

# OneGeology – Status and Progress

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OneGeology Managing Director

## Background

- Initiated in 2007 by Geological Survey Organisations from around the globe: national and state/provincial/territorial
- Voluntary initiative / no financial obligations for participants
- It worked perfectly for several years

## Achievements

- OneGeology has been a profound success for the geosciences
- It has more than delivered on all of its original goals
- It has raised the level of geological survey information delivery across the world
- It has spawned many projects and initiatives across the world some very large (i.e. OneG-E and GIN)
- It has made geology a global leader in the field of SDI & an exemplar of a scientific community working together

## Background

- Initiated in 2007 by GSO from around the globe: national and state/provincial/territorial
- Voluntary initiative / no financial obligations for participants (as BGS & BRGM funded 1G substantially from their budgets)
- It worked perfectly for several years, yet it was not sustainable in a long-term
- Consequentially, a feasible and sustainable solution was needed!

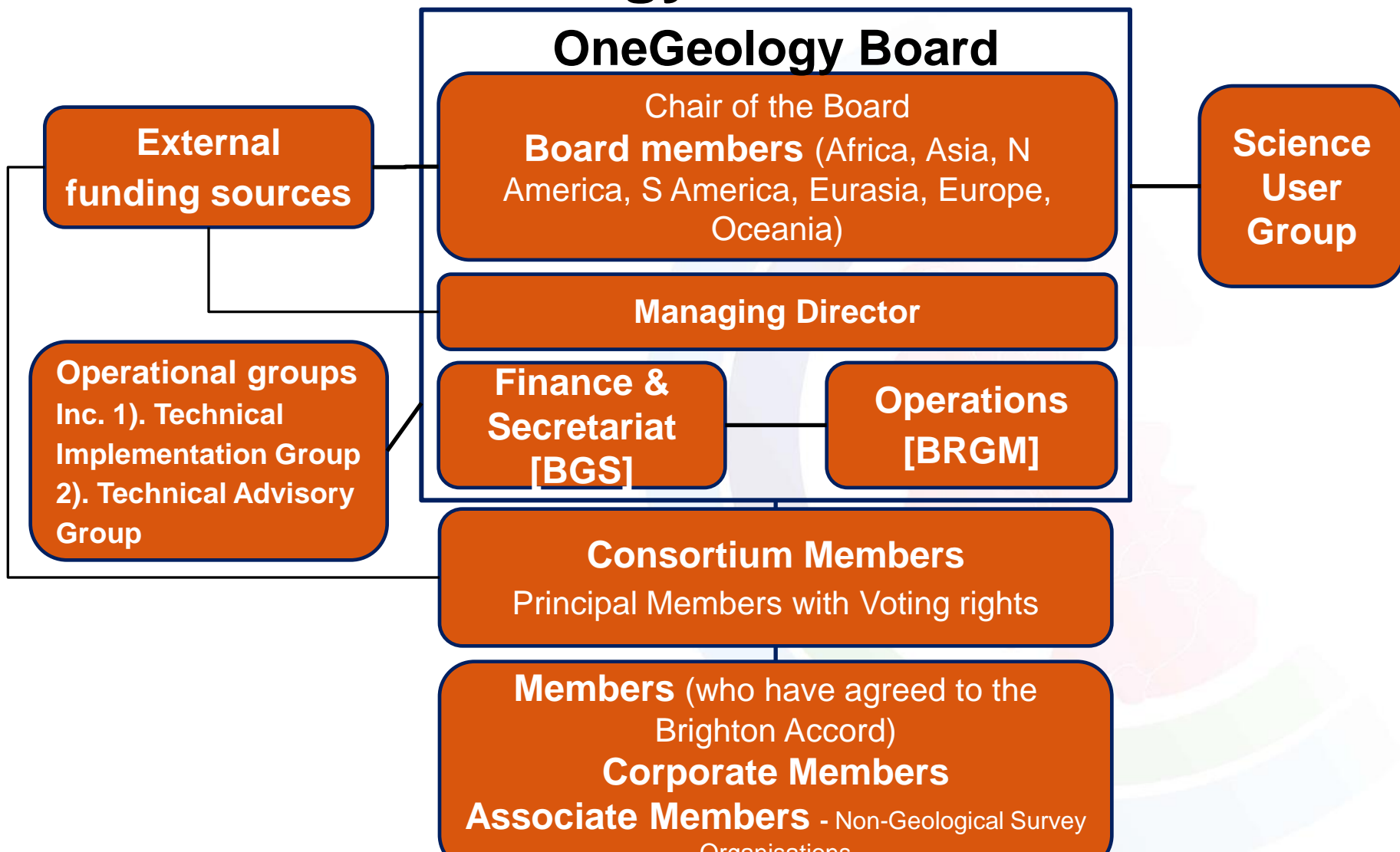
## OneGeology Consortium

- As of Oct 2013 OneGeology has become a Consortium with:
  - a clear governance structure,
  - formally defined rules,
  - membership commitments, and
  - with ambitious objectives.

## OneGeology Consortium

- Currently there are 117 Members, **17** Principal Members + **1** Corporate Member +
- **2** supporting intl. Organisations (IUGS, AAGS)
- Also formally supported by UNESCO, IUGS, ICSU, GEO
- Officially recognised as being ***the*** global model for open geo-data sharing

# OneGeology Governance



## **Objectives**

- 1. To be the provider of geoscience data globally**
- 2. To ensure an exchange of know-how and skills so all can participate**
- 3. Use of the global profile of OneGeology to increase awareness of the geosciences and their relevance (in contemporary society)**



# Obligations and benefits of being a member of OneGeology Consortium (1)



- Membership fee:
  - Members 2500/5000€; subject to membership type
  - Corporate Members – subject to negotiation)
- Advisory function in strategic matters
- Contribution & access to the expertise and experience of international geoscientists and informatics experts
- Leverage Members' research, survey and service contribution through its global presence

