CZECH REPUBLIC
DEVELOPMENT COOPERATION

Česká geologická služba

Czech Geological Survey

95 LET | ANNIVERSARY

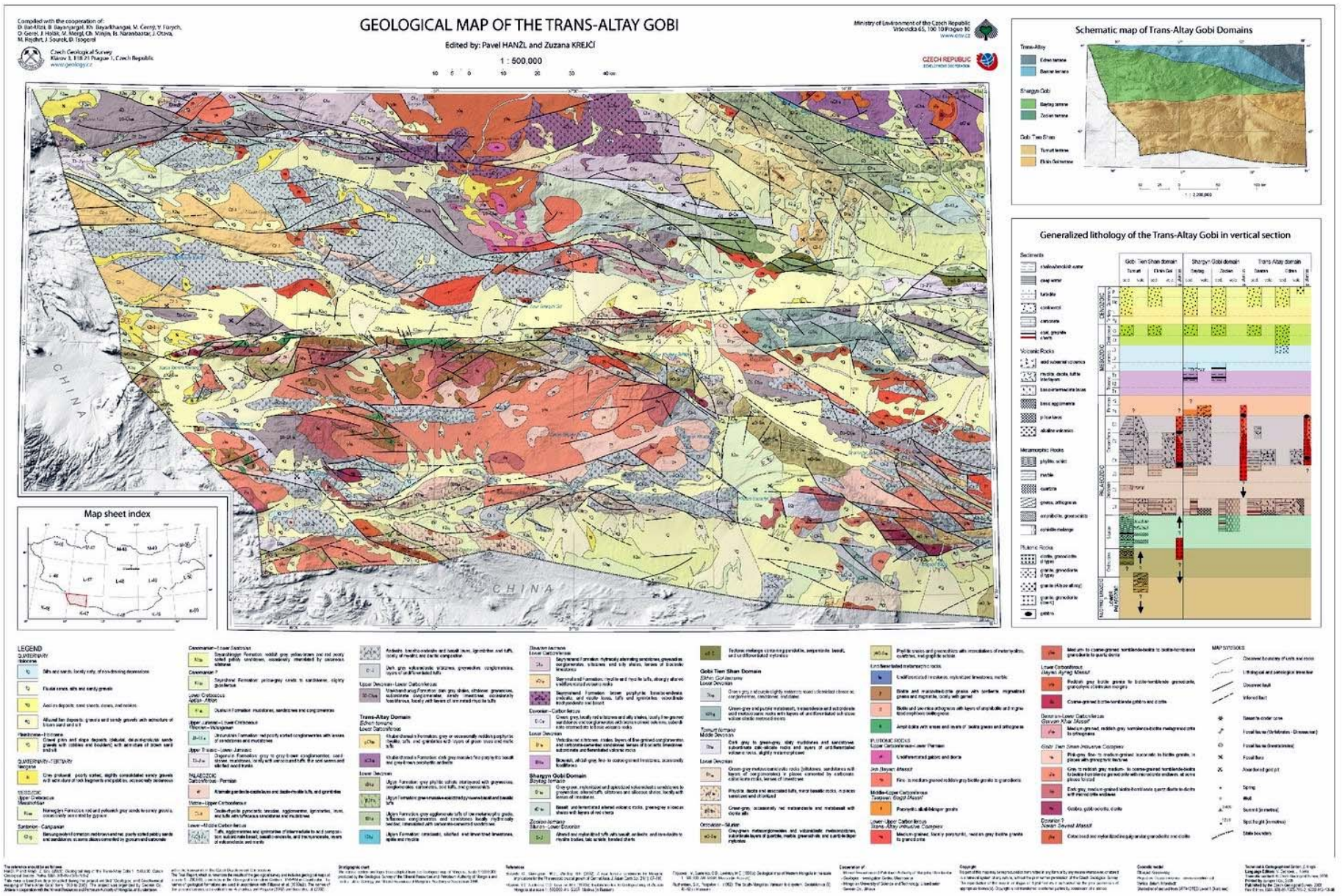
GEOLOGICAL MAP

DEFINITION AND DESCRIPTION

Geological map – what is it?

Geological map is a scale-down interpretation of the structure of selected area of the upper part of the Earth crust usually drawn on the topographic base (sometimes on DEM).

Geological map shows (using various colors and symbols) the rocks and boundary between them that would be seen on the Earth´s surface if the soils were removed.


GEOLOGICAL MAP OF THE TRANS-ALTAY GOBI
Edited by: Pavel HANŽL and Zuzana KREJČÍ
1 : 500,000
Compiled with the cooperation of:
Czech Geological Survey
Prague 1, Czech Republic
Ministry of Environment of the Czech Republic
Vršovická 65, 100 10 Prague 10
CZECH REPUBLIC
Schematic map of Trans-Altay Gobi Domains
Trans-Altay
Edren terrane
Baavar terrane
Shargyn Gobi
Baytag terrane
Zuulen terrane
Gobi Tien Shan
Tomurt terrane
Ekhin Gol terrane
Generalized lithology of the Trans-Altay Gobi in vertical section
Gobi Tien Shan domain
Shargyn Gobi domain
Trans Altay domain
Tomurt
Ekhin Gol
Baytag
Zuulen
Edren
Sediments
Volcanic Rocks
Metamorphic Rocks
Plutonic Rocks
CENOZOIC
MESOZOIC
PALAEOZOIC
PROTEROZOIC
Map sheet index
CHINA
LEGEND
QUATERNARY
NEOGENE
PALAEOGENE
Cretaceous
Jurassic
Triassic
Permian
Carboniferous
Devonian
Silurian
Ordovician
Cambrian
Trans-Altay Domain
Shargyn Gobi Domain
Gobi Tien Shan Domain
MAP SYMBOLS

Purpose of geological maps

To explore natural resources (raw material, underground water, water, geothermal eneregy…)

To locate rocks of particular age, lithology, structure …

To reconstruct the geologic history of area

To estimate composition and character of soil

To identified natural hazards

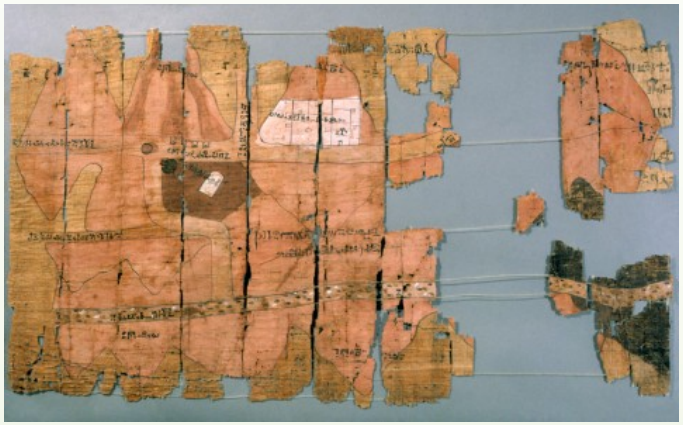
To estimate physical parameters of rocks for engineering geology

To locate places with bedrocks suitable for waste disposal

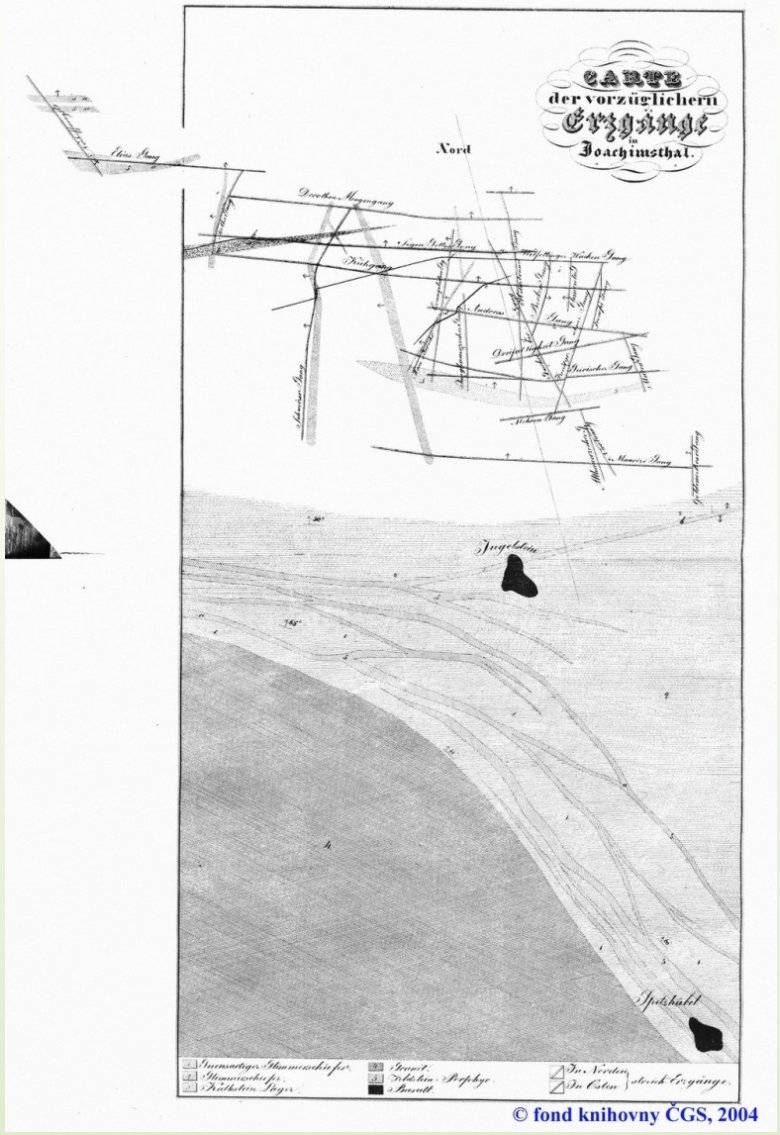
…

The geological maps can be used for **academic reasons** (how our planet and life were formed) but in fact geological maps are **essential to economic development** not only of individual countries but whole continents.

Oldest geological maps are related to mining



Old mines in Nubia (1300 BC)



Map of ore veins in Joachimsthal (1830) Central Europe

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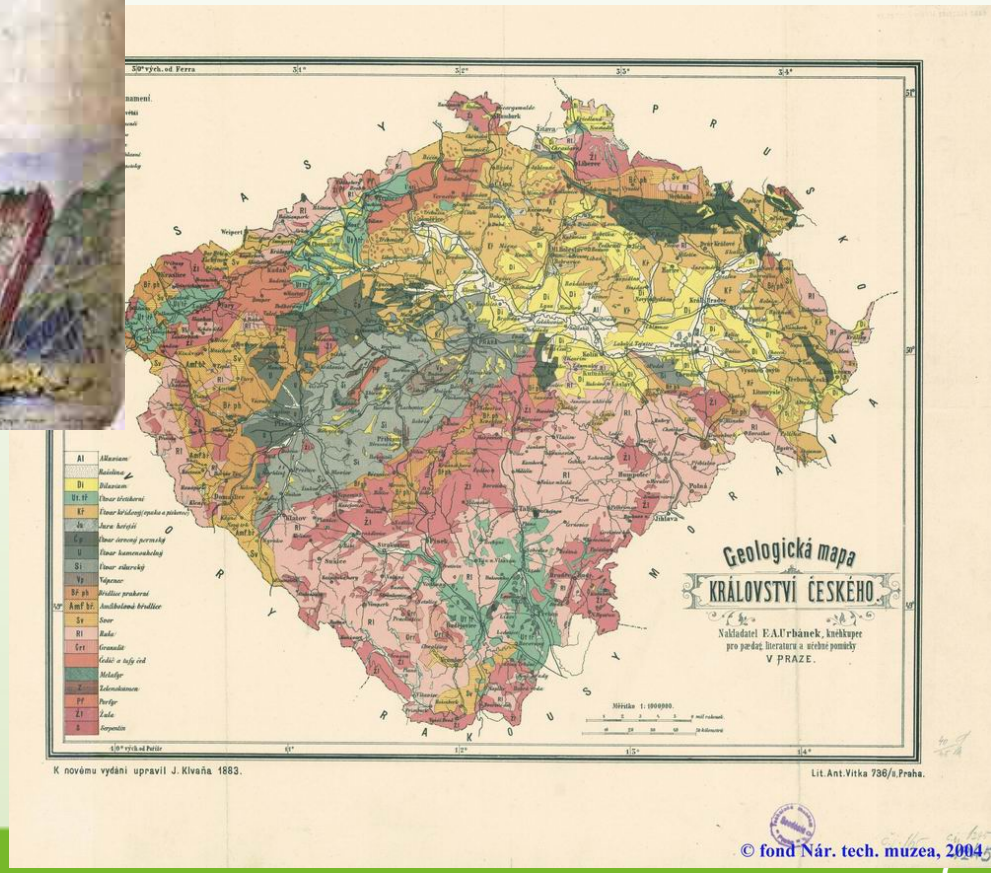
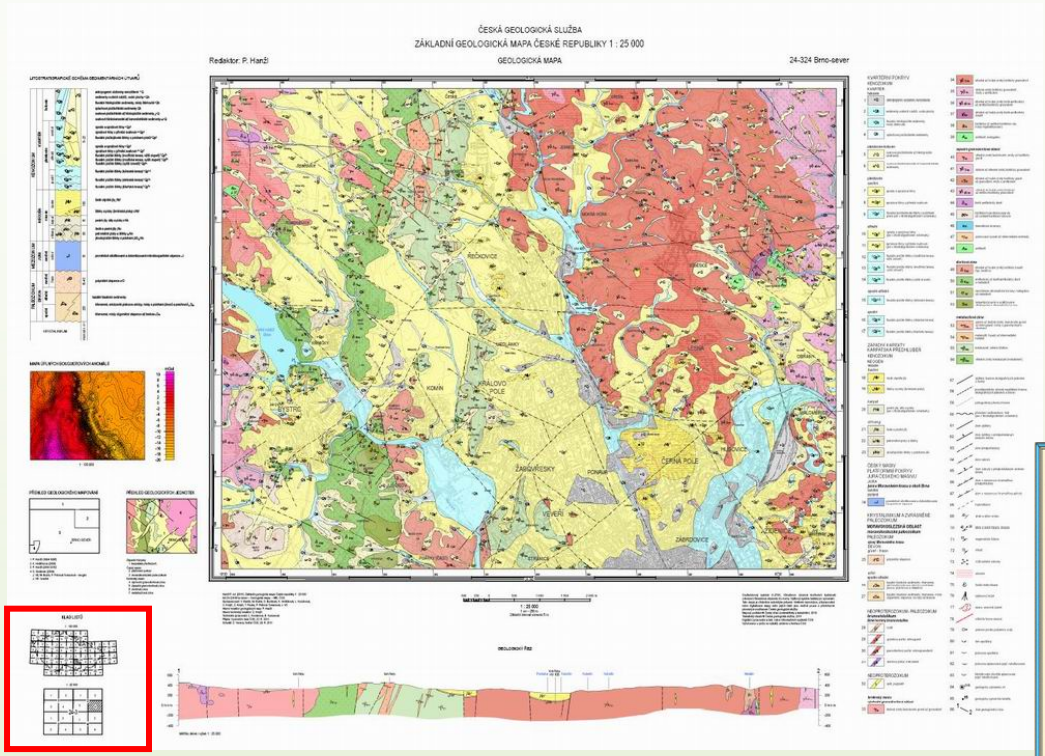
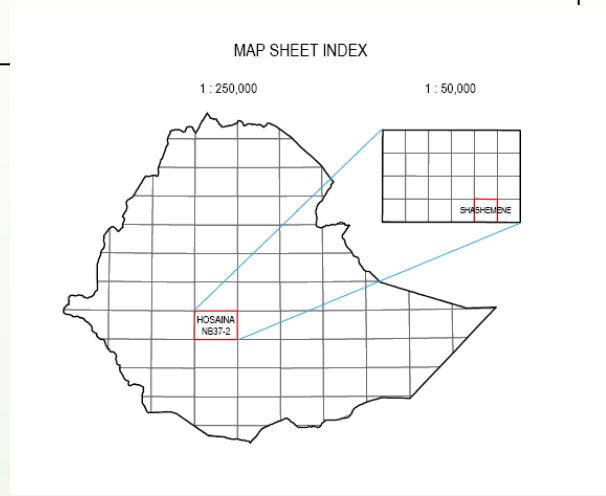
First geological maps could be dated to the end of the 18th century

