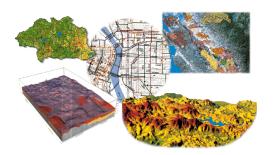
INTRODUCTION TO SPATIAL DATA INFRASTRUCTURES IN EUROPE



Tomáš ŘEZNÍK

Fall 2022



About the course

- Z8210 Introduction to spatial data infrastructures in Europe
- Language: English
- Extent and intensity: 2/0, 4 credits
- Type of Completion: k (colloquium)
 - an academic seminar
 - theory as well as practice
 - broad discussion
 - each student will present one topic (from the list advertised by the teacher) during the course



About the course

- Assessment methods
 - assessment of student's presentation;
 - assessment of student's activity during discussion throughout the semester.



Syllabus

- 1. Motivations and benefits of the European spatial data infrastructures (ESDI).
- 2. Metadata as the founding stone for linking between ESDI components.
- 3. Discovery processes, searching for spatial data and Web services.
- 4. View processes, preview of discovered spatial data.
- 5. Download processes, ordering and download of desired data.
- 6. Data models, understanding the UML diagrams and other formalised descriptions.
- 7. Map compositions on the Web, OGC Web Map Context.
- 8. Data sharing, use limitations and other licensing issues. Laboratory on Geoinformatics and Cartography



Literature

• required literature

- CRAGLIA, M. et al. 2012. Digital Earth 2020: towards the vision for the next decade. In International Journal of Digital Earth, Volume 5, Issue 1. 20 pages.
- <u>http://inspire.ec.europa.eu</u>
- NOGUERAS-ISO J., MURO-MEDRANO P.R., ZARAZAGA-SORIA F.J. Geographic information metadata for spatial data infrastructures :resources, interoperability and information retrieval. 1st ed. New York: Springer, 2005. xxi, 263 p. ISBN 3-540-24464-6.
- recommended literature
 - ANNONI A., CRAGLIA M., EHLERS M., GEORGIADOU Y., GIACOMELLI A., KONEČNÝ, M., OSTLAENDER N., REMETEY-FULOPP G., RHIND D., SMITS P., SCHADE S. A European perspective on Digital Earth. *International Journal of Digital Earth*, Abingdon, Oxon, UK: Taylor and Francis, 2011, July 2011, 4/4, p. 271-284. ISSN 1753-8947. doi:10.1080/17538947.2011.582888.
 - UML modeling languages and applications :UML 2004 Satellite Activities, Lisbon, Portugal, October 11-15, 2004 : revised selected papers. Edited by Nuno Jardim Nunes. 1st ed. New York, NY: Springer-Verlag Berlin Heidelberg, 2005. xiv, 294 s. ISBN 3-540-25081-6.
- KAMBA V. *Tvorba systémů a komponent podle specifikace UML*. Brno, 2002. 61 CD Laboratory on Geoinformatics and Cartography

1. MOTIVATIONS AND BENEFITS OF THE EUROPEAN SPATIAL DATA INFRASTRUCTURES

Spatial data infrastructure is like any other infrastructure (water, transport, electricity,...).

Decades of time, a lot of effort and money are needed. Users do not need to know how they work. **They just use it.**



Image adopted from: https://www.123rf.com



Initiative/legislation/framework to **discover** available spatial data, to evaluate their suitability for the purpose and to know the conditions applicable to their use.

