



# Growing up with INSPIRE

## Implementation of INSPIRE at the Czech Geological Survey



L. Kondrová, O. Moravcová, E. Hudečková,  
P. Čoupek, V. Kolečka, P. Kramolišová, D. Čápková

Czech Geological Survey  
18.9. 2018, INSPIRE conference 2018



# Presentation outline

- CGS and INSPIRE
- Relevant INSPIRE themes
  - harmonization - state-of-the-art
- Development of download services
- Conclusions

# CGS and INSPIRE

- gathering data for almost 100 years
  - first databases since 1970's, use of codes
  - Division of Informatics since 2001
- INSPIRE → LMO on behalf of the Czech Government for data from INSPIRE themes:
  - Geology, Soil, Natural risk zones, Mineral resources, Energy resources





# INSPIRE Implementation Steps

- Analysis of available data
- Mapping current structures to INSPIRE
  - simple transformations of data similar to INSPIRE
  - complex changes (transformations, additions, ...)
- Provision of web services for harmonized data
  - testing of available solutions → own development of the ATOM download service



## **Geology**

- Geological map 1 : 50,000 (GEOCR50)
- Geological map 1 : 500,000 (GEOCR500) } codelists mapping
- Borehole surveys

## **Geophysics**

- Geophysical surveys (~ campaigns)
- Seismic - well shoots, reflection profiles (~ measurements)
- Vertical Electrical Sounding (~ measurements)
- Gravimetry (surveys + measurements) – 12/2018
- Magnetometry, Radiometry, Spectrometry, Petrophysics - 2019



<http://www.czechgeo.cz>



# Geology

<https://maps.geology.cz>

The screenshot displays the 'Geofyzikální měření' (Geophysical measurements) section of the Geology.cz website. The interface includes a sidebar with filter options for 'Operační sítě' (Operational networks) and 'Geofyzikální měření' (Geophysical measurements). The main content area shows a list of measurement types, including 'Seismická' (Seismic), 'Vestibální elektrické sondování' (Vestibular electrical sounding), and 'VES profily' (VES profiles). A map of the Czech Republic is shown on the right, with various regions labeled, including KARLOVY VARY, ÚSTÍ NAD LABEM, LIBEREC, PRAHA, STŘEDNÍ ČECHY, JIHOVÝCHODNÍ ČECHY, PLZEŇ, BRNO, JIHLAVA, Znojmo, and Blatná. The map displays data points and profiles corresponding to the selected filters. The text 'Local geophysical measurements' is overlaid on the left sidebar, 'Seismic' is overlaid on the top of the filter list, 'VES' is overlaid on the 'VES profily' filter, and 'Region' is overlaid on the bottom left corner of the screenshot.



## Soil

- Soil map 1 : 50,000
  - Soil map 1 : 1,000,000
- } planned for 2019



## Natural Risk Zones

- Slope instabilities register – harmonized in 2018
  - observed events (landslides)
  - hazard areas – calculated for a testing area
- Radon index map 1 : 50,000 – harmonized in 12/2018



# Mineral Resources



# Energy Resources

- Mineral deposits and resources – harmonized (Minerals4EU project)
- Mining in the Czech Republic – harmonized (Minerals4EU project)
- Mining waste – harmonized (ProSUM project)
- Energy resources to be subtracted from M4EU data
- Information about energy resources is confidential!





# ATOM download services

- Testing of ArcGIS for INSPIRE → **unsatisfying results**
- Own development in 2018 → **a customized solution** for transformation of operational data to INSPIRE GML or Google KML
  - Set of PHP scripts
  - Individual configuration for every dataset, creation of a “piece of code” to link spatial data with their attribute information from a relational database
- Now in test phase
  - Geological Map 1:500k, Landslides in the Czech Republic
- 2018/2019 – validation/improvement of created services, creation of new services for other INSPIRE themes



# ATOM download services

**Download services**

Download services (as defined by the INSPIRE directive) are web services enabling copies of spatial datasets, or parts of such sets, to be downloaded and, where practicable, accessed directly.

**INSPIRE services**

This system of download services are acceptable in terms of INSPIRE - geo-related datasets download services (using ATOM feeds) and direct access download services (using WFS) with essential requirements - see technical guidance document to download from the INSPIRE INSPIRE.

**INSPIRE data**

All datasets that are listed below are available for download for free under the Creative Commons BY 4.0 license (Attribution International). Some of the data are available in Czech language only. You must give appropriate credit [to] Czech Geological Survey and indicate if changes were made.

**Data download (ATOM feed)**

The following datasets (not yet harmonized according to the INSPIRE requirements) are available in the form of prepared files (zip-archive format):

- Sesuvy, map. 1 : 50 000 (Česko celá)
- Sesuvy, map. 1 : 50 000 (Česko - měř.)
- Geologická mapa ČR 1 : 500 000 (Česko celá)
- Geol. map. 1 : 500 000

Data described in currently available only in the ArcGIS Pro for Desktop software. We are working on the solution with the software provider and we appreciate for any recommendations.

**Data download - direct access via WFS service**

CGS CR Bedrock and Superficial Geology - INSPIRE download service for the theme: Geology  
<http://inspire.geology.cz/geology/wfs/>

Mineral Resources in the Czech Republic - INSPIRE download service for the theme: Mineral Resources  
<http://inspire.geology.cz/mineralresources/wfs/>

Odebírat tento kanál pomocí

Pro odebrání kanálů vždy použijte aplikaci Aktuální záložky.

### INSPIRE data České geologické služby / ATOM feed

Zde naleznete aktuální harmonizovaná vektorová data publikovaná podle standardů INSPIRE. Systém běží ve zkušebním provozu.

**Sesuvy v ČR / Landslides in the Czech Republic**  
 1. září 2018 14:00

Datová sada sesuvů, generovaná pro účely INSPIRE z Registru svahových nestabilit, který obsahuje základní údaje o evidovaných a terénně ověřených svahových nestabilitách v České republice (sesuvech, proudech, řícní apod.) / Landslides dataset generated as the INSPIRE layer from the Slope Instability Register, which contains basic data of registered and verified slope instabilities in the Czech Republic (landslides, solifluction, rock falls, etc.)

**Geologická mapa ČR 1 : 500 000 / Geological Map of the Czech Republic 1 : 500,000**  
 1. září 2018 14:00

Geologická mapa ČR v měřítku 1 : 500 000 z roku 2007, upravená pro účely splnění požadavků INSPIRE (výřez pouze pro území ČR, harmonizace dat) / Geological Map of the Czech Republic 1 : 500,000 published in 2007, modified to be INSPIRE-compliant (cut-out for the area of the Czech Republic, harmonized data).



# Conclusions

- INSPIRE as an opportunity:
  - to consolidate our data store → **clean and documented data**
  - to find out what geodata is available in our country and/or other countries (metadata, web services) → **closer cooperation with similar institutions**
  - to **compare** our data with neighboring countries (harmonization)
  - to work/provide data in a more **open way**, to follow **new technical developments**



# Thank you for your attention!

lucie.kondrova@geology.cz



**Acknowledgement:**

Large infrastructure CzechGeo/EPOS is in the years 2016-2019 supported by the project LM2015079 of the Ministry of Education, Youth and Sports of the Czech Republic.