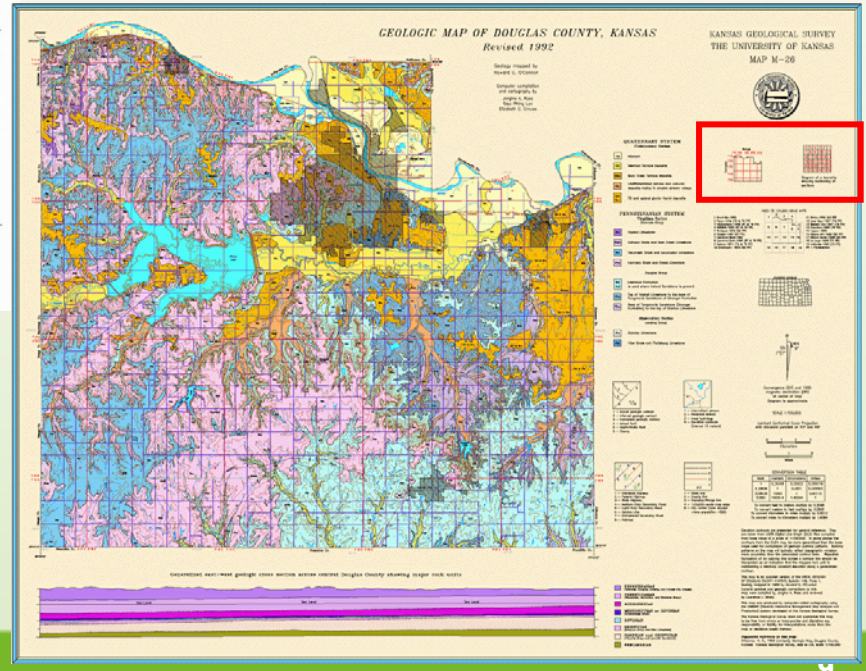


Geological maps are usually produced by Governmental institutions

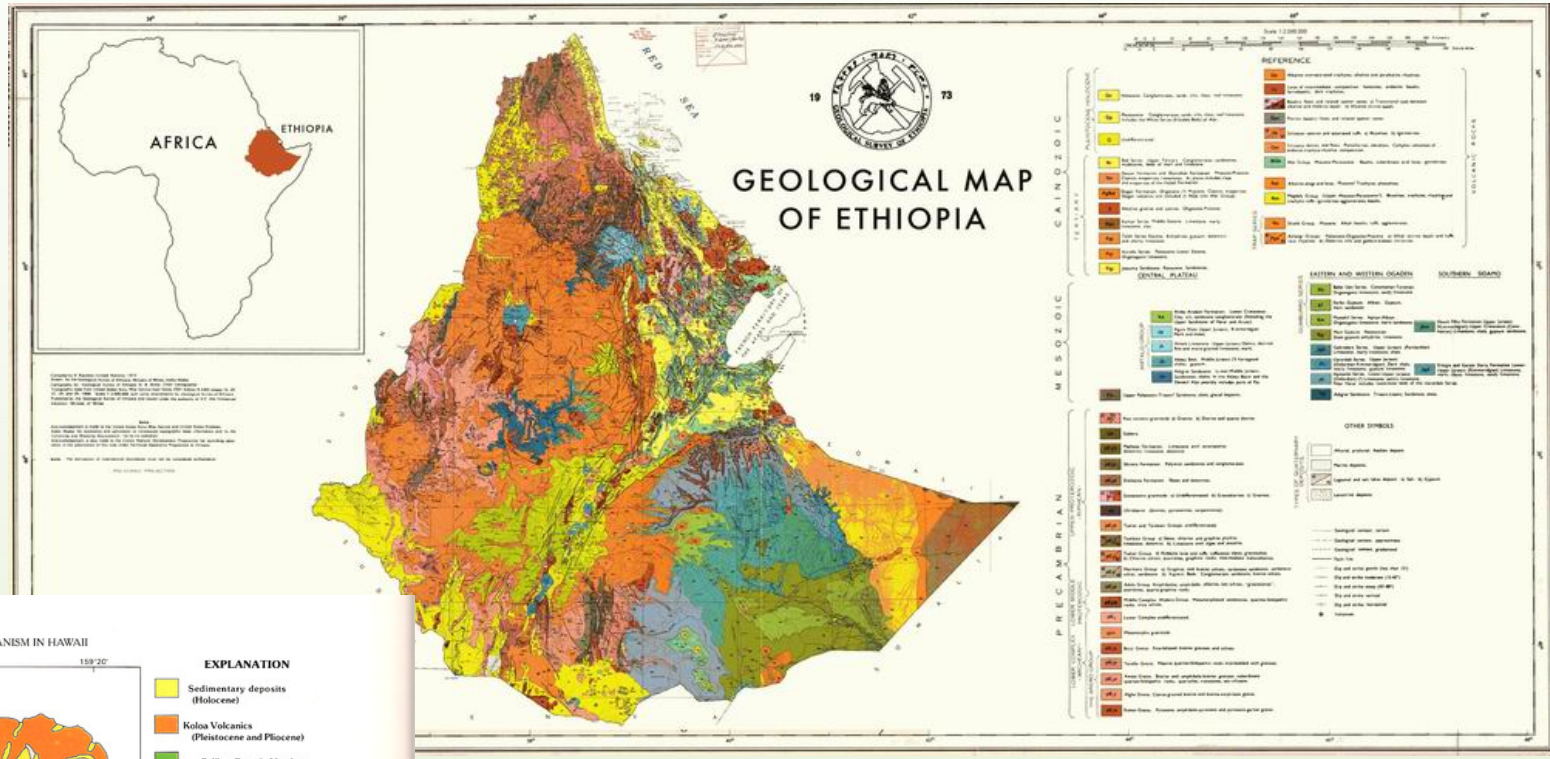
Map produced on topographic base of state map serie in defined sheet index







Special map focused on selected region or topic, not strictly limited to state map serie



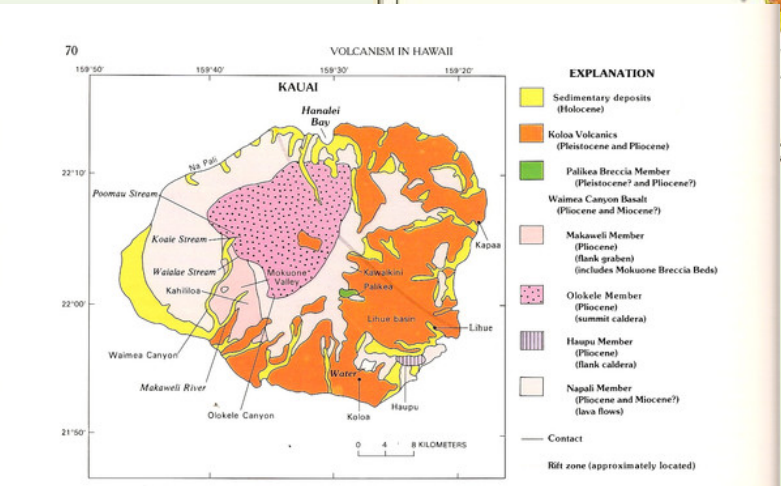
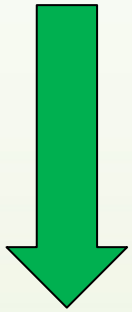


FIGURE 1.29.—Generalized geologic map of Kauai, showing localities mentioned in text. Modified from Macdonald and others (1983). Rift zones from Fiske and Jackson (1972). Summit caldera and southeast flank caldera are represented by Olokele Member and Haupu Member, respectively. Another flank caldera is represented by Lihue basin, a subcircular basin 10-15 km wide, which is almost bisected by southeast rift zone. There is no evidence that shield-stage or postshield-stage lava poured into this caldera, but it was later filled with rejuvenated-stage lava (Koloa Volcanics).

Geologic map is an interpretative (subjective) work



Techniques for map compilation must be defined to compare various geological maps

Uniform classification of rocks

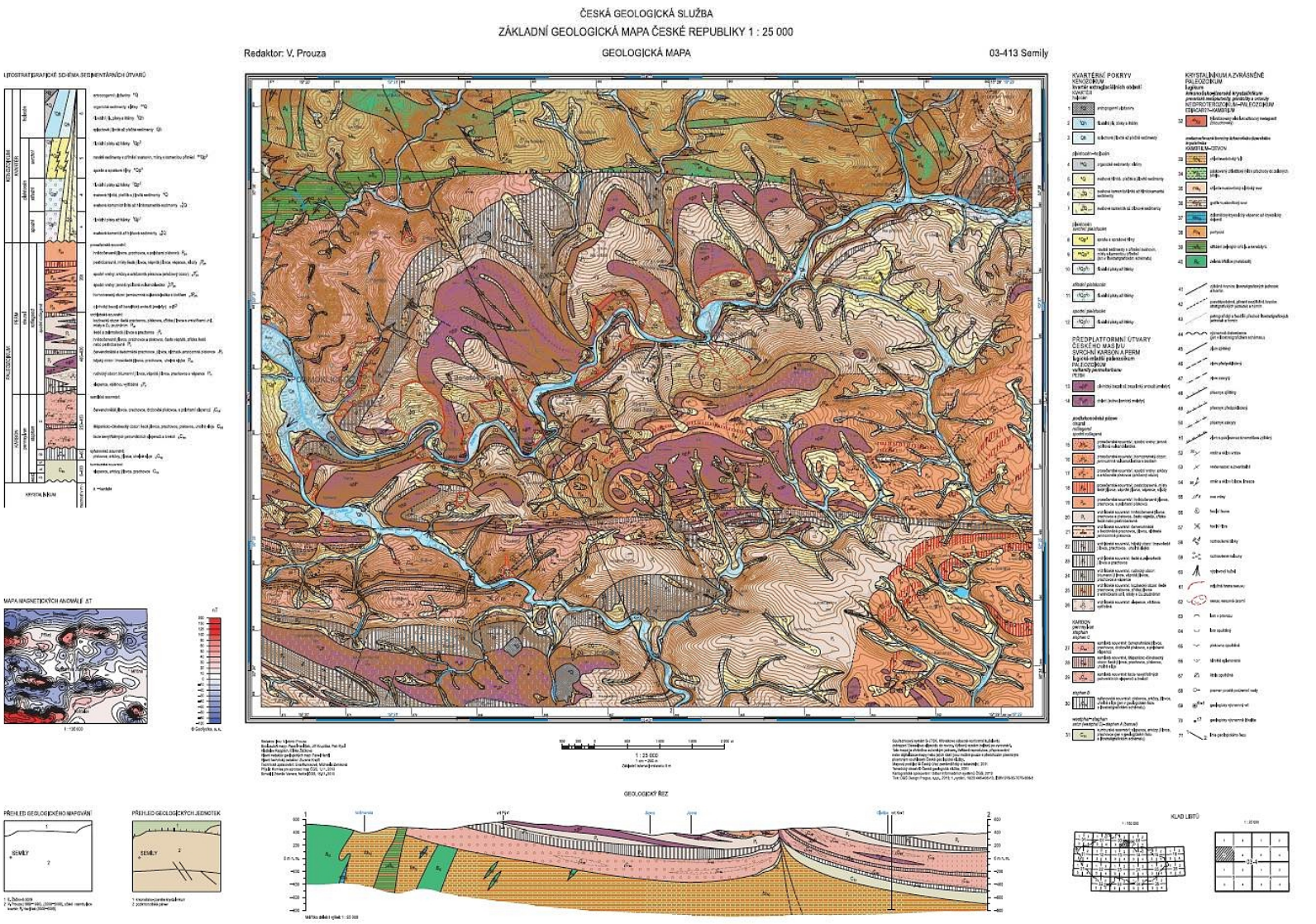
Uniform classification of tectonic phenomena