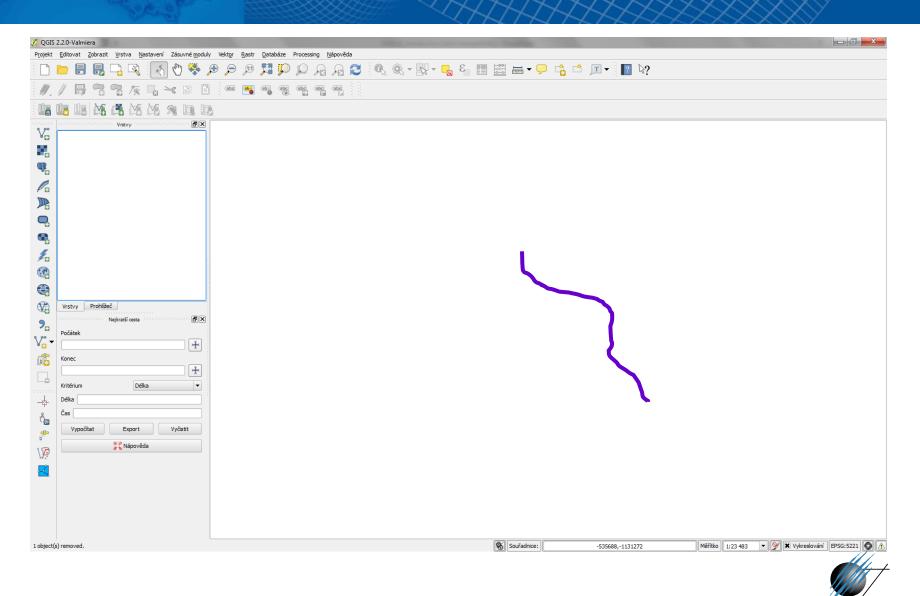


Why such emphasis on discovery process?

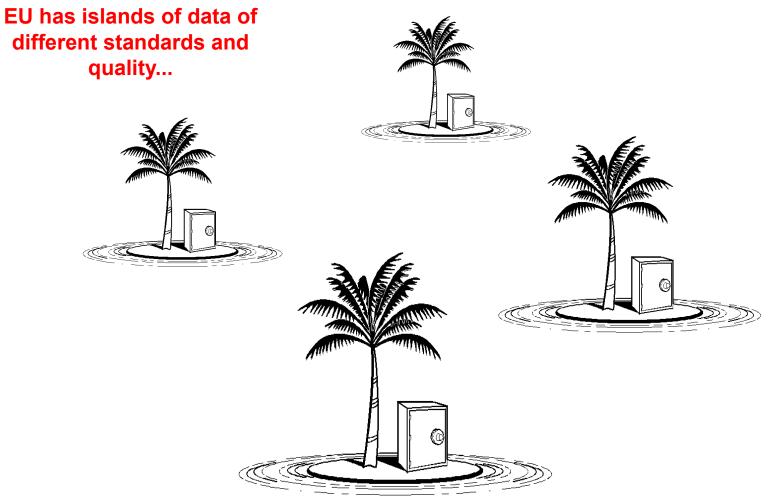
- Have you ever heard about the PSI directive?
 - DIRECTIVE 2003/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 November 2003 on the re-use of public sector information
- How could be any information re-used when we do not know that it exists?







"Spatial data islands"



