



INSPIRE Conference 2016

Barcelona, 26th - 30th September



WORKSHOP: Interoperable data for environmental management
and planning of coastal zone: the LIFE+IMAGINE experience

THE LIFE+IMAGINE EXPERIENCE IN LANDSLIDE DATA HARMONIZATION: CRITICAL ISSUES AND SOLUTIONS



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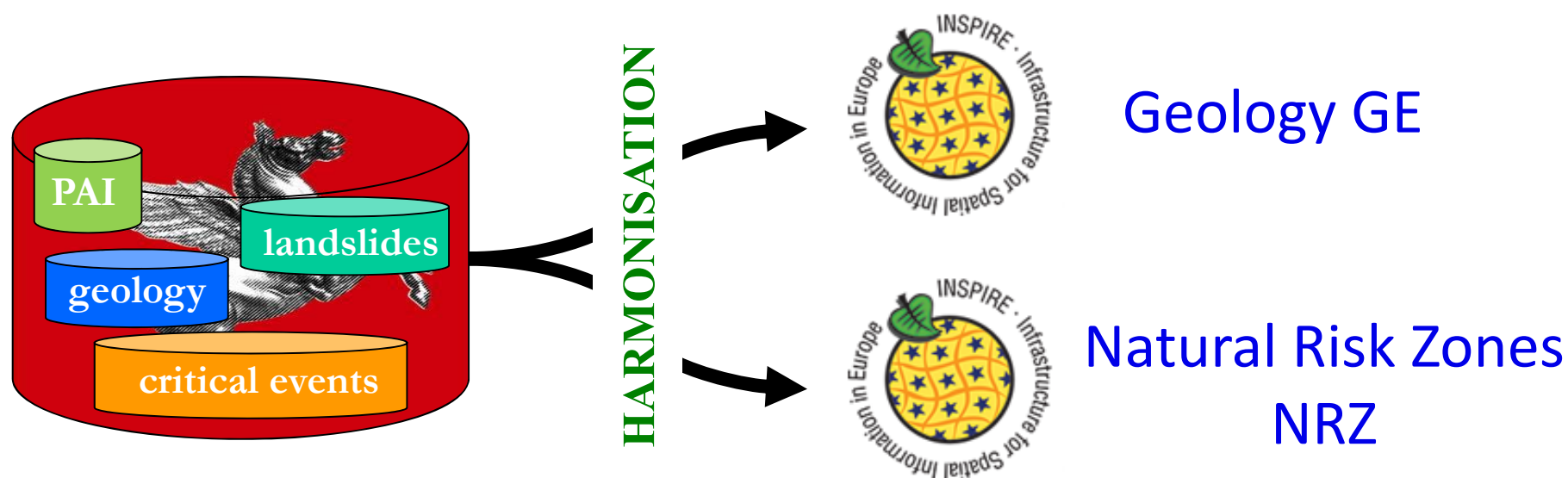
Integrated coastal area Management Application
implementing GMES, Inspire and sEis data policies



LIFE/12/ENV/IT/001054

Harmonisation process

Harmonised target schemas refer to different themes of the Inspire Data Specifications. The **Geology** theme focuses on the physical parameterisation of landslide objects as well as the **Natural Risk Zones** theme aims to classify hazard areas, independently from the kind of the event that characterise them.

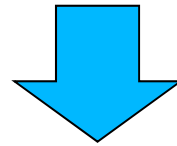


The harmonisation process has been carried out twice: once with the Natural Risk Zones theme, the other with the Geology theme.



Basic Assumptions

Inspire should be **as near as possible** to source datasets,
so that the processing chain is **as short as possible**

