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National Contaminates Sites Inventory in the Czech Republic

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REMTECH EUROPE

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REGULATORY FRAMEWORK *session 1*

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www.remtechexpo.com



Five Ws+H of a story



Who / What / When / Where / Why (+ How)

- What: contaminated sites inventory in Czechia
- Why: threats for human health and environment
- When: asap
- How: to identify and register CS via inventory
- Where: nationwide
- Who: government

WHAT: Contaminated Sites Inventory



History of development of contaminated sites databases in Czechia

- 1995 – first database: **System for Registration of Old Ecological Burdens (SESEZ)**
- 1998 – 2004 **United data platform** – the first integrated database
- 2005 – **Contaminated Sites Database System**
– **SEKM (1)**
- 2009 – **SEKM 2**
- 2019 – **SEKM 3**

Typical „old ecological burden“ Lagoons of acid tars/gudrons from waste oils refinery – city of Ostrava



WHO: government

Responsible bodies

- **National Property Fund** (1991-2006)
- **Ministry of Finance** (MF) – from 2006
- „**Ecological agreements**“ between MF and the company
- Investigation, risk analysis, project, corrective measures, supervision
- **Ministry of Environment (MoE) = Expert body :**
(Department of Environmental Hazards and Ecological Damages - DEHED)

WHY: threats for human health and environment



Reasons for action

- Need of information on old environmental burdens with impacts on the human health and on the environment (soil, subsoil, surface and underground water)
- Background documentation for privatization projects and **for support of the state guarantees for remediation** of the old environmental burdens occurred before privatization

WHY: threats for human health and environment



European and national impetuses / driving forces

- **Thematic strategy for soil protection**
- **Proposal for a Directive setting out a framework for soil protection** and amending Council Directive 2004/35/EC
- **INSPIRE Directive 2007/2/EC** establishing an Infrastructure for Spatial Information in the European Community

WHY: threats for human health and environment



European and national impetuses / driving forces

- **Directive 2006/118/EC** on the **protection of groundwater** against pollution and deterioration.
- **Directive 2000/60/EC** establishing a framework for Community action in the field of **water policy**
- **Directive 2004/35/CE** on **environmental liability** with regard to the prevention and remedying of environmental damage

The Thematic Strategy for Soil Protection



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 22.9.2006
COM(2006)231 final

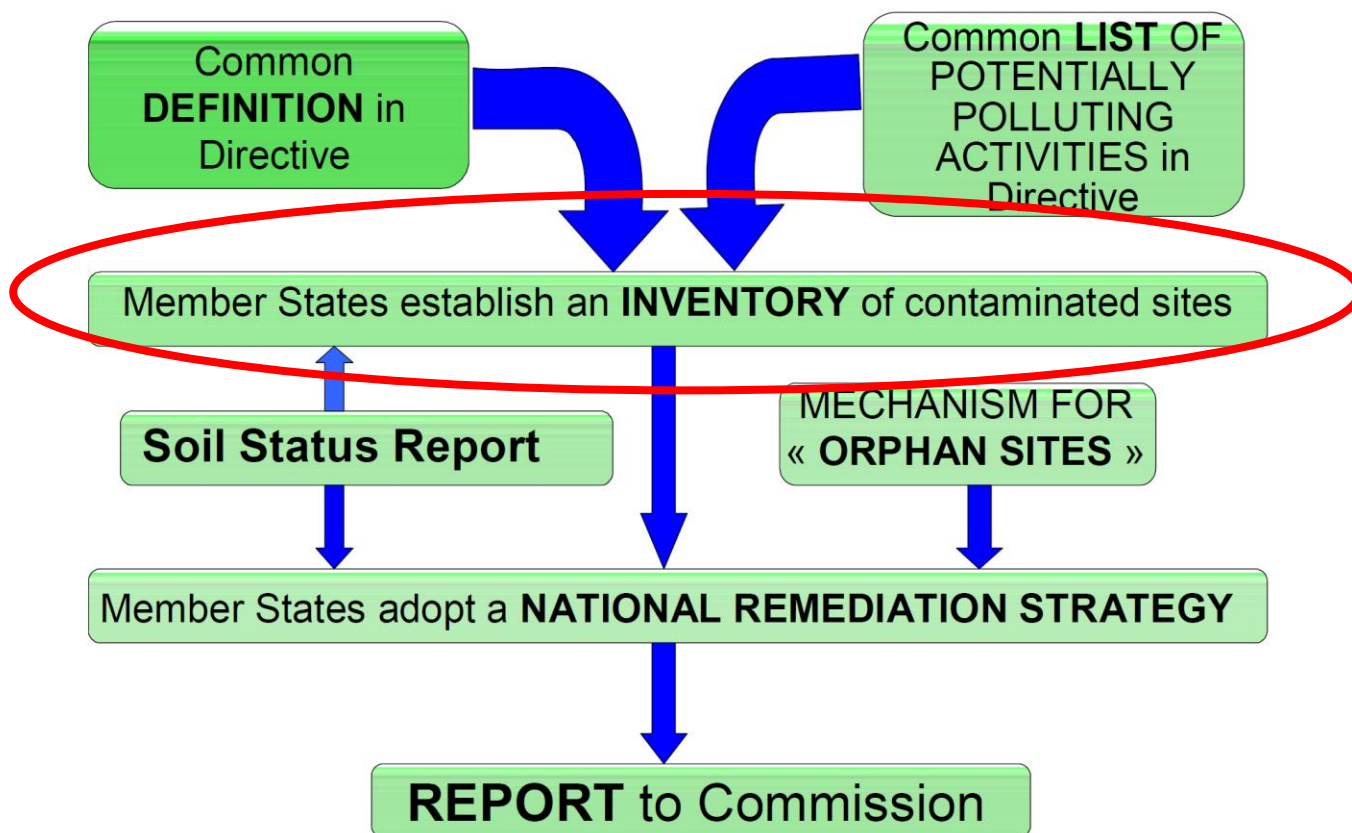
**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE
EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

Thematic Strategy for Soil Protection

[SEC(2006)620]
[SEC(2006)1165]

4.1.2. Contamination

With respect to management of contamination, an approach based on the following approach is envisaged:

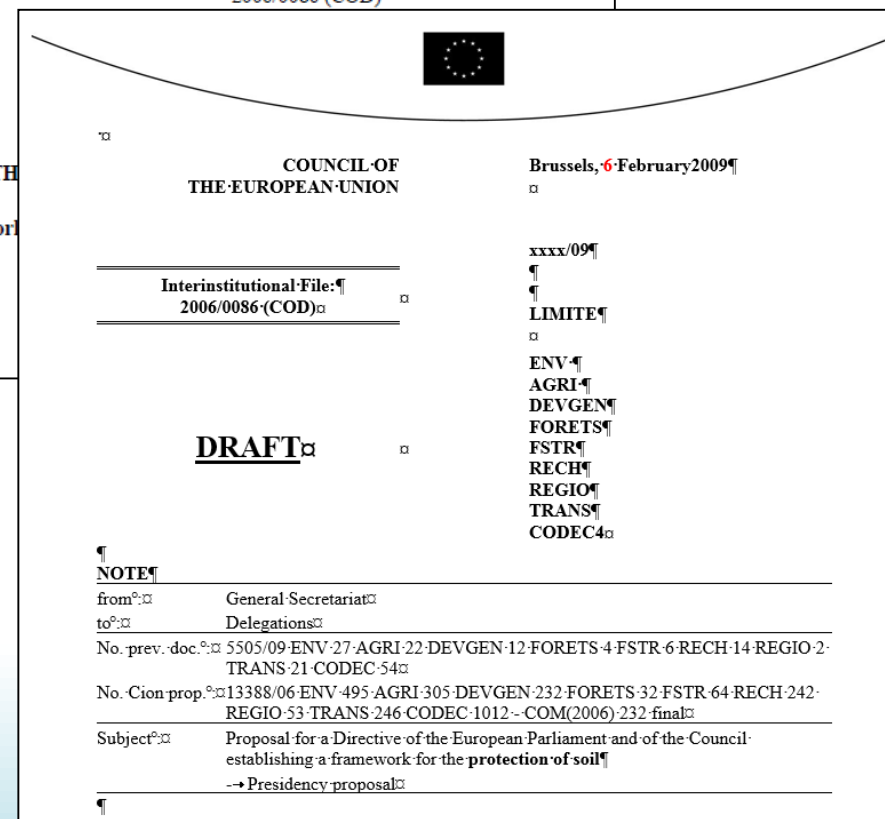
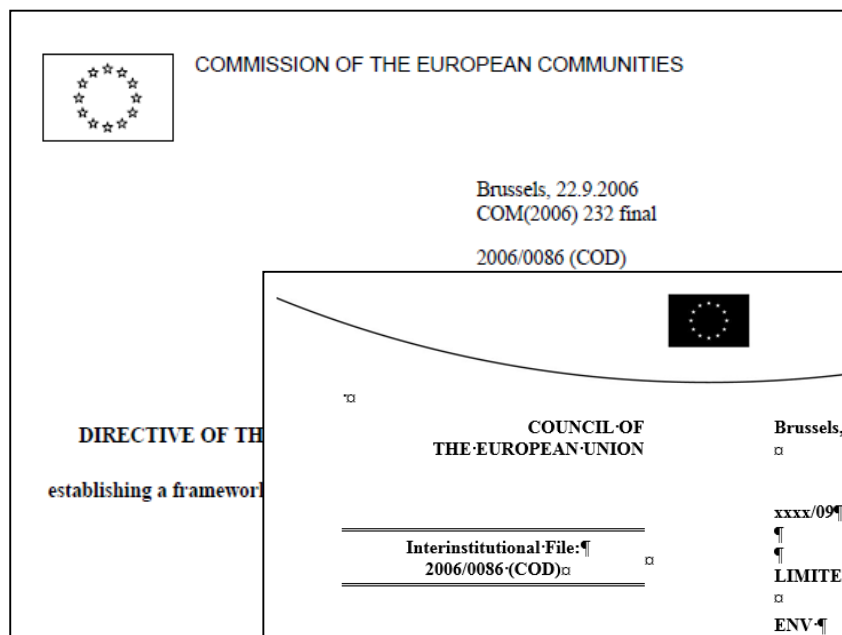


