

British Geological Survey  
NATURAL ENVIRONMENT RESEARCH COUNCIL

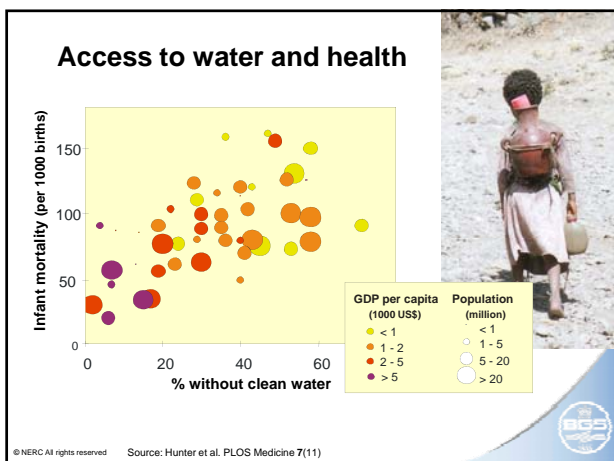
Applied geoscience for our changing Earth

## Characterising groundwater resilience to climate change in Africa

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### Food security: a growing concern

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### Groundwater questions

How can groundwater be used to **reduce poverty** and increase livelihood security?

How **resilient** will it be to climate change ?

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### Rapid project to inform policy

To improve understanding of groundwater across Africa and its resilience to climate change

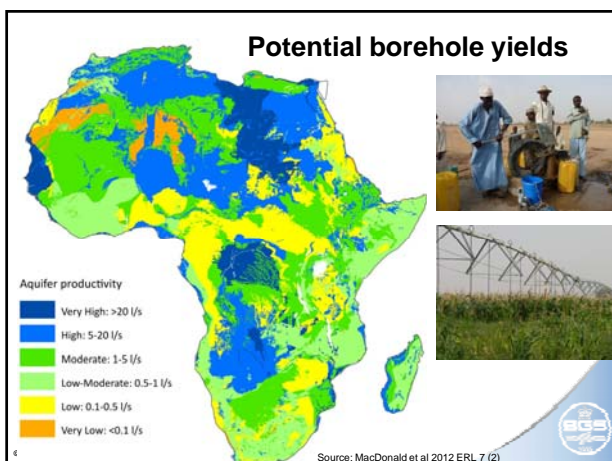
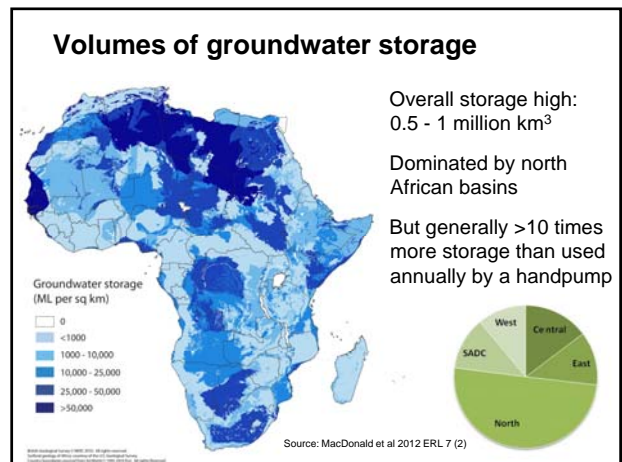
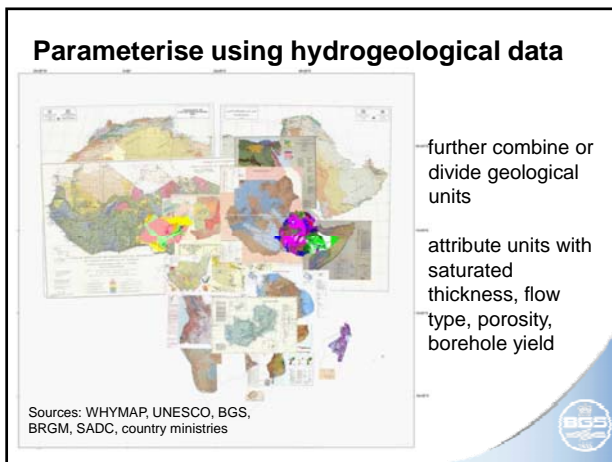
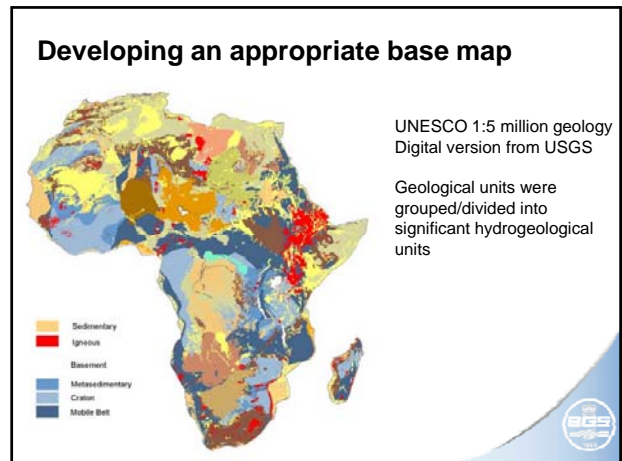
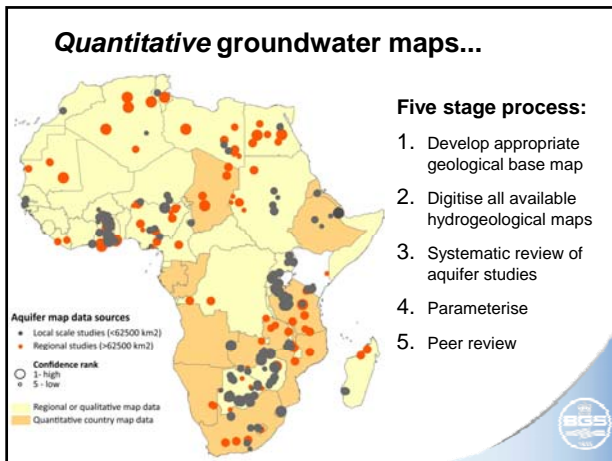
- Developing maps
- Systematic reviews
- Three case studies (soon to be published in Nature Climate Change and Hydrogeology Journal)

