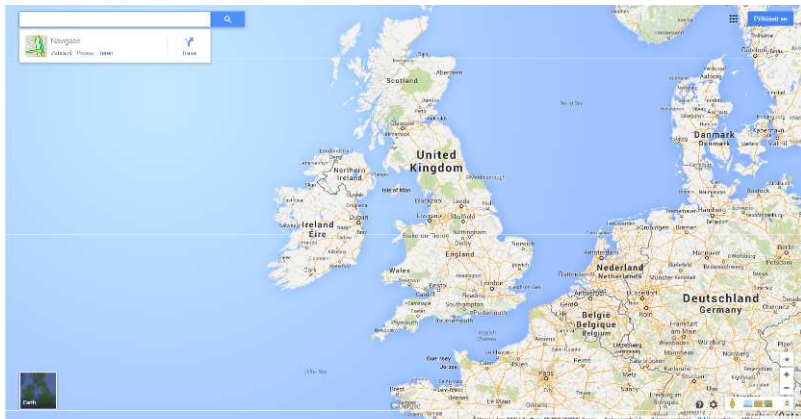


5. DOWNLOAD PROCESSES, ORDERING AND DOWNLOAD OF DESIRED DATA

The concept of download in ESDI

- *“Download services, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly (Article 11 of the INSPIRE directive)*
- Different than Google Maps, Mapy.cz, etc.
 - You may download “real” data



Not providing data for download under INSPIRE

- *“By way of derogation from Article 11(1), Member States may limit public access to spatial data sets and services through the services referred to in points (b) to (e) of Article 11(1), or to the e-commerce services referred to in Article 14(3), where such access would adversely affect any of the following:*
 - (a) the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law;*
 - (b) international relations, public security or national defence;*

Not providing data for download under INSPIRE...a long list

(c) the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;

(d) the confidentiality of commercial or industrial information, where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy;

(e) intellectual property rights;

Not providing data for download under INSPIRE...a really long list

(f) the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law;

(g) the interests or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned;

(h) the protection of the environment to which such information relates, such as the location of rare species.”

What about payments?

- **Question: How do I know whether I have to pay for data or whether they are free of charge?**
 - **Sure, in metadata describing those data**
- *Article 14: “Where public authorities levy charges for the services referred to in points (b), (c) or (e) of Article 11(1), Member States shall ensure that e-commerce services are available. Such services may be covered by disclaimers, click-licences or, where necessary, licences.”*
- **What does that mean?**

INSPIRE Download service

- Equals to ISO 19142
 - ISO 19142 equals to the OGC Web Feature Service 2.0.0
 - Only version 2.0.0!
- Implemented together with ISO 19143
 - ISO 19143 equals to the OGC Filter Encoding 2.0.0 implementation specification
- Standard for e-shop of GI products
 - Still none, discussion about OGC e-commerce services

