Map Projections Usgs

Map Projections--a Working ManualMap Projections Used for Large-scale Quadrangles by the U.S. Geological Survey
This book offers a much-needed critical approach to the intelligent use of the wide variety of map projections that are rapidly and inexpensively available today. It also discusses the distortions that are immanent in any map projection. A well-chosen map projection is one in which extreme distortions are smaller than those in any other projection used to map the same area and in which the map properties match its purpose. Written by leading experts in the field, including W. Tobler, F.C. Kessler, S.E. Battersby, M.P. Finn, K.C. Clarke, V.S. Tikunov, H. Hargitai, B. Jenny and N. Fran?ula. This book is designed for use by laymen. The book editors are M. Lapaine and E.L. Usery, Chair and Vice-Chair, respectively, of the ICA Commission on Map Projections for the period 2011-2015.
See journals under US Geological survey. Circular 982.
Supersedes USGS Circular 57, state coordinates and polyconic maps, dated May 1949, from which some portions are adapted.
Map projection concerns the science of mathematical cartography, the techniques by which the Earth's dimensions, shape and features are translated in map form, be that two-dimensional paper or two- or three- dimensional electronic representations. The central focus of this book is on the theory of map projections. Mathematical cartography also takes in map scales and their variation, the division of maps into sets of sheets and

nomenclature, and addresses the problems of making measurements and conducting investigations which make use of geodetic measurements and the development of graphical methods for solving problems of spherical trigonometry, marine- and aeronavigation, astronomy and even crystallography.

The GIS Weasel was designed to aid in the preparation of spatial information for input to lumped and distributed parameter hydrologic or other environmental models. The GIS Weasel provides geographic information system (GIS) tools to help create maps of geographic features relevant to a user's model and to generate parameters from those maps. The operation of the GIS Weasel does not require the user to be a GIS expert, only that the user have an understanding of the spatial information require- ments of the environmental simulation model being used. The GIS Weasel software system uses a GIS-based graphical user interface (GUI), the C programming language, and external scripting languages. The software will run on any computing plat- form where ArcInfo Workstation (version 8.0.2 or later) and the GRID extension are accessible. The user controls the process- ing of the GIS Weasel by interacting with menus, maps, and tables. The purpose of this document is to describe the operation of the software. This document is not intended to describe

the usage of this software in support of any particular environmental simulation model. Such guides are published separately.

This new Handbook unites cartographic theory and praxis with the principles of cartographic design and their application. It offers a critical appraisal of the current state of the art, science, and technology of map-making in a convenient and well-illustrated guide that will appeal to an international and multi-disciplinary audience. No single-volume work in the field is comparable in terms of its accessibility, currency, and scope. The Routledge Handbook of Mapping and Cartography draws on the wealth of new scholarship and practice in this emerging field, from the latest conceptual developments in mapping and advances in map-making technology to reflections on the role of maps in society. It brings together 43 engaging chapters on a diverse range of topics, including the history of cartography, map use and user issues, cartographic design, remote sensing, volunteered geographic information (VGI), and map art. The title's expert contributions are drawn from an international base of influential academics and leading practitioners, with a view to informing theoretical development and best practice. This new volume will provide the reader with an exceptionally wide-ranging introduction to mapping and cartography and aim to inspire further engagement within this dynamic and exciting field.

The Routledge Handbook of Mapping and Cartography offers a unique reference point that will be of great interest and practical use to all map-makers and students of geographic information science, geography, cultural studies, and a range of related disciplines.

A revised and expanded new edition of the definitive English work on map projections. The revisions take into account the huge advances in geometrical geodesy which have occurred since the early years of satellite geodesy. The detailed configuration of the geoid resulting from the GEOS and SEASAT altimetry measurements are now taken into consideration. Additionally, the chapter on computation of map projections is updated bearing in mind the availability of pocket calculators and microcomputers. Analytical derivation of some map projections including examples of pseudocylindrical and polyconic projections is also covered. Work undertaken in the USA and USSR on the creation of suitable map projections obtained through numerical analysis has been included. The book concludes with a chapter on the abuse and misrepresentation of map projections. An invaluable reference source for professional cartographers and all those interested in the fundamental problems of mapping the Earth.

After decades of using only one map projection, the Polyconic, for its mapping program, the U.S.

Geological Survey (USGS) now uses several of the more common projections for its published maps. For larger scale maps, including topographic quadrangles and the State Base Map Series, conformal projections such as the Transverse Mercator and the Lambert Conformal Conic are used. Equal-area and equidistant projections appear in the National Atlas. Other projections, such as the Miller Cylindrical and the Van der Grinten, are chosen occasionally for convenience, sometimes making use of existing base maps prepared by others. Some projections treat the Earth only as a sphere, others as either ellipsoid or sphere. The USGS has also conceived and designed several new projections, including the Space Oblique Mercator, the first map projection designed to permit mapping of the Earth continuously from a satellite with low distortion. The mapping of extraterrestrial bodies has resulted in the use of standard projections in completely new settings. Several other projections which have not been used by the USGS are frequently of interest to the cartographic public. With increased computerization, it is important to realize that rectangular coordinates for all these projections may be mathematically calculated with formulas which would have seemed too complicated in the past, but which now may be programmed routinely, especially if aided by numerical examples. A discussion of appearance, usage, and history is

given together with both forward and inverse equations for each projection involved.

A map projection fundamentally impacts the map making process. Working with Map Projections: A Guide to their Selection explains why, for any given map, there isn't a single "best" map projection. Selecting a projection is a matter of understanding the compromises and consequences of showing a 3-D space in two dimensions. It presents a clear understanding of the processes necessary to make logical decisions on selecting an appropriate map projection for a given data set. It discusses the logic needed in the selection process, why certain decisions should be made, and explains the consequences of any inappropriate decision made during the selection process. This book focuses clearly on explaining the processes involved in selecting a map projection, and how the map projection will impact the map's ability to fulfill its purpose, uses real world datasets as the basis for the selection of an appropriate map projection, and provides illustrations of an appropriately and inappropriately selected map projection for a given data set. It takes a novel approach to discussing map projections by avoiding an extensive inventory of mathematical formulae and using mathematics of map projections that matter for many mapping tasks. It also presents information that is directly applicable to the process of selecting map projections and is not tied to a specific software package. Written by leading experts, this book is an invaluable resource for anyone studying or working with geospatial data, from high school students to seasoned

professionals and will help readers successfully weigh the pros and cons of choosing one projection over another to suit the map's intended purpose.
Cartographers have long grappled with the impossibility of portraying the earth in two dimensions. To solve this problem, mapmakers have created map projections. This work discusses and illustrates the known map projections from before 500BC to the present, with facts on their origins and use.
Atlas of the United States] Grades 3-6 Atlas Features: [€[Extensive coverage of the United States and its regions through maps, photos, graphs, and text [€[Section on map & globe skills covers topics such as directions, scale, and how to read thematic maps [€[World map section features physical, political, and thematic maps [€[10 U.S. history maps [€[Eye-catching photos, engaging text, and fascinating "Time to Explore" features help to engage students [€[128 pages, paperback, 8.5" x 10 7/8"