### 6. DATA MODELS, UNDERSTANDING THE UML DIAGRAMS AND OTHER FORMALISED DESCRIPTIONS

# Well-known principles of INSPIRE (1/2)

- The infrastructures for spatial information in the Member States should be designed to ensure that spatial data are stored, made available and maintained at the most appropriate level;
- that it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications;
- that it is possible for spatial data collected at one level of public authority to be shared between other public authorities;

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# Well-known principles of INSPIRE (2/2) 4. that spatial data are made available under conditions which do not unduly restrict their extensive use; 5. that it is easy to discover available spatial data, to evaluate their suitability for the purpose and to know the conditions applicable to their use.

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## To not reach the bad feeling from INSPIRE...









requirements promised description solution

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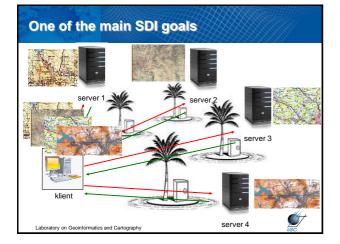
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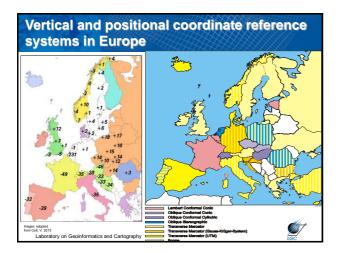


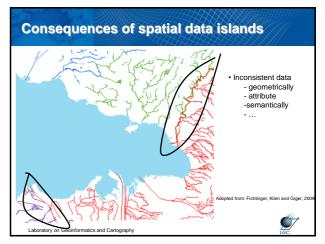
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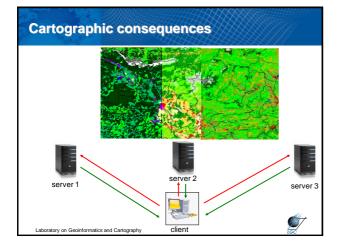


# Cross-border concern Natural disasters do not stop at national borders 20% of the EU citizens (115 million) live within 50 km from a border 70% of all fresh water bodies are part of a trans-boundary basin

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# Data models in INSPIRE

- Article 7: "[...] technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and services [...]"
  - What does that mean?

and Carto

 Based on existing initiatives and international standards for the harmonization of spatial data sets

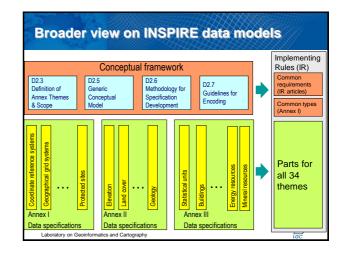
# Addressing following aspects of spatial data

- A common framework for the unique identification of spatial objects, to which identifiers under national systems can be mapped in order to ensure interoperability between them;
- · The relationship between spatial objects;
- The key attributes and the corresponding multilingual thesauri commonly required for policies which may have an impact on the environment;

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- · Information on the temporal dimension of the data;
- Updates of the data

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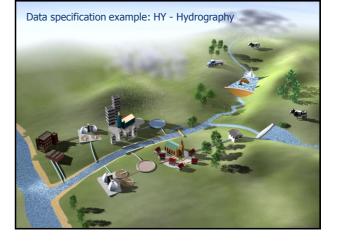
## **Documents for all INSPIRE data models**

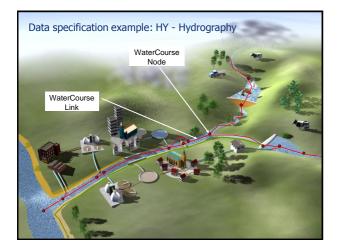
- Implementing rules (Commission Regulation 1089/2010 and 1253/2013)
  - Legally binding in all EU Member States
  - Defined according to the cost-benefit analyses
- Technical Guidelines (Data specifications) for all 34 spatial data themes
  - Technical basis for Implementing rules

