

# **Exercise in Remote Sensing, Geomorphology, Ecology and Development Geography based on Google Earth**

## **1. Aims and objectives**

This exercise will take you across an entire planet and allow you to study mainly geomorphological features but also different aspects of land use, how people get their livelihood secured and how they manage their resources under the conditions that are given by climate, soil, location in relation to other places, etc. Use Internet to search for additional information about the locations that you looking at.

## **2. Starting the exercise**

For this exercise you need access to a textbook in general Physical Geography/Geomorphology and a computer with Google Earth installed. The book used during the course NGEA01 Introduction to the Earth's Environments will serve very well for this.

You will use Google Earth to find different landforms in different parts of the world and explain their origin and relation to their surroundings.

Start the exercise by locating the file *Google and Geomorphology final 2017.kmz* on the server and then copy it to your working directory. Double click to open it in Google Earth. Another option is to open Google Earth and then use file – open and select this file.

In some cases it might be that Google has acquired new images since the text was written so please DO use the button for changing image dates to switch between image acquisition dates, one example is the first thematic stop in the World Sites section – 1. Glacial Landscapes. Here you are among other things requested to try to determine the tree limit in the area, while the current image is from December 2011 and the whole area is snow covered.

It may also be that some versions of Google do not display all images properly, e.g. the Mega Fly over Africa images that are the basis of the stops 5-8 in the World Sites section. Then try to improvise and answer the questions by using other images and materials available. Make sure you have ticked the Photo layer, which may provide valuable ground truth information.

## **3. Results and presentation**

At each “stop” described in section 4 and 5 you will find some statements, tasks or assignments to undertake. Try to comments and reflect on these as comprehensive as possible. You are not expected to write pages on each site but relevant comments and reflections are required. You will be randomly asked to present your findings for at least one of the sites, and to contribute actively

to your fellow students' presentations of other sites. Whenever specific landforms are present you should be able to name and describe them properly. Please comment on human activities and image quality at each site.

#### **4. Warming up with some local landscapes in Scania**

Zoom to an altitude of about 250 km over south of Sweden. Diagonally over Scania you have a linear pattern running in NW to SE direction. Name of the features generating this pattern? What process is generating these features? Check figure one for some hints. Implications on land use?

There is also a pattern that is less pronounced with linear features running from north and fanning out towards SW and SE. The lines seem to be depressions and often parts of them are occupied by elongated lakes. What process generated these linear features?

Zoom in on the twin lakes Ringsjöarna in central Scania. There were actually four lakes originally. Find the two that are now dried up. What are they used for today. Note that the northern part of the eastern lake is quite close to be cut off by the same process.

South of the two dry lakes is the village of Stehag. From the village a linear feature is running towards WSW. What is this called and how has it been formed?

Follow the railroad southwards from Stehag, via the small town of Eslöv to the village of Örtofta where the rail road cross a small river. Zoom so that the flood plain between the rail road and next major road (4 lane motorway E22) to the E fills the screen. Name and explain the major geomorphological features on the flood plain.

In the same screen you should have the Castle Svenstorp in the central left part. Remember the aerial photographs over the field south of the castle that had some initial traces of erosion – what has happened here now, about 30 years after the aerial photographs was taken?

Now move to the E of the town Ystad on the south coast. East of the town is a hotel named Ystad Saltsjöbad where they have put “Groins” perpendicular to the shore line. What is their purpose and which direction for the sand transport parallel to the coast do they indicate?

About 4 km east of the hotel you see a small river mouth on the Baltic Sea. It has no delta – why? Why does the river mouth run parallel to the shore for such long stretch? Another 3.5 km to the E you have another example of the same process.

About 18 km E Ystad you find Löderups strandbad, where groins have been used again. Examining the erosion/deposition makes it possible to state where erosion and sedimentation occurs and in which direction the near shore sand is transported. Explain!

