

INSPIRE Natural Risk Zones Data Specification

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Presentation of the theme

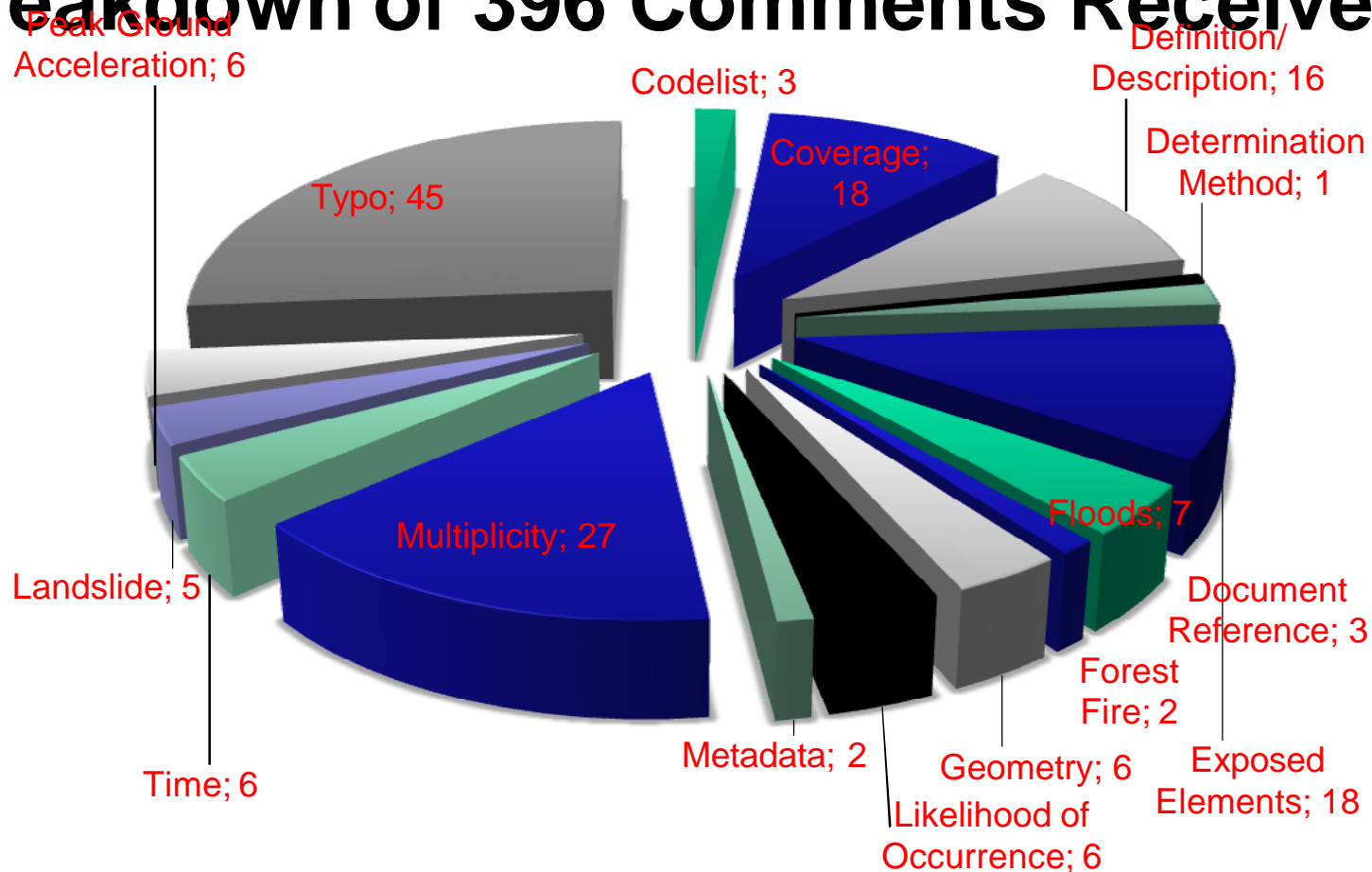
- **D2.3 Definition:**

«Vulnerable areas characterised according to natural hazards (all atmospheric, hydrologic, seismic, volcanic and wildfire phenomena that, because of their location, severity, and frequency, have the potential to seriously affect society), e.g. floods, landslides and subsidence, avalanches, forest fires, earthquakes, volcanic eruptions.»