Protection of Soil Directive



2006-2009

- Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil



Withdrawn in 2014

COM(2006) 232

Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC

Protection of Soil Directive



Article 10 Identification and inventory of contaminated sites

- within two years make public a national list of relevant activities which have a significant potential to cause soil contamination;
- within seven years to identify the location where the potentially soil-contaminating activities are taking place or have taken place in the past
- The results - for land use planning and development, to be compiled in a register of sites

Protection of Soil Directive - activities



ANNEX II List of potentially soil polluting activities

1. Establishments where dangerous substances are or were present in quantities equal to or in excess of the amounts indicated in Parts 1 and 2, column 2 of Annex I to Council Directive 96/82/EC (Seveso)¹⁶.
2. Activities listed in Annex I to Council Directive 96/61/EC.
3. Airports.
4. Ports.
5. Former military sites.
6. Petrol and filling stations.
7. Dry cleaners.
8. Mining installations not covered by Council Directive 96/82/EC, including extractive waste facilities as defined in Directive 2006/21/EC of the European Parliament and of the Council¹⁷.
9. Landfills of waste as defined in Council Directive 1999/31/EC¹⁸.
10. Waste water treatment installations.
11. Pipelines for the transport of dangerous substances.

HOW – the case of Czechia



- Since 2005 the key data source is provided through the MoE's Contaminated Sites Database System (SEKM) - www.sekm.cz
- Priority evaluation and risk profile of each contaminated site are included.

MoE's methodological support

- Methodological **Guidances** (7 documents)
- Methodological **Handbooks** (6 documents)
- other **Guidelines and Guidances** (3 documents).
- Methodological **Guidance** of the Ministry of Environment for the filling in the SEKM database incl. a priority evaluation (2011).
- **Guidance** for Categorization of Priorities of Contaminated Sites (2008)

Modernizing the database for enabling the inventory



2005 – 2008

- Two research projects (united methodology for prioritization, sw for database development and piloting inventory based on abroad experience)

2008 – 2010

- Two partial inventory projects (POPs, Environmental damages in former Soviet Army military areas)

Modernizing the database for enabling the inventory

- Studied databases and inventory from Australia, Belgium, Denmark, France, Canada, Ireland, Italy, Hungary, Germany, the Netherlands, Poland, Austria, Greece, Slovakia, United Kingdom, Spain, Sweden, Switzerland and USA.
- Experience taken into account from **TWG Thematic Strategy for Soil Protection** (EEA a JRS); **EEA - EIONET**; **programmes** CARACAS, CLARINET, EURODEMO; NICOLE, MINEO; U. S. EPA Clu-in, U. S. EPA ETV Program, NATO/CCMS.

Modernizing the database for enabling the inventory

- **In 2008 MoE decided to upgrade the database and to perform an inventory based on a surface survey**, with the aim to obtain the fullest possible overview of contaminated sites throughout the state's territory.
- Based on the call from the Czech Operational Programme Environment (EU Cohesion Fund), a project proposal of the **National Contaminated Sites Inventory (NIKM)** was prepared by CENIA.

NIKM 1st phase



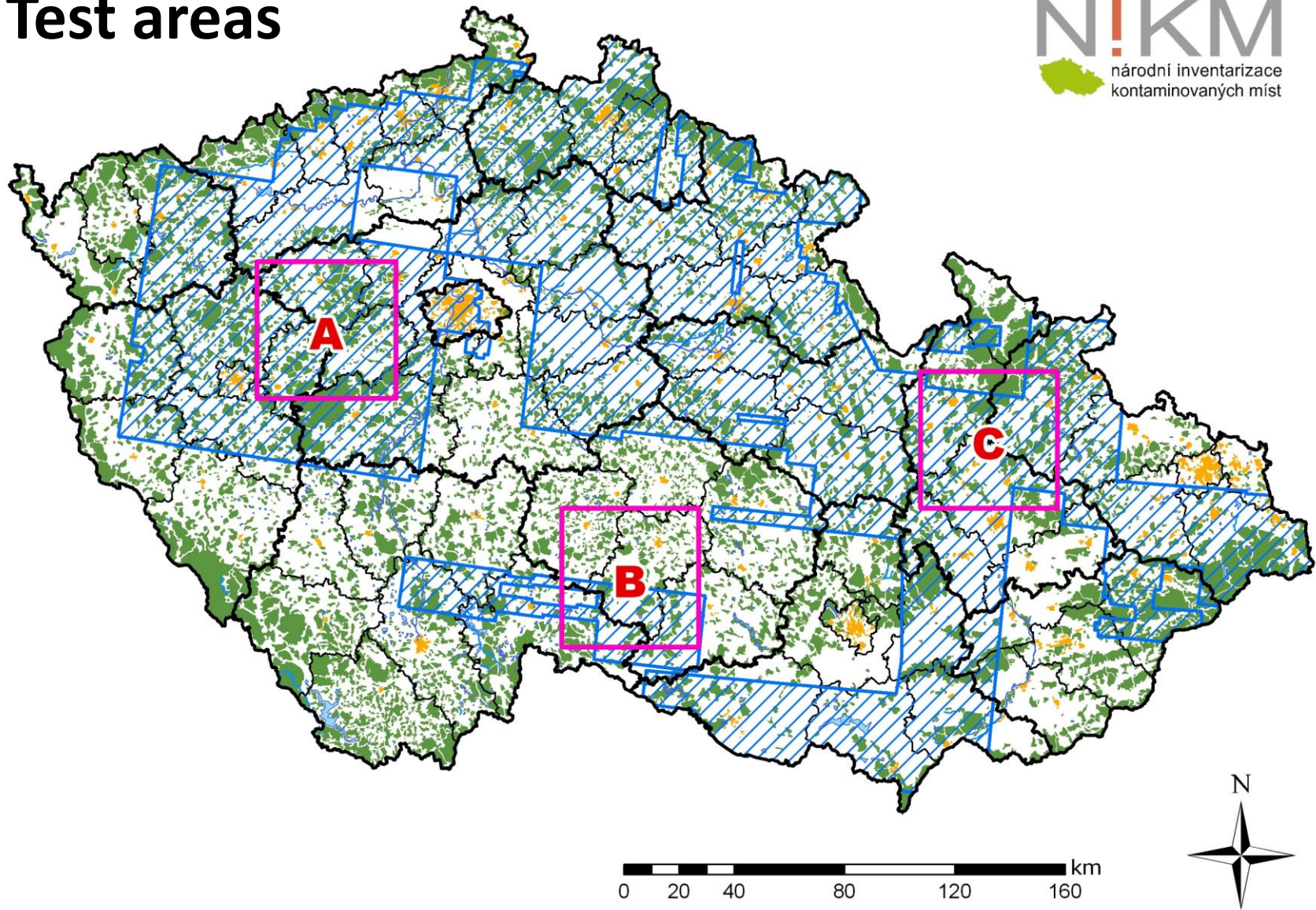
- NIKM project 1st phase was run in the period 2009 - 2013 by CENIA and several suppliers selected from an open public tender process.
- The project was focused **on methods of contaminated and potentially contaminated sites inventory and on a categorization of priorities**. Four-year project provided **tools and methodological background** for the proper inventory (NIKM 2nd phase 2018-2021)

NIKM 1st phase



- The project was **co-financed from EU funds** namely from the **Cohesion Fund** under the Operational Program Environment (area of support 4.2 - Remediation of historical environmental burdens) www.opzp.cz.
- 1st phase had a total budget approx. **4 million EUR**. EU contribution (Cohesion Fund) is approx. **3,4 million EUR**.

