

## GLOBAL CHARACTERIZATION AND MODELLING OF WATER PROCESS ON AN ELEMENTARY WATERSHED

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Water transfert study, in field, is attempted to be account for in terms of a global model of hydrologic process, on an elementary watershed near Rennes (MEROT, 1981). A lanscape study (figure 1) and particularly a study of structure, porosity and hydromorphy soil characteristics (figure 3) lend us to consider the variable source concept (KIRBY, 1978) as a basis for modelling. According to this former concept, the outflow may be separated into two parts : the overland flow and the exfiltration on saturated areas (figure 4).

The superficie of saturated areas, on the soil surface, is daily estimated (figure 6) from weekly measurements (figure 2) and have allowed to calculate the contribution of both of those terms, and to elaborate a modelling of daily outflow in winter, compared to experimental values (figure 7).

Three major conclusions are drawn from the soil study and the outflow modelling during winter : (1) 20 to 50 % of the resulting outflow comes from the variable source areas, by exfiltration and overland flow, according to the concept ; (2) in addition to that, a baseflow is approximatively constant during the winter period ; (3) a subsurface flow is also shown, which explains a short lag of the watershed response to rainfall, perhaps induced by different hydromorphy and structure of horizons.

SURFACE

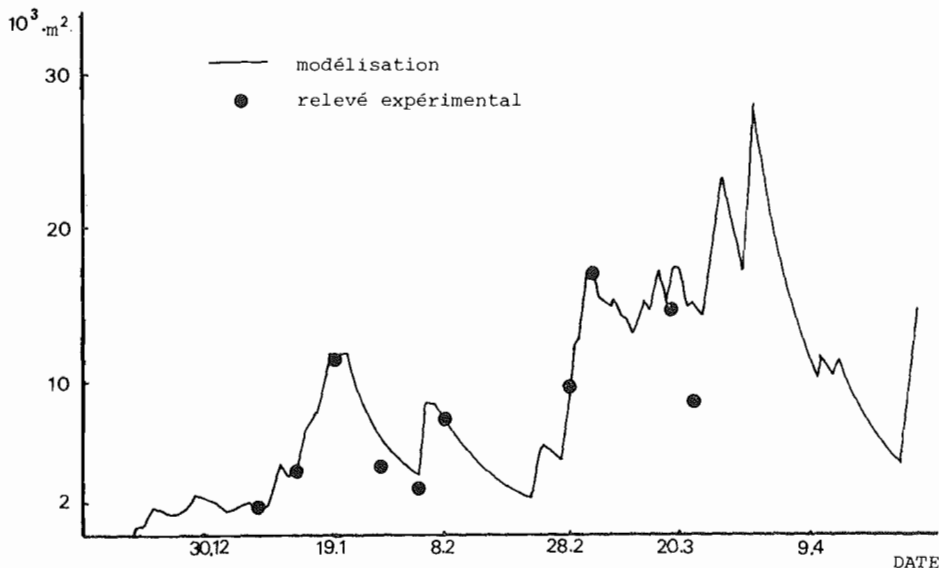


Figure 6 : Superficy modelling of saturated areas, in winter 80-81.

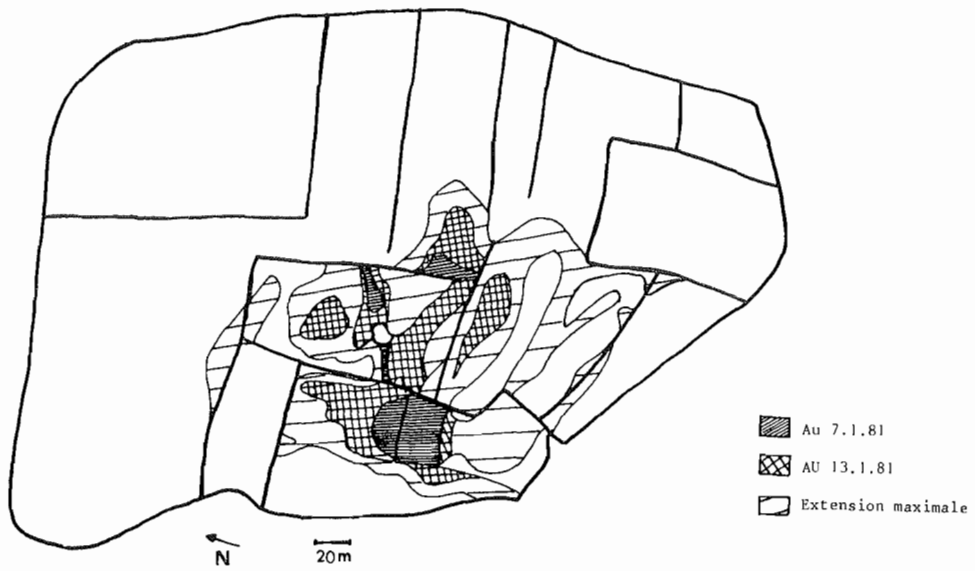


Figure 2 : Extent of saturated areas.