## Obligations and benefits of being a member of OneGeology Consortium (2)

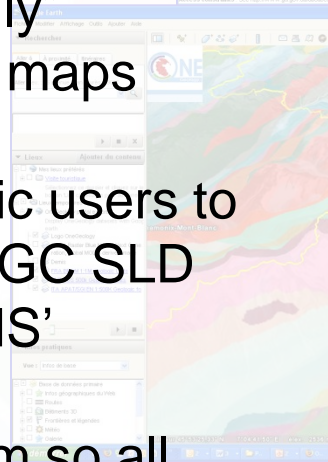
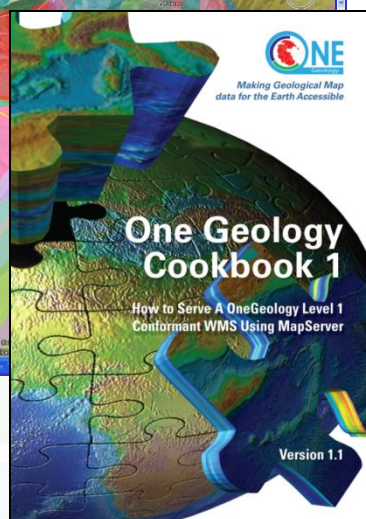
- Build upon 20+ years of geo-IT and web development (state-of-the-art) expertise
- Distributed dynamic system – serving the data by data provider or using a “buddy” survey
- Use of open global GeoInformation standards (WMS and WFS) to various topics
  - facilitating the cross-border/global analyses / modelling...

# Technical facts & recent devel.

- Based on **interoperability** principles (GeoSciML 3.2)
- Maps on distributed servers and sent directly to web client
- Participants deliver map data through a standard OGC web service (WMS / WFS)
- The list of metadata of maps / services is collected into a catalogue of services managed “centrally”
- The portal can display / aggregate all the maps
- Different projections capabilities
- Advanced functionality of the Portal public users to analyse OGC Web Feature Services & OGC SLD (Styled Layer Descriptor) querying of WMS’
- Can move data to Google
- Cookbooks, online help and buddy system so all nations can serve their data

Data provider	Data server	Country	Service URL
OGC	OGC	OGC	http://www.ogc.org/.../OGC_SLD_Desktop?
BGR	BGR	Europe	http://www.bgr.de/Service/OGC/OGC_SLD/OGC_SLD000001/
GA	GA	Australia	http://www.ga.gov.au/.../OGC_SLD/OGC_SLD000001/

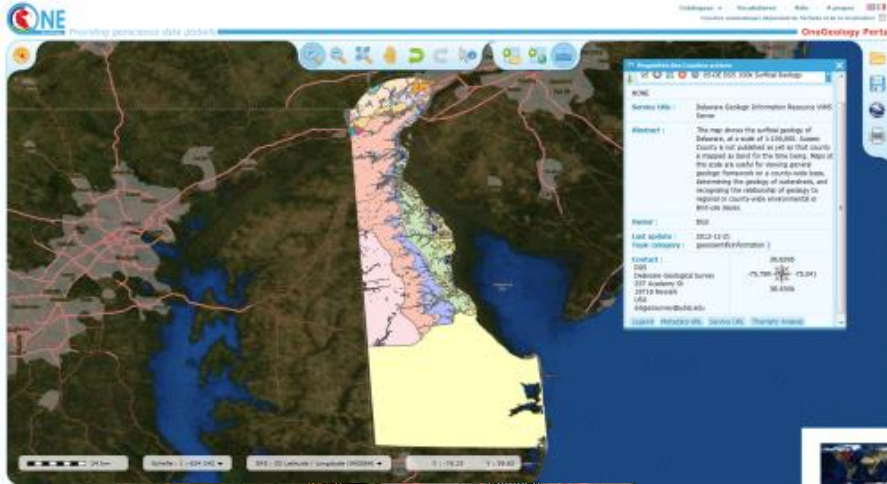



# INSPIRE list just adopted by Board

- OneGeology Board adopted the initial keyword dictionary list for specific topics of geoscience data
- List was taken from OneGeology-Europe project that developed the list compliant with the INSPIRE directive
- This will enable expanding services from serving purely geological data to serving the data from all geological (sub)disciplines
- A need to formalise the terminology related to geological/geoscience topics

## Providing geoscience data globally

**Advanced functionality:** use of SLD to display the polygons presenting a required lithology or age :



**Thematic analysis**

Filter by lithology	Filter by age
<ul style="list-style-type: none"> <li><input type="checkbox"/> Compound material           <ul style="list-style-type: none"> <li><input type="checkbox"/> Anthropogenic material</li> <li><input type="checkbox"/> Breccia</li> <li><input type="checkbox"/> Composite genesis material</li> <li><input checked="" type="checkbox"/> Igneous material               <ul style="list-style-type: none"> <li><input type="checkbox"/> Basic igneous material</li> <li><input type="checkbox"/> Fragmental igneous material</li> <li><input type="checkbox"/> Igneous rock</li> <li><input type="checkbox"/> Intermediate composition igneous material</li> <li><input type="checkbox"/> Intermediate composition igneous material</li> </ul> </li> <li><input type="checkbox"/> Sedimentary material</li> <li><input type="checkbox"/> Unconsolidated material</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Phanerozoic           <ul style="list-style-type: none"> <li><input type="checkbox"/> Cenozoic               <ul style="list-style-type: none"> <li><input type="checkbox"/> Eocene</li> <li><input type="checkbox"/> Neogene</li> <li><input type="checkbox"/> Oligocene</li> <li><input type="checkbox"/> Paleogene</li> <li><input checked="" type="checkbox"/> Quaternary                   <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Holocene</li> <li><input type="checkbox"/> Pleistocene</li> </ul> </li> </ul> </li> <li><input type="checkbox"/> Mesozoic</li> <li><input type="checkbox"/> Paleozoic</li> <li><input type="checkbox"/> Precambrian</li> </ul> </li> </ul>