Two possibilities of connecting to a download service

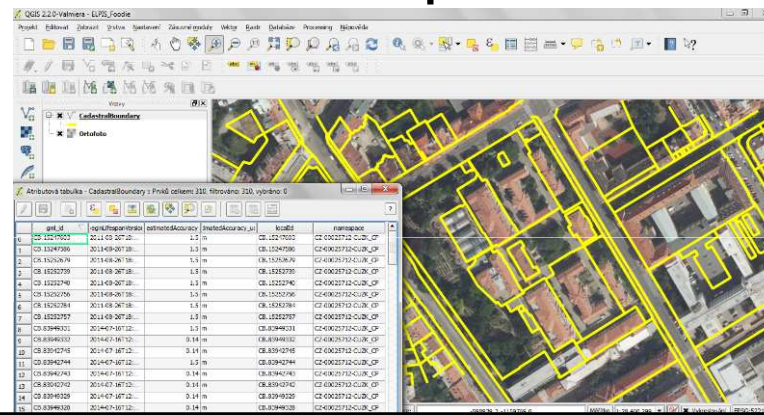
1. Through a “thin” client

- typically a Web browser...however, you have to exactly what to type and what to see

```
services.cuzk.cz/wfs/inspire-cp-wfs.asp?services=WFS&version=2.0.0&request=GetFeature&typename=CadastralBoundary&EBOX=-59008,-115...>
<-FeatureCollection xmlns:schemaLocation="http://www.opengis.net/gml/3.2 http://schemas.opengis.net/gml/3.2.1/deprecatedTypes.xsd http://www.opengis.net/wfs/2.0 http://schemas.opengis.net/wfs/2.0/wfs.xsd urn:x-inspire-specification:gmlas:GeographicalNames:3.0 http://services.cuzk.cz/xsd/inspire-specification/3.0rc3:GeographicalNames.xsd urn:x-inspire-specification:gmlas:CadastralParcels:3.0 http://services.cuzk.cz/xsd/inspire-specification/3.0rc3:CadastralParcels.xsd" timeStamp="2014-09-16T11:24:47" numberMatched="310" numberReturned="310">
  <-boundedBy>
    <-gml:Envelope srsName="urn:ogc:def:crs:EPSG::5514" srsDimension="2">
      <gml:lowerCorner>-599122.21 -1159181.21</gml:lowerCorner>
      <gml:upperCorner>-598382.14 -1159442.74</gml:upperCorner>
    </gml:Envelope>
  </boundedBy>
  <-member>
    <-CP:CadastralBoundary gmlid="CB.15247603">
      <CP:beginLifespanVersion>2011-08-26T18:44:55Z</CP:beginLifespanVersion>
      <CP:estimatedAccuracy uom="m">1.5</CP:estimatedAccuracy>
      <CP:geometry>
        <-gml:Curve gmlid="C.B.15247603" srsName="urn:ogc:def:crs:EPSG::5514" srsDimension="2">
          <-gml:segments>
            <-gml:LineStringSegment>
              <-gml:posList>
                -598732.94 -1159696.46 -598722.61 -1159690.4 -598721.61 -1159691.67 -598713.69 -1159704.6 -598713.48 -1159704.9
              </gml:posList>
            </gml:LineStringSegment>
            <-gml:segments>
              <-gml:Curve>
                <CP:geometry>
                  <-CP:inspireId>
                    <-base:Identifier>
                      <base:localId>CB.15247603</base:localId>
                      <base:namespace>CZ-00025712-CUZK_CP</base:namespace>
                    </base:Identifier>
                  </CP:inspireId>
                </CP:inspireId>
                <CP:parcel xlink:href="#CP.1549574702"/>
              </gml:Curve>
            </gml:Curve>
          </CP:geometry>
        </gml:Curve>
      </CP:geometry>
    </CP:CadastralBoundary>
  </member>
</FeatureCollection>
```

2. Through a “thick” client

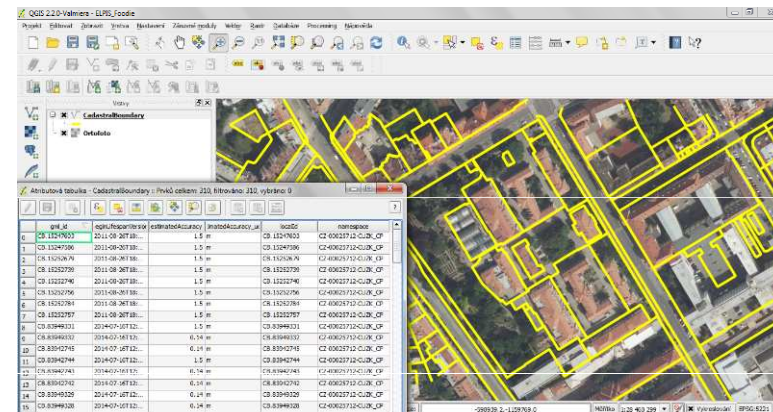
- e.g. GIS software, common for GI professionals



Legislation background

- Again, all this is originating from INSPIRE legislation (the same as for discovery services)

