

“IRIS II” – THE INTERACTIVE RAW MATERIAL INFORMATION SYSTEM OF AUSTRIA

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Abstract: During the past decades intensive programs were carried out to document the mineral occurrences and deposits and both. geochemical and geophysical distributions in Austria. These data were the base for the ”Metallogenetic Map of Austria” along with a voluminous explanation text book, edited by the Austrian Geological Survey and as CD-ROM (Interactive Raw material Information System “IRIS”).

Key words: Austria, mineral deposits, geochemistry, geostatistics, aeromagnetism, interactive information system

Introduction

During the past intensive programs were carried out to document the mineral deposits/occurrences (d/o), geochemical and geophysical distributions in Austria. These data were the base for the ”Metallogenetic Map of Austria”, an extensive explanation text book to the map (WEBER et. al. 1997 a, b) and a computer based Interactive Raw material Information System “IRIS” (IRIS I: WEBER et al., 2001 and IRIS II in 2002). L. WEBER was the coordinator of all projects. He was assisted by a team of more than 40 Austrian geoscientists.

The projects were financed by the Austrian Academy of Science, the Austrian Geological Survey, the Austrian Science Foundation, the Technical Museum/Vienna and the Austrian Mining Association. Support of software and hardware infrastructure was provided by the Joanneum Research Forschungsgesellschaft and the Kansas Geological Survey.

Base data and content of IRIS

IRIS is a simultaneous approach based on the following thematic layers:

situation, geology (lithology and tectonics), mineralization, geochemistry, aeromagnetics, rock density and geostatistics (Fig. 1, 2). Comprehensive information for 3,328 mineralizations (d/o) can be generated by visualizing data in an interactive way (Fig. 3, 4). IRIS is equipped with a zoom function, a dynamic legend to explain details of the individual layers, a hot link function supplying the data base of each d/o, and some search machines.

Geology

The newly compiled geological map (1:500,000) reflects the regional geological units along with some base lithologies (carbonatic, siliciclastic, basic and acid magmatic rocks and their metamorphic analogies). Available tectonic informations are: faults from both the surface units and the pre-Tertiary basement of the Molasse zone and other Neogene basins (based on petroleum and gas exploration).