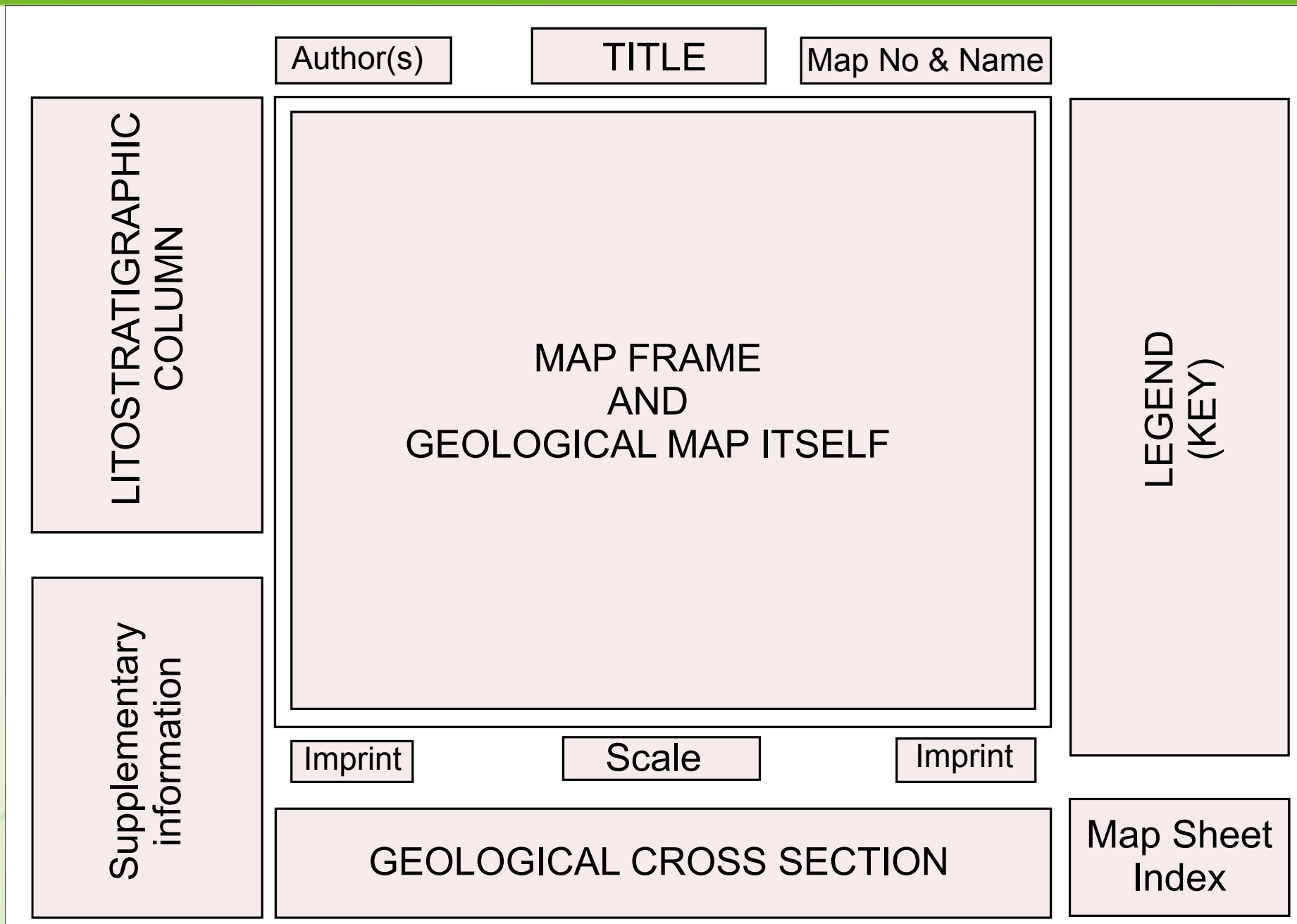
Uniform steps of outcrop´s description

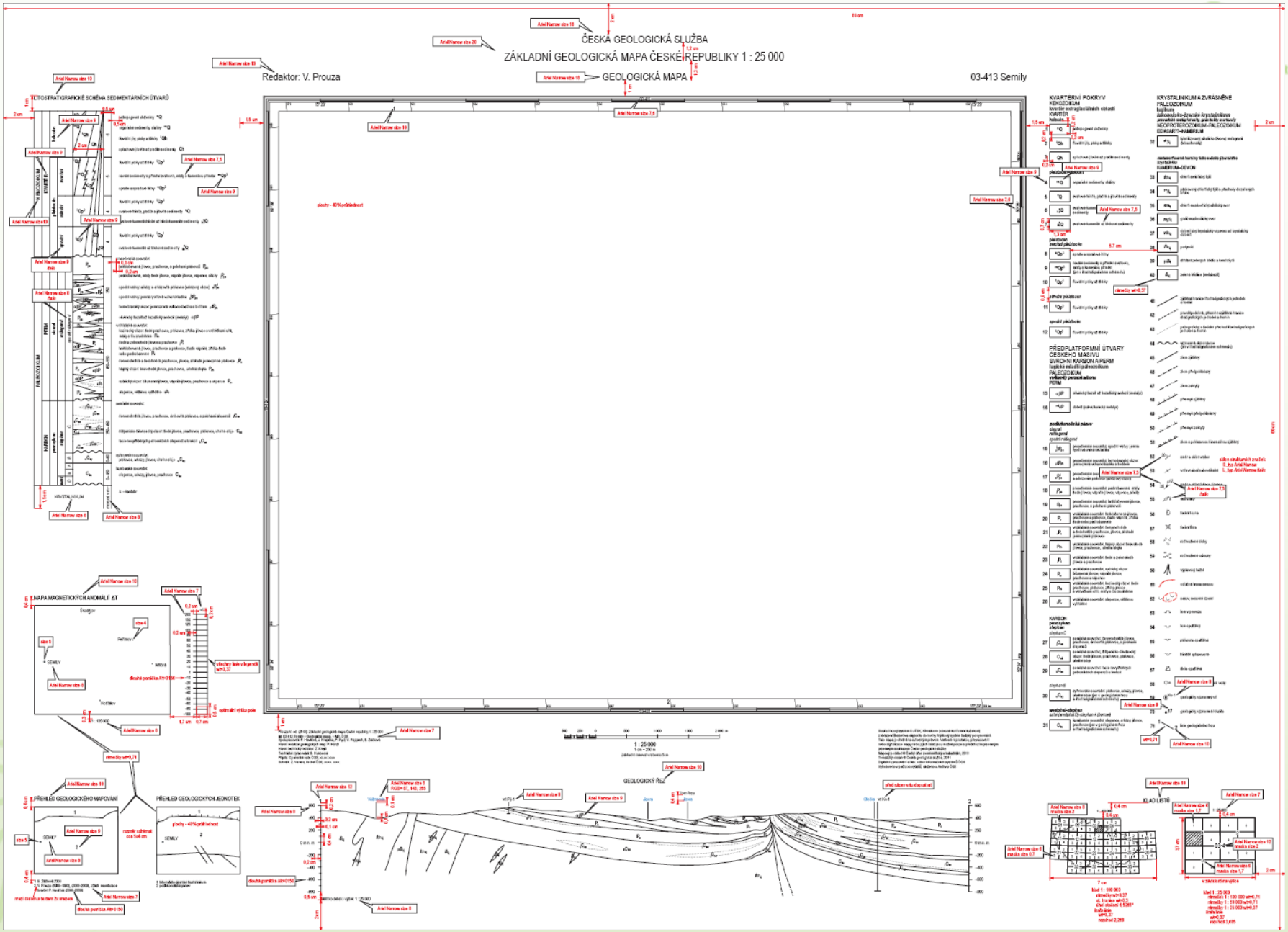
Uniform legend

...

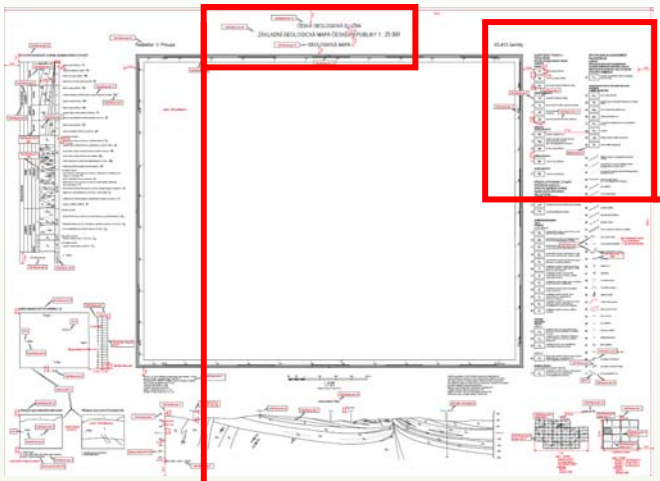
Layout of geological maps

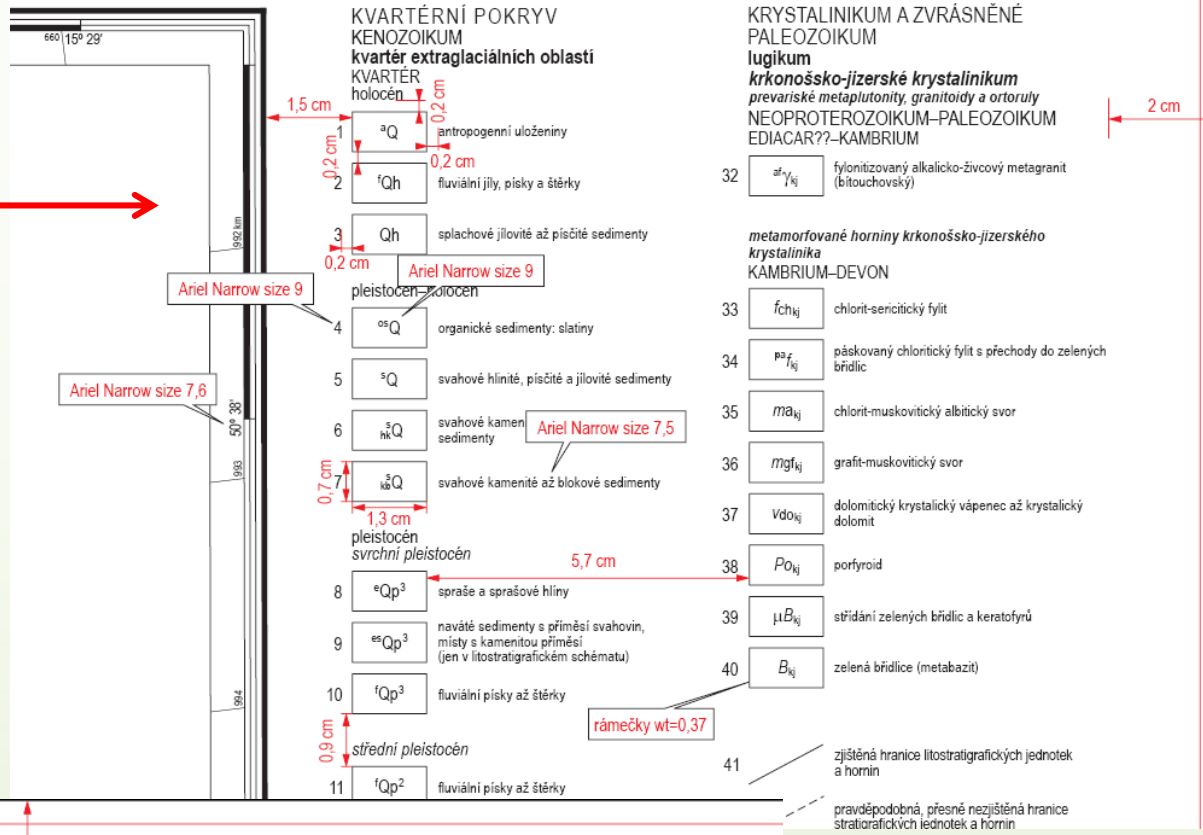


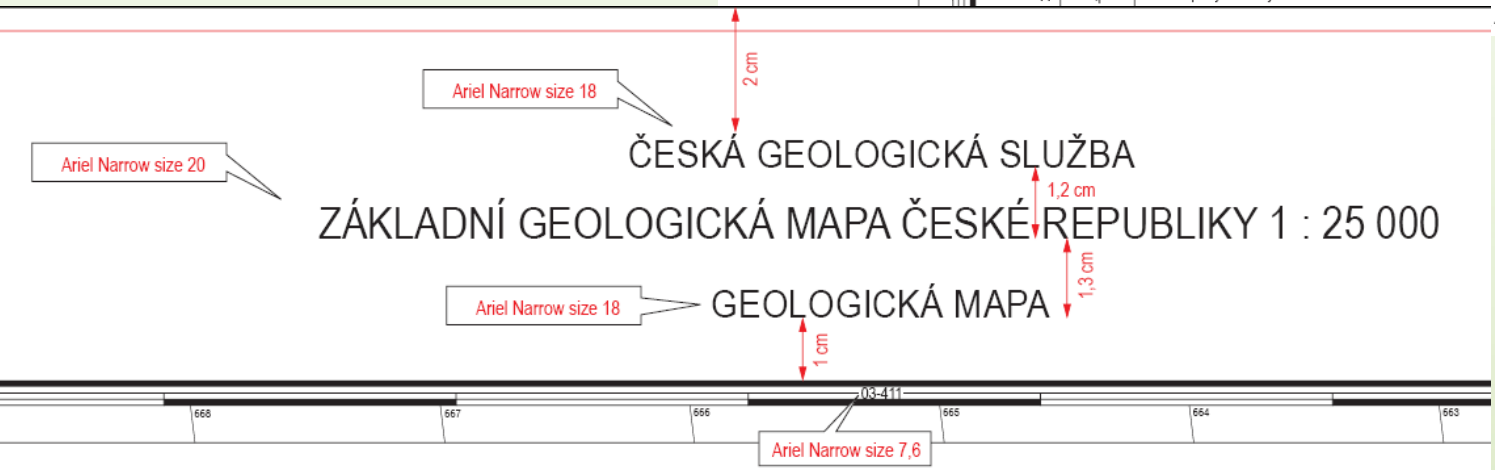

Author(s)
TITLE
Map No & Name
LITOSTRATIGRAPHIC COLUMN
MAP FRAME AND GEOLOGICAL MAP ITSELF
LEGEND (KEY)
Supplementary information
Imprint
Scale
Imprint
GEOLOGICAL CROSS SECTION
Map Sheet Index


ČESKÁ GEOLOGICKÁ SLUŽBA
ZÁKLADNÍ GEOLOGICKÁ MAPA ČESKÉ REPUBLIKY 1 : 25 000
Redaktor: V. Prouza
GEOLOGICKÁ MAPA
03-413 Semily
LITOSTRATIGRAFICKÉ SCHÉMA SEDIMENTÁRNÍCH ÚTVARŮ
KVARTÉRNÍ POKRYV
PŘEDPLATFORMNÍ ÚTVARY ČESKÉHO MASÍVU
SVRCHNÍ KARBON A PERM
MAPA MAGNETICKÝCH ANOMÁLIÍ ΔT
PŘEHLED GEOLOGICKÉHO MAPOVÁNÍ
PŘEHLED GEOLOGICKÝCH JEDNOTEK
GEOLOGICKÝ ŘEZ
SEMILY
NÁVRŠÍ
1 : 25 000

03-413 Semily







Czech Geological Survey Name of institution

Base Geological Map of the Czech Republic 1 : 25, 000

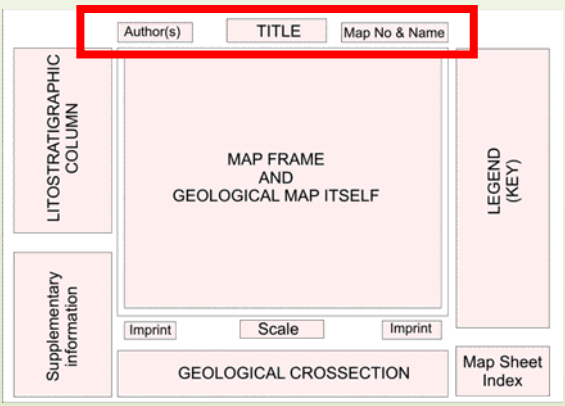
Name of map work or set

Geological Map

Type of map

Compiled by: V. Prouza

Name(s) of Author(s)

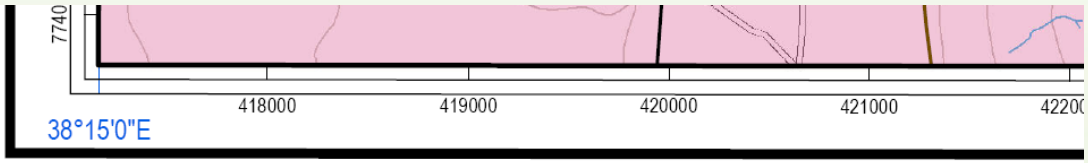


03-413 Semily

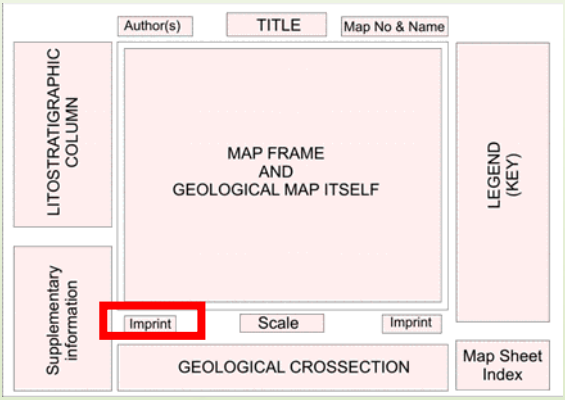
No. and name of map sheet

Left Imprint

Quotation of the map (in international standard)
Co-autors (names)
Editor in Chief and Technical Editor (name(s))
Technical processing (name(s))
Aproval (name of responsible person, date)

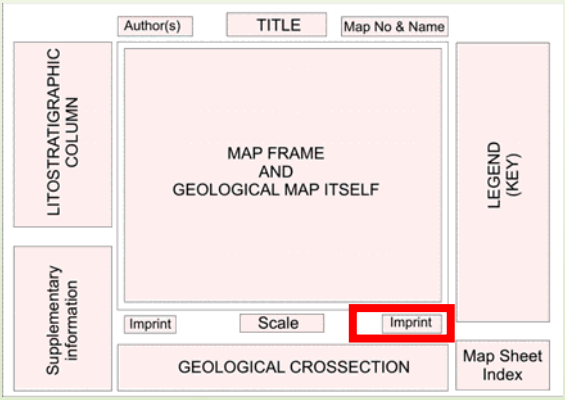


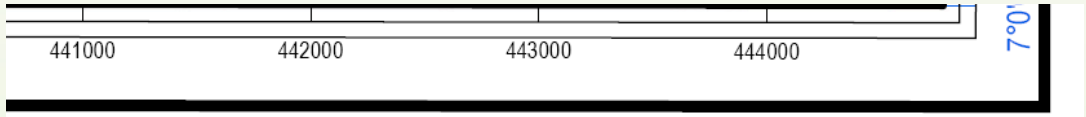
Set of Geoscience Maps of Ethiopia at Scale 1 : 50,000
Geological map of Hawasa subsheet
Collaborators: T. Hroch, K. Verner, Yewubinesh B., Daniel K., Habtamu M.
Digital cartography: D. Čížek



