



British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

Gateway to the Earth

Groundwater connectivity of a sheared gneiss aquifer in the Cauvery river basin, peninsular India

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UPSCAPE

World's biggest groundwater user
2/3 India underlain by crystalline rock



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2. Geological observations
3. Groundwater levels
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Site description



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2

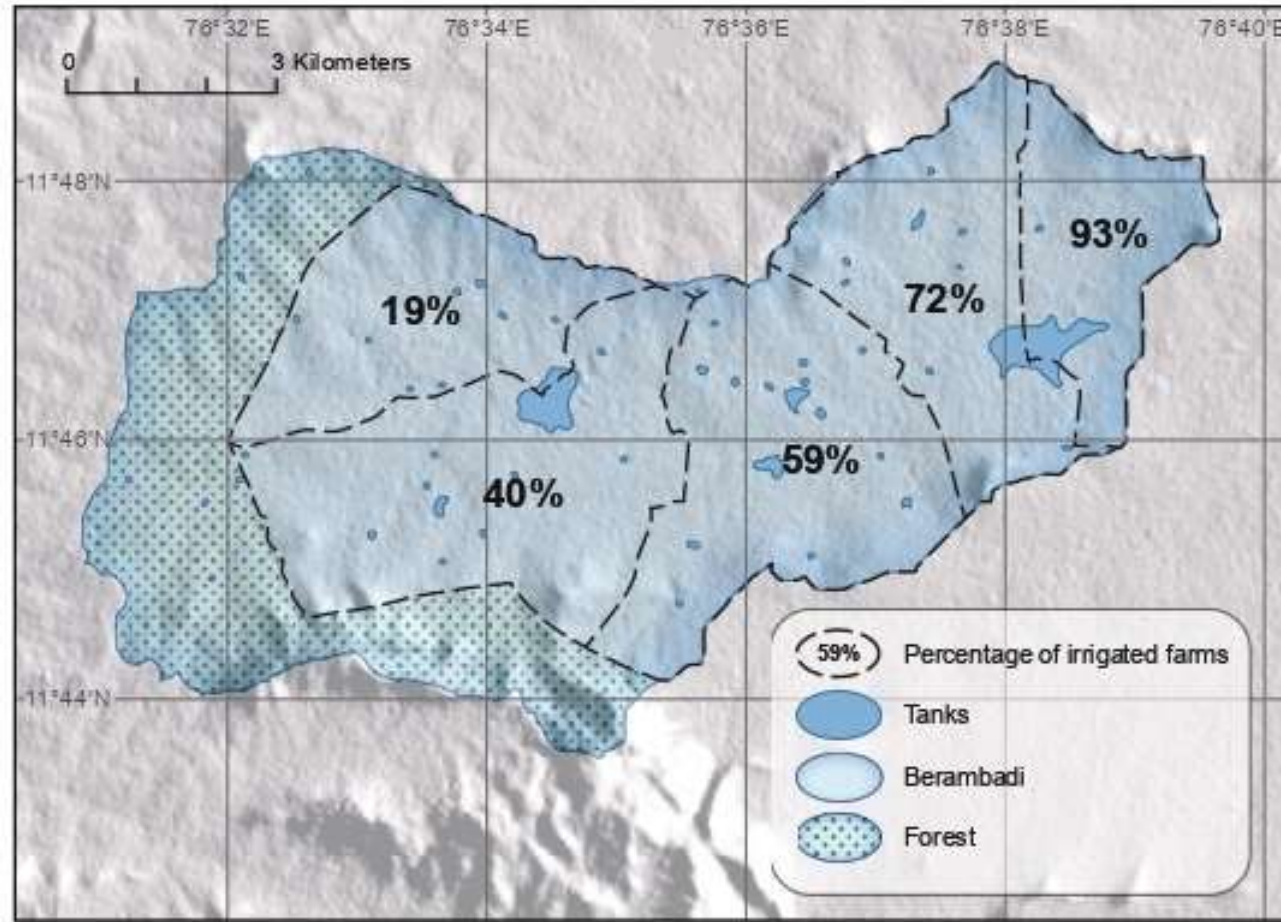
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Berambadi catchment



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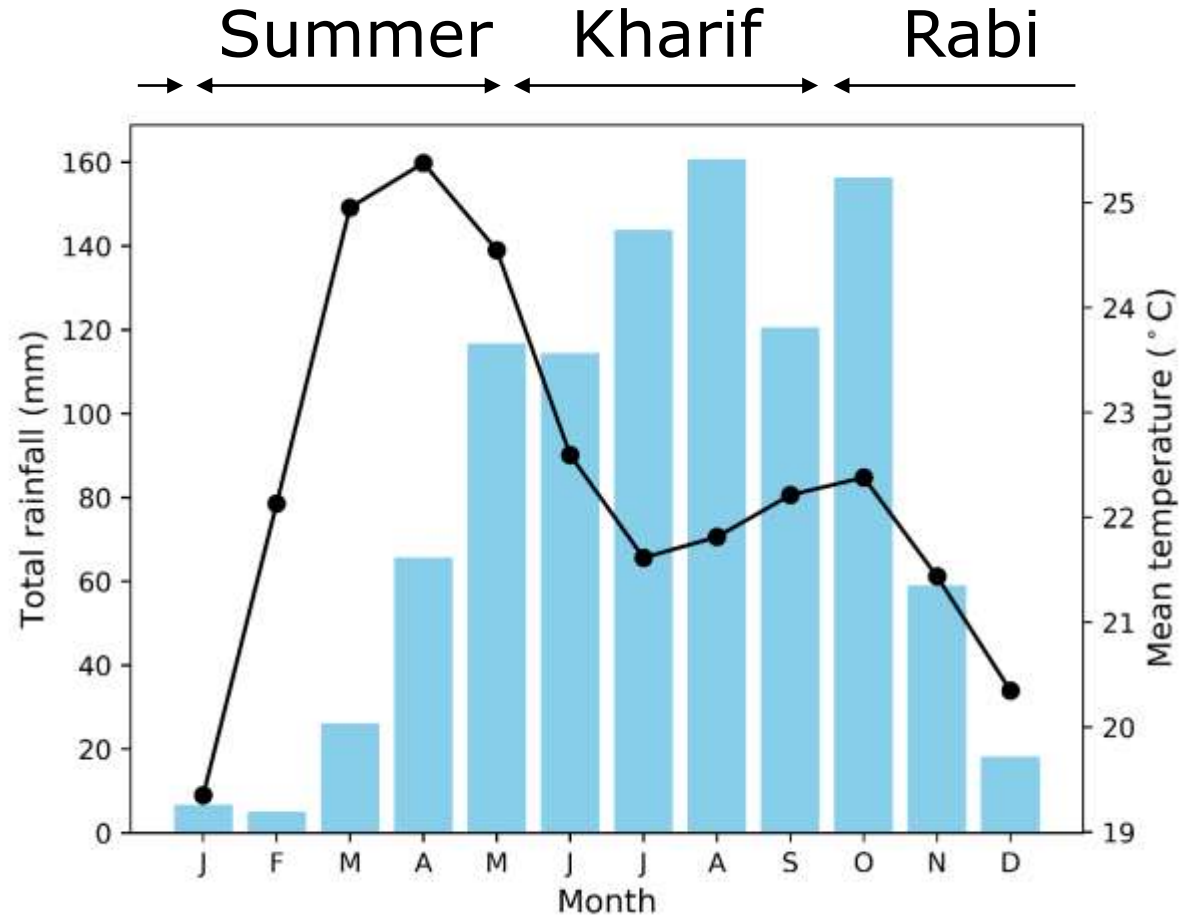
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Robert et al (2017)