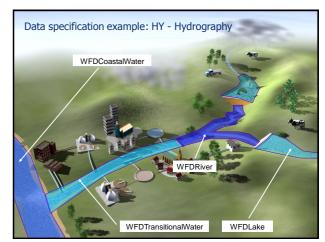
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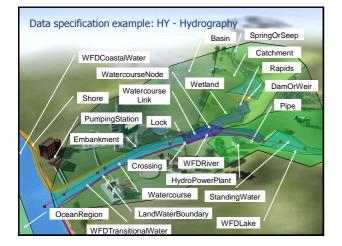
 Explanations and examples to guide you through the implementation process

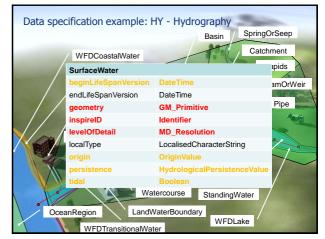
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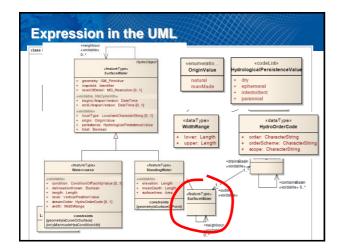












|                      |  |  |   | XXXX               |  |
|----------------------|--|--|---|--------------------|--|
| Sfru                 | icture o   | f a data s   | enocificat  | ion                | (1/2)  |
| 000                  |  |  | peenear   |                    |  |
|                      |  |  |   |                    |  |
|                      | 38295  | NOPRE NOPRE D  | ADPRE TROUGH  | MPRG<br>TROOM      | Reference IndiPAS, DataSpecification J.<br>RefPRE Data Specification on Hydrography 2012-04-28   |
| 100-                 | Interoperability   | Hydrography - Execu  | LIW202 LINES  | Limburg            | Nove on generation property  |
| 1 (11)               | General Executi  | The data specification for Hydrograph  |   | 3 Specifi          | cation scopes  |
| 100                  | The challenges regarding   | information between member states.   | 1 Scope   | This data specific | pice has only one scope. Ba perend scope.  |
| and in               | spatial information are con-   | with the description of the sea, lakes,  | This document specifies a hormonia  |                    |  |
| D2.8.L               | across the various levels of<br>to take modes non of county                          | This data specification is limited in bot<br>intand sortace waters are subject to #                                    | defined in Annea 1 of the INSENE De   |                    |  |
| D2.6.1.              | 2007/2/EC of the Europei   |  | This data specification anisolas the h  | 4 Identifi         | cation information   |
|                      | entablishing an Infrastract<br>annimomental policies, or p                           | (2005/65/EC) "surface water on the 5<br>one condition rate on the second rate  | (1) of the INSPIRE Directive Educity  | Table 1            | - Information identifying the INSPEC date specification Appropriat   |
|                      | INSPIRE will be based on 1   | tentitatial waters is neasured, estend   | implementation guidelines accompany   | Tels               | NUME data search data Matematika   |
| Tate                 |  | The remaining part of the waters will 1<br>Operating the avaptabilities' features                                      |   | AbsWad.            | Hydrography in the control of this data specification is involved with the<br>of the exact plans, many and other upters, with their phenomenon   |
| Control              | addressing the following internet order of another of                                |  | 2 Overview  | 100.00             | hydrographic related elements.   |
| Dete                 |  | This data specification does not inclus<br>the Annes   theme Transport Network   |   |                    | For mapping purposes, it includes a representation of physical skews   |
|                      | reporting procedures.  | the Acres & theore Dimutico, Ground  | 2.1 Name and acronys  |                    |  |
| Subject<br>Publisher | INSPIRE does not require<br>Member littles have to real                              | of e.g. rivers ranning underground that<br>within scope of this data specification                                     | INSPIRE data specification for the the  |                    | includes WPD surfaces water bodies. For spatial oralysis and modeling<br>a bootsciculty sound subacity of invest and carula.   |
| Type                 |  | reducek.   |   | Topic categories   | mandhuma   |
| Type                 | Interspeciality in INSPIRE<br>assertion activity the Firms                           | The Berrule, some of this data speci-  | 2.2 Informal descriptic   |                    |  |
| Lescoper             | itumizes or machines, 8 is i   | reporting and modelling purposes. Th   | Definition  | desciption         | where a Member State has and/or eventises pared-blocal rights  |
| Contribut            | apatial data sets through a<br>wither charging itumority                             | reporting and aut management of part<br>hydrographic data fulfin a function in   |   |                    | This INSPIRE data specification covers all stand surface waters. Co<br>are also a subject of this specification as far as personalizably defined a   |
| Format               | publication in the INSPIRE   |  | Hydrographic elements, including ma<br>including river basins and solutions             |                    | of the Water Pramework Directive (2566/90/EC): "surface water on th  |
| Scarce               | understanding and integral<br>apprecial  | The Hydrography there a concerned<br>charth. If down not define efficience if  | Device 2000/GEC of the Europea<br>a harwards for Community action in                    |                    | side of a line, every port of which is at a defance of one national seasond who have the regeneral point of the baseline from which the  |
