

## The landscapes of Scotland ...

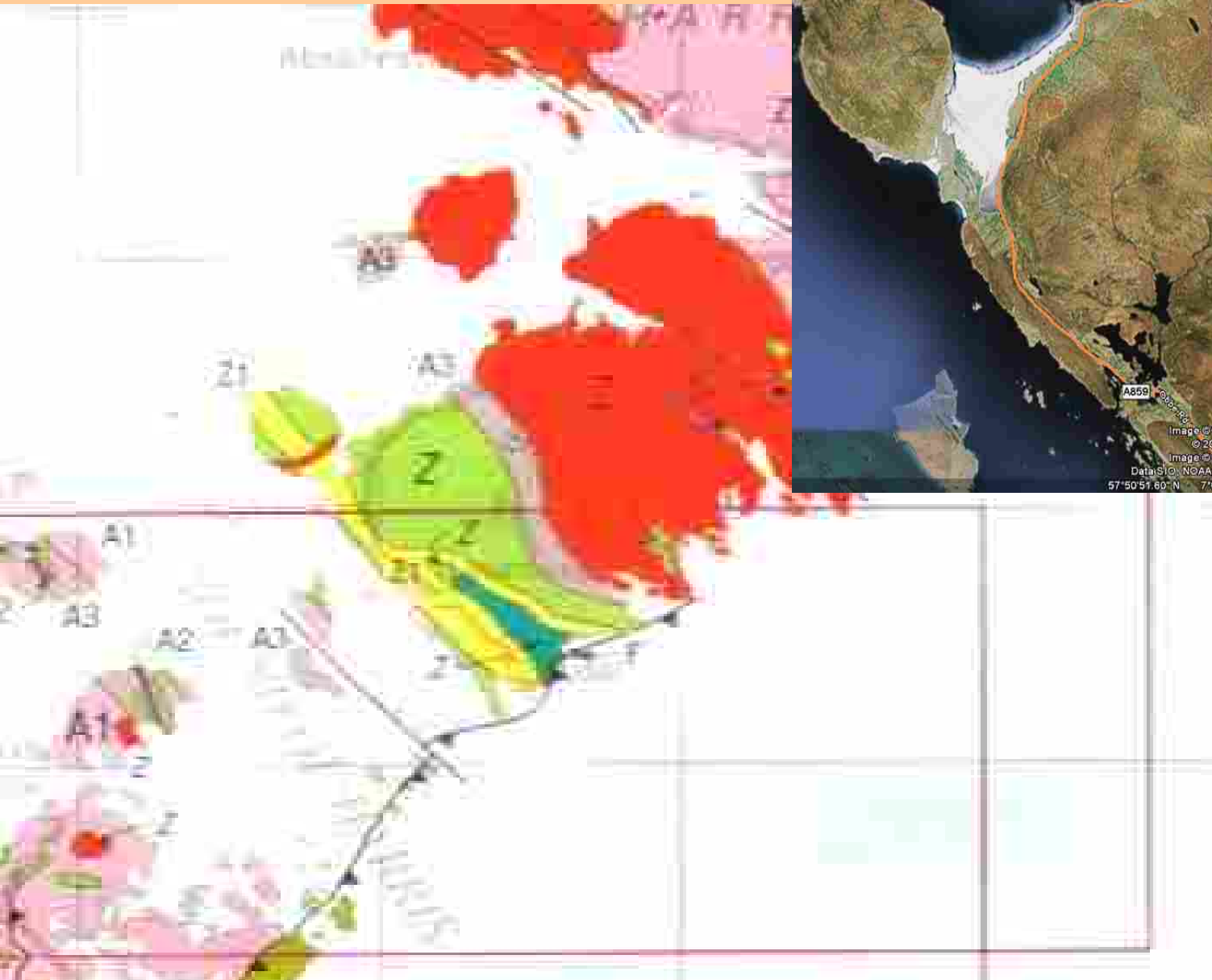
- what they tell us about *Scotland in the past*
- demonstration of the *ongoing processes* that have shaped the modern landscapes and will continue to do so into the future.
- Linking with *people* and how we use rocks and interact with the landscape.



# South Harris ~ Lewisian Gneiss ~ ancient continental crust



Glaciated landscape, poor soil formation, lots of exposed rock, different rock types give variations in local scenery