Berambadi climate



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Geological observations

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Weathering profile



Soil and colluvium
Saprolite
Saprock
Weathered
shallow
vertical and
horizontal
fractures

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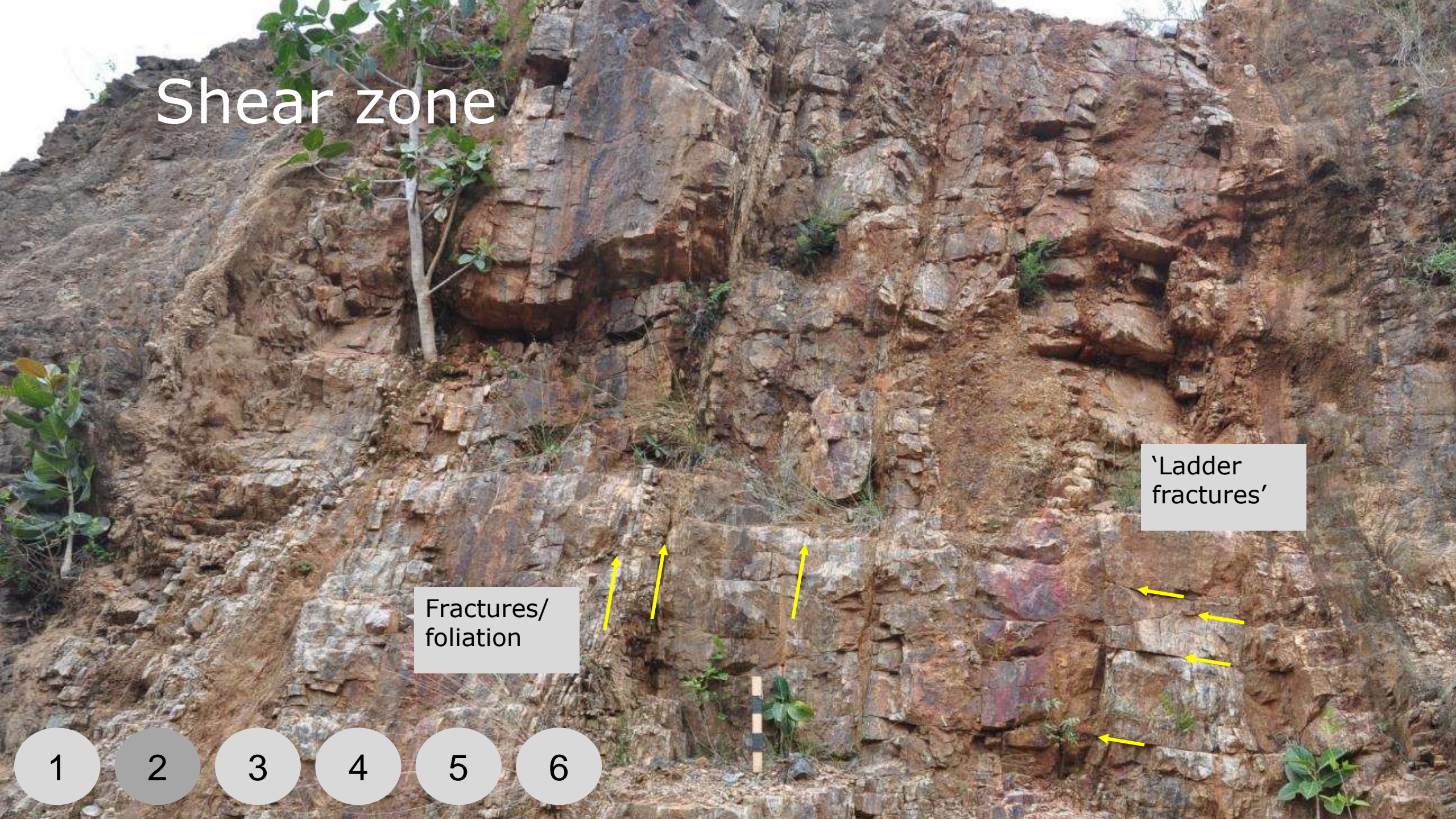
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Shear zone

Fractures/
foliation

'Ladder
fractures'

