Book Review:
A Framework for Geodesign: Changing Geography by Design

Carl Steinitz (2012)
California, USA: Esri Press
224 pp.

Introduction and History

Geographic Information System (GIS) technology has a long history of driving environmental understanding and decision making. Policy makers, planners, scientists, and many others worldwide rely on GIS for data management and scientific analysis. As the challenges facing our natural and human environments evolve to new levels of complexity, tools must also evolve (ESRI, 2010). The disciplines of geography and design have been around for a long time, but in the last half of the twentieth century they began co-evolving with computing technology. When a small group of people began exploring the new frontier of *"computational geography"* by blending maps and geographic information with mathematics and computing, they changed the way we see and understand our word. Similar developments occurred in the application of computing technology to the design of major changes to the environment. A new age of geography is dawning: the age of designing.

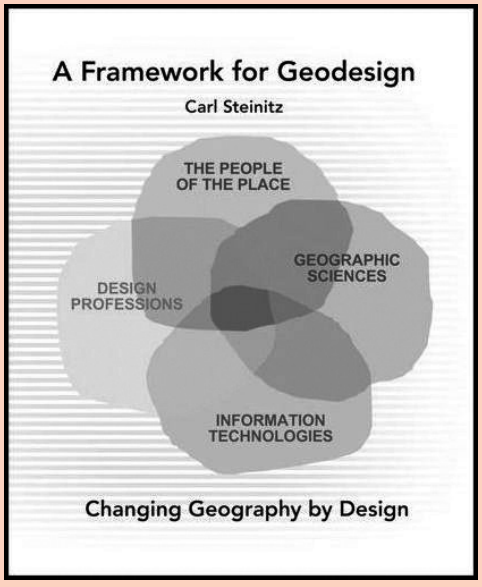

Figure 1. Cover page of A Framework for Geodesign book (Source: ESRI Press, 2012).

It's an agenda for moving beyond simply understanding how and why the world works, and towards a comprehensive understanding of the impacts of our decisions on the planet and using this information to make the world a better place. It will redefine our relationship with the environment. And this is what we call *"Geodesign"* (Dangermond, 2012). Geodesign is a vision for using geographic knowledge to actively and thoughtfully design. It will link and build the next generation of both geography and design.

Geodesign has become a buzzword in the past five years although its main origin goes back to the late 1960s, with the publication of McHarg's book Design with Nature (1969). *Carl Steinitz' s book A Framework for Geodesign: Changing Geography by Design* (Figure 1) comes at a prime time since scholars, designers, and GIS professionals have been intrigued to understand and explore this "new" trend. Geodesign is such a hot topic these days that Environmental Systems Research Institute (ESRI), the leading worldwide company in the GIS industry and publisher of this book, has been organizing annual Geodesign Summit meetings since 2012 (Haddad, 2015).

About the Author

Carl Steinitz is the Alexander and Victoria Wiley Professor of Landscape Architecture and Planning, Emeritus, at Harvard University Graduate School of Design (Figure 2). He has devoted much of his academic and professional career to improving methods to analyze large land areas and make design decisions about conservation and development. His applied research and teaching focus on highly valued landscapes that are undergoing substantial pressures for change (ESRI Press, 2012).

Rogers and Steinitz's research is devoted to improving the methods by which planners and designers organize and analyze information about large land areas and how they make major design decisions (Figure 3 and Figure 4). In 1984, he received the Outstanding Educator Award of the Council of Educators in Landscape Architecture; he also received the 1996 Distinguished Practitioner Award from the International Association for Landscape Ecology. He was awarded an honorary professorship in 1987 by the Beijing Forestry University (Harvard University Graduate School of Design, 2016).

