

# Enabling a two-way flow of geological information with maps, apps and augmented reality

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British Geological Survey



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# Outline

- About the British Geological Survey
- Open Geoscience initiative
  - Data delivery
  - Crowdsourcing/citizen science



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# British Geological Survey

- Founded in 1835
- Provider of objective and authoritative geoscientific data, information and knowledge to government, industry, academia and the public.
- Public sector research organisation - part of the Natural Environment Research Council (NERC)
- Funded primarily by Government, but have significant external income through commissioned research
- Many research highlights....



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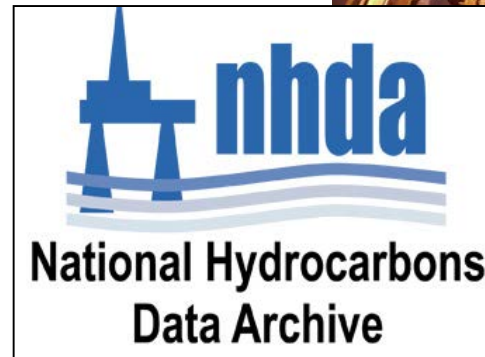
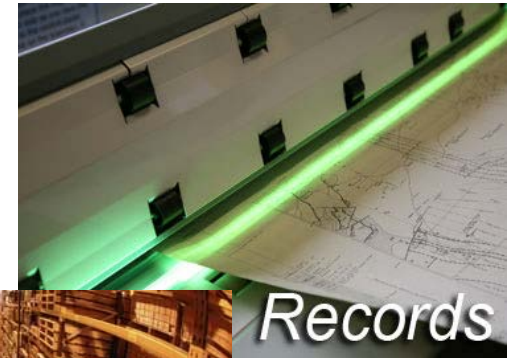






# National Geoscience Data Centre

- Part of BGS
- Support BGS and other NERC centres
- Maintain and **make data available** for the long term



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# Drive towards open data

- **PUSH** for public sector organisations to provide more materials openly
- **PULL** from an increasing environmentally aware and 'tooled up' community
- **DRIVE** from the data providers themselves to share more materials



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# OpenGeoscience Initiative



- In 2009 launched free open-access web portal providing geological information for research, education and commercial use

<http://www.bgs.ac.uk/opengeoscience>

- Provides access to (for example):
  - Geological maps for the whole of Great Britain at various scales
  - Web map viewers and web map services (WMS)
  - Software and Apps
  - Over 50,000 geological images
  - Databases, metadata, search tools *etc.*
  - Educational resources



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**USER CONFERENCE  
EUROPE**

October 14-16, 2015 | Salzburg, Austria



# A two way flow of information...

- Web apps
  - BGS map viewers
  - BGS Crowdmap
- Mobile apps
  - iGeology
  - iGeology 3D
  - mySoil
  - myVolcano



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-  **Surface Geology**
-  3D Models
-  Borehole Scans
-  Earthquake Timeline

### Surface Geology

- Superficial only
- Bedrock only
- Bedrock and Superficial

Visible geology:  
1:625 000 scale

**Geology Key**

[More on digital geology](#)



**Go to Location**


**Switch Basemap**

100%  0%

**Geology Transparency**

**Grid Ref: 523614, 178461**

W68DR

Bedrock geology  Superficial deposits 

**1:50 000 scale bedrock geology description:**  
London Clay Formation - Clay And Silt. Sedimentary Bedrock formed approximately 34 to 55 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.

**Setting:** deep seas. These rocks were formed in deep seas from infrequent slurries of shallow water sediments which were then redeposited as graded beds.

[Further details](#)   [What is Bedrock Geology?](#)

[To purchase detailed geological reports for this area, try our GeoReports service](#)

# GEOINDEX OFFSHORE



Enter location



HELP



ENQUIRIES



FEEDBACK



## Map Layers

### Sample Data

- ACTIVITY DATA
- GEOCHEMICAL DATA**
- GEOLOGICAL DATA
- GEOTECHNICAL DATA
- SEABED SEDIMENT DATA
  - Marine Sample: Folk Classification
- GSM Data
  - Carbonate Data
- Marine Environment Data & Information Network (MEDIN)
  - Oil and Gas Industry Site Surveys
  - Department for Energy and Climate Change (DECC)
    - Hydrocarbon Wells
    - Geophysical survey lines
    - Magnetic Anomaly Maps

LEGEND CLIP & DOWNLOAD

# GEOINDEX ONSHORE



Enter location



## Data

### Welcome to the Onshore GeoIndex

To begin click on 'ADD DATA' to add a new layer to the map and zoom to a location using the 'Enter location' box.

The Onshore GeoIndex is now mobile friendly, opening with a simplified user interface on a smartphone or tablet.