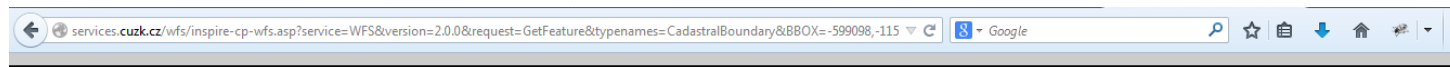
```
services.cadastre.wfs/inspire-cp-wfs.aspx?service=WFS&version=2.0.0&request=GetFeatureByParameters&CadastreBoundary&BBOX=-59908,-113...</pre><pre>-<FeatureCollection xmlns:schemaLocation="http://www.opengis.net/gml/3.2 http://schemas.opengis.net/gml/3.2/1/deprecatedTypes.xsd http://www.opengis.net/wfs/2.0 http://schemas.opengis.net/wfs/2.0/wfs.xsd urn:inspire-specification:gmls:GeographicalNames:3.0 http://services.cadastre.wfs/inspire-specification:3.0c3:GeographicalNames.xsd urn:inspire-specification:gmls:CadastralParcels:3.0 http://services.cadastre.wfs/inspire-specification:3.0c3:CadastralParcels.xsd" timeStamp="2014-09-16T11:24:47" numberMatched="110" numberReturned="110">-<boundedBy>-<gml:Envelope srsName="urn:ogc:defs:EPSG::5514" srsDimension="2">-<gml:lowerCorner>-599122.21 -1160181.21</gml:lowerCorner>-<gml:upperCorner>-598382.14 -1159442.74</gml:upperCorner>-</gml:Envelope>-</boundedBy>-<member>-<CP:CadastralBoundary gml:id="CB.15247603">-<CP:beginLifeSpanVersion>2011-08-26T18:44:55Z</CP:beginLifeSpanVersion>-<CP:estimatedAccuracy name="m">1.5</CP:estimatedAccuracy>-</CP:geometry>-<gml:Curve gml:id="C.CB.15247603" srsName="urn:ogc:defs:EPSG::5514" srsDimension="2">-<gml:segments>-<gml:LineStringSegment>-<gml:posList>-598732.94 -1159696.46 -598722.61 -1159690.4 -598721.61 -1159691.67 -598713.69 -1159704.6 -598713.48 -1159704.9</gml:posList>-</gml:LineStringSegment>-</gml:segments>-</gml:Curve>-</CP:geometry>-</CP:inspireId>-<base:identifier>-<base:localId>CB.15247603</base:localId>-<base:instanceName>CZ.0003732.CU22_CBP</base:instanceName>-</base:identifier>-</CP:inspireId>-<CP:parcel slink:type="simple" slink:href="#CP.1549574702"></pre>
```



- COMMISSION REGULATION (EC) No 1088/2010 of 23 November 2010 amending Regulation (EC) No 976/2009 as regards download services and transformation services
- <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32010R1088>

Let's make it complex...a use case with Web browser

- Type in <http://services.cuzk.cz/wfs/inspire-cp-wfs.asp?service=WFS&version=2.0.0&request=GetFeature&typename=CadastralBoundary&BBOX=-599098,-1159750,-598602,-1159520&srsName=urn:ogc:def:crs:EPSG::5514>



```
-<FeatureCollection xsi:schemaLocation="http://www.opengis.net/gml/3.2 http://schemas.opengis.net/gml/3.2.1/deprecatedTypes.xsd http://www.opengis.net/wfs/2.0 http://schemas.opengis.net/wfs/2.0/wfs.xsd urn:x-inspire:specification:gmlas:GeographicalNames:3.0 http://services.cuzk.cz/xsd/inspire/specification/3.0rc3/GeographicalNames.xsd urn:x-inspire:specification:gmlas:CadastralParcels:3.0 http://services.cuzk.cz/xsd/inspire/specification/3.0rc3/CadastralParcels.xsd" timeStamp="2014-09-16T11:24:47" numberMatched="310" numberReturned="310">
  -<boundedBy>
    -<gml:Envelope srsName="urn:ogc:def:crs:EPSG::5514" srsDimension="2">
      <gml:lowerCorner>-599122.51 -1160181.21</gml:lowerCorner>
      <gml:upperCorner>-598382.14 -1159442.74</gml:upperCorner>
    </gml:Envelope>
  </boundedBy>
  -<member>
    -<CP:CadastralBoundary gml:id="CB.15247603">
      <CP:beginLifespanVersion>2011-08-26T18:44:55Z</CP:beginLifespanVersion>
      <CP:estimatedAccuracy uom="m">1.5</CP:estimatedAccuracy>
      -<CP:geometry>
        -<gml:Curve gml:id="C.CB.15247603" srsName="urn:ogc:def:crs:EPSG::5514" srsDimension="2">
          -<gml:segments>
            -<gml:LineStringSegment>
              -<gml:posList>
                -598732.94 -1159696.46 -598722.61 -1159690 -598722.4 -1159690.4 -598721.61 -1159691.67 -598713.69 -1159704.6 -598713.48 -1159704.9
              </gml:posList>
              </gml:LineStringSegment>
            </gml:segments>
          </gml:Curve>
        </CP:geometry>
      </CP:CadastralBoundary>
      -<base:Identifier>
        <base:localId>CB.15247603</base:localId>
        <base:namespace>CZ-00025712-CUZK_CP</base:namespace>
      </base:Identifier>
      </CP:inspireId>
      <CP:parcel xlink:type="simple" xlink:href="#CP.1549574702"/>
    </member>
  </FeatureCollection>
```

Operations of an INSPIRE download service

- **Get Download Service Metadata**
- **Get Spatial Data Set**
- **Describe Spatial Data Set**
- **Link Download Service**

DOWNLOAD SERVICES

PART A

Download Operations

1. LIST OF OPERATIONS

In order to be in conformity with Article 11(1)(c) of Directive 2007/2/EC, the Download Service shall at least provide the operations listed in Table 1 of this Annex.

