INSPIRE Datasets and Network Services of the Romanian Hydrographic Network

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**INSPIRE Directive Implementation for the National Administration „Romanian Waters” (NARW)**

- A project with a bigger purpose: to create an Web GIS Architecture that support modern INSPIRE Solutions and Users operational needs

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<th>2017/2018</th>
<th>OCT</th>
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<td><strong>START – Kick off meeting</strong></td>
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<td><strong>HY Data Analysis and QAQC</strong></td>
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<td><strong>Optimized HY GDB to support INSPIRE</strong></td>
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<td><strong>Developing Spatial ETL for INSPIRE Data Harmonization</strong></td>
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<td><strong>INSPIRE Annex I Geodatabase for Romanian Hydrography</strong></td>
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<td><strong>INSPIRE Network Services and dissemination in the Romanian INSPIRE Geoportal</strong></td>
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<td><strong>Start Implementing an Enterprise GIS that will continue to create value and Give INSPIRE Data a Purpose</strong></td>
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It started with the need to implement INSPIRE for Hydrography, Annex I
Using a well known Implementation Pattern - ArcGIS for INSPIRE

- INSPIRE transposition into national legislation - OG 04/2010
- INSPIRE Geoportal in Romania
  - Supported by ANCPI (National Agency for Cadaster and Land Registration)
  - Supports the INIS Council (19 organizations)
- NARW – responsible for Spatial Data Theme I.8 Hydrography
- Still existing INSPIRE Political & Technical Challenges
  - Requires the most efficient Tools & Technologies to streamline and simplify the reporting, updating and maintaining data
A Complete Solution to implement INSPIRE workflow
Streamlining the process in each phase of the Implementation

• 1) Data **Harmonization** – highest complexity and many challenges

  - **INSPIRE HY Schema**
    Supported by Annex I GDB Templates & Documentation
  - Schema Mapping Requires a lot of effort
  - Data Preparedness needs extra QaQc Tools
  - **Spatial ETL for HY** data migration using ArcGIS Data Interoperability Extension ensures a streamlined, reusable process, packing the best validated practices

![Diagram of data pipeline]

- Schema Mapping
- Topological Consistency
- Ensuring Data Completeness
- INSPIRE HY Nodes automate Generation
- Missing Fields Calculation
- Thematic unique Ids Generation
Spatial ETL for HY
A live, extensible and reusable framework for Data transformation

- Spatial ET for HY
  - Very complex including serial and parallel transformations that not only migrate data, but generate data relationships and at the end, a new data model
  - Automated Schema Mapping
  - Standard and Parametric INSPIRE Transformers Embedded
  - Complex New Data Model Generation in one step
  - Translation Log & Data Inspection for monitoring the process
Spatial ETL for HY
A live, extensible and reusable framework for Data transformation
Spatial ETL for HY
Parametric Embedded Transformers reusable for INSPIRE

- **INSIRE_IFCID** – generates an unique IFCID for each object
- **INSIRE_voidable** – generates the voidable fields to be used accordingly
- **INSIRE_IdentifierSetter** – sets the value for id_namespace, id_localID (parameters)
- **INSIRE_LifeSpanSetter** – generates the value for begin and EndLifespanVersion fields

- Allows ETL updates at no cost, by simply editing the parameters of the transformers
Spatial ETL for HY

Typical ETL operations reusable for INSPIRE

- How to implement INSPIRE RID needed in any INSPIRE Theme for related tables
  - HY_netElement_RID – an embedded transformer that implement the relationship using a parallel group by operations to generate new IDs
  - Same logic is applied in different calculations in INSPIRE Networks

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<tr>
<th>INSPIRE Field</th>
<th>Description</th>
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<tbody>
<tr>
<td>IFCID</td>
<td>Unique INSPIRE ID for object/table</td>
</tr>
<tr>
<td>link</td>
<td>IFCID of watercourse</td>
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<tr>
<td>RID</td>
<td>Reference to IFCID from netElement table which contains the WaterLinkSequence</td>
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Spatial ETL for HY
Simple Geoprocessing tool for the end user

• Run from ArcGIS for Desktop

> Setting Source and Destination GDB

INSPIRE Annex I Geodatabase for Romanian Hydrography
A Complete Solution to implement INSPIRE workflow
Streamlining the process in each phase of the Implementation

II) Configuring View and Download Services for INSPIRE Hydrography Network

- Automated generation of Map Config file through Add INSPIRE Layer capability based on INSPIRE Annex I Romania HY GDB
- Share as a service with INSPIRE Capabilities
INSPIRE HY Network Services in the Romanian INSPIRE Geoportal
Available on-premises also for NARW

NEW:
http://inspire.rowater.ro/inspire/rest/services
INSPIRE Network Services federated in the Romanian INSPIRE Geoportal
Download service will be available soon

• III) Dissemination of Network Services for INSPIRE Hydrography Network
What’s next
Give INSPIRE Data a Purpose

INSPIRE Information Products & more
(collaboration, building solutions)

INSPIRE Network Services & more
(sharing, accessibility)

INSPIRE Data Products & more
(compliance)

NARW GIS Portals
Geoinformation Models
Esri Portal for ArcGIS
http://inspire.rowater.ro/inspire

NARW GIS Services
Hosting & GIS Servers
Hosting Mapping Analytics Image Cache

NARW Data Stores
WIMS BD INSPIRE BD WFD BD

WMS/WFS INSPIRE Network Services

Romania INSPIRE Geoportal

INSPIRE Network Services
ArcGIS for Server

INSPIRE Annex I HY
ArcGIS for INSPIRE

User engagement Water Management Dashboards Field Mobility EU Commission validation

INSPIRE Data Products & more
(compliance)

INSPIRE Network Services & more
(sharing, accessibility)

INSPIRE Information Products & more
(collaboration, building solutions)
Enterprise GIS
Maximize the value of data and meet the real organizational needs

- Apps that value INSPIRE Data and support users engagement, collaboration, analytics and better decision making
To sum up…
Conclusions from our experience with INSPIRE implementations

• In the **Short RUN** – in terms of data assets, INSPIRE made a huge progress in building an EU SDI
  - still challenges - complexity of data models
  - putting together the **most efficient Tools, Technologies & Practices** to streamline and simplify the process is important
  - our solution for INSPIRE is successfully validated in a few NSDI projects:
    - Transport Network (Road and Air), with The National Company for Road Infrastructure Administration (CNAIR) and The Romanian Air Traffic Services Administration (ROMATSA)
    - Hydrographic Network, with the "Romanian Waters” National Administration
    - Administrative Units, Transport Network, Hydro Network, Geographical Names, with the National Agency for Cadaster and Land Registration, ANCPI – one of the 1st projects in INSPIRE

• In the **Long RUN** – having the data, INSPIRE should focus more on **giving it a purpose**
  - start looking for a better overall ROI for users and organizations
  - creating value from this data by consuming it in enterprise systems that foster user engagement, collaborations, better decision making
  - see the big pictures – operational needs and how to address those
  - shift the focus to communities and how they benefit from this innovation and digital transformation
  - be more **AGILE driven** (responsive to change, interactions over processes, practical approach)
THANK YOU