- 1
- 2
- 3
- 4
- 5
- 6



Groundwater level monitoring

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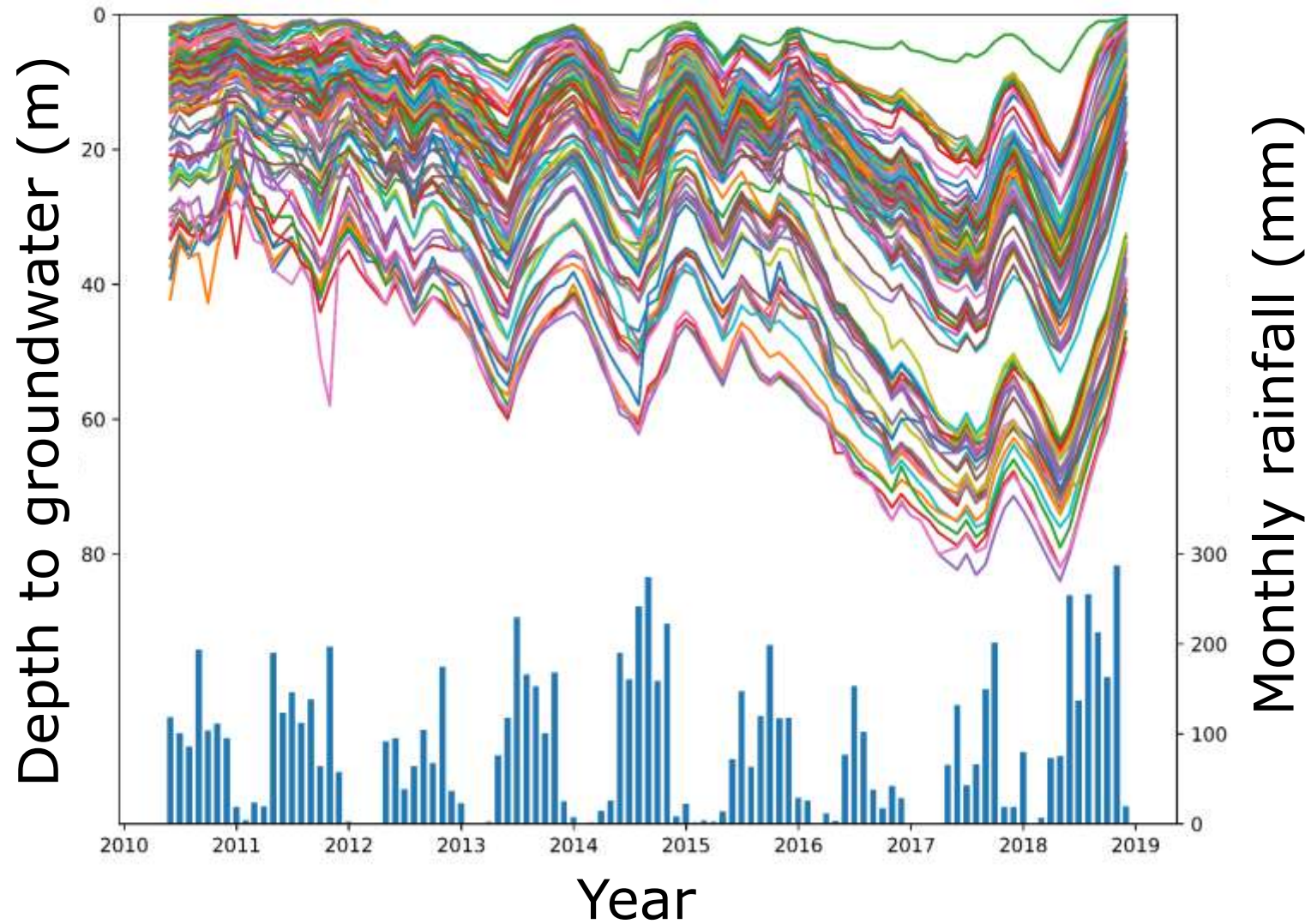
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Groundwater level dynamics



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Specific capacity tests

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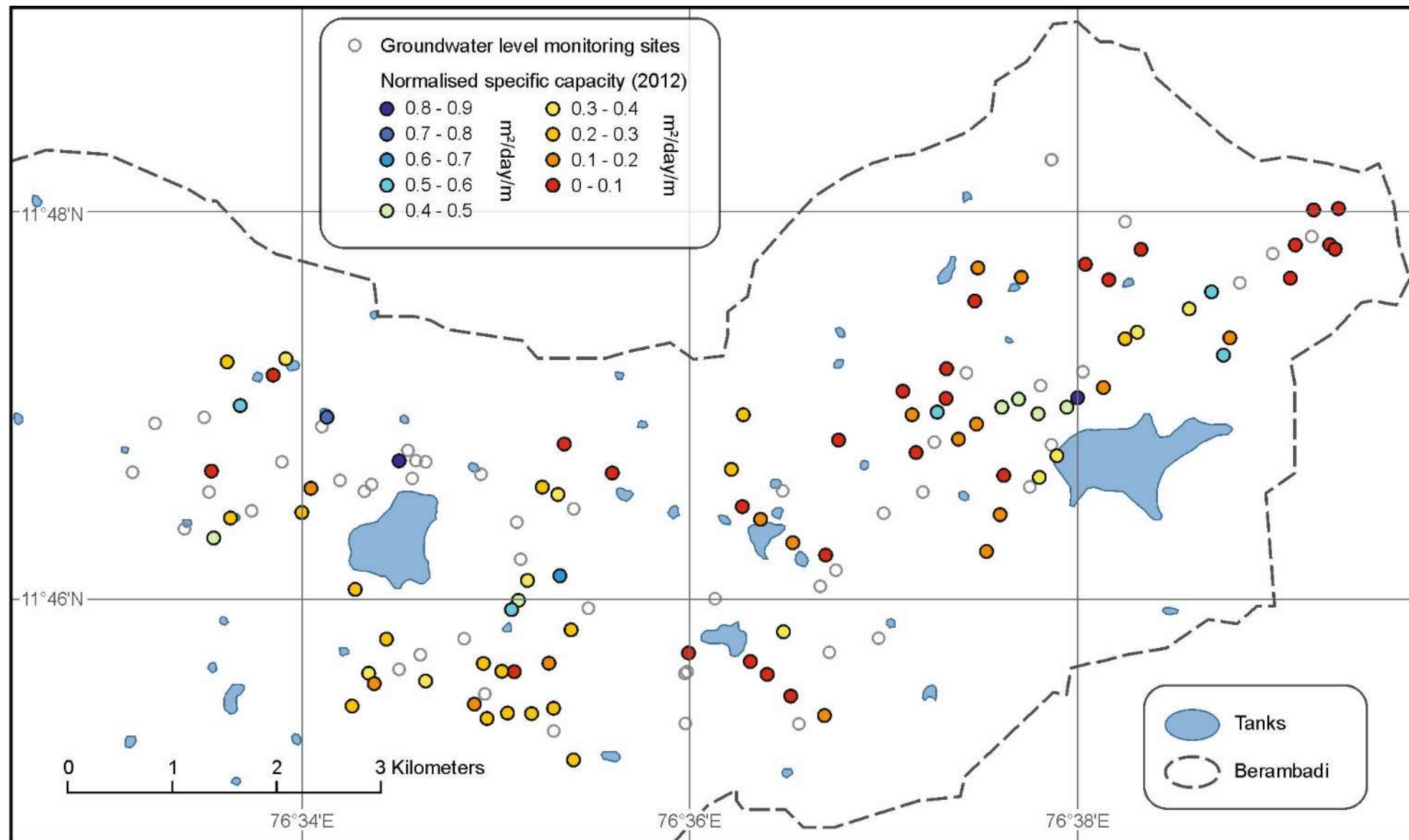
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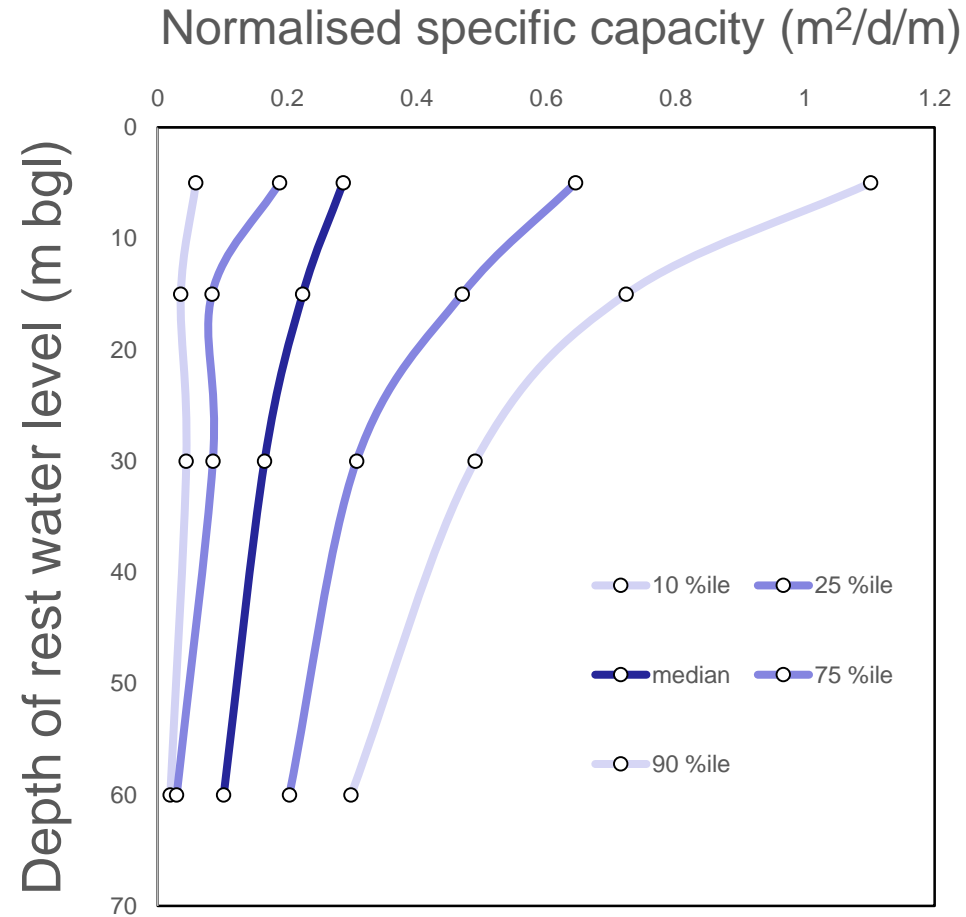
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Specific capacity vs. depth



