

Excerpts from the Supplement to the Case Study

6. Elements of Geospatial data quality

The following are brief definitions of the seven elements of spatial data quality. These were mostly adapted from Ostman, A. (1997). The Specifications and Evaluation of Spatial Data Quality. Proceedings from the 18th ICA/ACI International Conference, Stockholm Sweden, 23-27, Volume2. Pp836-847 and from the references below. These standard elements are integral components of spatial metadata. Each spatial data set has associated data quality measures and most organizations have particular data quality assurances. As the Atlas develops with nodes and thematic content determined, additional information will be available on the particularities of data quality for individual data sets. It is also important to note that documentation associated accompanying digital products is accompanied by quality disclaimers to remove liability in the case of error (e.g. hydrographic maps, digital in car routing maps, etc.).

1. **Lineage:** is the history of a geographical dataset, it is mandatory for describing the quality of geographical information. Information regarding the production of the data is mandatory and in some cases data source material is also provided.
2. **Positional accuracy:** if accuracy is defined as the "closeness of observation to true values or values accepted to be true" (CEN, 1996) then positional accuracy may be defined as a quality parameter indicating the accuracy of geographic positions.
3. **Attribute/thematic accuracy:** thematic maps show the spatial distribution of certain properties or attributes such as socio-demographics or concentration of penguin habitats, etc. Attributes can be quantitative or qualitative. Quantitative attribute accuracy may be expressed in traditional statistical terms such as RMSE while those of a qualitative nature, errors and uncertainties occur when the wrong class is assigned.
4. **Completeness:** is how well a dataset conforms to aspects of the real world with few observation errors. The term describes how much information is missing or should not be present. If applied on a feature level the term indicates whether all features that should be present in the database are present or not. On an attribute level, the term indicates to what degree a certain attribute is known.
5. **Logical consistency:** is "the degree of conformance of a geographical dataset compared with its nominal ground with respect to the constraints defined in the application schema" (CEN, 1996). Some constraints concern constraints on certain attribute values (domain consistency), constraints on relationships among tables (referential consistency) and constraints on spatial relations (topological consistency).

6. **Semantic accuracy:** “refers to the way the subject of analysis is conveyed through the use of a set of ‘words’, themselves linked by a specific ‘grammar’, which allow the modelling of the reality to be described” or “refers to the quality with which geographical objects are described in accordance with the selected model”, namely the meaning/pertinence of the meaning of the things or the geographical objects (Guptil & Morrisson, 1995:139).
7. **Temporal information:** if accuracy is defined as closeness of observations to true values or values accepted to be true then a strict definition of temporal accuracy would describe the accuracy of temporal observations. This may be expressed as the accuracy of the date of a product or phenomenon and may be described by mean time error or other statistical measures. Temporal accuracy also relates to aspects of temporal effects on the spatial data quality such as quality indicators of updateness (date of last update), rate of change and temporal lapse (time between a change in the real world and the updating of the database).

Other important references are:

- Guptil C.G, Morrison J.L, (eds.) (1995). Elements of Spatial Data Quality. Elsevier Science Ltd, Oxford, UK.
- CEN, (1996). Geographic information - Data description - Quality. Draft European Standard, PrEN 12656, European Committee for Standardisation, Brussels.
- American National Standards Institute, Inc. (1997). DRAFT American National Standard for Information Systems -Spatial Data Transfer Standard (SDTS) - Part 1, Logical Specifications.