| #Sghme               | in other to besuit from it   | be considered a isolation from other I<br>institution. Where work on such fleets                                       |   |                    | testitutial adarts in measured, estending where oppropriate up to the  |
| identifier.          | antiblabed under internal  | associations to be defined more taily i  | <ul> <li>OJ L 327,22,12,2900, p.1. Dead<br/>95,12,2001, p.1.1</li> </ul>                | Furperse           | baselitoral values".<br>The purpose of the document is to specify a harmonised data specificat   |
| Lawysnyi             | whenever possible.   | be extended should further user requi  |   | 1.0                | spatial data theres Hydropraphy as defined in Arresci of the INSPIRE C   |
| Relation             | To facilitate the implement  | Considering the importance of the Wa   | (Deactive 2007/2/EC)  |                    | The thematic scope of this data specification is kovards providing a soli  |
|                      | to participate its specificate<br>consensus building proce                           | decided to include the geographic dea<br>the structure alignetic and structures. A                                     | Description:  |                    |  |
| Courses              |  | The physical waterits and disultants. A<br>Management / multicline / moulation   | The Barne 'Hickography' is a basic of   |                    | tooles of water and relating structures and elipicits.   |
|                      | Commanities (SDIC) and L<br>participated in the user                                 | be of such importance for it has deci-<br>water locates as an internal part of the                                     | and uses.   |                    | However, each organization will have different responsibilities have the<br>will influence the kind of data they collect and namage and use. It  |
|                      |  | such as the European WISE and SER  | For mapping purposes its provide a s  |                    |  |
|                      | the technical documents of<br>tested the chall data sport                            | extension with reporting obligations of<br>denses its  | relationships), 8 inclusion the reporter<br>artificial. To fulfil reporting requirement |                    | arrangements. This data specification is provided as a basic travework use adout and if researed a antend for thermation. The workel is a  |
|                      | implementing rule on inters  |  | channel restorch, surface water boths   |                    | maximum reuse and the sharing of organisational data.  |
|                      |  | The data specification has been prep-<br>regional learn of experts in the field of                                     | transforal agles or costal agles,<br>upty lodge, Furthermore a topical                  |                    | Statut Obach Inni - and atim reacility   |
|                      |  | Netherlands, Scoln, Sweden, United I   | available and modeling.   |                    | This specification is mainly tooussed on the "aidely reused - wilely   |
|                      | * Non-Assession & Assisting and Table States   | requires no additional data capture by<br>flexible as possible. In this way it is do                                   | Geographically, the Berrie Thomasa  |                    | segment of spatial stipsch. It does not attempt to try and incorporatial object that might be used by any application. Such charts   |
|                      |  |  | basic districts as defined by WFD   |                    | buow, pairs and other constructions etc. These are all "application spe  |
|                      | <sup>1</sup> The manber of SDICs and LI<br><sup>1</sup> Summin on unique identifiers | The data specification has been base<br>standards, the TBG-has, around dt  | Farther therein of press 1.11 and 18-9  |                    | will be used/velenenced by at least one organisation.  |
|                      | * The Data Specification Draft<br>France, Demonry, Creace                            |  |   |                    | Associated 'non-Geographic' data<br>Any 'non-geographic data' (the majority of the data holdings in any on   |
|                      |  | lawed" ICT techniques such as the Ur   | Annax I     Geographical Names  |                    |  |
|                      | <sup>4</sup> The Thenatic Holizing Gro<br>Republic Demosity Finland                  | Language (GML) and Object Constrai   | <ul> <li>Administrativo Units -</li> </ul>  |                    | "water quantity," "state of the environment" and so on. While associate addition theorem of the second seco |
|                      |  | Comments on earlier versions of this update those versions into this version   | <ul> <li>Transportation - water</li> <li>Annex II</li> </ul>                            |                    | the spectrum has peneric use by a wide community whether they  |
|                      | * Pour documents describing a<br>pittalls in the text.                               | update those versions into this version<br>extented participants to the Conversal<br>specification has been discussed. | <ul> <li>Devation - concernal</li> </ul>  |                    | proprietre with an inn prographe Ada   |