ADD DATA

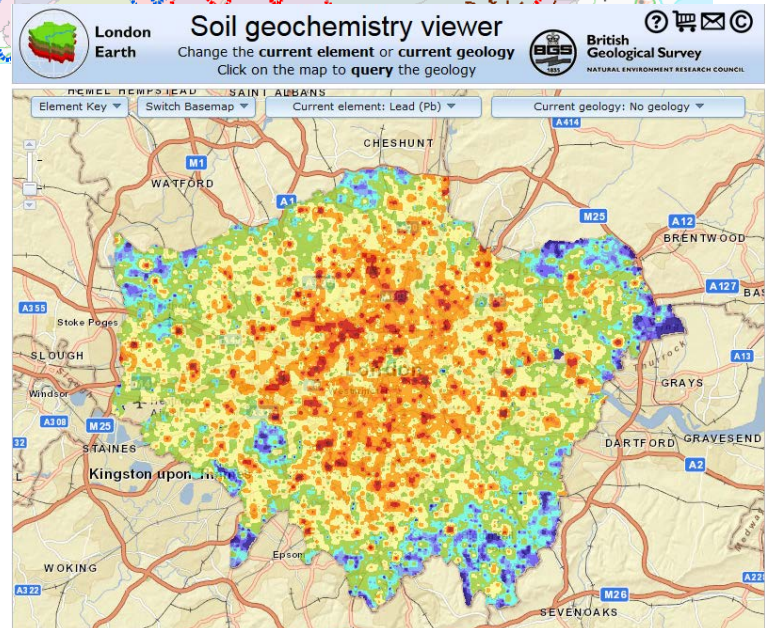
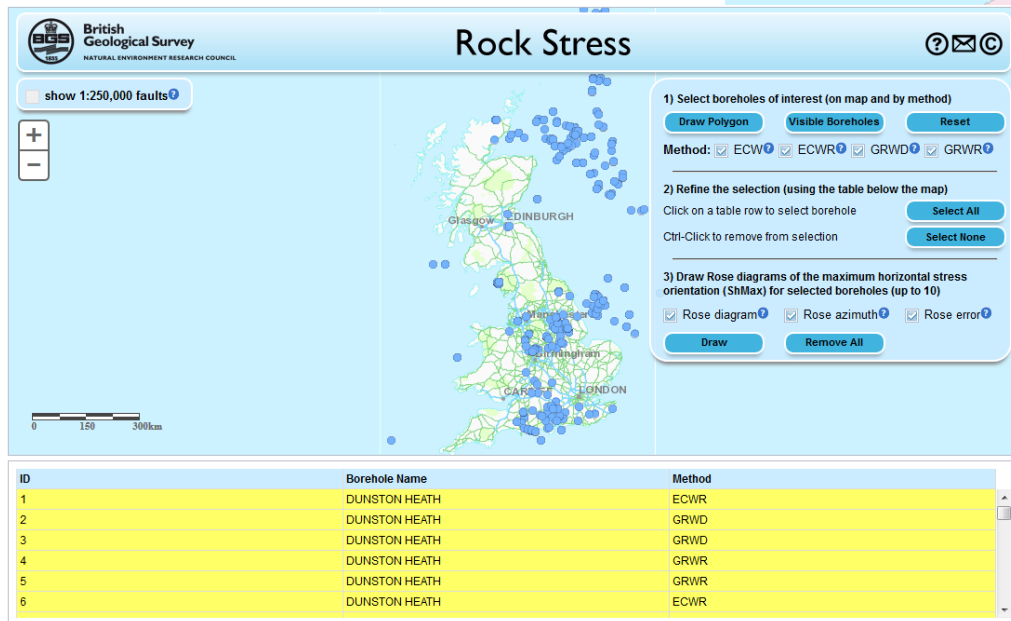