Table 1

Operation	Role
Get Download Service Metadata	Provides all necessary information about the service, the available Spatial Data Sets, and describes the service capabilities.
Get Spatial Data Set	The Get Spatial Data Set operation allows the retrieval of a Spatial Data Set.
Describe Spatial Data Set	This operation returns the description of all the types of Spatial Objects contained in the Spatial Data Set.
Link Download Service	Allows the declaration, by a Public Authority or a Third Party, of the availability of a Download Service for downloading Spatial Data Sets or, where practicable, Spatial Objects, through the Member State's Download Service while maintaining the downloading capability at the Public Authority or the Third Party location.

The request and response parameters of each operation complete the description of each operation and form an integral part of the Download Service's technical specifications.

Is it an OGC compliant service?

Second possible approach

A direct access download service extends the functionality of a pre-defined dataset download service to include the ability to query and download subsets of datasets. The direct access download service allows more control over the download than the simple download of a pre-defined dataset or pre-defined part of a dataset. It can therefore be considered to be more „advanced“ than pre-defined dataset download. In this case, the spatial information is typically stored in a repository (e.g. a database) and only accessible through a middleware data management system (although the precise implementation may vary). The term direct access is used to mean the capability of a client application or client service to interact directly with the contents of the repository, e.g. by retrieving parts of the repository based upon a query. The query can be based upon spatial or temporal criteria, or by specific properties of the instances of the spatial object types contained in the repository.

Do you understand it?

Direct access download service

- **Get Spatial Object**
 - i.e. GetFeature/GetCoverage according to the OGC
- **Describe Spatial Object Type**
 - i.e. DescribeFeatureType/DescribeCoverageType according to the OGC

PART B

Direct Access Download Operations

6. LIST OF OPERATIONS

Where the Download Service gives direct access to spatial data sets, it shall provide, in addition to the operations listed in Table 1, the operations listed in Table 2 of this Annex.

Table 2

Operation	Role
Get Spatial Object	This operation allows the retrieval of Spatial Objects based upon a query.
Describe Spatial Object Type	This operation returns the description of the specified Spatial Objects types.

The request and response parameters of each operation complete the description of each operation and form an integral part of the Download Service's technical specifications.

“Indirect” access INSPIRE download service

- For instance, <http://services.cuzk.cz/gml/inspire>

Directory listing [/gml/inspire/]

[\[To Parent Directory\]](#)

date	time	size	name
<directory>			ad
<directory>			au
<directory>			cp

services.cuzk.cz/gml/inspire/au/

Directory listing [/gml/inspire/au/]

[\[To Parent Directory\]](#)