Test areas



NIKM 2nd phase



- Project NIKM – 2nd stage (National Inventory of Contaminated Sites) is co-financed from **European Union Funds - the Cohesion Fund** - in the frame of the Operational Programme of the Environment 2014-2020, the area of intervention 4.2. - **The Rehabilitation of Old Environmental Burdens**“.
- The 2nd phase of the NIKM project is focused on the inventory and evaluation of information on contaminated sites **throughout the whole territory of the Czech Republic.**

NIKM 2nd phase



- The **target value** for the year **2023** is **9 053** registered contaminated sites **incl. their priority ranking**.
- NIKM 2st phase had a total budget approx. **4,6 millions EUR**
EU contribution (Cohesion Fund) is approx. **3,9 millions EUR**

Principles of contaminated sites inventory

- ❖ **Phase by phase methodological approach**

- ❖ **The mapping process is divided into several phases:**

(1) The initial stage,

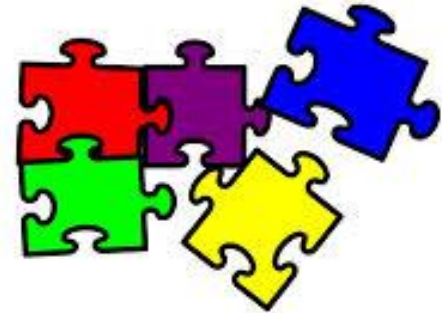
(2) Information campaign,

(3) Primary data analysis,

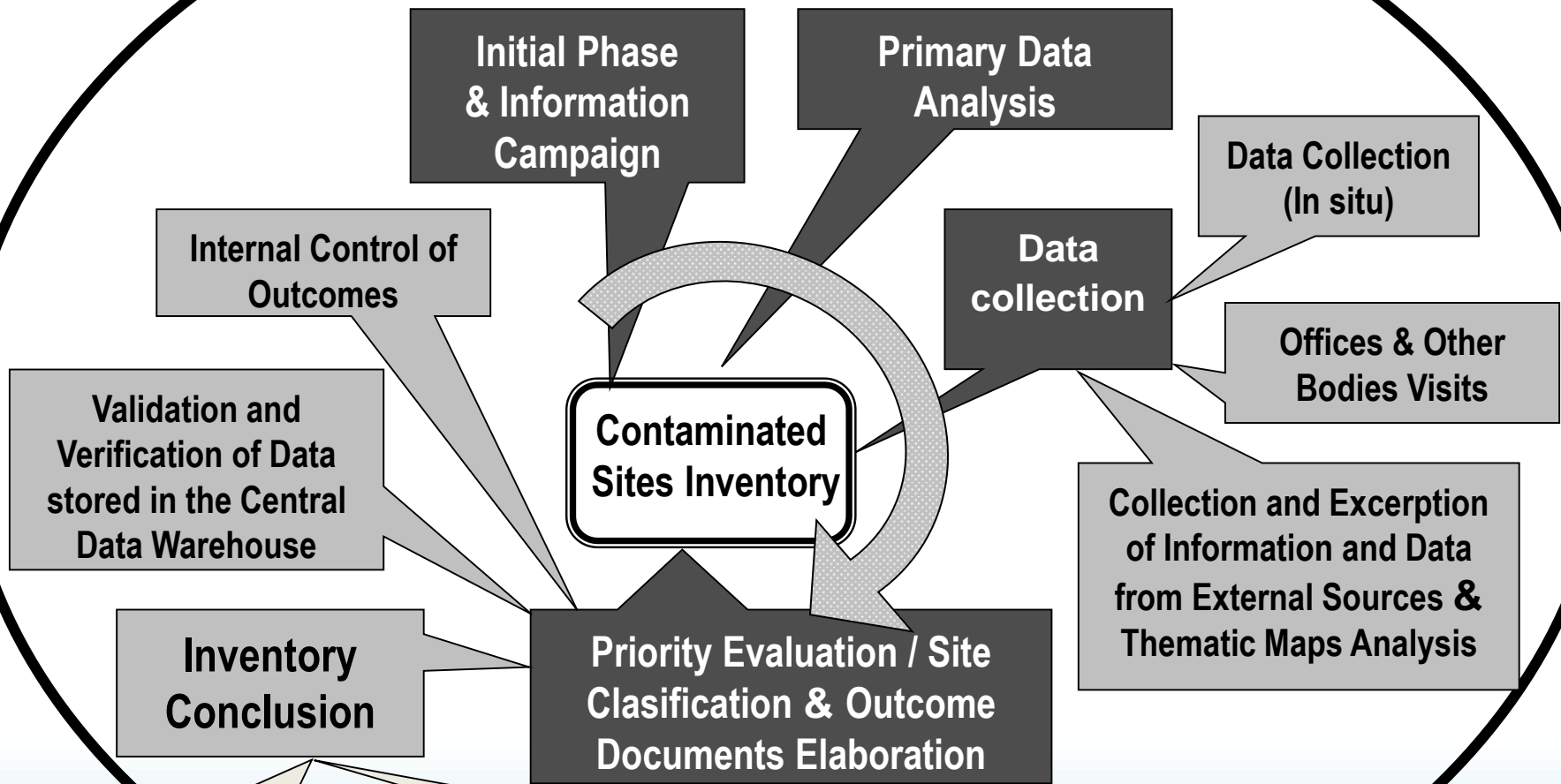
(4) Data collection,

(5) Priority evaluation and

(6) Outcome documents elaboration.



Territorial Inventory (2018 - 2021)



Registered Sites incl. Map Presentation on SEKM Portal

Evaluation Reports for the Regions and for the Czech Republic, incl. Map Presentation

NIKM 2nd phase



- In parallel with NIKM 2 project, an **upgrade of the Contaminated Sites Database System (SEKM 2) to the SEKM 3 database is running,**
- **to be in full function by December 2019.**

Historical orthophotomap (output of NIKM 1)

“Contaminated sites” www.kontaminace.cenia.cz

Kontaminovaná místa

Projekt NIKM | Návod | Aplikace | Licenční podmínky

NIKM národní inventarizace kontaminovaných míst

cenia

STÁTNÍ FOND ŽIVOTNÍHO PROSTŘEDÍ ČESKÉ REPUBLIKY

OPERAČNÍ PROGRAM ŽIVOTNÍ PROSTŘEDÍ

EVROPSKÁ UNIE
Fond soudržnosti

Pro vodu, vzduch a přírodu

Historická Současná Landsat

popisy

roky snímkování

evidovaná kontaminovaná místa



Tisk mapy

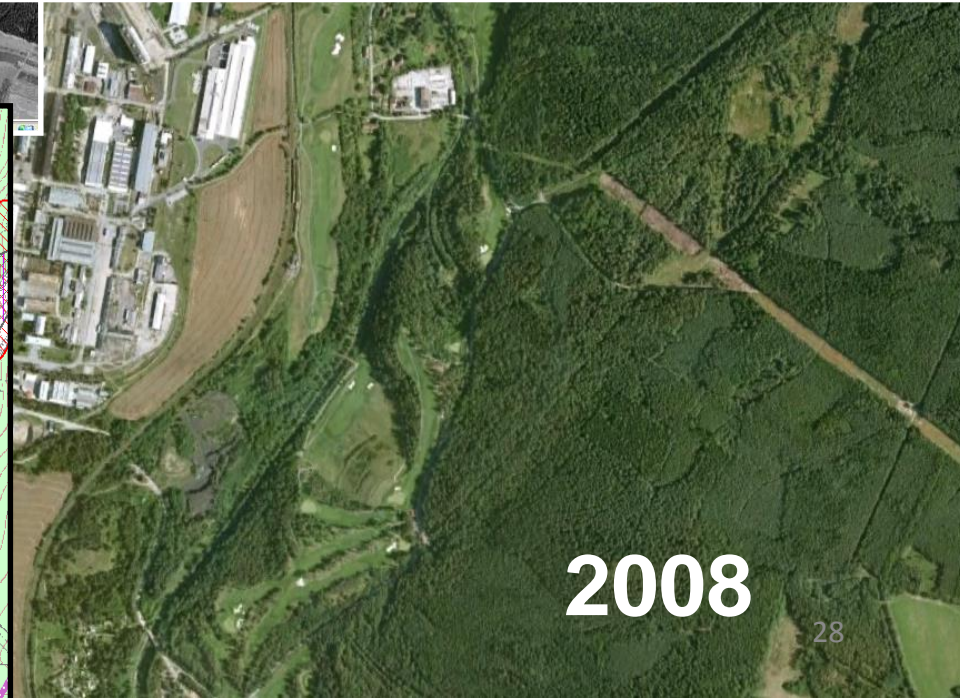
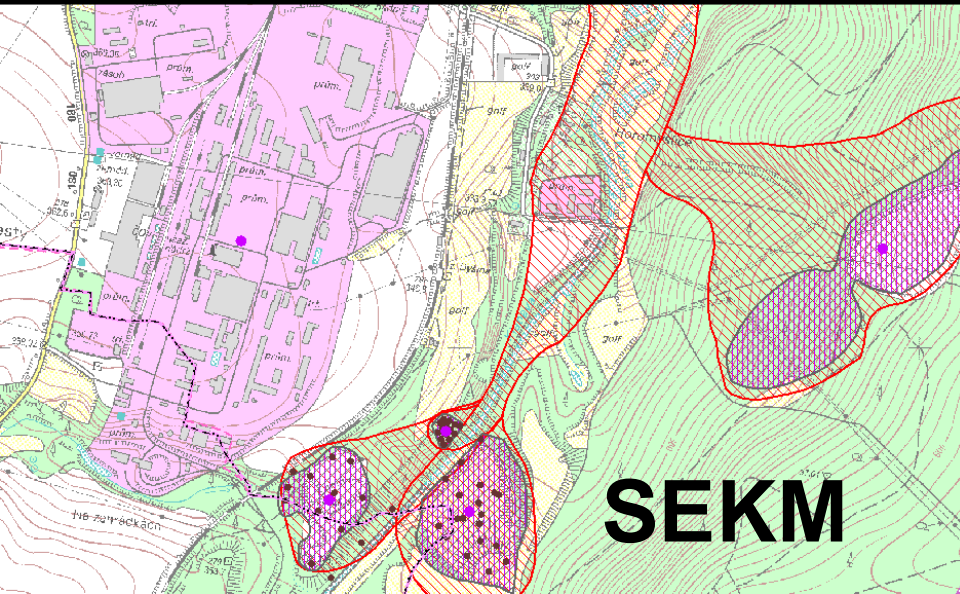
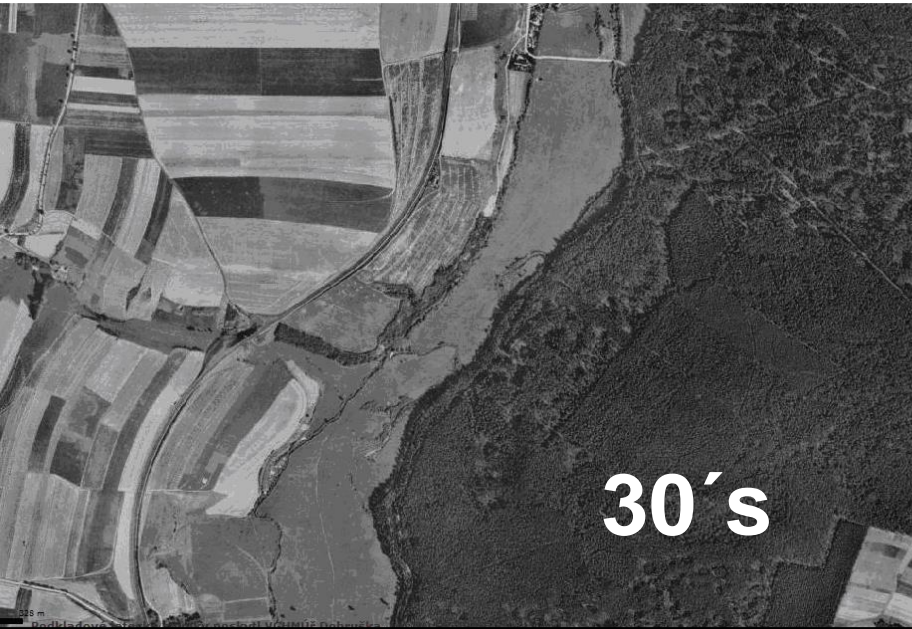
100 km
50 mi