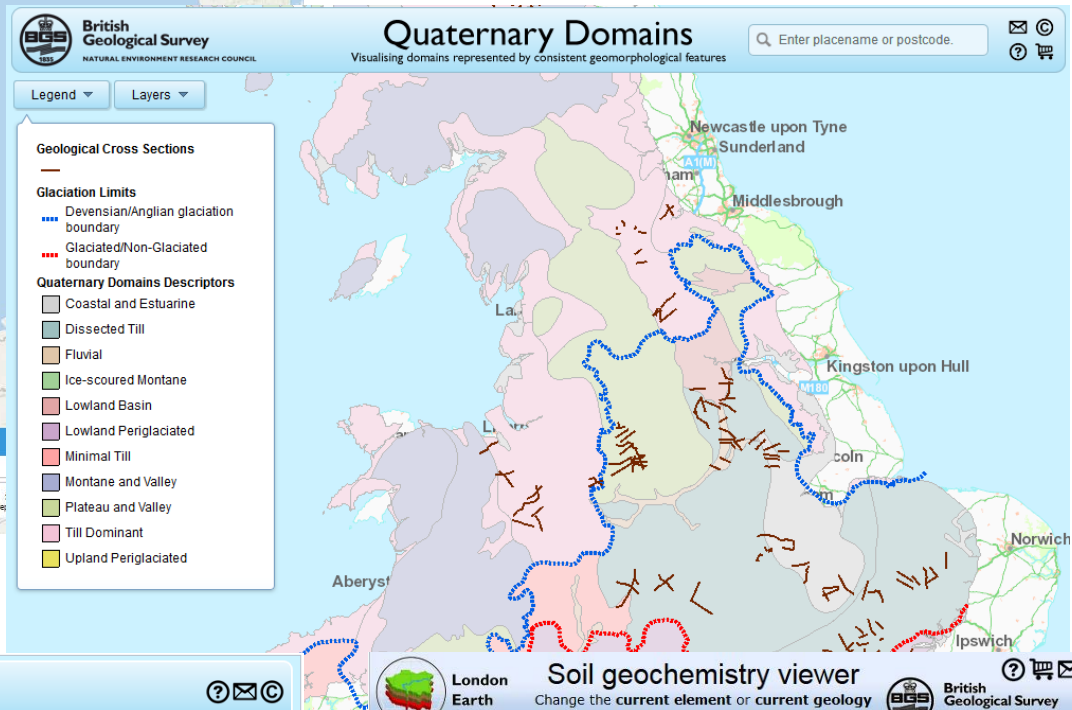
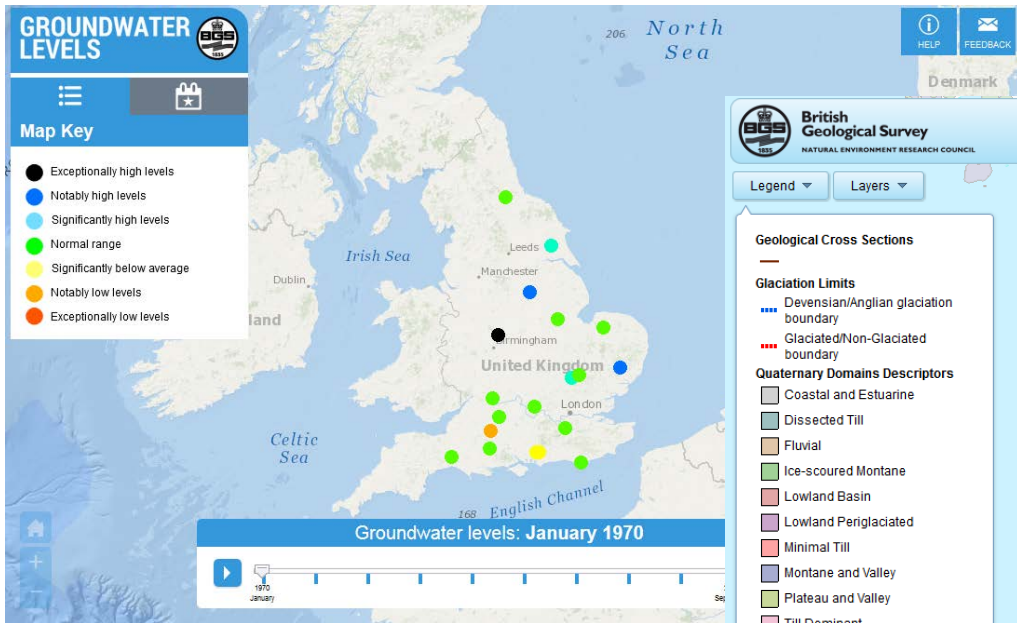
SHOW LEGEND