date	time	size	name
<directory>			epsg-5514
<directory>			epsg-4258

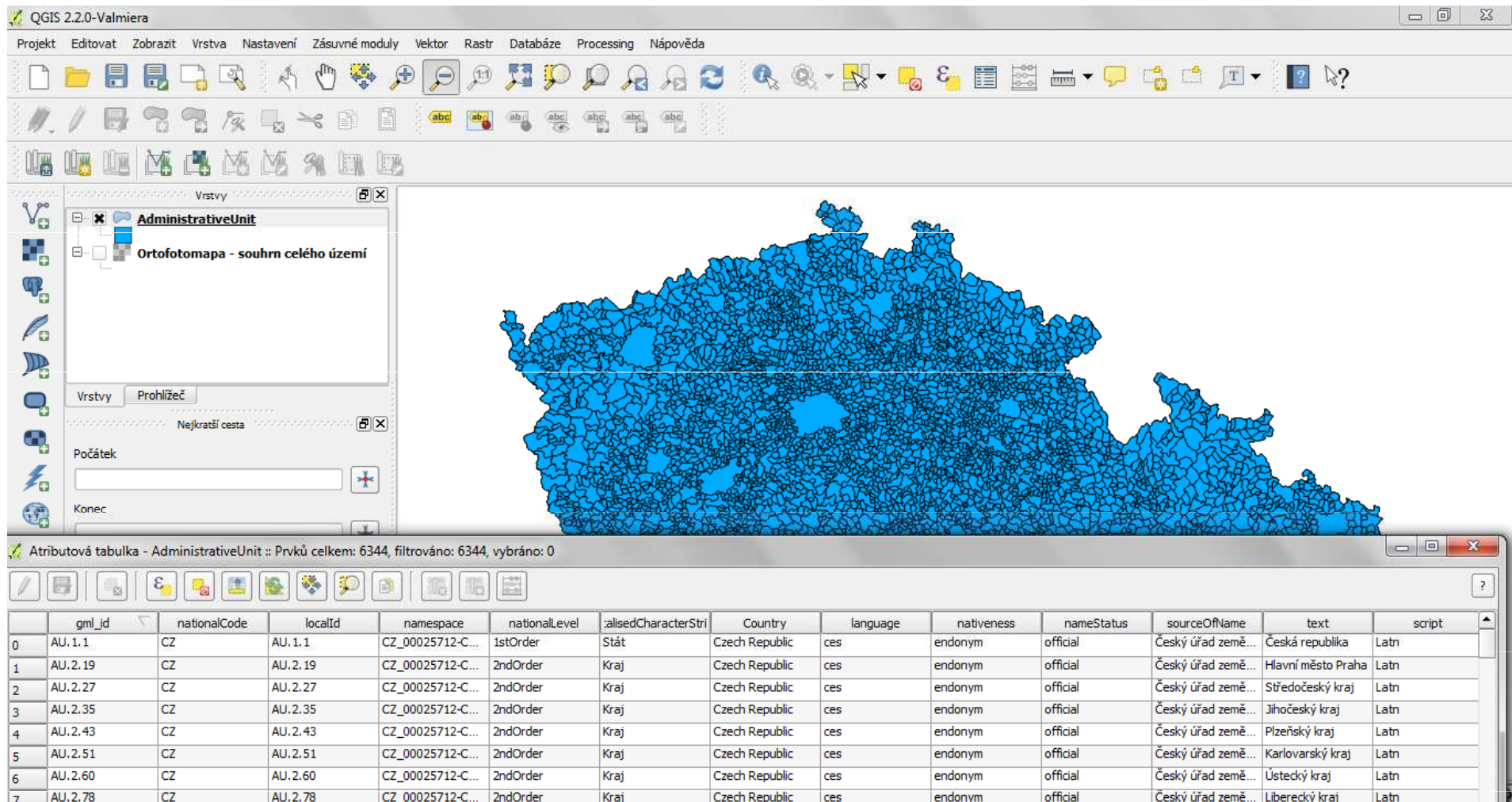
Directory listing [/gml/inspire/AU/epsg-5514/]

[\[To Parent Directory\]](#)

date	time	size	name
16.09.2014	02:10	78171145	AdminUnitsCZ.zip

“Indirect” access INSPIRE download service

- Result: **NO INSPIRE/GML KNOWLEDGE, NO DATA**



The screenshot shows the QGIS 2.2.0-Valmiera interface. The main map area displays a blue-shaded administrative boundary layer over a white background. The layer list on the left shows 'AdministrativeUnit' and 'Ortofotomapa - souhrn celého území'. Below the map, the 'Atributová tabulka - AdministrativeUnit' window is open, displaying a table with 13 columns and 8 rows of data.

	gml_id	nationalCode	localId	namespace	nationalLevel	alisedCharacterStri	Country	language	nativeness	nameStatus	sourceOfName	text	script
0	AU.1.1	CZ	AU.1.1	CZ_00025712-C...	1stOrder	Stát	Czech Republic	ces	endonym	official	Český úřad země...	Česká republika	Latn
1	AU.2.19	CZ	AU.2.19	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Hlavní město Praha	Latn
2	AU.2.27	CZ	AU.2.27	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Středočeský kraj	Latn
3	AU.2.35	CZ	AU.2.35	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Jihočeský kraj	Latn
4	AU.2.43	CZ	AU.2.43	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Plzeňský kraj	Latn
5	AU.2.51	CZ	AU.2.51	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Karlovarský kraj	Latn
6	AU.2.60	CZ	AU.2.60	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Ústecký kraj	Latn
7	AU.2.78	CZ	AU.2.78	CZ_00025712-C...	2ndOrder	Kraj	Czech Republic	ces	endonym	official	Český úřad země...	Liberecký kraj	Latn