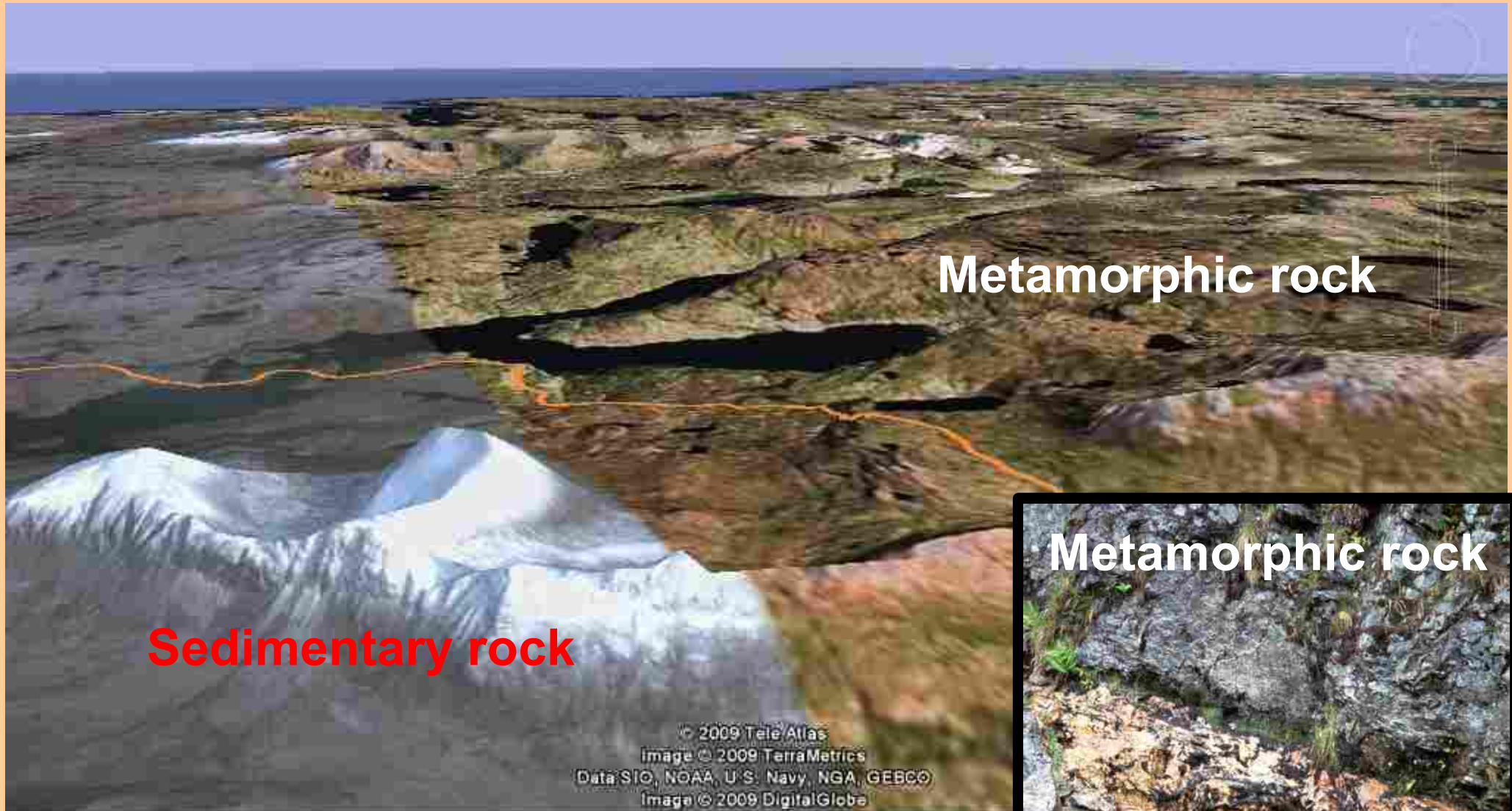
# Quarrying for aggregates

Outer Hebrides most famous hill – Roineabhal on Harris. Site of proposed superquarry & long planning battle. The symbolic mountain top was taken into custody by the Mi'Kmaq First Nation people.

Now to be a National Park.



