



AKTION

Soil/Rock and Water and Processes in the Earth Core/ Půda/hornina a voda v zemske kůře (SWAP-1)

DANUBE/MARCHFELD/WIENERWALD

Excursion Guide



Source: <https://www.wien.gv.at/umwelt/wasserbau/gewaesser/donau/> 13. April 2015



<http://en.academic.ru/dic.nsf/enwiki/1008979> 12.May 2011

Thursday, 14 January 2016

Venue: 11:00 BOKU, Bus to Kahlenberg, Leopoldsberg

Topic: Overview of Danube in Vienna, Leopoldsberg-Terrace

If weather permits, walk through Viennese Forest (Leopoldsberg – Kahlenberg), Land use: forest and vineyards.

Visit to hydropower station Freudenuau, fish by-pass, transfer to hotel

Facilitator: Loiskandl

DANUBE

The **Danube** is Europe's second longest river after the Volga. The river originates in the Black Forest in Germany from the two rivers Brigach and Breg. After the confluence of the two rivers at the German town of Donaueschingen the name Danube is given. The Danube (basin area: 817 000 km²) flows south-eastward for a distance of some 2850 km (1771 miles), passing through four Central and Eastern European capitals, before reaching the Black Sea via the Danube Delta in Romania and Ukraine. Along the river the hydraulic potential is heavily used for energy production (Fig. 1). Only two free flowing stretches remain, one is the Wachau and the other one is east of Vienna. Numbers 1 to 9 are hydropower stations.

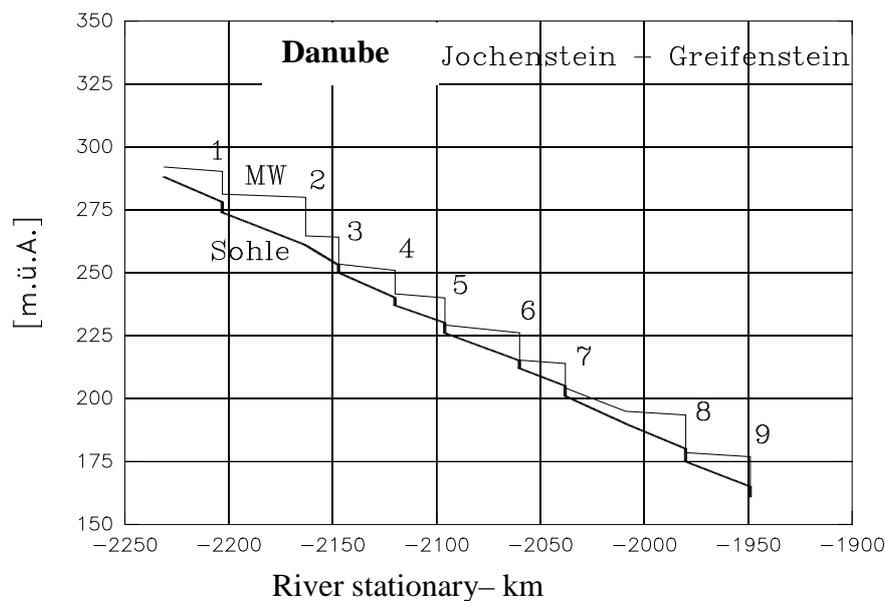


Figure 1: River bed and water level of the Austrina part of the Danube
Danube in Vienna:

The historical development is characterised by anthropogenic interventions which changed the course of the river bed dramatic. Until the beginning of the 20th century it was still a braided river system, then a main a river draining work was performed, straightening the river course and the adjacent area of Vienna was drained. The Danube channel and the so called “Old Danube” are the remains of the former braided river system. Large areas of the drained braided river system became an inundation plain and the land served only for flood protection. In the 1970’s the municipality of Vienna decided to transform the flood plain in a recreational area and flood protection channel the so called “New Danube”. A part of the area was elevated forming the “Danube Island”. The area is now used for swimming, boating, sailing and many touristic infrastructures are built.

(See ANNEX1/2)

KAHLENBERG/ LEOPOLDSBERG

Geography

Kahlenberg (484 m) located in the 19th District within Vienna and lies in the north-eastern foothills of the Eastern Alps. The mountain is mostly flysch, which is composed of quartz, limestone, marl, and other conglomerates. West of Kahlenberg is Leopoldsberg(425 m); and to the east are Reisenberg, Latisberg, and Hermannskogel (542 m).