Right Imprint

Information about map projection and coordinate system
Copyright for topographic base
Copyright for geological data
Name of workplace, year of proccesing
Number of prints





Coordinate system:
Blue numbers: longitude & latitude
Black numbers: UTM - zone 37 in meters
Projection: Transverse Mercator
Ellipsoid, Datum: Clarke 1880, Adindan

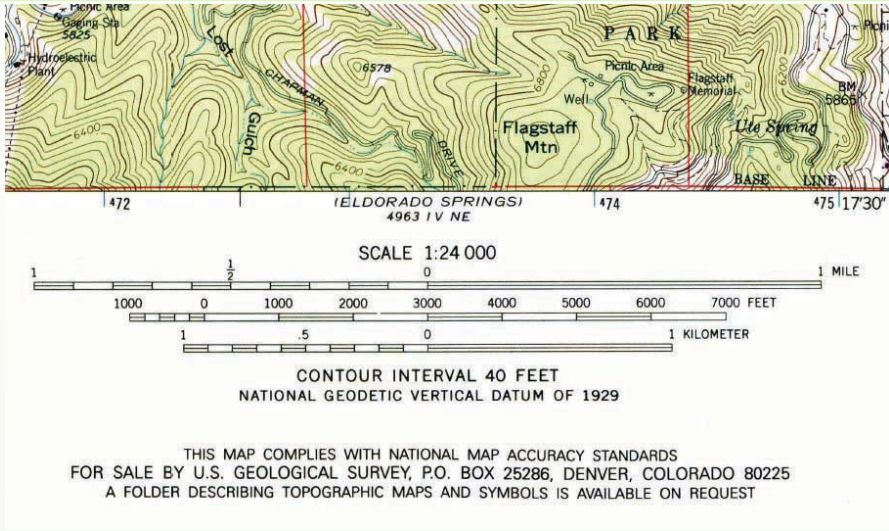
Topography derived from Ethiopia 1 : 50 000 scale maps
Ministry of Land Reform and Administration
(Survey and Mapping Department)

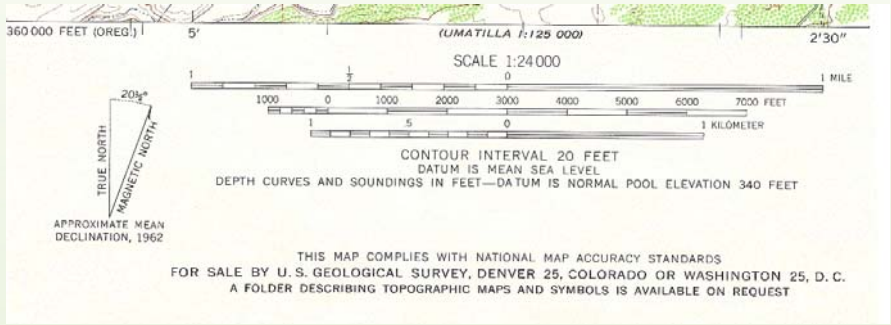
Scale

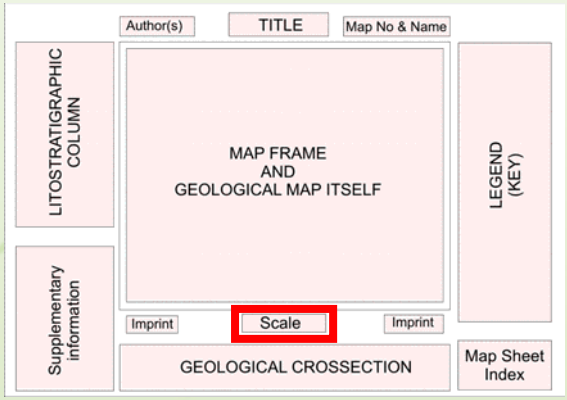
Graphic and numeric expression of scale

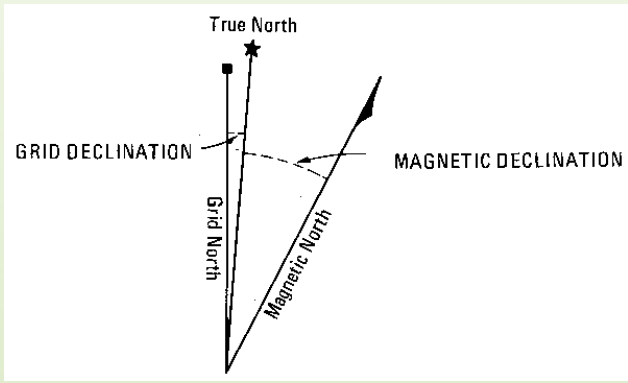
Information about contour interval

Could be completed by northstar, ussually with combination with magnetic declination



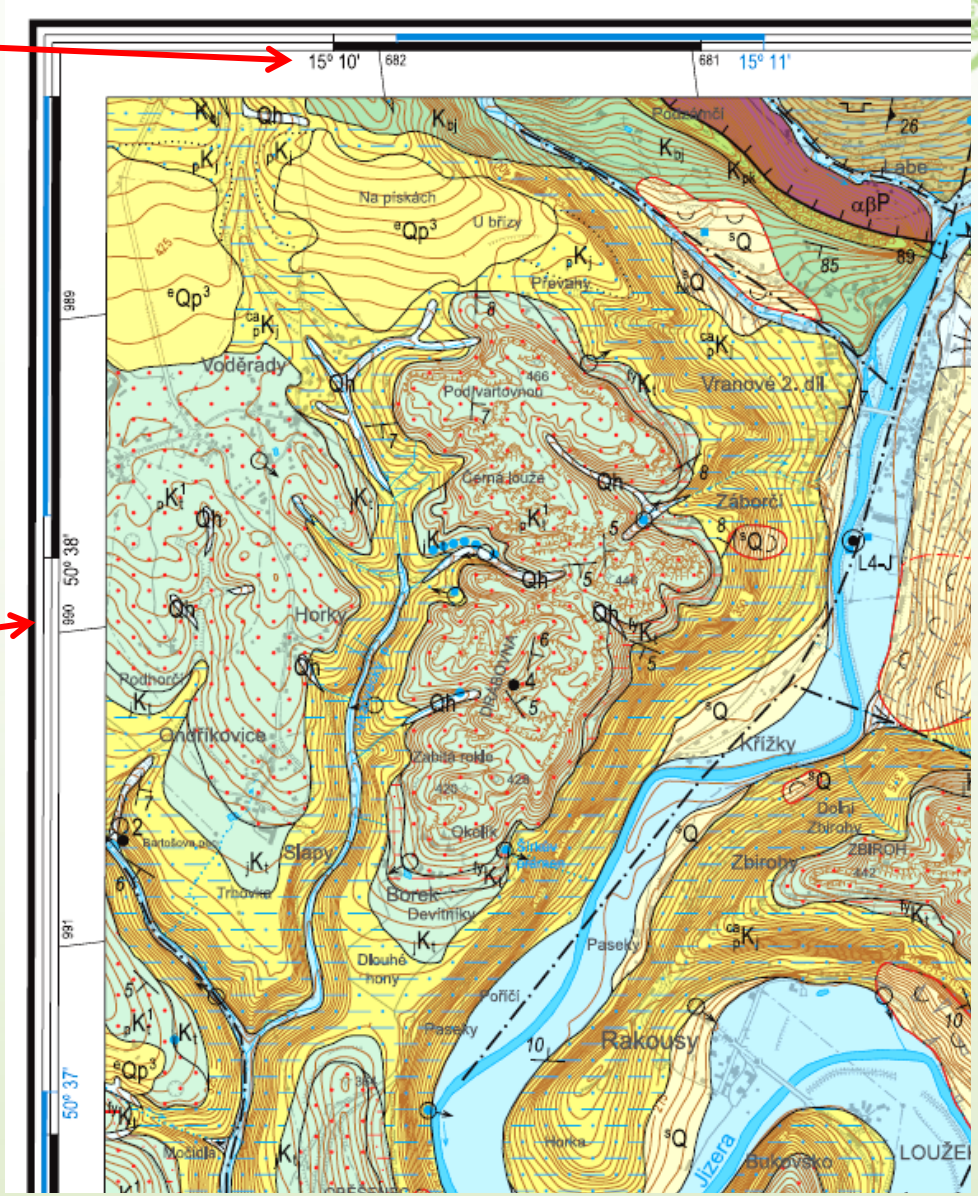


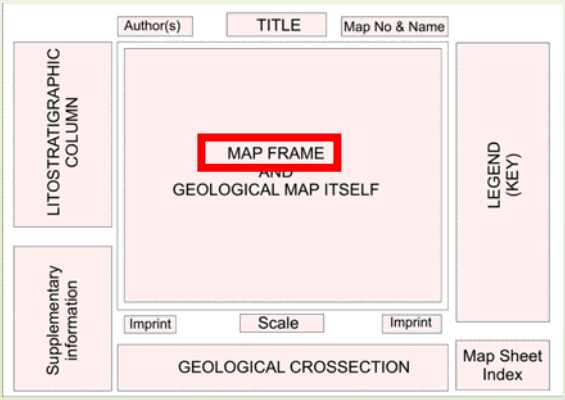


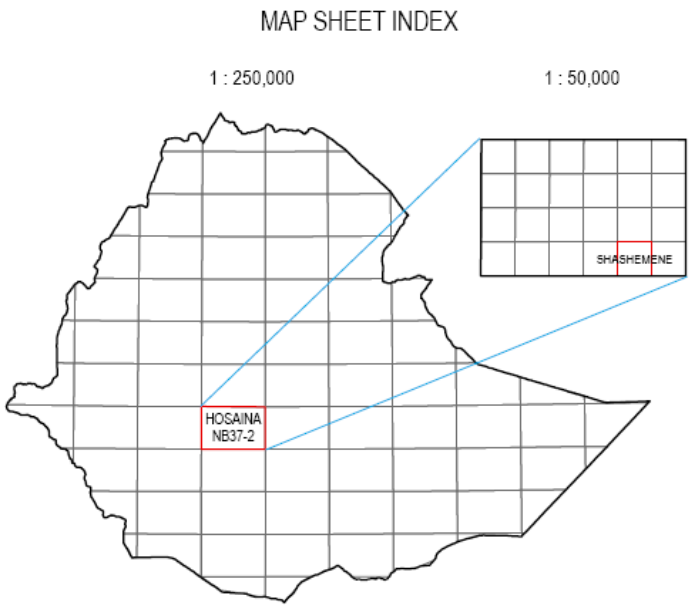


WGS84

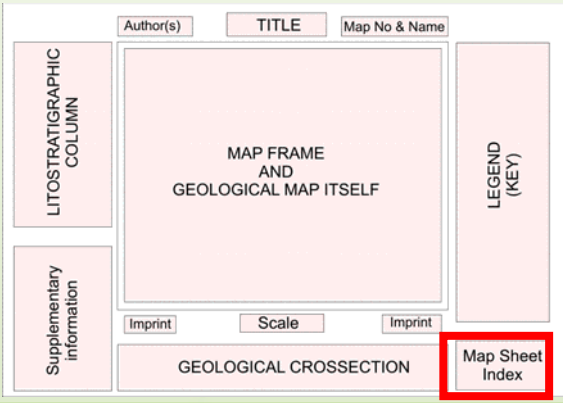
Local grid

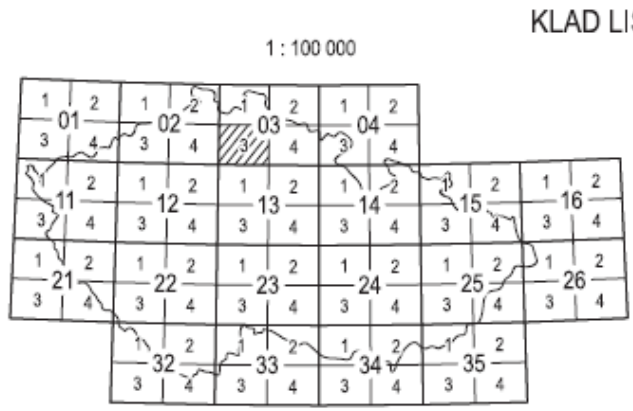


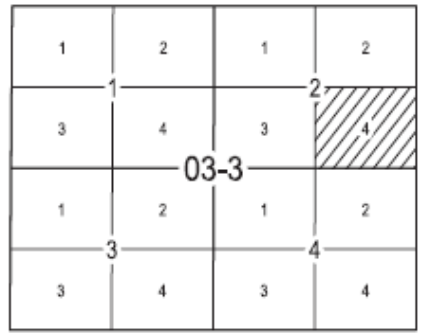




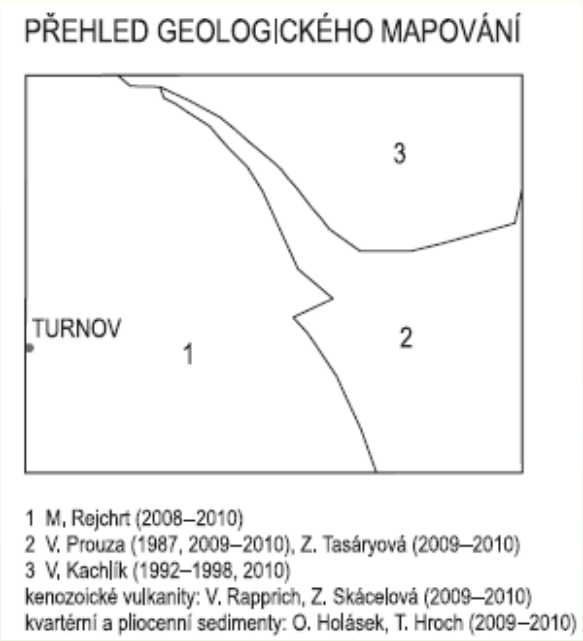
Position of map sheet in State topographic basemap