# Northwest Highlands: the Moine Thrust (Quinag & Loch Glencoul)



Range in rocks of different ages gives varied scenery



**Layered Torridonian sandstone**

**Cnoc and lochan: Lewisian Gneiss**

**Blue sky - October!**

**Exposed bedrock,  
Bedding and vertical  
Cracks allow rock to  
shatter**

**Formation of scree slope**



# Shetland landscapes: controlled by the grain of the rock

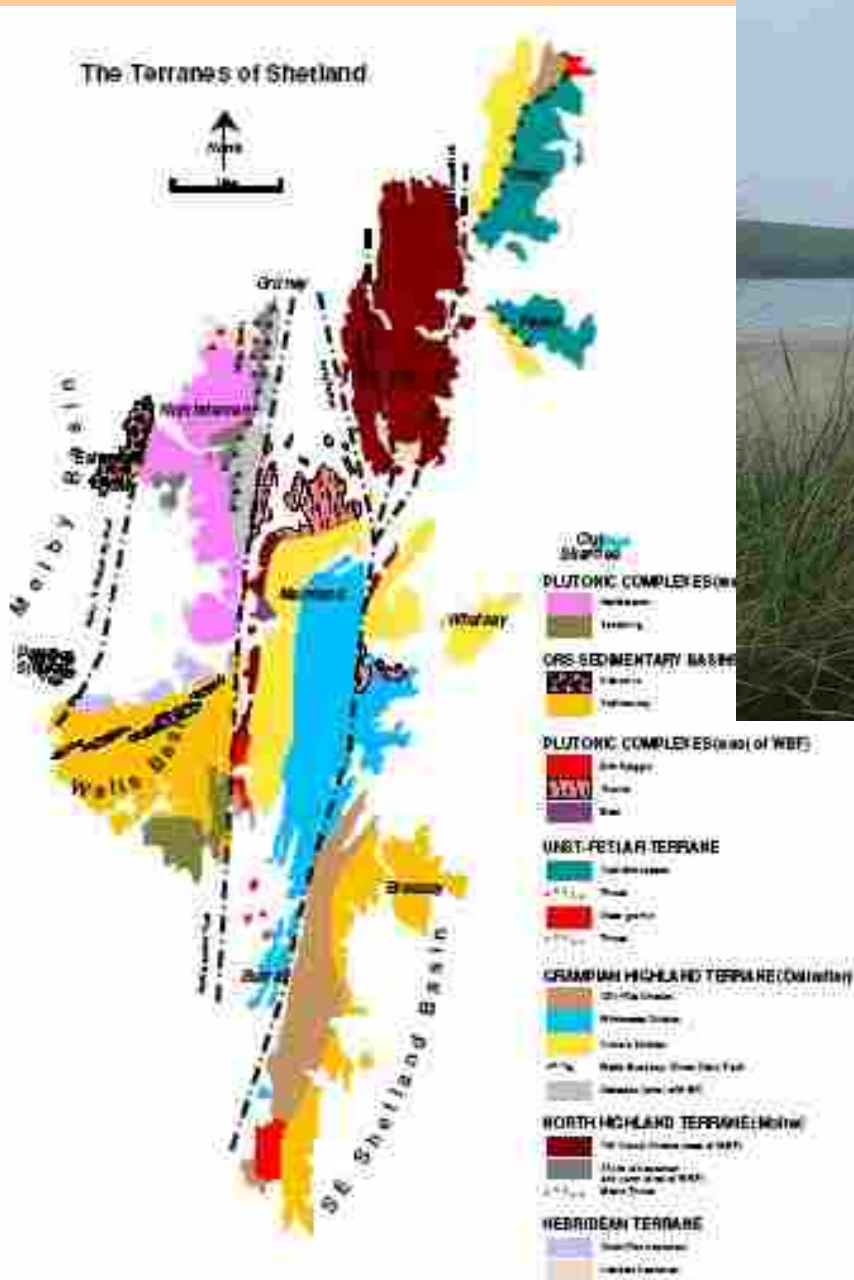


Figure A2.1. The Geology of Shetland



Tombolo



North-south flooded valley

# Metamorphic Highlands – altered marine sand and mud



Mallaig / Knoydart area ~ Moine rocks ~ tough, monotonous