Location: 893720, 318489



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# Citizen Science & BGS Crowdmap

- Volunteers perform research-related tasks
- Key benefits,
  - Allow scientist to accomplish research objectives
  - Promote public engagement in the research
- **BGS Crowdmap** encourages volunteers to record observations about temporary geological exposures or geological hazards
- Don't need to be qualified – just need to know where the event/observation is located.



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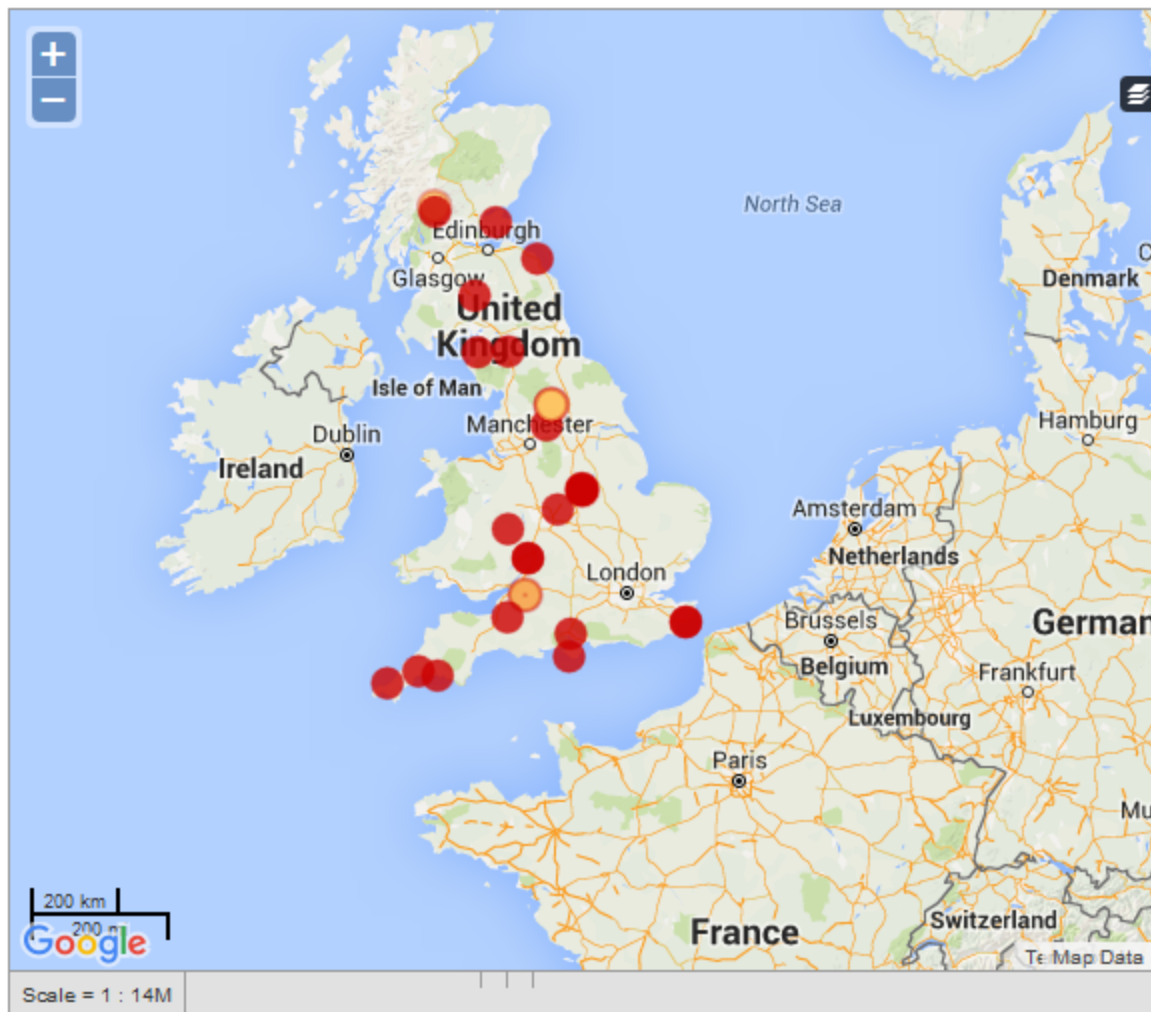
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This site's aim is to create a geological community where geologists (whether amateur or professional) can report a geological observation.

FILTERS → **ALL** NEWS PICTURES VIDEO

↓ CATEGORY FILTER [ HIDE ]



**ALL CATEGORIES**



**GEOEXPOSURES**



**LANDSLIDES**



**FLOODING**



**EXTREME EXPOSURES**



**OTHER**

## How to Report

By using an app:

[iPhone](#)

[Android](#)

By sending an email:

[BGScitizenScience@bgs.ac.uk](mailto:BGScitizenScience@bgs.ac.uk)

[By filling this form on our website.](#)

Interval: **Auto** From: **Sep 2011** to: **Aug 2015**

[More Information](#)

Enter as much information about the observation as possible. The mandatory report fields are: Report Title, Description, Categories and the Location name (under the map)... but please fill in as much as you are comfortable with.

View an [example detailed GeoExposures site report](#) or visit the [BGS citizen science page](#) for more general information.

## Submit a New Report

Select A Form Type

Report Title \*

A new report title....

Description \*

Allowed HTML tags: "a, p, img, br, b, u, strong, em, i".  
Iframes are only allowed from: www.youtube.com/embed/, player.vimeo.com/video/, w.soundcloud.com/player.