S-JTSK: X = 923299 Y = 774123

připraveno v projektu Národní inventarizace kontaminovaných míst - 1. etapa (NIKM),
spolufinancovaném Evropskou unií - Fondem soudržnosti, OPŽP (oblast podpory 4.2. - Odstraňování starých ekologických zátěží)

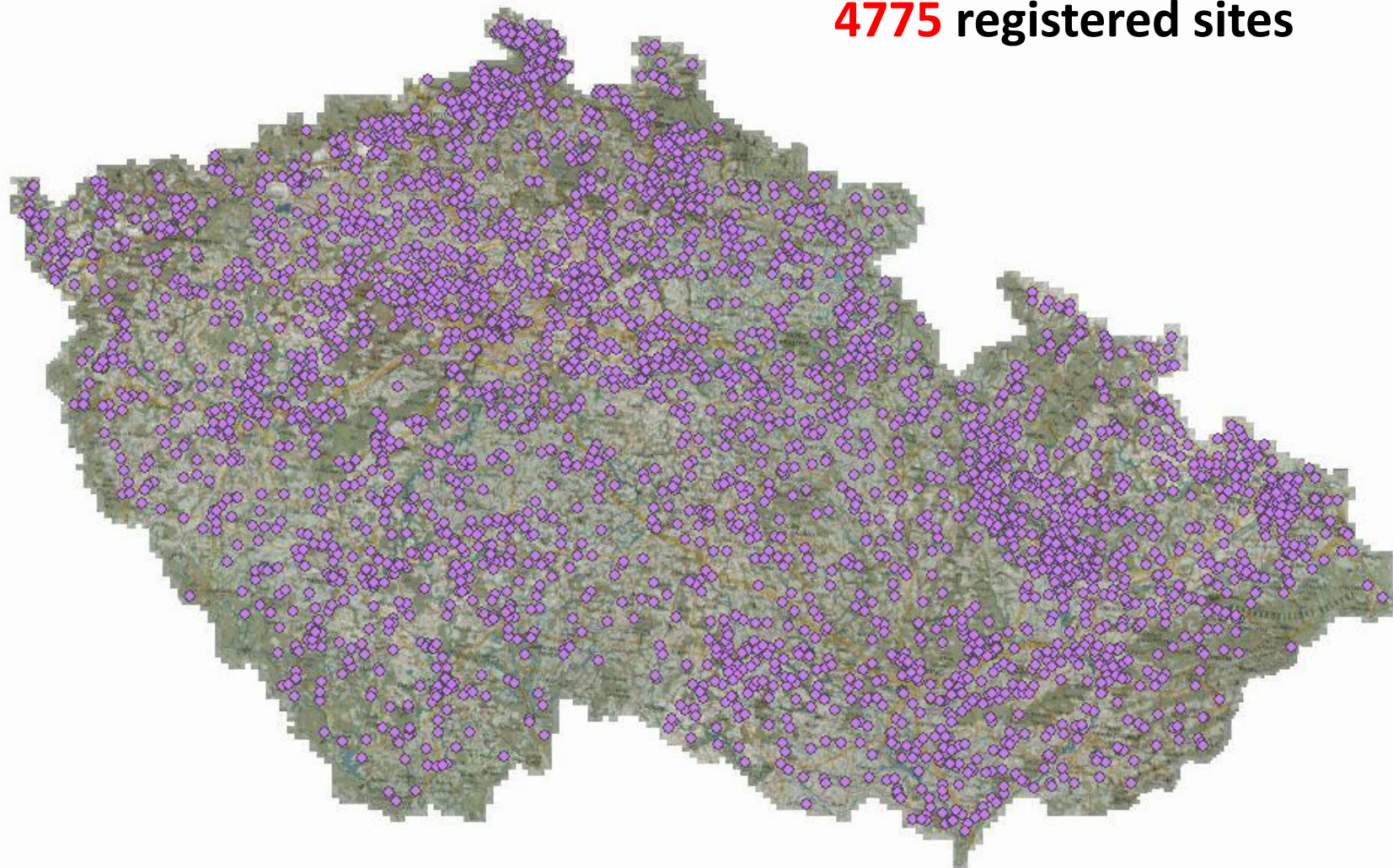
Podkladové letecké snímky poskytl VGHMÚř Dobruška. © MO ČR 2009

Industrial dumps – Landfill Ejpvovice

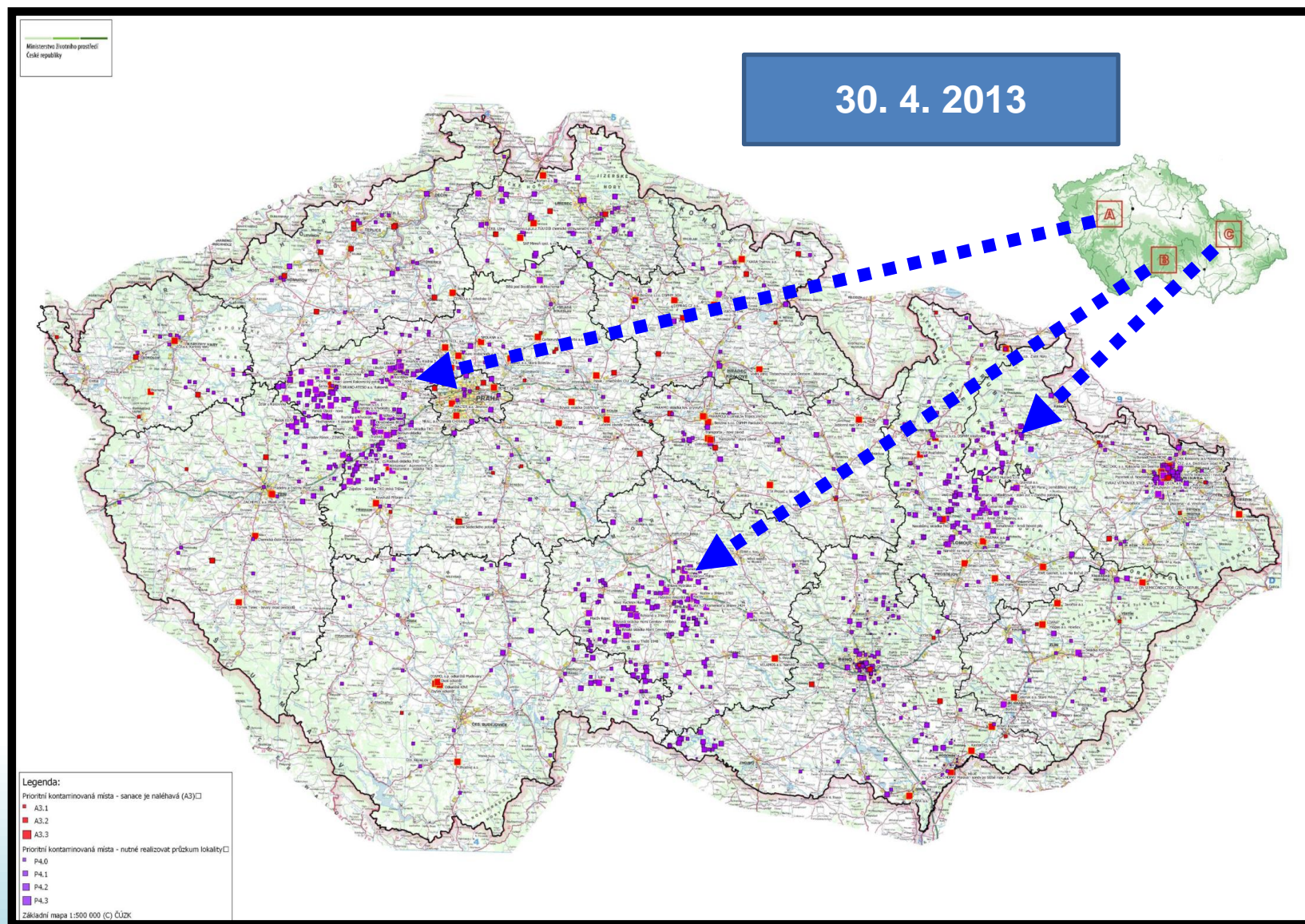


SEKM 1 – November 2013

4775 registered sites



NIKM I – contribution to the sites priority evaluation



SEKM 2 – November 2018

4965 registered sites



SEKM Info

System evidence kontaminovaných míst



[PRÁVA](#) [LOKALITY](#) [STATISTIKY](#) [ADRESÁŘ](#) [NÁPOVĚDA](#) [ADMINISTRACE](#)