Choose a color:

Portrayal    Reset

Thanks to a WMS-SLD query, only polygons which age is « Quaternary » are displayed  
 (Example with Delaware US-DE DGS 100k Surficial Geology)



**Advanced functionality:** use of WFS to present statistics on polygons displayed

- The WFS result (XML / GML) is analysed and transformed into statistics

(Example with United Kingdom (GBR BGS 1:625k Bedrock Age))

```

<wfs:FeatureCollection xsi:schemaLocation="http://www.opengis.net/wfs http://schemas.opengis.net/wfs/2.0/wfs.xsd http://www.geosiml.org/geosiml/2.1/xsd/geosiml.xsd http://www.opengis.net/om/1.0 http://schemas.opengis.net/om/1.0/om.xsd" >
  <gml:featureMember>
    <gsmi:MappedFeature gml:id="2397">
      <gsmi:observationMethod>
        <gsmi:CGI_TermValue>
          <gsmi:value codeSpace="http://www.cgi-iugs.org/uri">
            urn:cgi:classifer.CGI.MappedFeatureObservationMethod.201001.compilation
          </gsmi:value>
          <gsmi:CGI_TermValue>
            <gsmi:observationMethod>
              <gsmi:positionalAccuracy>
                <gsmi:CGI_NumericValue>
                  <gsmi:principalValue uom="urn:ogc:def:uom:UCUM:m">250</gsmi:principalV
                  <gsmi:CGI_NumericValue>
                </gsmi:positionalAccuracy>
              <gsmi:samplingFrame xlink:href="urn:cgi:feature.CGI.EarthNaturalSurface"/>
            </gsmi:specification>
          <gsmi:GeologicUnit gml:id="2397">
            <gml:name>j3</gml:name>
            <gsmi:geologicUnitType xlink:href="urn:cgi:classifer.CGI.GeologicUnitType.20
            <gsmi:observationMethod>
              <gsmi:CGI_TermValue>
                <gsmi:value codeSpace="http://www.cgi-iugs.org/uri">
                  urn:cgi:classifer.CGI.FeatureObservationMethod.201001:synthesis_of_mal
                </gsmi:value>
                <gsmi:CGI_TermValue>
                  <gsmi:observationMethod>
                    <gsmi:purpose>typicalNorm</gsmi:purpose>
                  </gsmi:preferredAge>
                <gsmi:GeologicEvent>
                  <gsmi:eventAge>
                    <gsmi:CGI_TermRange>
                      <gsmi:lower>
                        <gsmi:CGI_TermValue>
                          <gsmi:value codeSpace="http://www.cgi-iugs.org/uri">
                            urn:cgi:classifer.ICS.StratChart.200908.UpperJurassic

```

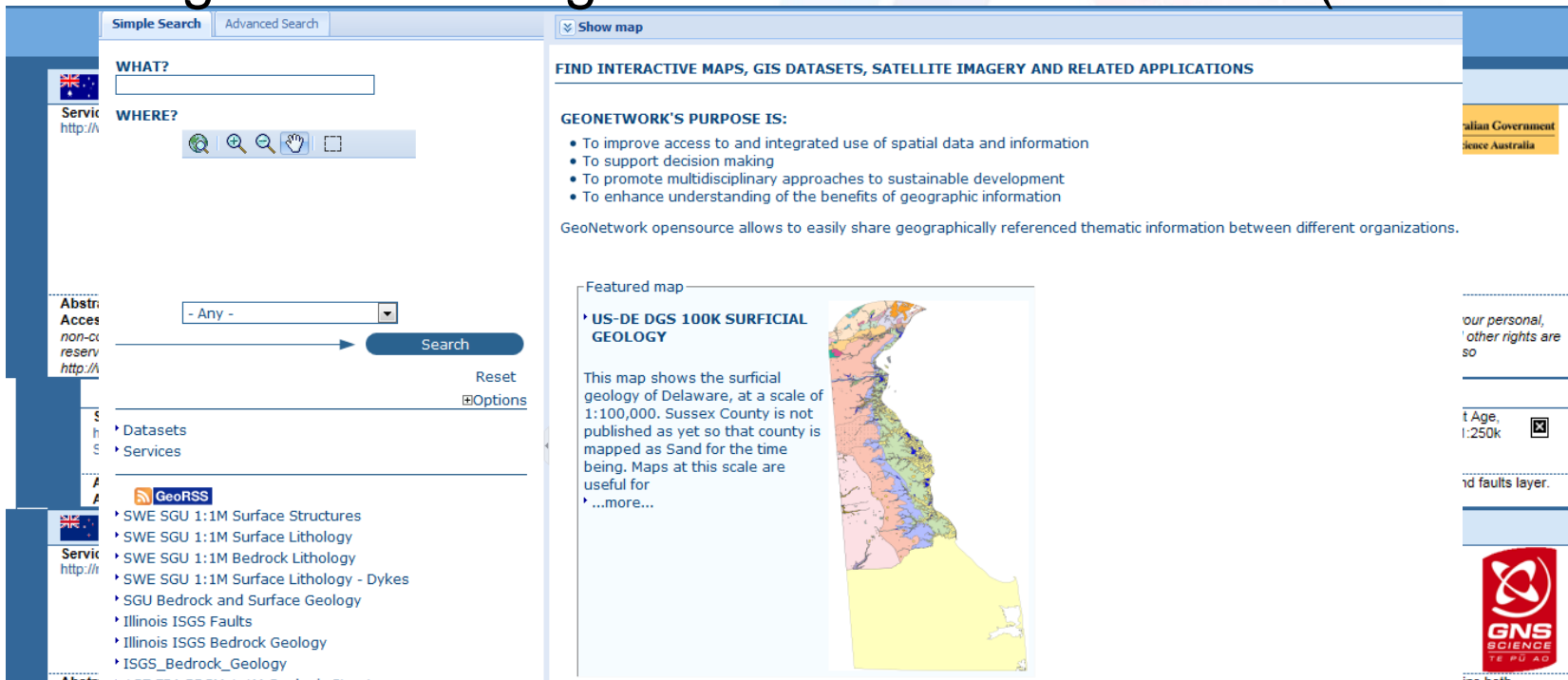


Please choose a field:

lithology	tlithology	count	pcarea
Granitoid	Granitoid	3	0.04 %
Basalt	Basalt	9	0.39 %
Iron rich sedimentary rock	Iron rich sedimentary rock	1	0.01 %
Siltstone	Siltstone	7	0.17 %
Pyroclastic rock	Pyroclastic rock	1	0.0 %
Ash tuff, lapillstone, and lapilli tuff	Ash tuff, lapillstone, and lapilli tuff	10	0.36 %
Coal	Coal	3	0.02 %
Doleritic rock	Doleritic rock	1	0.01 %
Rhyolitoid	Rhyolitoid	2	0.02 %
Mica schist	Mica schist	3	0.04 %
Limestone	Limestone	5	0.06 %
Mudstone	Mudstone	9	0.19 %
Breccia	Breccia	1	0.02 %
Biogenic silica sedimentary rock	Biogenic silica sedimentary rock	1	0.0 %
Wacke	Wacke	6	97.94 %
Fragmental igneous material	Fragmental igneous material	1	0.01 %
Sedimentary rock	Sedimentary rock	1	0.01 %
Serpentinite	Serpentinite	1	0.02 %
Claystone	Claystone	1	0.0 %
Tholeiitic basalt	Tholeiitic basalt	1	0.01 %
Quartzite	Quartzite	2	0.02 %
Fine grained igneous rock	Fine grained igneous rock	1	0.01 %
Gabbroid	Gabbroid	4	0.03 %
Ultramafic igneous rock	Ultramafic igneous rock	2	0.06 %
Sandstone	Sandstone	12	0.27 %
Conglomerate	Conglomerate	5	0.16 %

## Catalogue service (OGC CSW) – managed centrally

- In geonetwork catalogue, all WMS and WFS services and layers (datasets) are registered.
- The catalogue is then requested by the OneGeology portal thanks to a CSW request (XML response).
- Catalogue service registered in some intl. catalas ( GEOSS).



The screenshot shows the OneGeology portal search interface. It features a search bar with 'WHAT?' and 'WHERE?' sections, a search button, and a list of datasets. A featured map titled 'US-DE DGS 100K SURFICIAL GEOLOGY' is displayed, showing a map of Delaware with various geological layers. The interface also includes a sidebar with navigation options and a footer with logos for the Australian Government and GNS Science.

**Simple Search** | **Advanced Search**

**WHAT?**

**WHERE?**

**Search**

**Reset**

**Options**

**GeoRSS**

- SWE SGU 1:1M Surface Structures
- SWE SGU 1:1M Surface Lithology
- SWE SGU 1:1M Bedrock Lithology
- SWE SGU 1:1M Surface Lithology - Dykes
- SGU Bedrock and Surface Geology
- Illinois ISGS Faults
- Illinois ISGS Bedrock Geology
- ISGS\_Bedrock\_Geology

**Featured map**

**US-DE DGS 100K SURFICIAL GEOLOGY**

This map shows the surficial geology of Delaware, at a scale of 1:100,000. Sussex County is not published as yet so that county is mapped as Sand for the time being. Maps at this scale are useful for

• ...more...

**Italian Government**  
Science Australia

our personal,  
other rights are  
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t Age,  
1:250k

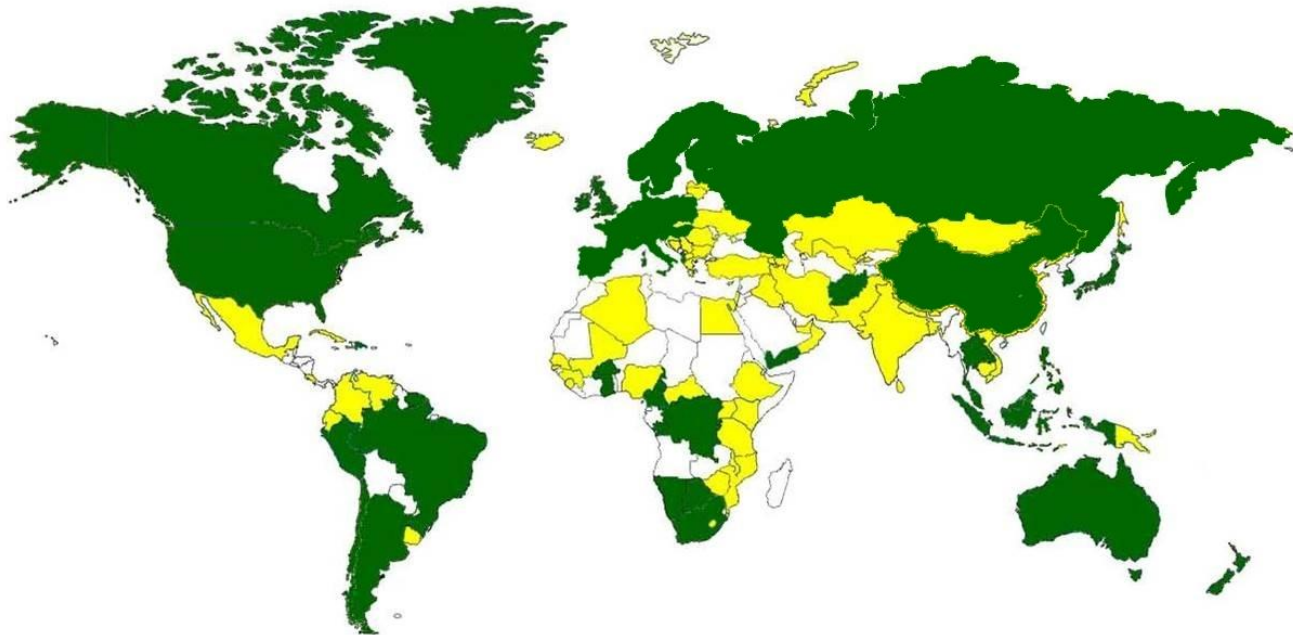
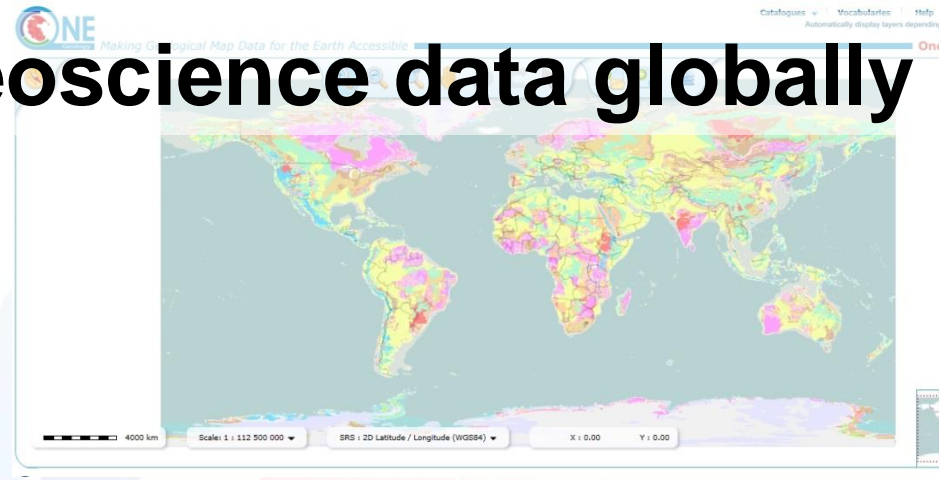
nd faults layer.