Source: <http://en.wikipedia.org/wiki/Kahlenberg> 15. May 2011

Kahlenberg and Leopoldsberg are part of the Wienerwald (Vienna forest) and are popular destinations for day-trips from Vienna, offering a view over the entire city. Terraces are located on the mountains: The church of Kahlenberg is also a pilgrimage place for Polish people (see history).

History

Kahlenberg was uninhabited until the 1700s. Originally, the mountain was called "Sauberg" (sow mountain) or "Schweinsberg" (pig mountain), after the numerous wild pigs that lived in the pristine oak forests. In 1628, Ferdinand II acquired the mountain from the Klosterneuburg monastery and called it "Josephsberg" (Joseph's Mountain).

After acquiring the mountain, Ferdinand II allowed a hermitage for the Kamaldulenser, an order of Catholic hermits, to be built. A few houses were built around the Chapel of Saint Joseph, which earned the name Josefsdorf. Jan III Sobieski, King of Poland launched his attack on the Turkish forces during the second siege of Vienna from here. Only after Emperor Leopold I renamed the original Kahlenberg (the neighbouring mountain) to Leopoldsberg was the name "Kahlenberg" given to the "Josephsberg".

Sources: <http://www.mainlesson.com/display.php?author=morris&book=german&story=vienna>
<http://en.academic.ru/dic.nsf/enwiki/1008979> 09 May 2011

To understand the landscape along the Danube it is important to have a look on the geological development and the climate.

Geology (excerpt from Fiebig, Leir)

The Danube basin is situated in the tectonically active Vienna basin, which was formed in the Miocene when a subsidence of the basin occurred (Decker et al., 2005). Later, the basin inverted and more than 200 m of surface uplift occurred. During the Alpine glaciations, the Danube River continuously incised into the uplifted Tertiary basin fill and accumulated meltwater terraces (Figure 2). Fuchs (1985) morphologically subdivided the present floodplain into two terraces called “Younger part of today’s valley floor” (=alluvium) and “Higher and older part of today’s valley floor” (Prater fluvial terrace). The floodplain consists of up to 10 m gravel (deposited on tertiary gravel and lime marl) and usually 1-2 meters of fine sediments (silt) on top. The river regulation induced a higher flow velocity in the main channel and led to the deposition of predominantly silt- and fine sand-sized particles on the islands (Lair et al., 2009). The deposited sediments are dominated by dolomite and show medium to low amounts of quartz, plagioclase, K-feldspar, chlorite, kaolinite and mica (Haslinger et al., 2006). Most of the soils classify as Fluvisols and show progressing development with age towards the Chernozem/Phaeozem group (WRB, 2006; Lair et al., 2007).

Climatic conditions

The climate in the Danube basin is intermediate between oceanic and continental. The precipitation reaches about 500-600 mm/a, the mean annual temperature is about 9°C. The vegetation period can be characterized by high rates of sunshine hours, high temperature and low precipitation (mean potential evaporation 566 mm/a). The values of temperature and precipitation presented in the following are given for the village “Orth an der Donau” (observation period 1851-1950; elevation: 145m a.s.l., Bundesanstalt für Bodenkultur, 1972):

TEMPERATURE & PRECIPITATION:

Month	J	F	M	A	M	J	J	A	S	O	N	D	MEAN/SUM
°C	-1.5	-0.4	4.1	8.8	14.3	17.3	19.6	18.5	14.3	9.0	3.7	0.4	9.0
mm	30	33	31	39	62	56	67	55	48	47	46	39	553

WIND: main wind from west, sometimes from south (maximum winds during summer time)