Statistiky

Obecná statistika databáze SEKM

Obecné informace k databázi

Celkový počet evidovaných lokalit:	4965
Celkový počet evidovaných látek:	309
Celkový počet evidovaných vzorků:	1148476
Celkový počet lokalit kde stav není uveden:	2338
Celkový počet lokalit kde stav je ke schválení :	54
Celkový počet lokalit kde stav je schváleno :	2558
Celkový počet lokalit kde stav je nepřijato :	15

Informace k organizacím

Celkový počet editujících organizací registrovaných v databázi SEKM:	268
Počet editujících organizací s přidělenou licenci:	94
Počet editujících organizací bez licence:	174

[Nahoru](#)



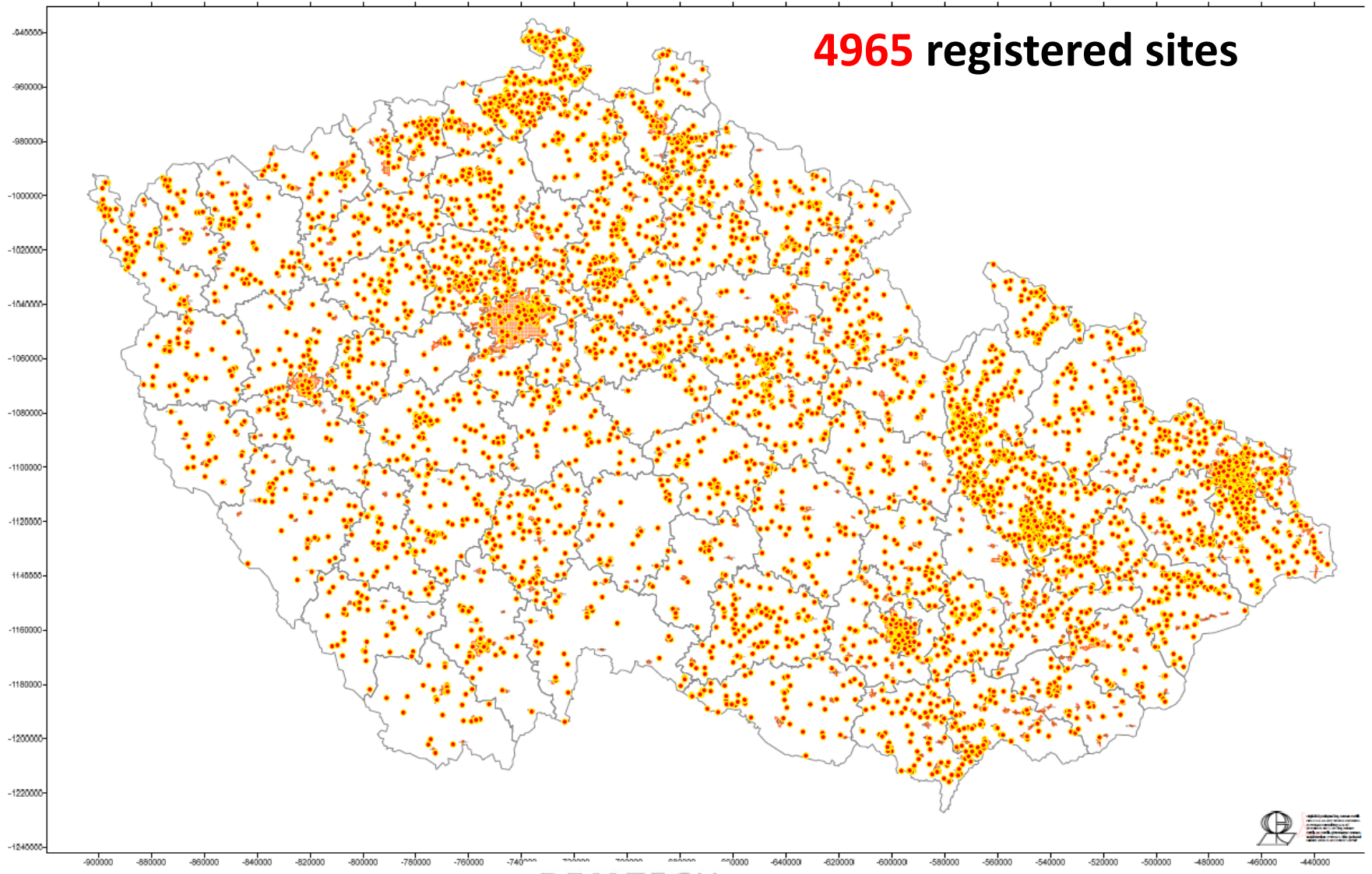
Ministerstvo životního prostředí
odbor environmentálních rizik
a ekologických škod

SEKM 2 – November 2018



Stávající SEKM lokality (podzim 2018)

4965 registered sites



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SEKM - March 2019

13 233 records

Přihlášen CENIANIKM / Odhlásit

SEKM Info



Systém evidence kontaminovaných míst

PRÁVA | LOKALITY | STATISTIKY | ADRESÁŘ | NÁPOVĚDA | ADMINISTRACE

Statistiky

Obecná statistika databáze SEKM

Obecné informace k databázi

Celkový počet evidovaných lokalit:	13233
Celkový počet evidovaných látek:	309
Celkový počet evidovaných vzorků:	1152013
Celkový počet lokalit kde stav není uveden:	10279
Celkový počet lokalit kde stav je k přijetí :	2
Celkový počet lokalit kde stav je ke schválení :	73
Celkový počet lokalit kde stav je schváleno :	2853
Celkový počet lokalit kde stav je nepřijato :	26

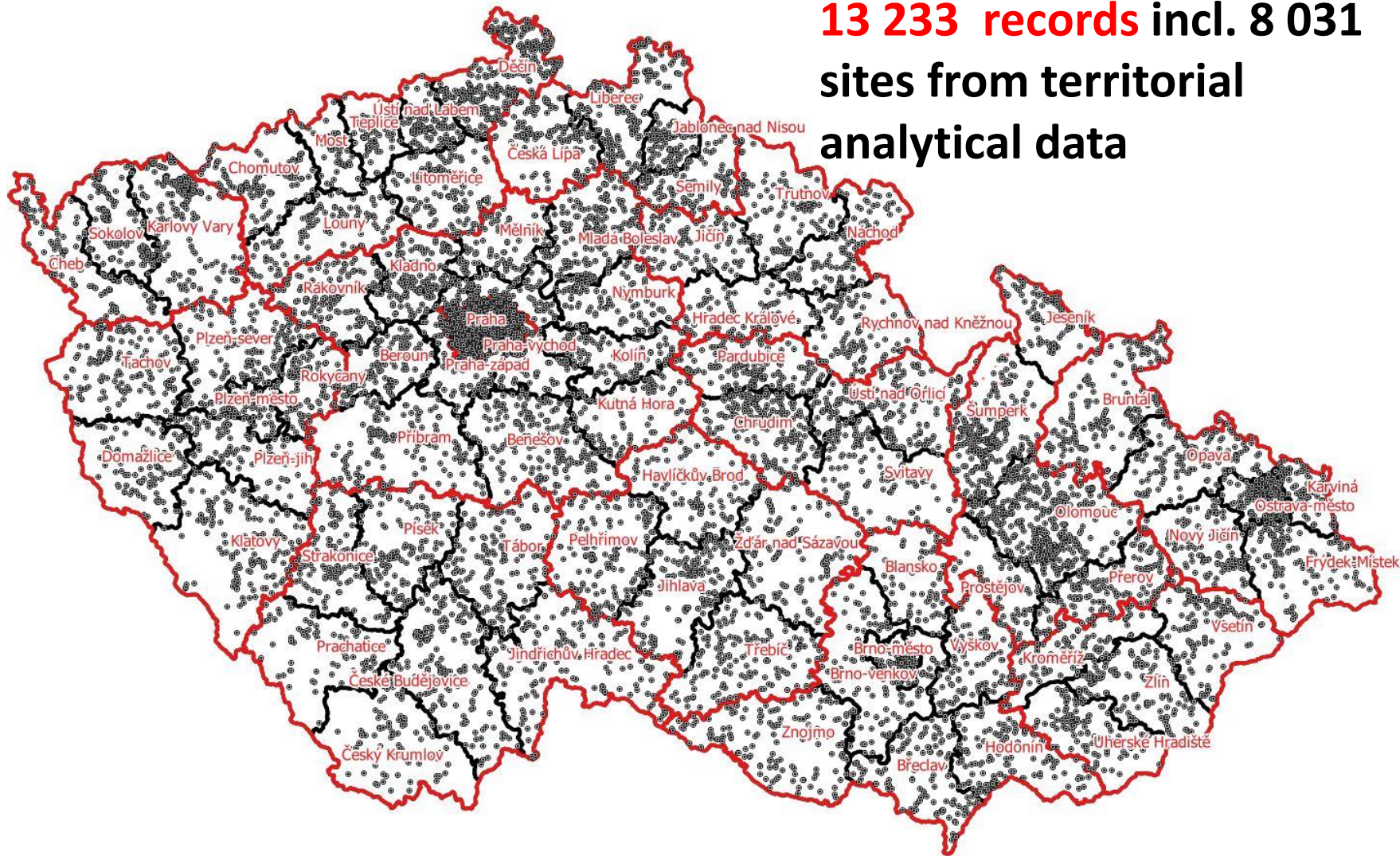
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Počet editujících organizací s přidělenou licencí:	108
Počet editujících organizací bez licence:	184

SEKM 2 - March 2019



13 233 records incl. **8 031 sites** from territorial analytical data



NIKM 2nd phase



- In the initial step (January 2018 to April 2019) of NIKM 2 we **collected clues** of contaminated sites using **Remote Sensing methods**.
- This task was **provided by CENIA**.
- The supplier's mapping teams for the field inventory have obtained, among other data sources, **a data layer containing information about the location and the type of clue of the contaminated site**.