**GNS**  
SCIENCE  
TE PU AO



Providing geoscience data globally

To be the provider of geoscience data globally





## Highlights

- 138 organisations from 117 nations now participating
- 127 OGC WMS delivering +300 layers 70 surveys (national & state)
- State-of-the-art portal developed and regularly upgraded
- Productive partnerships with CGMW and ISCGM
- Data used by researchers, education, industry, and international agencies
- **Improvements needed**
- More surveys serving their data
- More surveys serving their best data

## To ensure an exchange know-how and skills

- **Highlights**

- Skills to create digital geological spatial data and make it web accessible transferred across the world
- Cookbooks, email and web support developed
- Workshops and courses held in several continents
- Partnerships with UNESCO, CGMW, YES, IUGS

- **Improvements needed**

- Much more to be done – challenge with limited resources
- Better understanding of the challenges faced by the developing world (and sometimes the so-called developed world)

# Use the 1G profile to increase awareness of the geosciences and their relevance

## • Highlights

- Massive media attention and public interest (millions!)
- Huge external technical interest '000s of presentations given & posters & papers written
- Acknowledged as *the* IYPE and IUGS flagship initiative
- Partnerships with Geoparks, UNESCO, YES
- OneG4kids 😊

## • Improvements needed

- Fully capitalised PR potential is yet to be achieved
- More effort to outreach and communication in OneGeology – it will tangibly improve outcomes

# Accelerate interoperability and scientific consistency

## • Highlights

- Success of 1G-EU and USA-GIN
- Encouraging use of open global standards (WMS, WFS)  
– all data at 1G-Portal now GeoSciML3.2 compliant
- The Accreditation Scheme
- Active contributor to IUGS, GEO/GEOSS, INSPIRE, OGC
- Working with ESRI to emplace standards in ArcGIS

## • Improvements needed

- Geological community using basic geological standards that would make data much more useful for all (changing)
- Standards and IT management is not popular nor appealing (no SCI points)

## Why is OneGeology working? (1)

- Short simple mission and vision: 3 simple objectives
- Uncomplicated plan: start simple and build up
- Inclusivity: all geoscience institutions welcome – different nations have different abilities to participate
- Minimal intrusion into local systems
- A pragmatic approach to coordination and governance – those prepared to lead drive it forward

## Why is OneGeology working? (2)

- A “let’s do it” ethos, not excessively strategies about it!
- A “buddy” system to help those who need it
- Putting significant effort into outreach and media profile
- Pre-existence of international network of geoscientists and geological surveys

