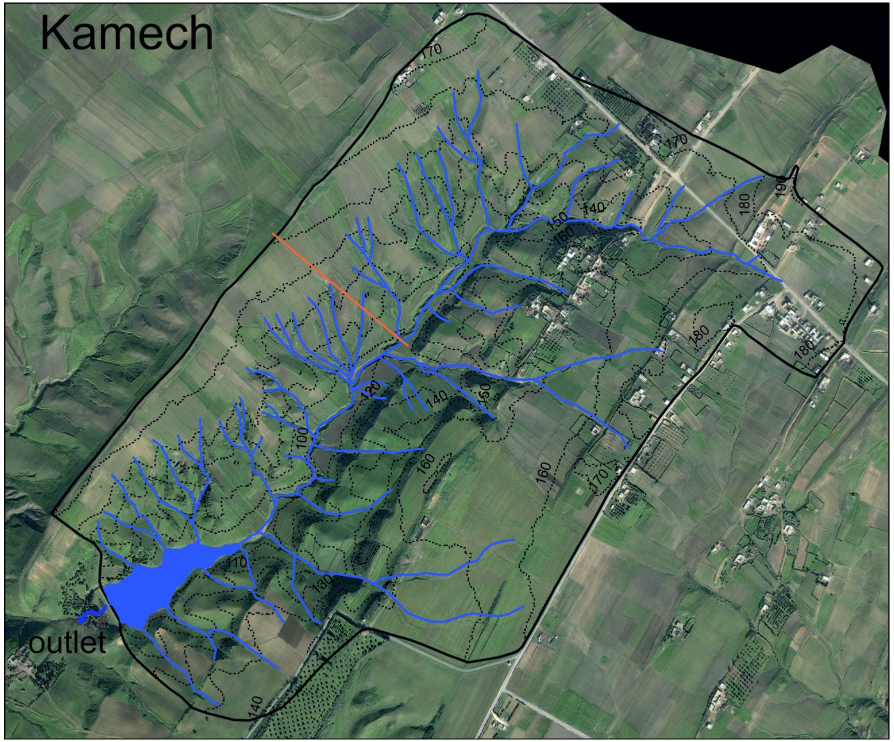
- **Landscapes**: *shaped by agriculture and farming system*
- **Soil**: *vulnerable and highly variable in space*
- **Climate**: *very large inter-annual and intra-annual variations, high frequency of intense storm and long periods of drought*

OMERE’s scientific questions

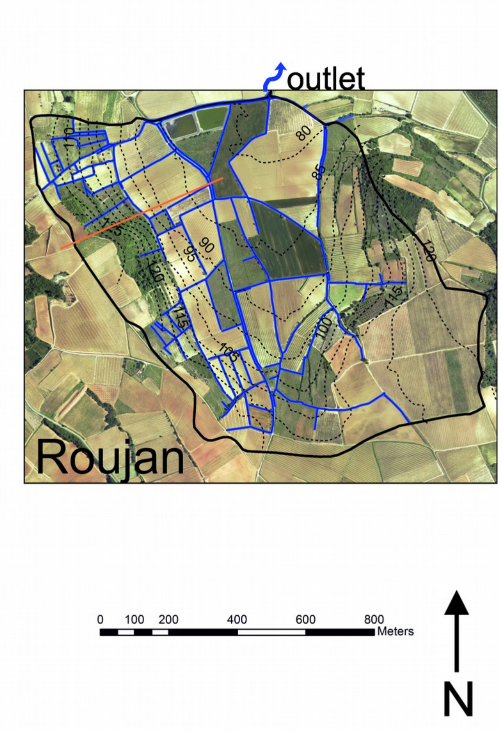
- estimate the fluxes of water, erosion, and contaminants and to identify their natural and anthropogenic drivers on short and long-term scales
- elucidate the aggregate effects of farming and land management on the mass fluxes across scales, from plot to catchment or landscape scales
- derive new scenarios for a sustainable agricultural management and improved delivery of ecosystem services by Mediterranean farmed landscapes (e.g., agricultural biomass production, water production, erosion prevention, flood regulation, and water contamination regulation)

