Czech experience about transformation of the themes Elevation and Orthoimagery

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PRESENTATION OUTLINE

ELEVATION THEME

ORTHOIMAGERY THEME

INTRODUCTION

SOURCE DATA

TRANSFORMATION ISSUES

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ELEVATION

ELEVATION
INTRODUCTION

GRID

* DMR 4G

DATA PROVISION:

* Reference to an external file
* Range set data format: TIFF
* Data provision for charges through eshop
    - download as predefined data set
    - Export units corresponding to the sheets of Zoned-Geographic-Grid (1_1M, 1_2M)-projected to ETRS89-TM33N

ELEVATION SOURCE DATA

* Metadata: *http://geoportal.cuzk.cz/getHTML.aspx?mode=Metadata&fnc=getRecord&identifierid=CZ-CUZK-DMR4G-V*

DMR4G (Digital Terrain Model of the Czech Republic of the 4th Generation)

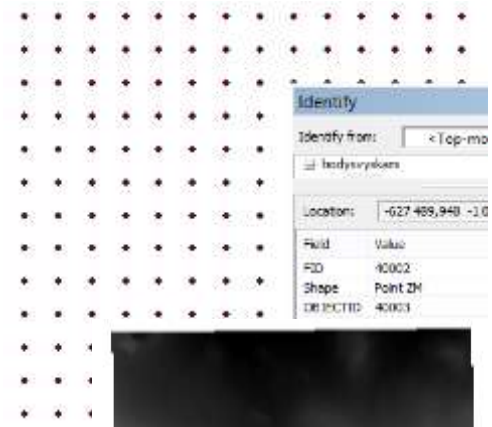
* DTM
* Data acquisition: airborne laser scanning **2009-2013**
* Discrete points in regular grid (**5 x 5 m**)
* Vertical total standard error: **0,3 m bare terrain**
  1 m forested terrain
* Data format: **.xyz**
* CRS: **S-JTSK Krovak East North** (EPSG: 5514)
* Height reference system: **Baltic Vertical Datum- After Adjustment**

ELEVATION
TRANSFORMATION ISSUES – CRS TRANSFORMATION

SOURCE FILE

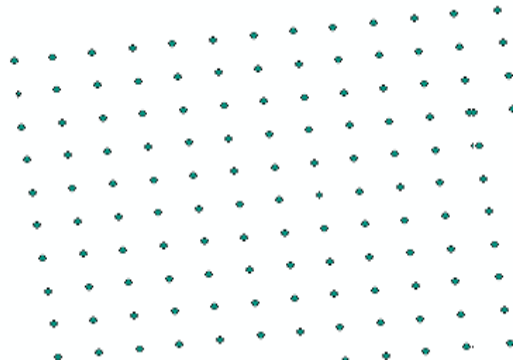
.xyz
Baltic ver
Nation

1	-627292.222	-1089977.636	539.850
2	-627291.650	-1089977.185	539.900
3	-627293.406	-1089975.878	539.910
4	-627291.412	-1089976.056	539.910
5	-627293.173	-1089974.779	539.900
6	-627291.190		
7	-627292.193		
8	-627293.191		
9	-627290.957		
10	-627291.089		
11	-627292.673		
12	-627292.435		
13	-627291.923		
14	-627292.070		
15	-627293.336		
16	-627291.785		
17	-627292.906		