Input documents

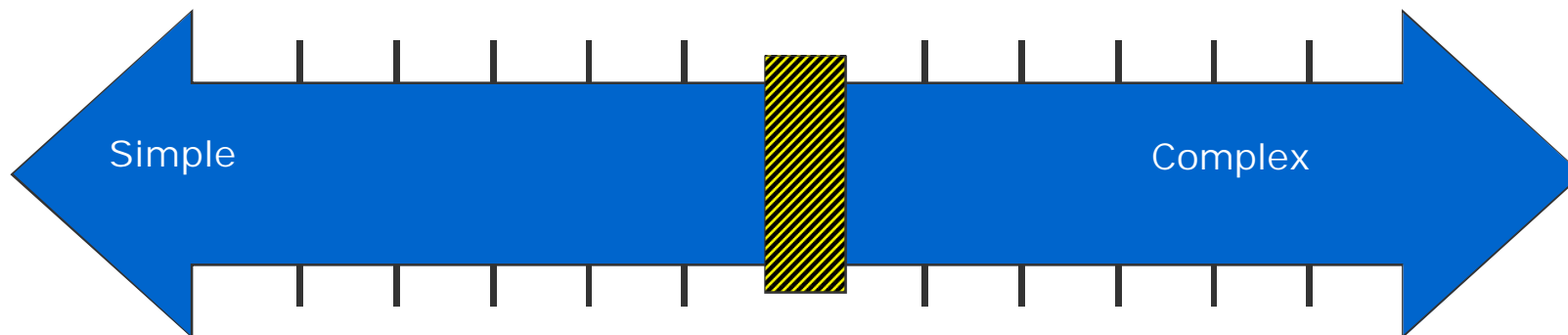
- 32 reference documents
 - The Floods Directive
 - Work carried out by several FP6, 7 and other projects Plan4All, Orchestra, Safeland
- Annex I : Hydrography TWG has defined an « InundatedLand » feature class

Breakdown of 396 Comments Received



"The Balance Challenge"

Which level of interoperability is "just right"?



Too simple:

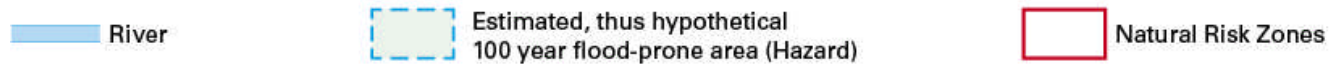
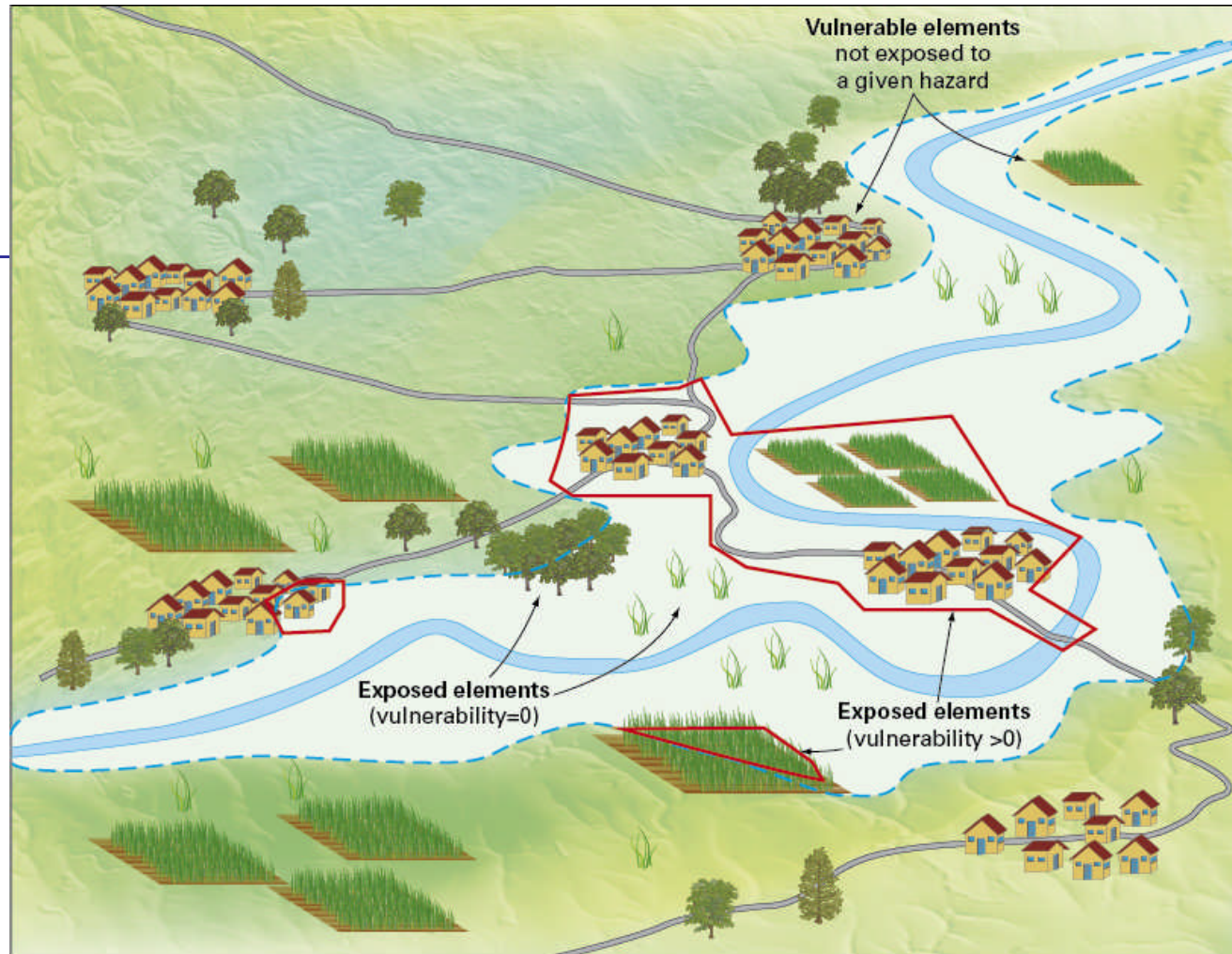
- Identified requirements can not be fully supported
- Limited harmonisation
- Few benefits