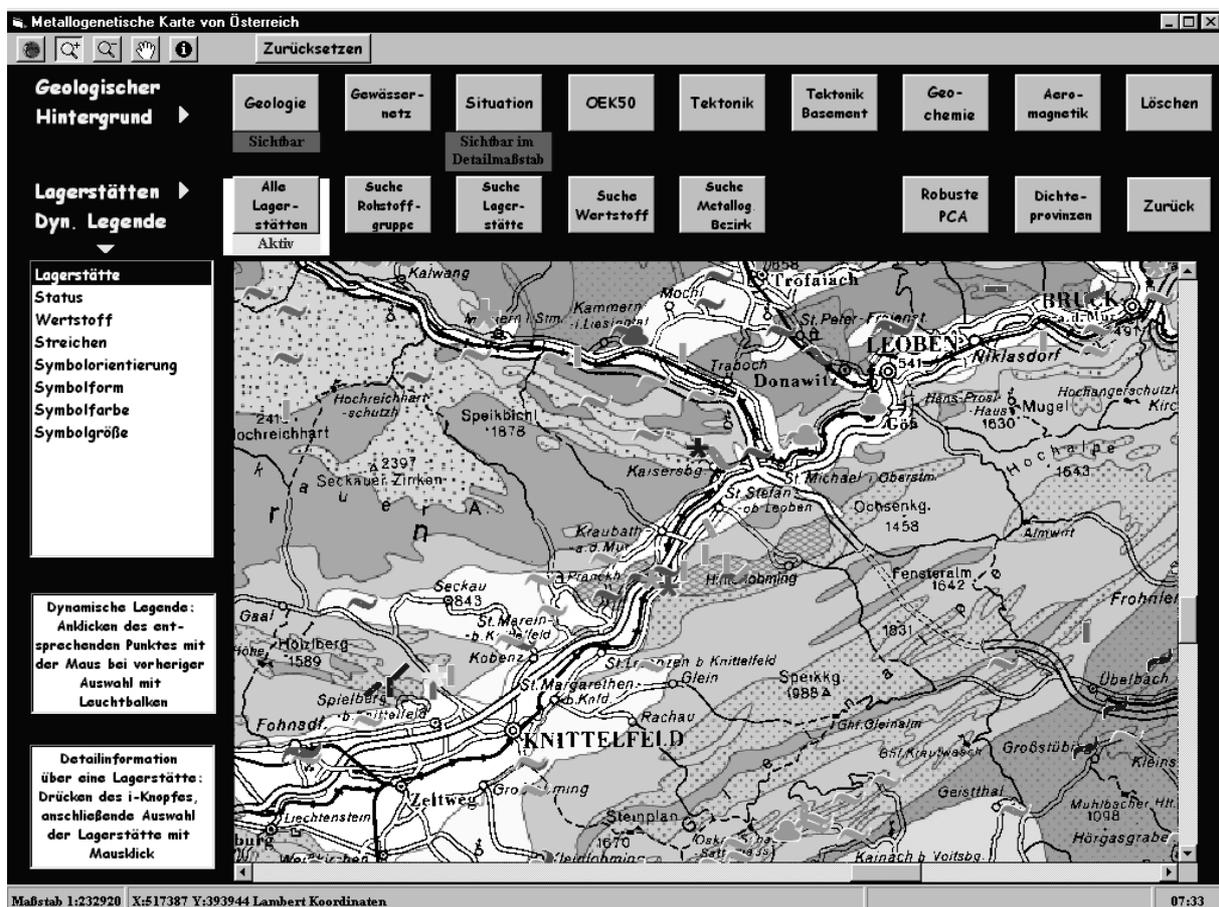


Fig. 1: Layers: Geology, mineralizations, situation (Mur Valley, Fohnsdorf/Knittelfeld Miocene Basin within the Middle Austroalpine crystalline complex).

Geochemistry, geostatistics

The geochemical background information for the Bohemian Massif and the Austroalpine crystalline and Paleozoic zones derived from 29,717 stream sediment samples, analyzed on

35 elements and published in the Geochemical Atlas of Austria (THALMANN et al., 1989). Geochemical information of the Molasse- and Flysch zone and the Northern Calcareous Alps of Upper and Lower Austria derived from other programs. IRIS II allows for the first time to calculate multivariate geostatistics applying principal component analysis. As an example this provides the differentiation between geogene and anthropogen geochemical anomalies.