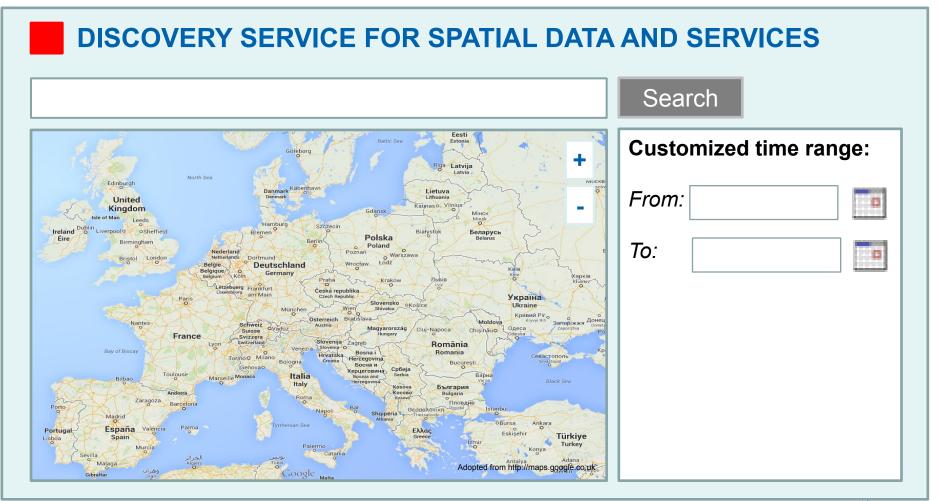




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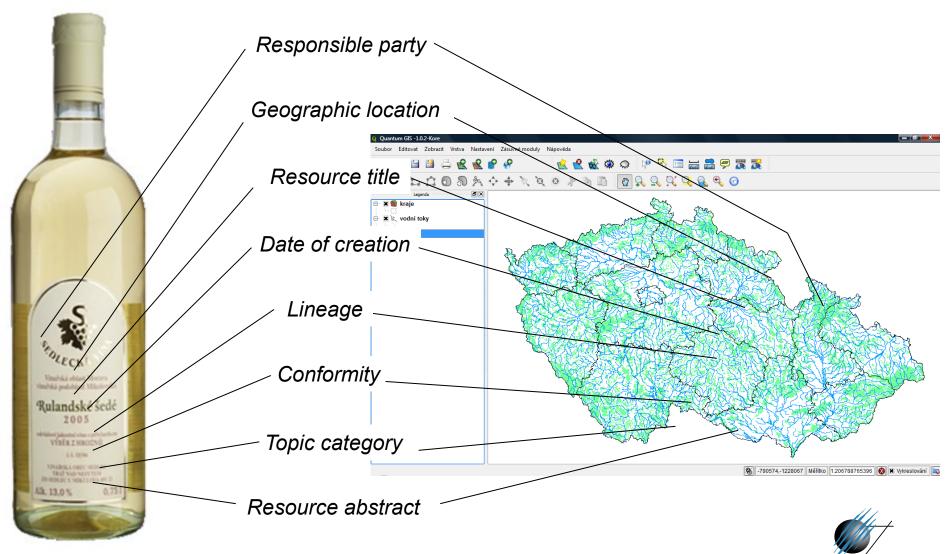
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INSPIRE metadata



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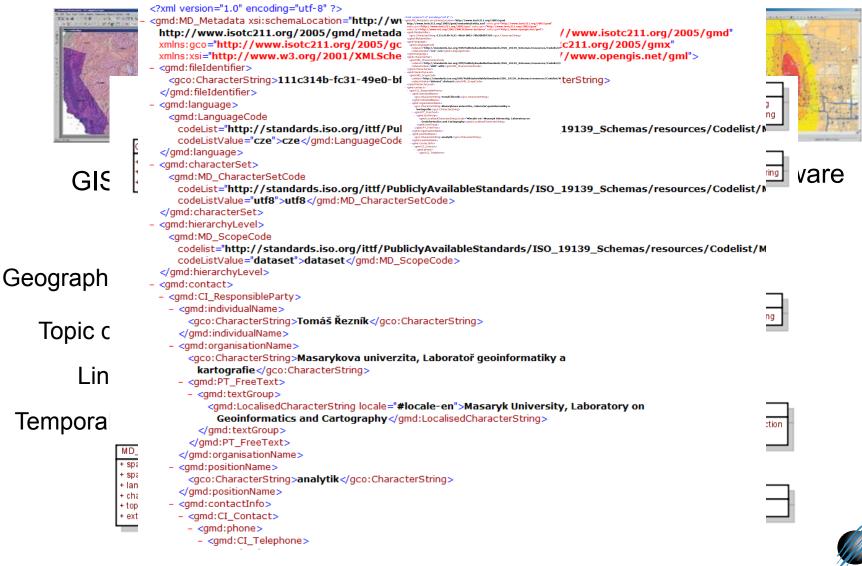