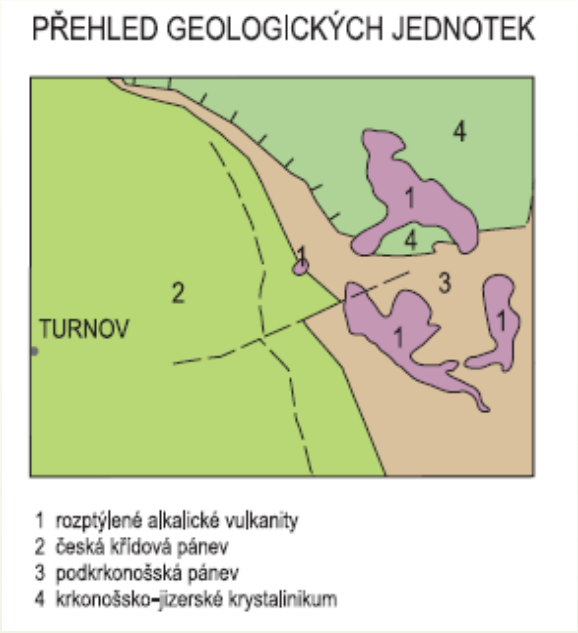




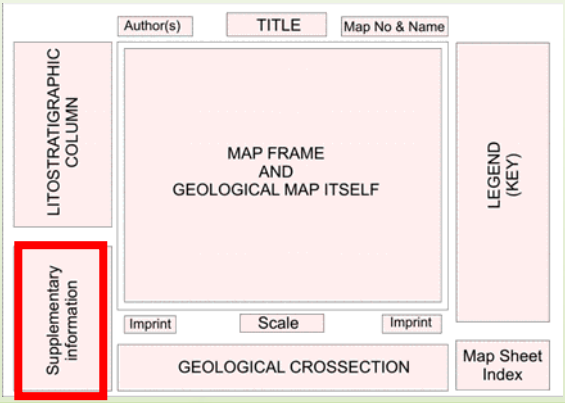
Review of Geological Mapping

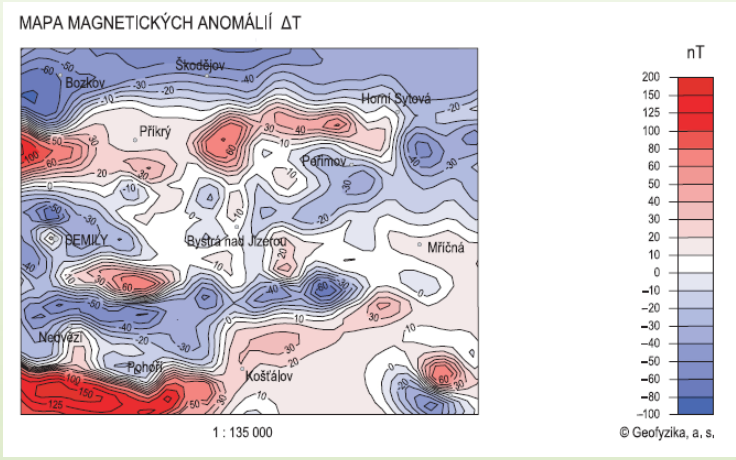


Review of Geological Units



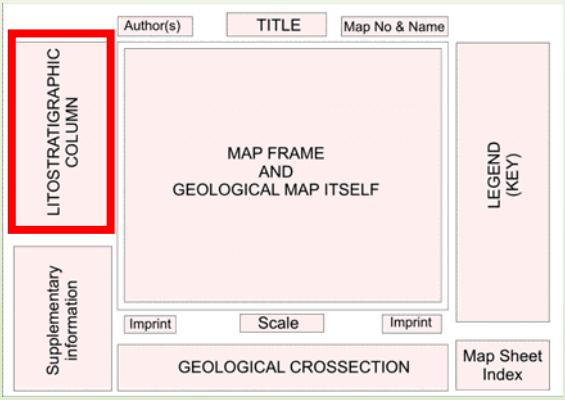
Net of faults

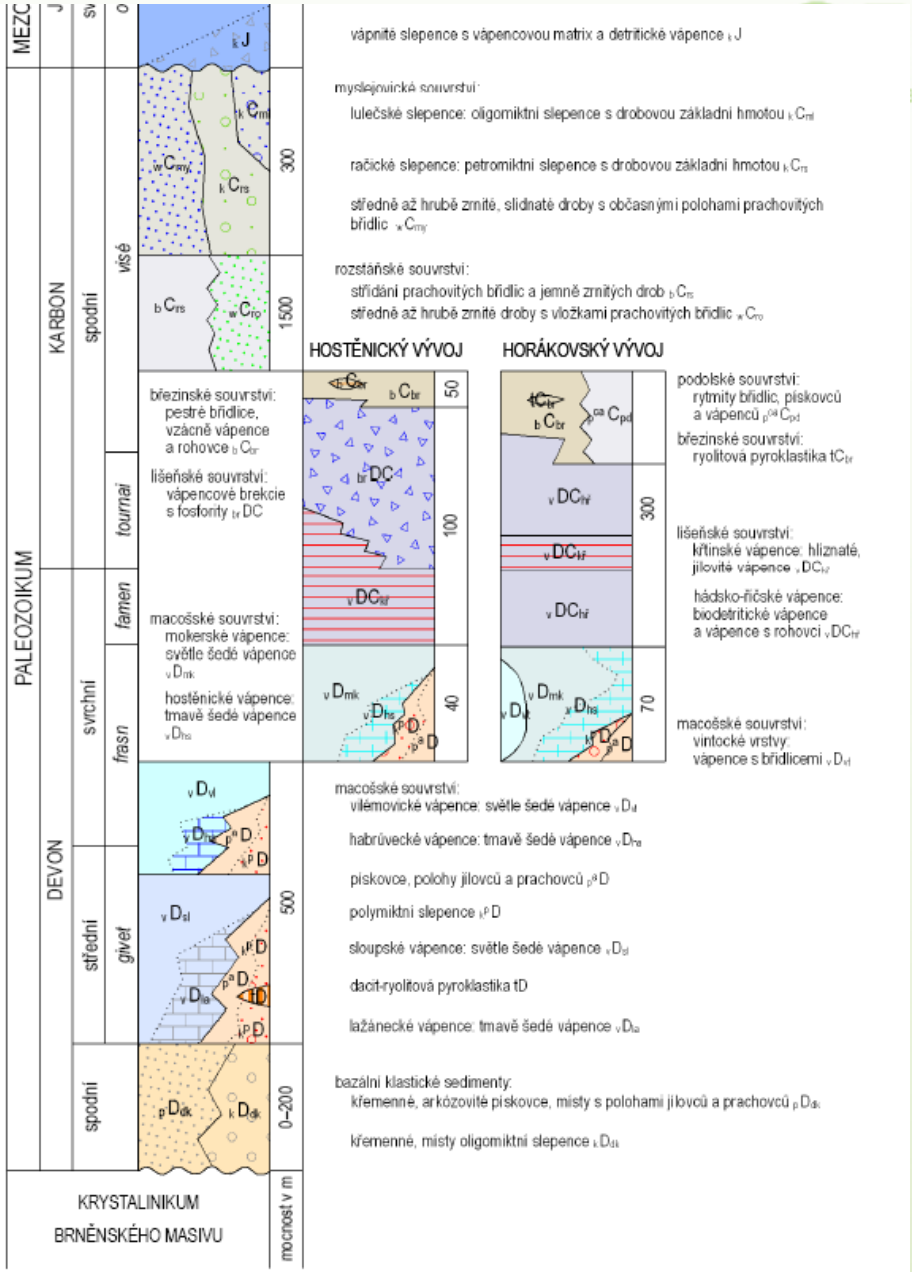




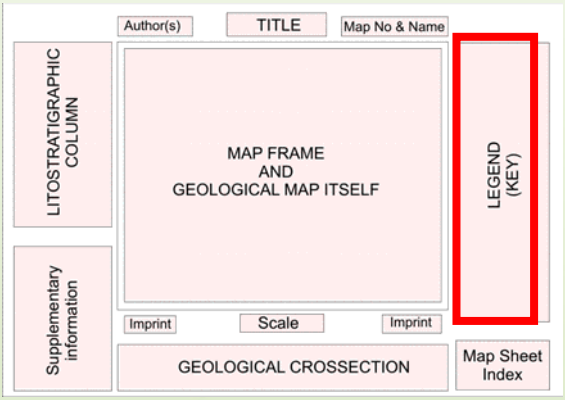
Geophysical schemes

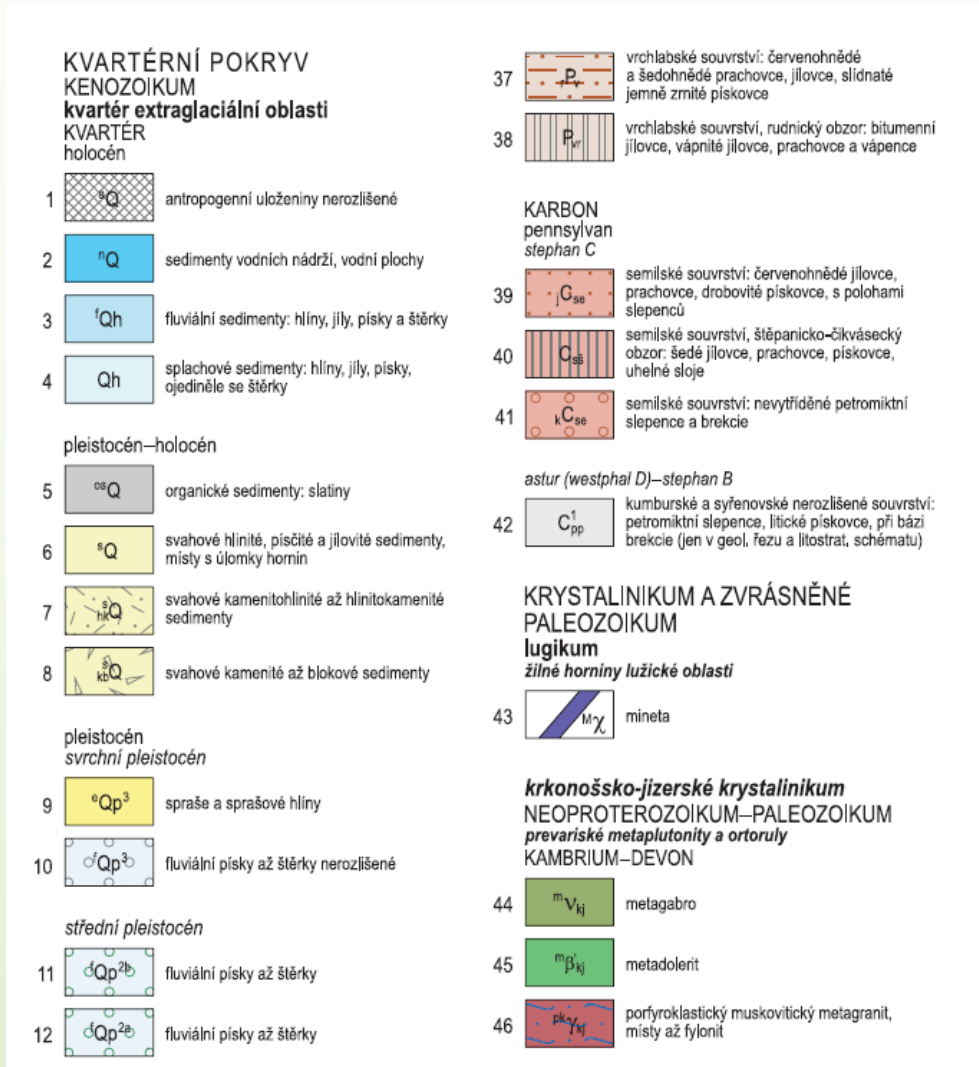
Litostratigraphic column depicts relationships between litostratigraphically defined units exposed on the maps and known from the footwall.

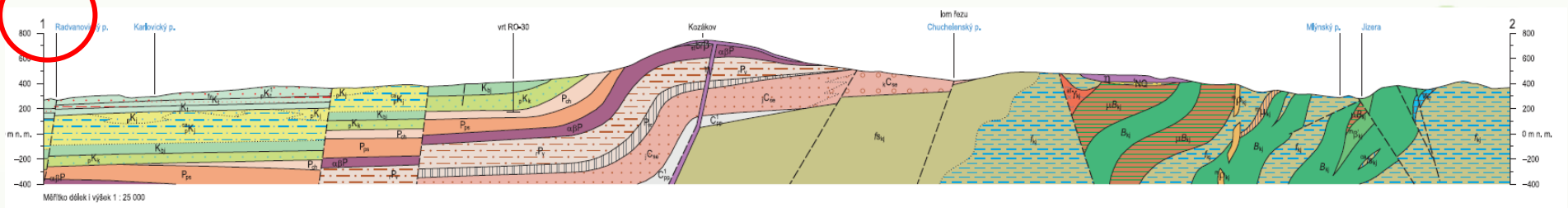




Legend explains way of graphic representation of geological phenomena depicted on geological map

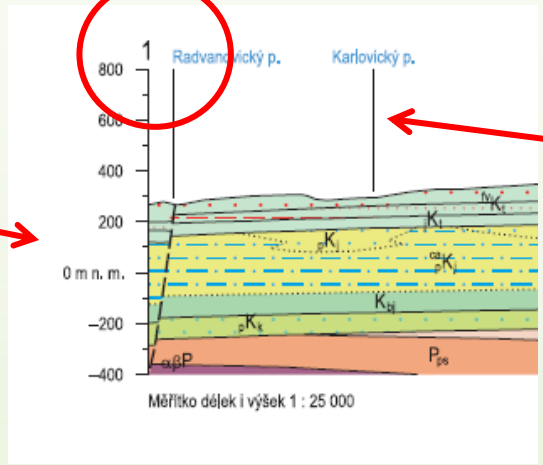




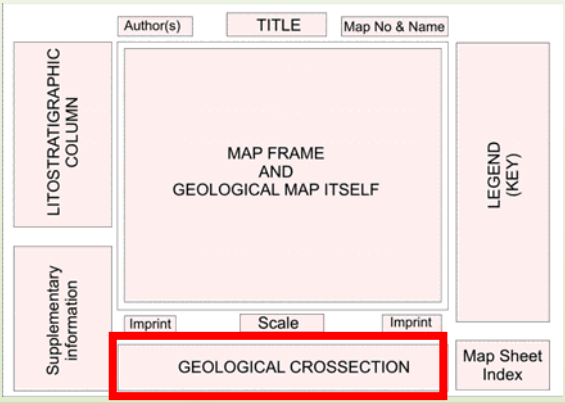


Geological cross section interprets geological structure to the depth along the line assigned in the map. It is at the same scale as the map.

