

Participatory Modelling of the Howard East Aquifer

PROJECT NEWS

TRaCK Modeling Project launched at public meeting, April 2009

With the help of Independent member Gerry Wood, the project team launched the Howard East modelling project in a public meeting at Girraween Primary School held on the 21st of April.



Dr Malcolm Cox and Gerry Wood presenting at the Girraween Primary School

Attended by over 30 residents and stakeholders, the meeting involved an hour of presentations by the project team and over one hour of question time facilitated by Gerry Wood.

Project Team Presentations

Local researcher **Sharna Nolan** (CSIRO/TRaCK) presented the results of recent work involving

over 40 interviews with stakeholders and long term residents in the Howard Springs area. Her findings showed that the key issues for local groundwater planning fall into five main categories:

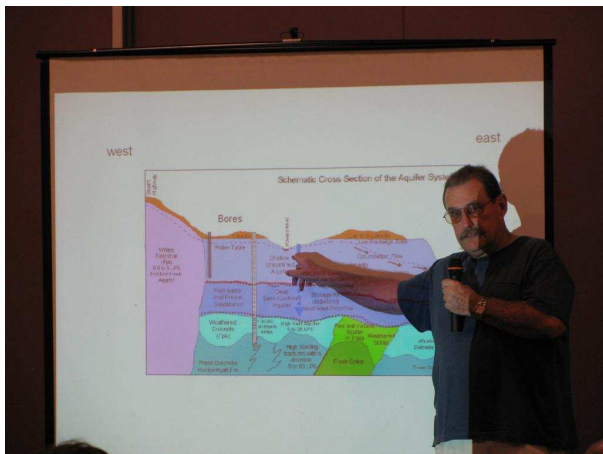
1. Many stakeholders have difficulty understanding the groundwater systems or the previous models that inform current decision making.
2. There is a lack of trust in the community of government driven planning
3. Some stakeholders have felt excluded from previous decision making and planning
4. There are trade-off decisions involved in securing future peri-urban, urban and commercial water supplies for Howard East, Darwin, Palmerston and Wendell.
5. There is concern about a lack of planning framework in place for protecting places of high conservation or recreational value, providing incentives for sustainable resource use or protecting water dependent livelihoods

For a summary of this work, please contact Sharna Nolan directly on (08) 8944 8420 or sharna.nolan@csiro.au, or download

Hydrogeologist **Dr Malcolm Cox**, Queensland University of Technology (QUT), presented important groundwater and hydrology concepts and explained his preliminary understanding

of the Howard East Aquifer. Using diagrams (see picture), Malcolm demonstrated that there are two aquifers in the bore field, the upper aquifer within the Cretaceous age sedimentary material and a lower (confined) aquifer within dolomite. Each is separated by largely impermeable layers of fine grain sediments and clay. This study should help improve our knowledge of seasonal recharge and drawdown rates in each aquifer.

As pointed out by Gerry Wood, this partly explains the significant drawdown observed in a number of shallow bores drilled into the Cretaceous aquifer. The implications for natural systems, such as the Howard Springs, and for horticulturalists and residential development will be a focus of this model.



Dr Malcolm Cox explaining the hydrology in the Howard East Aquifer¹

The final presentation by software modeller **Mark Dwyer** demonstrated the utility of the final 3D visualisation model. He showed the audience an example of a 3D cross section that could indicate the topography, soil type, rock formation and changing aquifer levels (over years and seasons). This information would help to determine the impact of bore extraction on water levels in each aquifer, and the levels of surface water Lagoons

¹ The diagram Malcolm refers to in this picture was developed by the Water Management Branch of NRETAS

such as Howard Springs, Girraween, McMinns etc.

Mark concluded by appealing to the public and stakeholders to get involved in the project and contribute information about bores and groundwater through surveys or the project website. Please contact Sharna Nolan on (08) 8944 8420 or sharna.nolan@csiro.au or visit the projects website at <http://www.track.gov.au/project/howard-east>

Project represented at Fred's Pass Rural Show

A large community display was kindly donated to the project by Litchfield Shire Council President, Mary Walshe. Housed in the Litchfield Shire Council Information tent, the display was presented by Sharna who introduced the project objectives to visitors and handed out information sheets and surveys. These materials will also be displayed in shopping centres and prominent areas around the case study area (see website).

Got a bore on your property? Worried about it running dry? Concerned about the state of groundwater resources?

An opportunity to express your views on water resources in the Howard Region
CSIRO (Australia) and the Queensland University of Technology (Australia) are developing a 3D model of the groundwater levels in the Howard East Aquifer.

Water allocation planning is coming
Good water planning relies on good information and a clear understanding of the water resource amongst the community. Groundwater 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.

Why is this survey important?
Local member, Gerry Wood has been supportive of the project and recently hosted a community meeting at Coraween Primary School to introduce the project to the public. He supports the aims of the project:
- to produce an independent model based on scientific information that can be understood by the community; and
- assist in making informed decisions about water resources.

"We've got to understand how much we can remove from the aquifer - we can't keep pumping more and more water until we know the effect this has on the environment and other bore users."
Local member, Gerry Wood, May 2009.

Local problem, Gerry Wood, hosting the public meeting with Malcolm Cox and Mark Dwyer at Coraween Primary School, April 2009.

Typical groundwater flow in Howard East area.

Howard Springs, the grey areas which indicate the water resource zone.

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**Associate Prof. Malcolm Cox
Geography Queensland University of Technology
Mark Dwyer (Research)
Queensland University of Technology**

TRACK
Tropical Rivers and Coastal Knowledge

GUT
Queensland University of Technology

AND SPATIAL

Posters on display at the Fred's Pass Rural Show and at various shopping centres at Howard Springs, Coolalinga and Humpty Doo

Participatory Mapping Exercises Launched

Sharna Nolan, is now interviewing bore drillers and community residents with an interest in groundwater resources. Using detailed topographic maps, Sharna is collecting the following types of information for inclusion into the model:

- Determining the productive and non productive zones in both aquifer systems
- Recording local drawdown effects from bore pumping from commercial water users
- Locating potential recharge sites to the upper aquifer, and areas of connectivity between the upper and lower aquifer
- Documenting anecdotal evidence of impact of groundwater extraction on water levels in local lagoon systems
- Documenting areas with changing water chemistry and underground rock formations
- Documenting anecdotal evidence of the impact of changes in management practices or land use on bore levels or surface water

Sharna will be interviewing interested community members over the next three months. In early August, she hopes to test the completed model with interview participants before the model is finalized and distributed in late August.

We encourage community members and stakeholders who are interested in being interviewed please get in touch with Sharna directly on (08) 8944 8420

Project website launched

On the 1st of June, the project will launch its dedicated website at URL: <http://www.track.gov.au/project/howard-east>

Visitors to the website will be able to contact project staff, read the latest project news,

download community surveys, posters & information packs, view the project photo gallery and have their say about water planning and ground water management through a community blog.

We encourage you to visit our site and get involved!



Sharna and Malcolm interview Henry Van Tilburg from NT Bores

Meet the project team!



Sharna Nolan

Local Research Officer (CSIRO/TRaCK)
Sharna has been working in community development for over four years in China, Afghanistan and the Northern Territory



Dr Malcolm Cox

Hydrogeologist and Associate Professor
Groundwater Visualization Unit, Queensland University of Technology.



Mark Dwyer

Software Modeler,
Groundwater Visualization Unit, Queensland University of Technology