



Warsaw-natural environment

How did the natural environment determine the development of the city ?

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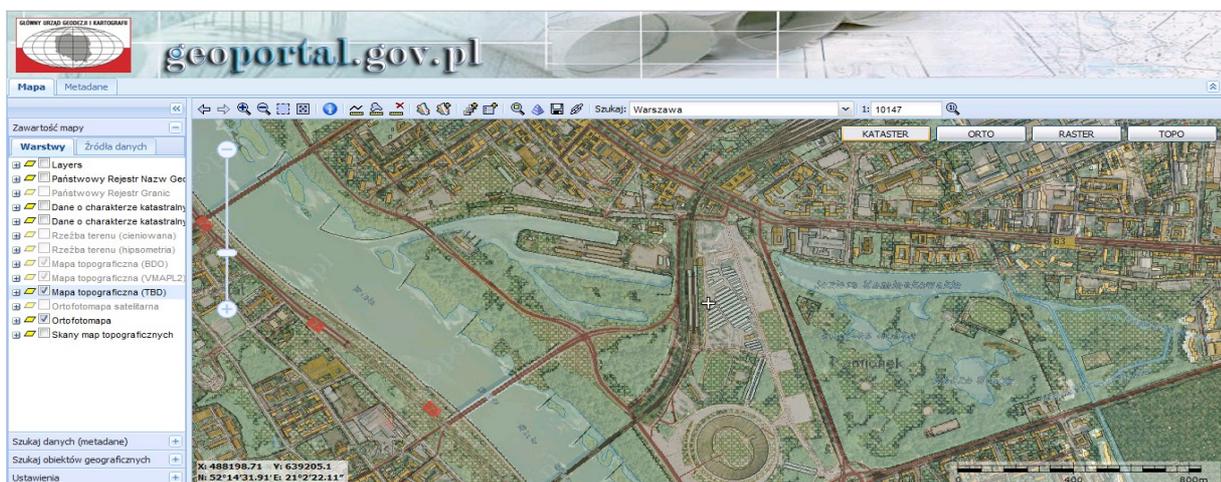
INSTRUCTIONS FOR STUDENTS

Part I : Geoportal.gov.pl

1. Open a web browser geoportal : geoportal.gov.pl
2. Navigate to Warsaw. In the search box, type: Warszawa or adequately enlarge the image on the Warsaw area.
3. From the legend menu select two layers:
 - orofotomapa
 - mapa topograficzna
4. Activate orthophoto layer. Clicking on the highlighted blue strip of the selected layer, select "Ustaw przezroczystość ". Set the layer transparency so you can analyze the two layers of the map at the same time.



5. Examine the development of the city and the natural environment.
 - Locate the main axis of the city.
 - Check the location of Old Town, Zoliborz, Saska Kępa, Ursynów.
 - Find the differences between the development of the Vistula River Valley and the Warsaw Plateau.
 - Where are the largest green areas, and where is the city center (Śródmieście)?
6. Zoom in to see more specific areas:

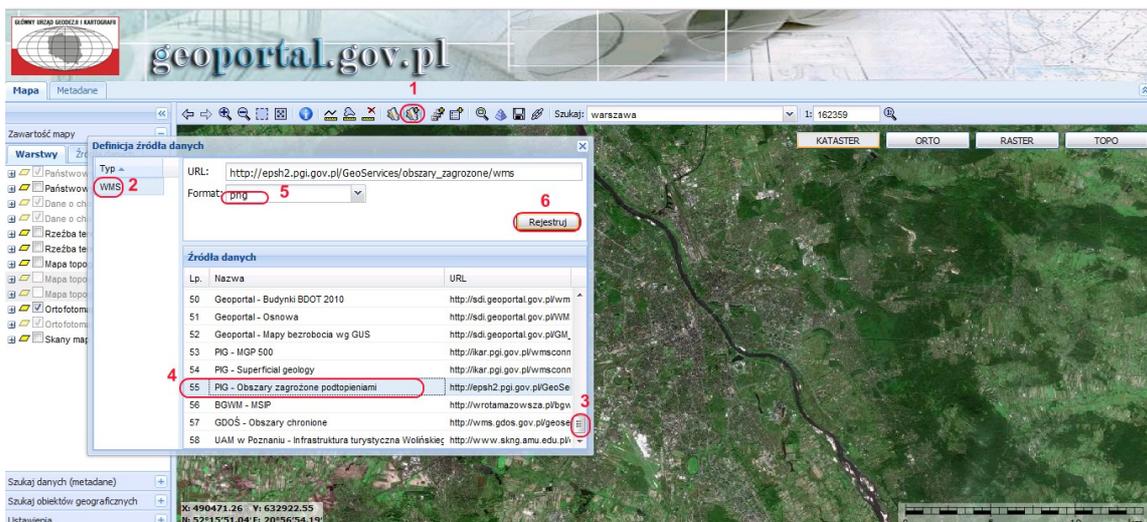


7. Navigate to:
 - Kępa Kiełpińska
 - Kępa Tarchomińska
 - Kępa Potocka
 - Kępa Zawadowska
 - Kępa Oborska

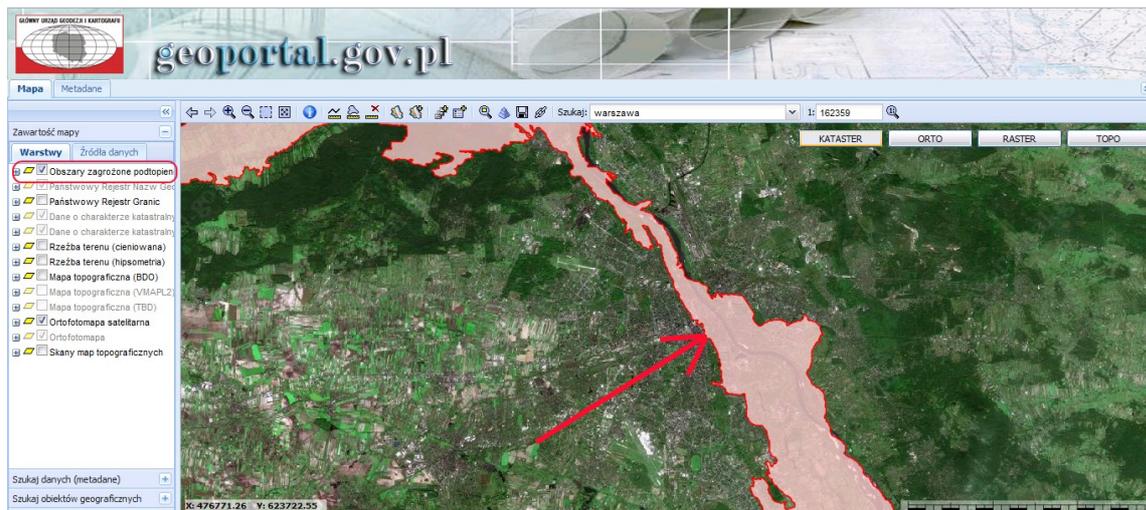
Locate these places on a map. Try to explain the origins of these names.

8. Close layer "mapa topograficzna" and using only a layer : "ortofotomapa" trace the course of the Vistula River valley from Kępa Oborska to Kępa Kiełpińska
 - Notice the shape of the valley.
 - Which parts of the valley are wide and which are narrow?
 - Note the characteristic forms found in the valley, name them.

9. Register and open the layer “PIG- Obszary zagrożone podtopieniami” (“showing flood areas risk”).
 1. For this purpose, use the tool, "zdefiniuj źródło danych" located in the top bar above the map.
 2. After opening the windows, click "wms". A list of possible sources of data will be displayed.
 3. Move the bar down and find the layer : “PIG- Obszary zagrożone podtopieniami”
 4. Select proper layer and click on it.
 5. Select the format "png"
 6. Click the "Rejestruj" button.



After registering, the layer will appear at the top of the list of legends and at the same time will show up on the map.



- Find out which areas are at risk of flooding.

10. See the appearance of the Vistula bed. Additional support is placed below the photo “Wyspy Zawadowskie” (author Marek Ostrowski)



źródło: <http://www.varsovia.pl/varsovia/>

11. Consider whether some district (e.g. Siekierki) could lay on the right bank of the river, and Saska Kępa on the left bank of Vistula, opposite to where they are now. Do you see any evidence for this?

Part II : Analysis of images and maps

1. Compare the old maps of Warsaw which are situated at the bottom of the following page:

<http://www.wislawarszawska.pl/?mode=news&nid=317>

Open the pages of the calendar for *January, February, May, July, November*

- See how different the Vistula river valley was and how it has changed. Locate new building areas in Warsaw.
- Study the relief of Warsaw Escarpment.

2. Examine Marek Ostrowski pictures from the page:

„Warszawa z lotu orła” - SKWER GEOLOGICZNY

http://www.samper.pl/warszawa_z_lotu_orla/

Part III: GEOCONTEXT-PROFILER

1. Open a web browser tool for drawing terrain profiles

<http://www.geocontext.org/publ/2010/04/profiler/en/>

2. Navigate to Warsaw.

3. See on web page HELP

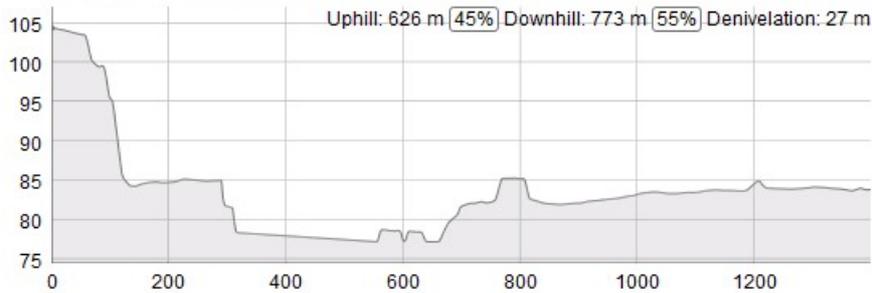
How to make a topographic profile?

