

OneGeology Strategic Steering Committee Kick off Meeting

21 – 22 March 2019

Present

Steve Hill	Chief Scientist: GeoScience Australia
Esteves Colnago	President: Geological Survey of Brazil CPRM
Maria Glícia da Nóbrega Coutinho	Head of International affairs: Geological Survey of Brazil CPRM
Linda Richard	Director: Northern Canada Division Canada Geological Survey of Canada
Mashiko Makino	Assistant Director General: Geological Survey of Japan
Kwang-Eun Kim	Vice President: Korea Institute of Geoscience and Mineral Resources (KIGAM)
JongGyu Han,	Head of Geoscience Data Centre: Korea Institute of Geoscience and Mineral Resources (KIGAM)
Tirza Van Daalen	Director: Geological Survey of the Netherlands
John Ludden	Chief Executive Officer: British Geological Survey
Pierre Toulhoat	Director: French Geological Survey, BRGM
Lars-Kristian Stolen	Digital Strategist: Sweden Geological Survey of Sweden
Kaj Lax	Head of Mineral Resources: Sweden Geological Survey of Sweden
Secretariat	
Matt Harrison	Director of Informatics: British Geological Survey and OneGeology Administration and Operations
Francois Robida	Director of Information Systems: French Geological Survey BRGM
Hazel Napier	Geoscience and Society Lead: British Geological Survey

Apologies:

- James Johnson, CEO Geoscience Australia and outgoing OneGeology Chair
- Oleg Petrov, Director of VSEGI
- Koen Verbruggen, Director of GSI

The OSSC acknowledge the excellent Leadership of the OneGeology Board by James Johnson over the past two and a half years. Without this leadership, the consortium would not be where it is now, and able to build on solid foundations for the next 10 years of OneGeology. The OSSC and administration team wish James well in all of his future endeavours and look forward to our continued collaboration with GeoScience Australia.

The OneGeology Strategic Steering Group held their kick off meeting in Uppsala on 21-22 March 2019. The evening of 21st took the form of a working dinner at the Radisson Blu hotel. Potential items for further discussion at the full meeting on 22 March were presented. The full meeting was kindly hosted by the Geology Survey of Sweden.

The initial list of ideas for discussion were;

- Digital basins/digital twins
- Connecting continents and oceans
- Influencing global policy on interdisciplinary/decision making
- User driven activities
- Issue driven activities vs data gathering
- Next decadal dream (forward look)
- Linking with other initiatives – e.g. Deep Time Digital Earth (DDE) initiative

The meeting agreed that the concept of a digital twin provided a valuable discussion point as it provided the group with the opportunity to cover some of the other points listed. By its very nature, a digital twin is interdisciplinary, requires strong user engagement and is issues focussed. It also provides an opportunity to develop a long term vision over the next 5-10 years.

What is a Digital Twin?

- Digital replica – joins virtual and physical world detailing interactions between different layers of information e.g. geology, groundwater, boreholes, geotechnical measurements, infrastructure, changes over time (past-present-future).
- Interdisciplinary - linking 3D geological models to other models e.g. rest of the earth, cities
- Sharing of goals between disciplines
- A move away from static 3D models to an emphasis on flows over space and time. Supports environmental assessments/consideration of boundary conditions
- IT Systems to make models linkable
- Focus on applied outcome not just the technical development
- Provider of a service with clear outputs
- Applications driven by the user's perspective
- Important for social acceptance of new initiatives (energy storage, waste disposal)

Considerations driving application of a digital twin

- Need applications at different scales
- Data strategy is important. Interoperability should be a key aim
- Existing workflows would need to change to support interoperability
- Feedback loop between model provider and model user will help improve models
- Digital twin can support transparency and public engagement

What is the vision?

A Unified digital twin of planet Earth that enables us to tackle global challenges

- Stakeholders interacting and sharing data/information
- Open digital twin that can be added to/enhanced/expanded
- Something that enables creators to influence stakeholders/policy and provide leadership in innovation and activities

Digital twin - definition

The group recognised the need for a working definition of a digital twin, particularly for external communication. The following words should be considered for inclusion in this definition.

- A digital replica
 - Joins virtual and physical world
 - Interactions
 - Coupling of processes (prioritise and keep simple)
 - Physical natural process
 - Manmade process
 - Monitoring
 - Diagnostics
 - Prognostics
 - Dependencies
 - Independencies
 - Open
- } enabled through a digital twin

Quick Wins

The group identified a list of possible quick wins (listed below). Names were assigned to each idea. Progress would be presented at the next OSSC meeting and the OneGeology Secretariat will work with IUGS to propose an Open Conference Session at IGC in Delhi 2020.