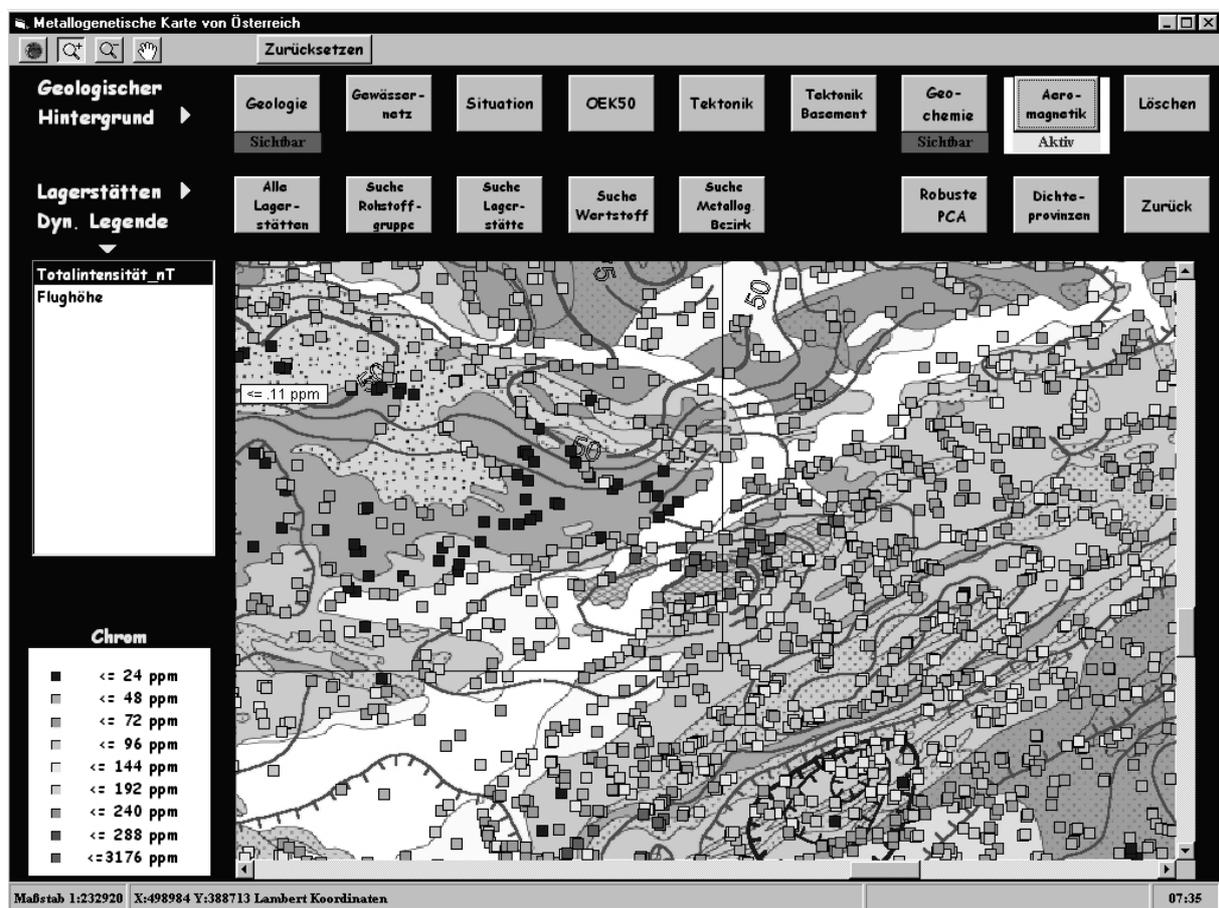


Fig. 2: Layers: Geology, geochemistry (Chromium), aeromagnetics (same area as in Fig.1).

Aeromagnetis

Aeromagnetic data (total magnetic intensity, altitude of the flight levels) are based on aeromagnetic survey work in 1977 – 1982 (BLAUMOSER, 1992). In the general overview the anomalies are shown in colored shadings. In detail the total magnetic intensity is expressed by isolines and the dynamic legend (Fig. 2).

Mean surface density

Mean surface density (in g/cm^3) reflects the main geological units. However the density of the individual sample points is too low to indicate mineralized areas.

Mineral deposits/occurrences (d/o)

The base information for 3,029 mineralizations is visualized in an interactive way. The informations include: position and name of the d/o, state of the deposit (in operation or not), mineral commodity and integration within the individual group of raw materials, orientation of stratiform/lenticular or vein d/o, shape of the deposit, and importance (minor or major) of the deposit.

Hot link function, search machines

The detail information of each d/o provided in the data base of IRIS is visible in a separate window after activating the hot link function. It includes: name of the d/o, mineral content, geographic position and coordinates, geological data, shape and orientation of the deposit, metallogenetic district, isotopic data (if known), vitrinite reflectance of coals, remarks, figures and sections if available, and references (Fig. 3, 4). The hot link function is operating in the information layer “mineral deposits/occurrences” and by using a search machine for the visualization of a special d/o. The search machines support the interactive work with IRIS. They are focussed to:

Raw material groups

All mineral d/o of the specific groups of raw materials (in brackets the number of d/o): iron and steel alloying metals (479), base metals (491), non ferrous metals (168), precious metals (91), special metals (172), industrial minerals (1342) are listed in a window. Each group is to visualize in the map.