TRANSFORMATION TO EVRS

TRANSFORMATION TO ETRS89-TM33N (ETRS



N TO
M

RANGE SET AS EXTERNAL BINARY FILE

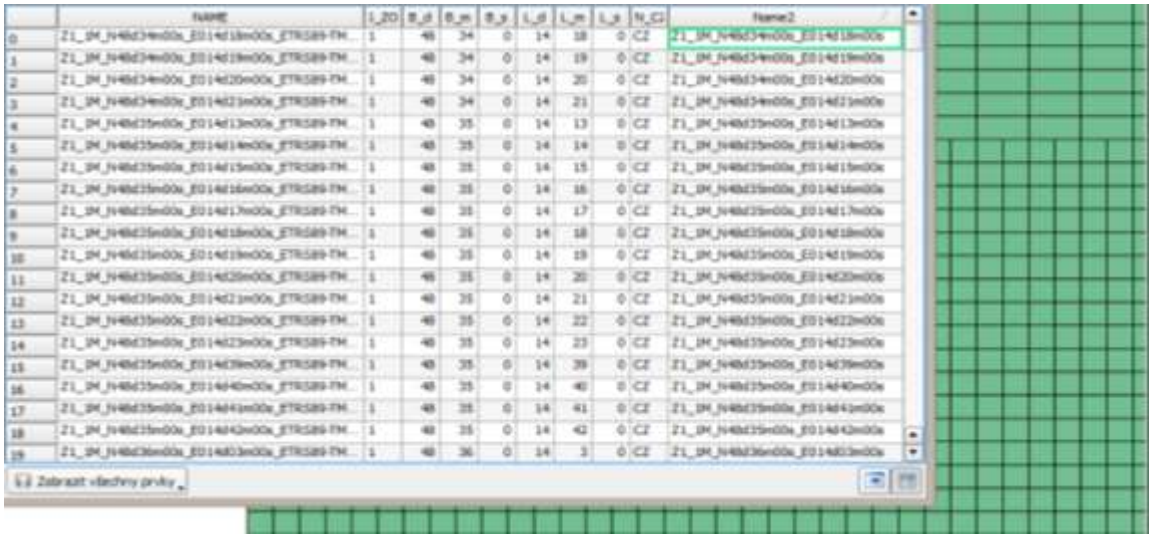
.tif file
EVRS
ETRS89-TM33N

ELEVATION
TRANSFORMATION ISSUES – GML CREATION

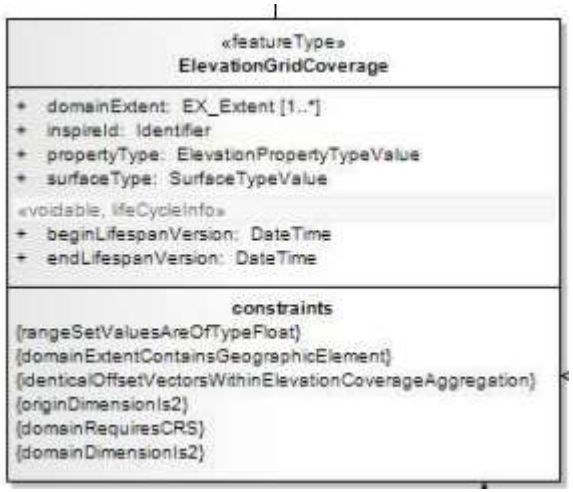
* Text editor, transformation tool – The HUMBOLDT Alignment Editor (HALE) v. 2.9.3

* Input data to HALE:

  -> vector layer of Zoned-Geographic-Grid



ELEVATION
TRANSFORMATION ISSUES – GML CREATION



ELEVATION GRID COVERAGE

* inspireId:

localId -> code of the concrete unit of Zoned-Geographic-Grid

```
<el-cov:inspireId>
  <base:Identifier>
    <base:localId>Z1_1M_N48d34m00s_E0114d18m00s</base:localId>
    <base:namespace>CZ-00025712-CUZK_EL</base:namespace>
  </base:Identifier>
</el-cov:inspireId>
```

