



Models are playing a greater role in water resource management due to the increasing complexity of systems that are being implemented and the range of factors that require consideration.

There are many existing computer models which are powerful tools that can be utilised to design and estimate the performance of various Water Sensitive Urban Design (WSUD) measures. This means that the performance of different development proposals can be assessed and compared using a common measurement system.

Essentially, models allow the extrapolation from existing systems and knowledge to analyse potential situations.

Models can be employed to meet many different objectives during the planning, design and operation of a water management system and therefore different types of models can be more appropriate than others depending on the issues to be considered.

What is Water Sensitive Urban Design?

Water Sensitive Urban Design (WSUD) is an approach to urban planning and design that integrates the management of the total water cycle into the urban development process. It includes:

- Integrated management of groundwater, surface runoff (including stormwater), drinking water and wastewater to protect water related environmental, recreational and cultural values;
- Storage, treatment and beneficial use of runoff;
- Treatment and reuse of wastewater;
- Using vegetation for treatment purposes, water efficient landscaping and enhancing biodiversity; and
- Utilising water saving measures within and outside domestic, commercial, industrial and institutional premises to minimise requirements for drinking and non-drinking water supplies.

There are many different WSUD measures which together form a 'tool kit' from which individual measures can be selected to form a specific response suiting the characteristics of each development (or redevelopment).

Those measures are described in detail in the WSUD Technical Manual, which can be found online at www.planning.sa.gov.au/go/wsud

When is a Model Required?

The level of modelling required to be undertaken will be defined by council development assessment officers and will be based on factors including:

- The level of impact the development is likely to have on the receiving waterways/water bodies; and
- The scale of the development.

For small developments and redevelopments there will be instances where detailed modelling is not required. In such cases, the consenting authority should have a clear understanding of the minimum WSUD measures required for such developments. Type curves can be utilised (where available) for instances when a model is not required.

Modelling Procedure

The modelling procedure should follow logical steps and the following approach is recommended:

- Preliminary consideration of objectives;
- Data collection and site inspections;
- Building a conceptual model of the existing system;
- Model refinement, checking and calibration;
- Detailed runs;
- Identification of problems;
- Scoping (identification and initial assessment) of remedies; and
- Preparation of a report.

In order of importance, the accuracy of models depends on:

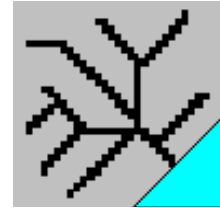
- The amount of data used to build and operate the model;
- The experience or skill of the analyst; and
- The quality of the model.

Models are ineffective without data and calibration.

Type of Models Available

There is a wide range of packages and approaches that can be applied to simulate water management systems. The models listed below have been selected due to their availability and wide use through the industry, their applicability to WSUD and South Australian conditions. It is important to note that the inclusion of these models in this list neither endorses any of these modelling systems, nor assures the quality of results that will be obtained from their use.

- MUSIC
- EPA-SWMM
- XP-SWMM
- WaterCress
- Drains
- E2
- HecRas
- SWITCH
- Switch2
- PermPave
- Raintank Analyser



Further Information

While there is a large range of useful resources and further information available on the modelling process and tools, in the first instance it is suggested that people read Chapter 15 of the *Water Sensitive Urban Design in Greater Adelaide Technical Manual*. Further information is available at www.planning.sa.gov.au/go/wsud

Other Summary Sheets

Other Water Sensitive Urban Design Summary Sheets for the Greater Adelaide Region are available in this series. To download the summary sheets, visit www.planning.sa.gov.au/go/wsud

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