Mineral deposits/occurrences (d/o)

All d/o are listed alphabetically with the nomination of their mineral commodities in a window. After selection of one d/o a blinking light in the map indicates its position, and all information of the data base are appearing in another window.

Mineral commodities

All mineral commodities and the number of their known d/o are listed in a window. A certain commodity may be selected from this list and all sites of the respected mineral commodity will be displayed on the screen. A list with all d/o of this commodity appears in another window as well.

Metallogenetic districts

All 150 metallogenetic districts of Austria are listed in alphabetical order. The district to be displayed can be selected by moving the light bar. After activating the enter-key only sites of this particular district will be shown on the screen.

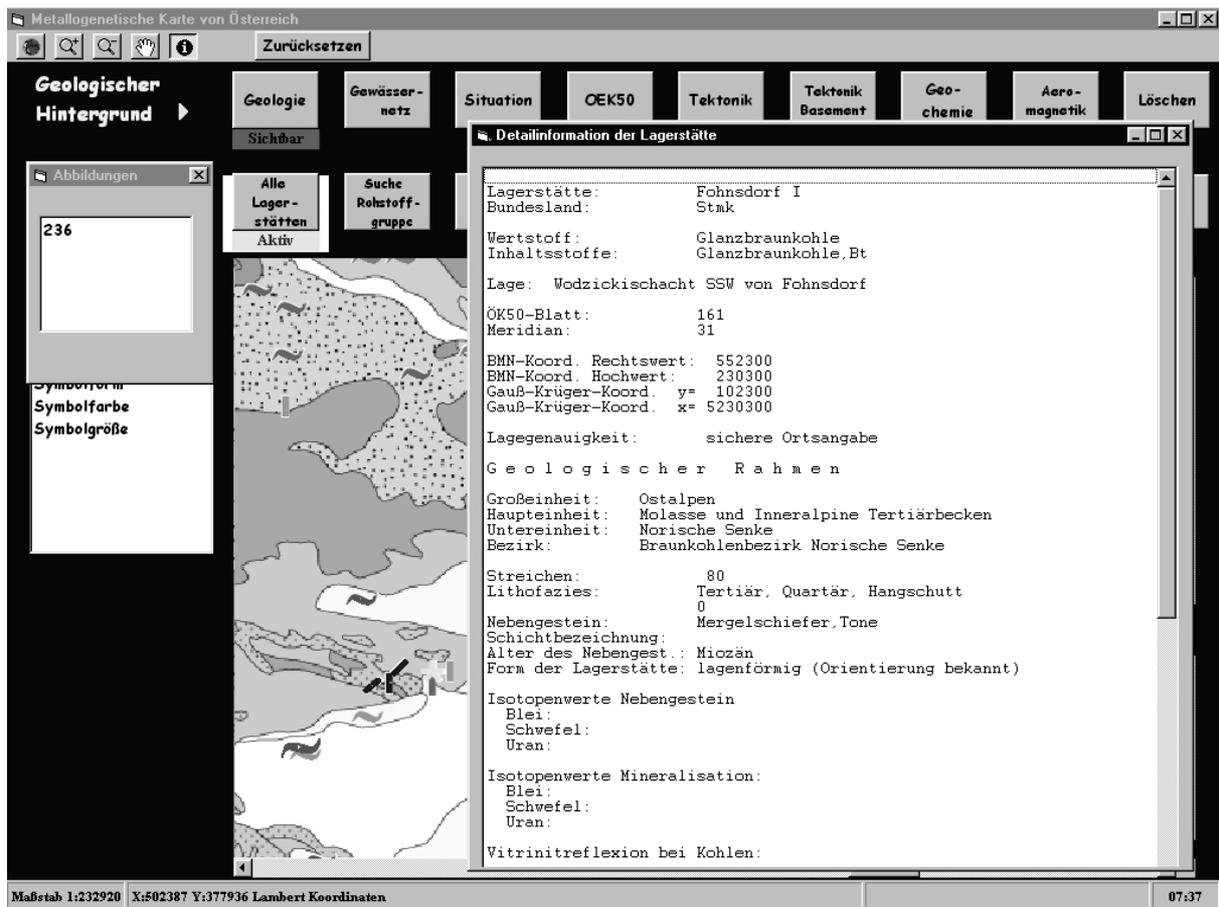


Fig. 3: Detailed information concerning “Fohnsdorf lignite deposit”.

GIS-Software and applied functions

