

CLIMATE CHANGE DOWNSCALING METHOD - TOOL

RIVER BASIN MANAGEMENT ISSUE									
Water Quality					Water Quantity		Alterations		Others
1	2	3	4	5	6	7	8	9	
						T	T		
(1) Diffuse pollution by agriculture (3) Contaminated sediment and floodplain soils (5) Pollution by organic matter (7) Water scarcity (9) Hydromorphological alterations					(2) Salinisation (4) Large scale pollution due to past mining / industries activities (6) Emerging compounds (8) Floods and low flow (10) Soil erosion				
C = System Characterisation T = System Trend					M = System Monitoring R = System Remediation, Mitigation				
RIVER BASIN									
Danube	Ebro	Meuse	Elbe	Brévilles	Others				
	✓	✓		✓	Not river basin specific				
Spec. : Results specific to selected River Basin									
KEY FINDING TYPE									
Laboratory based			Field based				Modelling		
							✓		
BENEFITS TO END-USERS									
Technical		Management		Policy					
WFD Implementation	Research	River Basin	Compliance	Policy making					
✓ - Climate modellers	✓								

INTRODUCTION

HYDRO 1 aims to take climate information from large scale model and to downscale the information in order for them to be relevant scenarios at the local and catchment scale. HYDRO 1 research consists of (i) collecting observed climate data for diverse study areas; (ii) evaluating climate models with respect to reproducing current climate data (such as rainfall and temperature data), their respective variability and extremes; (iii) studying droughts and extreme rainfall variation over Europe (up to 2070); and (iv) developing a weather generator including a rainfall model for the Dommel, Gallego, Brenta and Brévilles catchments.

TOOL SUMMARY

The climate change downscaling method is a framework for the construction of probabilistic climate change scenarios for the assessment of impacts on hydrological and hydro-geological systems at regional-to-catchment scales. A key aim of the method is to produce probability projections of future change by using multiple climate model estimates. The probabilistic approach enables the quantification of the uncertainties of the prediction and allows the estimation of the likelihood of the risk (with respect to set thresholds). The tool is a weather generator including a rainfall model. It takes outputs from climate models and produces high resolution outputs to be used by hydrological modellers. The method has been developed for the catchment scale but could be easily transferable to the basin scale. It offers a good reliability as the uncertainties can be quantified. The software is available as a freeware. Its development is possible at reasonable cost. The model is suitable for all

European climates (although only presently calibrated for the UK) but may not be suitable for modelling very dry climates.