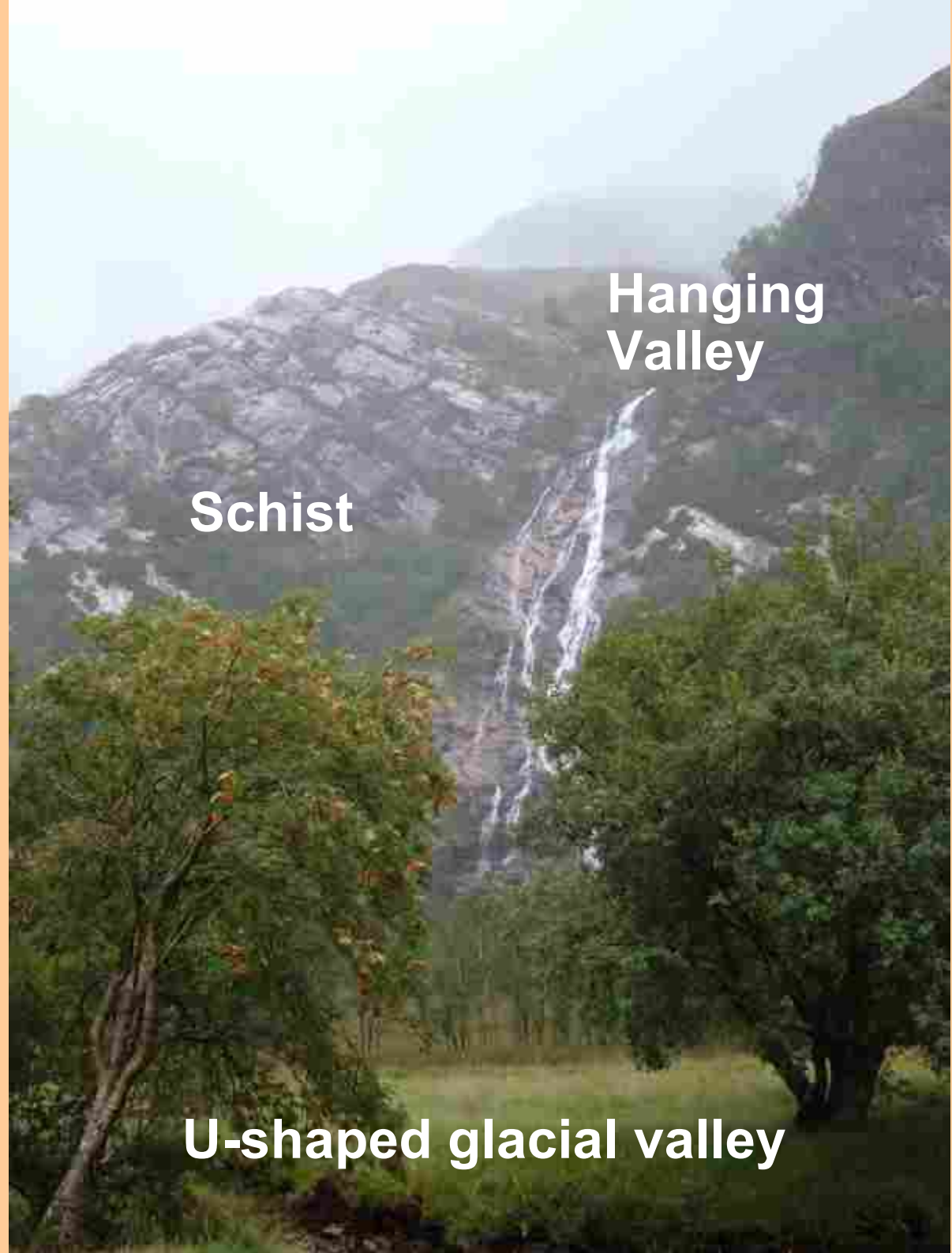
**Local hero beach**

**Quartz-rich schist  
breaks down to  
form sparkling sand**

Look close – see evidence of how sediment accumulated



Old Man of Steall,  
Glen Nevis



**Hanging  
Valley**

**Schist**

**U-shaped glacial valley**

# Glencoe: apocalyptic volcanic activity, cauldron collapse



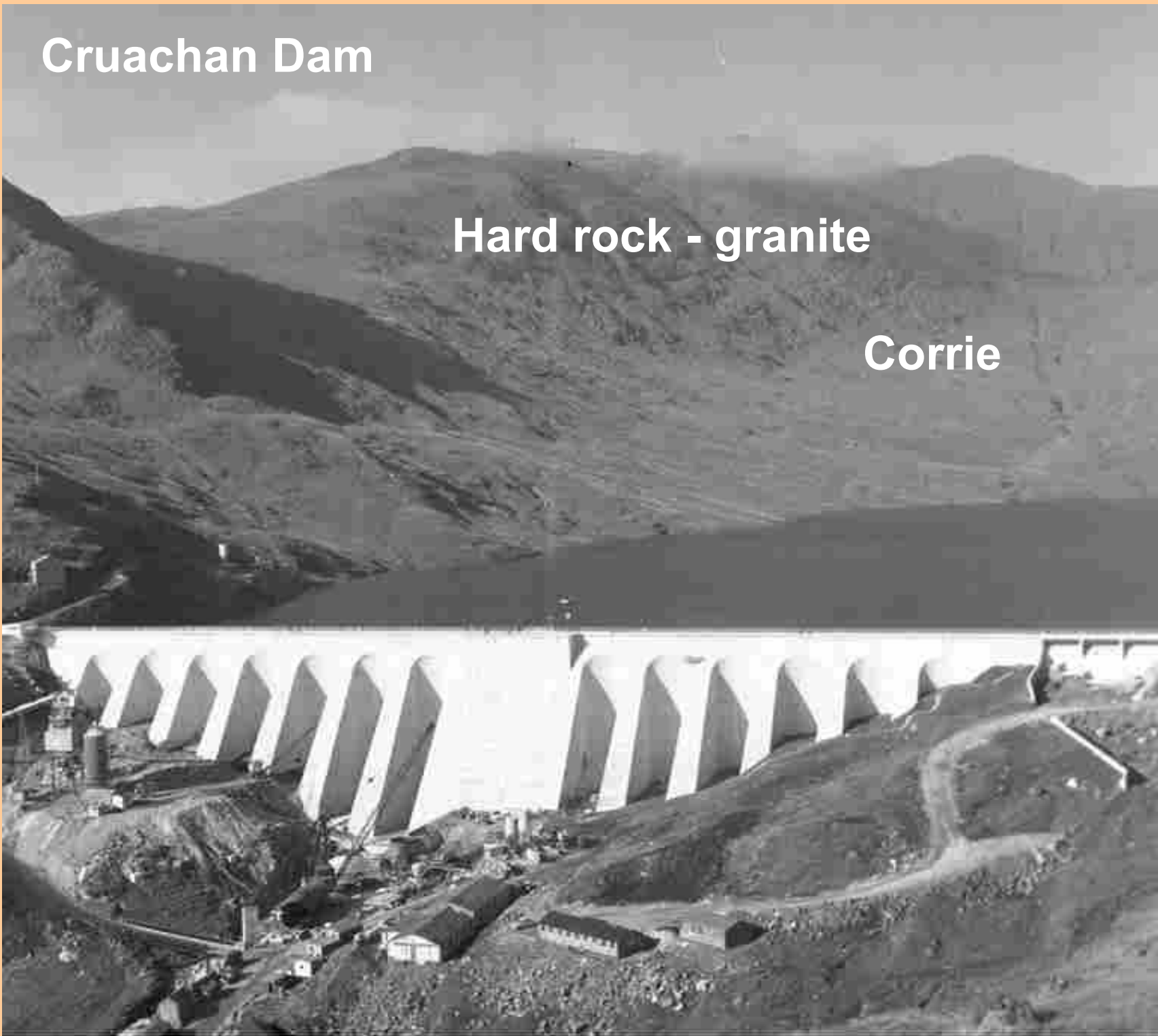


Plate 24 The ring-fault at An t-Sròn and on Stob Coire nam Beith (background) (viewed towards the south) is traceable in 1 km of vertical relief and shows at least 500 m of vertical displacement of the volcanic succession and Basal Andesite Sill-complex.

