

Preface

The term “map projection” suggests the idea of a translucent globe with a light inside shining the map outlines onto a flat surface. As a matter of fact, two well-known and very useful projections for limited areas, the Gnomonic and Stereographic, are derived directly from this perspective model, but most projections are produced mathematically.

The great majority of world map projections may be grouped into classes; each class has a distinctive outline and distortion pattern. Except perspectives, they are all mathematical constructions that have a variety of attributes.

There are hundreds of ways to arrange the globe surface within an oval, rectangle, or circle; no one system is best for all maps. Choosing a projection from among the many options requires something like a cost-benefit analysis. For every desirable quality there is often some consequent drawback, and furthermore the distortions associated with any map projection are not uniformly arranged; some parts of a projection are always less distorted than other parts.

Anyone who looks at world maps, on the printed page or on TV, should learn to make allowances for the distortions of shapes, sizes, directions, and distances that are bound to occur. Similarly, a cartographer, designer, editor, or anyone who wants to make a map or have one made for some use should make the selection of a projection an important element in the creative process. Projections should be chosen to best serve the objectives, and just as important, to keep from making a serious error by selecting one that is inappropriate.

To display the whole Earth on a flat map is a complicated operation. Before anything else can be done one must select a map projection to serve as a base. There are many from which to choose in each of the basic classes, and each one can be constructed in any desired aspect. One must settle on the necessary attributes and then adopt an appropriate distribution of the inevitable distortion.

It is not easy to make a choice, but the advantages of providing the best possible portrait of the Earth are worth the effort.

One of the tasks of the Commission on Map Projections of the International Cartographic Association (ICA) for the period 2011–2015 was to promote proper

use of map projections at all levels of education and for all map users. This book is the result of the four-year work.

In various publications on map projections, one can find a display of a great variety of map projections from which the choice of a particular map can be made. A well-chosen map projection is one which “extreme distortions are smaller than those in any other projection used to map the same area” and map properties match the purpose of the map. Yet, a map projection may have none of these general properties and still be satisfactory, or it can be widely used despite being considered a poor choice for a particular map.

Three small but valuable publications are:

- (1) Arthur H. Robinson and the Committee on Map Projections (1986): Which Map is the Best? Projections for World Maps. Special Publication No. 1 of the American Cartographic Association, American Congress on Surveying and Mapping, Falls Church, Virginia.
- (2) Arthur H. Robinson and the Committee on Map Projections (1988): Choosing a World Map: Attributes, Distortions, Classes, Aspects. Special Publication No. 2 of the American Cartographic Association, American Congress on Surveying and Mapping, Bethesda, Maryland.
- (3) Arthur H. Robinson and the Committee on Map Projections (1991): Matching the Map Projection to the Need. Special Publication No. 3 of the American Cartographic Association, American Congress on Surveying and Mapping, Bethesda, Maryland. As e-publication of the Cartography and Geographic Information Society available since 1997 at <https://courseware.e-education.psu.edu/projection/>.

Although none of the three publications is new, they are very informative and educational. The first two publications were printed and sold out. The third one is also available in digital format. A proposal by M. Lapaine was for the ICA Commission on Map Projections to take these three publications as a model and a base, and after some consideration and modification, as necessary, prepare and publish a new book on map projection choice.

The book ‘Choosing a Map Projection’ has been prepared by experts, but with the intention to serve laymen. The authors of the book are prominent persons in the field of map projections, as are famous Waldo Tobler, Fritz C. Kessler, Sarah E. Battersby, Michael P. Finn, Keith C. Clarke, Vladimir S. Tikunov, Henrik Hargitai, Bernhard Jenny, and Nedjeljko Frančula, just to mention some of them.

The book editors were Miljenko Lapaine and E. Lynn Usery, Chair and Vice-Chair respectively, of the ICA Commission on Map Projections for the period 2011–2015.

It is our hope the reader is going to be stimulated to understand map projections and appreciate their versatility. It is aimed at both those who display maps and those who look at them. Computer-assisted cartographic techniques now make a variety of map projections (along with coastlines and boundaries) quickly and inexpensively available. What is still needed is a more critical concern for their intelligent use taking into account distortions that are immanent in any map projection.

Finally, we would first like to thank authors who contributed to this book by writing about its theme from various angles. We would also like to thank CaGIS for permitting us to publish the first three chapters. We thank Professors Emeriti Waldo Tobler and Nedjeljko Frančula who read and reviewed individual chapters. E. Lynn Usery was responsible for proofreading and Marina Viličić produced nearly 130 new illustrations for the first three chapters. Springer's team contributed to making this book a reality. We thank all of them very much.

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