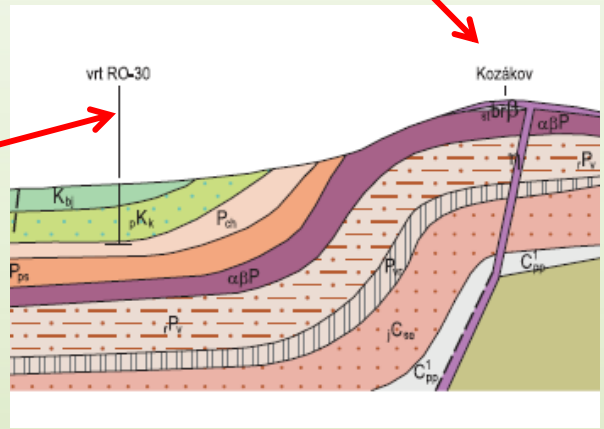
Altitude

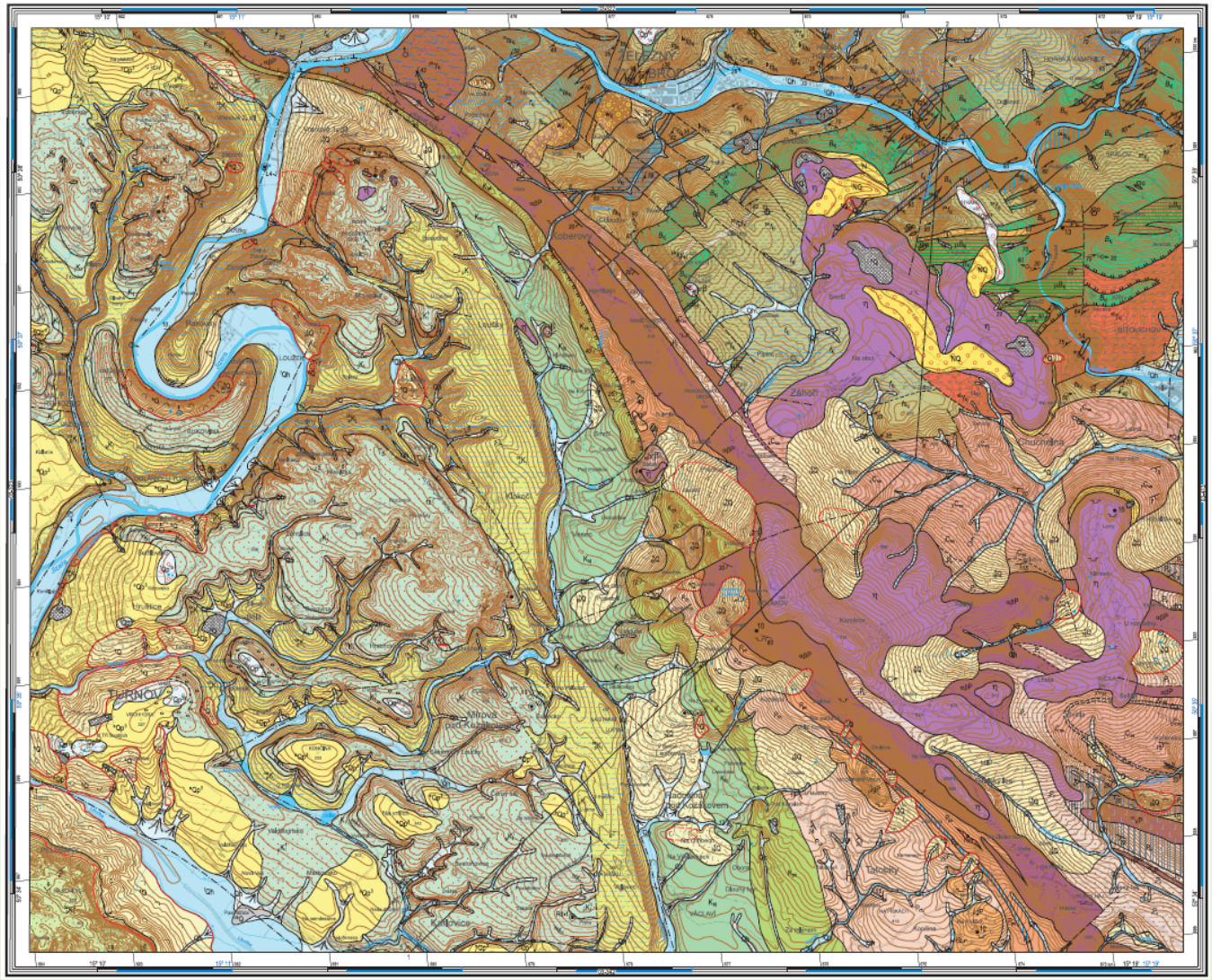


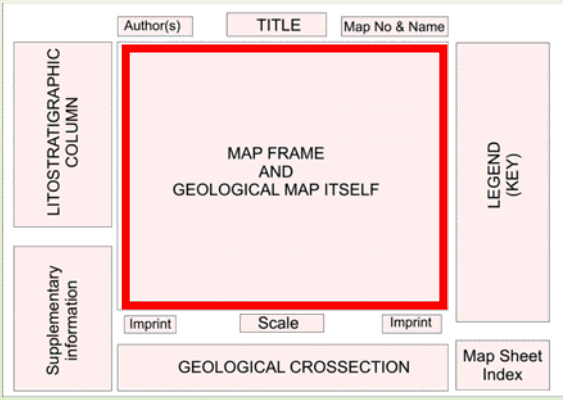
Important topographic points (spot height, rivers…)



Borehole

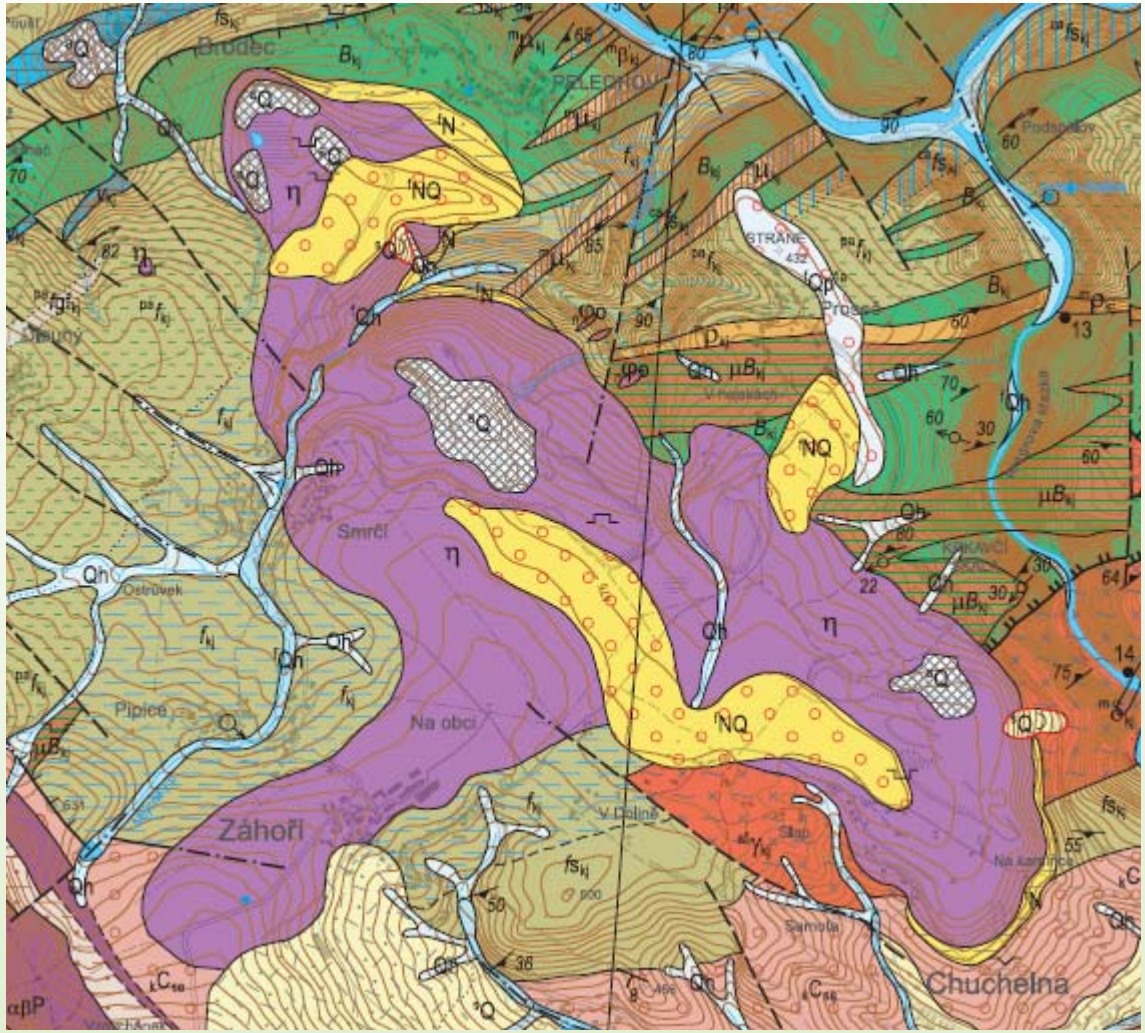






Geological map interprets geological structure of given area of the Earth´s surface and contains:

Areal distribution of geological bodies and its boundaries



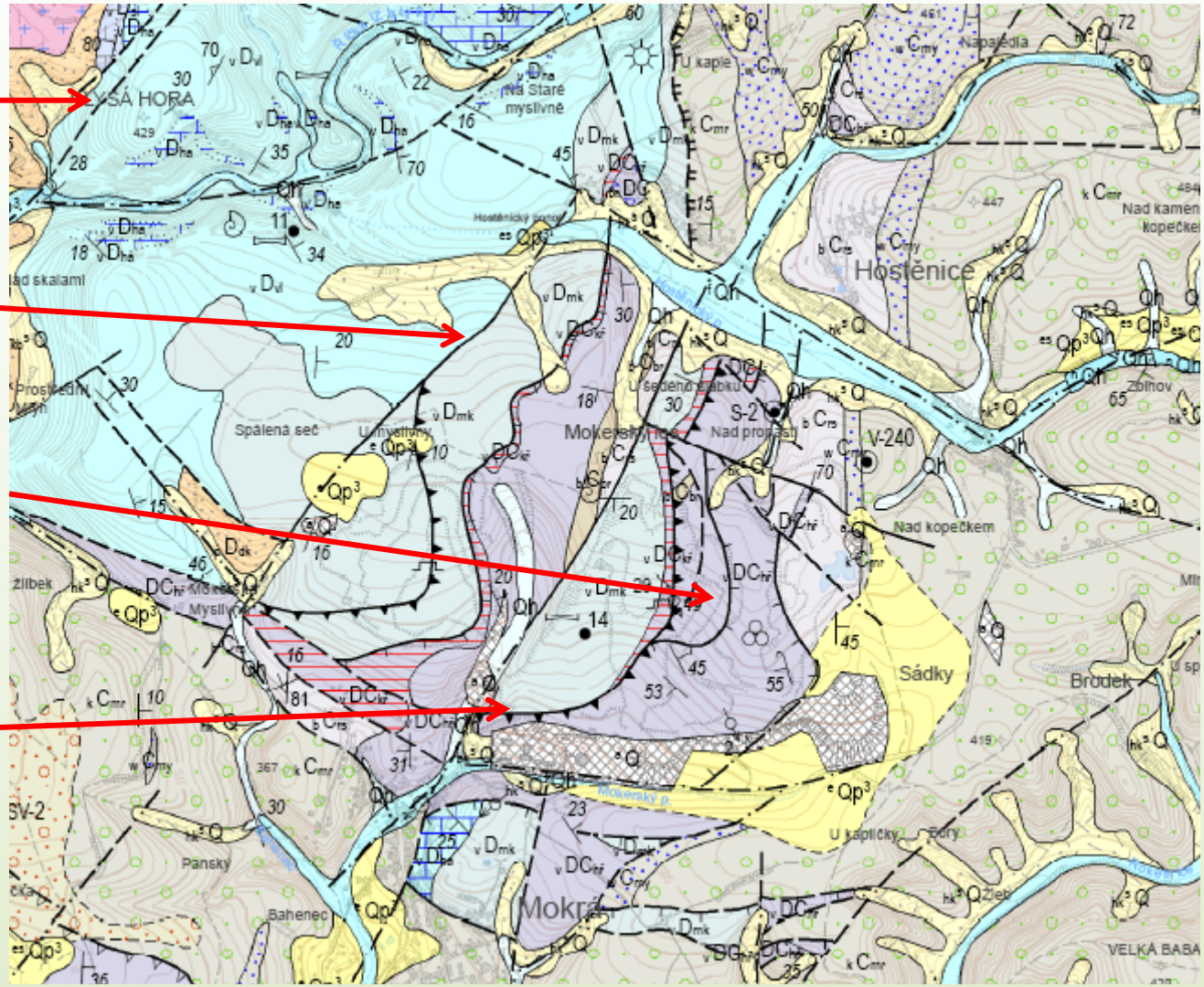
Course of faults and others tectonic lines on the Earth´s surface

Inferred fault

Fault

Reverse fault

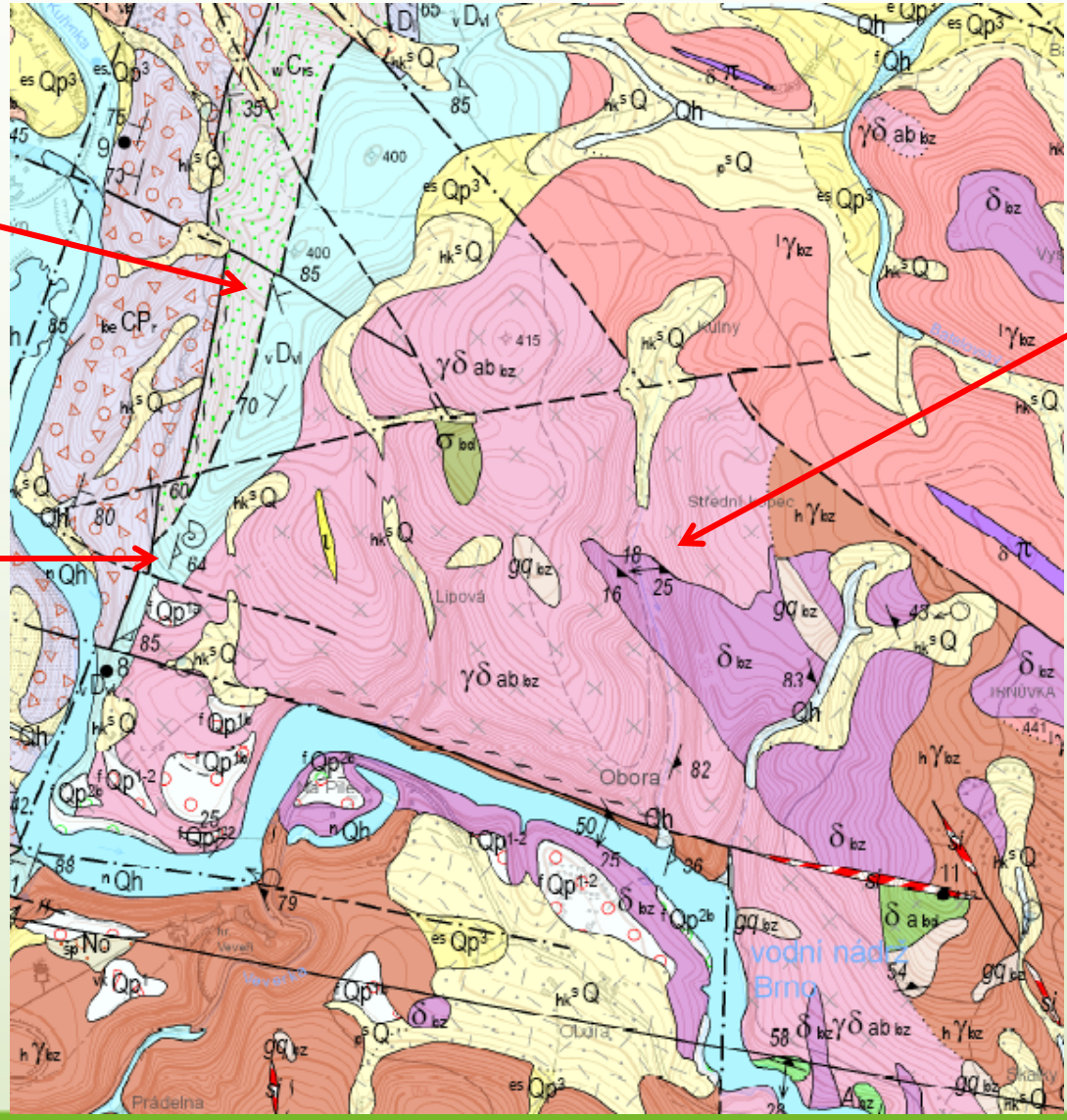
Nappe



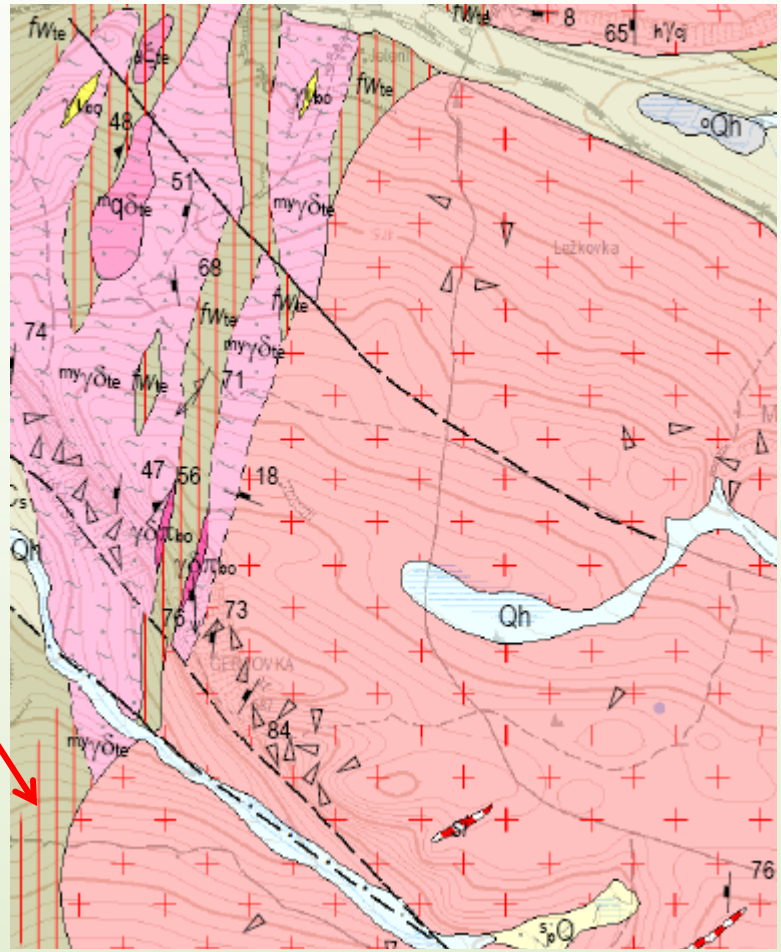
Small scale tectonic elements representing structure of geological units