Direct access download service

The screenshot displays the QGIS 2.2.0 interface with the title bar "QGIS 2.2.0-Valmiera - ELPIS_Foodie". The main window shows a map of an urban area with yellow cadastral boundaries overlaid on an aerial photograph. Two dialog boxes are open:

- Přidat WFS vrstvu ze serveru** (Add WFS layer from server):
 - Server: Katastr
 - Buttons: Připojit, Nové, Upravit, Smazat, Načíst, Uložit
 - Filter: (empty)
 - Table with columns: Title, Name, Abstract, Cache Feature, Filter
 - Buttons at bottom: Přidat, Vytvořit dotaz, Zavřít, nápověda
- Upravit WFS připojení** (Edit WFS connection):
 - Podrobnosti spojení (Connection details):
 - Název: Katastr
 - URL: <http://services.cuzk.cz/wfs/inspire-cp-wfs.asp?>
 - Pokud služba vyžaduje základní autentifikaci, zadejte uživatelské jméno a případně heslo (If the service requires basic authentication, enter the username and password if any):
 - Uživatelské jméno: (empty)
 - Heslo: (empty)
 - Button: Změnit...
 - Buttons: OK, Zrušit, nápověda

The bottom status bar shows coordinates: Souřadnice: -599116.3, -1159547.0, Scale: Měřítko 1:28 460 299, and Projection: EPSG:5221.

Even more downloadable data

- Much more downloadable data under INSPIRE than discovered through the INSPIRE Geoportal
- Several agreements, such as with European Space Agency (ESA) <http://www.vito-eodata.be>

The screenshot displays the vito website interface. The main content area features a map of Europe with a legend for 'SPOT-VEGETATION - FreeP (level2)'. To the right of the map is a table listing available data products. The table has columns for 'Download', 'Product ID', 'Start Date', 'Stop Date', and 'Size'. One product is highlighted in orange, indicating it is selected.

Download	Product ID	Start Date	Stop Date	Size
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F232	02/06/2014 15:12:40	02/06/2014 15:23:10	70
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F231	02/06/2014 15:10:00	02/06/2014 15:12:30	26
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F230	02/06/2014 13:45:52	02/06/2014 14:02:22	95
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F229	02/06/2014 13:33:22	02/06/2014 13:35:42	15
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F228	02/06/2014 13:30:03	02/06/2014 13:31:42	16
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F227	02/06/2014 13:28:32	02/06/2014 13:29:52	14
<input checked="" type="checkbox"/>	VGT_P_V2KRNP___20140602F226	02/06/2014 12:18:24	02/06/2014 12:19:14	5
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F225	02/06/2014 12:08:14	02/06/2014 12:18:04	51
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F224	02/06/2014 11:49:55	02/06/2014 11:51:45	16
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F223	02/06/2014 11:48:35	02/06/2014 11:49:25	9
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F222	02/06/2014 10:05:37	02/06/2014 10:24:27	129
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F221	02/06/2014 08:24:19	02/06/2014 08:53:39	184
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F220	02/06/2014 06:42:44	02/06/2014 07:13:43	18
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F219	02/06/2014 05:01:14	02/06/2014 05:18:24	121
<input type="checkbox"/>	VGT_P_V2KRNP___20140602F218	02/06/2014 03:19:47	02/06/2014 03:39:56	144

Quality of service

- Again defined in legislation
- For the **Get Download Service Metadata** operation, the response time for sending the initial response shall be **maximum 10 seconds** in normal situation.
- For the **Get Spatial Data Set** operation and for the **Get Spatial Object** operation, and for a query consisting exclusively of a bounding box, the response time for sending the initial response shall be **maximum 30 seconds** in normal situation then, and still in normal situation, the download service shall maintain a sustained **response greater than 0,5 Megabytes per second or greater than 500 Spatial Objects per second.**

Quality of service

- For the Describe Spatial Data Set operation and for the Describe Spatial Object Type operation, the response time for sending the initial response shall be maximum 10 seconds in normal situation then, and still in normal situation, the download service shall maintain a sustained **response greater than 0,5 Megabytes per second or greater than 500 descriptions of Spatial Objects per second.**
- The probability of a Network Service **to be available shall be 99 % of the time.**

Quality of service...still the same

Uptime [%]	Maximum downtime		
	Per week	Per month	Per year
95	8.4 hours	36.00 hours	18.25 days
98	3.4 hours	14.40 hours	7.30 days
99	1.7 hours	7.27 hours	3.63 days
99.9	10 minutes	0.73 hours	8.76 hours