



For River Managers & River Operators

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Executive Manager, Rivers and Catchments

The Source - River Manager Vision

- A national river system modelling platform
 - Flexible, fit for purpose across jurisdictions
 - Applicable from sub-catchment to basin scales
 - Relevant for next 20 years – extensible
- Consistency of modelling approach
 - Surface water modelling guidelines, community of practice
- Considering
 - Consumptive and environmental water use
 - Groundwater use & interaction with surface water
- As well as drivers considered by others
 - Climate change, land use, ecological demand

Value to our partners

- Better forecasting & evaluation of scenarios
- Operational efficiency – better implementation of complex IWRM policy
- Integration of surface/groundwater, climate and environmental outcomes
- Uniformity cross jurisdictions and regions
- Support for real-world problems
- Skilled and well-trained staff
- Support - training, user manuals, user guides



Standard configurations

eWater
River Manager

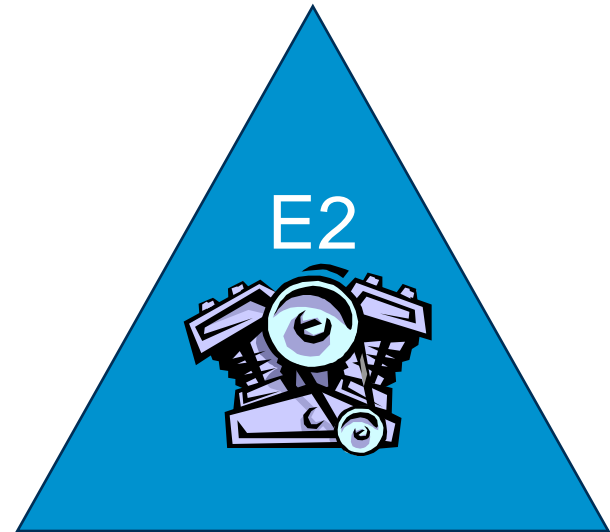
River systems
Planning and management

eWater
River Operator

River systems
Operations

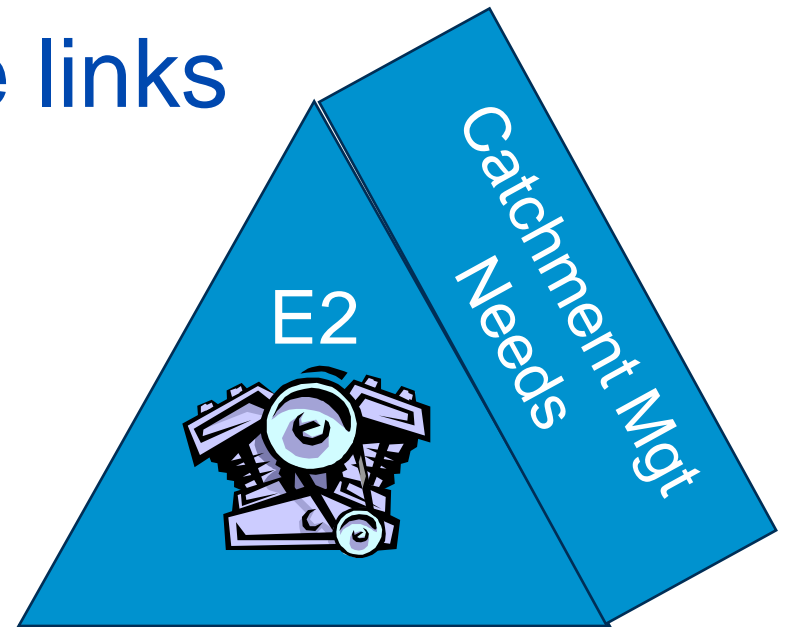
Common modelling platform

- Modelling of river systems
 - Flow, water quality and water ownership
- Scenario management & reporting
- Multi running
 - Stochastic climate
- Customisable through plug-ins



Catchment and climate links

- Spatial coverage
- Generation of flow and water quality
- Responds to land use + management and climate
- Local groundwater systems