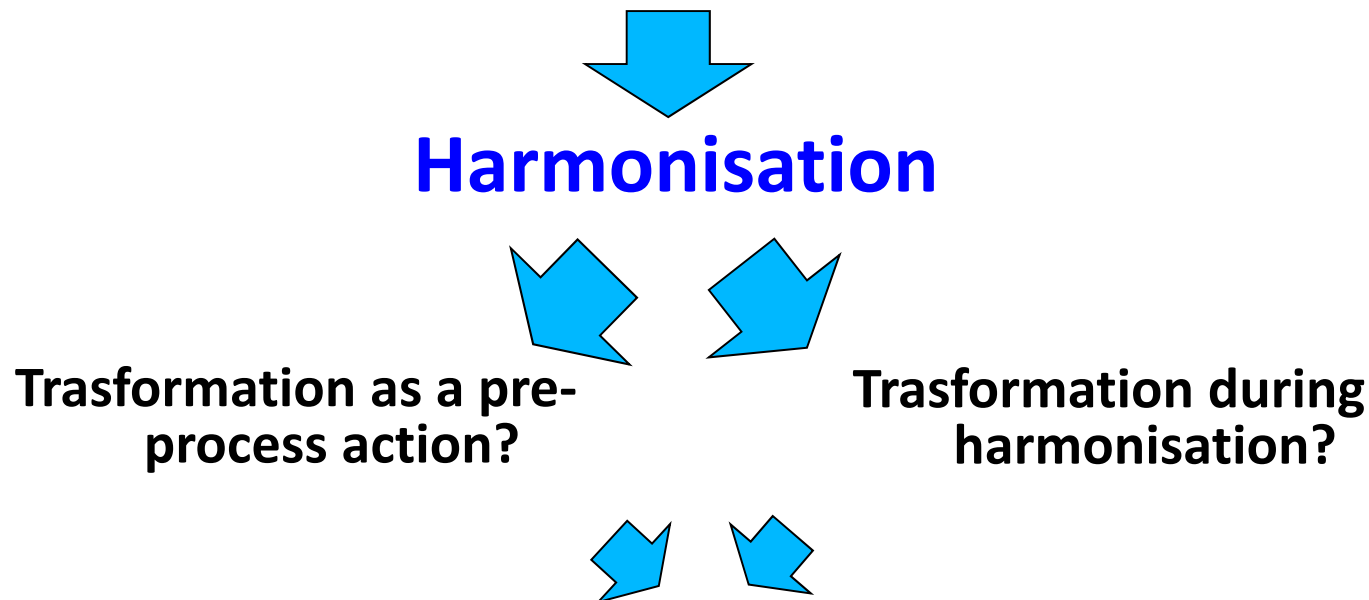


From the **data provider's point of view**, spatial
archives should be designed **taking into account**
interoperability requirements adding them to
institutional requirements



A Practical Consequence

Ex. The spatial reference system in italian cartographic archives are mostly based on EPSG:3003 or EPSG:32632, while, among those allowed by INSPIRE, the SRS we have chosen is EPSG:3044



Result is the same, process is different

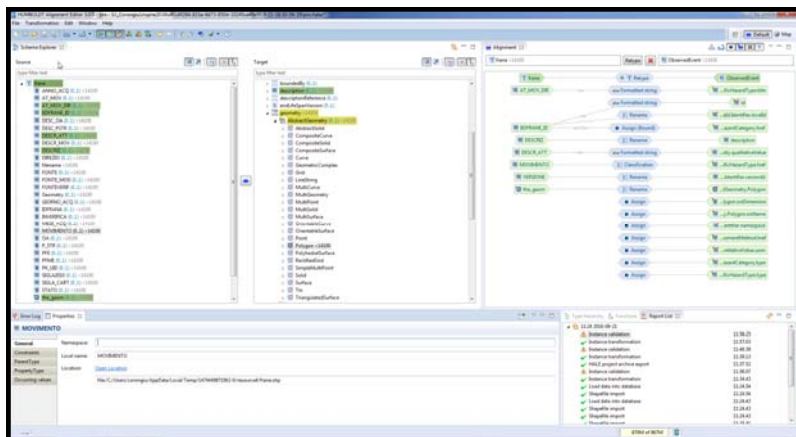
Harmonisation process

Matching table

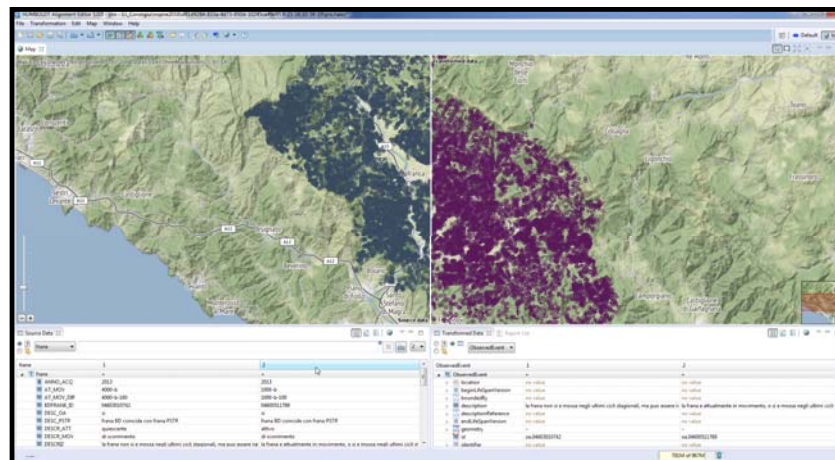
Application Schema 'Geology' (version 3.0)						Source Location of information						
Attribute role	Association role	Attribute / Enumerations	Values / Enumerations	Multiplicity	Visible / Variable	Source of information	Name of attribute	Source of information	Example of one data value	Example of one data target value	Unit	Remarks
keyid	External object identifier of the source record	Number		1	Visible	INSPIRE	keyid	INSPIRE				
name	The name of the geological feature	Text		1	Visible	INSPIRE	name	INSPIRE				
geom	The geometry of the geological feature	Geometry		1	Visible	INSPIRE	geom	INSPIRE				
activity	The activity of the geological feature	Text		1	Visible	INSPIRE	activity	INSPIRE				
usage	The usage of the geological feature	Text		1	Visible	INSPIRE	usage	INSPIRE				



Remapping



Transformation





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If you are a data provider or a technical body that supports Public Administrations (like LaMMA does) in designing source datasets, are you sure that the **actual structure is oriented to interoperable targets of INSPIRE data themes?**