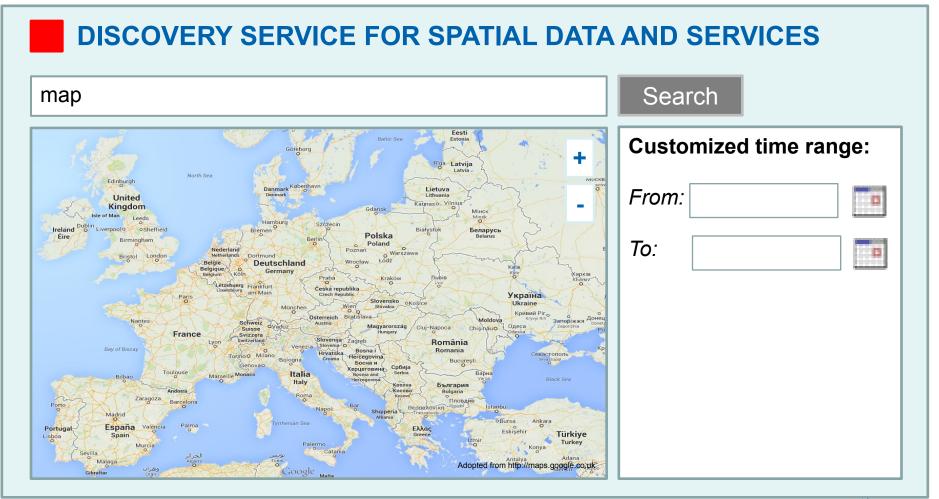


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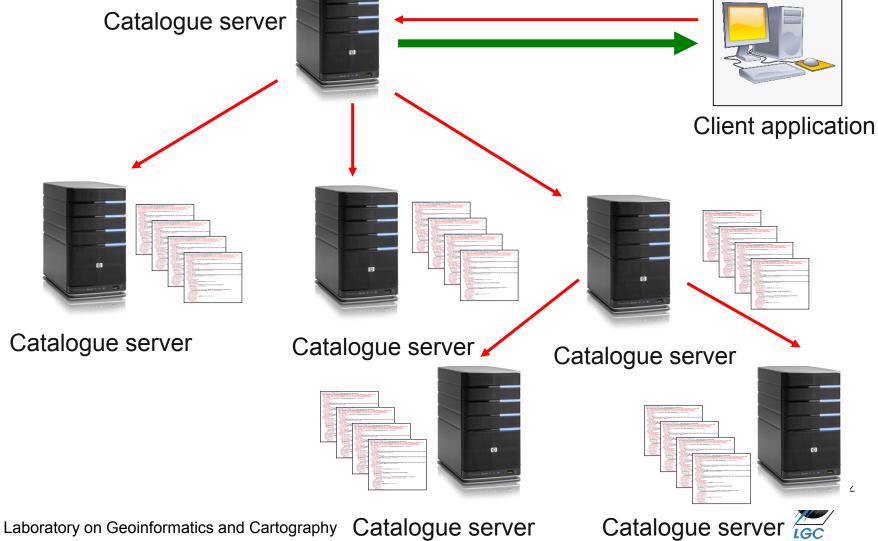
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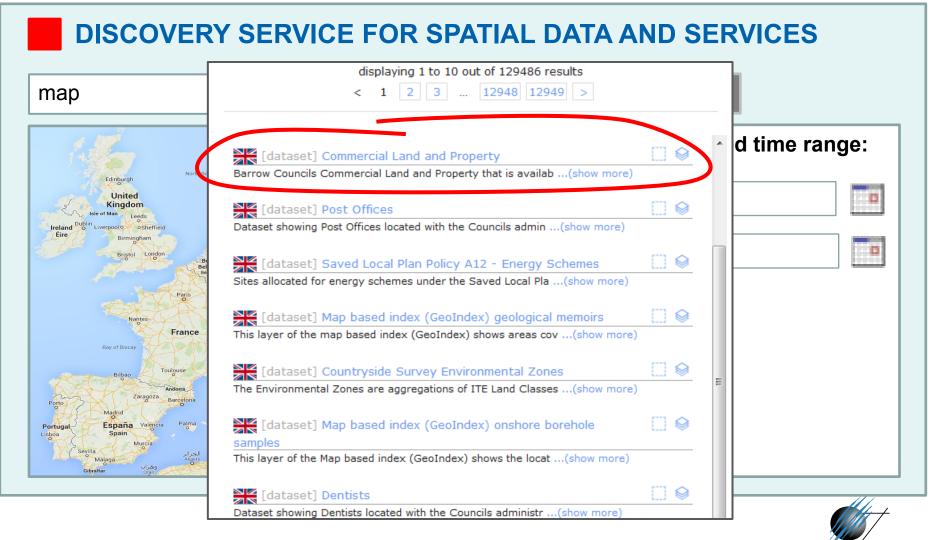