1. Reset
2. Find your area of interest on the map
3. Select the cursor min. 2 points (max. 150)
4. Ready – site profile will be generated in seconds

The screenshot shows the Geocontext website interface. At the top, there is a search bar with 'Warsaw' entered. Below the search bar, there is a 'Reset' button. The main map area shows a topographic profile of Warsaw, with a line indicating the profile path. The profile shows a peak of 1379m and a low of 100m. The map includes various streets and landmarks in Warsaw, such as the Vistula river and the Warsaw Escarpment. The interface also includes a 'Help' section with instructions: '1. Reset', '2. Find your area of interest on the map'. The map shows various streets and landmarks in Warsaw, including the Vistula river and the Warsaw Escarpment.



Zoom: 14 Counter markers: 6 Mouse px: 1062px, 109px Lat./Lng.: 52°15'16.33"N 21°2'29.31"E
 Center point: 52.25098807730653, 21.01948139317621 Center point location: Wybrzeże Gdańskie, Warszawa, Polska



4. Navigate on the map. Use tools to zoom in and out the map. Select a few areas to draw several profiles: one in the northern part of Warsaw, one in the central part and one in the southern part of Warsaw.

Start profiles on the left bank of the Vistula within the Warsaw Plateau and end on the right bank of the Vistula.

5. Pay attention to the different vertical and horizontal scales when comparing different profiles.

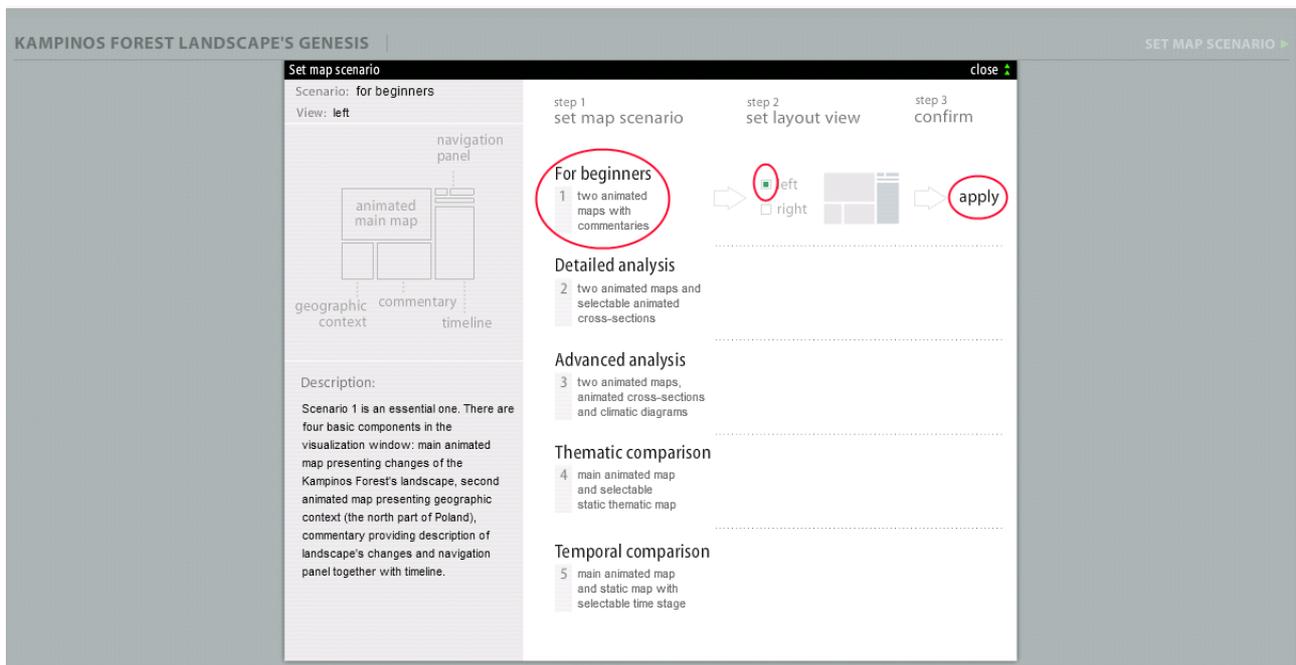
6. Analyze profiles. Answer questions:

- Is the Vistula valley symmetric?
- How many terraces can you find in the Vistula river valley?
- At what levels are the terraces?
- Are all the terraces preserved in the same way? Are the edges of the terraces sharply outlined or not?
- Do you recognize some smaller forms of terrain on the terraces?
- Is the Warsaw escarpment in all places inclined in the same way?
- How is the Warsaw Plateau shaped?

