Seqwater Storages

25 dams
47 weirs
14 bores
2.7 million People
Treat
Treat Riparian Protection
Treat

Nutrient Cycling
Treat

Optimising ecosystem services
Treat

Improvement to processes
Research to support management

Risk Quantification
- Pollution delivery and mobilisation
- Source water assessment
- Impact of climate change

Process Understanding
- Nutrient cycling
- Algal Productivity
- Food web linkages

Synthesis and Application to management
- Catchment modelling
- Reservoir modelling
- Reporting
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• Reporting
Communication Products
Process understanding
Algal productivity & food webs
Michele Burford
Griffith University
Subtropics

- High rainfall in summer months
- Large reservoirs
- Correlation between catchment characteristics & water quality
- Reservoir characteristics also contribute
• Catchment has high P conc.
• Wetting soil releases available P
• Substantial soil erosion
• High proportion dissolved nutrients stimulates cyanobacterial growth
• P promotes toxic cyanobacteria
Factors driving productivity

David Roberts
PhD student

Food Web
2007

1º Consumers

2º Consumers

3º Consumers

Pelagic Sources

Littoral Sources

Catchment Sources

David Roberts
Implications of altered energy sources

Bass (Carnivore)

Gar (Herbivore)

~ 50% Reduction

David Roberts
Summary

• Correlate catchment characteristics with water and sediment quality
• Sources, form and transformations of nutrients entering reservoirs
• Quantified the links between nutrient inputs and algal response
• Determined key factors important in promoting toxic algae
• Determined links between water quality & food webs
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Application to Management: Modelling

Badin Gibbes
• Small-scale meteorological variations indentified by anomalous model results.
• Additional monitoring stations installed and verified variations.
Innovative monitoring systems that incorporate automated aquatic vehicles, wireless sensor networks and state-of-the-art benthic flux chambers have been developed.

These systems are providing new insights into the physical and biogeochemical processes that control water quality in our water storage reservoirs.
Innovative data improving management

- New research commissioned to better understand spatial variations in meteorological data
- Unprecedented spatial & temporal data now available for management scenario testing.
Enhanced process understanding

- Models identify significant & previously unrecognised in-lake mixing process
Models at multiple scales

- Models provided valuable information on the dominate processes at different spatial & temporal scales
Future: Operational biogeochemical models

- Model-data fusion to predict potential ranges in water quality parameters (daily model runs).
Research Partners

The University of Queensland, Australia

BMT WBM
“Where will our knowledge take you?”

CSIRO

Griffith University

Seqwater
Water for Life
Thank You