



Environmental Systems Modelling Platform

EnSym Tools: BioSim

EnSym's BioSim assists decision making in planning and water resource divisions by predicting the impact of land management on water, sediment and agricultural chemical yields in a catchment.

BioSim is the biophysical modelling toolbox of EnSym, designed to simulate all major hydrologic components as simply and realistically as possible. BioSim simulates daily soil/water/plant interactions, overland water flow process, soil loss, carbon sequestration and water contribution to stream flow from both lateral flow and groundwater recharge. The models can be applied to any combination of soil type, climate, topography and land practice. For instance, BioSim can be used to evaluate the impacts of climate change, vegetation types (e.g. cropping, grazing, forestry and native vegetation) and land management (e.g. forest thinning and stocking rates) in different parts of the landscape.

The modules used in BioSim come from numerous sources including (CAT (Beverly 2007); PERFECT (Littleboy et al. 1987), EPIC (Williams et al. 1989), SWAT (Neitsch et al. 2010) and 3PG+ (Feikema et al. 2010). These publicly available models are widely used by the environmental modelling community.

Applications of BioSim

BioSim is useful for planners and decision makers looking to predict the impact of land management on water, sediment and

agricultural chemical yields in the catchment. It can be used for:

- Research on biophysical modelling of the landscape
- Planning for future water resource use
- Catchment planning.

User requirements

EnSym programmers tailor BioSim to solve the problem required by the client. Due to the highly technical nature of BioSim programmers operate BioSim on behalf of the client.

Case Study: Wannon Water sustainable bore extraction

Wannon Water in Warrnambool was working with a large private consulting firm to assess the impact of climate change on the viability of water supply in the region. They needed a way to predict the water balance in the catchment under climate change scenarios.

The consulting firm utilised BioSim as a water balance calculation tool. This tool enabled them to assess the change in water balance under seven climate change scenarios. The range of scenarios provided by BioSim allowed an accurate assessment of Wannon Water's risk due to climate change.

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