Development of a practical toolkit for flow naturalisation

Background

Hydrologists have always been required to produce naturalised flow sequences but CAMS (Catchment Abstraction Management Strategies) and the introduction of RAM (Resources Assessment and Management) has increased demand. Naturalised flow sequences now have to be produced using a consistent, repeatable method.

The Environment Agency published a document called "Good Practice in Flow Naturalisation by Decomposition" which is a procedural manual for hydrologists undertaking naturalisation through decomposition. This manual explains the principals behind flow naturalisation by decomposition but it doesn't provide hydrologists with detailed guidance on the naturalisation process or any tools to help with the decision making.

The Development of a Practical Toolkit for Flow Naturalisation Science Project was commissioned to provide:

- guidance for undertaking flow naturalisation by decomposition for a variety of uses;
- supporting tools for flow naturalisation;
- ways of measuring the sensitivity of the naturalised flow to the data used.

The project used synthetic artificial influence data sets to assess the impact on the flow naturalisation of using different estimates of artificial influences. The research indicated that the overall uncertainty was mainly related to the water use patterns within the catchment and the magnitude and purpose of the dominant artificial influences.

The research was undertaken by the Centre of Ecology & Hydrology (CEH) and used input from key practitioners in the Environment Agency.

The Outputs

A number of guidance manuals and Excel based tools have been delivered by the project. These include:

- Decision Framework - flow chart document which guides hydrologists through the decision process for flow naturalisation;
- Flow Naturalisation Handbook - provides hydrologists with further advice and information relating to the decision framework;
- Tool A - to identify non-stationarity within a time series;
- Tool B - to assess the level of artificial influence impact on the flow data;
- Tool C - works with artificial influence data from Low Flows 2000 to assess the significant artificial influences within the catchment to limit the uncertainty within the final naturalised flow sequence;
- Guidance for Tools - guidance on how to use Tool A, B and C.

These products should be used with the "Good Practice in Flow Naturalisation by Decomposition" manual. The Good Practice in Flow Naturalisation by Decomposition manual provides hydrologists with an overview of the naturalisation process. The outputs from project SC010050 provide hydrologists with a logical structure for working through the flow naturalisation process and tools to help make key decisions.

This summary relates to information from Science Project SC010050 (W6-075) reported in detail in the following output(s):-

Science Report: SC010050/SR
Development of a practical toolkit for flow naturalisation.

Report Product Code: SCH01005BJVY-E-P

Dissemination Status: RESTRICTED

CD-ROM:
Flow Naturalisation Handbook
Guidance for Tools
Decision Framework
Tools: A, B & C

Product code: SCH01005BJWA-E-C

Dissemination Status: RESTRICTED

Further copies of this summary and related report(s) are available from our publications catalogue on or our National Customer Contact Centre T: 08708 506506 or E: enquiries@environment-agency.gov.uk.