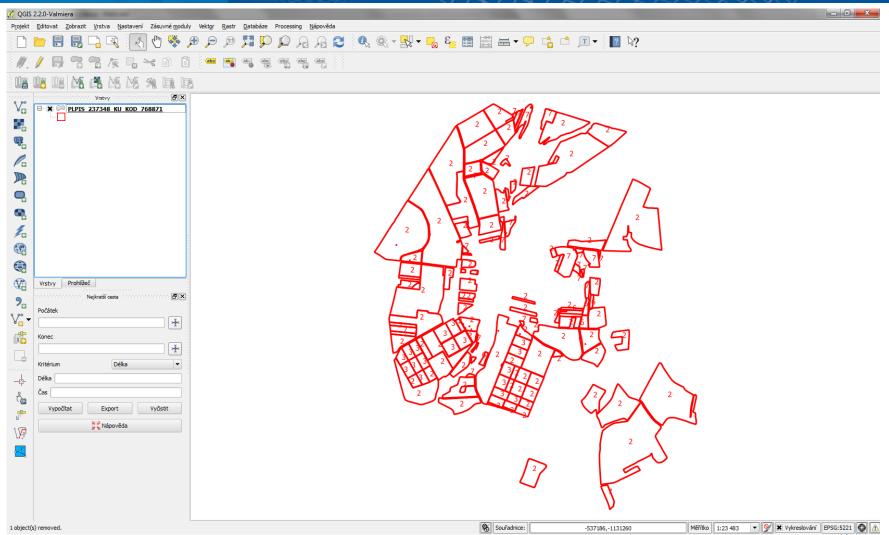


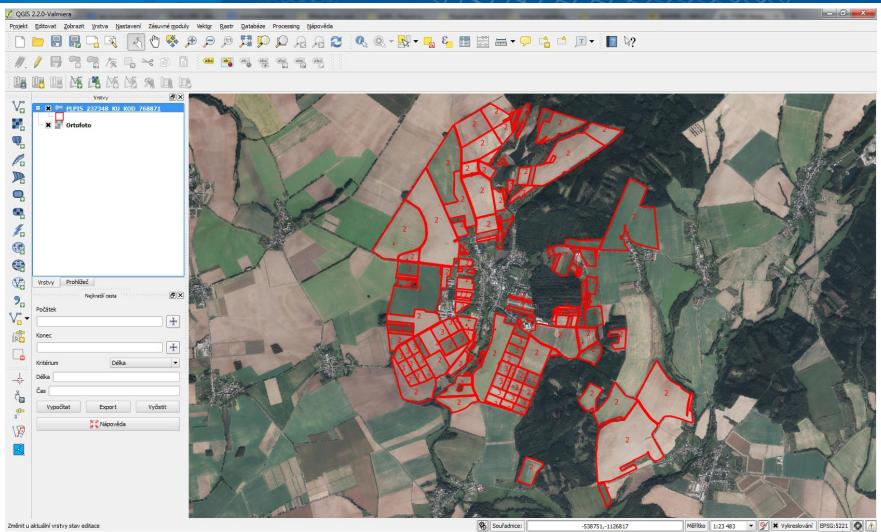




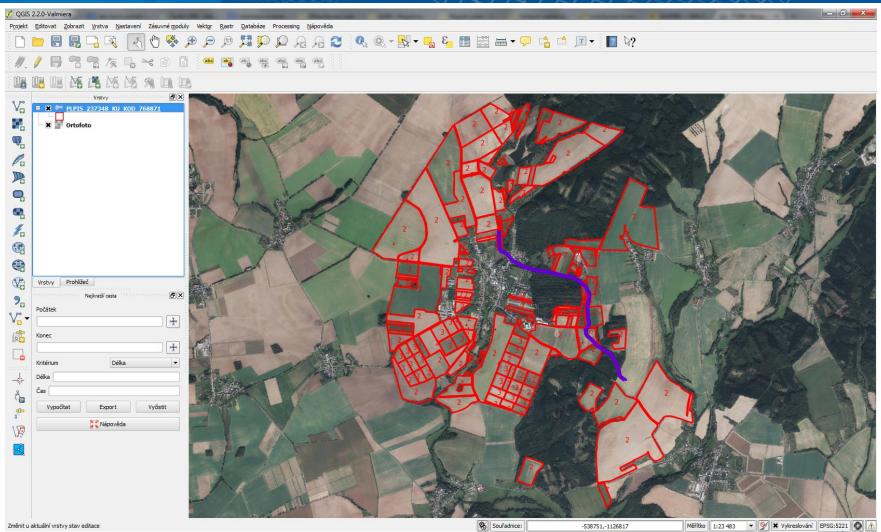


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For which themes may I search?

Annex I

- 1. Coordinate reference systems
- 2. Geographical grid systems
- 3. Geographical names
- 4. Administrative units
- 5. Addresses
- 6. Cadastral parcels
- 7. Transport networks
- 8. Hydrography
- 9. Protected sites

Annex II

- 1. Elevation
- 2. Land cover
- 3. Orthoimagery
- 4. Geology



For which themes may I search?

Annex III

- 1. Statistical units
- 2. Buildings
- 3. Soil
- 4. Land use
- 5. Human health and safety
- 6. Utility and governmental services
- 7. Environmental monitoring facilities
- 8. Production and industrial facilities
- 9. Agricultural and aquaculture facilities
- 10. Population distribution demography

11. Area

management/restriction/regulati on zones and reporting units

- 12. Natural risk zones
- 13. Atmospheric conditions
- 14. Meteorological geographical features
- 15. Oceanographic geographical features
- 16. Sea regions
- 17. Bio-geographical regions
- 18. Habitats and biotopes
- 19. Species distribution
- 20. Energy resources
- 21. Mineral resources



INSPIRE spatial data themes

• Exactly those themes that any student should choose and present its content to the audience.



Building blocks of any spatial data infrastructure

Monitoring and reporting

Data sharing

Network services

Metadata

Data

Who is obliged to create such SDI building blocks in the European Member States?

- So-called Legally Mandated Organisations (LMOs)
- Generally defined by the European directive 2007/2/EC
 - English version: <u>http://eur-lex.europa.eu/legal-</u> <u>content/EN/TXT/HTML/?uri=CELEX:32007L0002&fro</u> <u>m=EN</u>
 - Versions for all 24 official European languages: <u>http://eur-lex.europa.eu/legal-</u> <u>content/EN/ALL/?uri=CELEX:32007L0002</u>
- In detail written in the appropriate legislation of each Member State, such as Zákon č. 123/1998 Sb. (CZ) or Zákon č. 3/2010 Z.z.(SK)



Which data shall be published under INSPIRE?