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Hydrogeo- chemical tracers

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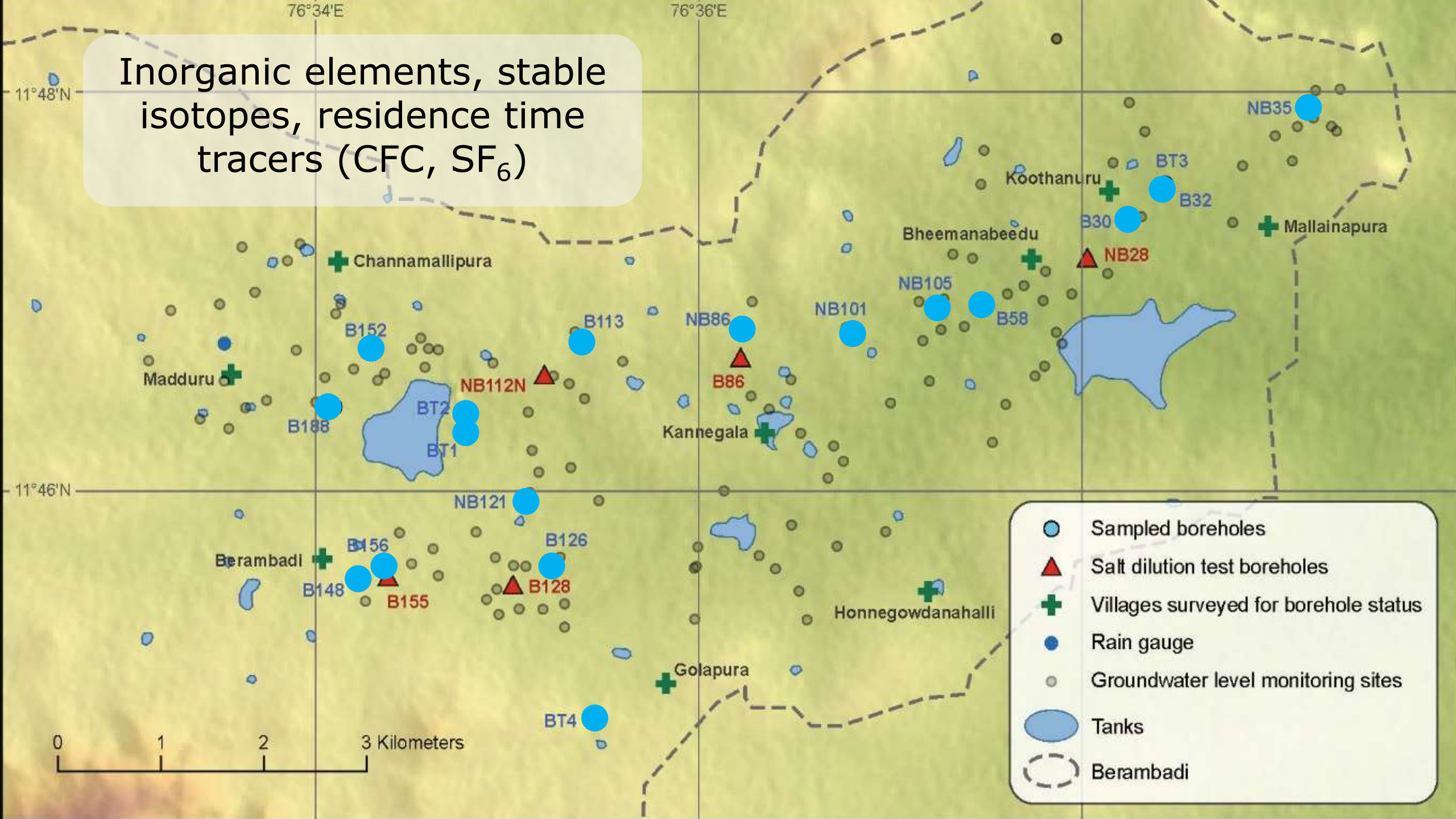
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Inorganic elements, stable isotopes, residence time tracers (CFC, SF₆)



- Sampled boreholes
- ▲ Salt dilution test boreholes
- ✚ Villages surveyed for borehole status
- Rain gauge
- Groundwater level monitoring sites
- Tanks
- ⋯ Berambadi

