

The Making of *Mapping for a Sustainable World*

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Introduction: *Mapping for a Sustainable World* is a jointly-published United Nations (UN) and International Cartographic Association (ICA) open source textbook providing an introductory guide for reaching the 17 Sustainable Development Goals (SDGs) through the monitoring and mapping of geospatial data (Kraak et al. 2020). The UN adopted the 2030 Agenda for Sustainable Development in 2015, and defined a global indicator *global indicator framework* of progress targets and data indicators for collective transformation and action toward a more equitable and just world: <https://sdgs.un.org/goals>. Cartography plays a critical role in public understanding of these data and the possibilities for change that they reveal over time (Kraak et al. 2019, Kent et al. 2020), although mapping them is not without its difficulties (Kraak et al. 2018, Pirani et al. 2020). *Mapping for a Sustainable World* provides background on cartographic design principles to navigate these challenges of mapping the SDGs.

Purpose: Here, we report on the “behind the scenes” design of *Mapping for a Sustainable World* conducted at the University of Wisconsin Cartography Lab (Cart Lab): <https://geography.wisc.edu/cartography/>. The text for *Mapping for a Sustainable World* was drafted by a team of editors from the UN Geospatial Information Section (Ayako Kagawa and Guillaume Le Sourd) and ICA (Menno-Jan Kraak, Britta Ricker, and Robert Roth), with some text derived from earlier collaborative activities between the UN and ICA. The Cart Lab completed the book design and layout as pro bono service to the ICA. As part of this service, the Cart Lab helped prepare 227 unique maps, diagrams, and figures for the book (Figure 1): 94 SDG maps, 68 schematic maps, 35 SDG diagrams, and 30 other figures. Some of these maps and figures were first designed by the editors while others were created from scratch in the Cart Lab, but all were edited and compiled into a single look and feel for the textbook across a Cart Lab team of two facstaff (Tanya Andersen Buckingham and Robert Roth) and four student designers (Gareth Baldrice-Franklin, Alicia Iverson, Chris Archuleta, and Megan Roessler). As the project evolved over nearly two years of work, we came to rely through experience on three major design tenets: (1) Design the book like an atlas, (2) maintain a living specification sheet, and (3) archive the data and design process for provenance.

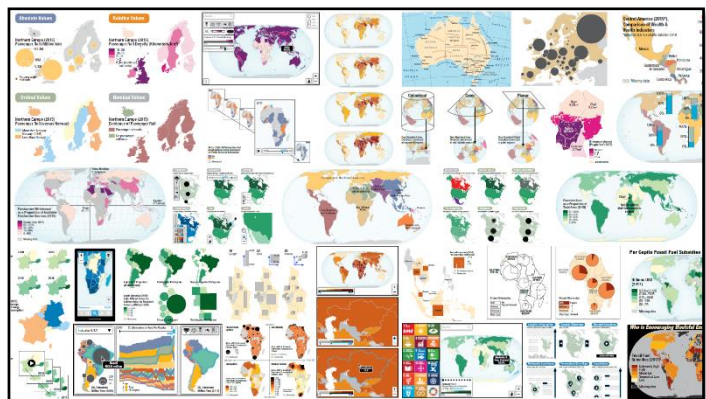


Figure 1: A sampling of maps, diagrams, and figures from *Mapping for a Sustainable World*.

Design the Book like an Atlas: The project team desired a small book versus a traditional textbook, both to maintain accessibility for readership not familiar with mapping and reduce printing costs. As a result, the book was designed in an A5 layout (148x210mm, 5-7/8x8-1/4in), which placed constraints on both the text length and figure design. Regarding text, we decided on maintaining each of the 51 “chapters” as a single, two-page spread, which reduced the text to roughly 250-500 words per topic depending on the number of supplemental figures. Because of the compartmentalized topical approach, we also created a comprehensive hyperlinking and glossary strategy to navigate non-linearly across the book. We then drew on principles of atlas layout to flow the text between the maps, diagrams, and other figures. Specifically, we imposed an eight-column grid across the two-page spread, using a 12-point rule and 12-point margins between columns and a 72-point gutter for the fold (Figure 2, top). Map templates were then designed to layout as 2-col, 3-col, 4-col, and 6-col assets, with 6-col maps breaking the Atlantic Ocean in the gutter. The 8-column grid was applied flexibly between text-heavy chapters and atlas-like inserts between sections (Figure 2, bottom), and therefore is a flexible template for any global mapping of the SDGs moving forward.