Too complex:

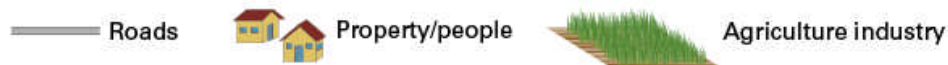
- Difficult to implement
- Substantial benefits available only to few users
- High costs

Scope

- Analysis of input documents
- Production of use cases
 - « Flood » (Cross Thematic)
 - « Landslide »
 - « Forest fire »
 - « Earthquake »
- Hierarchical codelist of 4/22 high level natural hazard categories
 - 82 hazards (so far)
- Meetings with Floods Directive working group



Elements vulnerable to floods

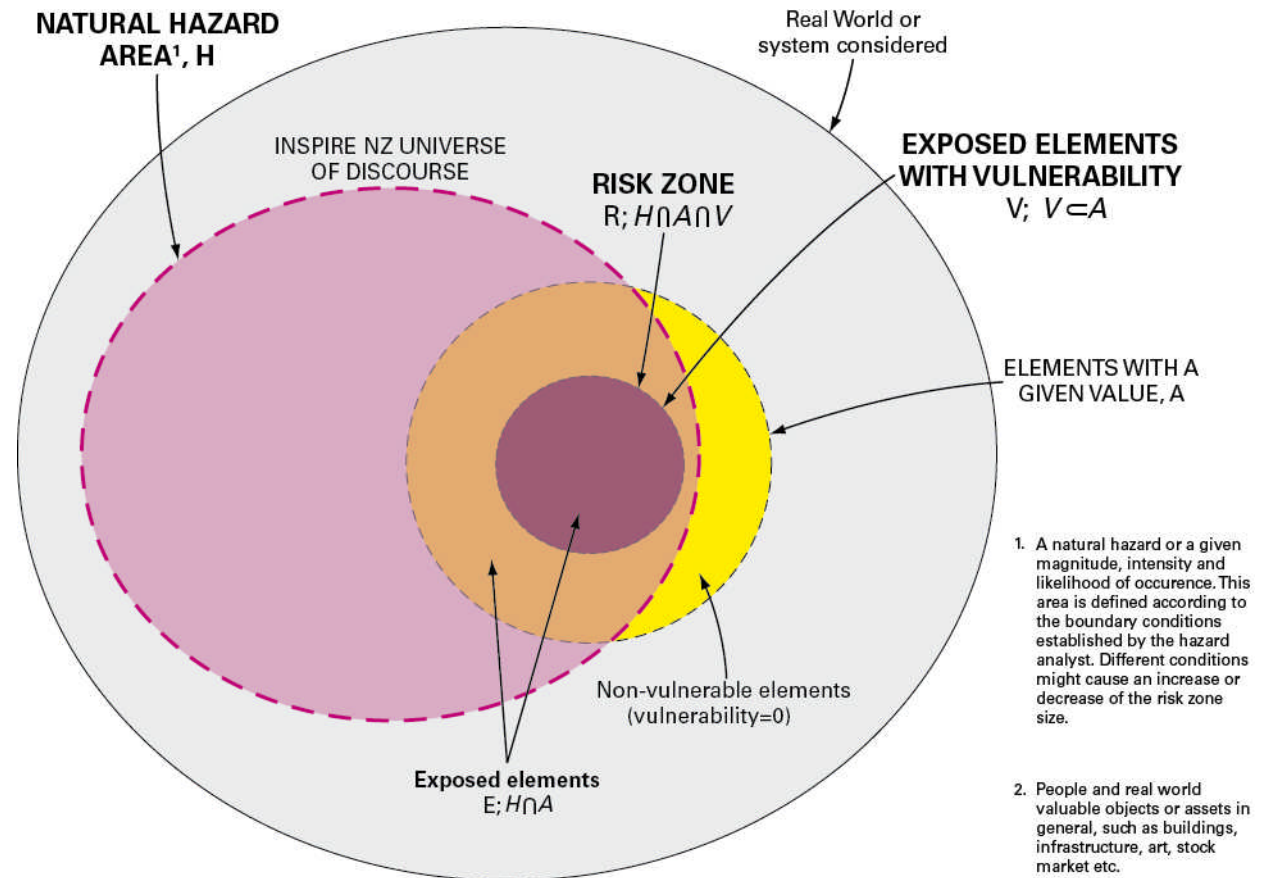


Elements non-vulnerable to floods



Presentation of the theme

- Risk defined as:



$$R(\text{risk}) = H(\text{hazard}) \times E(\text{exposure}) \times V(\text{vulnerability})$$

Model v3.0- Final

- Main Objectives:
 - Design a generic core model to encompass all natural hazards
 - Apply it to all types of data (vector and coverage)
 - As an example, apply this core model to flood risk

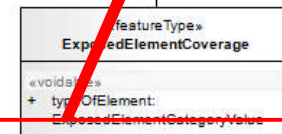
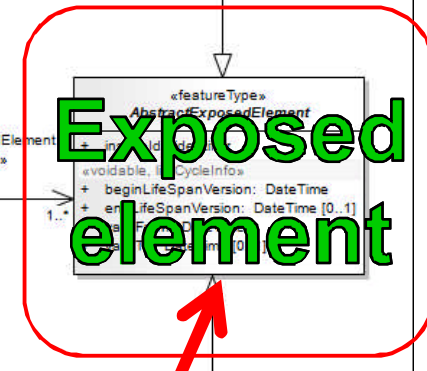
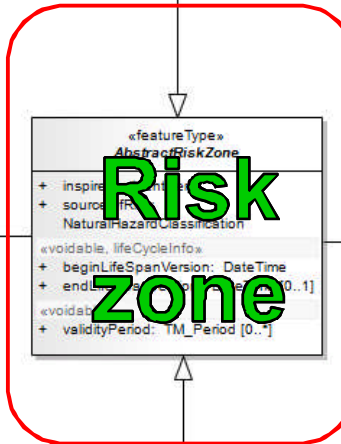
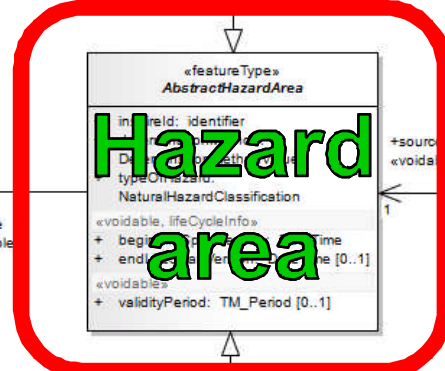
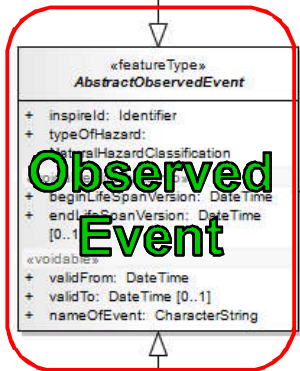
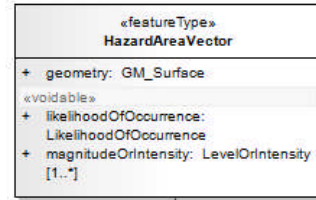
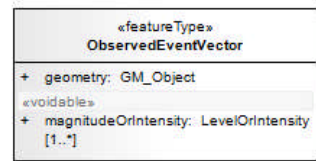