Numerical transect model

1

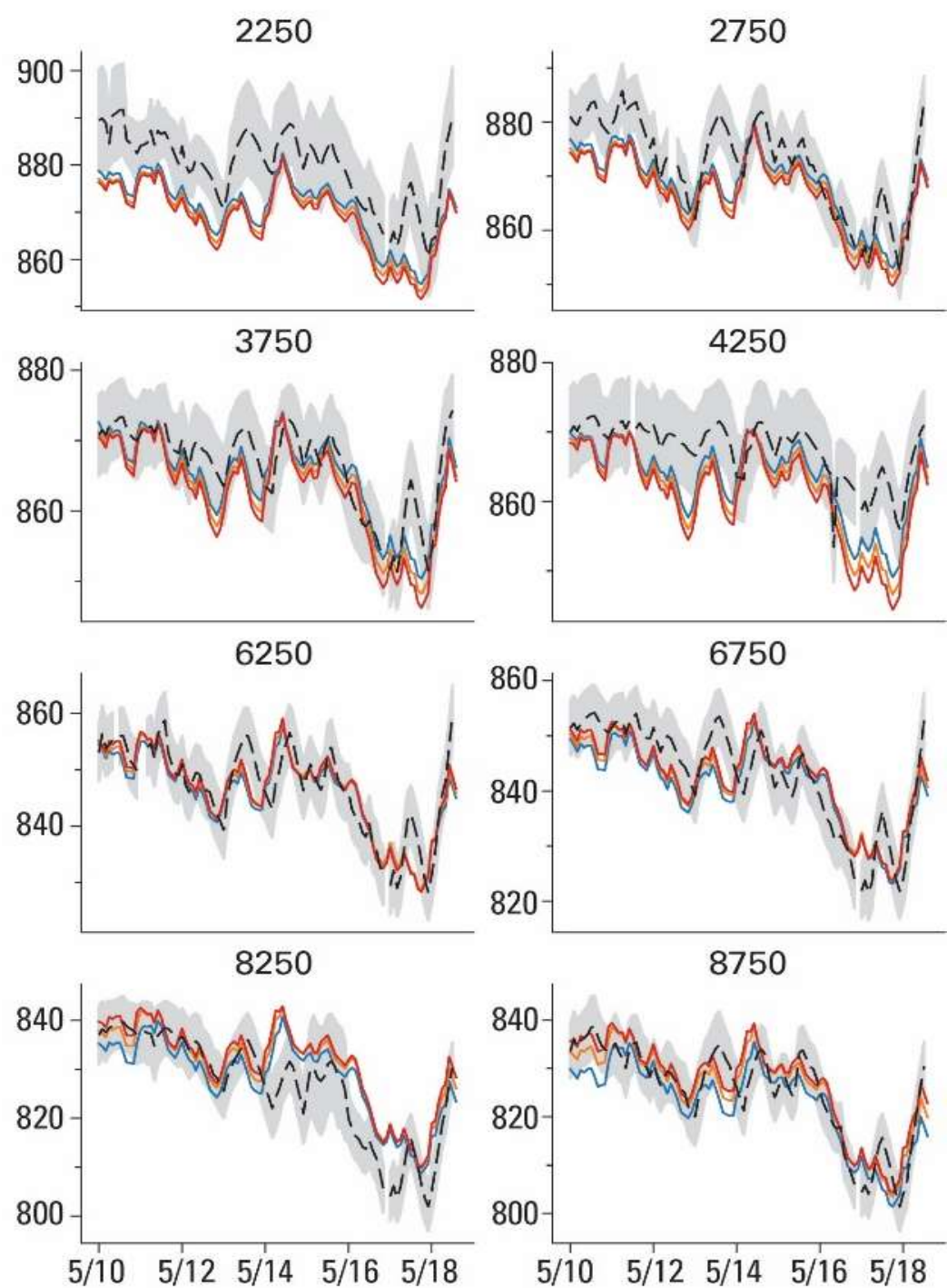
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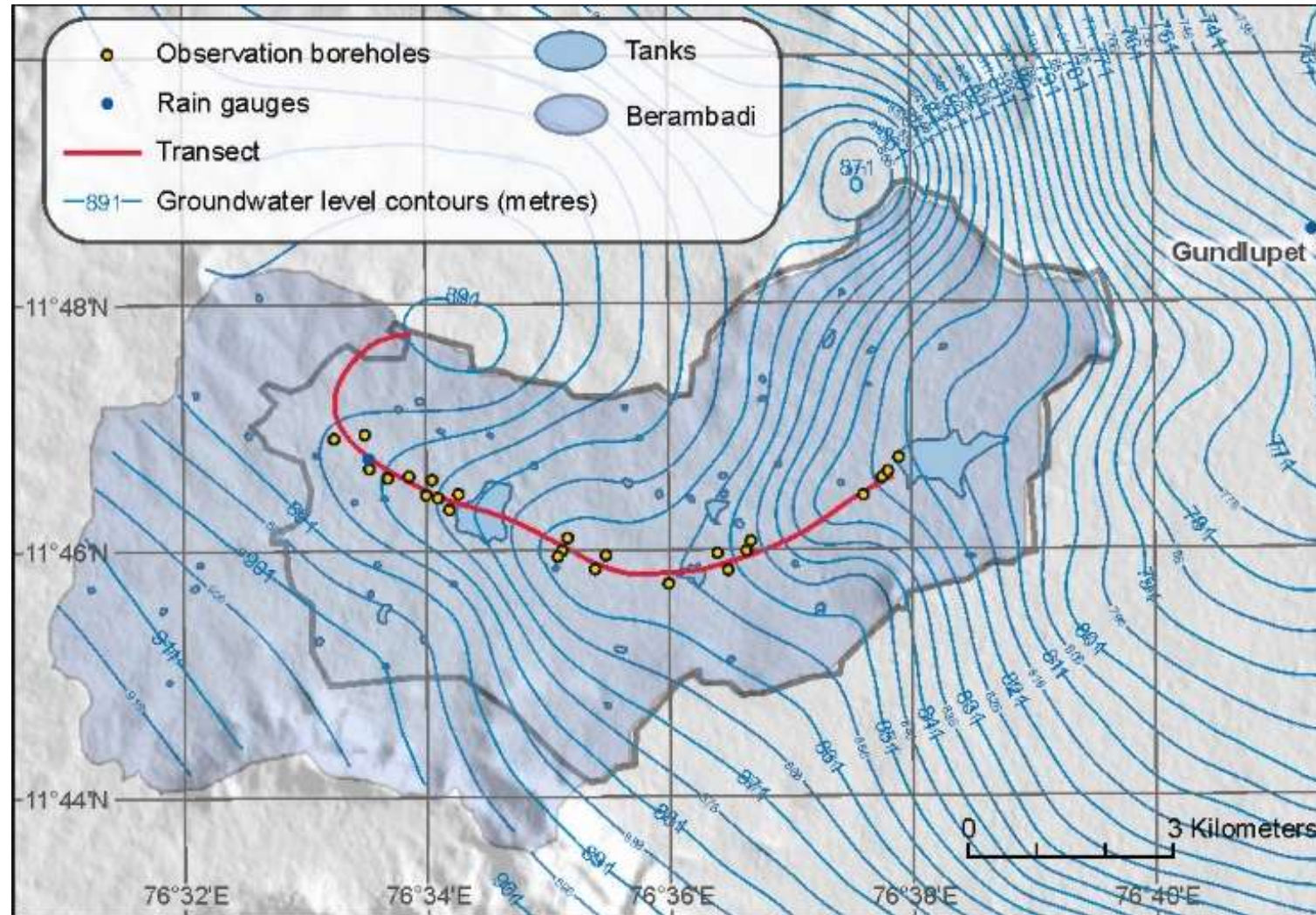
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Numerical flow model transect