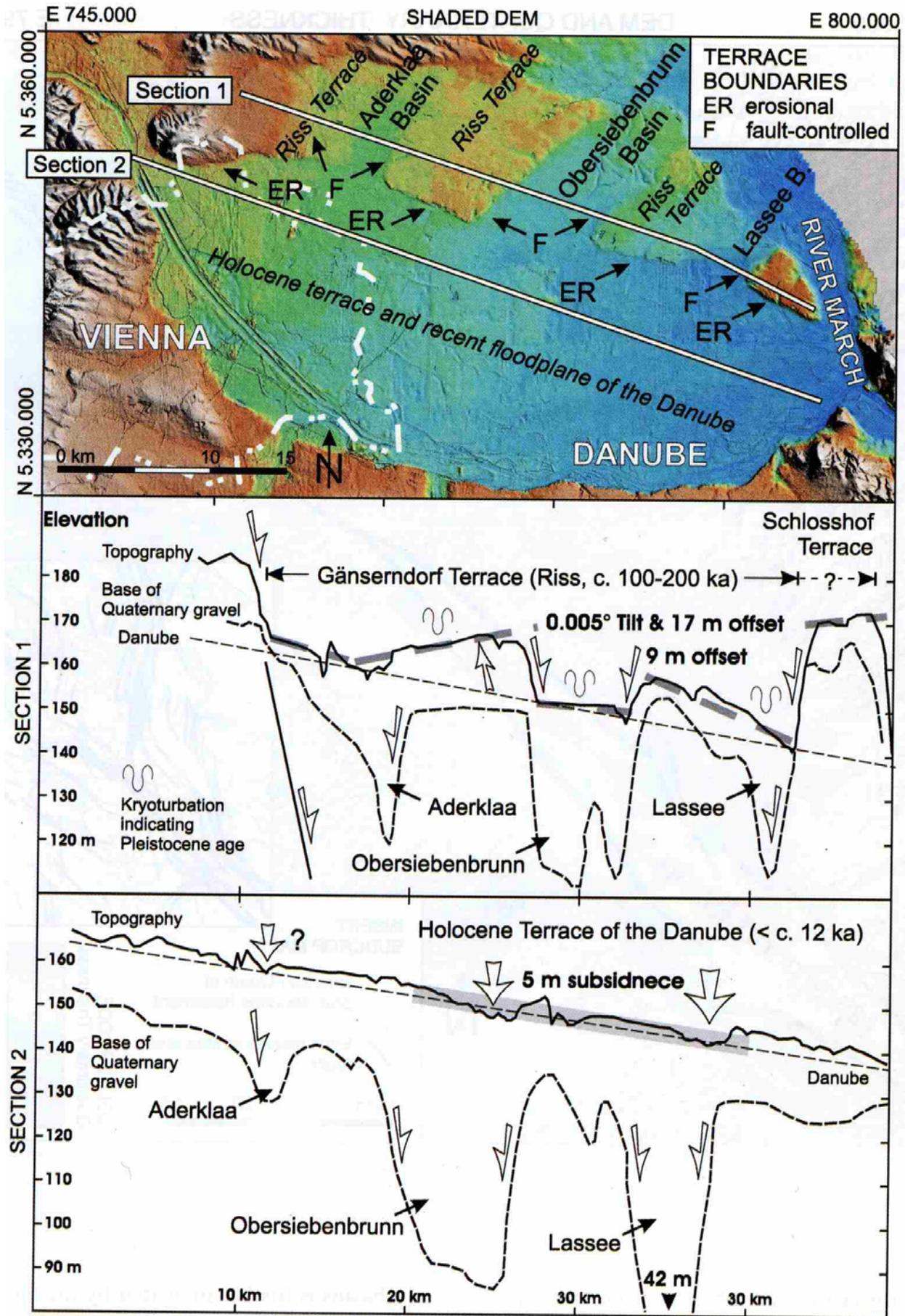


Figure 2: Overview and profile of the Vienna basin (Decker et al., 2005).

The climate of the Viennese forest shows slightly higher precipitation (Figure 3)