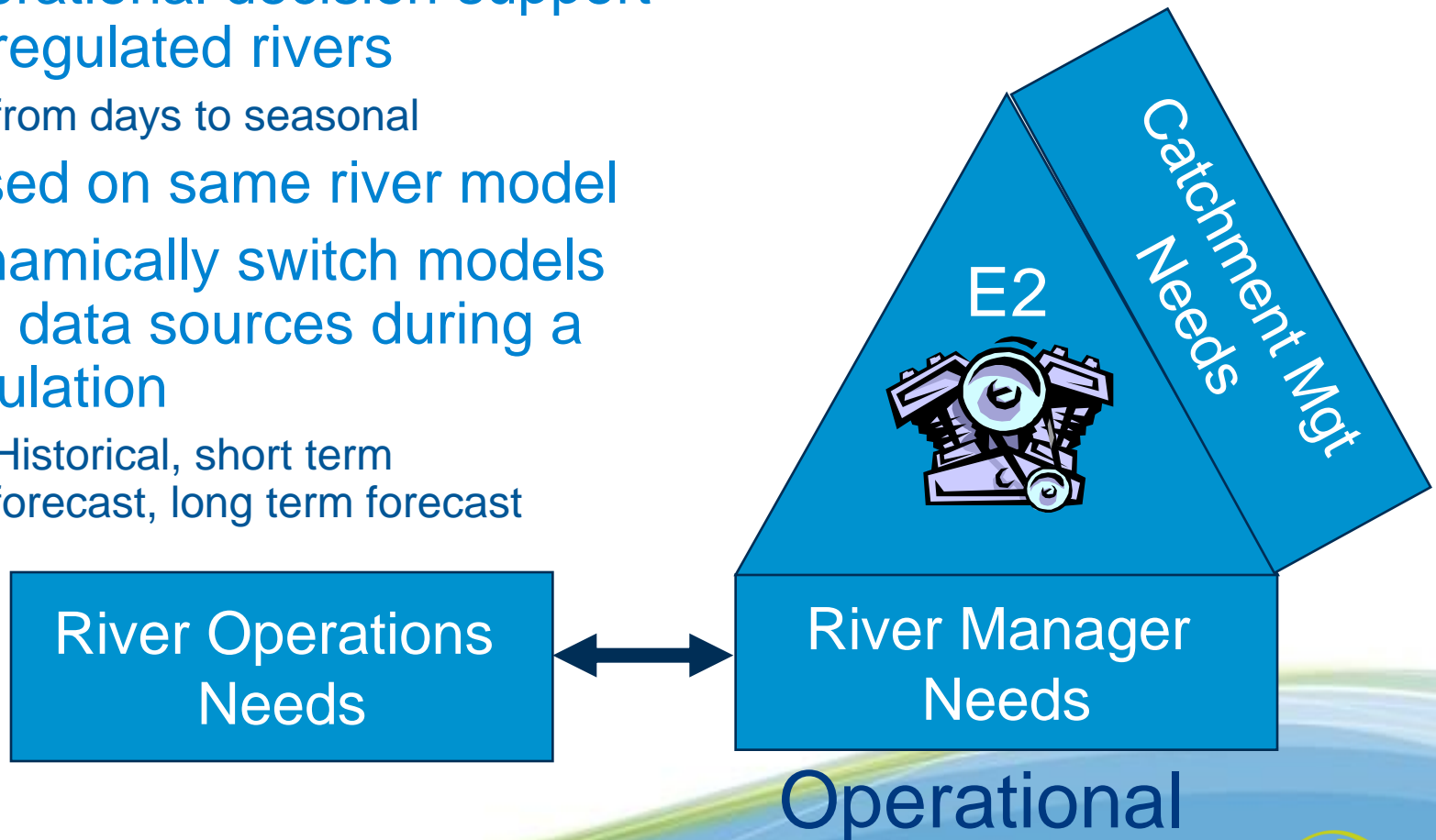
eWater River Manager

- Supply, demand and use in rural regulated systems
- Resource assessment
- Water ownership
- Regional groundwater systems