OMERE : Roujan (France) and Kamech (Tunisia) catchments

Since 1994

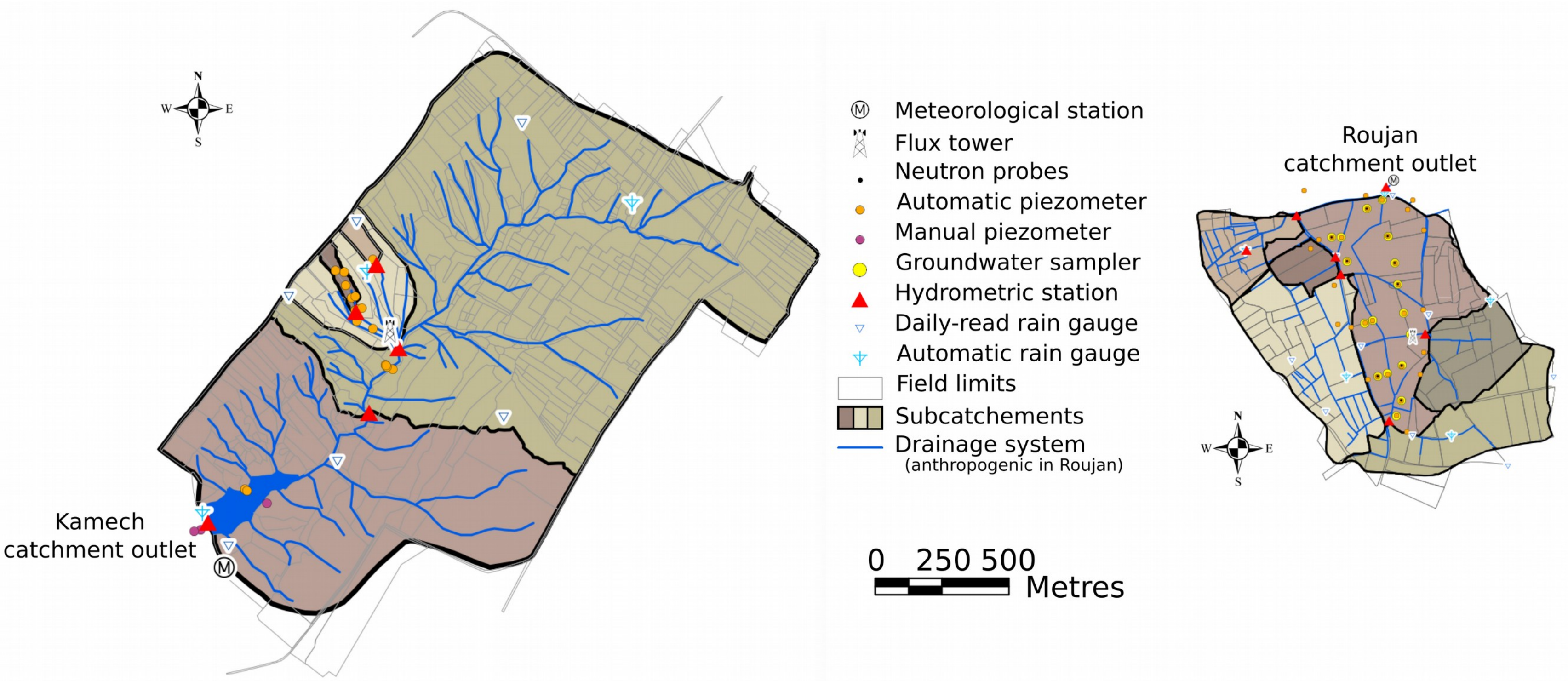


Since 1992



Location and areal maps of the two catchments

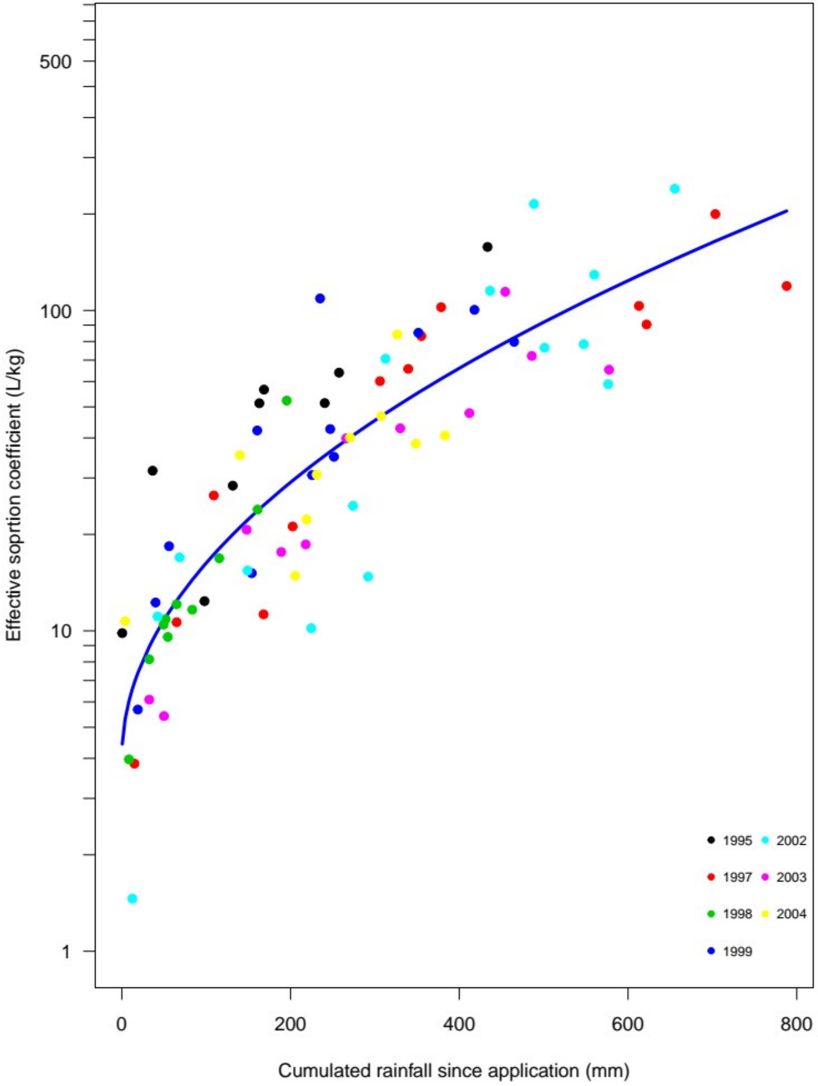
OMERE : Roujan and Kamech catchments



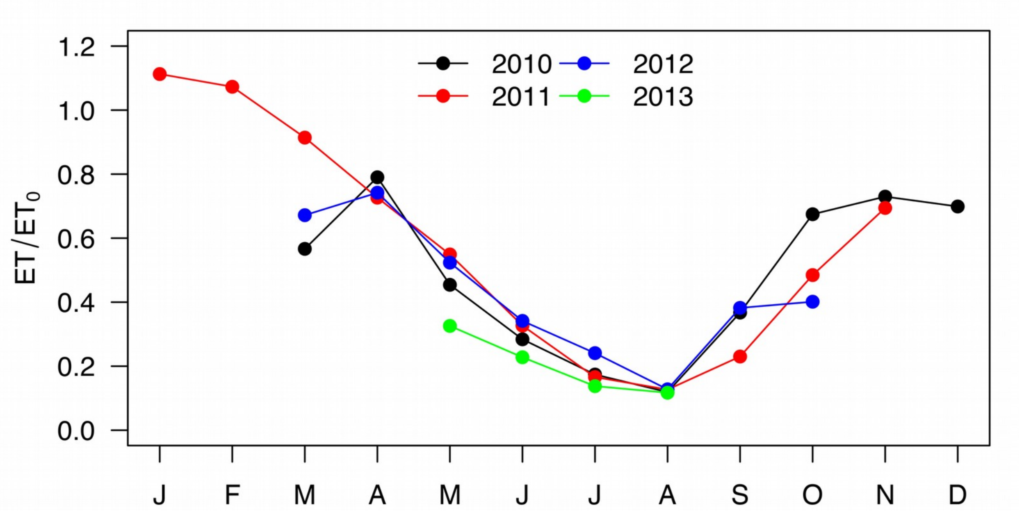
Hydrometeorological monitoring infrastructure. The different surface colors indicate the subcatchments delineated from hydrometric stations. In the Roujan catchment, the drainage system contains mainly anthropogenic ditches, fed by surface runoff. In the Kamech catchment, the drainage system consists mainly of a network of natural wadis and permanent gullies.

Water, Erosion, and Contaminant Fluxes: Estimation and Drivers (1)

Temporal variation in the effective sorption coefficient for diuron vs. cumulated rainfall since application, observed for 7 yr in Roujan (adapted from Louchart and Voltz, 2007)