- Fulfilling the following conditions (see Article 4)
 - they relate to an area where a Member State has and/or exercises jurisdictional rights;
 - they are in electronic format;
 - they are held by or on behalf of any of the following:
 - (i) a public authority, having been produced or received by a public authority, or being managed or updated by that authority and falling within the scope of its public tasks;
 - (ii)a third party to whom the network has been made available in accordance with Article 12;

- they relate to one or more of the themes listed in Annex I, II or III. Laboratory on Geoinformatics and Cartography



Deadlines

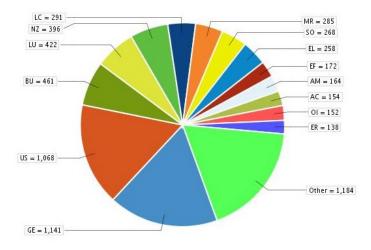
See also http://inspire.ec.europa.eu/index.cfm/pageid/44

Implementation		
Milestone date	Article	Description
15-May-2010	21§1 21§2	Implementation of provisions for monitoring and reporting
03-Dec-2010	6(a)	Metadata available for spatial data sets and services corresponding to Annex I and II
09-May-2011	16	Member States shall provide the Discovery and View Services with initial operating capability
30-Jun-2011	15	The EC establishes and runs a geo-portal at Community level
19-Oct-2011	17(8)	Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for new arrangements
09-Nov-2011	16	Discovery and view services operational
28-Jun-2012	16	Member States shall provide the Download Services with initial operating capability
28-Jun-2012	16	Member States shall provide the Transformation Services with initial operating capability
23-Nov-2012	7§3, 9(a)	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and service: for Newly collected and extensively restructured Annex I spatial data sets available
28-Dec-2012	16	Download services operational
28-Dec-2012	16	Transformation services operational
04-Feb-2013	7§3, 9(a)	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services for newly collected and extensively restructured Annex I spatial data sets
19-Oct-2013	17(8)	Implementation of Regulation as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions for existing arrangements
03-Dec-2013	6(b)	Metadata available for spatial data sets and services corresponding to Annex III
21-Oct-2015	7§3, 9(b)	Newly collected and extensively restructured Annex II and III spatial data sets available
23-Nov-2017	7§3, 9(a)	Implementation of Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and service for other Annex I spatial data sets still in use at the date of adoption
04-Feb-2018	7§3, 9(a)	Implementation of Commission Regulation (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services for other Annex I spatial data sets still in use at the date of adoption
21-Oct-2020	7§3, 9(b)	Other Annex II and III spatial data sets available in accordance with IRs for Annex II and III



Feedback from the Member States

- Public consultations and testing
- 6554 comments related to the data specifications in 2011
 - Each comment has to be answered and if appropriate, then also addressed



Theme	Issues	^ %
GN	1	0
CS	2	0
GS	2	0
AD	3	0
HY	7	0
PS	7	0
None	13	0
O&M	25	0
AF	47	0
BR	56	0
MF	63	0
SR	68	1
GCM & encoding	71	1
PF	80	1
SU	86	1
PD	96	1
OF	100	1
SD	100	1
HH	106	1
all	122	1
HB	129	1
ER	138	2
01	152	2
AC	154	2
AM	164	2
EF	172	2
EL	258	3
so	268	4
MR	285	4
LC	291	4
NZ	396	6
LU	422	6
BU	461	7
US	1068	16
GE	1141	17



At the end there is more than 6'000 pages...

INSPIRE directive (2007/2/EC) Commission Commission Commission **Regulation No. Regulation No. Regulation No.** 1205/2008 (metadata) 1089/2010 (data) 976/2009 (services) . . . Technical Guidelines Data Specifications **Technical Guidelines** (34)for Network Services for Metadata (1) (4) . . .



Laboratory on Geoinformatics and Cartography

Legally binding

INSPIRE objectives (purpose of all the 6'000 pages...)

Make relevant, harmonised spatial data <u>available</u> for Community Environmental Policy (formulation, implementation, monitoring and evaluation) and for the citizen ...