Remote sensing

- **Inventory methodology includes analysis of raster data (aerial photomaps and satellite images).**
- **Used QGIS software.**
- **As a mapping unit chosen regional districts - ORP (Municipality with extended competence = "small districts", there are 206 in Czechia).**
- **Their areas are very different in size (the smallest is 45 km², while the largest is 1242 km²)**

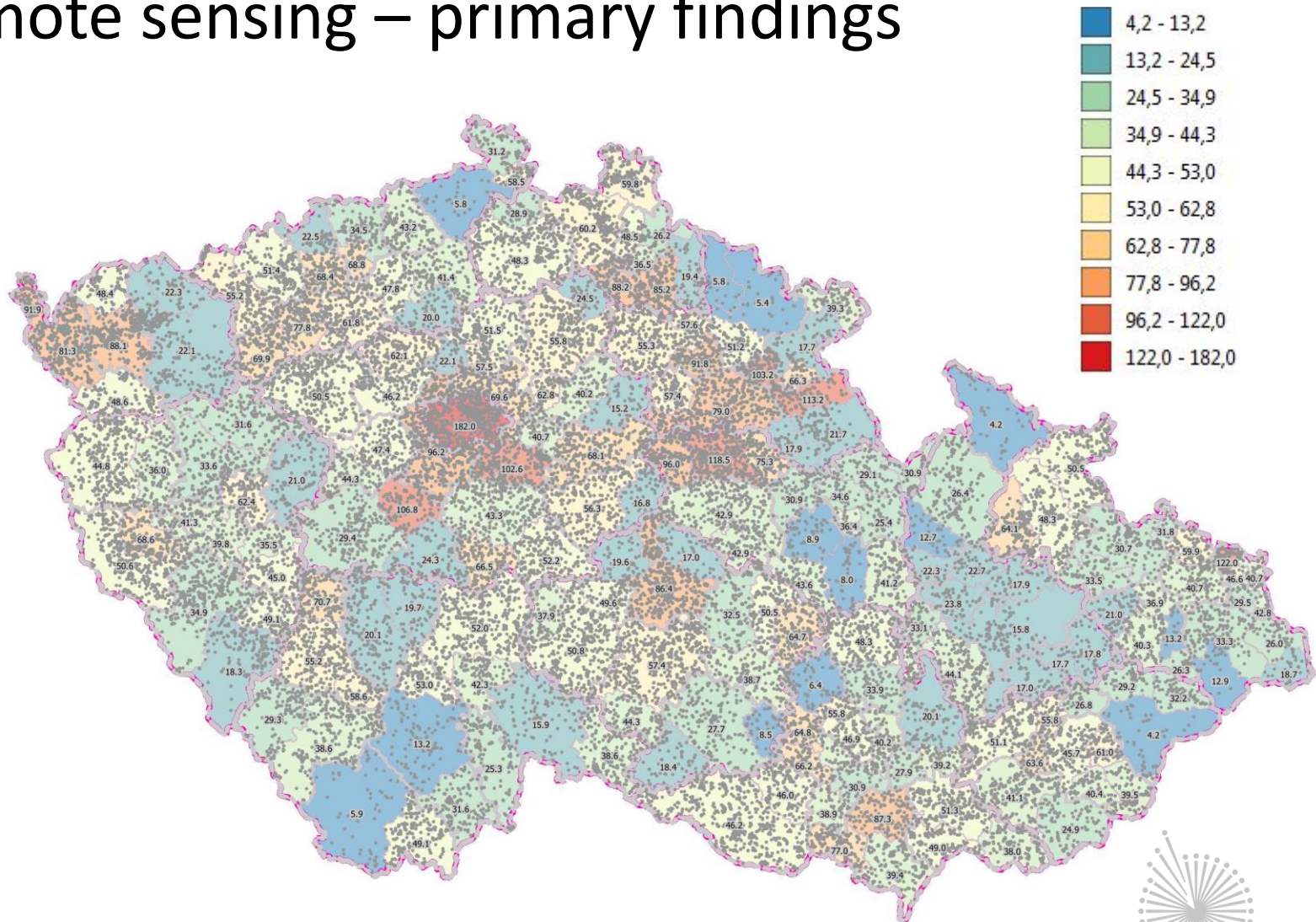
TYOLOGY AND KNOWLEDGE BASES OF OBJECTS OF INTEREST

- 11 clue types already defined in NIKM I project
- February 2018 –completed to 14 types
- The knowledge base - the methodical aid - the interpretative key (manual)

Code	Contamination type	Code	Contamination type
<i>a</i>	industrial park with an impact on the environment	<i>p</i>	suspicion of illegal dump site
<i>b</i>	industrial brownfield	<i>s</i>	a new clue linked to the site already included in SEKM database
<i>c</i>	illegal dump / landfill	<i>v</i>	scrapyard
<i>h</i>	dunghill	<i>z</i>	abandoned agriculture object/farm / agricultural brownfield
<i>j</i>	silage pit	<i>n</i>	unrecognized, other type of clue
<i>l</i>	abandoned quarry	<i>t</i>	waste dumps within the industrial area
<i>o</i>	abandoned property	<i>r</i>	object identified only in DMR (Hill Shaded Digital Terrain Model)

Remote sensing – primary findings

Density of clues per 100 km²



33 436 findings (14 types)



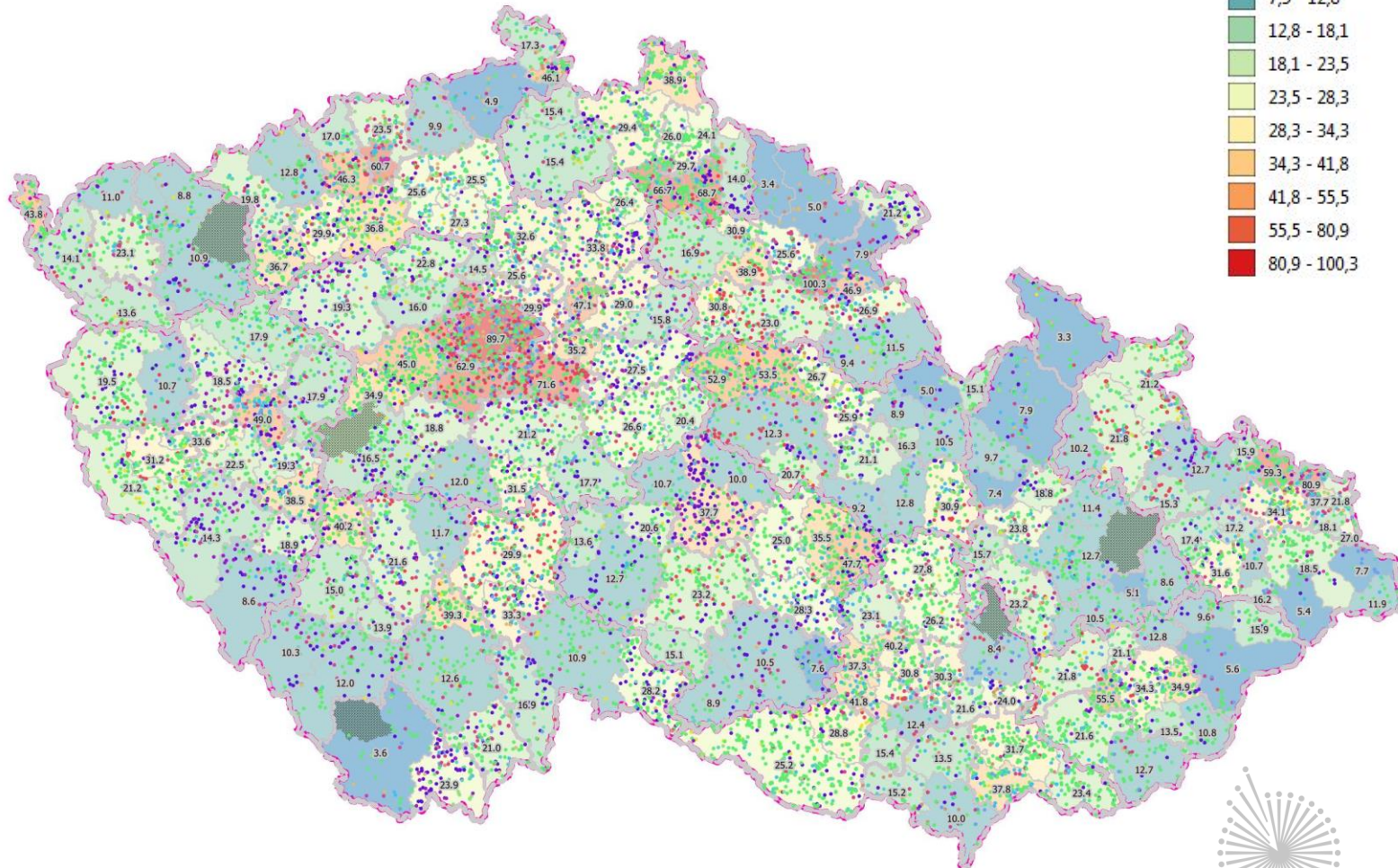
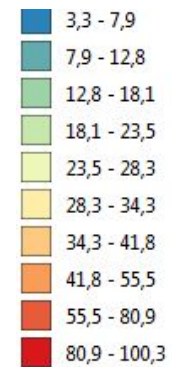
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Remote sensing – after revisions

