**Glacial landscape**

In this location you should find the following features:  
  
Alluvial fan  
Braided river  
End moraines  
Glacial niche  
Talus cone  
U-valley  
  
Try to determine the altitude of the tree limit in the area - Note that to do this you will have to swap to a summer image of the area. Any traces of human activity in the area? Where is it most logic to find such traces?

**Arid Landscape**

General description of the landscape:  
Vegetation and agriculture  
  
Geological structures:  
Folding  
Syncline and anticline  
  
Geomorphological features:  
Alluvial fan  
Fluvial terrace  
Meander  
Ephemeral river  
Gully  
  
Human structures:  
Cultivation terrace  
Irrigation dam in water course (just south of Barkhan)  
Irrigation canal  
  
Barkhan is a name for a landform - which?

**Geological feature**

How has this landscape been formed? It is useful to zoom in or out to get different perspective on the area. Topography? Any distinct or marked changes?

**Extreme drainage**

What is controlling how the rivers flow in this area? General landscape characteristics?

**Details of land degradation and soil erosion**

Make sure that you check the "on" box for the layer - Gallery/National Geographic Magazine/Mega Flight over Africa. These sites will be marked with a small red aircraft. When you zoom in you will see a small overlaid image (the dimensions of the detailed "frame" is roughly 120 by 80 m) on top of the regular satellite images with a very high geometrical resolution.   
  
Note that the place marker is on one in a series of totally 21 images with this extremely high resolution. Follow this series first 8 images towards NW, then 4 images S, then W and finally N. An altitude of about 2.0 km is fine in order to see the high resolution frames. Then zoom in on these one by one.  
  
Your task is to note different traces of erosion and degradation processes indicators that you can detect along this transect. Note that not all frames contains distinct erosion traces and many traces are found in several frames.

**Bilma**

The City of Bilma is very remote. What information can you find on the Internet about it?  
  
In this region houses are often built from salt stones. Could you give an explanation to where the salt comes from?  
  
Look at sand accumulations connected to many of the rock outcrops occurring in this area. What is the prevailing wind direction and in what direction are sediments moving?  
  
About 3.5 km north of Bilma there are some sand dunes. Name of dune and direction of movement. What more do they tell you about the characteristics of sediments?  
  
Zooming out from Bilma you see another type of dunes south of the city. Name and how are these formed?  
  
Center on Bilma and zoom to about 700 km altitude. You see a mountain range to the NE of the city. A main peak is called Toussidé. How is this formed? How is the mountain chain in general formed? What type of rock does the formation process imply? How hard is this rock? What exogenic processes are currently shaping it? Very close to Toussidé you find some photograph of Le Doon, or Trou au Natron, that gives very valuable information and a spectacular view.  
  
Identify at least some traces of mass movements.

**Sandstone plateau**

Click on the red aircraft symbol and inspect the image. Despite the fact that this area has been submitted to erosion for millions of years the general top surface is flat. What is a large flat area called according to Davis (the landscape cycle)?  
  
The sandstone plateau has distinct patterns of erosion. What type of erosion dominates? Is this active under present climate or a relic from passed climate situations?  
  
If you inspect the images connected to the red aircraft symbols towards the north you move from the sandstones out on a very flat area that becomes more and more covered by moving sand dunes. Name some and describe formation and connect to availability of blown sand.

**Sandstone and drainage**

This is a very dry area but still the traces of fluvial erosion are very dominating. If you look at the Megafly over Africa images that are taken in this area you see that there is accumulation of new deposited sand in lee positions all over, indicating a very active wind erosion/transport. The very smooth rounded rock outcrops indicate tropical weathering.  
  
So past climates were probably different. Follow the water course that flow NNW from the place marker. It turns 90 degrees towards WSW after a short while. You can see the river bed very clearly. After a while it vanish more and more but the Levees on both sides still protrude despite that the river bed is filled with blown sand. Could this be discussed in a sense of changing climate?  
  
The river definitely disappear about 37 km W of the place marker. If you zoom to an altitude of about 1000 km you can trace a linear feature from where the river disappears that goes to the north and then gently bends west. Here you find the city of Djanet (see next place marker).

**City of Djanet**

This is an oasis in Algeria. To the East of Djanet is an escarpment, and further East, on the border to Libya is one more followed by one more inside Libya. These are Cuestas. How are they formed? Could the location of the oasis be influenced by this?

**La Grande Erg Orientale**

What does the word "erg" mean?  
  
What is the type of dunes present in this area called and what is characteristic for their formation? Prevailing wind direction(s)?  
  
North of the place marker there are several flat areas with whitish tone. What is this? Describe the process.  
  
About 300 km ENE of the place marker the Tunisian city of Tataouine (yes it was from this city the name of the planet in Star Wars was derived and all scenery from the films shot) is located. Travel this distance at a fairly low altitude and make a brief description of how the dune types change and relate to availability of moving sand. What is the prevailing wind direction(s)? If you zoom in close you can see several smaller dunes superimposed on the larger ones. Why?  
  
During the route there is a quite sharp border from the erg to a different soil, called loess. What kind of grain size builds the loess plateau ot the Matmata? Loess is very easily eroded by water erosion; some loess areas in the world have an erosion rate of up to 4 m per year.  
  
Travelling in a NNW direction along the Matmata range will take you to the village of Matmatat Al Qadimal. Here there are a lot of round holes in the ground - what is this and how could they have been formed and why so?

**Murchison falls**

Use the possibility to look at historical images. At least two are from high water level situations and one is from dry season - which one? What is controlling the water in the Nile at this location?  
  
The river is the Nile. Zoom out and characterise the general drainage in the region and the water availability. Ecosystem/biome?  
  
Try to find a wetland in the area.  
  
Some of you will see this live in the beginning of March 2016...

**Mississippi delta**

Use the time series facility to describe the development of the Port Eads mouth of the Mississippi delta from present back to 1998. Describe major changes in the barrier islands by the mouth? Reasons to these changes? On the image from 1998 you can detect different generations of accumulation on the island to the south of the river mouth. Reflect on this process.

**River**

Make a brief analysis of the river in this area. There are several levels of terraces and it has been cutting deep in the underlying substrate. What do the terraces tell about landscape development in this area? What kinds of rocks are present? Describe other processes than fluvial erosion?

**Lut Desert**

Explain the landscape in this area. Active processes and name of landforms?  
  
Try to find some photographs from the ground to get a better view of the shapes. Which country are we in?

**Dunes**

Identify dune types. Note that we are probably facing different generations of dunes. Climate indicators?

**Siwa Oasis**

Alexander the Great was given a half prophesying by the Oracle in Delphi. The suite of this was to be delivered by the, at the time, equally famous Oracle in Siwa. Was that the reason he decided to conquer Egypt?  
  
Name features and describe genesis of this landscape. You would definitely need to zoom out, the context where you have lots of water bodies in the Sahara is really interesting.

**Wau an Namus**

Landforms, processes, what is so special with this place?

**Amazonas deforestation**

Use the time facility to check the development in deforestation in this area, starting by the image from 1970. As a scientist used to critical thinking you immediately discover a major error. Please describe the process over the time series that is available with one recording per year. What could have caused the error displayed in the series? What structures might have accelerated the processes?

**River disappear**

Finally back in Sweden, a last puzzle to solve.   
  
West of the place marker a river is flowing that suddenly disappears and only re-appears about 3 km to the ENE. In the terrain you still see a lot of traces from fluvial processes, such as e.g. meanders.   
  
What kind of bed rock is underlying the river bed?  
What other indications (landforms) supports a conclusion for a specific type of bed rock?  
  
A common name for this type of landscape is?