## Why is OneGeology working?

Data providers  
need/want/have to  
share their  
geoscience data

**OneGeology  
makes it  
happen**

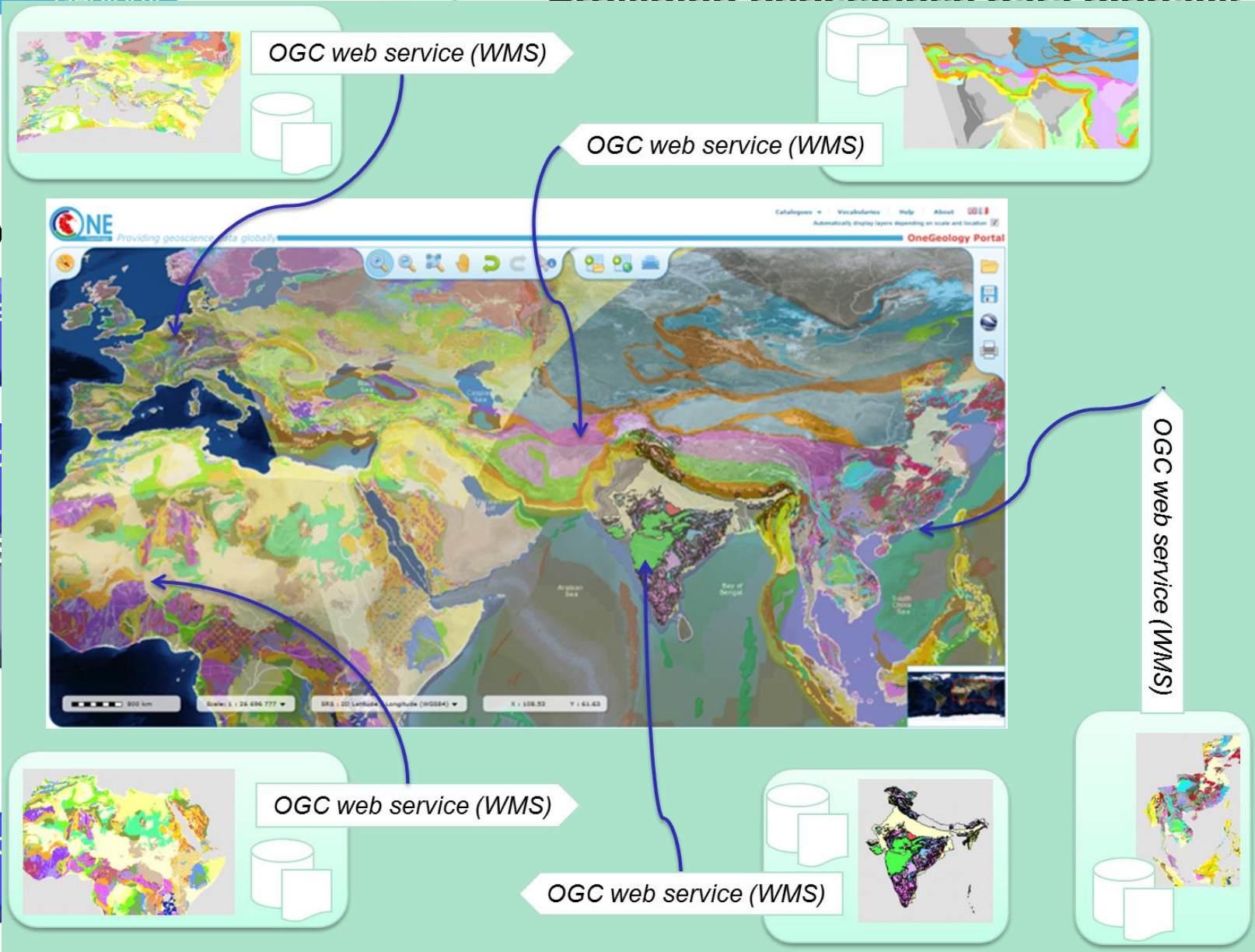
End-users need/want the  
reliable access to the  
geoscience data (in one  
place and updated in the  
best possible way)



• It's stay

GEOSCIENCE DATA

GEOSCIENCE DATA



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**What about this beautiful part of the world?**  
**Is your country participating and serving the**  
**data?**

**Will your country join and actively insure the**  
**sustainability of OneGeology?**



Brazil...





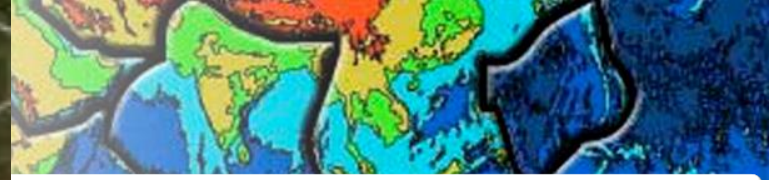
Providing geoscience data globally

Suriname...





