Joint (synergistic) applications of the NRFA (daily mean flows) with other UK datasets (rainfall and water quality): selected case studies from the 1990s

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The NRFA, used primarily to assist with strategic UK water resources (quantity) monitoring/assessment, has facilitated and stimulated other hydrological research covering the UK - the poster outlines two examples.

River mass load estimation

NRFA daily mean flows

Harmonised Monitoring Scheme (HMS) river water quality concentrations

catchments above gauging stations/sampling sites, by coastal zones

- Great Britain: Nitrate-N annual load estimates
- Great Britain: Total phosphorus annual load estimates

Rainfall-streamflow (RS) model parameter regionalisation

In the UK and elsewhere spatially lumped conceptual RS models, e.g. IHACRES, have been applied to national river flow and rainfall daily datasets, seeking relationships between model dynamic response characteristics (DRCs) and physical catchment descriptors (PCDs) - e.g. to assist with estimating hydrographs for ungauged catchments and for climate change impact studies.

\[ c \] - depth of a conceptual catchment wetness store [L]
\[ \tau_c \] - catchment drying time constant [T]
\[ f \] - temperature modulation factor (°C⁻¹)

(IHACRES DRCs)

\[ \tau_q \] - quick flow response decay time constant [T]
\[ \tau_s \] - slow flow response decay time constant [T]
SFI - slow flow index [-]

Recent work indicates that the typical large uncertainty in statistical relationships between DRCs (any model) and PCDs might be reduced, e.g. by using sub-daily data for flashy gauged catchments.


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