Participatory Modelling of the Howard East Aquifer

PROJECT INFORMATION

The Queensland University of Technology (QUT), Griffith University and CSIRO are developing a 3D groundwater visualisation model of the Howard Springs aquifer. Funded through the Tropical Rivers and Coastal Knowledge (TRaCK) research hub, the project aims to:

1. Provide an independent, scientific and educational tool that improves community understanding of ground and surface water resources in the Howard East aquifer.
2. Assist major stakeholders and community members to visualise the impact of bore extraction on groundwater resources and subsequently make informed management decisions in forthcoming water allocation planning.

Why is this important?

The Howard Springs area relies on groundwater supplies to satisfy rural and urban residential, horticulture and commercial needs. However, despite recent and significant growth, there is no regional water plan in place to ensure that this resource is managed sustainably for future generations.

Water allocation planning will be required to manage the Howard Springs area.

Good water planning relies on good information and a clear understanding of the water resource amongst the community. Ground water resources are difficult to visualise, prompting CSIRO and QUT to trial and develop a 3D model of the Howard East Aquifer. By representing the system as an entire unit, the model aims to build community understanding and encourage the informed participation of community members in local water allocation planning.

The model will rely on the best available data to answer the following questions:

- How does the Howard East Aquifer work?
- What effect does the current rate of pumping have on local ground water levels?
- Is the aquifer taking longer to recharge during the wet season?
- Can you see any effects of pumping on the surface water bodies (e.g. Howard Springs, Girraween and McMinns Lagoon)?
- Are older shallower bores likely to run dry in the future?

Howard Springs. Do you know which aquifer this water comes from?

Which area are we modeling?

The area to be modelled will include the Howard Springs Nature Park, McMinns Lagoon, Girraween Lagoon, Power and Water's bores and a large number of new and older private residential blocks[1]. This site has been chosen to capture key issues of concern in the area including the effects of bore extraction from Power Water and new residential development on groundwater resources

What can the model do?

The model will be able to be 'interrogated' by community users and provide detailed cross sections of the Howard East Aquifer at specific points of interest in the modelled

1 Model will display NW-SE area approx 20km by 8km = 160km², bounded on west by Stuart Highway and east by Howard River. Please refer to the project website at http://www.track.gov.au/project/howard-east for map of study area.

TRaCK Tropical Rivers and Coastal Knowledge
Australian Government
Department of the Environment, Water, Heritage and the Arts
Land & Water Australia
National Water Commission
CSIRO
QUT
Griffith UNIVERSITY

area. By selecting these areas, users will be able to see the surface and natural drainage features of the system, as well as watch short animations that illustrate the changes in aquifer levels over time and season.

The model will also demonstrate the relationship between rainfall and ground water recharge and build understanding of the impact of variable wet seasons.

The Howard East model will be available to the public free of charge on a CD between August and September 2009.

Hydrologist Dr Malcolm Cox in mapping exercise with bore driller Henry Van Tilburg

Model information requirements

The model has collected data from a number of government agency and scientific sources:

- Ground and surface water measurements, hydrology and water chemistry measurements from Department of Natural Resources, Environment, The Arts and Sport (NRETAS)
- Bore monitoring data from NRETAS[2] and Power Water Corporation
- Environmental flow measurements, water balance data and evapo-transpiration data from TRaCK researchers based at Charles Darwin University
- Regional digital elevation models and rainfall data from the Bureau of Metrology and Australian Geoscience
- Cadastre and land use and tenure information from the Northern Territory Government
- Information about ground water and bore extraction gained from community surveys and participatory mapping exercises with bore drillers.

2 The results from NRETAS voluntary bore metering project, which monitors 26 bores yielding greater than 5L/s in the Howard Springs

How can you get involved?

1. Visit the project website to join our mailing list and receive project newsletters
2. Fill out an anonymous bore survey for your property (10 minutes, download here)
3. Get involved in a participatory mapping exercise
4. Tell us about your bore experience and stories on our special blog page
5. Listen to our community radio program (date to be confirmed)
6. Attend our community meeting and workshop in September 2009
7. Get in touch with local project staff directly by email and speak to the modellers and researchers

Expected benefits of the research

By developing and trialling new ways to engage your community in regional water planning, we aim to inform a set of national guidelines that can help water planners work in collaboration with communities across Australia.

Project staff

This research is being conducted by CSIRO (Darwin), Griffith University and Queensland University of Technology. The research team is made up of:

Sharna Nolan and Sue Jackson
CSIRO Darwin

Malcolm Cox
Hydro Geologist, Groundwater Visualisation Unit
Queensland University of Technology

Mark Dwyer
Software Modeler, Groundwater Visualisation Unit
Queensland University of Technology

Poh Ling Tan
Project Leader, Griffith University

For further information:

Sharna Nolan, Research Officer, CSIRO
P: 08 8944 8420 E: Sharna.Nolan@csiro.au
www.track.gov.au/project/howard-east

TRaCK
Tropical Rivers and Coastal Knowledge

TRaCK receives major funding for its research through the Australian Government's Commonwealth Environment Research Facilities initiative; the Australian Government's Raising National Water Standards Programme; Land and Water Australia and the Queensland Government's Smart State Innovation Fund.