Question on version

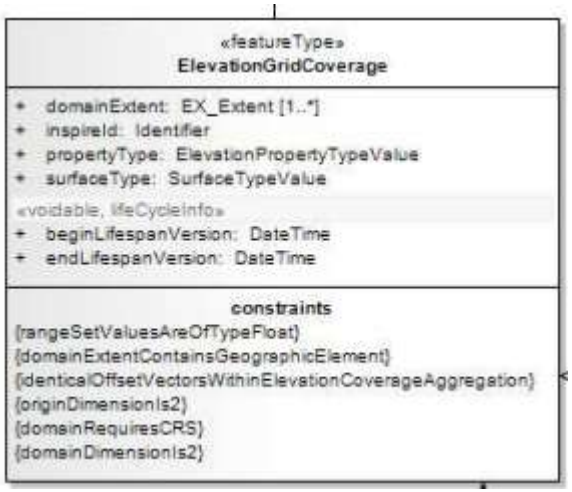
* *Change of version should occur only when the elevation grid coverage is reprocessed using the same source data, for example to correct geometrical errors or thematic inconsistencies, or when an enhanced processing algorithm is available.*

-> Different date of creation X same version

(beginLifespanVersion) (versionId)

-> every creation – new version

ELEVATION
TRANSFORMATION ISSUES – GML CREATION



* **domainExtent**:

*„NOTE The EX_GeographicExtent abstract class is specialized by the **EX_BoundingPolygon**, EX_GeographicBoundingBox and EX_GeographicDescription classes specified in ISO 19115.“*

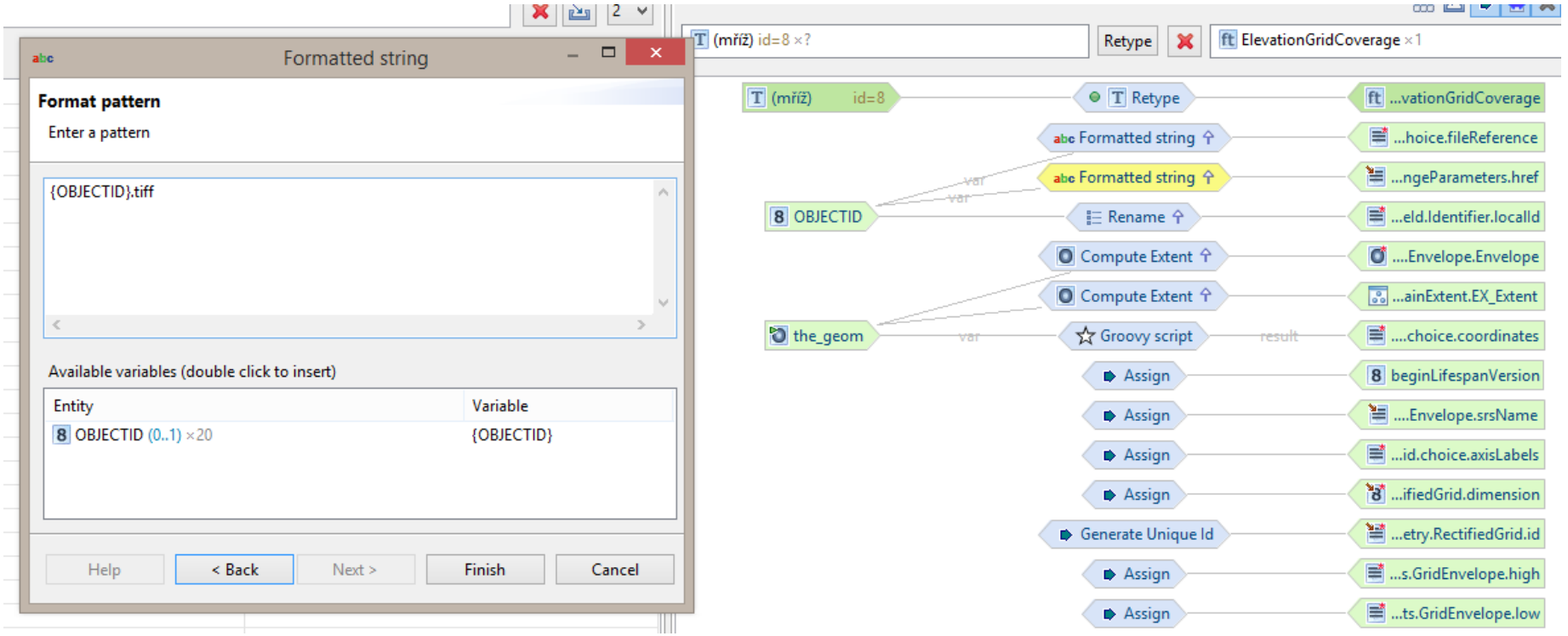
```
<gmd:EX_Extent>
  <gmd:geographicElement>
    <gmd:EX_BoundingPolygon>
      <gmd:polygon>
        <gml:Polygon gml:id="_01d1dc18-163c-4dff-91b7-b78f4e5bbd48" srsName="http://opengis.net/def/crs/EPSG/0/3045" srsDimension="2">
          <gml:exterior>
            <gml:LinearRing>
              <gml:posList>314869.3444617209 5541828.673379524 316063.4603497024 5541787.520838038 316000.6275453983 5539934.831218621 314804.945
            </gml:LinearRing>
          </gml:exterior>
        </gml:Polygon>
      </gmd:polygon>
    </gmd:EX_BoundingPolygon>
  </gmd:geographicElement>
</gmd:EX_Extent>
```