|  | cture  | 0.0000000  |  | OriginValue   |   |  |
|--|--|--|--|---|---|--|
|  | 5.3 Application schema Hydro – Physical Water<br>5.3 1 Description<br>5.3 1 Naturate description<br>The Theory 5.3 2 Feature<br>specific day<br>the twen<br>the twen |  |  | Definition:<br>Status:<br>Stereotypes:<br>Governance:<br>Value: natural   | An enumeration type specifying a set of hydrographic 'origin' cat<br>man-made) for various hydrographic objects.<br>Proposed<br>errumerations<br>May be extended by data providers. |  |
|  | The following  | where the  | Feature catalo   | Definition:   | An indication that a spatial object is natural.   |  |
|  | sta  | Land Gev and<br>- generative CAL, burle<br>- regeneral standard<br>constation, the Systematics   |  | Value: manMade<br>Definition:<br>Description:   | An indication that a spatial object is man-made.<br>SOURCE [DFDD].  |  |
| -  |  | <ul> <li>and lange transition</li> <li>composition thread</li> <li>dation should read</li> </ul>   | 2 2 Million Dour   | Stereotypes:  | <pre>«featureType»</pre>  |  |
|  | NGPINE<br>THEORY<br>AND<br>AND<br>AND<br>AND<br>AND<br>AND<br>AND  |  | Type<br>Crossing<br>CrossingTypeV<br>DamOrWeir               | Attribute: elevatio<br>Value type:<br>Definition:<br>Description:<br>Multiplicity:<br>Stereotypes:  | n<br>Elevation above mean sea level.<br>SOURCE [Based on EuroRegionalMap].<br>1<br>«voidable»   |  |
| 5 Data c<br>The Hydrograp<br>couply corresp<br>1. Physical<br>2. Network<br>3. Manaper |  | erettatis, the point data<br>agent, de genire data<br>erettatise<br>rettatise<br>- geneety GM_Suits  | DrainageBasin<br>Embankment<br>Falls<br>FluvialPoint<br>Ford | Attribute: meanDe<br>Value type:<br>Definition:<br>Multiplicity:<br>Stereotypes:  | pth<br>Length<br>Average depth of the body of water.<br>1<br>evoidables   |  |
| Each of the the<br>contained in a t<br>The Physical ID<br>informat. For the            | · 200744   | distortgan<br>Laddiestisedery  | HydroPointOffn   | Attribute: surface/<br>Value type:<br>Definition:<br>Multiplicity:<br>Stereotypes:  | Area<br>Area<br>Surface area of the body of water.<br>1<br>evoidables   |  |
|  | · begin  | A thickness<br>active and the second<br>active and the second<br>active and the second<br>active active active<br>active active active<br>active active<br>active active<br>active active<br>active active<br>active active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>active<br>activ | Constraint: geome<br>Natural<br>language:<br>OCL:            | trylsSurfaceOrPoint<br>Standing water geometry may be a surface or point<br>inv: self geometry ocllsTypeOf(GM_Surface)<br>self geometry ocllsTypeOf(GM_Point) |   |  |