European Commission

Model v3.0-Final

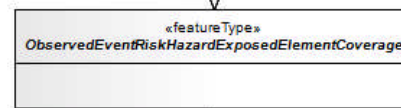


class_1_core_feature_types



```

/*range set is described by magnitude or intensity, or by the likelihood of occurrence. */
inv: rangeSet.odIsKindOf(LevelOrIntensity) or rangeSet.odIsKindOf(LikelihoodOfOccurrence)
  
```



```

/* Range set is described by level, or intensity */
inv: rangeSet.odIsKindOf(LevelOrIntensity)
  
```

```

/* Range set is the level, or intensity, of the vulnerability assessment */
inv: rangeSet.odIsKindOf(VulnerabilityAssessment.LevelOfVulnerability)
  
```

```

/* domain is a rectified grid or referenceable grid */
inv: domainSet.odIsKindOf(CV_RectifiedGrid) or domainSet.odIsKindOf(CV_ReferenceableGrid)
  
```

Observed Event

Hazard area

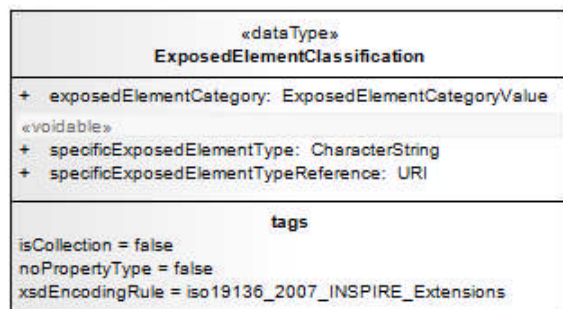
Risk zone

Exposed element

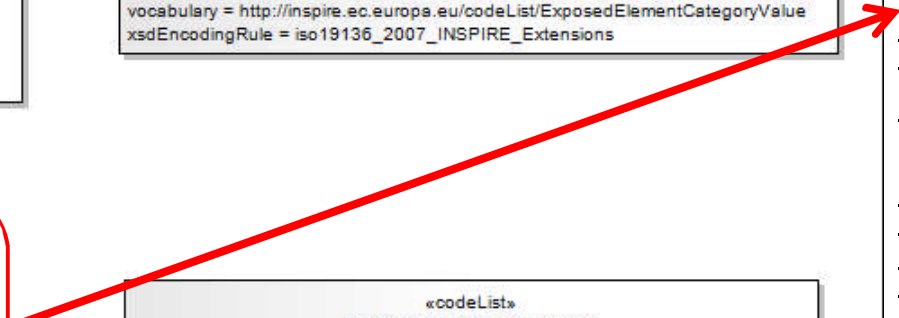
Vulnerability

Model v3.0-Final

class 4_Codelists



<u>Geological / Hydrological</u>
Tsunami
Volcanic
Earthquake
Subsidence and collapse
Landslide
Snow avalanche
Flood
Toxic or radioactive materials
<u>Meteorological / climatological</u>
Drought
Extreme temperature
Tornados, hurricanes and strong winds
Lightning
Storm surge
Fires
Forest fires or wild fires
Underground fires
<u>Biological</u>
Infestation
Epidemic
Allergens
<u>Cosmic</u>
Meteorite impact
Magnetic disruption
Solar and cosmic radiations



INSPIRE NZ Requirements

1. Spatial data sets related to the theme Natural Risk Zones shall be made available using the spatial object types and data types specified in the following application schema(s): <ApplicationSchema1>, <ApplicationSchema2>. These spatial object types and data types shall comply with the definitions and constraints and include the attributes and association roles defined in this section.
2. Attributes of spatial object types or data types whose type is an enumeration shall only take values included in the enumeration.
3. Attributes of spatial object types or data types whose type is a code list with an “obligation” value of “IR” shall only take values that are valid according to the code list’s specification.
4. **The “RiskOrHazardCategory” must be completed for every “HazardArea” feature**
5. The “LikelihoodOfOccurrence” must be completed for every “ModelledOrDeterminedHazard” features
6. Each risk zone must have a risk type value.
7. **Every “RiskZone” features must be linked to one “HazardArea” feature**
8. **Every “RiskZone” features must be linked to at least one “ExposedElement” feature**
9. **In the ‘DocumentReference’, either the locationOfMethod or the contact Information attribute must be completed.**
10. In the “Contact Information”, either the phone, or the address, or the online resource must be completed.
11. In the “Contact Information”, if the address is completed, then either the individual name or the organisation must be completed.