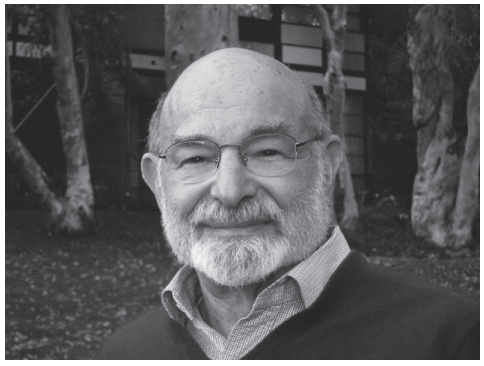

Figure 2. Carl Steinitz, author of A Framework for Geodesign (Source: Harvard University Graduate School of Design, 2016).

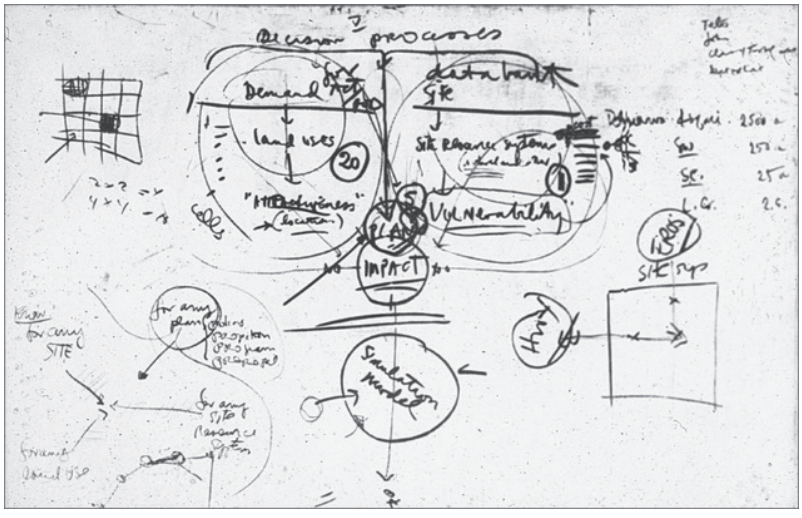

Figure 3. Steinitz's earliest diagram for the information flow for a large-area design study, 1967. (Courtesy of C. Steinitz.) (Source: ESRI, 2013)

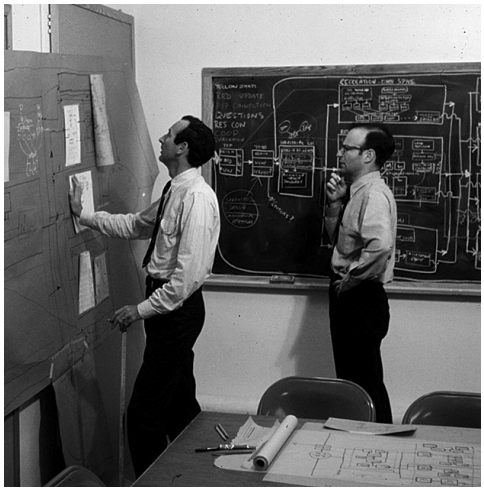

Figure 4. Peter Rogers (left) and Carl Steinitz at the Laboratory for Computer Graphics, Graduate School of Design, Harvard University, in 1967. (Source: ESRI, 2013)

Changing Geography by Design

In his book *"A Framework for Geodesign: Changing Geography by Design"* Steinitz brings his vast experience as a landscape architect and planner to such an issue. For those not familiar to the term Geodesign, Steinitz (2012) writes in his preference to the book that it "is an invented word, and a very useful term to describe an activity that is not the territory of any single design profession, geographic science or information technology" (page ix). More generally Steinitz (2012) frames Geodesign as "the development and application of design-related processes intended to change the geographical study areas in which they are applied and realized" (page 1). Or another way of putting it, the merging of geography and design through computers. This is reiterated later on by a quote from Michael Flaxman were he states "Geodesign is a design and planning method which tightly couples the creation of design proposals with impact simulations informed by geographic contexts, systems thinking, and digital technology" (Flaxman quoted in Steinitz, 2012 page 12).