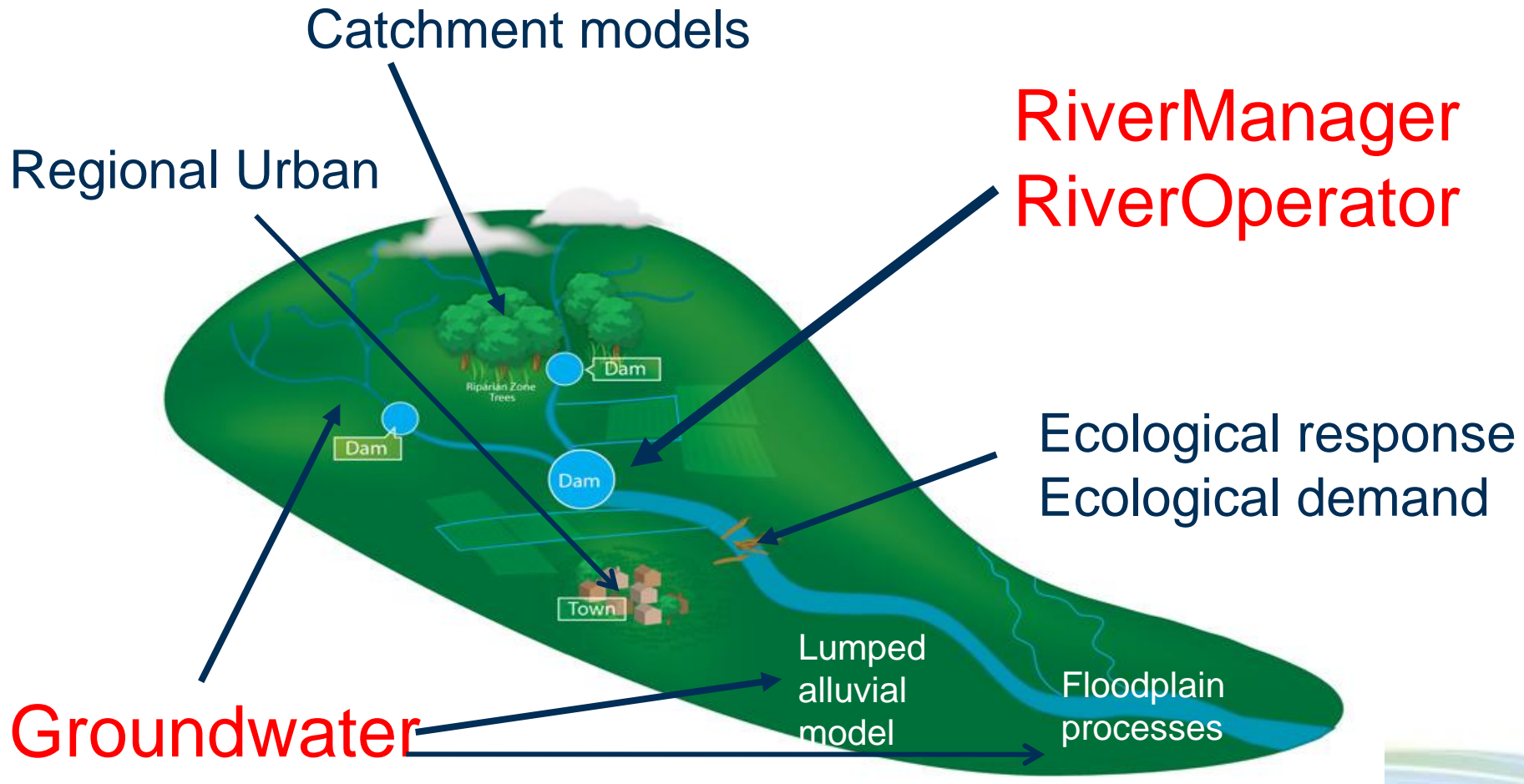


eWater River Operator

- Operational decision support for regulated rivers
 - from days to seasonal
- Based on same river model
- Dynamically switch models and data sources during a simulation
 - Historical, short term forecast, long term forecast



Integrated modelling system



Enhancements on existing models

- Tracks multiple parcels of water as they are stored and move through a river system
- Swaps between spatial, schematic and temporal views
- Integrates river system modelling with catchment models
 - Runoff generation
 - Forest cover change impacts
 - Farm dam impacts
- Considers surface and groundwater interactions

Enhancements (cont.)