ELEVATION
TRANSFORMATION ISSUES – GML CREATION

DOMAIN SET

* Most of elements must be added manually X same for every file
* **Origin.Point.pos**: in HALE use of Groovy script -> get from geometry.boundary.coordinates()

```
<gml:domainSet>
  <gml:RectifiedGrid gml:id="ElevationGridCoverage_id_ba8a1b96-7642-4390-9bf0-6c1f703c6a79" dimension="2">
    <gml:limits>
      <gml:GridEnvelope>
        <gml:low>0 0</gml:low>
        <gml:high>547 461</gml:high>
      </gml:GridEnvelope>
    </gml:limits>
    <gml:axisLabels>x y</gml:axisLabels>
    <gml:origin>
      <gml:Point gml:id="ElevationGridCoverage_id_163914ef-31f9-47ae-936a-77b538d5ee66" srsName="http://opengis.net/def/crs/EPSG/0/3045" s
        <gml:pos>316000.6275453983 5539934.831218621</gml:pos>
      </gml:Point>
    </gml:origin>
    <gml:offsetVector srsName="3045" uomLabels="m">0 -5</gml:offsetVector>
    <gml:offsetVector srsName="3045" uomLabels="m">5 0</gml:offsetVector>
  </gml:RectifiedGrid>
</gml:domainSet>
```




```
<gml:rangeSet>
  <gml:File>
    <gml:rangeParameters xlink:href="Z1_1M_N48d34m00s_E0114d18m00s.tiff"
    xlink:role="http://opengis.net/spec/GMLCOV_geotiff-coverages/1.0/"
    xlink:arcrole="fileReference"></gml:rangeParameters>
    <gml:fileReference>Z1_1M_N48d34m00s_E0114d18m00s.tiff</gml:fileReference>
    <gml:fileStructure></gml:fileStructure>
    <gml:mimeType>image/tiff</gml:mimeType>
  </gml:File>
</gml:rangeSet>
```