Moreover, Geodesign can be considered both as a verb and as a noun which Steinitz (1995) relates to design more generally. In the sense as a *verb,* Geodesign is about asking questions and as a *noun*, Geodesign is the content of the answers. In this book Steinitz not only clears up the meaning of Geodesign but more importantly provides a comprehensive framework (based on his past work) for thinking about strategies of Geodesign, and for organizing and operationalizing these meanings.

The book is made up of twelve chapters and split into four parts which include:

Part I: Framing geodesign

The first part is spent on framing geodesign and sets the scene for the remainder of book. For example, chapter 1 notes that, for geodesign to be successful, one requires collaboration between the design professions (e.g., architects, planners, and urban designers), geographical sciences (e.g., geographers and ecologists), information technologies, and those people living within the communities where geodesign is being applied (Figure 5). This is reiterated throughout the book. Chapter 1 also traces the history of geodesign, and how the advent of computer methods for the acquisition, management, and display of digital data can be used to link many participants, thus making design not a solitary activity. Chapter 2 introduces the reader to the context for geodesign in the sense that (1) *geography matters* and that different societies think differently about their geography; (2) *scale matters* in the sense of what scale should a geodesign project be applied at (e.g., local, regional, or global), and what are the appropriate considerations that need to incorporated at each scale; and, finally, (3) *size matters*—if the size of the geographic study area increases, there is a high risk of a harmful impact if one makes a mistake.

Part II: A framework for geodesign

The second part of the book lays out a framework for geodesign. It is important to note that Steinitz does not call this a methodology for geodesign, as he argues one cannot have a singular methodology as the approaches, principles, and methods are applied to projects across a range of geographies, scales, and sizes. He therefore introduces a framework as a verb, specifically for asking questions, choosing among many methods, and seeking possible answers. In order to develop this framework Steinitz walks the reader through six different questions and types of models common in geodesign projects.

Chapter 3 focuses on components of the framework and the questions one needs to address for a successful geodesign project (Figure 6). These questions are broadly:
(1) How should the study area be described?
(2) How does the study area operate?
(3) Is the current study area working well?
(4) How might the study area be altered?
(5) What differences might the changes cause? (6) How should the study area be changed? As posed by Steinitz, these questions are not a linear progression, but have several iterative loops and feedbacks both with the geodesign team and the application stakeholders. Moreover, Steinitz argues that such questions should be asked three times during the geodesign study. The first time they are treated as *why* questions (e.g., to understand the geographic study area and the scope of the study). Secondly, the questions are asked in reverse order to identify the *how* questions (e.g., to define the methods of the study; therefore geodesign becomes a decision-driven rather than a data-driven process). Finally, the questions are asked in sequential order to address the what, where, and when questions as the geodesign study is being implemented. Once these three iterations are complete, there can be three possible decisions: yes, no, and maybe.

Figure 5. Designers and scientists come from different directions. The territory of most effective geodesign collaboration is likely to be where they overlap. (Source: GSD Talks; Harvard University Graduate School of Design, 2013)

If maybe or no, more feedback is needed between the geodesign team and the stakeholders. These iterations highlight how geodesign is an ongoing process of changing geography by design.

Using this framework, Chapter 4 discusses the first iteration of questions: that of scoping the geodesign study. The emphasis of this iteration is ensuring that it is being decision driven as opposed to data driven. Moreover, it goes over the six questions in an attempt to identity the intended scope for the study before looking at a feasible methodological plan. Chapter 5 moves onto the second iteration: that of designing the study methodology. Having identified the scope of the study (the why) from the first iteration, the geodesign team must then explore how it will be carried out and what are the evaluation criteria (Figure 7). Chapter 6 discusses the third iteration: that of carrying out the geodesign study (the what, where, and when questions). Throughout these chapters Steinitz reiterates the need for stakeholder input and feedback from the geodesign team. Moreover, at the end of chapter 6 Steinitz reiterates that the choices mater. The why questions provide a sense of the scope and objectives of the design application: the problem, the study area, and those scales required for operationalizing a successful project.