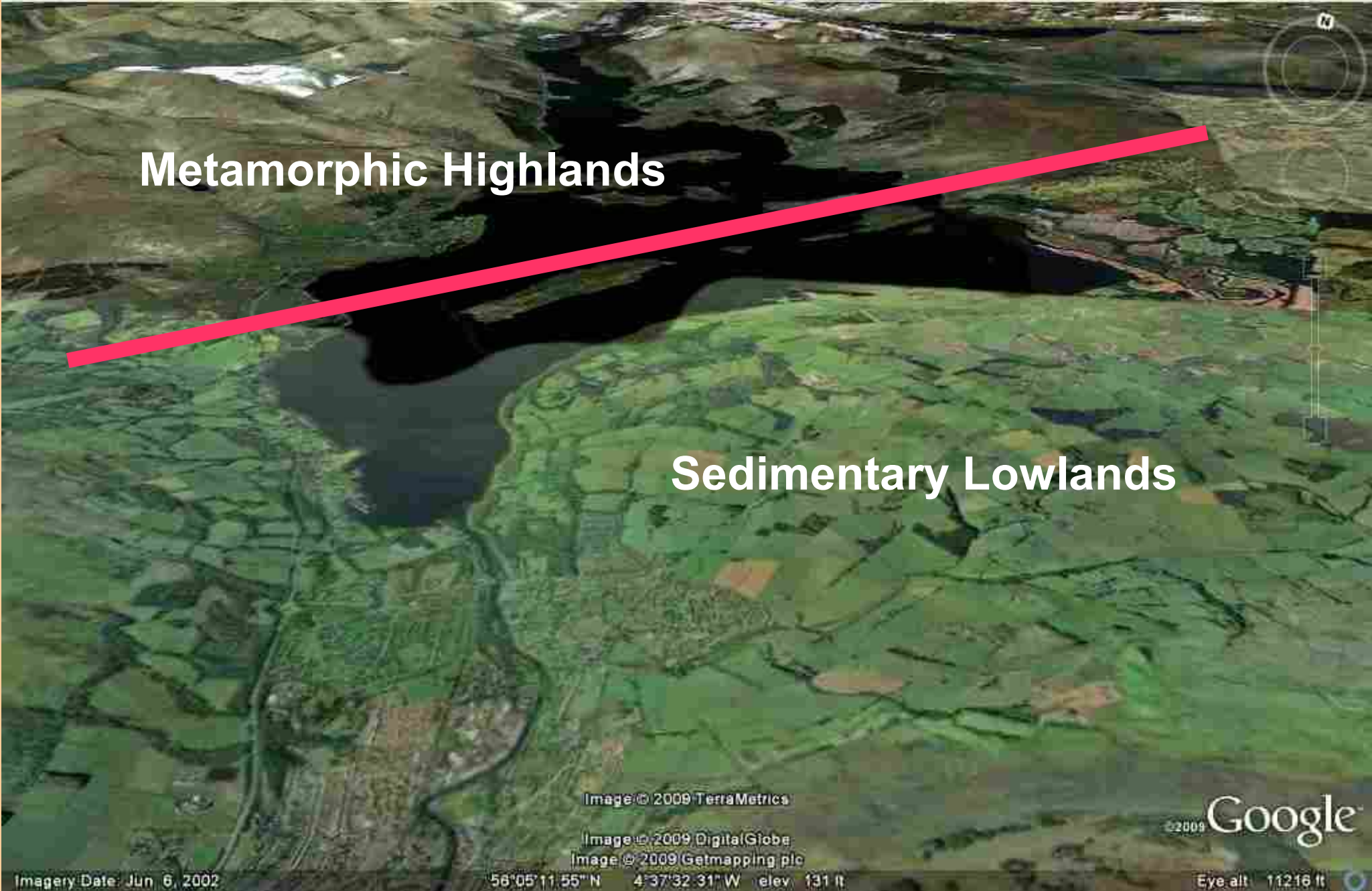
# Cruachan Dam

Hard rock - granite

Corrie



# Loch Lomond & the Highland Boundary Fault



**Metamorphic Highlands**

**Sedimentary Lowlands**

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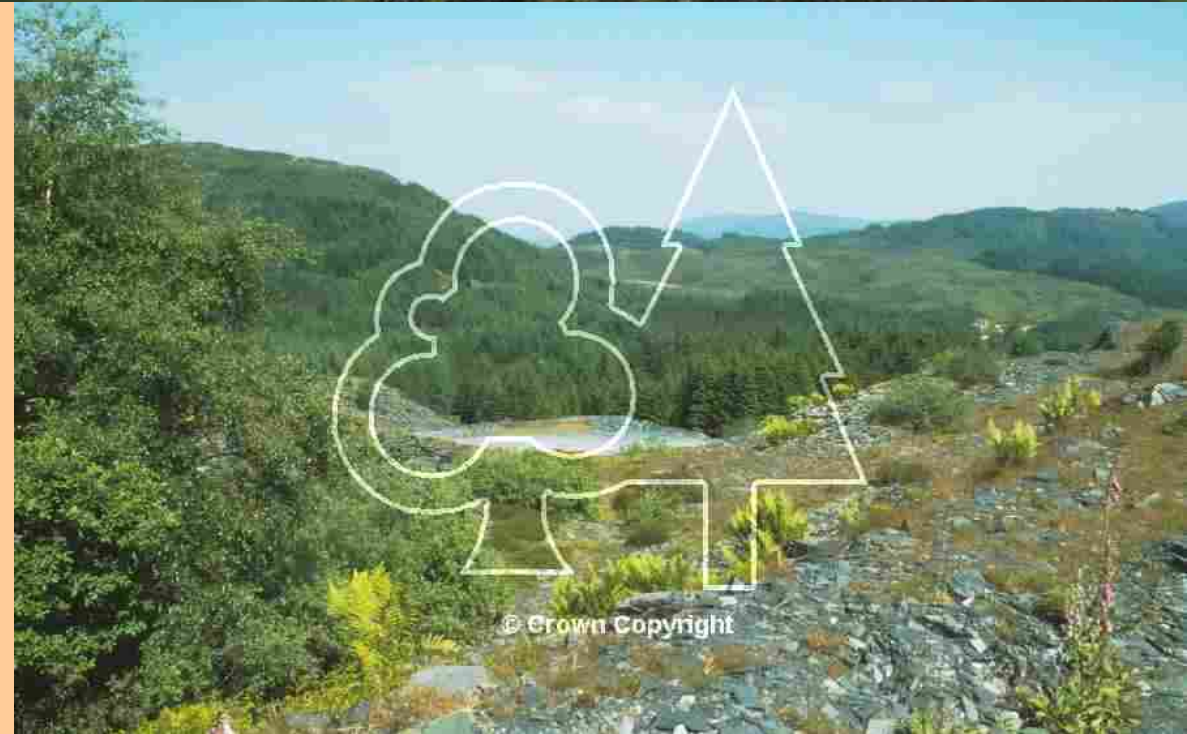
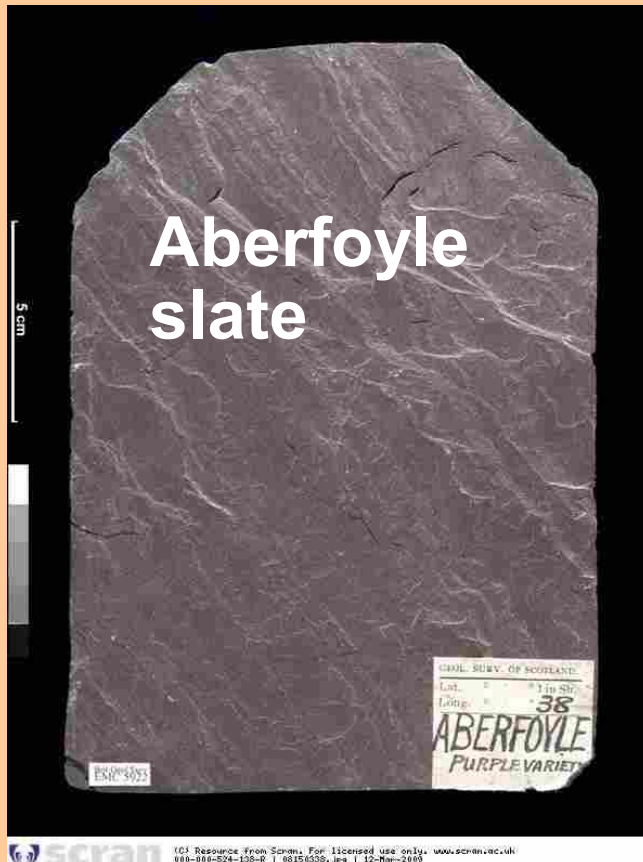
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Imagery Date: Jun 6, 2002

