

The background of the cover is a map of the Pacific region, overlaid with a vector field representing wind patterns. Two prominent cyclones are visible: one in the lower-left quadrant and another in the lower-right quadrant. The wind vectors are color-coded, with blue representing lighter winds and yellow/orange representing stronger winds. The text is overlaid on this background.

DISCOVER QGIS 3.x

Second Edition

**A Workbook for Classroom
or Independent study**

Kurt Menke

DISCOVER QGIS 3.X

Second Edition

A WORKBOOK FOR CLASSROOM

OR INDEPENDENT STUDY

KURT MENKE



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Discover QGIS 3.x - Second Edition

by Kurt Menke

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Foreword

Whether you are new to GIS or a seasoned GIS user trying to migrate to QGIS, the 2nd edition of Discover QGIS 3.x will allow you to quickly get up to speed with the basics as well as more complex tasks.

The book was written around the time QGIS 3.26 Buenos Aires was due for release. Despite the ever changing and evolving QGIS application, the book's content will remain relevant for many years to come. The shelf life of the book for most of the content goes well beyond the upcoming QGIS releases.

The book is a very good reference for educators and trainers who can find inspiration in its examples and content. With a gentle introduction to the basic concepts of GIS and QGIS, users can then delve into more practical applications and solve real life problems. You will find example files, and step-by-step instructions to solve spatial problems. Furthermore, readers are invited to participate in a series of questions and discussions so they can put their learning into practice.

One of the most powerful parts of QGIS is the cartographic tools. The book can be used as a best practice guide for creating clear and meaningful maps by following some well explained techniques. There is also more content for advanced features such as the geometry generator and blending modes, helping you bring your maps to a whole new level.

The spatial analysis section explores the various tools and algorithms available in QGIS. Each example explains the type of problem, how it can be solved using one or more spatial algorithms in QGIS, and what input data and parameters are required.

QGIS or any GIS software is only as good as the data. This is the first QGIS-related book which extensively covers the various aspects of data collection: defining a survey project, creating its map layers and designing forms for easing data collection in the field.

To summarize why I recommend this book to all QGIS enthusiasts, students and educators, you need look no further than Kurt Menke's enthusiasm and eagerness over the past 20 years for learning new and upcoming features in QGIS and his passion to train, educate and raise awareness in those who can greatly benefit from using QGIS.

Saber Razmjooei
Managing Director
Lutra Consulting

About this Book

This year we are celebrating the 20th anniversary of QGIS, and to continue the celebration, it is with great pleasure that I welcome you to the Second Edition of Discover QGIS 3.x. This is an update to the original Discover QGIS 3.x title published in 2019. Since 2019, there have been 10 new QGIS releases, three of which were long-term releases. With improved processing, streamlined workflows, support for point cloud data, development of the Temporal Controller, and improved symbology options, it is an exciting time to be learning QGIS. The improvements in QGIS 3.x allow this Second Edition of Discover QGIS 3.x to be roughly the same length as its predecessor and cover many more features.

You will find clear learning objectives and a task list at the beginning of each chapter. Of the 31 exercises in this workbook, 7 are new and 8 have seen considerable updates. Among the 500 new screenshots, this edition includes new figures showing the layout of each GUI. There are more thorough descriptions of many features, for instance, blending modes. There was a time when cartography was a weakness of QGIS. Today it is one of its greatest strengths. The final two parts of the book teach you many modern cartographic and data visualization features unique to QGIS. All of the exercises are up to date with QGIS 3.24 - Tisler, yet will still work with the long-term release version 3.22 Białowieża. The exceptions to this are Part 5 - Exercise 7 - Task 2 and Exercise 9 - Task 2 which include a new Elevation Profile tool. These can only be accomplished with version 3.26 Buenos Aires, which is clearly noted in the text. Another new feature is a series of Appendices which cover working with CRSs, keyboard shortcuts, useful plugins and contributing to the QGIS project. This workbook will serve you for a long time.

