



Mount Lofty Ranges E2 Model

Issued June 2007

EPA 703/07: This information sheet is part of a series (704 and 705). It provides details about the decision-making capability of the Mount Lofty Ranges E2 Model in assessing water quality and protecting the Mount Lofty Ranges Watershed.

Introduction

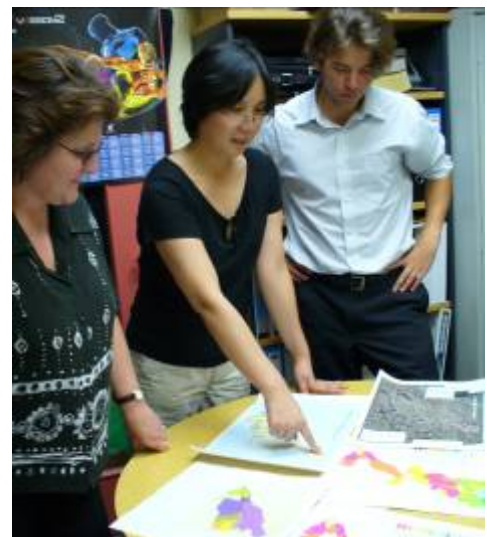
For the Environment Protection Authority's (EPA) Watershed Protection Office (WPO) and those responsible for managing water quality in the Mount Lofty Ranges (MLR) Watershed, the MLR E2 Model is a valuable tool to aid environmental assessment and decision making. It has been specially adapted for the MLR Watershed area.

In conjunction with on-ground monitoring and local knowledge the model will assist the WPO and its stakeholders to protect the water resources in the Watershed through providing a broad picture of what is happening and what could happen if conditions or management practices were to change. Efforts and programs can then be prioritised in a more efficient, logical and structured manner.

The Mount Lofty Ranges E2 Model

The MLR E2 Model is complex in its design and capable of predicting the effects on water quality within the Watershed. It is essentially a dynamic water quality and runoff model that incorporates full GIS coverage, component models and graphical interface. It has the ability to compare different land use and land management scenarios readily, simulate the effect on instream water quality and permit easy incorporation of new models.

The MLR E2 model has been developed to undertake whole-of-catchment and sub-catchment analysis covering a wide range of water and land management issues in the Watershed. It will enable the EPA to simulate the likely impacts of land management actions on water quality and flows over the whole of the Watershed area.



As well as the MLR E2 Model, the team at the WPO uses on-ground monitoring & local knowledge to support assessment & decision making processes.

How will the MLR E2 model be used?

The MLR E2 model is a baseline model allowing an assessment of the state of the environment in the Watershed as well as a prioritisation of sub-catchments. Using the baseline model we can develop specific sub-catchment project models.

Model Outputs

The MLR E2 Model is able to provide the following:

- daily flow
- constituent loads including Total Suspended Solids, Total Nitrogen, Total Phosphorous, *Cryptosporidium* and *E coli*.

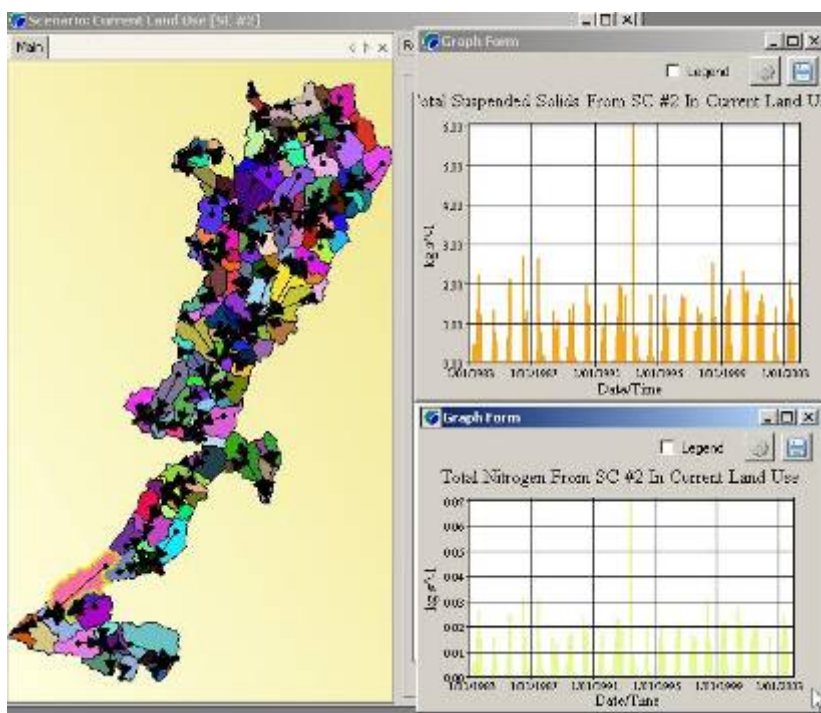
Formats in which results can be presented include:

- graphs
- GIS format (for commercial GIS software)
- export to 'csv' format (for Microsoft Excel/Word applications)
- export to 'html' format (for web).

Data Requirements

Data input for the MLR E2 Model includes:

- climate (rainfall and potential evapotranspiration)
- pollutant concentrations
- flow
- topography
- land use
- storages
- land management practices.



An example of map, graph and data outputs from the MLR E2 Model. The MLR Watershed contains 44 sub-catchments. As seen in the map to the left, the MLR E2 Model has determined there to be 180 sub-catchments due to the hydrology of the area and ease of reporting results, thus, demonstrating the complexity of its design and its capacity to predict the effects on water quality with changing land uses in all of these sub-catchments.

MLR E2 Model application

- 1 A smaller sub-catchment project model has been completed for the Myponga Watercourse Restoration Project, allowing an assessment of the sediment load reductions associated with increased riparian zone vegetation.
- 2 The MLR E2 Model is also being used in a collaborative project with SA Water, CSIRO, the Adelaide and Mount Lofty Ranges Natural Resource Management Board and Dairy SA to determine nutrients, sediment and pathogen load reductions associated with land use and land management changes in the Myponga catchment.
- 3 The MLR E2 Model will soon have the capability to model climate variability impacts on water quality in the Watershed.
- 4 The MLR E2 model will be used for other projects in which WPO is a partner. These include the Lenswood Creek pesticides and nutrients project, the Cox Creek Nutrient Mitigation Project and the National Pollution Inventory reporting requirements for the Mount Lofty Ranges Watershed project.

Limitations

The MLR E2 model will not undertake regional groundwater, ecological or sophisticated economic modelling.

Where did the MLR E2 Model come from?

The Cooperative Research Centre for Catchment Hydrology (CRCCH) developed E2 as a catchment-modelling framework. The MLR E2 Model has been developed using this framework because of its ability to undertake whole-of-catchment analyses covering a wide range of water and land management issues.

Development of the MLR E2 Model

Work began in 2003 on the development of the MLR Environment Management Support System (EMSS). Staff at the WPO undertook this with assistance from CRCCH.

The EMSS model was the predecessor to E2. In 2004 CRCCH completed the development of E2, a more superior modelling framework to EMSS.

When the E2 modelling framework became available, data and work already undertaken for EMSS were incorporated into the E2 modelling framework.

Related readings

South Australian Environment Protection Authority 2007, [EPA Information Sheet—E2 Catchment Modelling Framework](#), EPA, Adelaide, viewed 5 June 2007, <www.epa.sa.gov.au>.

—2007, [EPA Information Sheet— Frequently asked questions about the Mount Lofty Ranges E2 Model](#), EPA, Adelaide, viewed 5 June 2007, <www.epa.sa.gov.au>.

FURTHER INFORMATION

For further information go to <www.toolkit.net.au/e2> or <www.epa.sa.gov.au/watershed>

You can also contact:

Environment Protection Authority
Mount Lofty Ranges Watershed Protection Office
Suite 2/85 Mount Barker Road
Stirling SA 5152
Telephone: (08) 8139 9900
Freecall: 1300 134 810