- Supports both rules based and optimised solutions to multiple supply storages and paths
 - Provides an expression engine for creating rules
 - Two different types on NETLP solvers
 - Supports part system optimisation
 - Supports optimisation on a daily time step with multiple owners
- Provides a range of demand models
 - Regression and time series
 - Several crop models
 - Urban
 - Environmental (event and frequency based)

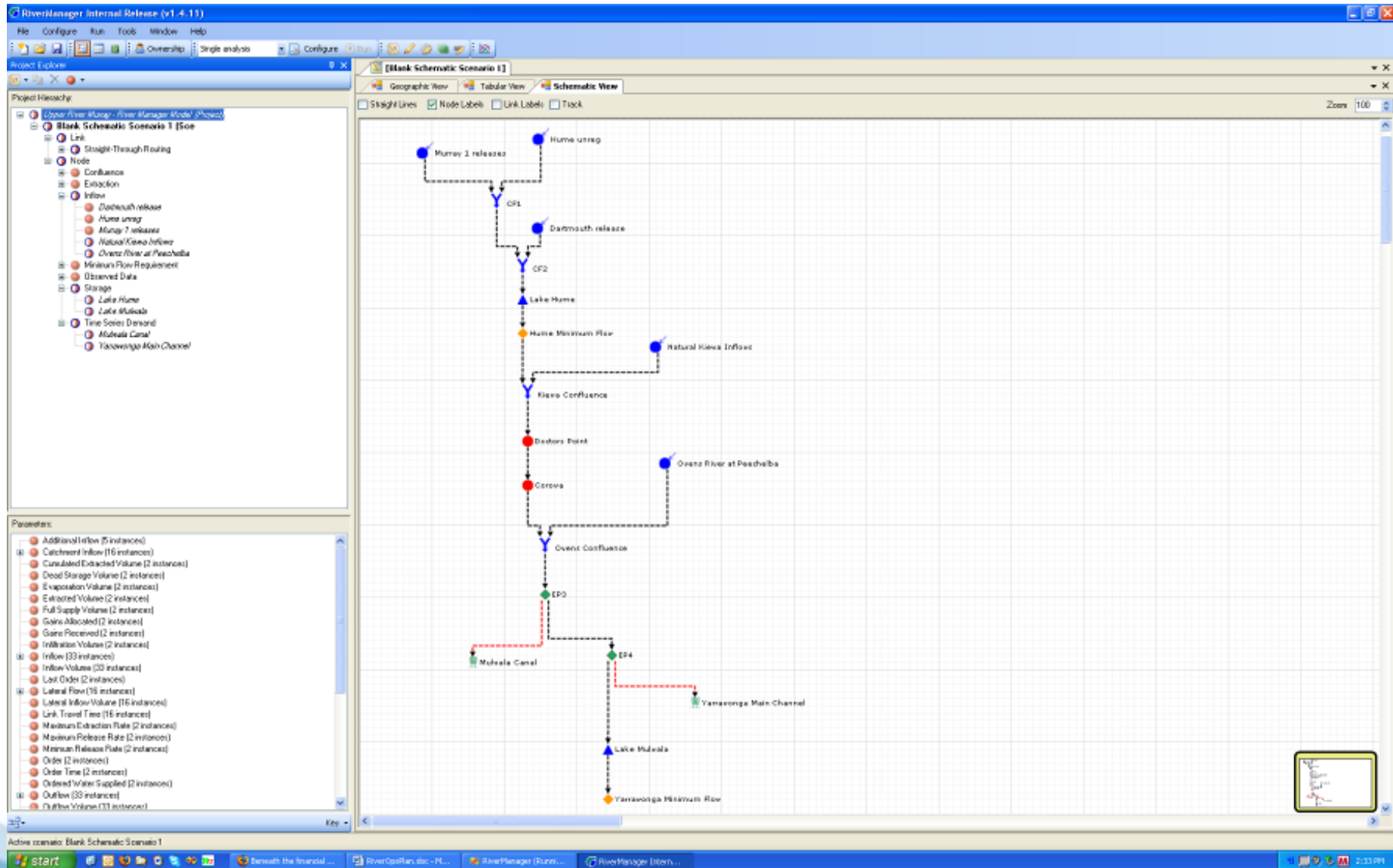
Enhancements (cont.)

