

Applied geoscience for our changing Earth

Geohazards & Risks: The UK perspective

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Geohazards in Britain



Subsidence Claims - (Association of British Insurers)



How BGS considers geohazards?

Primary geohazards

- cyclical in occurrence
- return periods determined by analysis of past events
- affect regions
- controlled by *regional* geology
- generally not predictable as processes not well understood
- probabilistic methods used for hazard management

Secondary geohazards

- often triggered by primary geohazards
- return periods difficult to determine (limited data)
- affect sites and districts
- controlled by *local* geology
- partially predictable as there is good understanding of processes
- deterministic methods used for hazard management



Primary geohazards earthquakes

• Earthquakes





Primary geohazards flooding

- Flooding
- 2000 costs:
 €1,500,000,000



Limited to floodplains so.....

we can plan for them



Secondary (Shallow).....















BGS approach to Risk Modelling?





National scale assessment

567 SP38Sml DOUGLAS TECHNICAL SERVICES LIMITED CONTRACTOR 17 MESSAS THOMAS DEDFORD & PAR-JACUAR CAPS LTD &ROWNS LANE LINK ROAD ALLESLEY, COVENTRY TIPE OF NUMINE SHELL & AUGH NATIONAL GRO REF. GROUND SUMACE LEVEL 113 - 35 m A G.D. DATE STARTED \$12/65 DIAVETER 150 mm LINING TUBES TO K-ODM INCLINATION VEHICAL BGS Landslide Pro-Forma P1 -Enter New Side Create New Survey Sarvey Ma 110 000 Sheet Continue Browsing Pupture Max Width Preview Report For This Landslide Print Report For This Landslide Date Prec Fault control Y/N HEAD Solifluction deposits 1.5-3 m thick B DIR ! 💌 B SP ! 💌 J DIR J SP . -· In Constant Course Course Course Over Date Tet and System Eak Year · In Course Cou UKNOW - GOG Termed Great Oolite in ref 1 B DIR 💽 🕶 B SP 💽 💌 DIR J SP . ARTDP - WMGR - Quarry backfill and spoil B DIR - 💌 B SP - 💌 J DIR - J SP -UKNOW - EEL Termed Weathered Fullers Earth in ref 1 E UNDERVISIO FRANCE FELLS LIMESTONE FALSE ELL COAL (DERBY) FELC Record: IN FELL FELL SANDSTONE FORMATION Section E: Add FELM FELMERSHAM MENBER ΕN FENCE CONGLOMERATE MEMBER FENC FENTON COAL (BARNSLEY DISTRICT, YORKSHIRE) FEND FENLAND FORMATION FENL FENWICK LIMESTONE (NORTHUMBERLAND)

National Data Collection

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BGS's National geohazard maps



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Shrink-swell clays

4,750,000 (15%) of homes within "significant potential" zone

€4.5 billion damage in last 10 years





Collapsible & compressible

2,260,000 (9%) of homes within "significant potential" zone





Dissolution

1,085,000 (4%) of homes within "significant potential" zone





Running sand

310,000 (1%) of homes within "significant potential" zone





Nationwide Assessment



- 1st High Resolution National Assessment of Geohazards in the world
- 700 000 people use it every year
- Can be integrated with other datasets.....



Knowledge transfer

- 700 000 people use it every year
- Homebuyers Information Pack
- Local Authorities, civil engineers, planners, network operators....
- Most home-insurance companies





Debris Flow Study Scottish Government

Modified GeoSure methodology which takes into account the different factors that cause debris flows.

These include:

- Availability of debris material
- Hydrogeological conditions
- Land Use
- Proximity of Stream Channels
- Slope Angle



Methodology created in conjunction with TRL Scotland for the Scottish Debris Flow Study.



Landslide Assessment Forestry Commission Wales



- Landslide screening using BGS data sets:
 - ✓ Digmap
 - ✓ GeoSure
 - National Landslide Database
 Debris flow study
- Identified forestry blocks where landslides had been recorded as well as those with a high landslide/ debris flow potential.

Aim was to determine where landslides have already occurred and where was susceptible to future landsliding.



Pipeline Landslide Assessment





Conclusion of BGS Experience



A European Risk Model?

A seamless continuous model combining hazard & vulnerability accessible to all stakeholders within the European Union.

But at what

- Spatial Scale (1 million or smaller) &
- Complexity (no of elements, no of hazards, forcing factors)
- Natural & anthropogenic hazards



Thank you for your attention

Any questions



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For more information ...

http://www.bgs.ac.uk/research/lan dUseAndDevelopment_sgr.html

Thank you for your attention