Description of the exposure, landslide, flood event or exposure...

Date & Time: Today at 12:00 pm (Europe/London)

[+ Modify Date](#)

Categories \*

Geoexposures

Landslides

Flooding

Extreme Exposures

Other

Status of the site/exposure



DELETE LAST

DELETE SELECTED

CLEAR MAP

Find Location

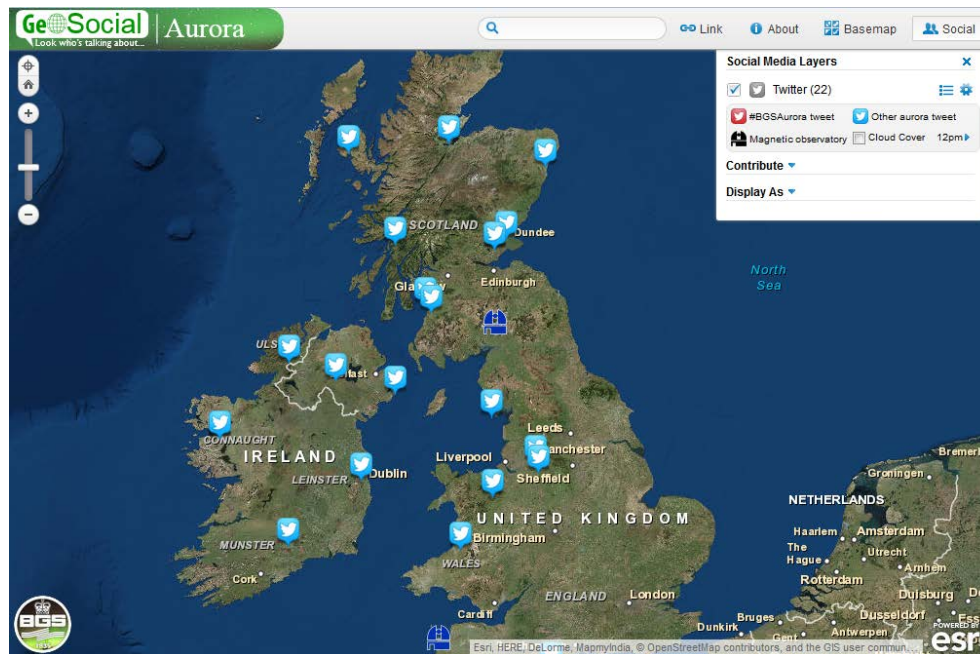
\* Search for your location using a location name OR latitude,longitude coordinates (format: 38.19, 85.61), OR click on the map to pinpoint the correct location..

Location Name \*

Example: Corner of City Market, 5th Street & 4th Avenue, Johannesburg

# Social Media for Scientific Analysis

- Passive Crowdsourcing to answer questions
- I.e. How far south will the aurora borealis be seen?



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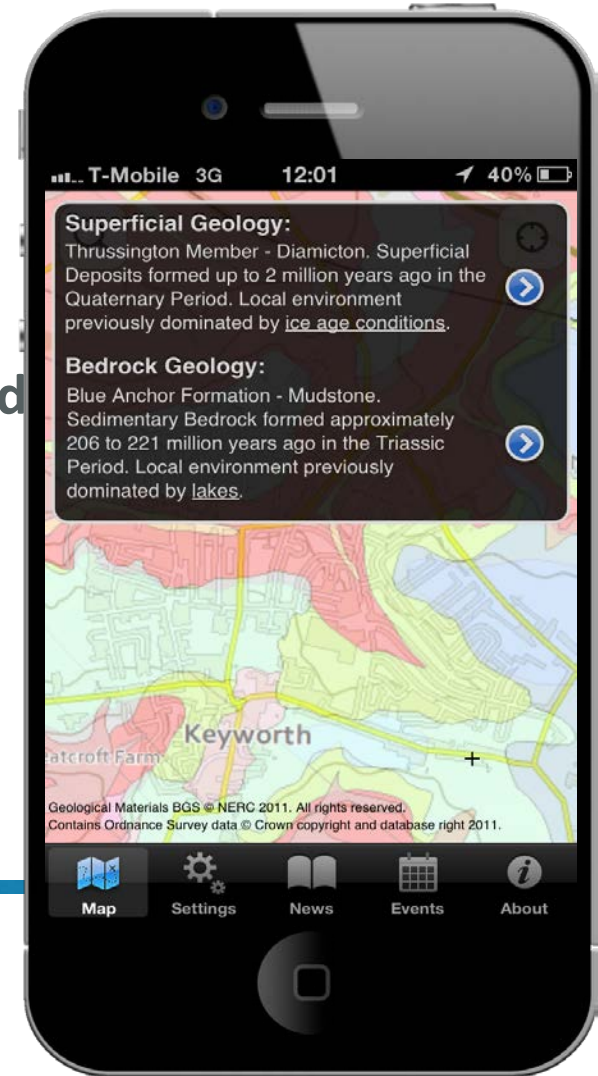