- Considers conjunctive use
- Supports a range of accounting systems
 - Annual accounting
 - Continuous accounting
 - Continuous sharing
 - Surplus flow sharing
- Models head driven connections between wetlands and storages
- Can be configured as both a planning and operational model Links to common databases (Hydsys, Oracle and SQL)

Common engine – different user interfaces

1. Spatial interface
2. Schematic interface
(River Manager)
3. Temporal interface
(River Operator)

Schematic view



Temporal view

RiverManager Internal Release (v1.4.11)

File Configure Run Tools Window Help

Ownership Single analysis Configure Run

Project Explorer

Project Hierarchy:

- Upper River Murray - River Manager Model (Project)
 - Blank Schematic Scenario 1 (Sce)
 - Link
 - Straight-Through Routing
 - Node
 - Confluence
 - Extraction
 - Inflow
 - Dartmouth release
 - Hume unreg
 - Murray 1 releases
 - Natural Kiewa Inflows
 - Ovens River at Peechelba
 - Minimum Flow Requirement
 - Observed Data
 - Storage
 - Lake Hume
 - Lake Mulwala
 - Time Series Demand
 - Mulwala Canal
 - Yarawonga Main Channel

Parameters:

- Additional Inflow (5 instances)
- Catchment Inflow (16 instances)
- Cumulated Extracted Volume (2 instances)
- Dead Storage Volume (2 instances)
- Evaporation Volume (2 instances)
- Extracted Volume (2 instances)
- Full Supply Volume (2 instances)
- Gains Allocated (2 instances)
- Gains Received (2 instances)
- Infiltration Volume (2 instances)
- Inflow (33 instances)
- Inflow Volume (33 instances)
- Last Order (2 instances)
- Lateral Flow (16 instances)
- Lateral Inflow Volume (16 instances)
- Link Travel Time (16 instances)
- Maximum Extraction Rate (2 instances)
- Maximum Release Rate (2 instances)
- Minimum Release Rate (2 instances)
- Order (2 instances)
- Order Time (2 instances)
- Ordered Water Supplied (2 instances)
- Outflow (33 instances)
- Outflow Volume (33 instances)

View Runs Hide/Show

View Runs Hide/Show

View Runs Hide/Show

Lake Hume : Level	Lake Hume : Volume	Lake Hume : Release	Hume Minimum Flow : Flow	Default Link #40 : Flow	Default Link #27 : Flow	Doctors Point : Level	Doctors Point : San Flow	Doctors Point : Flow	Default Link #28 : Flow	Corowa : Level	Corowa : Flow
0.057938135241	0	0	0.937352228492	0	0	0.010848984126	0.937352228492	0.937352228492	0	0.010848984126	0.937352
0.005681648288	0	0	10.303035495942	0	0	0.115248096018	10.303035495942	10.303035495942	0	0.115248096018	10.30303
0.018900551216	0	0	0.850051084492	0	0	0.009838554219	0.850051084492	0.850051084492	0	0.009838554219	0.850051
0.033096470313	0	0	0.030354617354	0	0	0.00035132659	0.030354617354	0.030354617354	0	0.00035132659	0.030354
0.035538833854	0	0	9.938821340514	0	0	0.115032654404	9.938821340514	9.938821340514	0	0.115032654404	9.938821
0.013650210884	0	0	1.698731563446	0	0	0.019661244947	1.698731563446	1.698731563446	0	0.019661244947	1.698731
0.027879990353	0	0	1.953177353126	0	0	0.022606219365	1.953177353126	1.953177353126	0	0.022606219365	1.953177
0.049763896983	0	0	3.139865363627	0	0	0.036341034301	3.139865363627	3.139865363627	0	0.036341034301	3.139865
0.009840449661	0	0	1.538427659311	0	0	0.017805875686	1.538427659311	1.538427659311	0	0.017805875686	1.538427
0.004983185867	0	0	0.7277189696	0	0	0.008422673259	0.7277189696	0.7277189696	0	0.008422673259	0.727718
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0.032631972886	0	0	3.740866604472	0	0	0.043297067181	3.740866604472	3.740866604472	0	0.043297067181	3.740866
0.009076701573	0	0	0.794981740724	0	0	0.009201177555	0.794981740724	0.794981740724	0	0.009201177555	0.794981
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0.005881098925	0	0	0.135128208388	0	0	0.001563983893	0.135128208388	0.135128208388	0	0.001563983893	0.135128
2.729522940829	0	0	4.395762703466	0	0	0.050876883142	4.395762703466	4.395762703466	0	0.050876883142	4.395762
177.1080145778...	843382295.6913...	0	0	0	0				0		
177.1028621234...	842853653.86668	0	0	0	0				0		
177.0967144288...	842222900.3974...	0	0	0	0				0		
177.0943204492...	841977278.0950...	0	0	0	0				0		
177.0870135342...	841227588.60942	0	0	0	0				0		
177.0865935781...	841184501.1213...	0	0	0	0				0		
177.07962184673	840469301.4744...	0	0	0	0				0		
177.0745168874...	839945432.6561...	0	0	0	0				0		
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177.0474945665...	837172941.5053...	0	0	0	0				0		
177.0403730196...	836442271.8110...	0	0	0	0				0		
177.0337509755...	835762890.0942...	0	0	0	0				0		
177.0278809097...	835160581.3432...	0	0	0	0				0		
177.0212636668...	834481652.22059	0	0	0	0				0		
177.0169638228...	834040488.2229...	0	0	0	0				0		
177.0093590378...	833260237.2857...	0	0	0	0				0		
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176.9952109483...	831836324.0216...	0	0	0	0				0		