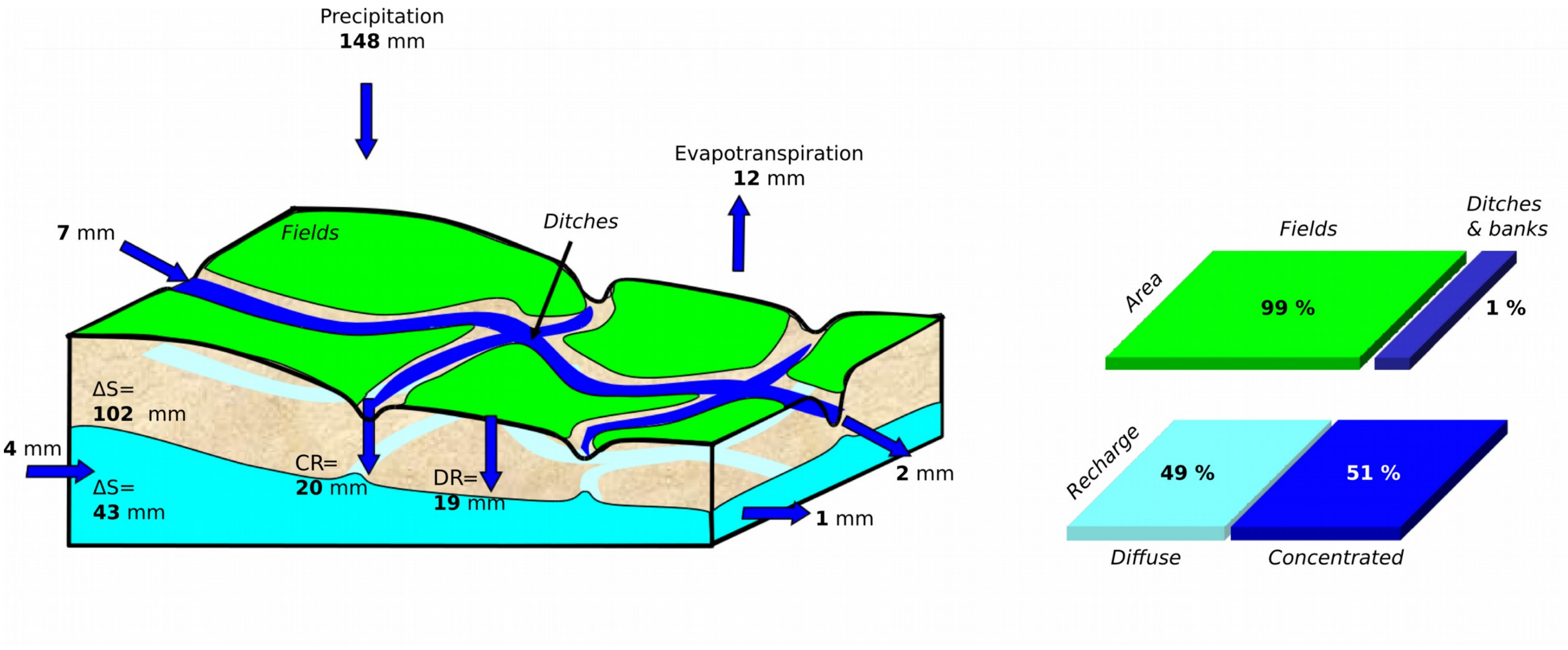


Water, Erosion, and Contaminant Fluxes: Estimation and Drivers (2)



Seasonal evolution of the ratio of actual (ET) to reference (ET_0) evapotranspiration at the hillslope scale across 4 yr in Kamech. Actual evapotranspiration was measured by the flux tower installed on the northern hillslope of Kamech, whereas ET_0 was measured by the meteorological station (adapted from Zitouna-Chebbi et al., 2018)