Wien
209 m

9.9 Grad C
613 mm

Cfb

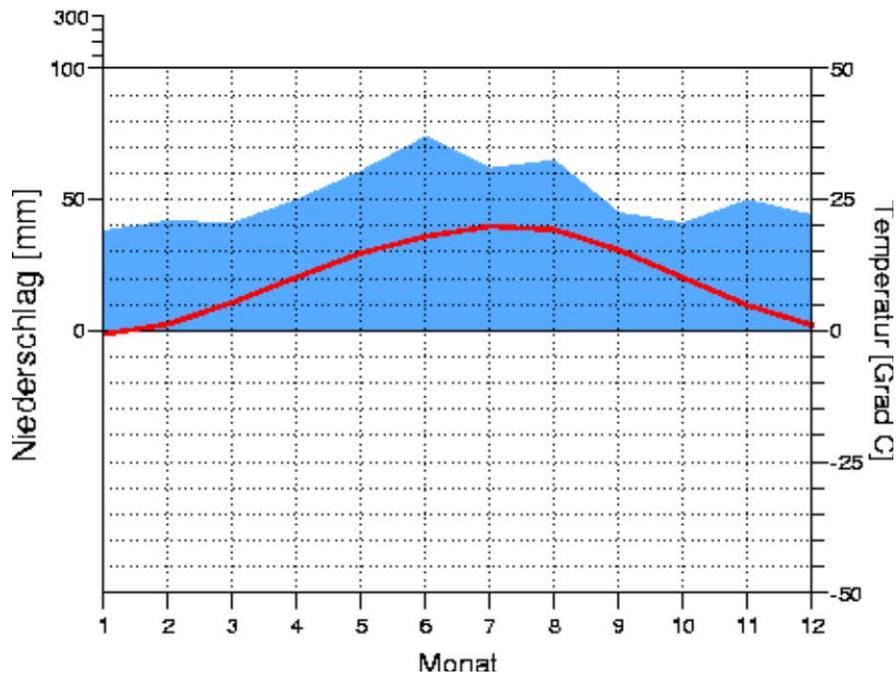


Figure 3. Precipitation (Niederschlag) and Temperature diagram at the boarder of the Viennese forest.

Flysch is a sequence of sedimentary rocks deposited in a deep marine facies in the foreland basin of a developing orogen.

Molasse is deposited on top of the flysch. It is therefore called a syn-orogenic sediment (deposited contemporaneously with mountain building).

A **conglomerate** is a rock consisting of individual stones that have become cemented together. Conglomerates are sedimentary rocks consisting of rounded fragments and are thus differentiated from breccias, which consist of angular clasts.

<http://www.fi.edu/fellows/fellow1/oct98/expert/conglomerate.htm> Conglomerate Rocks on Rock Hound. Rock Hounds. Retrieved on July 29 2007. Source: <http://en.academic.ru/dic.nsf/enwiki/1008979> 09 May 2011

Loess wind transported (= Aeolian), very fine grained sediment deposited in non-glaciated area; it is characterized by its stability which is due to calcareous cementation (gorge, wine cellars)

Biosphärenpark (Biosphere reserve) Wienerwald

The Wienerwald was admitted as a biosphere reserve in 2005 by UNESCO. Biosphere reserves are internationally awarded areas within the UNESCO program "Man and the biosphere" (MAB). Thus, the Wienerwald became a model region for sustainable life, economy, education and research. Goals of Biosphere reserves are to establish sustainable protection of biodiversity, to pursue economic and social development, and to preserve cultural values. Ecological balance, economic security and social equality are the three pillars for sustainability of the Biosphärenpark Wienerwald. By taking equally into consideration the three aspects, favourable living conditions for present and future generations is guaranteed.

Facts

The Biosphärenpark Wienerwald is situated in the federal states of Lower Austria and Vienna. It considers itself a habitat for man and nature living in equal cohabitation, reciprocally benefiting from each other. Its uniqueness is characterized by the diversity of nature, culture and sustainable management at the outskirts of the main city of Vienna. The aim is to protect nature where habitats and species need protection and, at the same time, to develop the area into a living region, economically responsible for their actions.

- An initiative of the federal states of **Lower Austria and Vienna**;
- The area: 105.645 hectares - approximately 110,000 soccer fields;
- Population: approximately 750,000 inhabitants live in the biosphere reserve communities. Border communities are not situated entirely in the biosphere reserve.
- Habitants living in their second place of residence: approximately 50,000;
- Communities: 51 Lower Austrian communities and 7 Vienna districts form the biosphere reserve;
- Dimension of the communities: 60% of the municipalities have less than 5,000 inhabitants; 3 municipalities - Baden, Mödling and Klosterneuburg –count more than 20,000 people;
- Traffic axes in the biosphere reserve: A1 West motorway, A21 Vienna outer ring motorway, West- and South railway;
- Climate: sub continental **cold winter seasons, dry and hot summer seasons**;
- Vegetation: more than 20 types of forest, dominating are **beech, oak and hornbeam** forests, more than 17 types of **meadows**;
- **Flora: over 2000 species**;
- **Birds: approx. 150 breeding birds**;

Key features of a biosphere reserves:

- Protecting ecosystems and landscapes, preservation of biological and cultural diversity and conservation of genetic resources;
- developing and promoting ecological, economic and socio-cultural forms of sustainable cultivation of land;
- supporting research, environmental monitoring, and educational activities in order to better understand the interactions between people and nature.