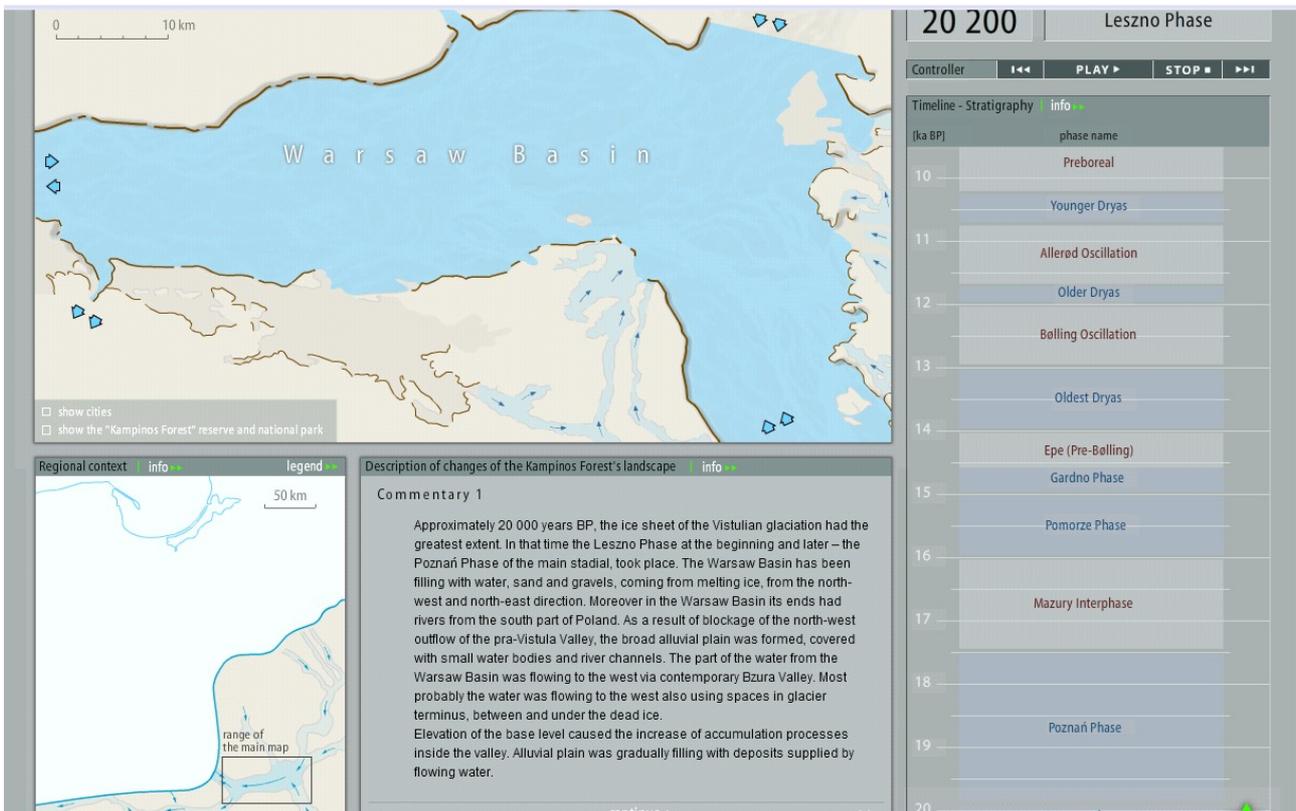
Animated maps on the **KAMPINOS FOREST landscape's genesis** website can help you understand the genesis of the Vistula River valley.

Part IV: KAMPINOS FOREST landscape's genesis

1. Open a web browser : <http://folk.ntnu.no/opach/>
2. Click the right button under the picture: „[Animated map](#)”
3. Choose the first option for beginners: "For beginners”, choose your own view of the right kind or left kind. Finally confirm your choice by clicking"apply".

