

An introduction to

Geo.Rep.Net.

The Geological Repository Network

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Geo.Rep.Net.



Science & Technology
Facilities Council

Funded in late 2012

by STFC Futures Programme Global Challenge Networks

The objective of GeoRepNet is:

“bring together a wide diversity of scientists, policy makers and instrument designers to consider and prioritise the key scientific and technical challenges in understanding the geochemical, geophysical and biological processes that influence the establishment, operation and monitoring of geological repositories.”

Several sub-objectives:

1) Establish a network of experts in the scientific areas of relevance to geological repositories (geochemistry, geophysics, geobiology, geology) and the technical areas of relevance (instrument development, monitoring).

Mobilising the UK community.

✓ **Website: www.georepnet.org**

✓ **During the project there will be 3 main meetings**

2) Identify and prioritise the key challenges facing the scientific and technical community in determining the key geochemical, physical and biological processes that will influence the establishment, operation and monitoring of geological repositories.

✓ **Paper resulting from meeting 1 (2013)**

✓ **Meeting 2 (2014)**

3) Create a bridge between STFC-supported instrument development in planetary sciences and astronomy, particle and nuclear physics and the development/use of this instrumentation in the construction and monitoring of geological repositories.

✓ **Meeting 2 (2014)**

✓ **Provide funding for a smaller workshop**

4) Engage with end-users, policy makers and other organisations involved in planning geological repositories through knowledge exchange activities.

✓ **Funding available for travel between labs or organizations** (both for science or for developing policies and engage with policy makers)

✓ **Meeting 3 (2015)**

5) Ensure the formation of a network of scientists and instrument developers that will persist long after the completion of the network period (3 years).

✓ **Meeting 2 (2014) and Meeting 3 (2015)**

✓ **We expect that after the project finishes the network and website will continue**

GeoRepNet Structure

**Susana Direito (PDRA),
Charles Cockell**, Network Leaders
(Edinburgh)
Jon Lloyd
(Manchester)
Microbe-mineral interactions in
Geological Repositories (WP1)

Geophysical Processes
in Geological
Repositories
(WP2)
Vitaly Kudryavtsev
(Sheffield)

Geochemical Processes
in Geological
Repositories
(WP3)
**Gareth Law/
Katherine Morris**
(Manchester)
Vern Phoenix
(Glasgow)

Long-term environmental
change and effects in
Geological Repositories
(WP4)
Blanca Antizar-Ladislao
Edinburgh

Monitoring Methods
for Geological
Repositories
(WP5)
Nick Smith
National Nuclear
Laboratory

Planetary science/
astronomy
technology translation
(WP6)
Ian Hutchinson
(Leicester)

Core science workpackages:

Work Package 1 (Biological Processes):

e.g. role of organisms in deterioration of storage materials.

Work Package 2 (Geochemical Processes): e.g. effects of changing geochemistry on waste storage and disposal (particularly for radioactive waste oxidation state).

Work Package 3 (Geophysical Processes): e.g. transport of fluids in porous media and its effects on the repository stability.

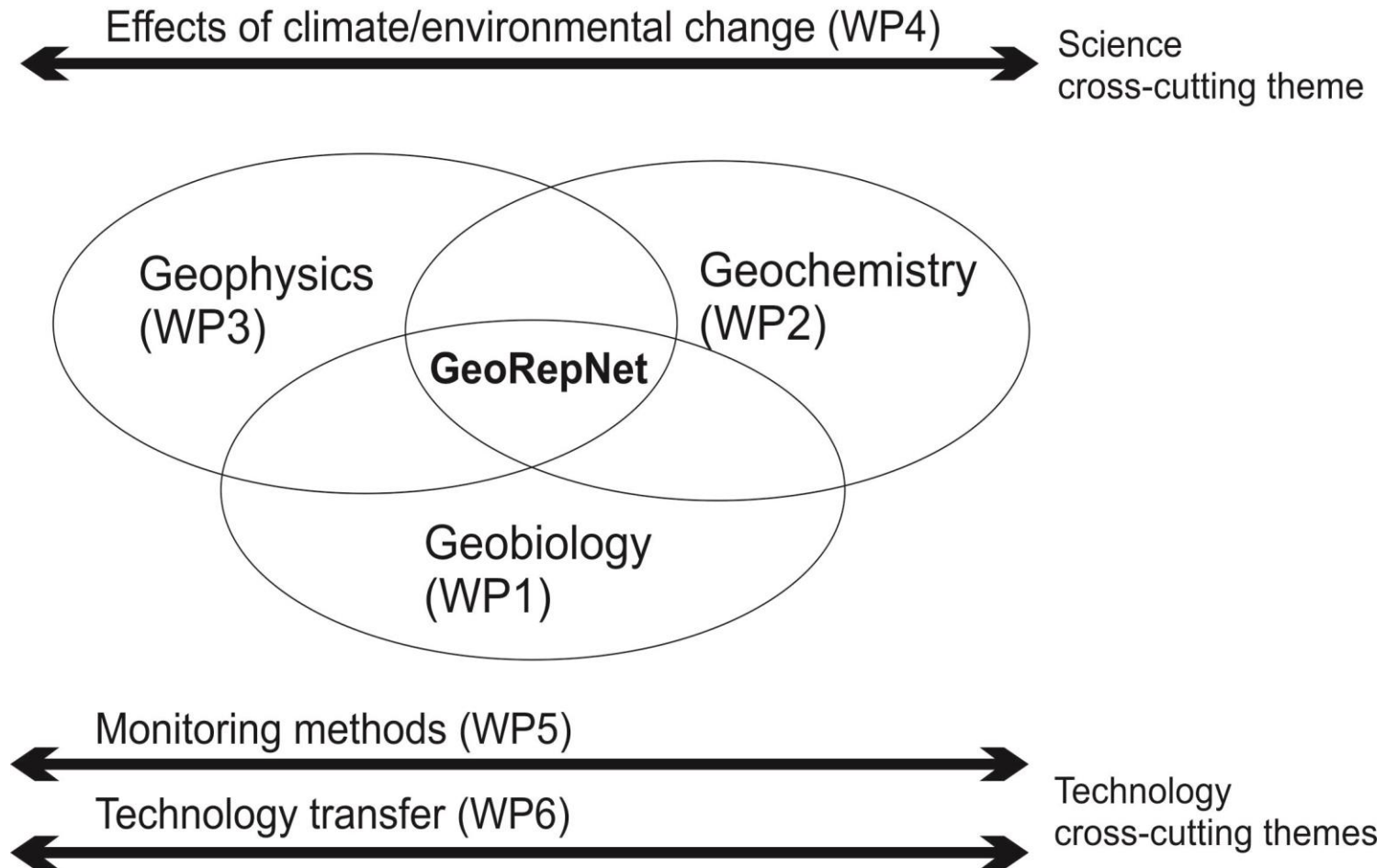
Work Package 4 (Long-term Environmental Changes and Effects): e.g. effects of sea-level rise, temperature changes, earthquakes, etc.