IRIS was developed in Visual Basic 6.0 from Microsoft and MapObjects 2.0 from ESRI. MapObject is an ActiveX control (OCX) with more than 45 programmable ActiveX Automation objects that can be plugged in to many standard Windows development environments such as Visual Basic. The required GIS-functionality is supplied by MapObjects. The development was done under Windows NT 4.0.

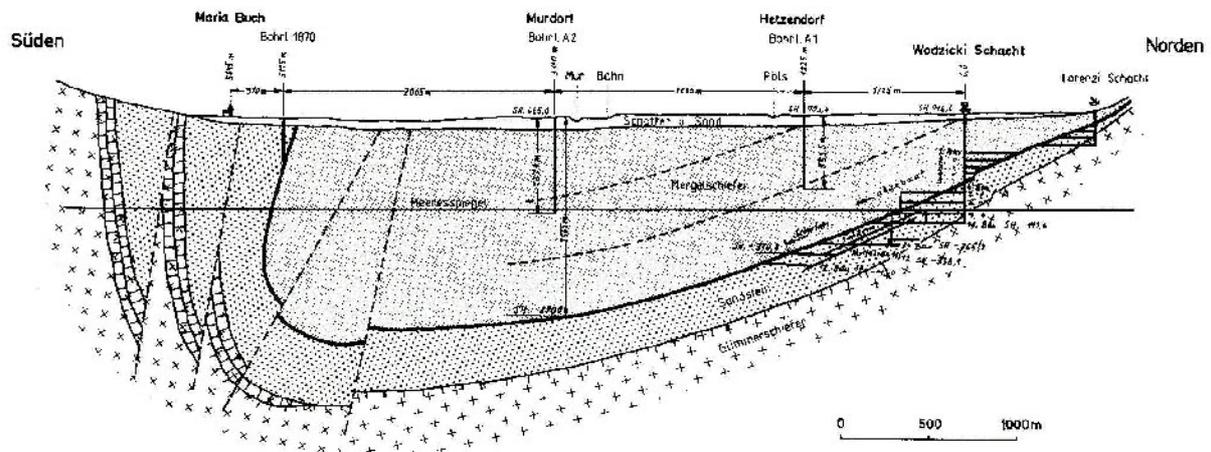
Technical requirements to run IRIS

Operating System: Windows 98 or NT (version 4.0 and SP3 or higher), 2000, XP

Hardware: 64MB RAM, a minimum of 350 MB free disk space. Pentium with 166 MHz or higher. IRIS II is available for sale at the Geological Survey of Austria/Vienna.

Outlook

The positive experience with IRIS is a big challenge to improve the data base and the interactive handling. Therefore in the next future some other important layers with special regards to mineralizations will be implemented (e.g. metamorphism both pre-Alpine and Alpine, heat flow etc.).



**Profil durch die Braunkohlenlagerstätte von Fohnsdorf
aus: WEBER, L. & WEISS, A. 1983**

Fig. 4: Cross section of the Fohnsdorf lignite deposit (mine). This section is available from the data base of this deposit (announced as Fig. 236 in the separate window of the hot link information of Fig. 3).

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