The concept of UNESCO's biosphere reserve provides a comprehensive tool for protection and development. By associating protection and exploitation while involving man, it is tailor-made for traditional landscapes with high nature values.

Zones of the Biosphere Reserve

Zoning by types of function

A biosphere reserve is allowed to be divided into a mosaic type; core-, conservation-, and development zones. The 'protection of typical nature landscapes' means the same as 'preservation of cultural landscapes'. With zone division there is no ranking order of importance. Each area has its own function. The biosphere reserve wants to coordinate the various exploitation interests.

Transition area

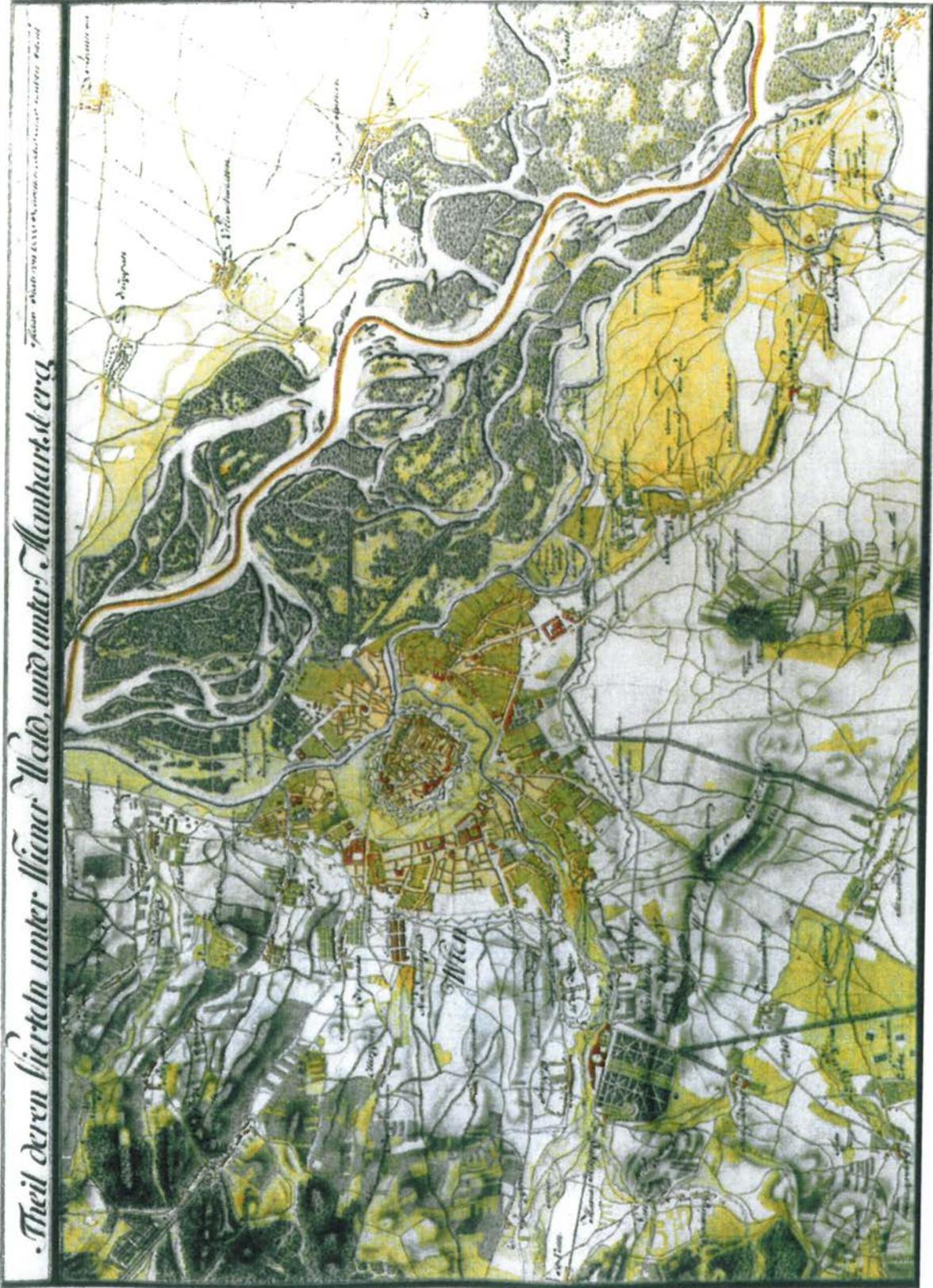
The transition area is a life-, economy- and relaxation area for its inhabitants. Business strategies are to be developed to equally assist man and nature. These strategies also serve as a model in the whole country! Environmentally and socially friendly tourism is just as much part of it as the production and marketing of environmentally friendly products.