INSPIRE NZ Requirements

12. In the “Contact Information”, if the address is completed, then either the individual name or the organisation must be completed.
- 13. When a risk zone feature is associated with a hazard area, then the risk zone feature and the hazard area feature must overlay (at least partially).**
- 14. When a risk zone feature is associated with an exposed element, then the exposed element must overlay with the risk zone feature.**
15. A “RiskZoneCoverage” must be associated with at least one “ExposedElementCoverage”
16. A “RiskZoneCoverage” must be associated with at least one “HazardCoverage”
17. The value domain of spatial properties used in this specification shall be restricted to the Simple Feature spatial schema as defined by EN ISO 19125-1.
18. For the coordinate reference systems used for making available the INSPIRE spatial data sets, the datum shall be the datum of the European Terrestrial Reference System 1989 (ETRS89) in areas within its geographical scope, and the datum of the International Terrestrial Reference System (ITRS) or other geodetic coordinate reference systems compliant with ITRS in areas that are outside the geographical scope of ETRS89. Compliant with the ITRS means that the system definition is based on the definition of the ITRS and there is a well-established and described relationship between both systems, according to EN ISO 19111.
19. INSPIRE spatial data sets shall be made available using one of the three-dimensional, two-dimensional or compound coordinate reference systems specified in the list below.
20. Other coordinate reference systems than those listed below may only be used for regions outside of continental Europe. The geodetic codes and parameters for these coordinate reference systems shall be documented, and an identifier shall be created, according to EN ISO 19111 and ISO 19127.

INSPIRE NZ Requirements

21. For the display of the INSPIRE spatial data sets with the View Service specified in D003152/02 Draft Commission Regulation implementing Directive 2007/2/EC of the European Parliament and of the Council as regards Network Services, at least the two dimensional geodetic coordinate system shall be made available.
22. For the display of the INSPIRE spatial data sets with the View Service specified in D003152/02 Draft Commission Regulation implementing Directive 2007/2/EC of the European Parliament and of the Council as regards Network Services, at least the two dimensional geodetic coordinate system shall be made available. For referring to the non-compound coordinate reference systems listed in this Section, the identifiers listed below shall be used. For referring to a compound coordinate reference system, an identifier composed of the identifier of the horizontal component, followed by a slash (/), followed by the identifier of the vertical component, shall be used.
23. The Gregorian calendar shall be used for as a reference system for date values, and the Universal Time Coordinated (UTC) or the local time including the time zone as an offset from UTC shall be used as a reference system for time values.
24. The metadata describing a spatial data set or a spatial data set series related to the theme **Natural Risk Zones** shall comprise the metadata elements required by Regulation 1205/2008/EC (implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata) for spatial datasets and spatial dataset series (Table 3) as well as the metadata elements specified in Table 4.
25. The metadata describing a spatial data set or a spatial data set series related to the theme *Natural Risk Zones* shall also comprise the theme-specific metadata elements specified