Now move to the town of Landskrona and explain the process active in the near shore areas of the bay just south of the city.

Now zoom out to about 250 km altitude again and compare the coast lines of Scania and Blekinge. What features controls the differences in appearance?

## 5. World sites

In this section you are supposed to visit a number of places. You navigate to a place by using the provided place marker file (KML/KMZ). In the description of each site you have a list of features that you are supposed to find by image interpretation. The place marker will take you to an area but you will have to roam and, most important, zoom to be able to answer the questions. Make sure that you have checked relevant layers in the table of content, e.g. photographs published by the public could assist a lot. Make sure you use all available sources, many of these places are really famous ones and has several information sheets attached in Google.

1. Glacial Landscapes
2. Arid Landscape
3. Geological feature
4. Extreme drainage
5. Details of land degradation and soil erosion
6. Bilma
7. Sandstone plateau
8. Sandstone and drainage
9. La Grande Erg Orientale
10. Murchison falls
11. Mississippi delta
12. River
13. Lut Desert
14. Dunes
15. Siwa Oasis
16. Wau an Namus
17. Amazonas deforestation
18. River disappears'

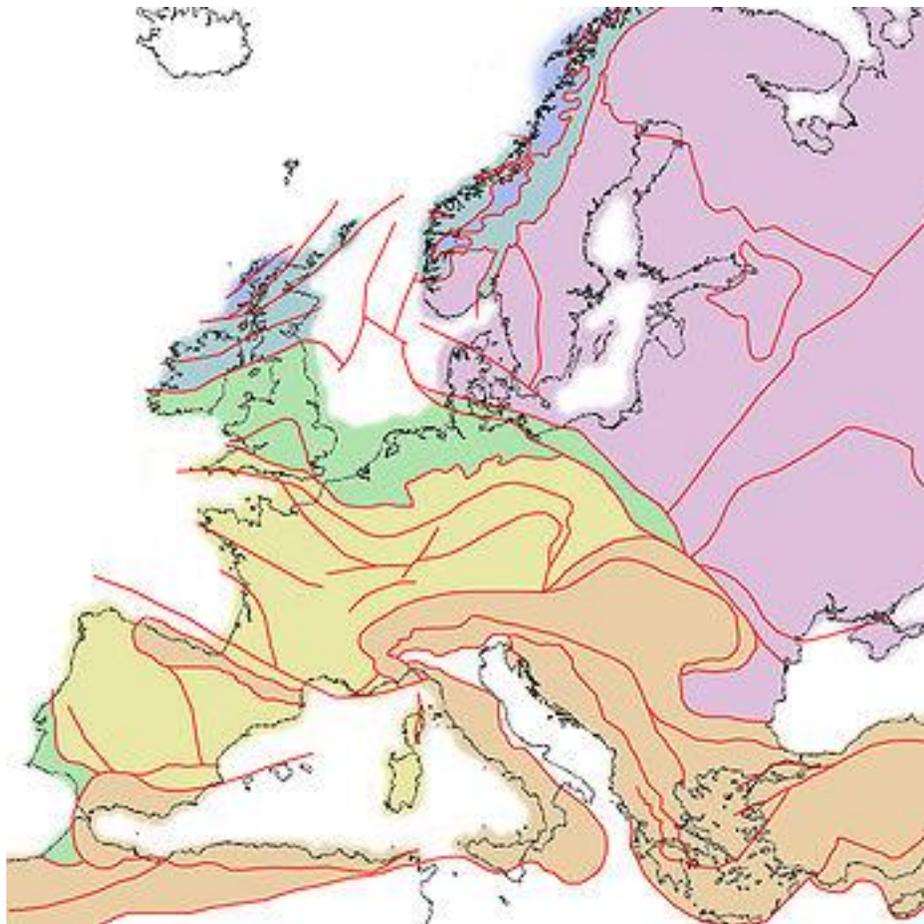


Figure 1: Geology and tectonics for Europe.