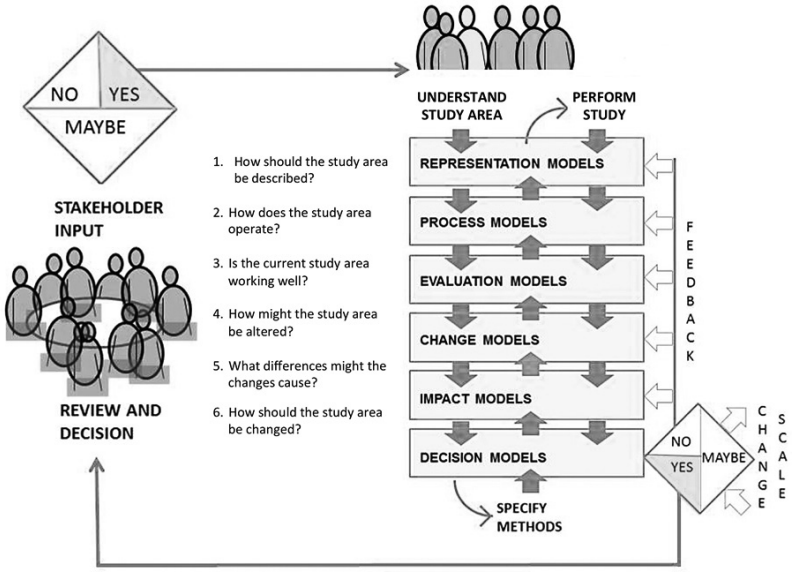

Figure 6. A Framework for Geodesign: Changing Geography by Design by Carl Steinitz. (Source: ESRI Press, 2012)

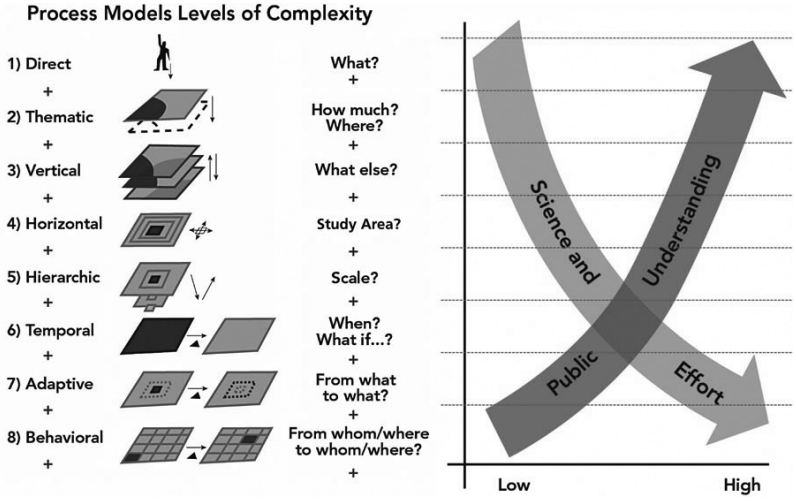

Figure 7. Better science and more effort versus better public understanding by Carl Steinitz. (Source: ESRI, 2012)

Part III: Case studies in geodesign

In the third part, Steinitz describes how the framework can be applied to nine case studies, all but one of which he was directly involved with as a member of the geodesign team. The projects were developed for places in the U.S. and other countries, such as Italy, Costa Rica, Mexico, and the United Kingdom (Figure 8). The cases differ from each other mainly with regards to the type of change model being applied (related to the question, How might the study area be altered?). The change models are indeed the part of the framework that is mostly related to the act of designing. The author uses the lens of a design professional to describe the cases. The perspective of information technologists, for instance, which should be equally important in the team, is not mentioned or referred to, leading to a designer point of view bias in the narrative.