56°05'11.55"N 4°37'32.31"W elev. 131 ft

Eye alt. 11216 ft

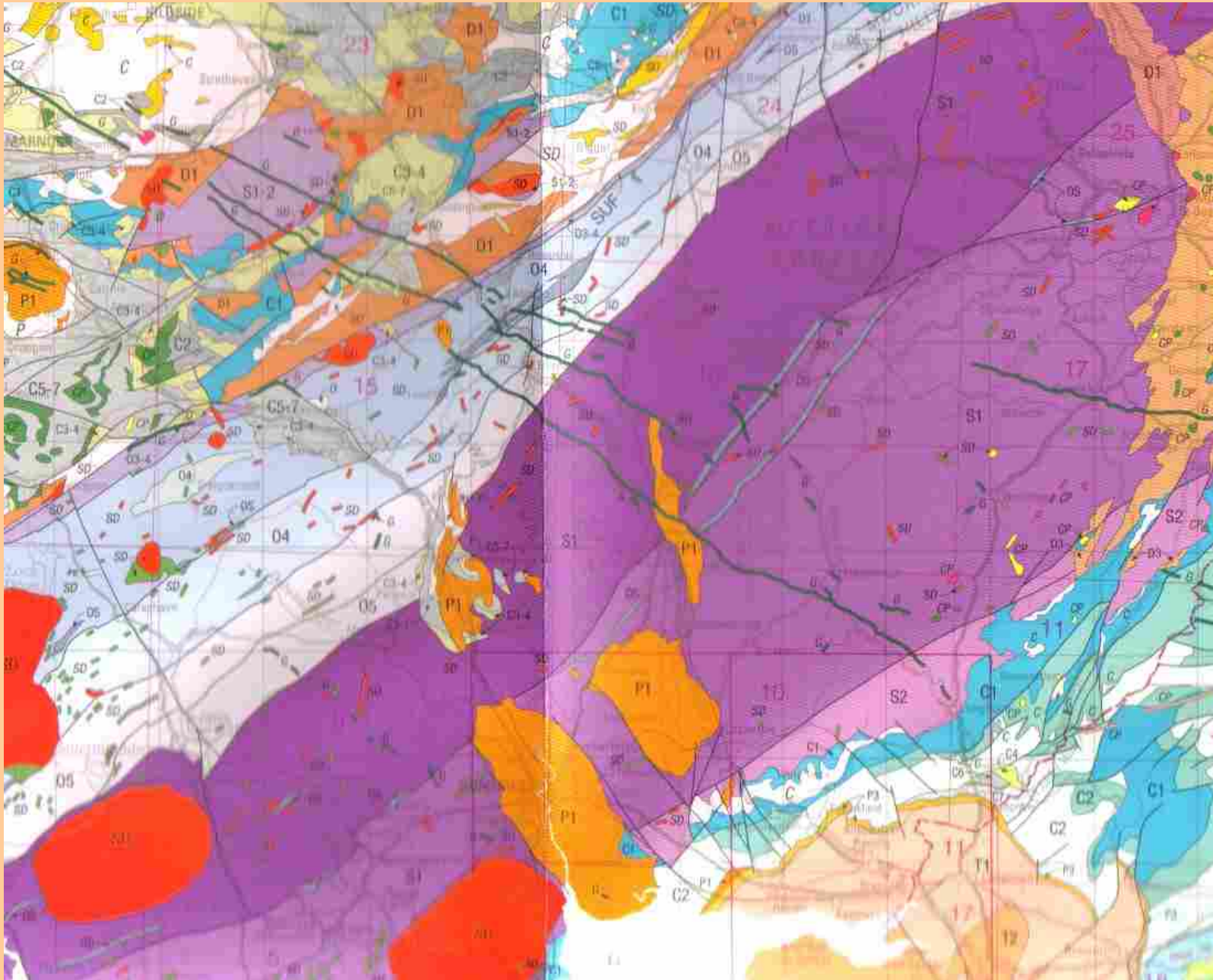
# Dalradian Metamorphic rocks in the Southern Highlands



# Fault movement and erosion: conglomerate at Dunnottar



Southern Uplands – lie of the land reflects origin of rocks. Ocean-floor sedimentary rocks, compressed and folded





