Spatial Data Quality

A. Stein[1], W. Shi[2] and M. R. Delavar[3]

[1]Department of Earth Observation Science, University of Twente, Enschede, the Netherlands

[2]Department of Land Surveying and Geo-informatics, The Hong Kong Polytechnic University, Kowloon, Hong Kong

[3]Center of Excellence in Geomatic Eng. in Disaster Management, School of Surveying and Geospatial Eng., College of Engineering, University of Teheran, Teheran, Iran

Spatial data quality concerns the accuracy and trustworthiness of data and their fitness for use. In our new era of spatial big data this topic requires more attention than ever before. The 'big five' in spatial data quality are lineage, positional accuracy, attribute accuracy, logical consistency and completeness. On each of these aspects (and more) attention is given in the proceedings. The urgency to proceed with the analysis of spatial data quality is the increasing availability of Volunteered Geographical/Geospatial Information and the wide use of spatial data in new and so far unexplored applications. In this sense, the fitness for use of spatial data has become more important than ever. In a methodological context, machine learning and deep learning in artificial intelligence are the new focal points. An important issue is the propagation of uncertainty in spatial data through spatial analyses: data of a low quality can have a disastrous effect on decisions.

The papers in these proceedings do not stand on their own, but build upon a range of symposiums organized in the past around Spatial Data Quality. Those started in Hong Kong the early nineteen nineties and have continued ever since. Key scientists have given their contributions to develop this exciting field. In the current proceedings the latest developments, now also including data quality in space and time, are presented. One highlight is the contribution on contextual uncertainties in geographic and environmental health research, where the new domain of geohealth is emphasized, and where specific data quality aspects, in particular related to contextual uncertainties are addressed. Another highlight concerns the development of spatial data quality and uncertainty assessment in smart cities: also here we see that data quality issues are finding their place in a novel domain. Further contributions in the proceedings concern the wider context of spatial data quality, like validation of photogrammetric algorithms and machine learning algorithms. We further emphasize data quality on images as a rapidly developing source of important information from which 3D and temporal information is being extracted. Examples are image registration as a key issue in image processing, and the comparison of different versions of the general image quality equation. Also a quality check of crisis maps produced over five years is included. With the advent of new facilities, data and applications, also methodology are further developing, and in the proceedings we have contributions on quality control for crowdsourcing and advances in spatial sampling and spatio-temporal clustering. Finally, there is room for much extension in the range of applications. Without being exhaustive, we would like to emphasize the important domains in soil water assessment and land cover products that are relevant within the climate change discussion, and of course digital elevation models.

The proceedings are based upon the ISSDQ symposium during the GeoSpatial Week, 2019. The symposium aimed to bring together researchers involved in different topics related to spatial data quality, from the data themselves, through the methodologies towards the applications in its widest sense. Points of attention in this symposium were: spatial data quality in space and time and in relation to big data, artificial intelligence, volunteered geographical/geospatial information, uncertainty

modeling, assessment and propagation in spatial analyses and Error assessment and propagation in DEM.

We like to thanks the organizers for hosting the symposium and for their efforts to compile the proceedings.

Enschede, 13 June 2019.