



Predicting Catchment Behaviour

Project 1A: Implementation of the Catchment Modelling Toolkit

Project Leader: Joel Rahman (CSIRO Land and Water)

Deputy Project Leader: Susan Cuddy (CSIRO Land and Water)

Project objectives

- Implement or support the implementation of the Cooperative Research Centre (CRC) for Catchment Hydrology's models in the Catchment Modelling Toolkit. Support the integration and implementation of industry models. Facilitate and assist in the interlinking of models (see also Project 1B: Methods for Integration in Catchment Prediction').
- To provide and support an environmental modelling framework within the CRC and its Parties and equip the model development community with the skills to develop models within the framework .
- In addition, the project serves the industry Parties directly by adding value to their current suite of river management models (IQQM and REALM).
- Implement specified models within the catchment modelling framework and accommodate the inclusion of other models outside the framework, but within the Catchment Modelling Toolkit.
- Promote the use of The Invisible Modelling Environment (TIME) to assist researchers and model developers.

Background

The CRC's business plan (1999-2006) identifies a collection of catchment modelling software known as the Catchment Modelling Toolkit as a key deliverable. This project focuses on the software development required to underpin the delivery of the Toolkit, and associated documentation as well as adding value to established industry models, such as IQQM and REALM. Beyond the life of the CRC for Catchment Hydrology, the Toolkit will provide a repository of software and data to assist practitioners in implementing and coordinating whole of catchment scale modelling in Australia.

This project has a software implementation and integration role by supporting the development and packaging of targeted modelling capability in high quality software. It provides and supports a sophisticated model development environment for use by project staff and other researchers in a range of programming languages.

Project focus

The project is focused on model development, delivery and training within a sophisticated modelling framework. The CRC has recently developed this environmental modelling framework that is called The Invisible Modelling Environment (TIME). It allows the easy development and integration of models written in different programming languages, including Visual Basic, Fortran 95, C++ and C#. TIME operates on the Microsoft .NET platform and allows models to be deployed as Windows, console or web based applications. The CRC has developed TIME in

For further information please contact:

Joel Rahman
CRC for Catchment Hydrology,
CSIRO Land and Water
GPO Box 1666 Canberra
ACT 2601 Australia
joel.rahman@csiro.au

Geoff Podger
CRC for Catchment Hydrology,
CSIRO Land and Water
GPO Box 1666 Canberra
ACT 2601 Australia
geoff.podger@csiro.au



**Current Projects**

2003-2006

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response to stakeholder requests that we provide a software development environment that can support multiple languages.

TIME was developed in CRC Project 1.1 (1999-2002), as a system to combine the ease of use of ICMS and the flexibility and scalability of Tarsier (existing modelling frameworks), while adding important multi language capabilities. CRC models previously implemented in the ICMS and Tarsier environments are being progressively migrated into TIME. This includes components of models such as the Environmental Management Support System (EMSS) and 'local (smaller scale) EMSS' (LEMSS).

The software development undertaken in this project is largely driven by instructions received from the other CRC projects, and is coordinated by the Toolkit Strategy Group (TSG).

Project outputs

This project is focussed on delivering three key software products:

- A model development environment (TIME) that supports the development of component models, the integration of models and the testing and application of models (see www.toolkit.net.au/time).
- A library of modules, each encapsulating some model, or part of a model, from the CRC's other research projects. Each module will be developed within TIME.
- A high level application focussing on catchment scale modelling (known as E2), integrating the various modules in the library, and allowing the interchange of key modules, such as flow and pollutant generation, pollutant filtering and instream processes including routing.

Together, these products will encompass the core components of the Catchment Modelling Toolkit. The development of these products is supported by documentation, training examples and workshops.

Project team**Project leader**

Joel Rahman, (CSIRO Land and Water)

Researchers:

Shane Seaton, (CSIRO Land and Water)

Harold Hotham, (CSIRO Land and Water)

Jean-Michel Perraud, (CSIRO Land and Water)

Nick Murray, (CSIRO Land and Water)

Susan Cuddy, (CSIRO Land and Water)

Matthew Gooda, (Natural Resources, Mines and Energy, Qld)

For further information

<http://www.catchment.crc.org.au/catchmentprediction>

<http://www.toolkit.net.au>