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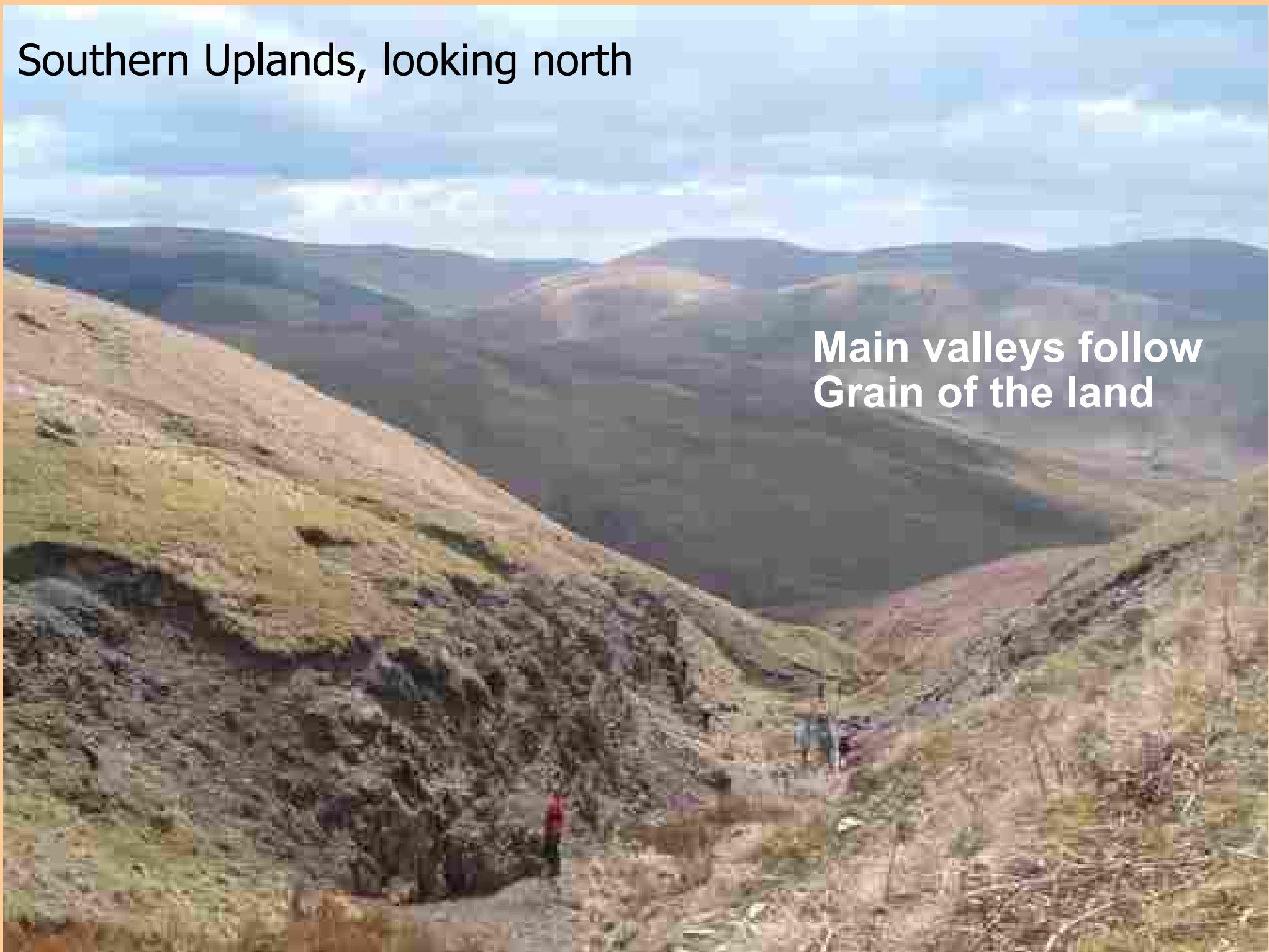


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# Southern Uplands, looking north

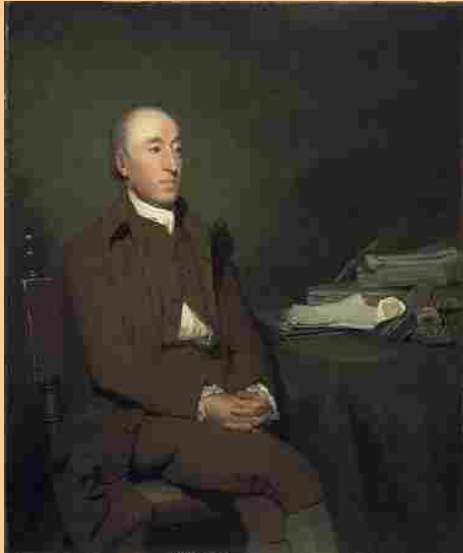
**Main valleys follow  
Grain of the land**





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Siccar Point: the mind seemed to grow giddy looking so far into the abyss of time .... we became sensible how much further reason may sometimes go that imagination can venture to follow



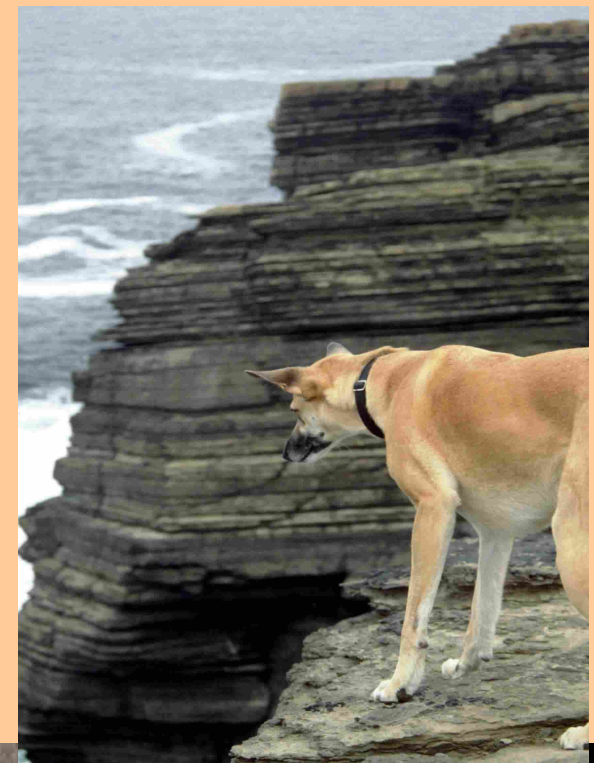
# Siccar Point unconformity



Younger 'Old Red' Sandstone  
formed in quieter times

Old contorted  
Tilted Greywacke  
Sandstone from  
The lapetus Ocean

After the collision, erosion and Old Red Sandstone. e.g. Caithness and Orkney



# Igneous and sedimentary rocks in the Midland Valley: Stirling



Ochils - lavas

Flat plain: eroded  
Sedimentary rocks

Resistant Igneous Intrusions

Image © 2009 TerraMetrics  
Image © 2009 DigitalGlobe  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image © 2009 Getmapping plc