Matching table

Attribute / Association role / Constraint	Association / Association role / Constraint	Values / Enumerations	Multiplicity	Voidable / Non-Voidable	Data Type Attribute	Data Type Attribute documentation	Data Type / Values / Code Lists / Enumerations	Multiplicity	Voidable / Non-Voidable	"File name" or URL	Name of attribute	Example of one data source value	Example of one data target value	Void Reason	Remarks
inspireId	External object identifier of the spatial object.	Identifier	1		localId	A local identifier, assigned by the data provider. The local identifier is unique within the namespace, there is no other spatial object carries the same namespace	CharacterString	1		plata sqtfe	UUD	04424b5-5531-440a-9af6-a7a6058a7101	04424b5-5531-440a-9af6-a7a6058a7101		
name	The name of the geologic feature.	CharacterString	1	voidable	namespace	The identifier of the namespace	CharacterString	1	voidable						
geologicHistory	An association that relates one or more geologic events to a geologic feature to describe their sequence.	GeologicEvent	1..*	voidable											
themeClass	A thematic classification of the geologic feature. A GeologicFeature may be classified according to one or more thematic schemas, for example geological, geomorphological, etc.	ThematicClass	0..*	voidable											
naturalGeomorphologicFeatureType	The natural geomorphologic feature.	GeomorphologicFeatureType	0..1	voidable						plata sqtfe	movimento	c ("di colomente")	04424b5-5531-440a-9af6-a7a6058a7101		
activity	The level of activity of the natural geomorphologic feature.	GeomorphologicActivityValue	0..1	voidable			code list			plata sqtfe	stato	1000 ("attivo")	04424b5-5531-440a-9af6-a7a6058a7101		
shape	The geometry of the mapped feature.	GML_Object	1							plata sqtfe	geometry				
mappingFrame	The surface on which the mapped feature is	MappingFrameValue	1				code list								

INSPIRE APPLICATION SCHEMA

LOCAL APPLICATION SCHEMA



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Source datasets: choices due to the federal system

On landslide scenario, the source datasets refer to the **IFFI inventory national database** on landslides, but each **Regional Administration has personalised** that information **following their own requirements**, for instance:

- Type of spatial components (polygons, points, lines, etc.)
- Type of movement
- State of activity

Moreover complex databases have been structured in order to **combine and process landslide data together with other spatial datasets** aimed at the constitution of a repository. **Events have been designed to dynamically study different environmental phenomena.** These two kinds of layers have been **merged to define the impact for the landslide scenario.**



Source datasets: choices due to physical platform

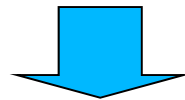
At the regional level, the choice of specific platform at the physical level impacts the definition of contents:

- **unique IDs;**
- **spatial extent of datasets** (by municipalities, by river basins, by region etc.): for instance PAI (Hydrogeological Asset Plan) is based on province boundary while hazard risk models start from identification of a river basin;
- **spatial geometries** (polygons or multi-polygons, lines, points, etc.), spatial and temporal accuracies, etc.: definition of sub-areas related to a complex landslides to characterise different zones of movement of the same phenomena (depositional area, collapsed area, main scarp, etc.)
- **spatial and temporal accuracy, etc.**



ISSUE → Complex source database and selection on-the-fly (in Hale) 1/2

The CQL (Common Query Language) Hale filter allows the selection of a part of source datasets but **not for** complex datasets or related to **spatial intersections** (for instance, considering different feature types from different datasets or when you have to select some landslides in specific municipalities by intersection with administrative boundaries)

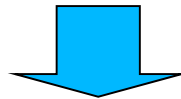


SOLUTION → Pre-process the dataset you want to harmonise (do the intersection before remapping)



ISSUE → Complex source database and selection on-the-fly (in Hale) 2/2

Starting from specific characteristics of the source datasets, requirements of Inspire that don't impact with any other requirement of Public Authority engineering process, **is an expensive pre-process activity**



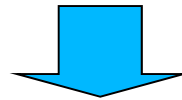
SOLUTION → customisation of Hale software:
- i.e. “reproject geometry” on-the-fly;
- i.e. read natively spatialLite data extension (*.sqlite)
from the Tuscany Regional Administration



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ISSUE → compliant metadata

For harmonised datasets you have to compile new metadata in a different **specific step**



SUGGESTION → there should be a combined software that will be able to output metadata



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Conclusions

- Harmonisation process raises some critical issues for **design and management** of a unique landslide database (in a logical sense) and **deliver Inspire compliant services**, through different harmonised datasets, **as institutional tasks in a Public Body**
- Harmonisation process needs to plan what pre-process before transformation and what on-the-fly, taking into account that the processing chain should be **as short as possible**
- The management of the **harmonisation process over time** requires an **effort** in terms of resources and time to plan each dataset taking into account **interoperability characteristics**. The available tools to carry out harmonisation are easy to use but keep in mind the **in depth knowledge of the Inspire Data Specifications**
- Landslide complex databases should be structured in order to **combine repository contents together with critical events in real-time updates** to dynamically study different environmental phenomena and **the impact for the landslide scenario**



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Thanks for your attention!

QUESTIONS?

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