As with the first edition, the Second Edition of Discover QGIS 3.x is largely based on The GeoAcademy. The first three parts are updates to the original GeoAcademy material. In addition, I augment that material with features I find invaluable in my day-to-day work as a GIS consultant. This workbook represents the best parts of the GeoAcademy combined with my diverse experience teaching QGIS, and using it in an applied work setting. The notes included throughout introduce features not explicitly addressed by the exercise, but of which you should be aware. I hope you enjoy the book!

The GeoAcademy

The GeoAcademy was founded in 2013, when Dr. Phil Davis brought together subject matter experts to author the first ever GIS curriculum based on a national standard—the U.S. Department of Labor’s Geospatial Competency Model (GTCM). The GTCM is a hierarchical model of the knowledge, skills, and abilities (KSA’s) needed to be a working GIS professional in today’s marketplace. Forty U.S. college GIS educators vetted these KSA’s. Since 95% of U.S based colleges and universities use a single vendor’s GIS software, the GeoAcademy decided to offer an alternative free and open source GIS curriculum. A cost effective and accessible alternative. Over the summer of 2014 the exercises were beta tested on Canvas by over 3,000 students. The first edition of the GeoAcademy was released in September 2014. The GeoAcademy’s mission was an attempt to teach GIS using QGIS, versus the creation of a QGIS manual.

Since its development, the GeoAcademy curriculum has been presented at several FOSS4G conferences and is relied on by many professors in their GIS programs. Over 5,000 people enrolled in the online GeoAcademy MOOC. In 2015 the GeoAcademy team won the Global Educator of the Year Team Award by GeoForAll (<http://www.geoforall.org/>).

Who This Book is For

The original motivation behind the GeoAcademy was to produce material that could be easily used, in whole or in part, by instructors wanting to incorporate QGIS into their curricula. This motivation holds true for Discover QGIS 3.x. It is designed for the classroom. It introduces the QGIS interface and covers: basic GIS concepts, spatial analysis, modeling, data creation and editing, cartographic design and data visualization. The material is modular. Instructors can opt to use the book in its entirety or select specific exercises to augment their courses.

There are solution files for each exercise and many exercises include a challenge exercise and discussion questions.

Discover QGIS 3.x also serves as an independent study resource for beginners and experts alike. New to GIS? This workbook guides you on an introductory path. Wishing to learn the new workflows and features in QGIS 3.x? It's in here too.

The Data

The data for this book are available for download at http://locatepress.com/workbook_qgis3. They are organized by part and exercise. Each exercise includes solution files and answers to exercise questions. The package for the entire workbook is 3 Gb in size (1.6 Gb zipped). The size of the data package is in part due to the fact that this workbook deals with many different types of data such as imagery, mesh and point cloud data. The data for most exercises is quite small and manageable. It is also due to the author's belief that it is beneficial to learn using data from numerous sources covering different topic areas. All the data are in the public domain.

About the Author

After running a successful consulting business in the USA, Kurt moved to Denmark in the middle of the pandemic. Oddly the pandemic provided the necessary space to make this large move. He and his wife moved in early January, 2021. Kurt now works the Danish open-source geospatial firm Septima P/S (<https://septima.dk/>) in Copenhagen. He wrote this updated second edition from his new home office in Helsingør, Denmark.

Kurt was a professional archaeologist before returning to graduate school and earning Masters of Arts degree in Geography from the University of New Mexico in 2000. His areas of focus are public health, conservation and education. Kurt Menke has a broad skillset. He is a spatial analyst, cartographer, web map developer, trainer/teacher and author. He has a long history using QGIS. He first downloaded it in 2005 when it was at version 0.7 Seamus. He is an open-source GIS authority, having authored and co-authored eight books on QGIS. He can frequently be found speaking at FOSS4G and QGIS conferences. In 2015 was elected as an OsGeo Charter Member. He is an experienced FOSS4G educator and is a co-author of the GeoAcademy. Kurt developed his first semester long course on QGIS in 2009. He is a QGIS Certified Instructor. His current courses can be browsed here: <https://septima.dk/courses.html>. In 2015 he was awarded the Global Educator of the Year Team Award by GeoForAll as part of the GeoAcademy team.

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