Bedding

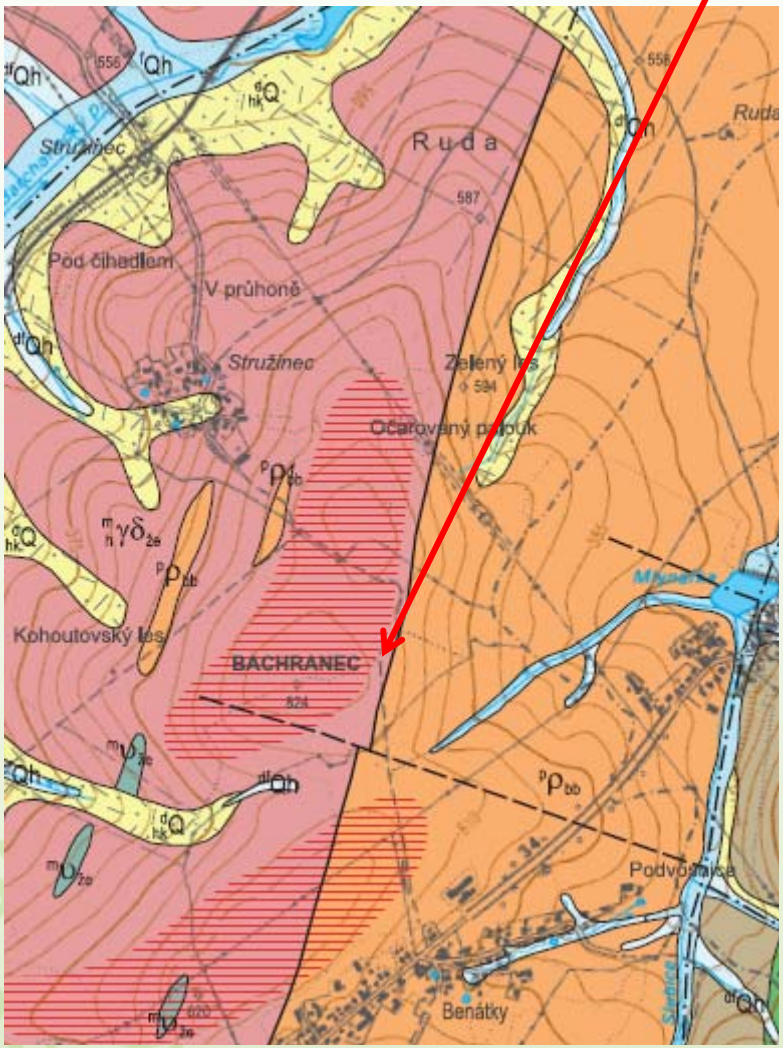
Cleavage

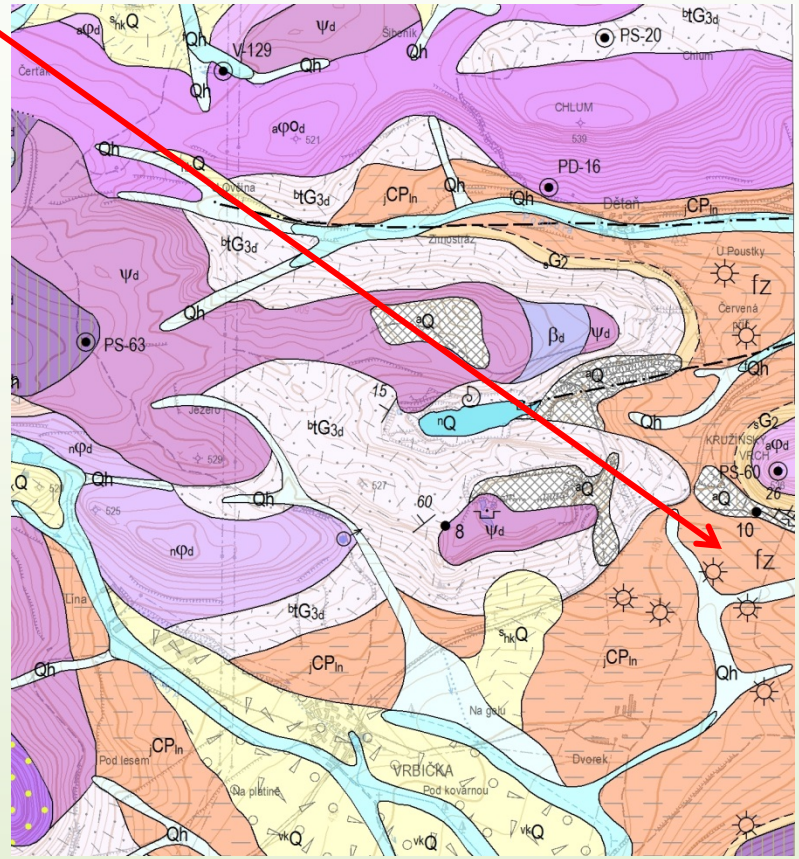


Zones of thermal and hydrotermal alterations



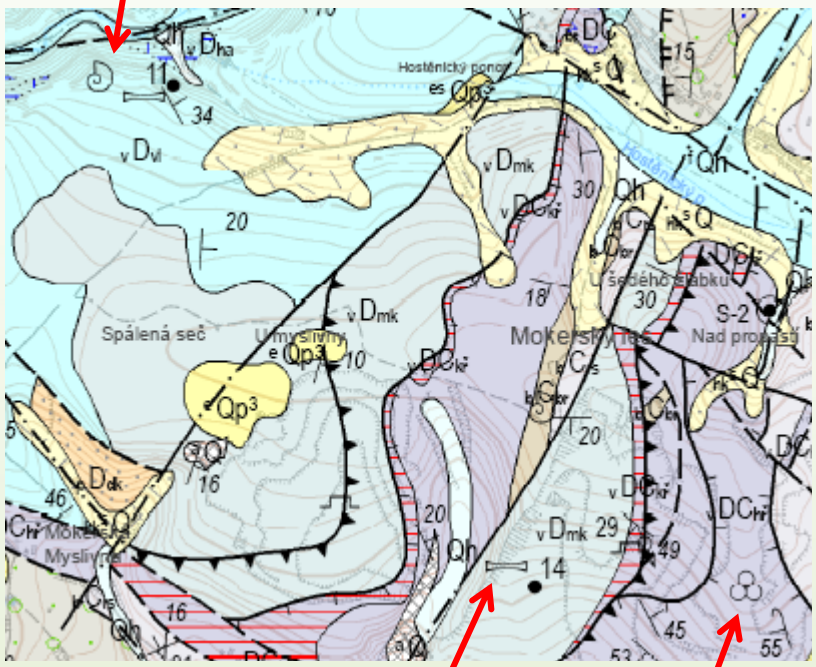
Existence of important ancient weathering





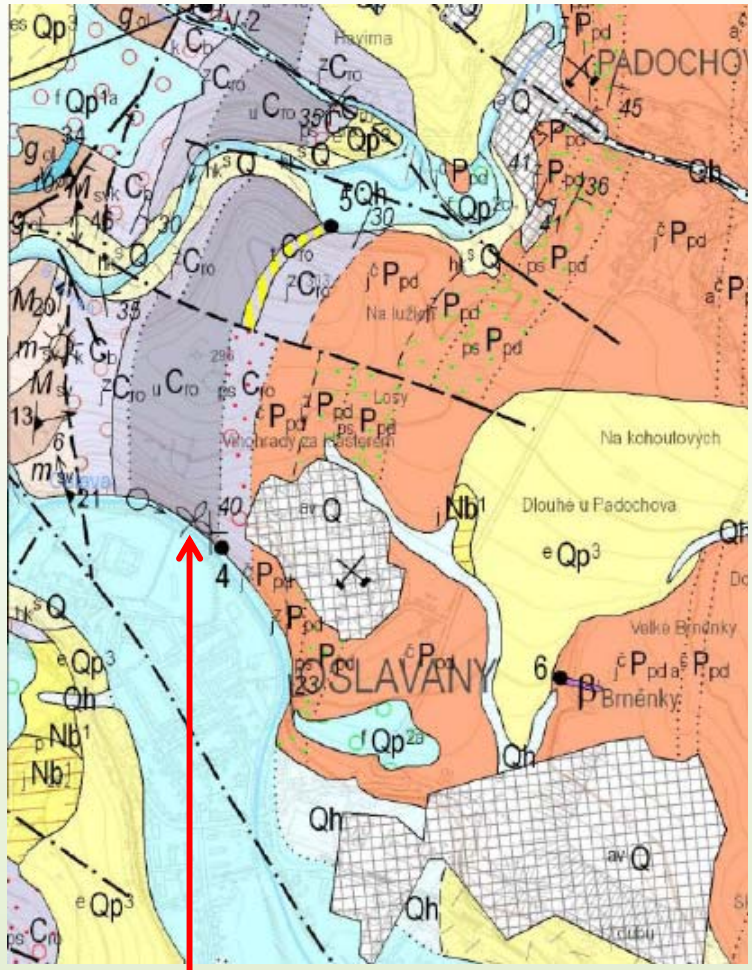
Important paleontological findings (localities)