Quick Win	Responsible Person	Lead Organisation
Crustal scale minerals systems Mineral provinces Key stakeholders <ul style="list-style-type: none"> - Industry - Governments - Land use planners - Local community 	Linda Richard Steve Hill Lars-Kristian Stolen	Geological Survey of Canada
High resolution energy corridor (multiscale) Leads to new knowledge of deep geology structures Key stakeholders <ul style="list-style-type: none"> - Energy companies - Local communities 	Matt Harrison John Ludden	BGS
Hazards <ul style="list-style-type: none"> - Sea level rise - Coastal hazard - Landslides - Small islands 	Matt Harrison Kwang-Eun Kim Steve Hill Mashiko Makino	BGS

<ul style="list-style-type: none"> - Multi-hazard <p>Key stakeholders</p> <ul style="list-style-type: none"> - Citizens - National emergency orgs - NGOs 		
<p>Urban subsurface interations</p> <ul style="list-style-type: none"> - Smart cities - Resilient cities - Construction/Building Information Models (BIM) - Cities – countries - Subsurface cadastre - Subsurface governance/legal/policy <p>Key stakeholders</p> <ul style="list-style-type: none"> - Government - Industry - Citizens – understanding of risk management <p>Possible locations</p> <ul style="list-style-type: none"> - Netherlands - UK- Glasgow - Switzerland - Slovenia - Varanasi - India 	<p>Tirza van Daarlen François Robida Matt Harrison</p>	<p>TNO</p>
<p>Catchment Scale e.g. Amazon Basin, Rhine-Meuse</p> <ul style="list-style-type: none"> - Forestry - Aquifer management - Rise in river levels – river side communities - Oil companies - Mining companies 	<p>Maria-Glicia Tirza Van Daarlen</p>	<p>CPRM TNO</p>
<p>Shallow Marine - Dogger bank</p> <ul style="list-style-type: none"> - Multiple use of marine/sea bed - Sea bed mining - Ownership/governance issues 	<p>Matt Harrison John Ludden</p>	<p>BGS</p>
<p>Paektu Mountain, Korea – active volcano</p> <ul style="list-style-type: none"> - Volcanic hazard 	<p>Kwang-Eun Kim</p>	<p>KIGAM</p>
<p>Coastal Hazard</p> <ul style="list-style-type: none"> - Tsunami – past, present, future 	<p>Mashiko Makino</p>	<p>GSI</p>
<p>Permafrost discussed but not likely to be ready for this year</p> <ul style="list-style-type: none"> - Climate change 	<p>Linda Richard</p>	<p>GSC</p>

Next steps

Each 'quick win' lead to gather together key people virtually in order to develop a digital twin concept for presentation at IGC and at the next OSSC meeting which will run alongside the 36th IGC meeting, being held in Delhi 2-8 March 2020.

A five-year roadmap to be produced and presented at the next OSSC meeting, March 2020. This should include a one pager clearly defining the OSSC vision including differences and overlaps with existing initiatives such as LOOP, DDE. A wider group including the likes of Lesley Wyborn to be consulted – list from the CODATA meeting?

A standards group should be set up to ensure consistency of approach ahead of any developments

The OSSC does not currently have an African member. Council for GeoScience is the Secretariat of the Organisation of African Geological Surveys (OAGS). Matt Harrison agreed to engage with OAGS and invite someone to a future OSSC meeting. He will also explore possibilities when next in Nigeria. Pierre Toulhoat also agreed to explore when in Morocco at beginning of April.

The group agreed that countries that are ahead of the game in certain areas (e.g. Netherlands have excellent 3D data for the whole country) should provide leadership to others.

The group agreed that there are many 3D models across the world at different scales and that although we cannot create a global 3D model, we can follow a common approach to querying these data and models. 3D demonstrators could be developed. Priority should be given to filling in OneGeology data holes

The position of the Chair of the OSSC was discussed, which is to be a two year appointment. Tirza Van Daalen was nominated by the group and has accepted the position. Matt to formally recognise her appointment.

Actions and Tasks

Task	Description	Lead	Deadline
0.1	Each 'quick win' lead to gather together key people virtually in order to develop a digital twin concept for presentation at IGC and at the next OSSC meeting which will run alongside the 36th IGC meeting, being held in Delhi 2-8 March 2020	Quick Win Leads	Meet at least quarterly and report back on progress to the OneGeology Operational Group either in person or by correspondence with onegeology@bgs.ac.uk
0.2	A five-year roadmap to be produced and presented at the next OSSC meeting, March 2020. This should include a one pager clearly defining the OSSC vision including differences and overlaps with existing initiatives such as LOOP, DDE.	Matt Harrison/ Steve Hill	September 2019
0.3	A standards group should be set up to ensure consistency of approach ahead of any developments	OneGeology TIG Lead	September 2019
0.4	Matt Harrison agreed to engage with OAGS and invite someone to a future OSSC meeting. He will also explore possibilities when next in Nigeria	Matt Harrison	September 2019

0.5	Pierre Toulhoat also agreed to explore OSSC membership when in Morocco at beginning of April.	Pierre Toulhoat	28/04/19
0.6	Digital Earth Australia – provides EO data over time via Geoscience Australia website (products from images, not raw data). Digital Earth Africa next. Steve Hill to send link	Steve Hill	05/04/19
0.7	Matt to contact Deep Time Digital Earth (DDE) consortium to strengthen engagement between OSSC and DDE	Matt Harrison	28/04/19
0.8	<i>Group to identify key people – who we can work with, who we can influence, who can help</i>	<i>ALL</i>	<i>Standing</i>
0.9	<i>All to engage individual networks to encourage membership of OSSC – China and Finland are potential members</i>	<i>ALL</i>	<i>Standing</i>
0.10	<i>Matt to write a letter to outgoing OSSC board chair James Johnson thanking him for his contribution. Highlight that the OSSC is interested in developing standards and will contact the DDE consortium.</i>	<i>Matt Harrison</i>	<i>Closed</i>
0.11	Plan next OSSC meeting alongside IGC, 2-8 March 2020 in Delhi, India	OneGeology Administration	Jan 2020
0.12	Tirza Van Daalen has accepted the position as chair of OG – Matt to formally recognise her appointment	Matt Harrison	05/04/19