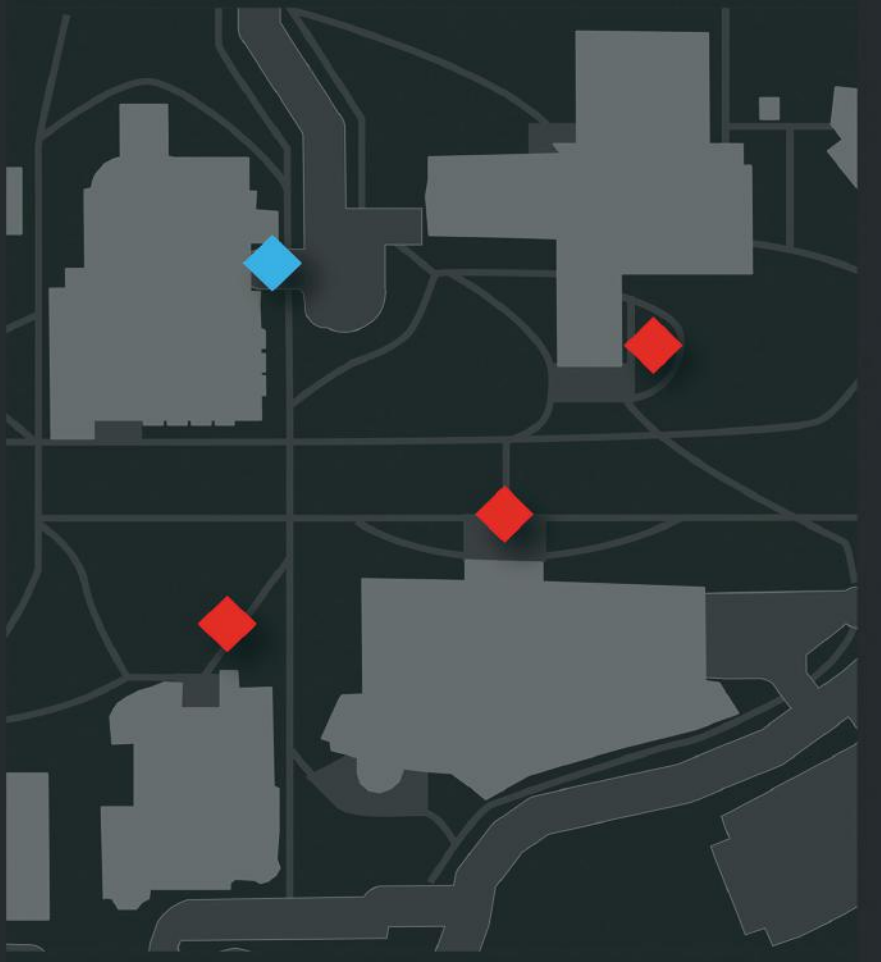
Web Cartography

Map Design for Interactive and Mobile Devices



Ian Muehlenhaus

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To Birgit, Svenja, Antja, and Mette.

Ich hab euch Lieb.

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Preface

The idea for this book came to me three years ago when I was teaching an interactive and Web cartography course for the first time. Many of my students had taken some introductory GIS (geographic information system) courses but had absolutely no coding experience, nor any knowledge of HTML, and often, only rudimentary math skills. On the other hand, a certain subset of the class had programming and math skills but absolutely no knowledge of cartography or design. Long story short teaching interactive and Web cartography was a real challenge.

It remains so today. One of the most confounding issues I keep confronting is that there are few comprehensive texts dealing specifically with Web map design. Those that do exist tend to either be extremely technical or edited volumes that are often too academic for nonexperts. So, instead of using a single text, I typically hunt down journal articles and academic book chapters on a variety of pertinent topics.

Thus, it occurred to me that what I needed was an approachable, comprehensive, and nontechnical text about map design for the Web—not a book about scripting, application programming interfaces, or about designing exploratory tools. Rather, I wanted a book that talked about map communication best practices, a book based on spatial data visualization and graphic design theory. Theoretically, such a book would be approachable enough for desktop GIS users, print cartographers, and university students who have little-to-no experience in Web programming. However, I also felt that the ideal book would be written so that anyone who wants to design effective Web maps could learn about the core concepts of cartography without needing to refer to an additional, potentially more esoteric, source. Essentially, I needed a book that was written by a cartographer about Web map design and written in a language that anyone with even a slight interest in Web mapping could easily understand.

I could not find such a book. So, I decided to write my own.

My goal with this book is to offer a solid cartographic launching pad from which students, practitioners, and innovators can begin to design aesthetically pleasing and intuitive Web maps. With my backgrounds in cartography and map design, I was able to collate and synthesize current Web-mapping norms into this text. My training has also allowed me to critically assess Web mapping within the broader history and science of mapmaking.