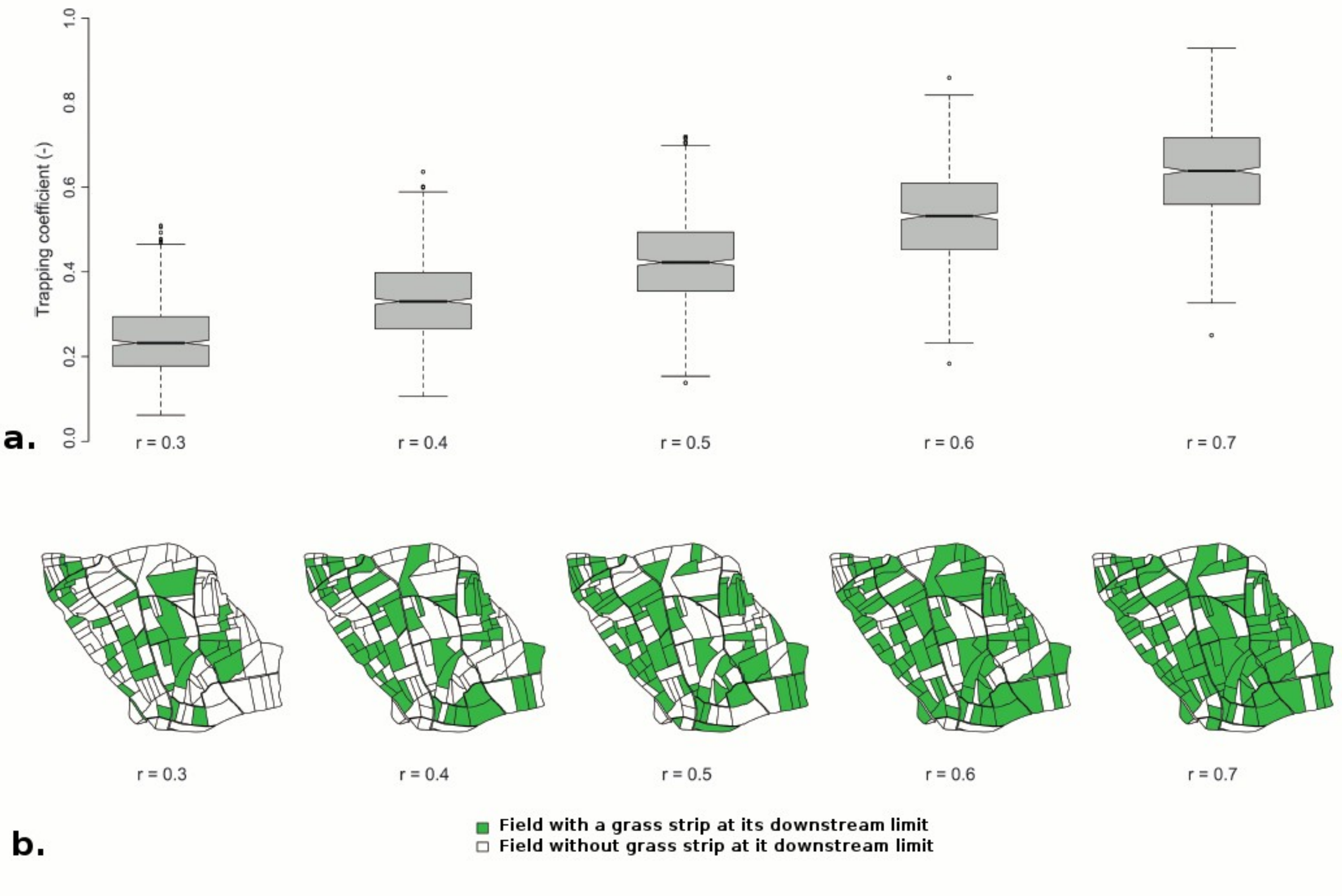
Aggregation Effects of Farming and Land Management



Water balance of the central depression of the Roujan catchment, calculated for the period of 7 to 20 Oct. 2005. CR, DR and ΔS stand for concentrated recharge, diffuse recharge and water volume variations in groundwater and in vadose zone, respectively (adapted from Dagès et al., 2009).

Toward New Scenarios for Sustainable Agricultural Management

Simulated effects of grass strip density on the sediment yield at the Roujan catchment outlet, using the MHYDAS-Erosion model and a stochastic generation model of grass strip locations. Panel a shows boxplots of the sediment trapping efficiency (i.e., the percentage of sediment reduction due to sediment trapping by grass strips, considering a grass strip density [*r*] varying from 0.3 to 0.7 and 800 repetitions of grass strip locations computed according to a Monte Carlo-based numerical procedure). The notches indicate the 95% confidence interval of the median value, and the whiskers indicate the 25th and 75th percentiles of the trapping coefficient distribution. Panel b shows the best configuration of grass strip locations, with regard to soil loss reduction at the Roujan outlet for grass strip density, ranging from 0.3 to 0.7 (adapted from Gumiere et al., 2015).



OMERE's perspectives

- Seeking higher spatial and temporal resolution of the measurement design
- Moving progressively from an agro-hydrological observatory to an agroecological observatory

More :

www.obs-omere.org

Voltz, M., and A. Albergel. 2002. OMERE: Observatoire Méditerranéen de l’Environnement Rural et de l’Eau-Impact des actions anthropiques sur les transferts de masse dans les hydrosystèmes méditerranéens ruraux. Proposition d’Observatoire de Recherche en Environnement. Minist. Français Rech., Paris

Molénat, J., Raclot, D., Zitouna R., ..., Albergel, J., and Voltz M., 2018, OMERE: A Long-Term Observatory of Soil and Water Resources, in Interaction with Agricultural and Land Management in Mediterranean Hilly Catchments, Vadose Zone J., 17:180086. doi:10.2136/vzj2018.04.0086