Density of clues per 100 km²

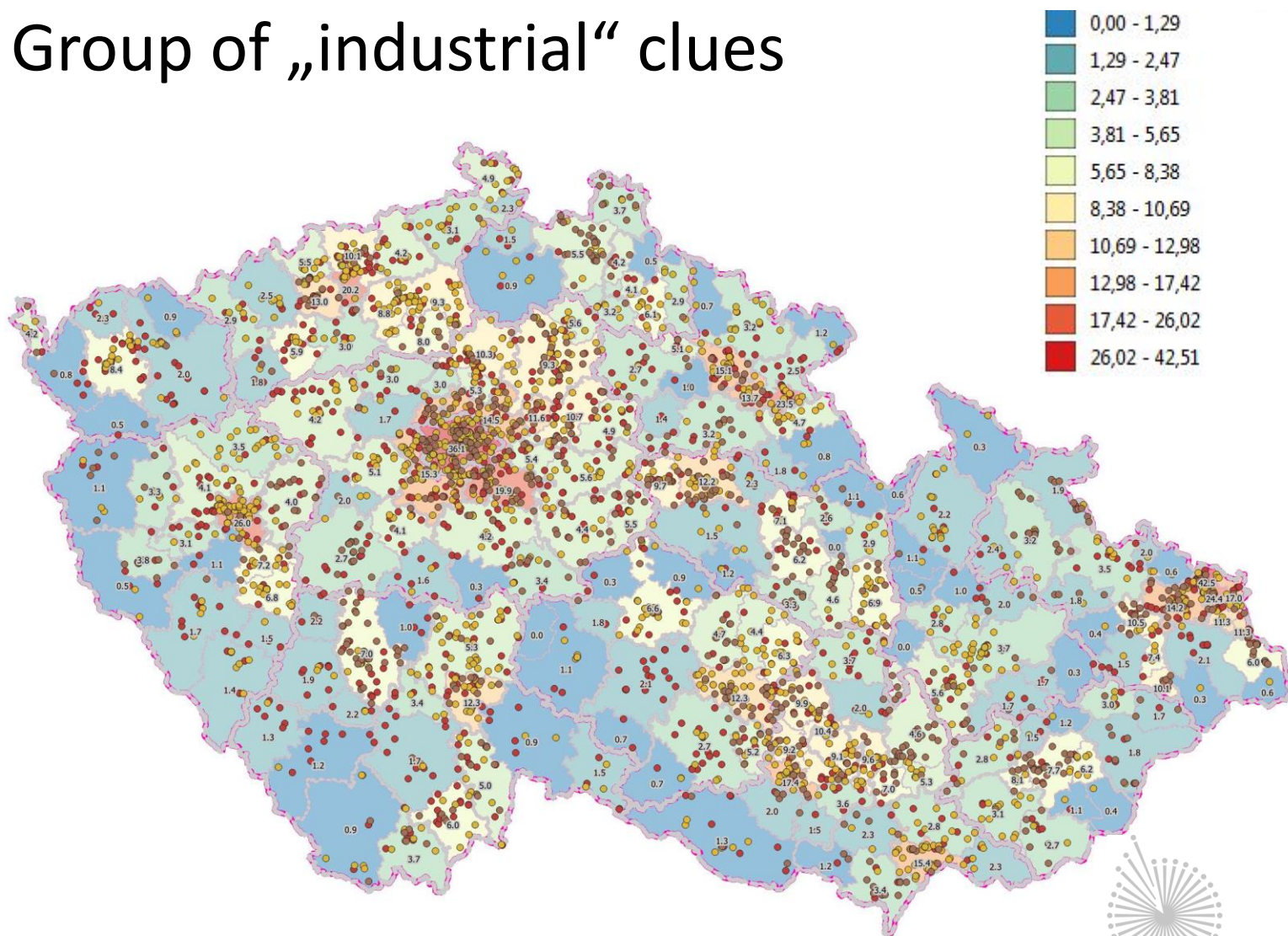


17 011 clues after revisions (16 425 eliminated)

