

# Preface

This book was an interesting challenge, especially because it was not planned before the 2015 meeting of the International Cartographic Association (ICA). To avoid publishing a mere collection of unrelated papers, we aimed to organize this book in accordance with the underlying ideas of its authors. However, to present this collection in a meaningful way, we had to learn about the motivation for the research and the results found in these papers. Moreover, it is reasonable for the reader to expect that these papers be organized as a reference book. Therefore, as the studies represent a snapshot of a rich and diverse landscape of map-related research across the globe, the question remained: How can we organize this collection of papers in a logical manner?

We arranged this book to enhance the knowledge that brought everyone together at this conference, which focused on cartography and geographic information science (GIScience). It was possible to organize this book in sections around a common theme, which was defined by the researchers' approach to cartography, GIScience, and related technological advances. Consequently, the organization of this book is based on the definitions of cartography and GIScience specified in the ICA Strategic Plan 2003–2011 ([www.icaci.org/mission](http://www.icaci.org/mission)):

“**Cartography** is the discipline dealing with the art, science and technology of making and using maps.”

“**Geographic Information Science** (GIScience) refers to the scientific context of spatial information processing and management, including associated technology as well as commercial, social and environmental implications. Information processing and management include data analysis and transformations, data management and information visualization.”

Every section of the book includes papers that are related to a particular aspect of cartography and GIScience. In addition to the characteristics that form their definitions, there are two further sections: the History of Cartography and Historical Cartography (Part IV) and Modern Applications of Geo-technology (Part V).

Part I (Art, Culture, and Cartography) discusses the effect that cultural differences have on symbol design and presents a collection of planetary maps for children. Part II, named Cartography as Science and Technology, includes papers

that describe research results that are related to the creation and use of maps. The section begins with a mathematical demonstration of the existence of azimuthal projections with more than one standard parallel. Three chapters present research results on map visualization using modern screen technologies, including real three-dimensional (3D) and pseudo-3D cartographic visualization. Then, a research issue, the principles of universal design and design for all, is discussed in relation to the map design and production process. This section concludes with a discussion of the general issues of orienteering maps. Part III focuses on GIScience, featuring papers that describe research related to spatial data infrastructure and ontologies, temporal spatial database and temporal spatial data visualization, and the use of neural network methods for both the spatial prediction of landslide hazards and data integration.

The importance of the history of cartography is emphasized in Part IV, which includes a chapter on cartographic heritage. In this section, you can read about positional accuracy variations in the Mercator's Map Sclavonia, Croatia, Bosnia cum Dalmatiae parte, and the historical toponymic analysis of the 1823 Carta Geographica of the Rio de Janeiro province. A third chapter completes this section with a presentation of a photogrammetric method for digitizing old globes. A very important aspect of cartography and GIScience is how to efficiently—and occasionally essentially—support a large variety of applications, which is the theme of Part V of this book. This section provides a space–time visualization for investigative and forensic purposes, a high-resolution social vulnerability map of South Africa, a citizen mapping of ecosystem services, the use of geo-technology and multimedia resources in cartography lessons for environmental studies, activities with Google Earth and Google Maps in elementary and secondary schools in Brazil, geo-design for urban planning, and geo-ecological and thematic mapping for the analysis of estuarine environments in northeastern Brazil.

This book brings together 26 papers, which were selected from among 177 submitted papers from 30 countries, into an important volume in the series on the state-of-the-art research in cartography and GIScience. It is a collection of selected peer-reviewed papers that have been organized into contemporary topics of research, as presented at the 27th International Cartographic Conference (ICC) in Rio de Janeiro. Therefore, to read this book is an opportunity to become acquainted with and learn about the cartography and GIScience research that is being developed around the world at this moment in time.

Claudia Robbi Sluter  
President of the ICC 2015  
Scientific Committee

Cartography - Maps Connecting the World

27th International Cartographic Conference 2015 -  
ICC2015

Robbi Sluter, C.; Madureira Cruz, C.B.; Leal de Menezes,  
P.M. (Eds.)

2015, XVII, 386 p. 168 illus., 140 illus. in color.,  
Hardcover

ISBN: 978-3-319-17737-3