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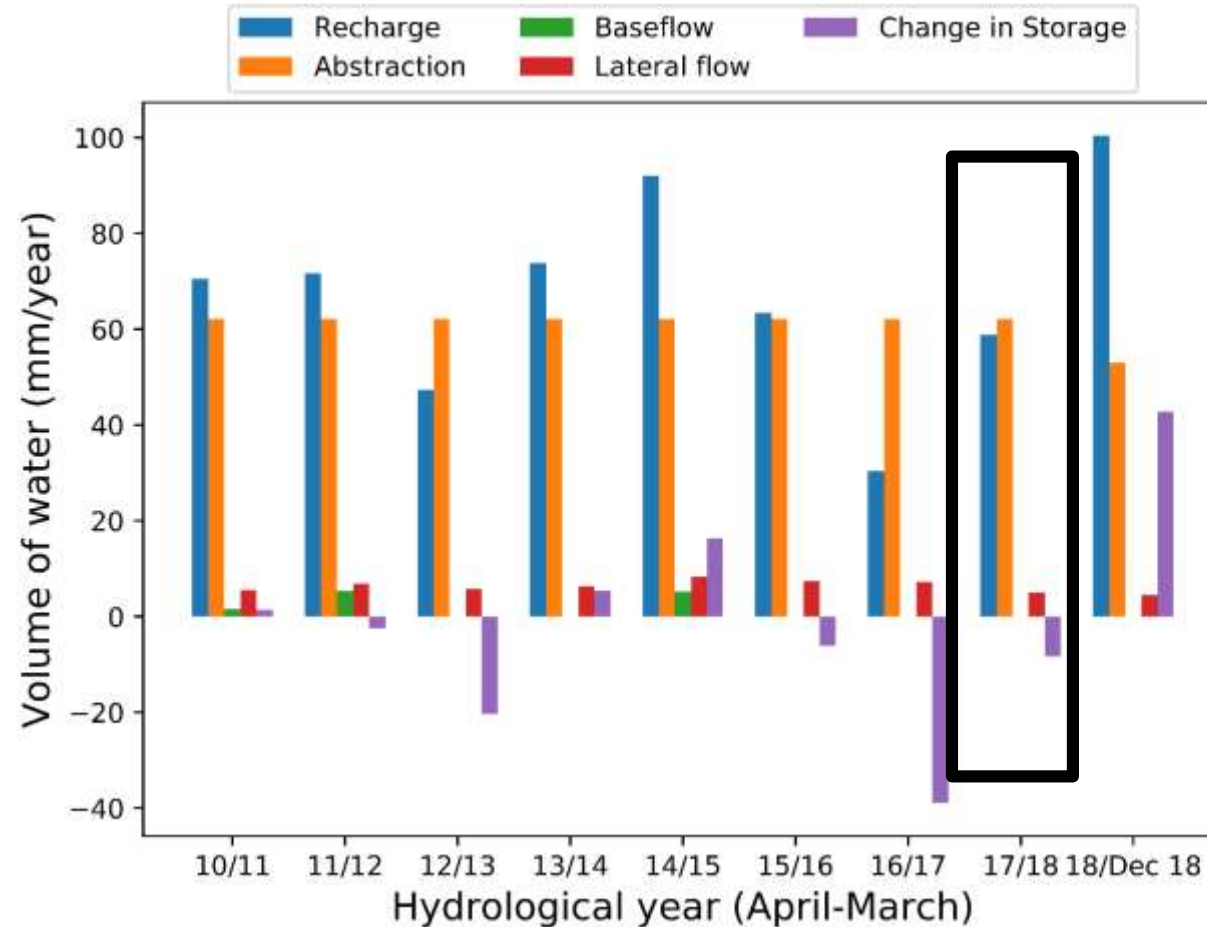
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Numerical flow model – results



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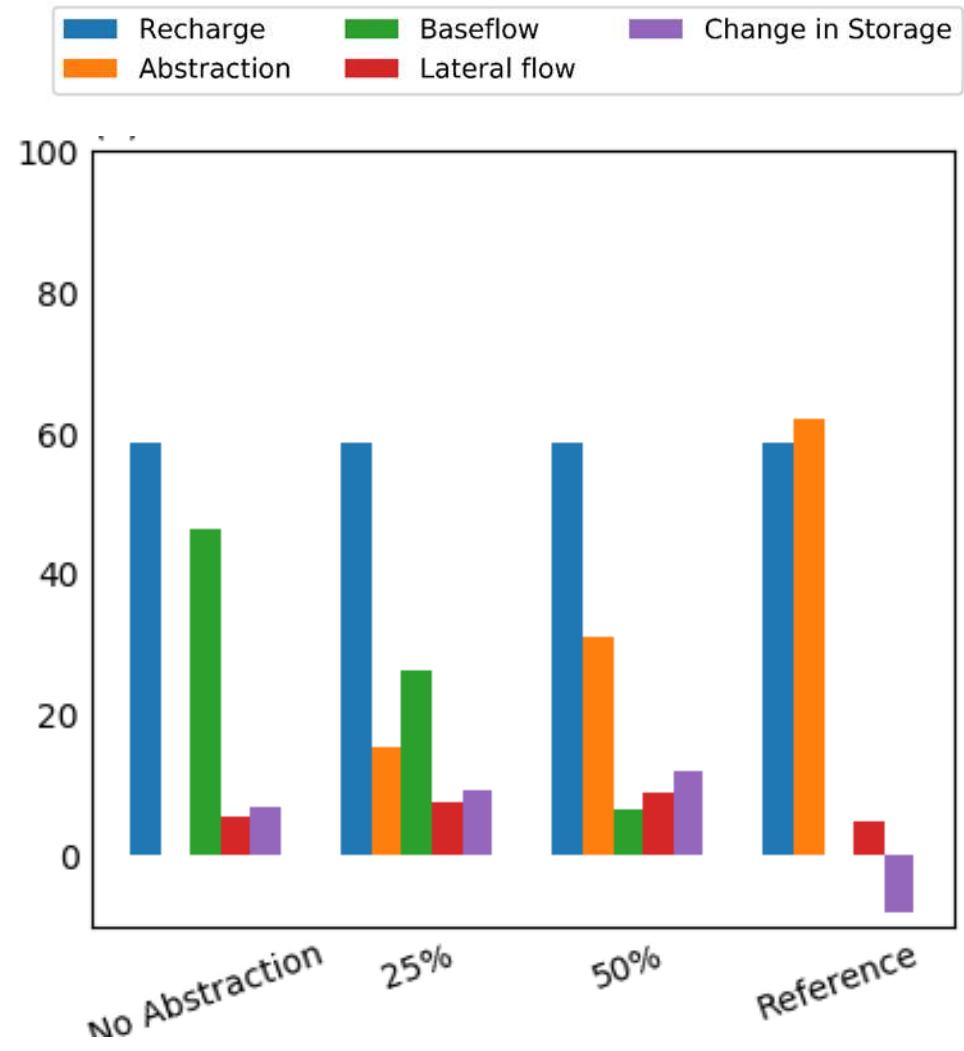
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Numerical flow model – results