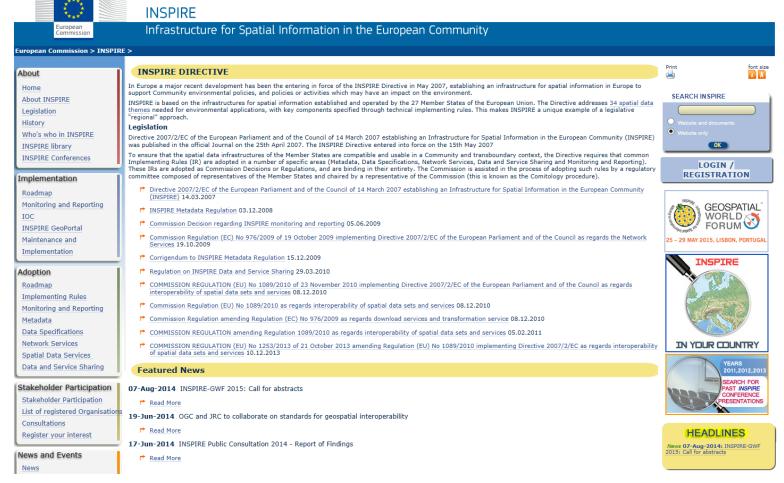
... through the establishment of integrated spatial information services, based upon a distributed network of databases, linked by common standards and protocols to ensure compatibility.



INSPIRE document repository

<u>http://inspire.ec.europa.eu</u>

Contact | Search | Legal notice | Privacy statement | English (en) V



INSPIRE Geoportal

• <u>http://inspire-geoportal.ec.europa.eu</u>





Czech national INSPIRE geoportal







Tematické mapy (dle směrnice INSPIRE)

I.2 - Zeměpisné soustavy

souřadnicových sítí

II.4 - Geologi

1085

I.3 - Zeměpisné názvy

III.1 - Statistické jednotky

Vítejte na stránkách Národního geoportálu INSPIRE

Seminář autorské právo & Open data 09.09.2014

V úterý 9. 9. 2014 se pod záštitou projektu Zvýšení efektivity ochrany autorských práv v kartografil a geoinformatice a ve spolupráci s Českou asociací pro geoinformace uskuteční seminář Autorské právo & open data. Místo konání Novotného lávka 5, Praha 1, sál č. 217. Seminář je v rámci podpory projektu zdarma, je však nutné se předem zaregistrovat. Více detailů o... (<u>pokračování</u>).

Náhrada geologické mapy 08.07.2014

HORSKÁ

KVILDA

I.4 - Správní jednotky

III.3 - Půda

Z WMS służby Geologická a geomorfologická mapa ČR (CENIA/cenia_geolog_geomorf) provazované CENIA byla odstraněna geologická mapa 1:500 000, Nové provazovaná služba obsahuje pouze geomorfologické denění ČR a je dostupná na adrese http://geoportal.gov.cz/ArcGIS/services/CENIA/cenia_geomorfologie/MapServer/WMSServer, Připojení Geologické mapy ČR 1:500 000 je i nadále možné prostřednictvím WMS... (<u>pokratován</u>).

Strategie pro implementaci INSPIRE v České republice

Pro účelnou implementaci INSPIRE v České republice je od začátku r. 2014 vytvářená národní strategie implementace INSPIRE. Tato strategie je v rámci České republiky základním dokumentem pro realizaci požadavků vyplývajících ze Směrnice INSPIRE. Cilem implementace je vytvořit, udržovat a rozvíjet infrastrukturu pro prostorové informace INSPIRE. Hlavním důvodem pro tvorbu Strategie je... (<u>gokračován</u>).

Přihlásit odběr novinek 1 (10) Novinky v katalogu metadat



I.7 - Dopravní sítě

TTL5 - Lidské zdraví a

bezpečnost

I.5 - Adresv

III.4 - Využití úzo



ZÁKLADNÍ ŠKOLA

III.6 - Veřejné služby a

služby veřejné správy



III.7 - Zařízení pro

sledování životního

prostředí





II.2 - Krajinný pokryv







Smen 2014 -

11 12 13 14 15 16 17

18 19 20 21 22 23 24

25 26 27 28 29 30 31

Dnes

1 2 3 4 5 6

30

4 5 6 7

2 3

1

8 9 10

I.3 - Ortofotosnímky



III.10 - Rozložení obyvatelstva - demografie