Fossil fauna



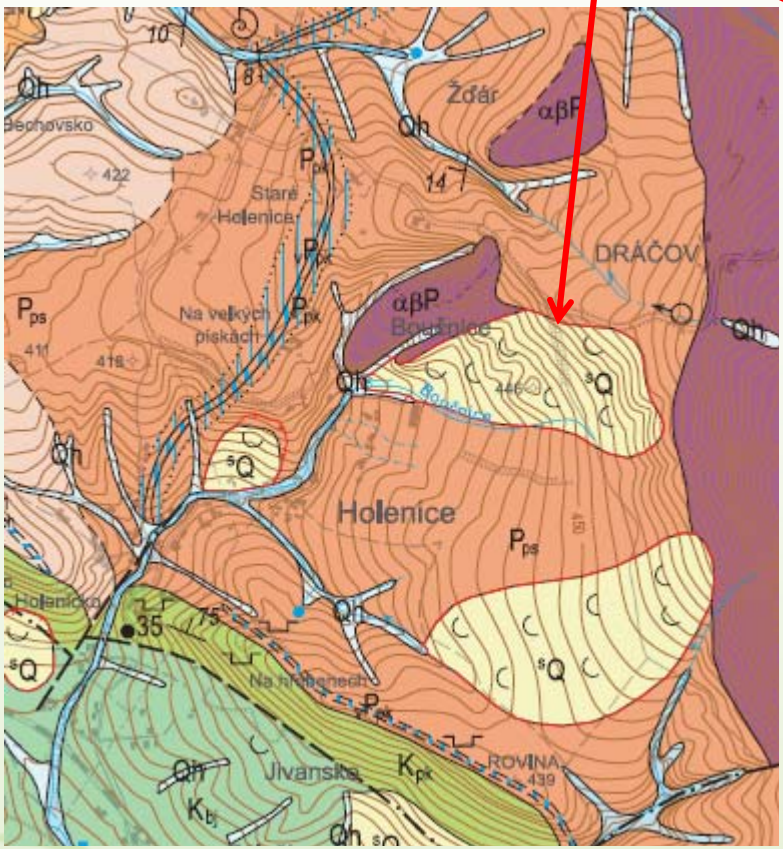
Fossil vertebrata

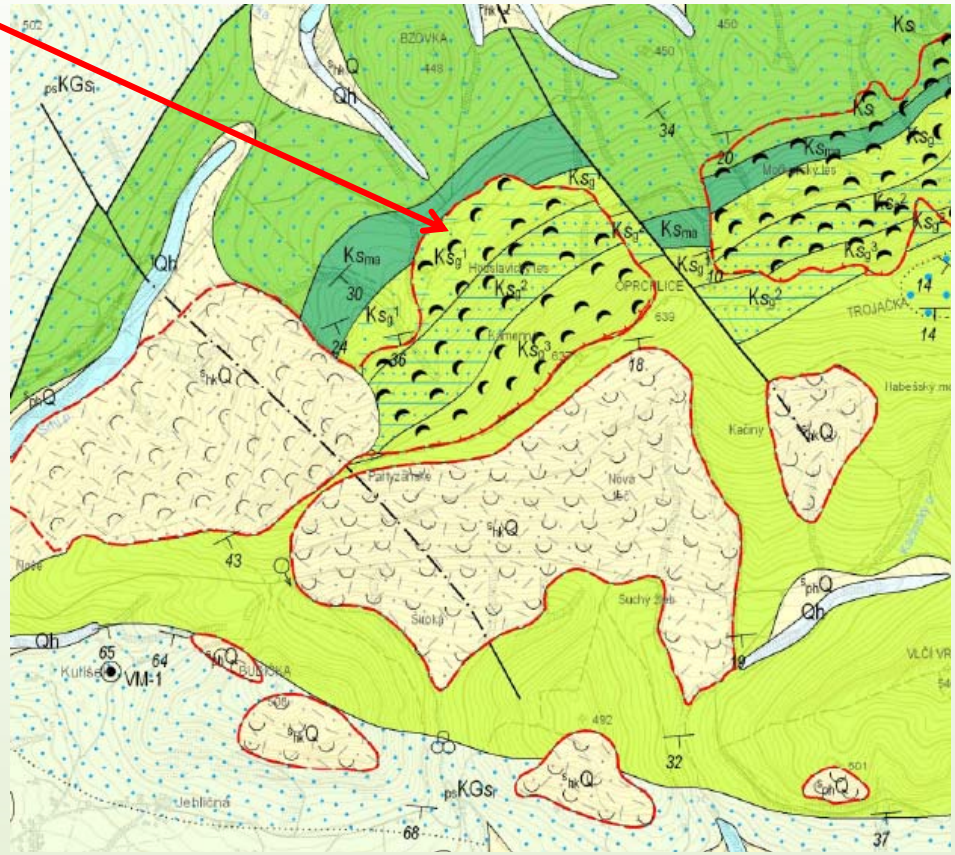
Microfossil



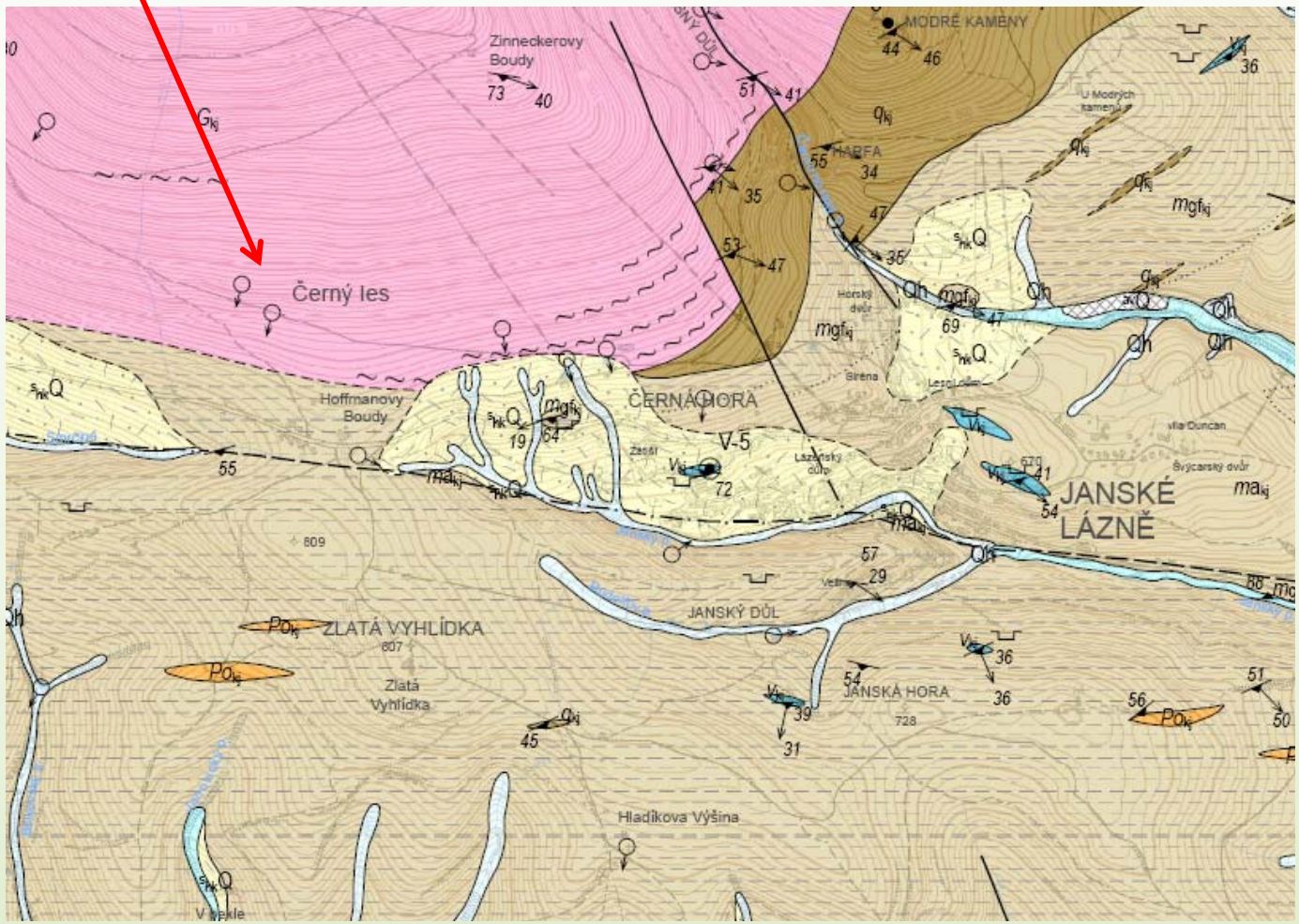
Fossil flora

Important geodynamic phenomena

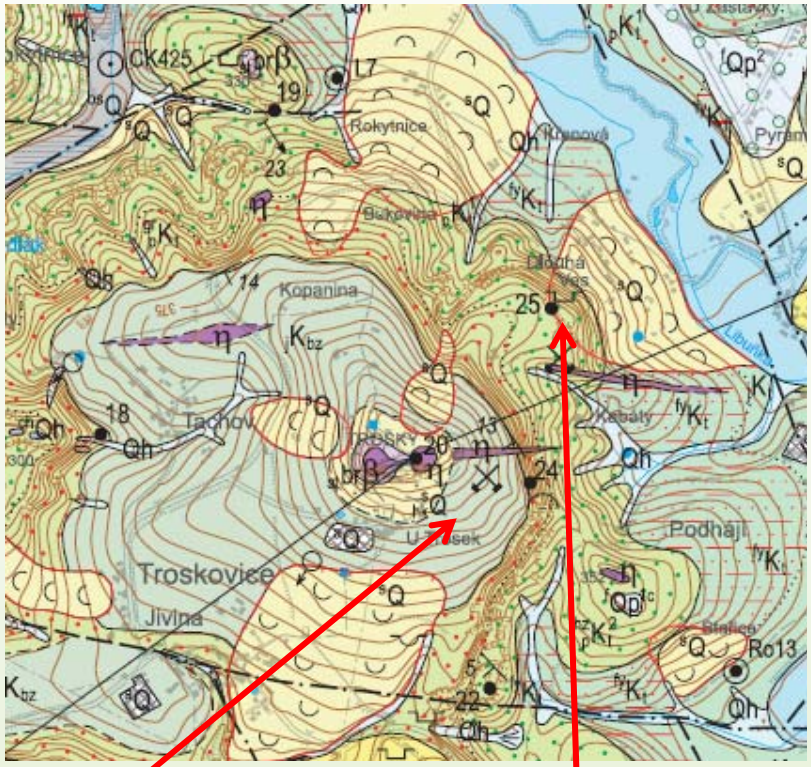


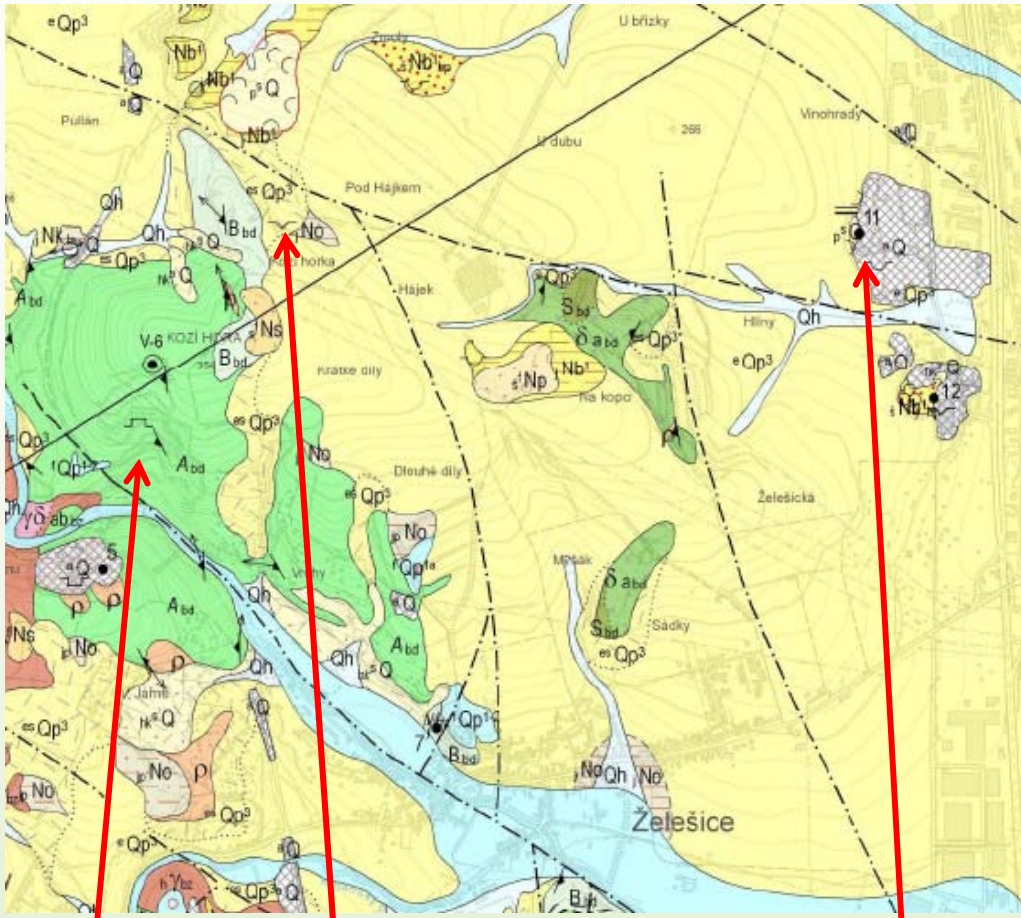


Important water and mineral water springs



Selected recent and historic mines





Abondoned mine

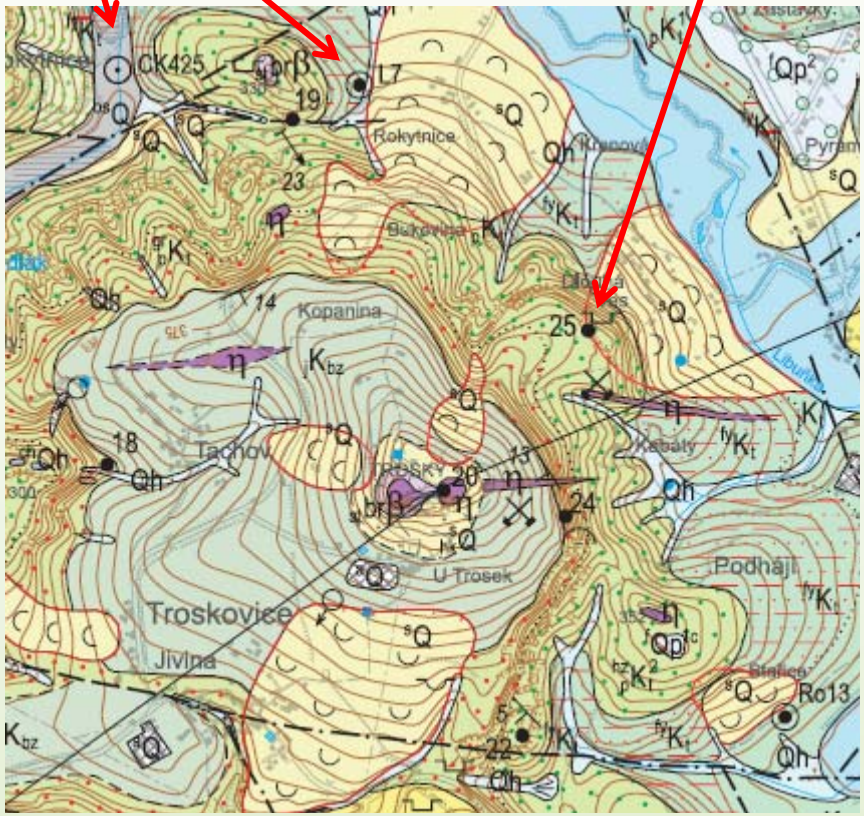
Abondoned quarry

Active quarry

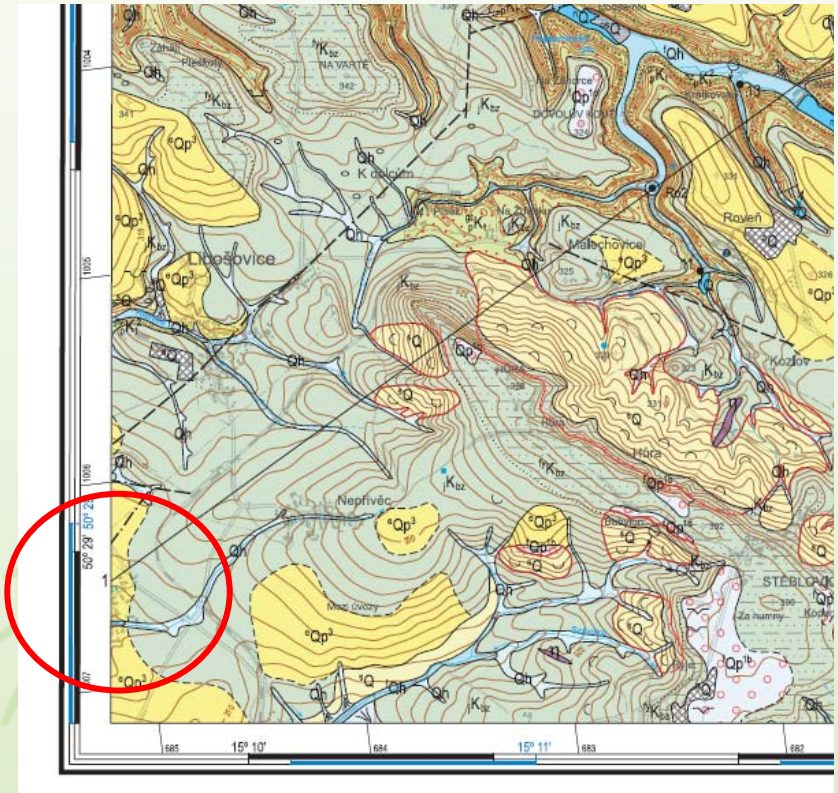
Abandoned sand-pit

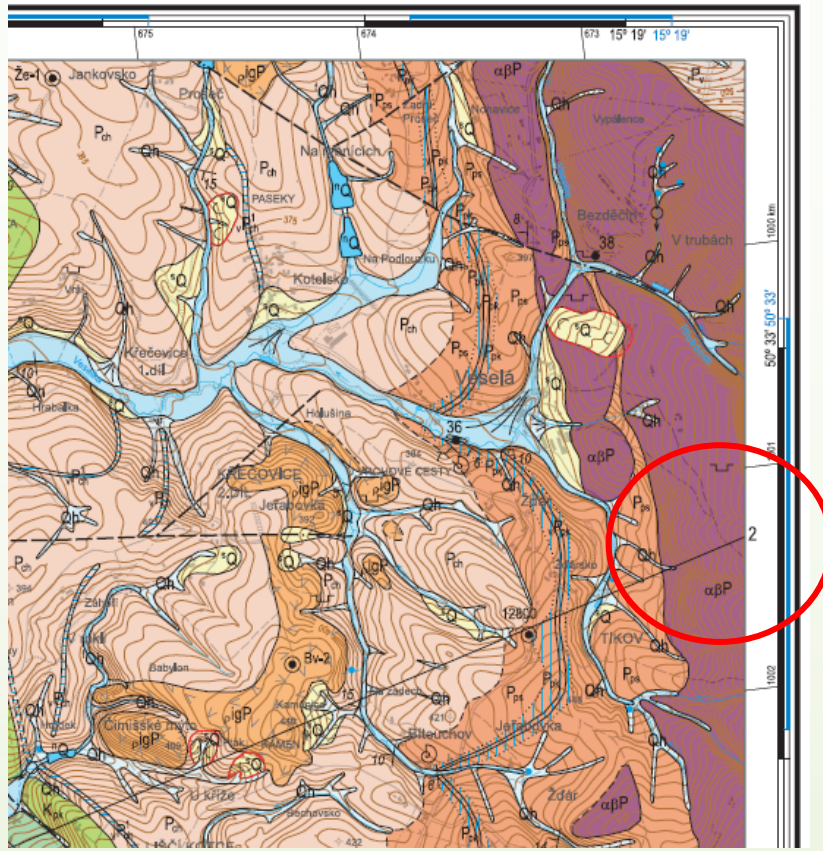
Abandoned clay-pit

Important boreholes and geological localities



Line of geological cross section





End-points are situated on the map´s rim. Left rim of crossection is situated westerly

To summarize geological map

Geological map bears information about

areal distribution of rocks and its boundaries
tectonics
paleontology
hydrotermal processes and weathering

Completed by information about

hydrogeology
geodynamic phenomena
and minig

GEOLOGICAL MAP itself and LEGEND are crucial parts of printed map sheet