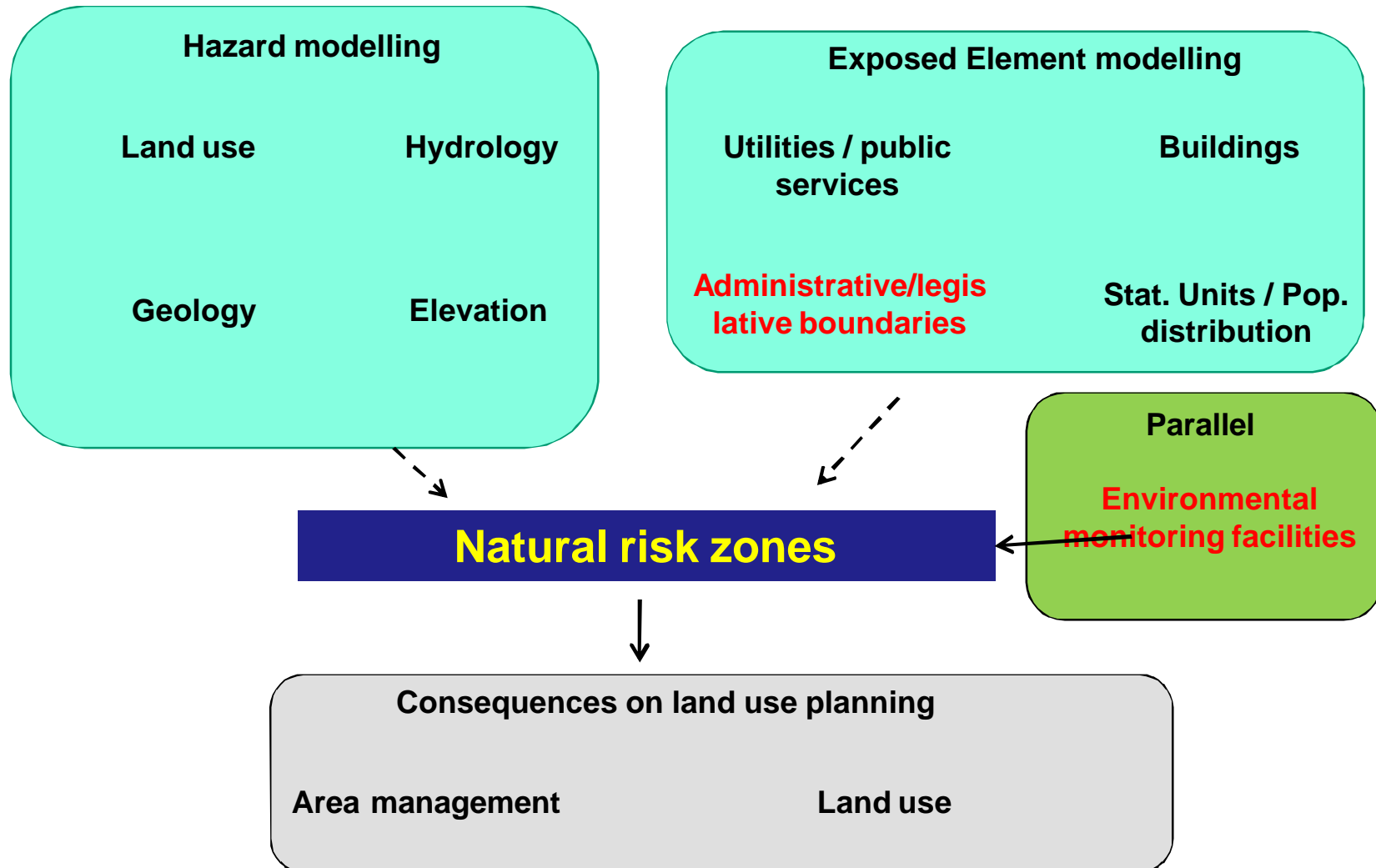
INSPIRE NZ Recommendations

1. The reason for a void value should be provided where possible using a listed value from the VoidValueReason code list to indicate the reason for the missing value.
2. Additional and/or use case-specific information related to the theme *Natural Risk Zones* should be made available using the spatial object types and data types specified in the following application schema(s): <ApplicationSchema1>, <ApplicationSchema2>. These spatial object types and data types should comply with the definitions and constraints and include the attributes and association roles defined in this section.
3. Attributes of spatial object types or data types whose type is a code list with an “obligation” value of “TG” should only take values that are valid according to the code list’s specification.
4. If life-cycle information is not maintained as part of the spatial data set, all spatial objects belonging to this data set should provide a void value with a reason of "unpopulated".
5. Where it is impossible to express the evaluation of a data quality element in a quantitative way, the evaluation of the element should be expressed with a textual statement as a data quality descriptive result.
6. Conceptual consistency should be evaluated and documented using Logical Consistency as specified in the tables below.
7. For reporting the results of the data quality evaluation, the data quality elements, sub-elements and (for quantitative evaluation) measures defined in chapter 7 should be used
8. The metadata elements specified in the following tables should be used to report the results of the data quality evaluation. At least the information included in the row “Implementation instructions” should be provided.
9. The metadata describing a spatial data set or a spatial data set series related to the theme *Natural Risk Zones* should comprise the theme-specific metadata elements specified in Table 5

INSPIRE NZ Recommendations

10. The Conformity metadata element should be used to report conceptual consistency with this INSPIRE data specification. The value of Conformant should be used for the Degree element only if the dataset passes all the requirements described in the abstract test suite presented in Annex A. The Specification element should be given as follows:
 11. - title: “INSPIRE Data Specification on <Theme Name> – Draft Guidelines”
 - date:
 - dateType: publication
 - date: 2012-02-24
10. To describe the transformation steps and related source data, it is recommended to use the following sub-elements of LI_Lineage:
 11. For the description of the transformation process of the local to the common INSPIRE data structures, the *LI_ProcessStep* sub-element should be used.
 12. For the description of the source data the *LI_Source* sub-element should be used.
 13. It is recommended that also the encodings specified in this section be provided for the relevant application schemas.