Buffer zone

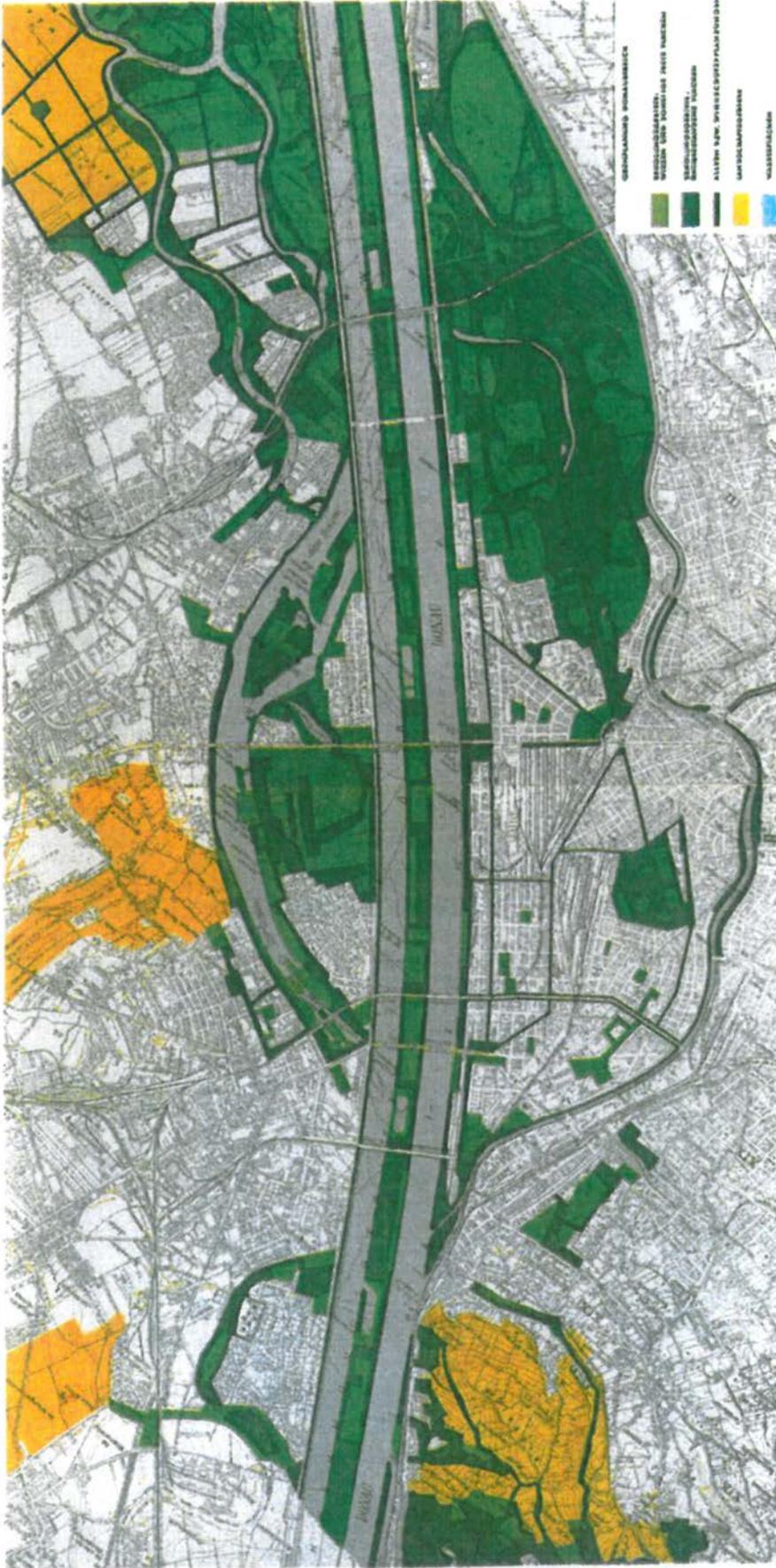
The buffer zone helps the preservation of living areas that are cultivated or affected by human use (e.g., meadows, pastures). This zone has an incredible high variety of species used by man and livestock. In addition, it protects the core zone from damage and contains the dependent cultural landscape that specially needs protection and conservation.