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Eye alt 2287/ft

# Direction of ice movement



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Elie, Fife ~ Contrast between sedimentary and igneous creates coastal features too: headlands and beaches



**Volcanic vents**

Image © 2009 DigitalGlobe  
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Image © 2009 Getmapping plc  
Image © 2009 TerraMetrics

©2009 Google

Imagery Date: 1999

56°11'12.75" N 2°49'21.37" W elev 1 ft

Eye alt 4995 ft

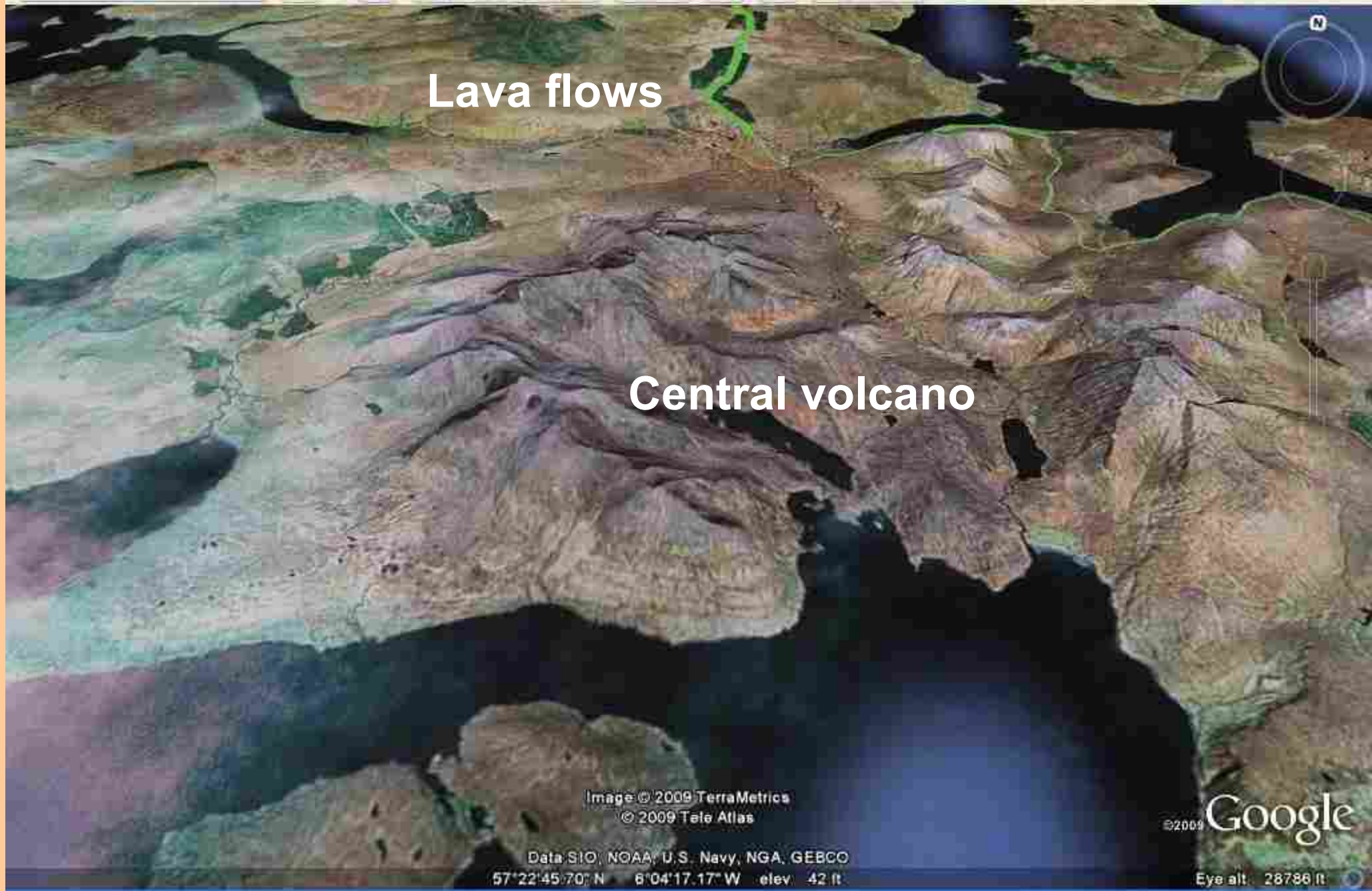
## Rock & Spindle St Andrews

Volcanic vent: contrast between  
solid basalt and softer vent  
agglomerate give local detail



Magma cooling in conduit  
Produces radiating columns

# Inner Hebrides: volcanic activity, continental splitting



**Eigg**

**Lava flow cliffs**

**Skye Cuillin**

**Raised beach**

**Softer sedimentary rocks  
Worn away  
Preserved only by hard  
Lava flows above**





**LAVA 60 million years old**

**GRANITE 400 million years old**

**GNEISS up to 3000  
million years old**



**Geodiversity ... the  
best small country in  
the world**