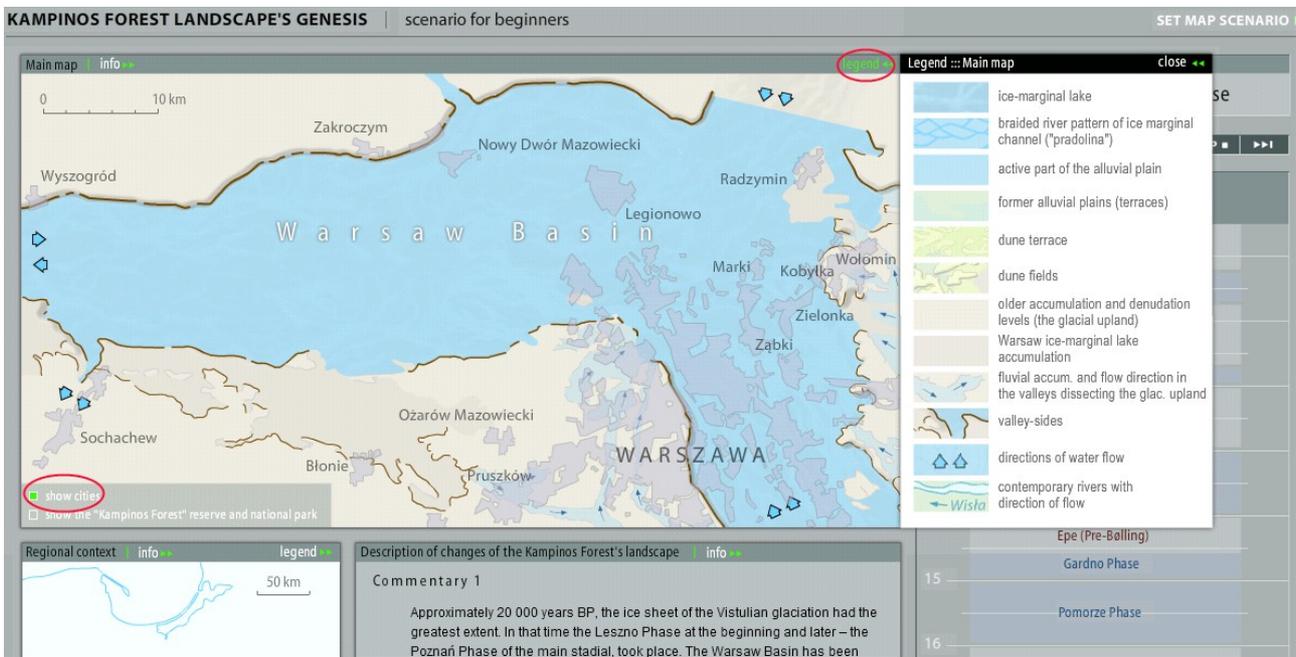


4. After opening the selected scenario, press the F11 key to switch to full screen. Adjust the view to see: the upper and lower maps , stratigraphic table and commentary .



5. On the top map click the small box "show cities".

6. Open the legend by clicking the word "legend" in the upper right corner of the top map. Refer to the legend, then close it.



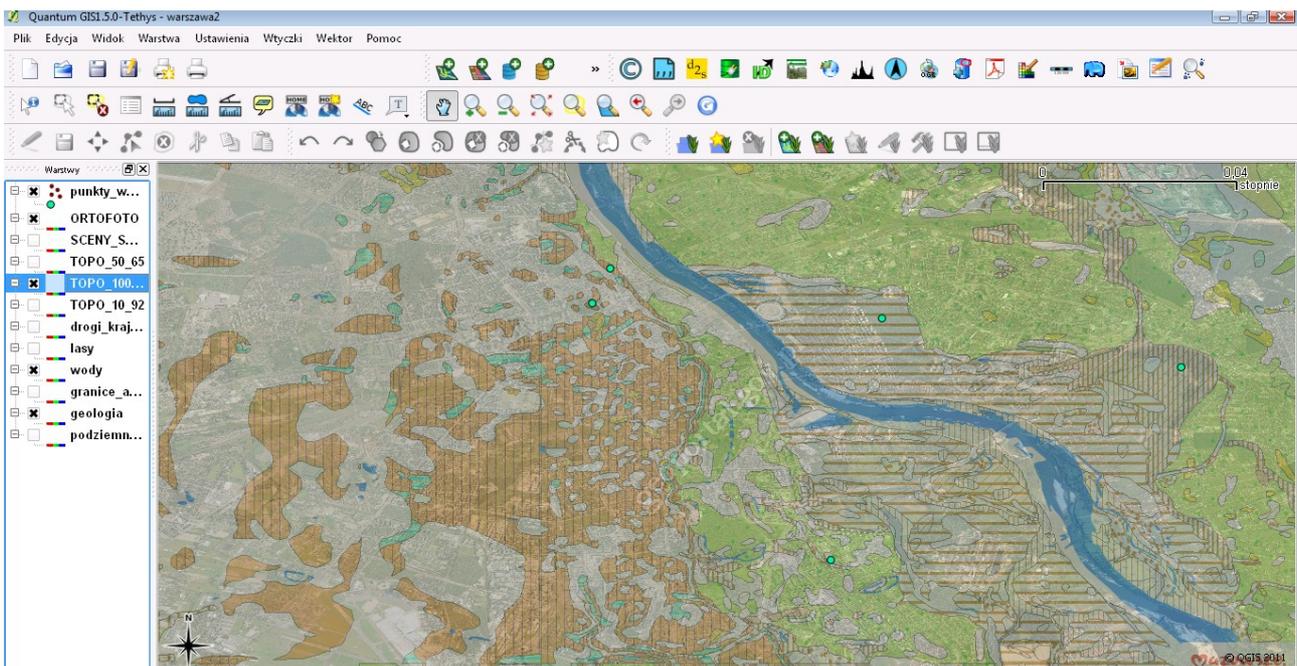
7. Trace the origins of the natural environment of the Warsaw area. Click "play". Observe changes on both maps. See, how the hydrography, geology and the formation of the Warsaw Basin has changed over time. Answer the questions:

- Which factors and processes developed relief of the Warsaw area?
- Which sediments filled the Warsaw Basin ?

