Centre for Ecology & Hydrology

NATURAL ENVIRONMENT RESEARCH COUNCIL

PC-QUASAR

Quality Simulation Along Rivers

PC-QUASAR is a water quality and flow model for river networks. It is designed to be used by river regulatory authorities and water/ sewerage utility companies to help manage river water quality.

PC-QUASAR allows easy comparison between the existing state of the river and that which would exist after a planned change or an unplanned event had occurred in the river network.

The model describes the changes in water quality over time, and allows tracking of pollution pulses downstream.

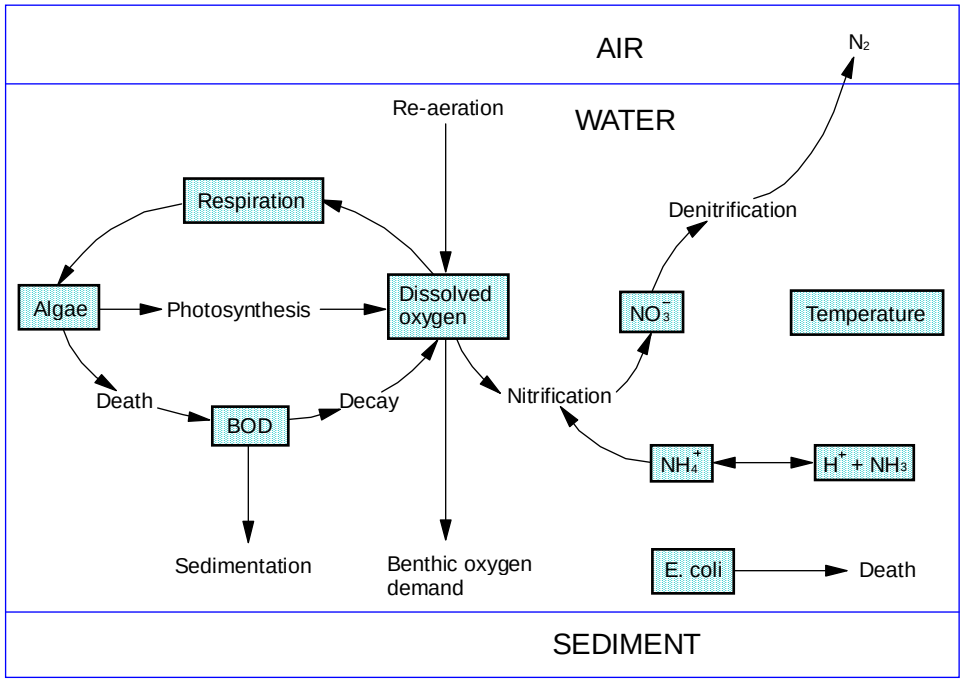
In *planning mode* PC-Quasar can provide distributions of flow and quality at key sites of interest, allowing river regulators to set effluent consent levels designed to meet river quality objectives.

In *dynamic (prediction) mode*, PC-QUASAR provides river flow and water quality estimates at each reach boundary over a period of time, allowing proposed changes in the river's use, flow or quality to be assessed.

The following determinands can be modelled:

- river flow
- ammonia
- pH
- nitrate
- temperature
- *E.coli*
- biochemical oxygen demand
- dissolved oxygen
- conservative pollutant or tracer.

PC-QUASAR models a river as a series of reaches, usually defined by the locations of tributary confluences, weirs, public water supply intakes or effluent discharges.

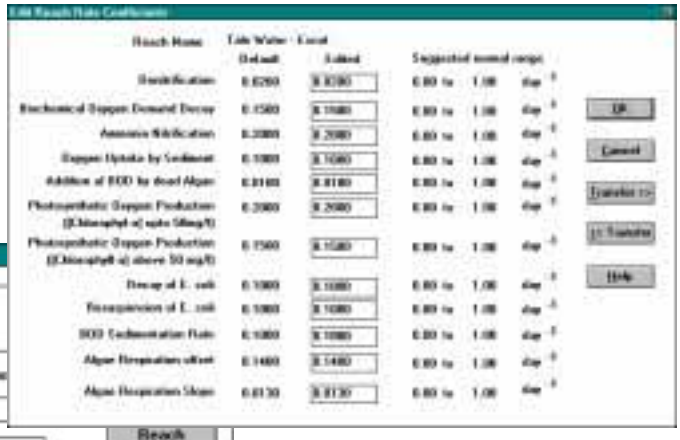


Processes and determinands represented in PC-QUASAR

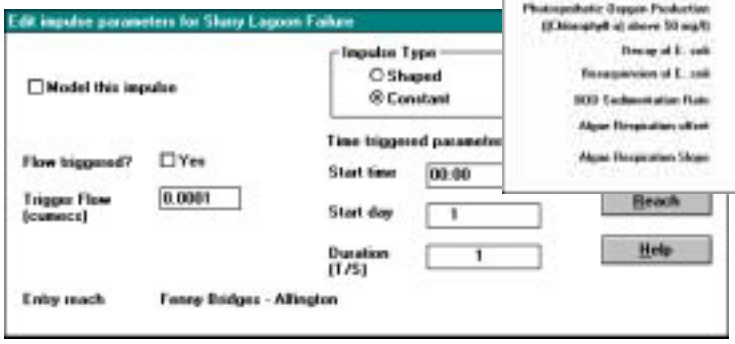
During their passage through the reach the concentrations of the water quality determinands are modified according to in-stream physical, biochemical and chemical processes. In the case of dissolved oxygen, for example, additions are made through re-aeration and photosynthetic oxygen production. Losses occur due to the decay of biochemical oxygen demand (BOD), the nitrification of ammonia and the respiration of algae and river mud.