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edi  
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UCL  
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**BBC NEWS SCIENCE & ENVIRONMENT**

20 April 2012 Last updated at 11:45

**'Huge' water resource exists under Africa**

By Matt McGrath  
Science reporter, BBC

**The Telegraph**

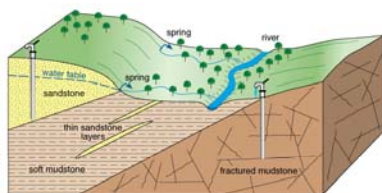
Scientists say the not-so-hidden reservoir of groundwater in the African continent is sitting on a vast reserve that will help it overcome the future challenges of climate change according to British scientists.

**MailOnline**

**We'll drink to that: Massive underground reserves of water found in some of Africa's driest areas - including the Sahara Desert**

Researchers estimate that reserves of groundwater across the continent are 100 times the amount found on its surface.

### What about groundwater resilience?



*"The ability to resist long term damage and to recover from a shock"*

Gunderson 2000

The resilience of groundwater to long term changes in recharge (decadal)

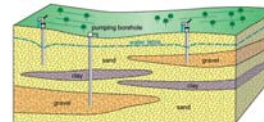
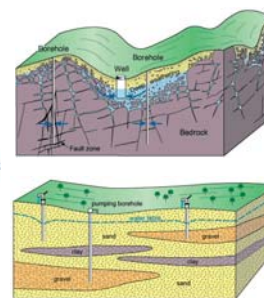
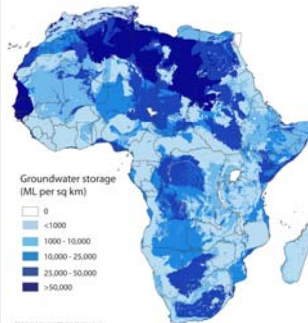
The resilience of groundwater to short term changes in recharge (interannual)

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### GW Resilience to long term climate shifts

...storage

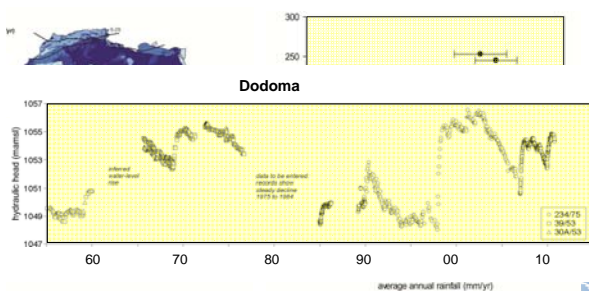


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### GW Resilience to drought

storage + long term recharge



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### Resilience of groundwater supplies



Lessons from research into groundwater and drought:

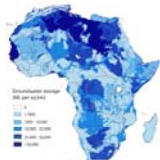
Calow et al. 1997, 2010, Bonsor 2011

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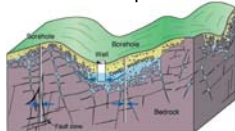


### Resilience of groundwater supplies

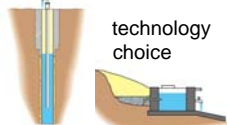
Resilient groundwater



Permeable aquifer



Demand



technology choice

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### Summary


- Tackling poverty in Africa = **access to groundwater**
- **Quantitative maps** developed using best available data
- Large groundwater resources, but unevenly spread
- **Groundwater resilience to CC** unpacked: long-term change and droughts
- Resilience of **water supplies** more complex but generally good practice

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Groundwater resilience to climate change in Africa



[www.bgs.ac.uk](http://www.bgs.ac.uk)

Grids of the maps can be downloaded

Continued work on recharge and storage changes in Africa

New project Indo-Gangetic Basin: 2012 – 2014

Session on Thursday on the role of hydrogeology in water supply in developing countries



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