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Conclusions

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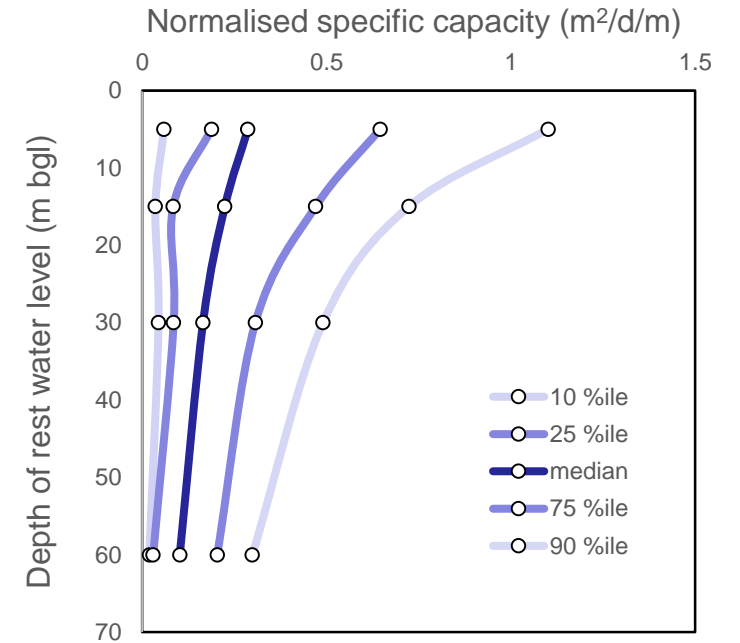
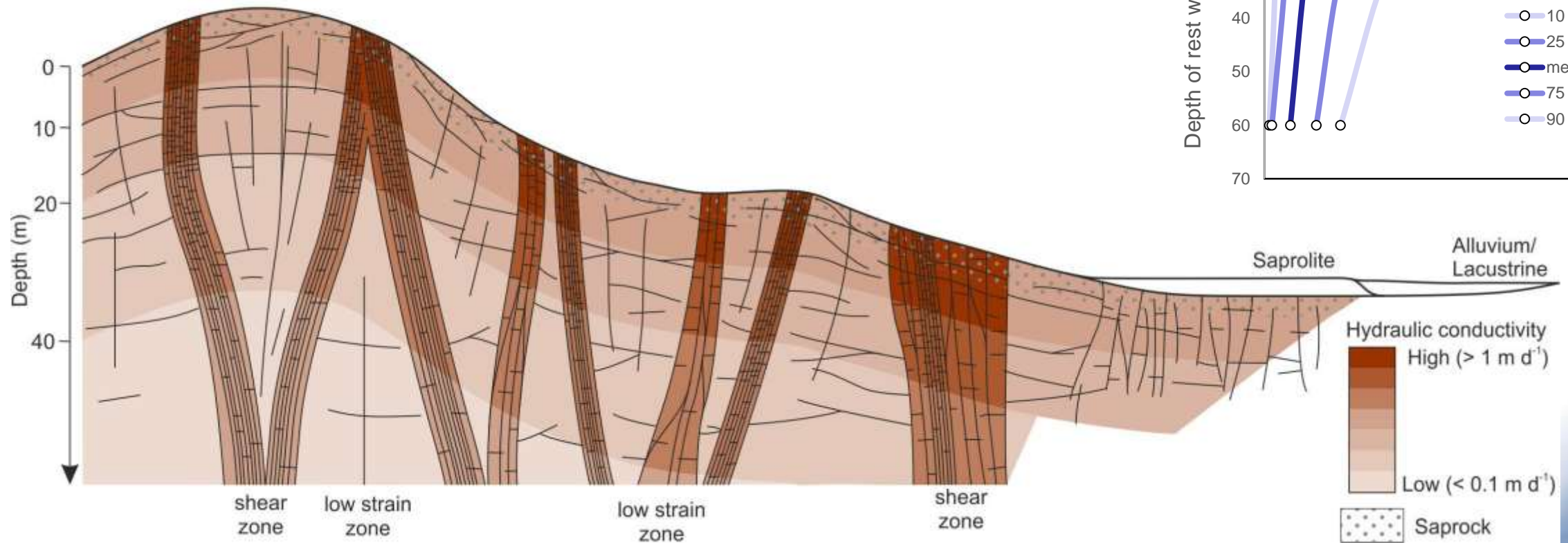
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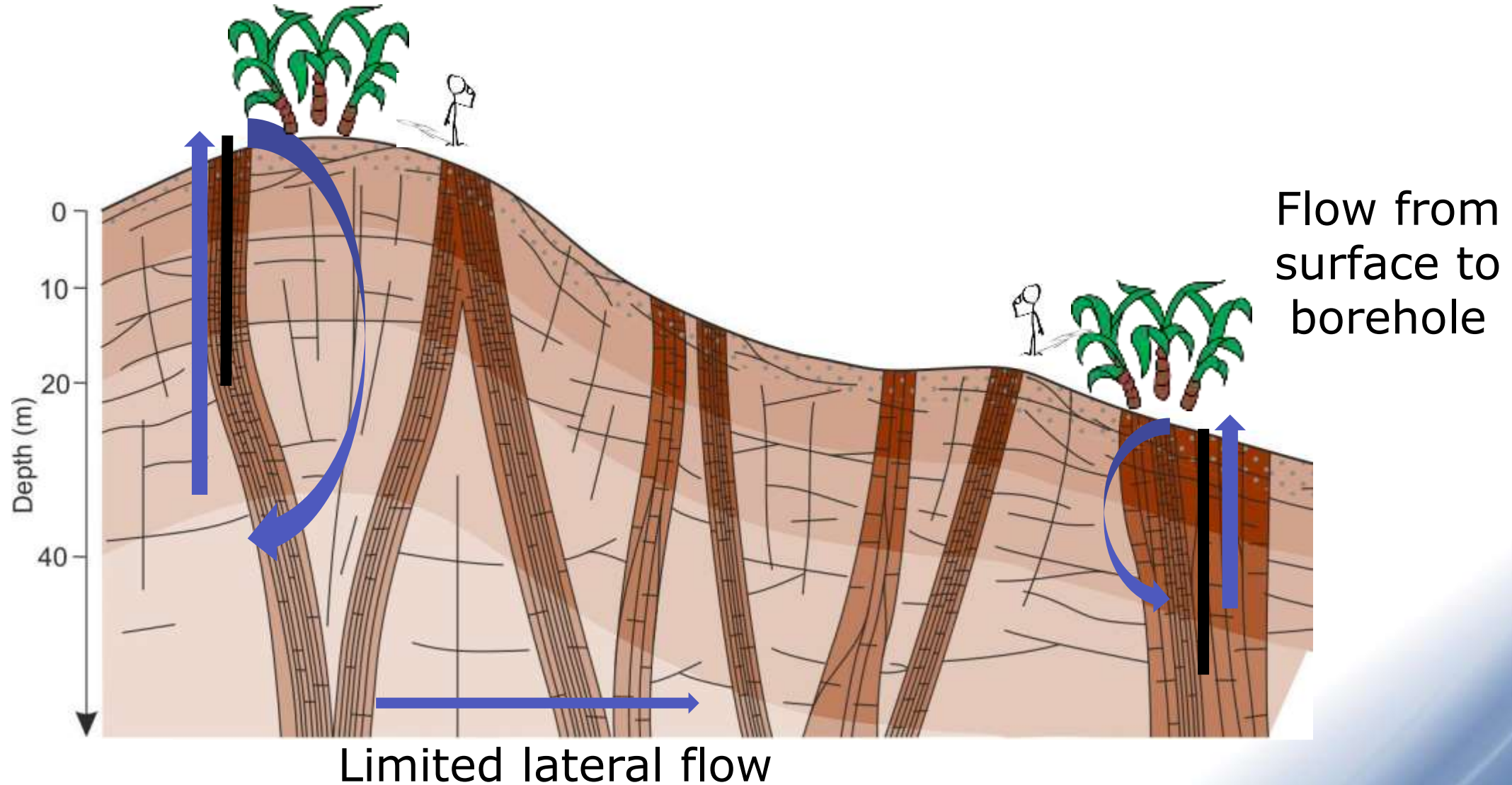
Conclusions