These water quality determinands may be edited by the user or imported from an ASCII file, for some or all segments of the river to be modelled. Modelling may then be undertaken using any combination of observed and edited parameters to predict the effects of real or potential changes to the river's use.

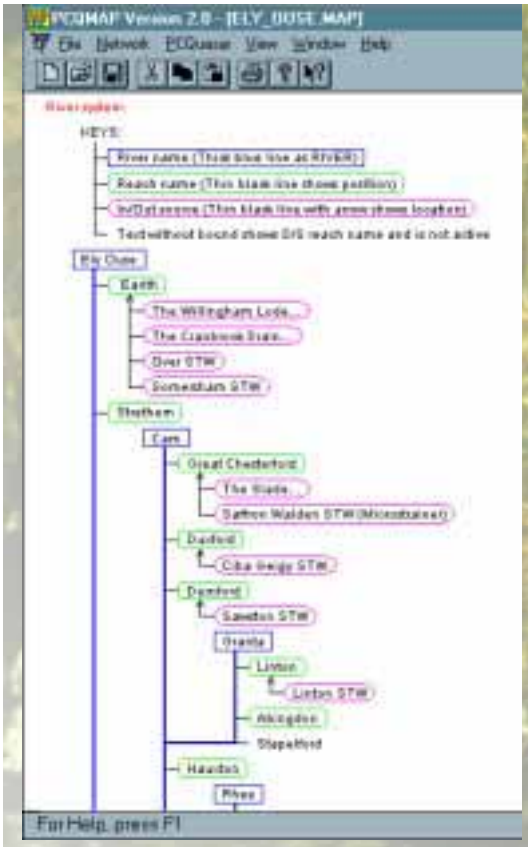
PC-QUASAR



Rate coefficient editing



Impulse definition

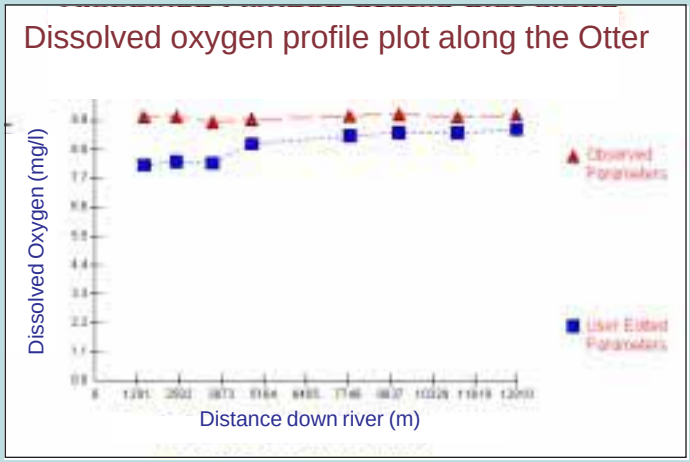


incorporates PCQMAP (left), a utility that allows the user to build up and modify river and reach definitions at will, allowing easier model data map file creation and editing.

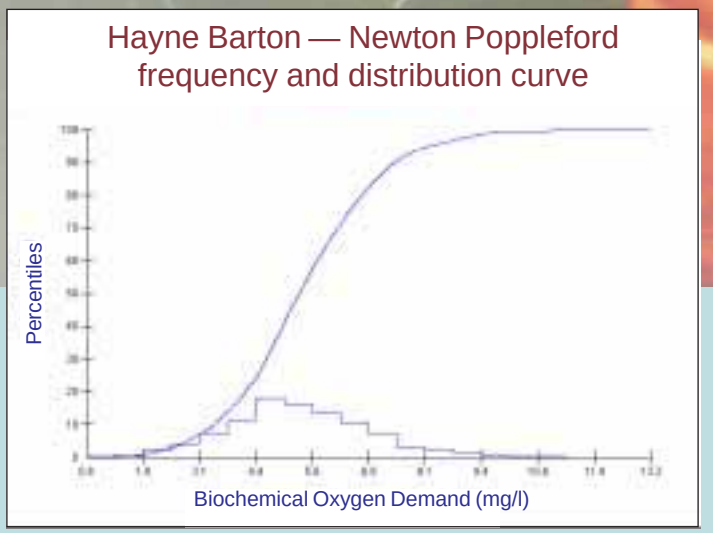
Output

In *dynamic mode* the simulated water quality and flow can be viewed either as a profile along the river system or against time at any reach of interest (e.g. river abstraction site).

In *planning mode* cumulative frequency and distribution data are produced. These can be exported to a spreadsheet or a statistical package.



Example of a reach profile plot



Example of a planning mode plot

PC-QUASAR is a WINDOWS 3.1 compliant package. It will also run under WINDOWS 95 and WINDOWS NT. Its functionality is similar to the VAX package QUASAR.

Hardware requirements

Minimum PC with 386 processor and 8MB RAM.
Advised PC with 486 processor and 16MB RAM.
An SVGA monitor is required.
Any Windows® supported hard copy device may be used for output.

More information

For more information about PC-QUASAR and other IH software please contact:

Software Sales and Support, Institute of Hydrology
Crowmarsh Gifford, Wallingford
Oxfordshire OX10 8BB

Tel: +44 (0) 1491 838800
Fax: +44 (0) 1491 692424
E-mail: dbb@ceh.ac.uk
WWW: http://www.nwl.ac.uk/ih

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