ELEVATION
TRANSFORMATION ISSUES – GML CREATION

RANGE TYPE

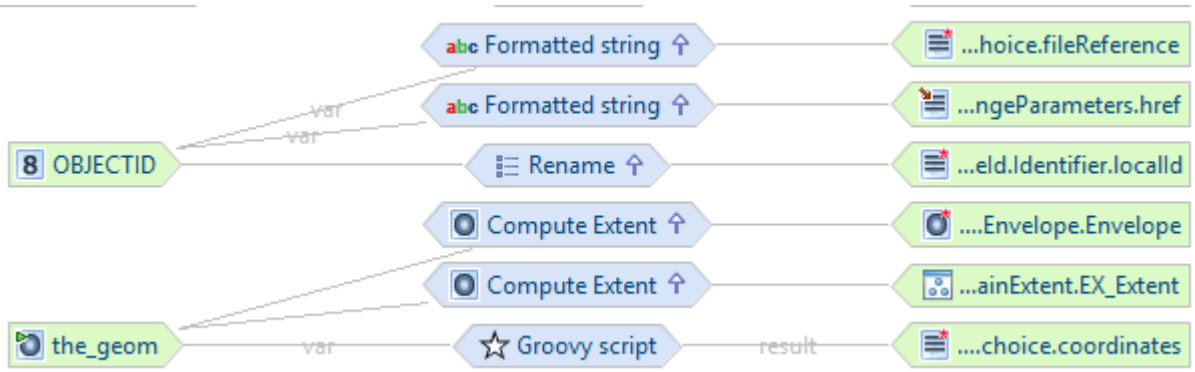
* **nilValues x AllowedValues:**

„It is aimed at providing the list of no data values (nil values) that are present in the elevation coverage, this is to identify the reserved values that are used to stand in for missing actual elevation values. “

-> nilValues = noData value

-> AllowedValues = interval of possible values

```
<gmlcov:rangeType>
  <swe:DataRecord>
    <swe:field name="elevation">
      <swe:Quantity definition="height">
        <swe:description>Elevation property measured along a plumb line a direction opposite to Earth´s gravity field (upwards).</swe:descript
        <swe:nilValues>
          <swe:NilValues>
            <swe:nilValue reason="http://www.opengis.net/def/nil/OGC/0/unknown">-9999.999999</swe:nilValue>
          </swe:NilValues>
        </swe:nilValues>
        <swe:uom code="m"></swe:uom>
        <swe:constraint>
            <swe:AllowedValues>
                <swe:interval>115.000000 1603.000000</swe:interval>
            </swe:AllowedValues>
        </swe:constraint>
      </swe:Quantity>
    </swe:field>
  </swe:DataRecord>
</gmlcov:rangeType>
```



VALUES FROM VECTOR LAYER	MANUALLY ADDED VALUES	
	Same for each file	Different for each file
localId	namespace	beginLifespanVersion
rangeParameters::href	limits.GridEnvelope.low	limits.GridEnvelope.high
fileReference	axis.Labels	
origin.point	offsetVector	
domainExtent	fileStructure	
boundedBy.Envelope	mimeType	
	GridFunction.sequenceRule	
	GridFunction.startPoint	
	nilValue	
	allowedValues	
	propertyType	
	surfceType	

ELEVATION
STATE OF PLAY

- Sample GML file
- Tool for gridded data transformation
- Delivering data through eshop as downloading a predefined dataset (till December)

ORTHOIMAGERY

ORTHOIMAGERY
INTRODUCTION

* Czech orthophoto data set

DATA PROVISION:

* Reference to an external file
* Range set data format: TIFF
* Data provision for charges through eshop
    - download as predefined data set
    - Export units corresponding to the sheets of Zoned-Geographic-Grid

ORTHOIMAGERY
SOURCE DATA

ORTOPHOTO OF THE CZECH REPUBLIC

* Spatial resolution: **0,25 m**
* Standard error: **0,25 m flat terrain**
  0,5 m hilly terrain
* Data format: **.jpg**
* CRS: **S-JTSK Krovak East North** (EPSG: 5514)
* Data acquisition: two years period

* Metadata:
  http://geoportal.cuzk.cz/getHTML.aspx?mode=Metadata&fnc=getRecord&identifierid=CZ-CUZK-ORTOFOTO-R

ORTHOIMAGERY
TRANSFORMATION ISSUES – CRS TRANSFORMATION

ORTHOIMAGERY
TRANSFORMATION ISSUES – GML CREATION

inspireId:

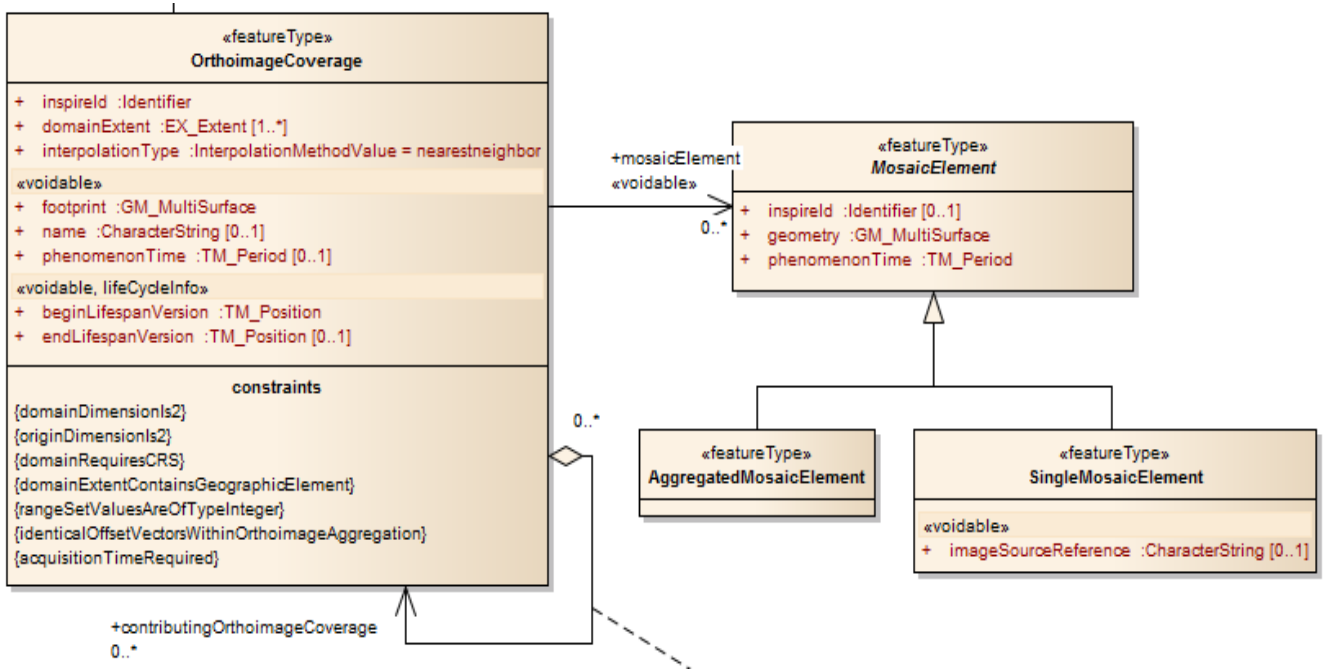
- Every two year - change of **localId**

```
<el-cov:inspireId>
  <base:Identifier>
    <base:localId>Z1_1M_N48d34m00s_E0114d18m00s_2014</base:localId>
    <base:namespace>CZ-00025712-CUZK_OI</base:namespace>
  </base:Identifier>
</el-cov:inspireId>
```

ORTHOIMAGERY
TRANSFORMATION ISSUES – GML CREATION

QUESTION ON PHENOMENON TIME

* *"The acquisition time of the orthoimage coverage shall be provided through the phenomenonTime attribute or mosaicElement association."*



ORTHOIMAGERY
STATE OF PLAY

- Sample GML file in preparation
- Availability of tool for data CRS transformation
- WMS since July
- Delivering data through eshop as downloading a predefined dataset since July (without GML for now)

CONCLUSION

CONCLUSION

- **Issues connected with Czech environment:**
  - National CRS -> transformation needed
- **Current issues:**
  - Every order – new GML creation
- **Future**:
  - WCS for a download with a direct access to the data set

THANK YOU FOR YOUR ATTENTION

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