



"The Ways of Water" in the Euregio Maas-Rhine (Belgium, The Netherlands and Germany): an integrated geomorphological, ecological and environmental study

F. Lehmkuhl (2), H. Blümel (2), J. De Moor (3), **E. Hallot** (1), W. Hendrix (4), K. Kasse (3), J. Mols (1), C. Mönnig (2), E. Nilson (2), F. Petit (1), H. Van Buggenum (5), R. Van Balen (3), J. Vandenberghe (3)

1) Laboratory of Hydrology and Fluvial Geomorphology, Departement of Geography, University of Liège, Belgium,(2) Physical Geography and Geoecology, Department of Geography, RWTH Aachen, Germany,(3) Departement of Quaternary Geology and Geomorphology, Vrije Universiteit Amsterdam, The Netherlands,(4) Rijks Water Staat, Directie Limburg, Maastricht, The Netherlands,(5) Waterschap Roer en Overmaas, Sittard, The Netherlands.(Contact e-mail: info.wegedeswassers@geo.rwth-aachen.de)

Water managers will have to face new challenges in the future. According to new European guidelines, water management should be integrative and should consider all factors influencing water bodies in a holistic approach. This new orientation will require new methods of water monitoring which have to cover the complex interdependencies in whole river catchment areas. In addition to data concerning the physicochemical characteristics of the rivers, area-measured data about climate, present and historical land use, soils and subsoil geology will have to be regarded. One special integration aspect in the Euregio Maas-Rhine is the homogenisation of data at the border triangle Belgium-Netherlands-Germany, according to the motto: Rivers knows no borders! The part of the Euregio Maas-Rhine covered by the WdW project is marked by the Maas at the western border and it ends with the catchment of the Rur in the east area. The confluence of the Rur with the Maas defines the northern edge and in the south large parts of the Vesdre catchment are in the focus of the project. The project 'Wege des Wassers' ('Ways of the Water', in short: WdW) aims to (1) give input for a decision support system for operative water managers, (2) survey and network cross-bordering water related data, (3) investigate the main components interacting in the

catchments (4) prepare the implementation of an 'Integrative Water Management' and (5) contribute to a sustainable improvement of water conditions in the Euregio Maas-Rhine according to ecology and economy. The project is structured in five 'Project Interest Group's' (in short PIG). (1) 'PIG Fluvial Dynamics' works on the determination and mapping of morphological parameters of the rivers and their dynamics. Straightening and channelization of water courses is associated with particularly drastic changes in river morphology and dynamics. (2) For the 'PIG Land use change' the land use in river catchments is one of the key variables in explaining sedimentological, morphological and physicochemical characteristics of rivers. A change in land use from grassland to crops will increase soil erosion in that area, the rivers sediment load and finally sediment accumulation on the floodplains. At the same time biochemical changes in the water will occur. (3) The 'PIG Fluvial Geoecology' focusses on the physicochemical characteristics of the water. Continuous daily and annual variations of numerous parameters are measured. These variations are partly of natural and partly of anthropogenic origin. (4) In the 'PIG Sedimentology and Soil Science' the fluvial deposits are studied as a valuable archive of landscape history. Heavy metal contamination (Pb, Zn) in some layers of floodplain sediments tell a story about mining activities in some catchments of the Euregio Maas-Rhine. The distinct changes between contaminated and non-contaminated sediments allow an absolute determination of the sediment ages from which sedimentation rates can be calculated. (5) Finally the 'PIG Data Integration' works on collecting, processing and maintaining the information and a database, which has been provided by earlier studies. In addition, new data and the results of our work will be made available to the scientific community and to the public in standard formats in order to be of long-term use. Overall 10 institutions (Universities, Water Managers) are working together in the WdW project which is financed by the European Union (Fund Interreg III) and by other regional institutions.