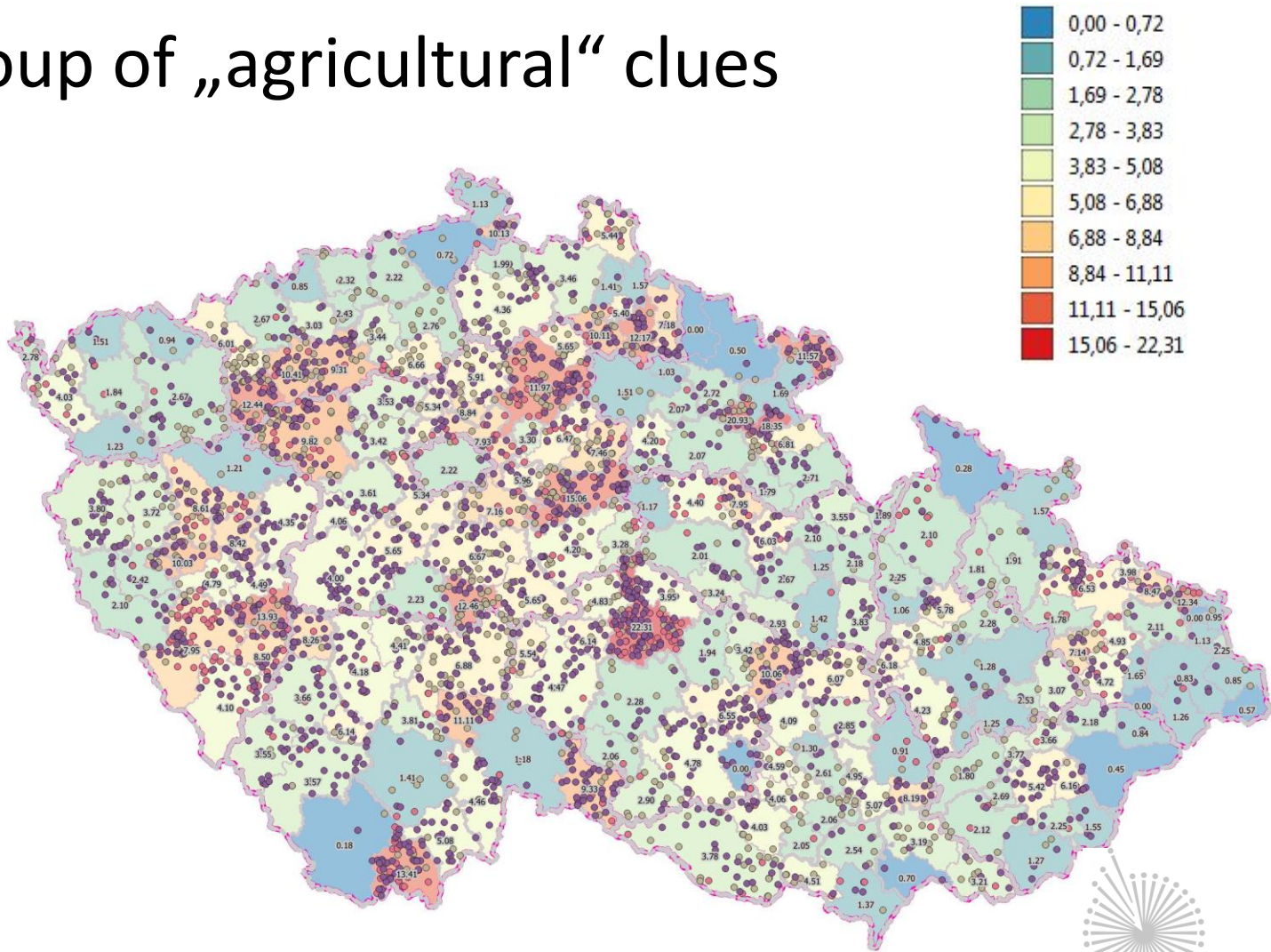


Group of „industrial“ clues

Density of clues per 100 km²

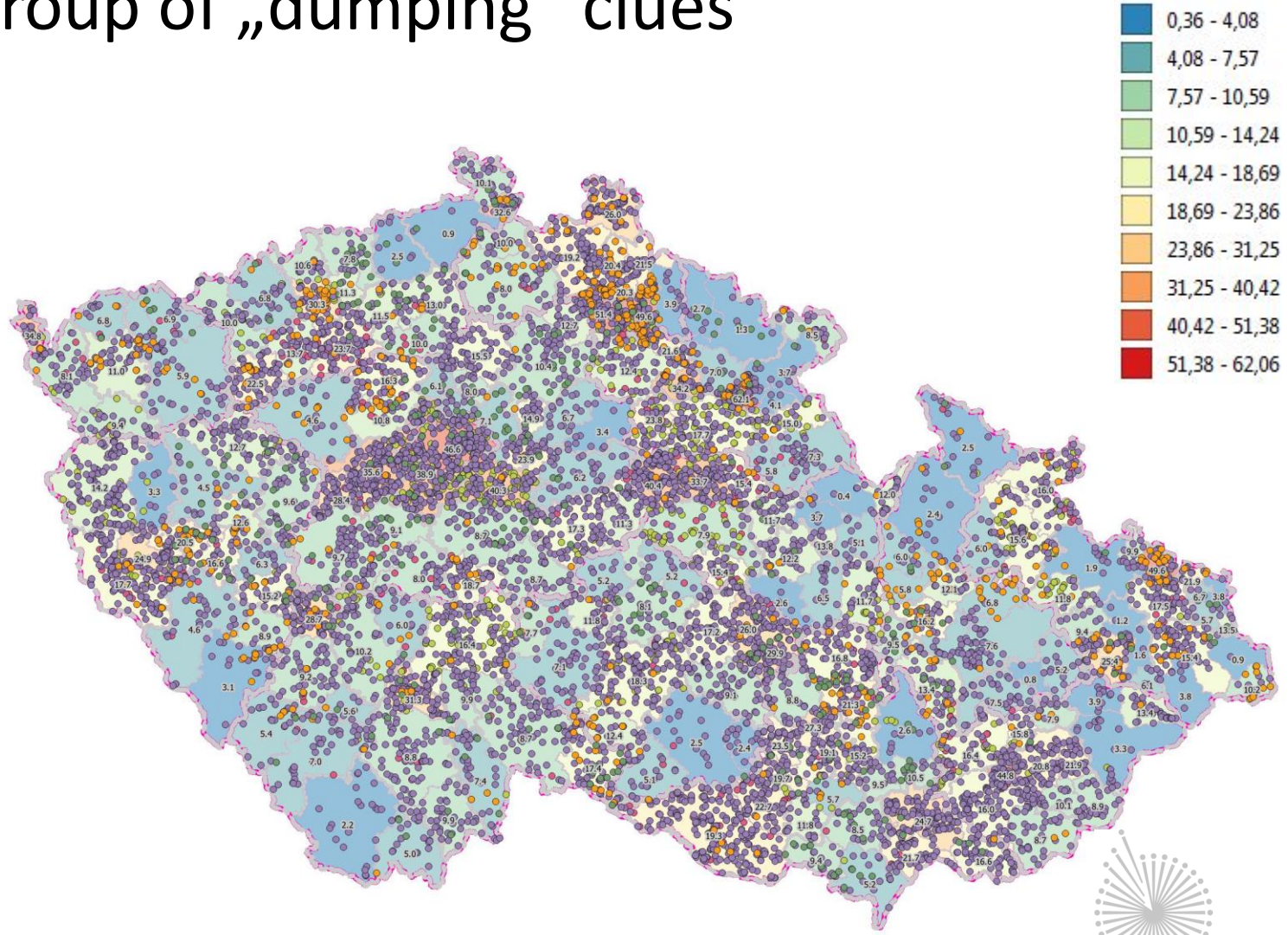


Group of „agricultural“ clues



Group of „dumping“ clues

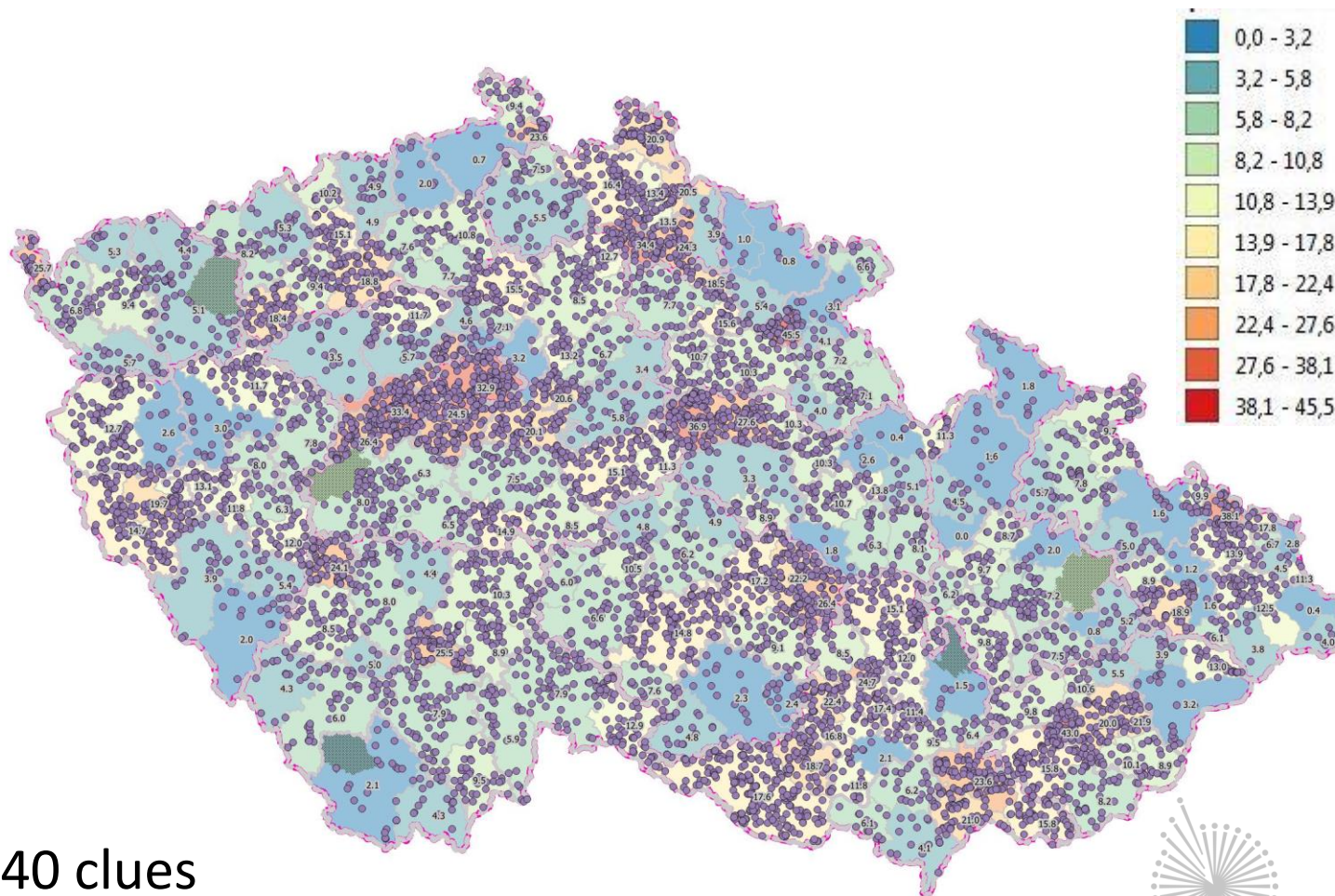
Density of clues per 100 km²



- 0,36 - 4,08
- 4,08 - 7,57
- 7,57 - 10,59
- 10,59 - 14,24
- 14,24 - 18,69
- 18,69 - 23,86
- 23,86 - 31,25
- 31,25 - 40,42
- 40,42 - 51,38
- 51,38 - 62,06



Illegal dumping clue (type „p“)



7540 clues



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Illegal dumping clue (type „p“)



cenia



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Illegal dumping clue (type „p“)



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Illegal dumping clue (type „p“)



The state of inventory in numbers

after 7 districts finished (from 77 districts – 9 %)

District	SEKM			Remote sensing			New sites	Imput total	Registered total In 7 districts	Number of sites - projection after 7 districts done
	Data source SEKM	registered	excluded	Data source RS	registered	excluded				
Czechia	13233			17011			79	30323	1073	11433
Česká Lípa	218	137	81	163	38	125	14	395	189	
Český Krumlov	104	56	48	157	8	149	4	265	68	
Chrudim	231	115	116	425	25	400	9	665	149	
Karviná	109	87	22	125	3	122	20	254	110	
Rakovník	177	113	64	173	5	168	1	351	119	
České Budějovice	173	87	86	340	5	335	8	521	100	
Šumperk	339	281	58	110	34	76	23	472	338	
7 districts total	1351	876	475	1493	118	1375	79	2923	1073	11433

Summary of investments and remediation expenses

Remediation and inventory financed from EU OP Environment

exchange rate 1 EUR = 25,5 CZK

in billions

	2007 - 2013	2014 - 2020	total
CZK	5,245	3,16	8,405
EUR	0,21	0,12	0,33

Summary of investments and remediation expenses

Investments for inventory of contaminated sites

exchange rate 1 EUR = 25,5 CZK
in millions

	NIKM 1 2009 - 2013	NIKM 2 2018 - 2021	NIKM total
CZK	100,7	116,6	217,3
EUR	3,9	4,6	8,5

Summary of investments and remediation expenses

Remediation of the old ecological burdens - the state by the end of 2018

in billions

	from 1991	spent by 2018	guarantees solved by 2018	paid from 1991	remains	new remediations under contracts	already paid	to be solved
Guarantees CZK	175,7	23,5	36,7	62,6	139	42,1	39	100
Guarantees EUR	6,9	0,9	1,4	2,5	5,5	1,7	1,5	3,9
No. of Ecological agreements	326		185		141			

Summary of investments and remediation expences

Remediations financed from **National Environmental Fund** (for private persons, municipality, regions)

in millions

	since 2015
CZK	100
EUR	3,9



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THANKS FOR THE ATTENTION,

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