So, thank you for picking up this book. I truly hope you enjoy it and that it helps you design more powerful and effective Web maps.

Ian Muehlenhaus
La Crosse, Wisconsin, USA

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Acknowledgments

I cannot thank Birgit Muehlenhaus enough for her patience and encouragement, as well as her incredible editing capabilities. (She literally saved you from reading about 100 pages of superfluous text.) How much time she set aside to help me with this book is unfathomable—time that she did not have. On top of this, she has kept our household from falling apart as I spent numerous evenings and weekends locked in the basement with my computer. Thank you, Birgit. This book would not have been finished without you. You are a coauthor in all but title.

I must thank Svenja Muehlenhaus for interrupting my writing binges to listen to the goofy guy and goofy girl sing "Bird'n'Roll" and "John McEnroe." You may not remember this period of your life once you grow older, but just know that I will always cherish my time listening to Dionysos with you throughout the writing of this book. "What's up, le Monde?!"

I would like to thank my mother for always encouraging me to try new challenges. I am where I am in this world because of you.

Thank you, Irma Britton for being so patient and not letting me give up on the project. I really appreciate this and am forever grateful. You are the best editor ever.

I would like to thank my former colleagues in the Department of Geography and Mapping Sciences at the University of Wisconsin–River Falls. It was there that the idea for this book first came to fruition. I miss the daily banter. John, thanks for telling me I should write this book.

I owe a debt of gratitude to my current colleagues in the Department of Geography and Earth Science at the University of Wisconsin–La Crosse. I apologize that my door has been shut so much over the past semester as I wrapped this up. It opens again tomorrow. I am very fortunate to be working with such great people and at such a great university.

I would like to thank all of my students from semesters past and present. I wrote this book because of, and for, you. If it weren't for you, I wouldn't be in academia. Of particular significance while writing this book were Mary Windsor, Derrick Sailer, Hannah Moseson, and everyone from my fall 2012 cartography course. You have all made teaching a real joy since arriving at La Crosse.

I would not be where I am today if it were not for those who taught, inspired, and helped me. Matti Kaups and Roger Miller … I miss you both. Thanks to Gordon Levine for encouraging me to return to academia.

Scott Freundschuh is responsible for getting me excited about map design as an undergraduate student. He was instrumental in providing me feedback during my dissertation, and he continues to help me out careerwise on a regular basis. Scott, I truly appreciate all that you have done for me.

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Steven Rosenstone will probably never read this book (he is a political scientist, after all), but after my dissertation defense, he gave me a bit of sage advice that I will never forget. It is because of this advice that this book was written. Thank you, Steven.

Last but not least, I would like to thank my adviser, Robert McMaster. It was an honor being your graduate advisee. I hope I have done you proud. (Oh, and I promise I will have my students still use your, Terry's, and Fritz's textbook, too.)

To all of those I missed, and I am sure there are many, please forgive me. Thank you, too.

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About the Author

Ian Muehlenhaus fell in love with maps growing up in Duluth, Minnesota. During the long, dark winters of his childhood he perused atlases and daydreamed about distant, warmer lands. He went on to earn his M.Sc. in geography at The Pennsylvania State University in 2002 and his Ph.D. in geography at the University of Minnesota in 2010. Today, he is fortunate enough to study maps for a living as an assistant professor at the University of Wisconsin – La Crosse.

Ian's research on maps has been published in a variety of journals, including *The Cartographic Journal, Cartography and Geographical Information Science* (CaGIS), *Cartographica*, and *Cartographic Perspectives*. He is the coordinator of the annual CaGIS Map Competition and a former co-chair of the Student Dynamic Map Competition for the North American Cartographic Information Society (NACIS). Ian has also acted as the chair of the Cartography Specialty Group of the Association of American Geographers and is currently an editorial board member of *Cartographic Perspectives* and a map reviewer for the *Journal of Maps*. He has worked as a consultant for the National Geographic Society and National Endowment for the Arts, and been invited to lecture on effective map design at the NASA Goddard Space Flight Center.

Ian's map interests are myriad, although all tend to come back to map aesthetics and purposeful design. Beyond Web mapping, the focus of Ian's research is on systematically designing maps for more effective information recall, likability, and persuasiveness. More recently Ian has become interested in the scholarship of teaching and learning (SoTL). *Web Cartography* was an attempt to write a book that was extremely approachable to a broad audience.

During the academic year Ian resides in La Crosse, Wisconsin, with his wife (fellow cartographer Birgit Muehlenhaus), two daughters, and their Wheaten terrier. In the summer, he and his family are often found in Germany, France, and Hungary visiting family and friends. More information can be found about Ian at www.ian.muehlenhaus.com or on Twitter @iMuehlenhaus.

Ian loves spreading the word about maps and map design! If you would like to have Ian come speak in your neck of the woods or do a Webinar, please don't hesitate to contact him.

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