It is important to highlight two main issues with regards to the book's use of figures and the U.S. centered perspective of the narrative. First, on one hand, the colorful diagrams can be very helpful for the visualization of the different concepts and can facilitate an understanding of the text, and some people might find them useful. On the other hand, when overused, figures can make readers confused especially when they are very different from each other, and other people might be distracted by them. Second, since the book is mostly based on the author's experience, it has a very specific geographic location in its narrative. However, the framework has global applicability.

Part IV: A future for geodesign

To minimize this bias, in the final part of the book, a few questions related to geodesign in developing countries could have been included as well. The framework is certainly already being applied formally or informally in various places around the world. Some of these places may face obstacles to implement the framework, such as including the people of the place in the geodesign

process, or providing good education for information technologists. Including issues like that in a research agenda would help promote the dissemination of geodesign (Haddad, 2015).

There are several key strengths that make the book shine. First, a highlight of the book is how public participation is an integral part of the framework, reflecting how planning processes should be conducted. The people of the place, as Steinitz calls them, have a central role in all the iterations described above, and should be part of the framework loop as much as possible. In addition, there is no doubt that it is a very timely publication because of the ongoing interest in geodesign, and the fact that there are very few books currently available on the topic.

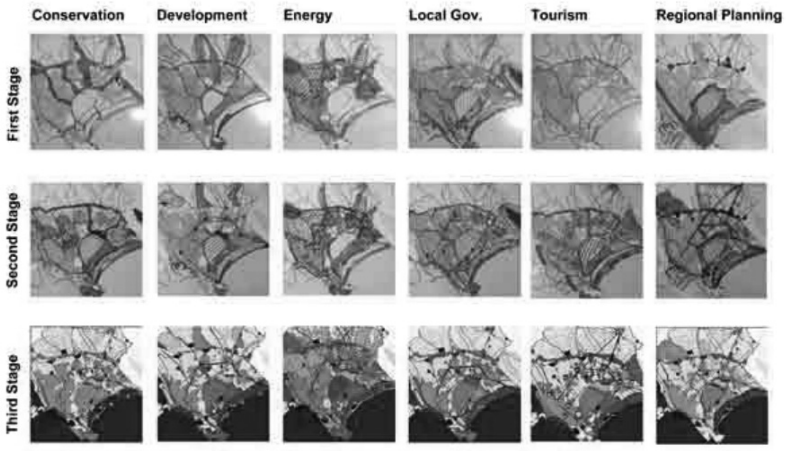

Figure 8. The six final designs and their stages of design development for the Metropolitan area of Cagliari, Sardinia, Italy (Source: Albert et al., 2015).

Knowing that "one size fits all" does not belong to a design dictionary, the author does a very good job suggesting a variety of applications for the framework, making it better reflect reality. For instance, when describing the evaluation models (related to the question, Is the current study area working well?) during the second iteration, he connects the concepts with work he helped develop in La Paz, Mexico. This collection of possibilities comes from his extensive design experience, added to the fact that some external historical design-related ideas are inserted sporadically in the text. To illustrate, before introducing the complexity of process models, the author briefly describes the work of Fagg and Hutchings (1930) to highlight that "landscapes are interrelated systems, with complex elements that are connected to each other" (page 64).

Discussion and Conclusion

Because of its strong visual elements and the way it is organized, the book could certainly be adopted in planning studios that are design-related. Time allowing, students could focus on at least one of the three iterations proposed by the author. This idea is embedded in the text because many of the presented case studies took place in studios that Steinitz taught at Harvard, where he likewise conceptualized and tested his framework along the years. This book could also benefit practitioners who are interested in changing geography by design while including public participation in the planning process and adopting a multidisciplinary approach. Overall, the book is extremely well written and Steinitz provides a critical and personal account of geodesign, which shows his expertise in the area from his years of teaching and carrying out geodesign work. The use of figures and real-world examples really helps support the discussion. But if you are looking for a textbook for ''how to'' do geodesign, or a list of technologies that enable geodesign, you need to look elsewhere. This is a book about the principles and practice of geodesign in a general sense, which provides a valuable resource for those interested in this topic.

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