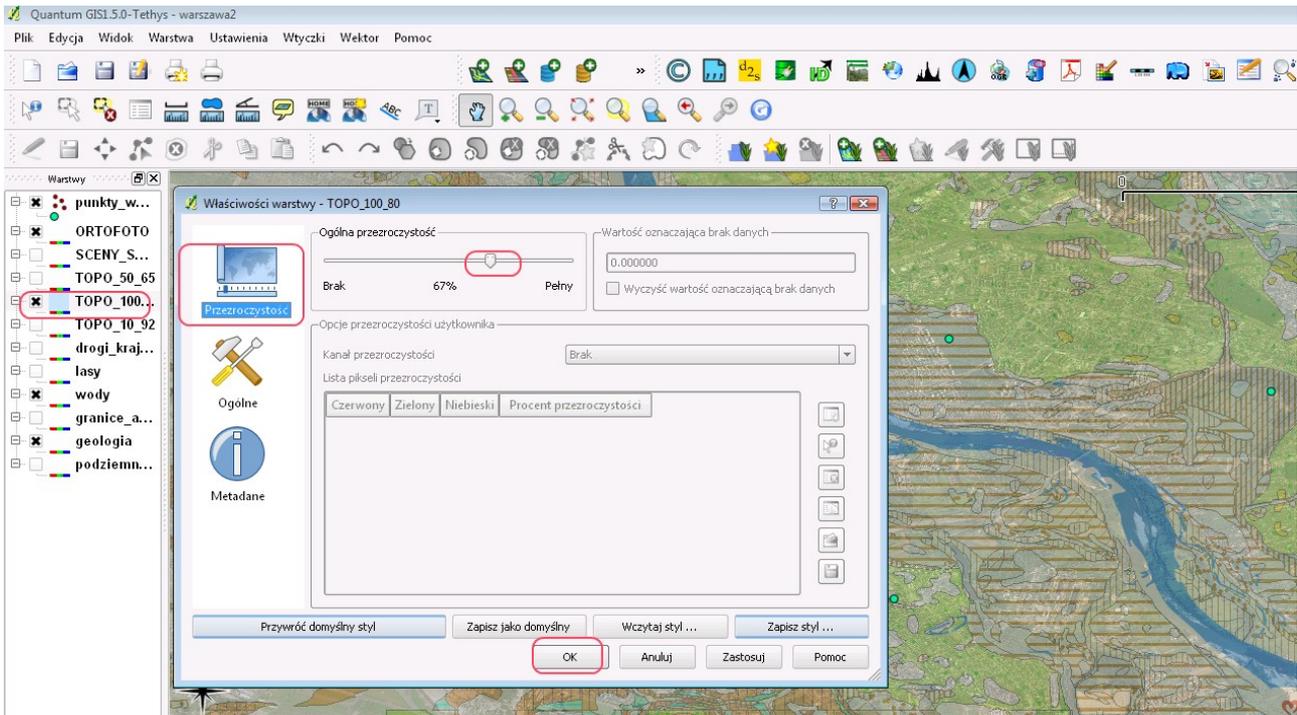
Examine the geological map of Warsaw.

Part V: Geological map 1:50 000 in QuantumGIS program

1. Open QuantumGIS program. Open project: „warszawa2” and activate 4 layers: „geologia”, „ortofotomapa”, „TOPO 100” and „wody.”



2. Set the transparency of layers to allow you to view the details of the map well. For this purpose, activate the selected layer and by double-clicking go to layer properties. Select "Przezroczystość" slide to set the correct transparency. Click "OK" at the bottom of the frame to confirm changes you've made.



3. Navigate on map. Try to examine whether there are relationships between the geology and spatial development of Warsaw city.
In order to gather information about surface sediments (layer, "geologia") use the tool: "information". Remember to enable the layer by clicking on it. A layer is active when there is a blue light-bar area around the layer name.



TASK

4. Using layers: geologic maps (layer "geologia"), topographic maps (layer "TOPO100), orthophotomapa (layer "ortofotomapa) and included photos, profiles and descriptions make an analysis.
5. After the analysis is done, fit out the following: pictures, profiles, descriptions of the designated points and points on the map (layer on the map: "punkty_wawa"). More than one point can be placed on some profiles. On each profile, type points ids from the map, id of the image, and id of the description.