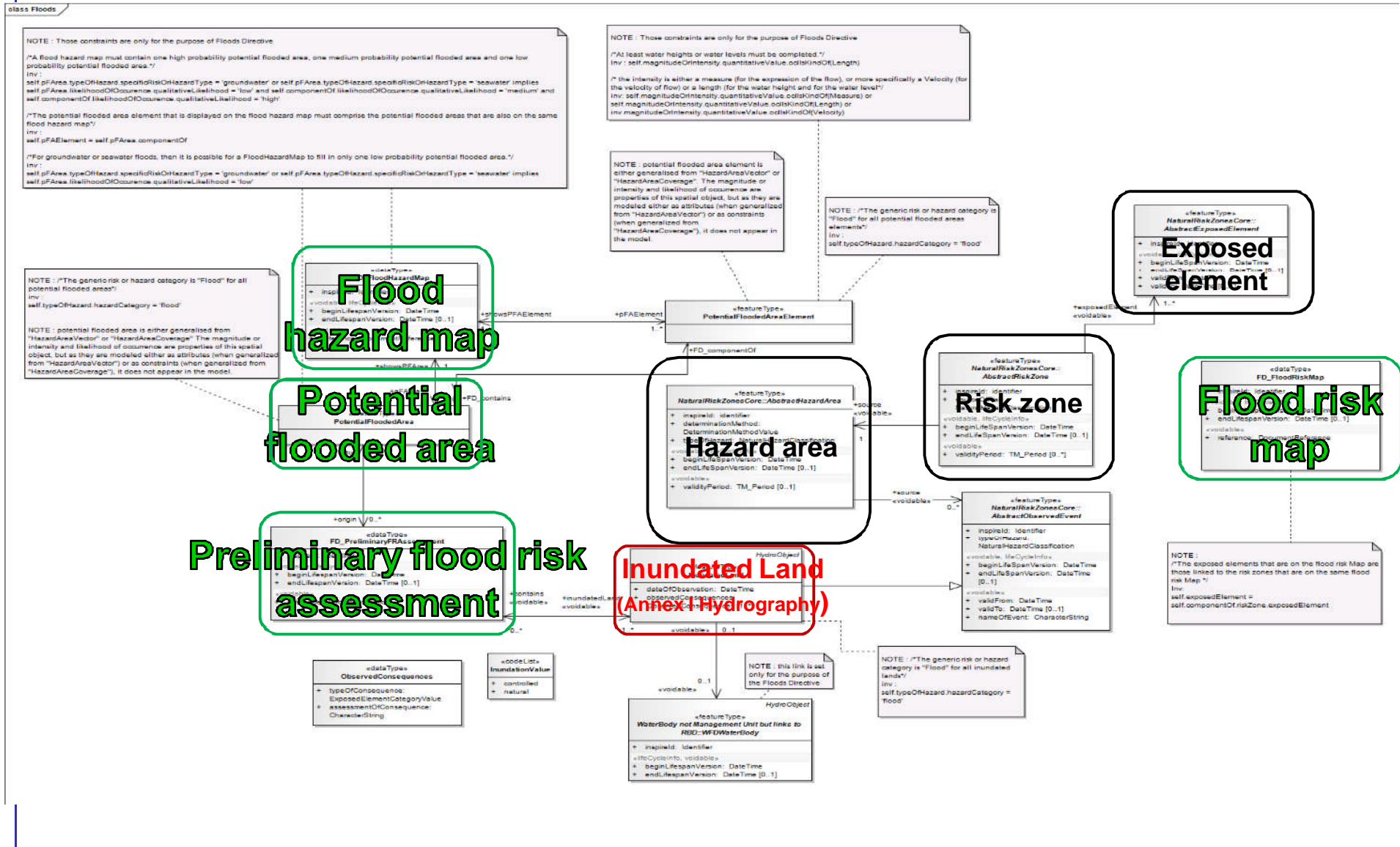
Model v2.0 Links



Model v3.0 : Floods Example

- Why floods and no other hazard?
 - Directive 2007/60/CE (« Floods Directive »)
- Overall idea:
 - Take the core model, specialize it to make it meet Flood Directive's requirements
 - Use the navigability of the links to avoid redundances, and the constraints to ensure the coherence of the model

Model v3.0 : Flood Example



Next Stages

- Address some final Member State concerns
- Publication of Implementing Rules
- Promote widely
- Still a lack of understanding beyond the GSO communities
- Formalisation of maintenance process