Active scenario: Blank Schematic Scenario 1

start

Beneath the financial ... RiverOpsPlan.doc - M... RiverManager (Runni... RiverManager Intern... Schematic.bmp - Paint

2:36 PM

eWater

Spatial view

RiverManager Internal Release (v1.4.13)

File Configure Run Tools Window Help

Project

Project

Single analysis

[2002 conditions]

Assign Models...
Input Data...
Parameters...

Parameters:

- Area (945 instances)
- Catchment Inflow (105 instances)
- Dead Storage Volume (1 instances)
- Evaporation Volume (1 instances)
- Full Supply Volume (1 instances)
- Infiltration Volume (1 instances)
- Inflow (211 instances)
- Inflow Volume (211 instances)
- Lateral Flow (105 instances)
- Lateral Inflow Volume (105 instances)
- Link Travel Time (105 instances)
- Maximum Release Rate (1 instances)
- Minimum Release Rate (1 instances)

Key

Active scenario: 2002 conditions

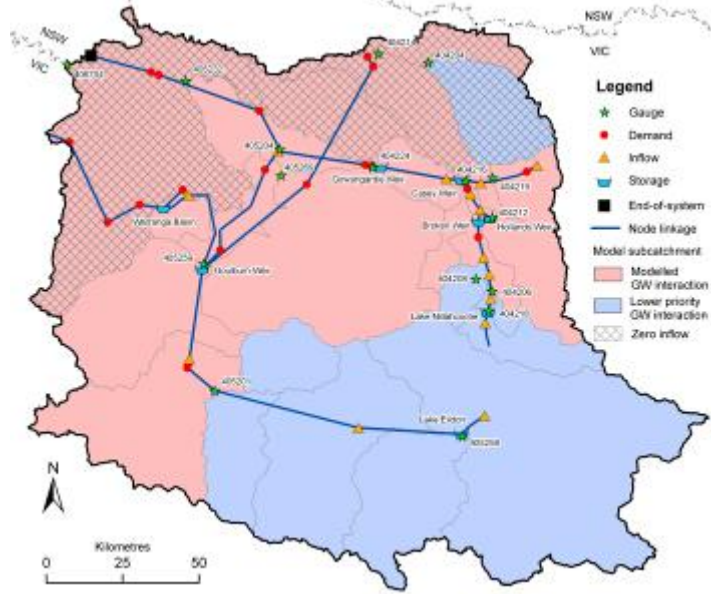
Quality Assurance fundamental

- Trial applications
 - Improvement on existing models
 - Consistency of application
- Use cases
- User Groups and community of Practice
- Quality Assurance
 - Specifications; Building code; Testing code; Bugs/maintenance
- Documentation (help and user manuals)
- Training
- Improved project management processes