DESCRIPTION of the points:

- *a. The point is located on the Warsaw Plateau near the edge of the Warsaw Escarpment. The slope is steep. There are tills in the base. This place is attractive: nice views of the narrow Vistula Valley, a favorable climate due to its good ventilation through the valley of the Vistula. Prince's castle was built in the thirteenth century in this place.*
- *b. The point is situated at an altitude of about 87 meters above the sea level, on the terrace of the Vistula. In close vicinity to this point is Warsaw's largest natural lake, which is a remnant of the historical water system of the Vistula. The surface layer of the terrace is built mainly of river sands .*
- *c. The point is located in the former meandred river. This area is filled peat and gytia. Over this point the Wawer terrace is located. Historical documents show that in the past, the area was at the point of the lake - old river bed of the Vistula.*
- *d. The point is located on the plateau characterized by a varied geology and topography of the land. The point is located within the boulder clay, but in the immediate vicinity there are also _clays and silts, humic sands and gravel sands, and sandy boulder clays. At the foot of the slope, there are also peat and river sands and gravels. At this point the Vistula valley is broad. The point is remote from the river, about 6 km in a straight line. At a distance of less than 100 meters from this point there is a Natolin Reserve.*
- *e. The point is located on the gently sloping plateau – the Warsaw Plateau . There are media saturated with boulder clay. The Warsaw Escarpment lies a few hundred meters to the East. This point is located in the central part of Warsaw, in the park.*
- *f. The point is located on the terrace of the Vistula River floodplain, although not currently threatened with frequent floods. It is separated from the Vistula with embankments and other anthropogenic features. The substrate has recorded the history of accumulation and erosion of the river. This point lies on the clays and in places with mixed muds and sands (alluvial soils). Today this point lies in one of the most beautiful parks in Warsaw.*

Pictures of following points



A



D



B



E

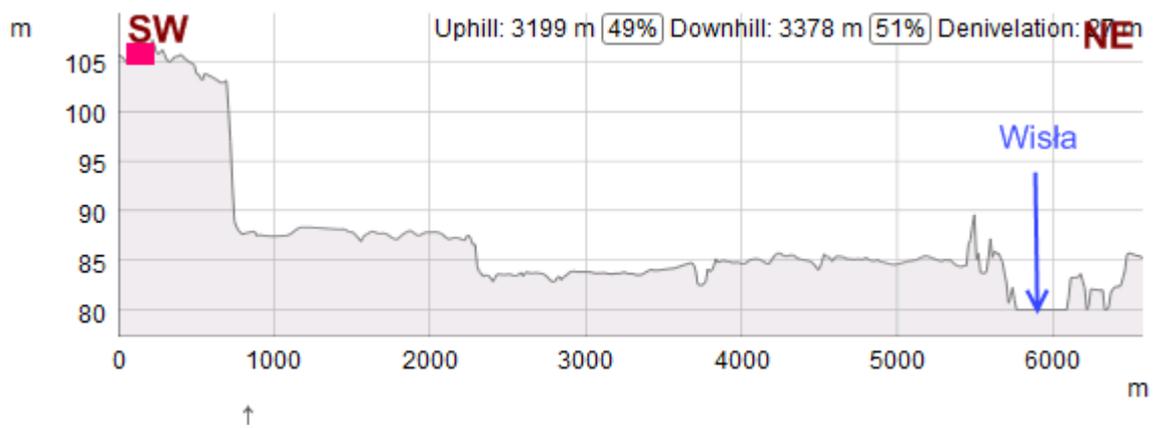
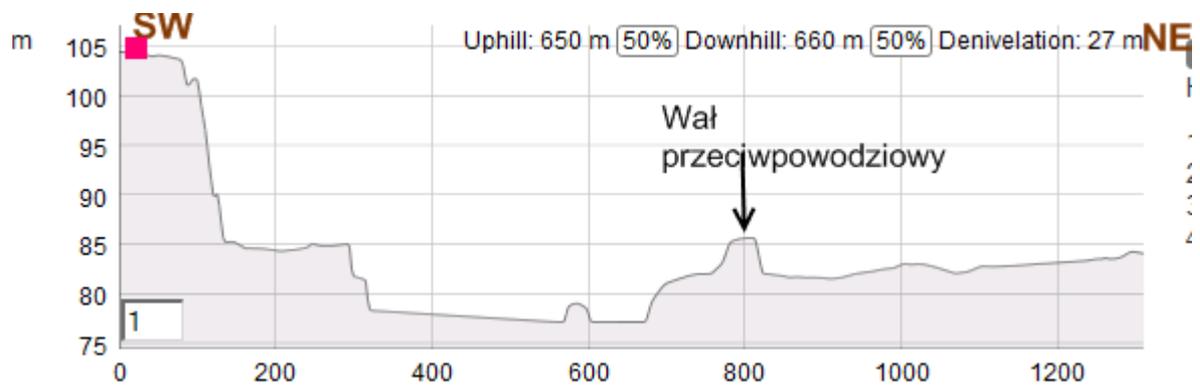
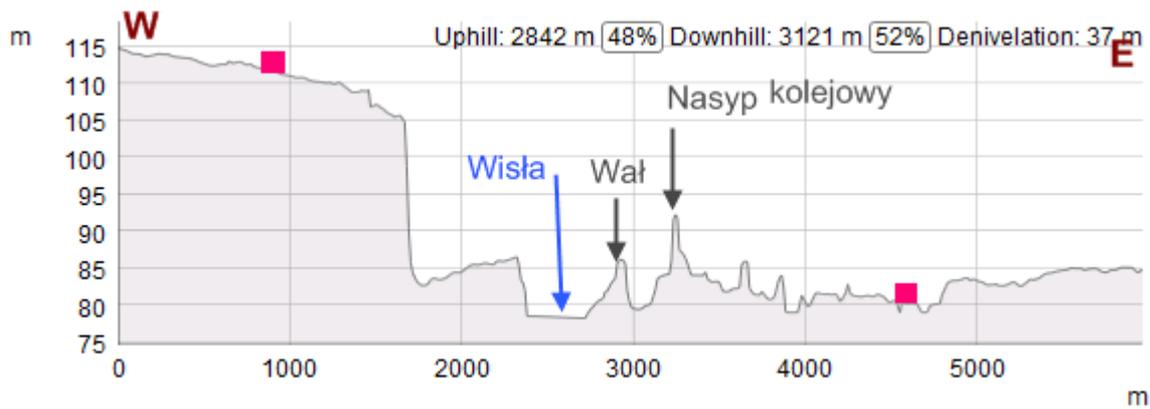