| 7 Dat  | 9 Delivery   | 10 Data Ca<br>Regiment 31  | 11.2 Defa                               | ult Style                                     | Feature Type          | Style       | NoFINI Helence NoFINI (stalgeshater)<br>NOFINI AND Part Sectorization or Helencet  |
|--|--|--|---|---|-----------------------|-------------|--|
| This succi<br>associated<br>Hydrograp/                     | 9.1 Delive   | Objects are corned<br>1. They are part   | Requirement                             |   |                       | Persistence | TWO-HY INDPIRE Data Specification on Herbography 2015-04-25  |
| NOTE   | Represent 25   | the Water Fri<br>hydrographic i<br>2. They are used                              |   | sity/4  |                       |             | Annex A<br>(normative)   |
| Data qualit<br>pleature typ<br>descrip in th               | Requirement 25   | <ol> <li>They are not<br/>surroundings.</li> <li>They are anali</li> </ol>       | if no<br>INS<br>be o                    |   |                       |             | Abstract Test Suite  |
| Ta ensure<br>consistency<br>naturals ();                   |  | Recommendation   | <u> </u>                                |   |                       |             | Any dataset conforming to this INSPISE data specification shall reset all requirements ap<br>document.                   |
| consistency<br>used to ev<br>describes 1<br>bulk, or if it | EXAMPLE 1 The<br>pre-defined date as<br>detell access to the<br>edgests based upon<br>following information  | 10.1 Data caj  | Layer Name<br>Style Name<br>Style Title | Table 1<br>HY Phys<br>HY Phys<br>Water bo     |                       | Man-made    | NOTE A common abstract test suite including detailed instructions on how to test each<br>will be added at a later steps. |
| Recordena  | <ul> <li>the list of spa<br/>service (to be<br/>and the gase<br/>is query expri-<br/>show assist</li> </ul>  | 10.1.1 Incardab<br>Excluded from ins<br>network, included<br>form part of it one | Style Title<br>Style<br>Description     | Physical                                      | StandingWater<br>5    | Default     |  |
| Chapter &<br>elemation                                     | <ul> <li>a description<br/>through the 2</li> </ul>  | gross mers' and<br>purpose of floodin<br>at high water (wate                     |   | and the shorder. F                            |                       | Persistence |  |
| Table<br>Section   | ExamPLE 2 The<br>Examplementors has<br>a deady called by<br>that a not yet conta<br>legal data shared<br>and data in<br>a Statte made<br>anged data in<br>- Taget made<br>- Taget made |  | Symbology                               | of 6 pixel<br>without b                       |                       |             |  |
| _  | 9.2 Encod<br>9.1 Encodes   |  |   | permemper<br>detail o<br>lisse ui<br>filled b |                       | Man-made    |  |
| Norme<br>This all  |  |  |   | ale depi<br>reprefan<br>hander. (             | LandWaterBou<br>ndary | Default     |  |
| 7.1.1  |  |  |   |   |                       | Man-made    |  |
| 7.2.1  | NOP OF<br>TRG-HY   | NG295<br>TWO-NT  |   |   | DrainageBasin         | Default     |  |
| 722  |  | 100  |   |   |                       | Landa       |  |
| 723  | Regarment 27   |  |   |   | RiverBasin            | Default     |  |
| 7.3.1  | 9211 Detautié  | Buintdest T  |   |   | WatercourseLi         | Default     |  |
| 1215   | Formal name: 'Bydi<br>Version of the Same  | A COMPANY  |   |   | rik.                  | Death       |  |