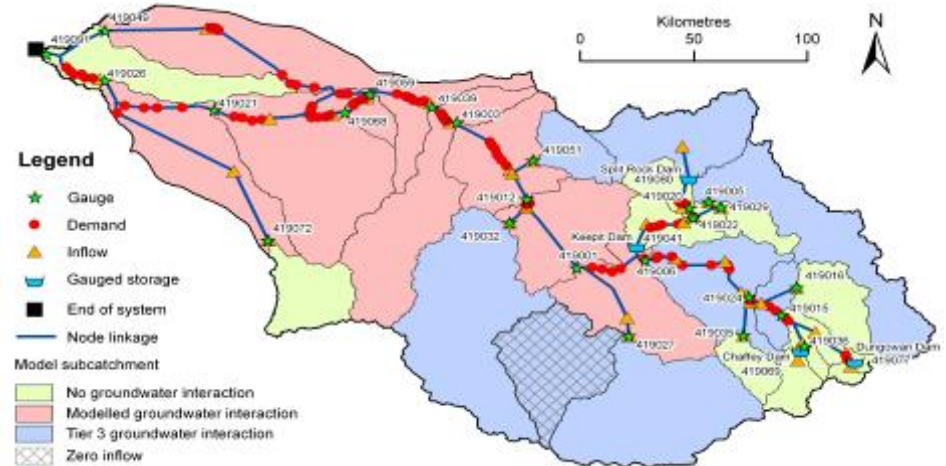
Trialling functional components

Murray-Darling Basin - Trials

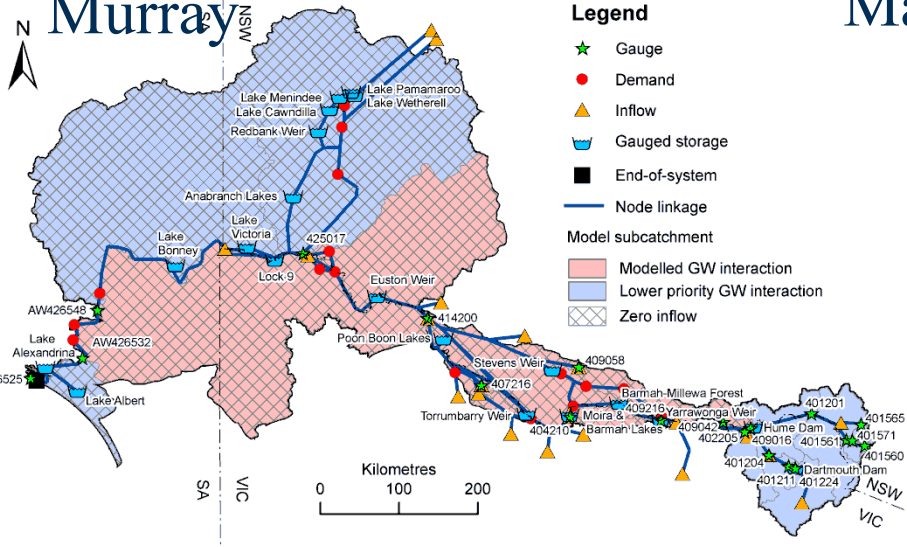
Goulburn Broken



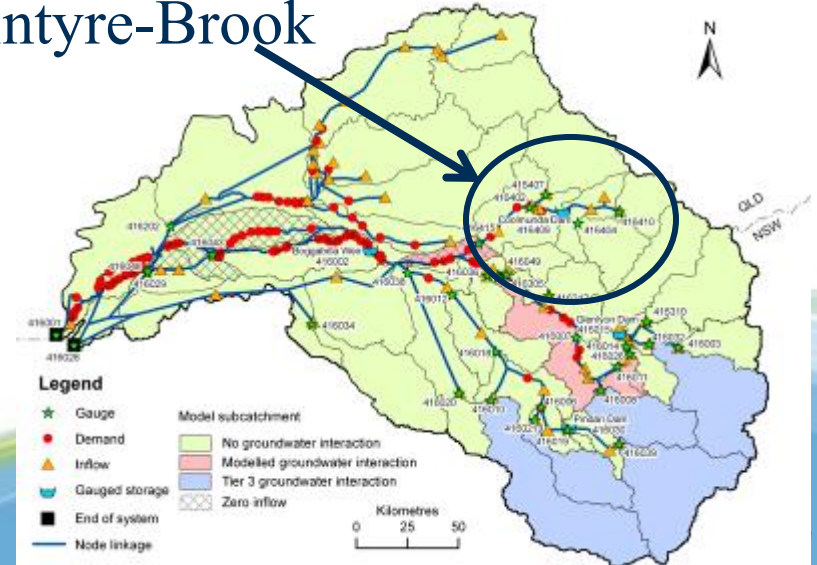
Namoi



Murray



Macintyre-Brook



Trial applications

- Goulbourn-Broken
 - Multiple supplies
- Namoi
 - Continuous accounting
 - Transfer between storages in series
 - Surface groundwater interactions
- Murray
 - Forecasting and complex!
- Macintyre-Brook
 - Continuous sharing

Timeline for River Manager delivery

July 2009	Prototype 'Base' model
Sept 2010	V1.0 Beta model
July 2011	V1.0 Commercial model V2.0 Beta