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## **Synergies of fundamental and applied research: a personal perspective**

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One of the strengths of the university system is to be able to use the synergies between theoretical and applied research. This paper will review a number of examples, where recent scientific achievements are believed to have made a difference in practical hydrological decisions and, conversely, advantage is taken of the return flow of information from applied to fundamental research to provide guidance on research issues as well as realistic data bases. Examples to illustrate how fundamental research can contribute to applied research include a flood regionalisation method developed in an EC funded project that has been used as a rapid assessment tool in guidelines of spillway design for large dams in Austria. The top-kriging method developed in basic research projects has been used for mapping the flood risk of Austrian streams in the HORA project funded by an Austrian ministry and the Austrian Association of Insurance Companies in the context of the European Flood Directive. A conceptual hydrological model developed in an EC funded project has been used for low flow estimation to assess the potential impact of the European Water Framework Directive on power production in a project funded by the Austrian Association of Electricity Companies. Examples to illustrate how applied research can contribute to fundamental research include the flood data base developed in the HORA project which is currently used in a project funded by the Austrian Science Foundation to further regionalisation methods. The soil moisture estimates in the Kamp catchment obtained in a practical flood forecasting project is used to assess the potential of satellite data for soil moisture estimation in a more theoretical context, and a new variant of the

Ensemble Kalman Filter developed in that forecasting project is used to assimilate regional satellite snow data in an EC funded project. It is argued that this dual approach of theoretical research and applied engineering problems provides significant mutual benefit to both activities and may expedite the process of new methods finding their way into engineering hydrology.