Standardized Quality Estimation of OSM Data

A presentation on the planned application, its examination methods and the challenges in adapting the methods

International Workshop on Spatial Data Quality
Lena Jossek
Can OSM data keep up with proprietary data?

Zielstra & Zipf, 2010:
„A Comparative Study of Proprietary Geodata and Volunteered Geographic Information for Germany“

**Question**
Quality differences between VGI data and commercial data

**Approach**
Comparison of total road length

**Result**
Total road length
OSM < Tele Atlas data
OSM Data: enormous growth rate
Reduction of total length difference in 8 months:
29% → 7%

**Consequence**
OSM data set is to be classified on the same quality level regarding completeness
Example: global inspection of the completeness of the building stock

- 183 million buildings
- Ø Completeness = 21%

**OpenStreetMap Building Completeness in Urban Centers**

- Europa, Central Asia: 67%
- North America: 56%
- Latin America, Caribbean: 17%
- East Asia, Pacific: 16%
- Central and North Asia: 11%
- South Asia: 7%
- Sub-Saharan: 29%

[Map showing global completeness of building stock with various regions and completeness percentages marked]
Overview

**OSM vs. Conventional data**
- OSM data in comparison to proprietary data
- Challenges in estimating the quality

**Application**
- Quality features
- Structure of planned application

**Examination methods**
- Presentation of two intrinsic methods
- Challenges in adapting methods

**Insight**
- Insight and presentation into the current state of the application
Standardized quality features

Completeness

Positional accuracy

Temporal accuracy

Logical consistency

Thematic accuracy
Overview workflow of planned application

1. Select area
2. Select quality feature
3. Examination method
4. Quality classification

- Completeness
- Temporal accuracy
- Thematic accuracy
- Logical consistency
- Positional accuracy
Temporal accuracy: intrinsic examination method

**Area:** State of Brandenburg, Germany

**Quality feature:** Temporal Accuracy

**Examination method:** Currentness

**Currentness for Fire Stations**

![Graph showing currentness for fire stations with median year 2019]
Completeness: intrinsic examination method

Area: State of Brandenburg, Germany

Quality feature: Completeness

Examination method: Mapping Saturation

Mapping Saturation

The saturation of the last 3 years is 90.95%. Saturation is in progress (30% < Saturation ≤ 97%).
Accuracy of examination method „Mapping Saturation“

OSM Completeness for Building Area with OQT in Europe

- MSE: 15.6780
- MAE: 0.9937
- R²: 0.0469

Points not shown: 7

OSM Completeness for Building Count with OQT in Europe

- MSE: 10.5743
- MAE: 0.9191
- R²: -0.1089

Points not shown: 7
Accuracy of examination method „Mapping Saturation“

[Graph: OSM Completeness for Building Area with OQT in Germany]

MSE: 0.1055
MAE: 0.1697
R²: -0.1316

Points not shown: 0

[Graph: OSM Completeness for Building Count with OQT in Germany]

MSE: 0.1395
MAE: 0.2530
R²: -0.0269

Points not shown: 0
Accuracy of examination method „Mapping Saturation“

Residuals for Building Count

Residuals for Building Area
Insights into current status of the application
Thank you for your kind attention!

Bundesamt für Kartographie und Geodäsie
Organisationseinheit
Richard-Strauss-Allee 11
60598 Frankfurt am Main

Lena Jossek
lena.jossek@bkg.bund.de
www.bkg.bund.de
Tel. +49 69 6333 – 3937