
Preface third edition

Geographical Resources Analysis Support System (GRASS) is one of the largest Free Software Geographical Information System (GIS) projects released under the GNU General Public License (GPL). It combines powerful raster, vector, and geospatial processing engines into a single integrated software suite and includes tools for spatial analysis, modeling, image processing and sophisticated visualization.

With this third edition of *Open Source GIS: A GRASS GIS Approach*, we enter the new era of GRASS 6, the first release that includes substantial new code developed by the International GRASS Development Team. It comes at a time when dramatic growth in acceptance of the Open Source concept fuels further development of Free and Open Source Software for Geoinformatics (FOSS4G) and brings interoperability to a new level of efficiency. The major FOSS4G projects, including GRASS, have become part of the OSGeo foundation – an organization established in 2006 to “support and promote the collaborative development of open geospatial technologies and data.” Following the spirit of the foundation, GRASS is tightly integrated with the latest GDAL/OGR and PROJ libraries supporting range of raster and vector formats, as well as projections. GRASS toolkits for Quantum GIS (QGIS) and R Project for Statistical Computing have been developed thanks to strong links with these projects.

The third edition of *Open Source GIS: A GRASS GIS Approach* reflects these new developments. The first chapter includes information about the OSGeo foundation. Chapter three that introduces GRASS and the new sample data set, has added information about the new graphical user interfaces that can be used with GRASS 6. The properties of GRASS raster and vector data are described in chapter four, which also includes extensive material on importing data in various formats, and an introduction to new geocoding tool. The raster chapter has been enhanced with new examples, more comprehensive topographic analysis and modeling, and introduction to voxel data processing. The chapter on vector data has been completely rewritten to reflect introduction of a new vector data format and attribute support through

database management system (DBMS) in GRASS 6. This chapter now includes new sections on attribute database management and SQL support, vector networks analysis, linear reference systems, and lidar data applications. The site data chapter of earlier book editions was integrated within the chapter six as vector point data processing section. The visualization chapter reflects the changes in 2D display, nviz, and use of Paraview. Image processing was reduced and updated, orthophoto chapter was eliminated to make space for more new material. Application chapter was merged with raster analysis. Equations and SQLite-ODBC connection guide were added into Appendix. All chapters were enhanced with numerous practical examples using the first release of a free, comprehensive, state-of-the-art geospatial data set. The examples are based on the GRASS 6.3 version from July 2007.

Finally, we briefly recall history of GRASS and this book: GRASS was developed in 1982-1995 by the U.S. Army Corps of Engineers Construction Engineering Research Laboratory (CERL) in Champaign, Illinois to support land management at military installations. After CERL withdrew from further GRASS development in 1995, the GRASS 4.2.1 release, published in 1998, was coordinated by this book's author at the Institute of Physical Geography and Landscape Ecology, University of Hannover. The development of the GRASS 5.0 release started in 1999 when GRASS was released under GPL. Since 2001, the "GRASS Development Team" has its headquarters at FBK-ITC (Centro per la Ricerca Scientifica e Tecnologica), Trento, Italy. GRASS 5.0.0 was officially released in 2002, accompanied by the first FOSS4G – GRASS users conference held in September 2002 in Trento, Italy, and by the publication of the first edition of this book.

The book has its own history. It started as "GRASS Recipes" written in 1995 for students at the Institute of Landscape Architecture, University of Hannover. In 1996, the first continuous German text was written and later published in "Geosynthesis" series at the Geographical Institute, University of Hannover. The first english edition of the book, published in June 2002, was the result of collaborative work of a number of translators and a new coauthor. It was written for the GRASS 5.0pre3 release. The second edition, published in 2004, was based on the GRASS 5.3 release and included updates reflecting the system enhancements and the feedback from our readers. This third edition is based on GRASS 6 and represents a fundamental update and enhancement of the material.

The GRASS project's Web site, providing access to the GRASS software and documentation, can be reached at "GRASS Headquarters" at <http://grass.itc.it> and a number of mirror sites. The material related to this book can be accessed at <http://grassbook.org>.

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