# iGeology

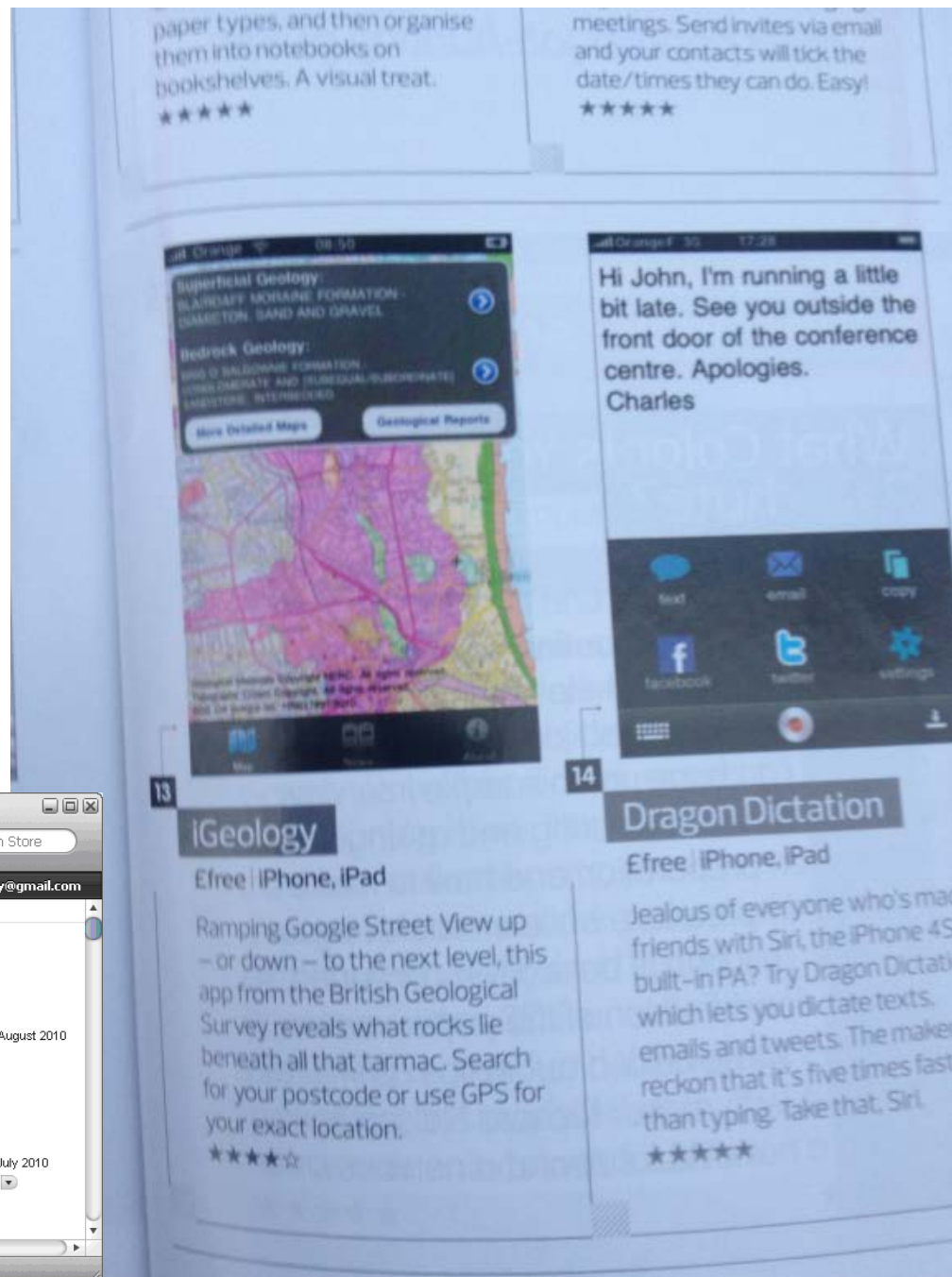


- Free iOS and Android App.
- Allows access to the equivalent of 500 geology maps.
- Access to information on the geology around you
- Choose layers and generate reports
- Developed and maintained in-house.
- Downloaded over 200,000 times !