C

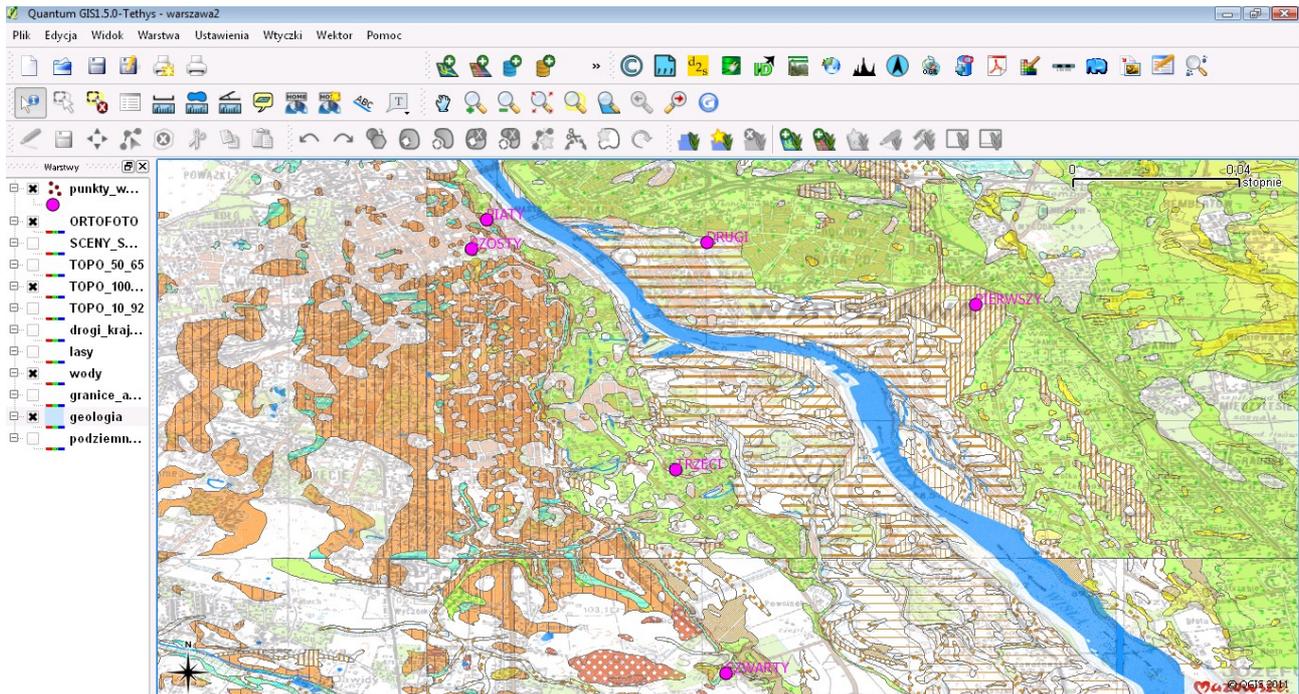


F

PROFILES of the points:



Geological map from QuantumGIS with points:



Can you now verify the research hypothesis ?

What kind of relationships between natural environment and spatial development of the city have you noticed ?