Work Package 5 (Monitoring Methods): monitoring methods and new devices for short and long-term monitoring.

Work Package 6 (Planetary Science/Astronomy/Particle Physics Technology Translation): e.g. use of technology in astronomy (e.g. spectroscopy) for monitoring atmospheric composition of repositories.

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Network Structure



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3 main GeoRepNet meetings:

Meeting 1 (September 2013)

Location and Number: Edinburgh, 30 people

Objectives:

- 1) Bring the community together, establish a network, mobilise UK scientists
- 2) Identify and prioritise key questions to be addressed and key technical challenges
- 3) Create a link with instrument development

Output: Review paper on geological repositories: scientific priorities and high technology transfer (e.g. Journal of Hazardous Materials).



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Meeting 2 (23rd and 24th October 2014)

NERC RATE joint meeting

Location and Number: Location BGS, Keyworth; ~100 people

Scientific objectives – to present and discuss existing knowledge in the key challenge areas identified in Meeting 1, identify unknown areas.

Technical objectives – to present and discuss existing technology that can be used to study major geophysical, geochemical and biological processes identified in Meeting 1 and key technologies that could be used to monitor these processes *in situ*. To identify technology to be translated from the space science sector and to seek new technology paths for technology translation. (GeoRepNet Objectives 2, 3, 6).

Meeting 3 (2015)

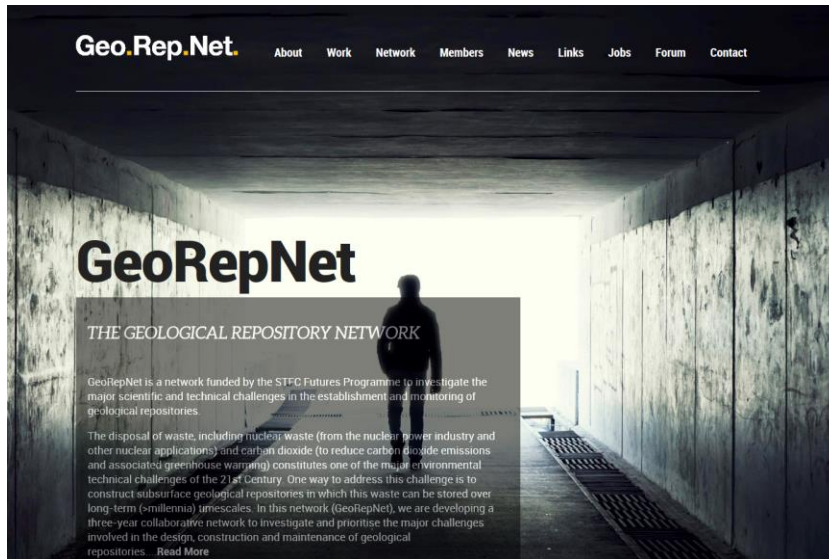
Major Conference: *Geological Repository Processes, 2015*

Location and Number: Location TBD; 200-300 people

Purpose: To present and consolidate the major findings of the network and to create a legacy for GeoRepNet by generating an international community working on understanding processes in geological repositories. (GeoRepNet Objectives 1, 4, 5, 6) and new groups working on proposals.

Geo.Rep.Net.

Webpage:



www.georepnet.org

The main point of contact for the network, providing information and updates on activities. You can register as a member.

Facebook: Geological Repositories Network

Twitter: GeoRepNet