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# mySoil



- European soil properties map
- Soil texture, pH and depth
- Organic matter
- Topsoil thickness
- Parent material



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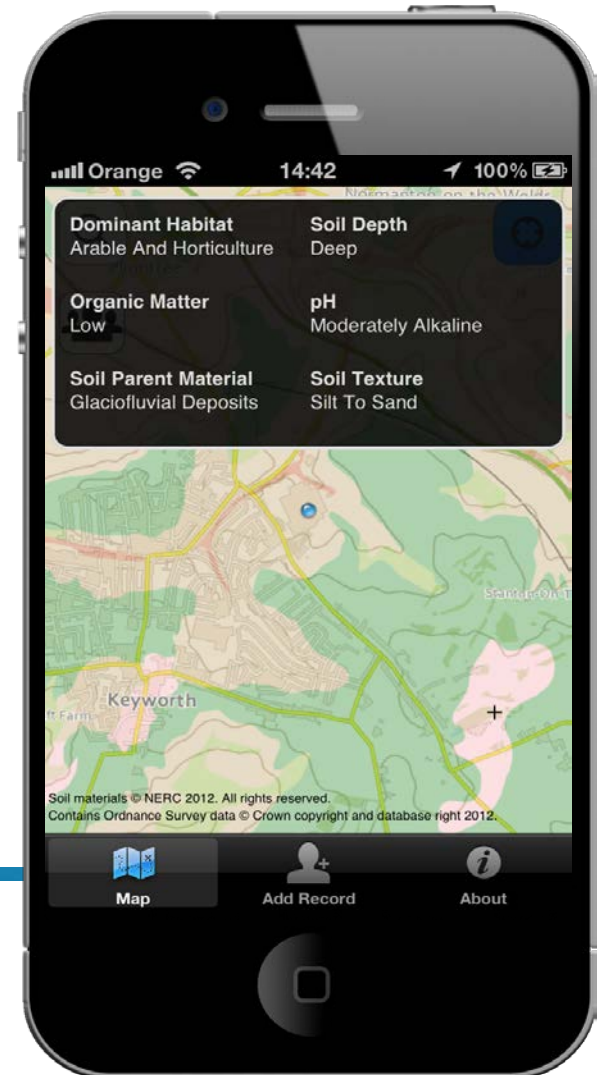
**Centre for Ecology & Hydrology**

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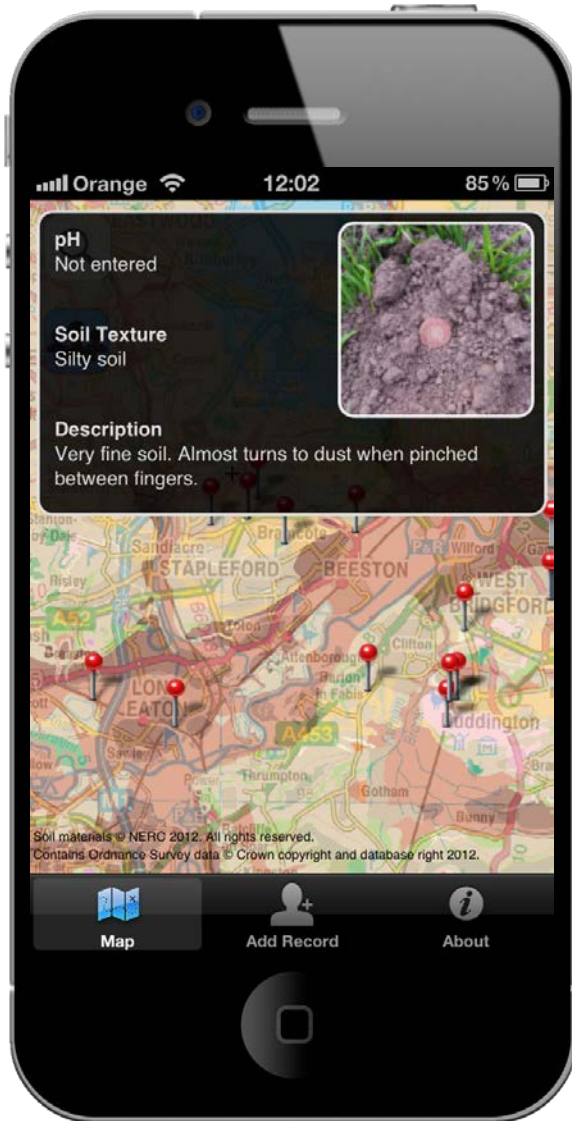
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# Crowdsourced Data

- Users can add data to the map
- Extend and validate data holdings
- 3000+ crowdsourced points



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# myVolcano

- Share data on volcanic hazards
- Write a description, submit a photo, take measurements, collect and send a sample
- Map interface uses ESRI Runtime SDK
  - Find your own location
  - See crowd-sourced data
  - Locations of world volcanoes
  - Basic index data of world volcanoes
  - Collaboration with the Smithsonian Institution