Core area

The core area is a zone where nature can develop itself without being affected by man. UNESCO demands lawful protection of the core zone (e.g. conservation area). The core zone of the Biosphere Reserve Wienerwald consists exclusively of forest areas.



Vienna and environment
Josephinische landsurvey 1773 to 1781



Planing of Danube area 1961

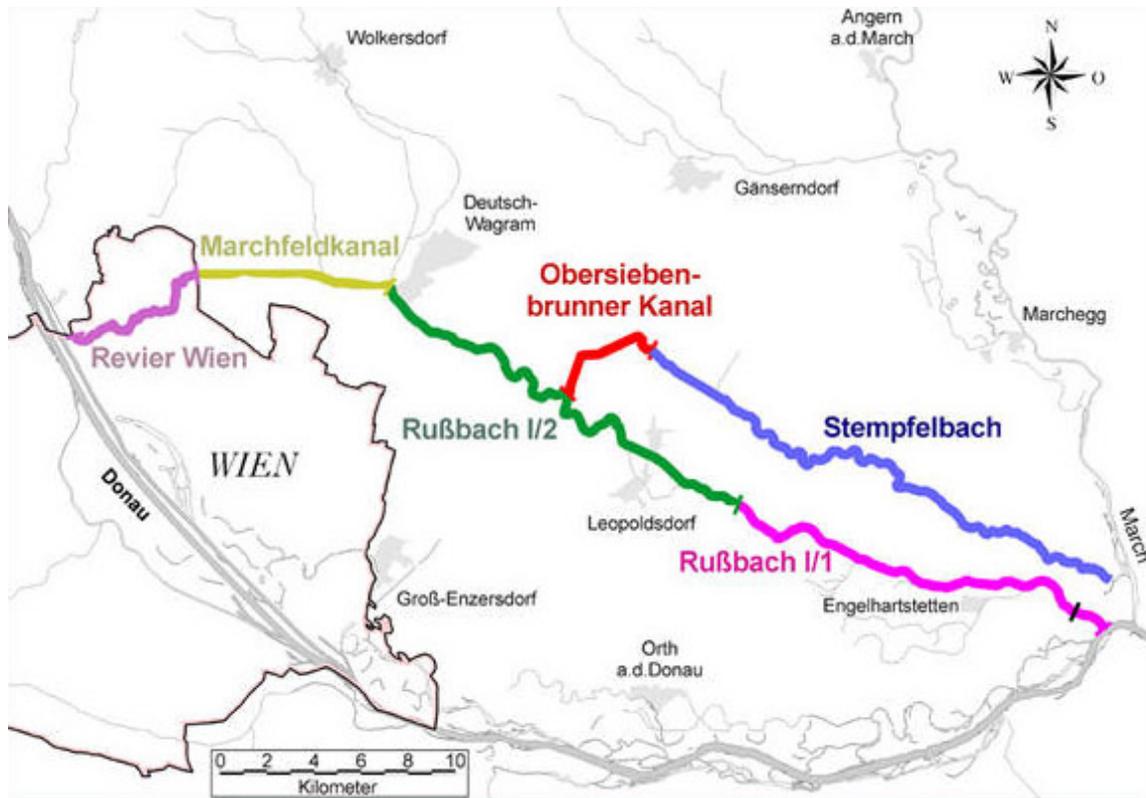
Friday, 15 January 2016

Venue: 9:00 – 11:00 Marchfeldkanal, Operation office and field visit, infiltration ponds, weir and small hydropower station.

11:15 – 12:00 Experiential farm BOKU

12:00 Visit at Danube national park, short walk (depending on weather)

Facilitator: Loiskandl



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