**Chile...**

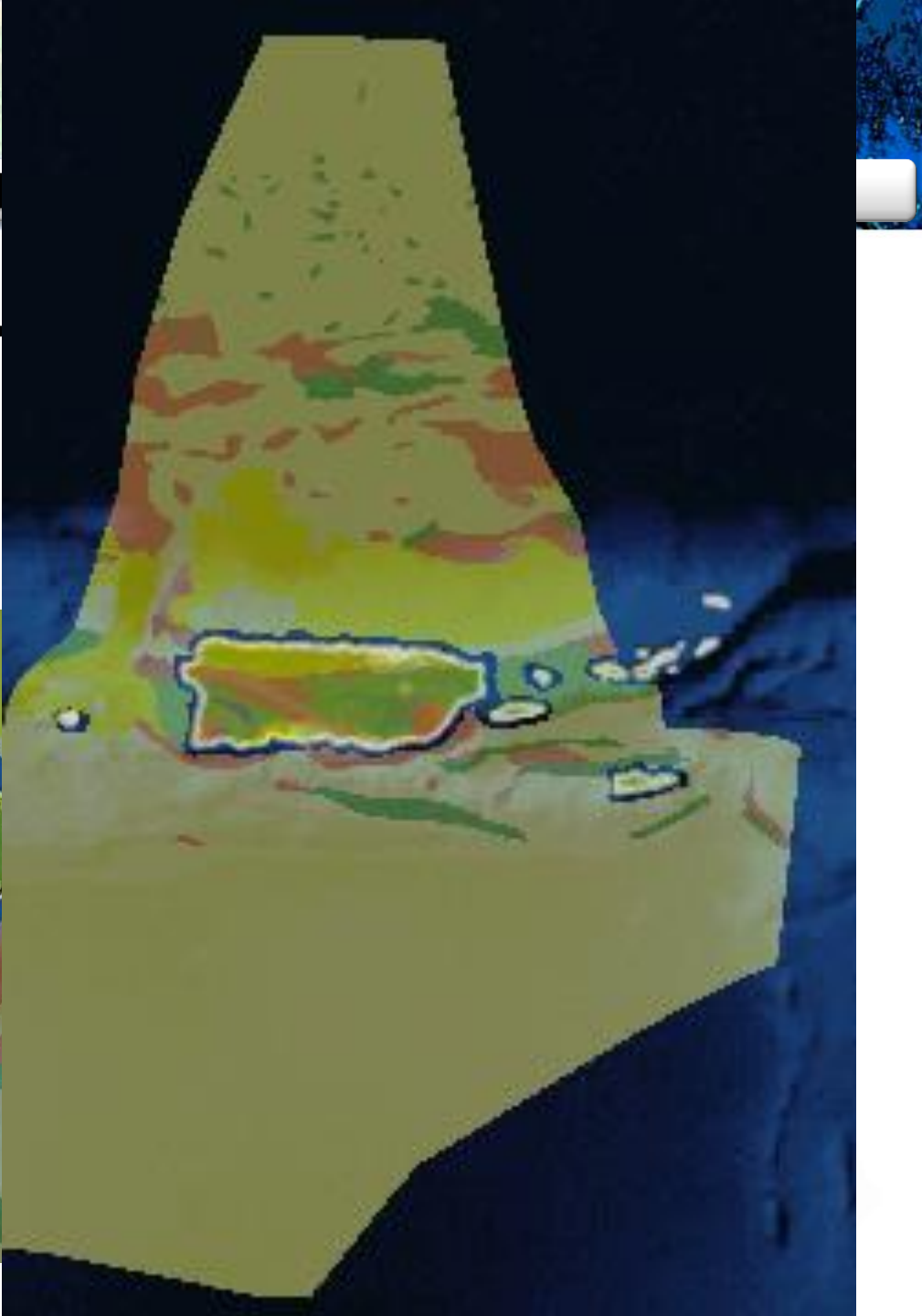


**geoscience data globally**

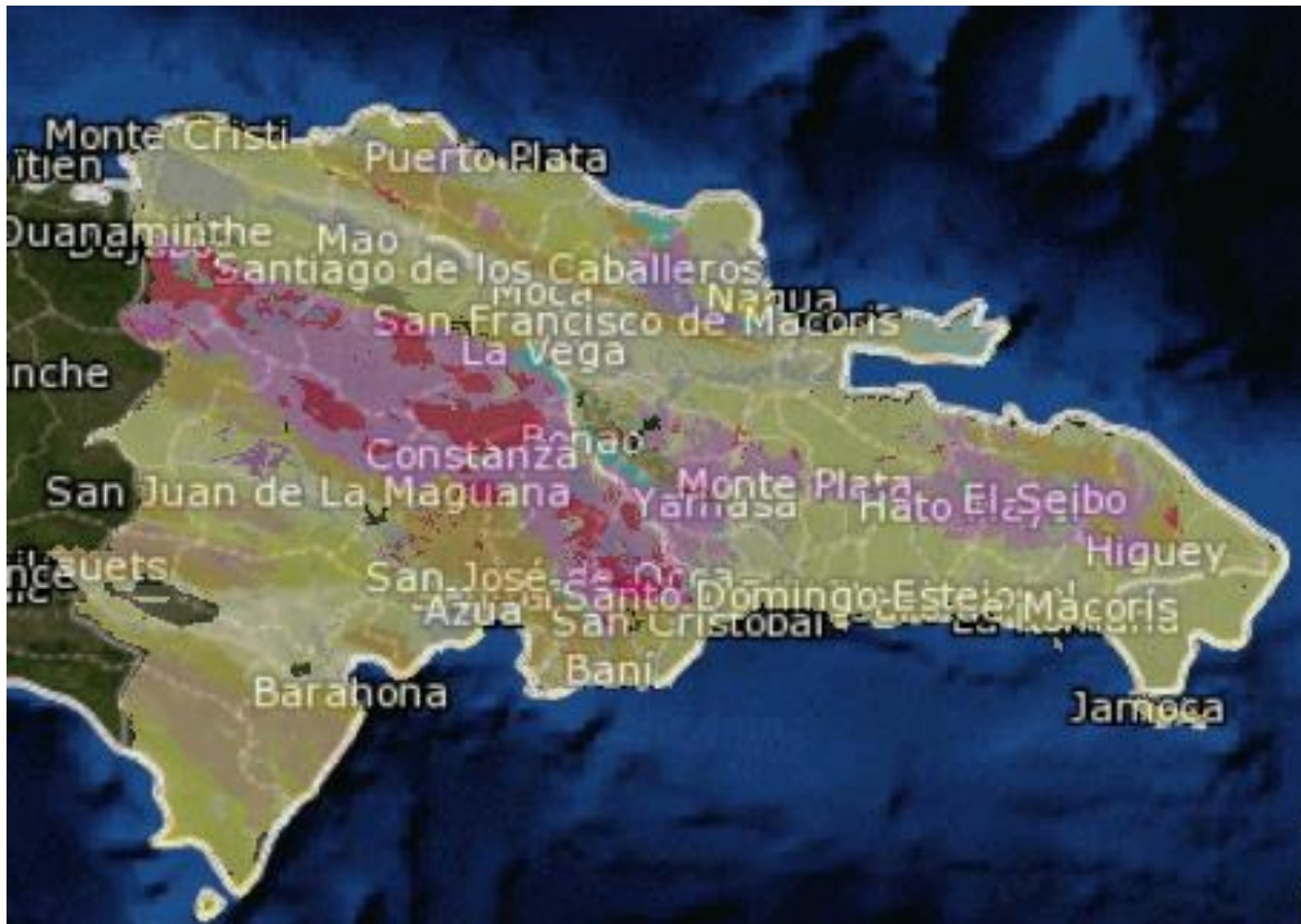




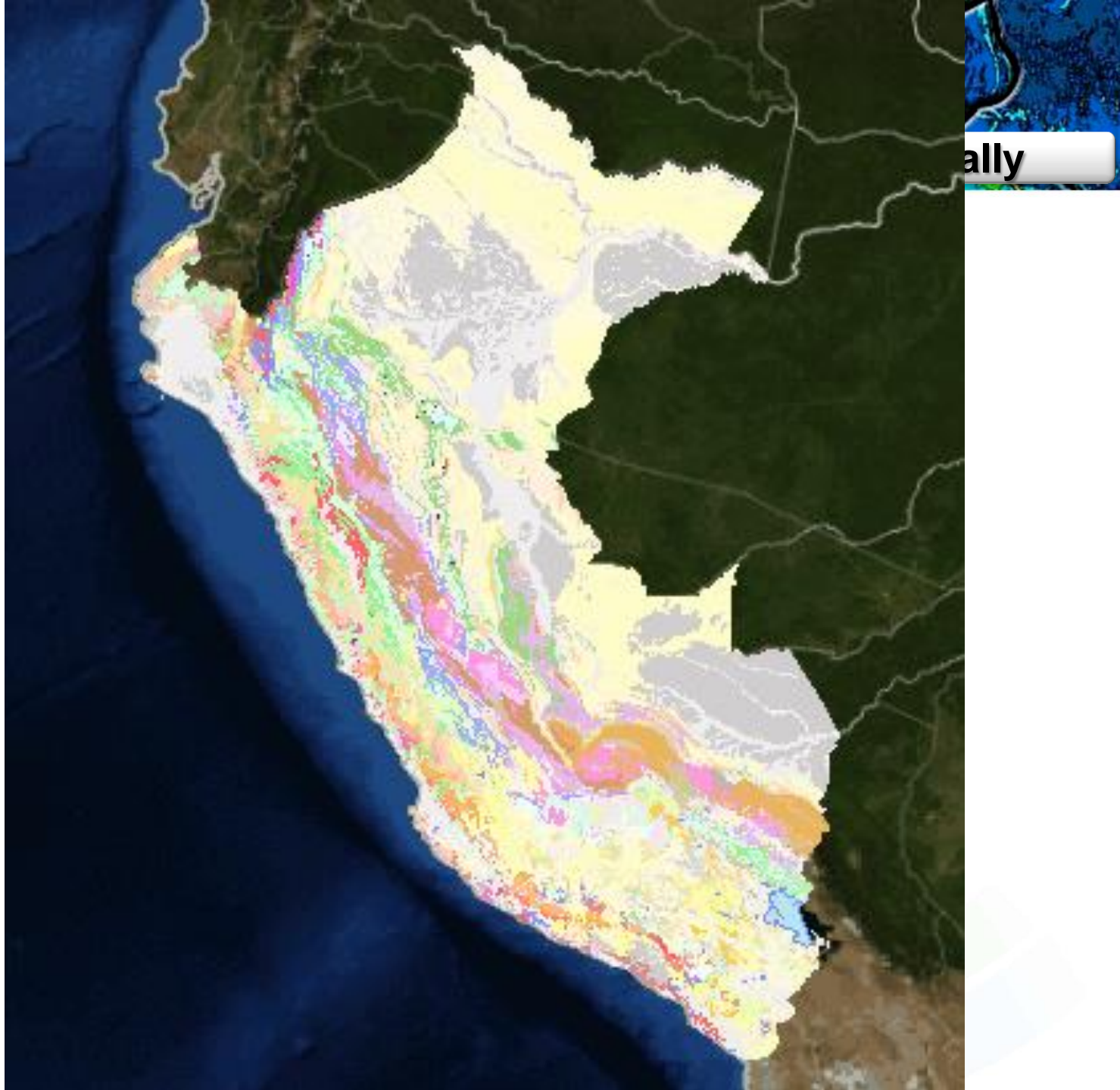
# Dominican Republic...

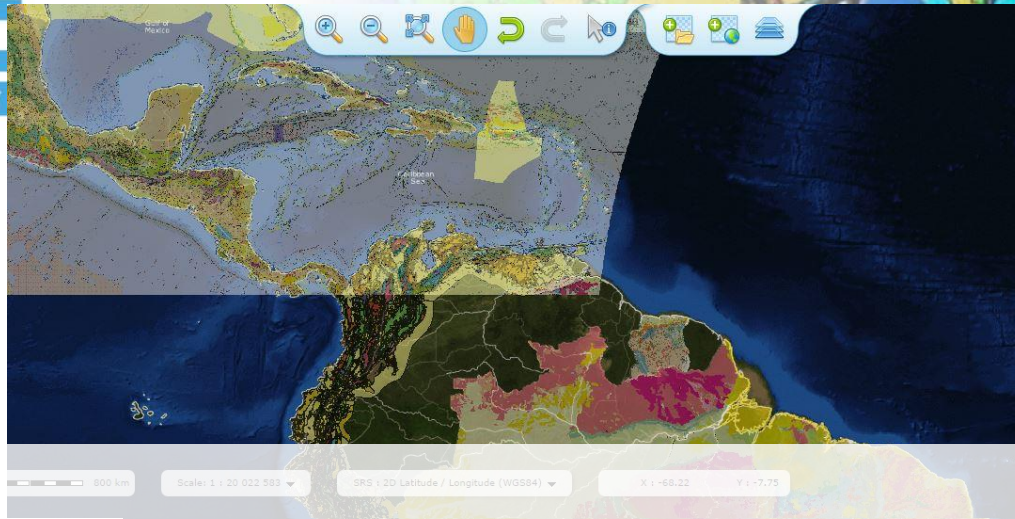


# Puerto Rico...



Peru...





**Let's jointly pursue larger involvement of South American countries!**





**OneGeology is about sharing geoscience data**

**Sharing is essential to the future of all multi-disciplinary science and industry**

**Data availability is essential to achieving the optimal application of geoscience data for the benefit of the sustainable societal progress**

**Thank you for your @10tion!**

**Thanks to all the OneGeology members for their input (financial and in-kind) and to supporting organisations!**

**We encourage you to join OneGeology and to visit us at [www.onegeology.org/](http://www.onegeology.org/) and [portal.onegeology.org](http://portal.onegeology.org)**

[onegeology@bgs.ac.uk](mailto:onegeology@bgs.ac.uk); [marko.komac@geo-zs.si](mailto:marko.komac@geo-zs.si)