Maintain a Living Specification Sheet: Early in the project, we created a specification sheet to define and receive feedback on the look and feel of maps in the book (Figure 4). As the project evolved, we needed to append the spec sheet with additional map types and figures as well as revise prior specs to conform to design recommendations in the book itself. The spec sheet therefore became the key anchor point for discussing the book, accessible to all stakeholders through a shared cloud account. The spec sheet also enabled students to be brought into the process mid-project, using the spec sheet as a visual guide for quickly getting started on design. Ultimately the editors found the living spec sheet so valuable that an entry on Map Legends was added using portions of the spec sheet, resulting in 51 instead of the even 50 chapters in *Mapping for a Sustainable World*.

Archive the Data and Design Process for Provenance:

Finally, the global indicator framework is highly dynamic, and during the course of the project the United Nations published several updates in which the number and definition of targets and indicators changed. *Mapping for a Sustainable World* reflects the framework as of April 2020 and already is out of date. In addition, the United Nations revises or removes data from the Global SDG Indicators Database, and some of the indicator data we map or chart in the book no longer is available online. Accordingly, we devised a system to archive the data used for each map or diagram, available at: <https://github.com/uwcartlab/MappingSDGs>. We also provide our design process as a technical supplement at: <https://github.com/uwcartlab/MappingSDGsTechnicalSupplement> (Houtman & Roth 2021).

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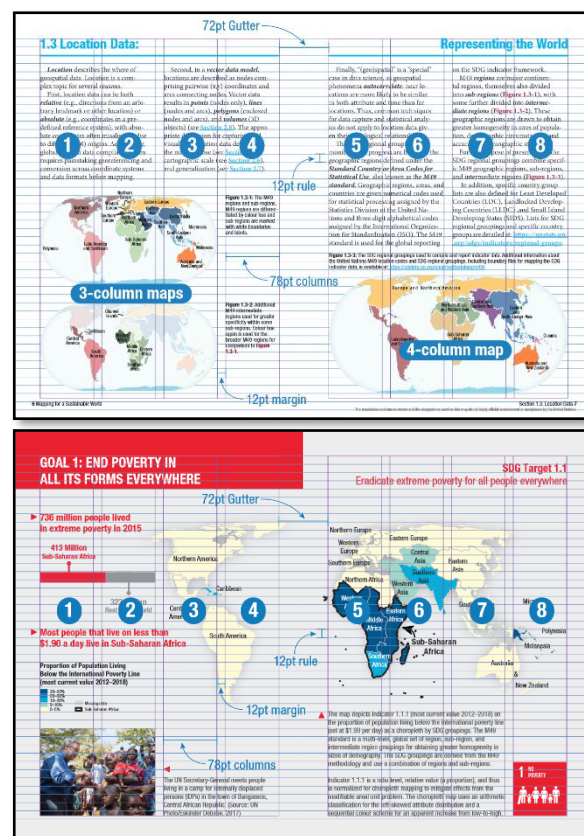


Figure 2: The grid on a chapter (top) and insert (bottom).

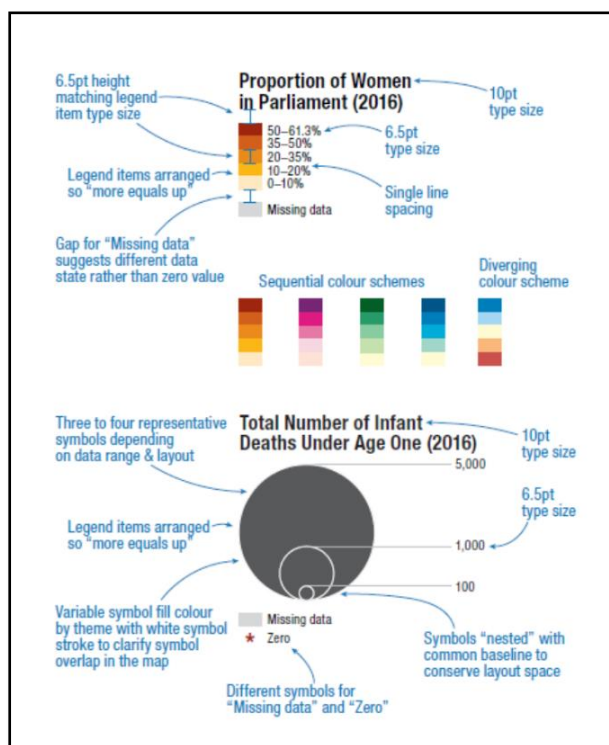


Figure 3: Excerpts from the living spec sheet.

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