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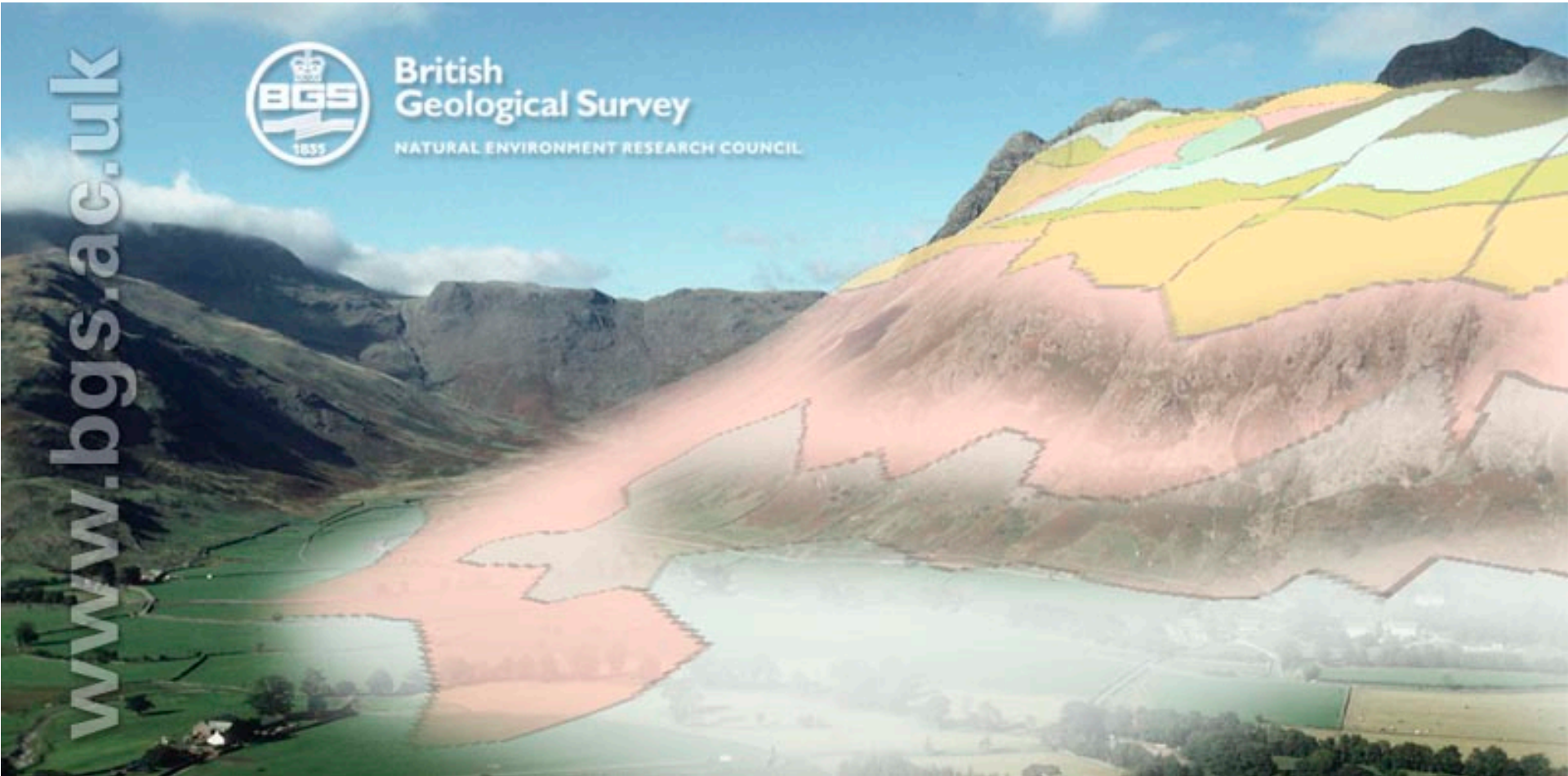
# iGeology 3D – Augmented Reality

www.bgs.ac.uk



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# Augmented reality with terrain draped data

- Discover the Geology of Britain in 3D!
- Creates a 3D model of the landscape around you and drapes the (transparent) geological map over the surface
- Displays the model matching the view through your camera
- Tap on the screen to discover more
- Uses phones GPS to move the view as you walk
- Unlock the landscape....



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# 200 Years of Geological Maps



1815 William Smith map



Modern paper maps

Interactive web maps



Augmented reality apps



mySoil/myVolcano



Mobile map apps  
iGeology





# Questions?



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