1. 3D aquifer properties



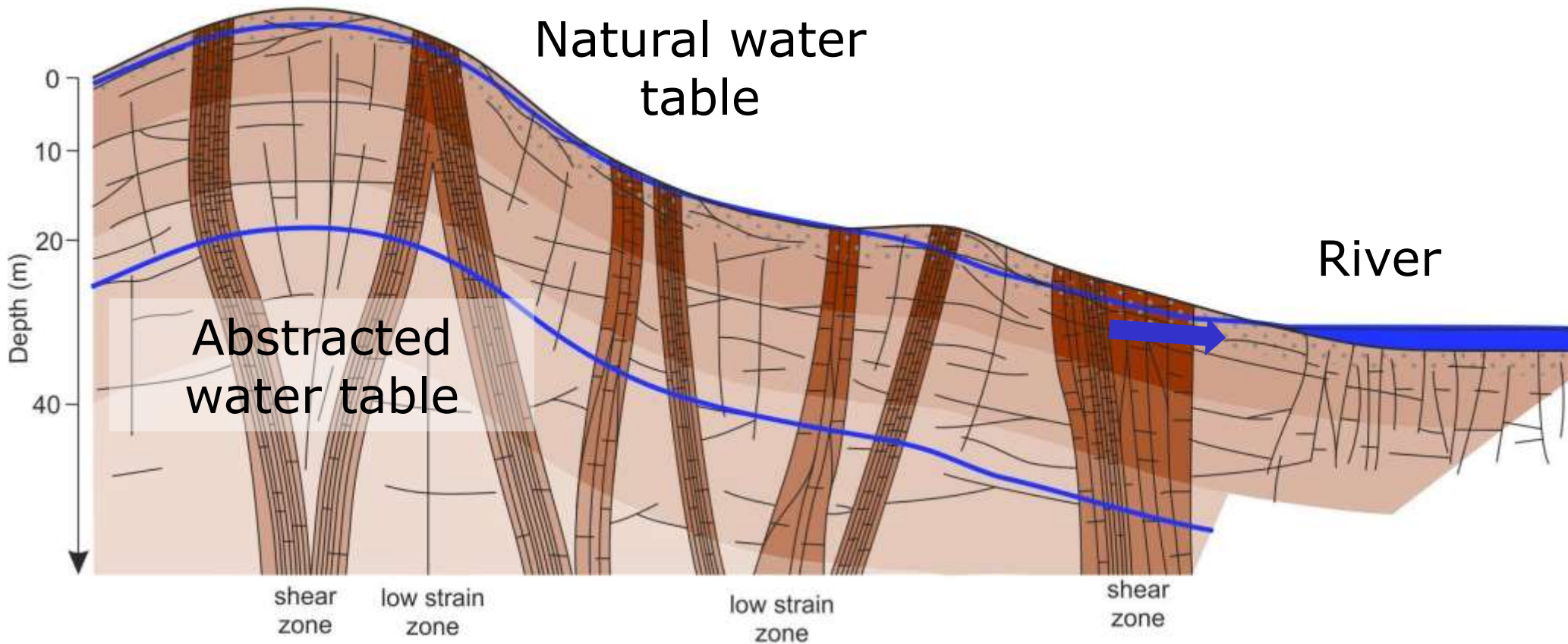
Conclusions

2. Vertical flow dominates



Conclusions

3. Loss of baseflow to river



Conclusions

4. Short-term buffer to poor rainfall

