Advanced information technology infrastructure is being employed increasingly in the Earth sciences to provide researchers with efficient access to massive databases and an ability to integrate diversely formatted information from a variety of sources.

A range of geoinformatics initiatives are enabling manipulation, modeling, and visualization of Earth Science data and are helping to develop integrated Earth models at various scales, and from the near surface to the deep interior.

This book provides a series of case studies that demonstrate the use of cyber-infrastructure across the Earth Sciences. Chapters are grouped thematically into sections that cover data collection and management; modeling and community computational codes; visualization and data representation; knowledge management and data integration; web services and scientific workflows.

Geoinformatics is a fascinating and accessible introduction to this emerging field for readers across the solid Earth sciences and is an invaluable reference for researchers interested in initiating new cyberinfrastructure projects of their own.

G. Randy Keller is a Professor of Geophysics and McCullogh Chair at the Mewbourne College of Earth and Energy, University of Oklahoma.

Chaitanya Baru is a Distinguished Scientist at the San Diego Supercomputer Center, University of California-San Diego.

The two editors have collaborated since the emergence of geoinformatics as an organized scientific initiative in the USA in the late 1990s – helping to lead and organize the US Geoinformatics initiative and communicate its potential to colleagues around the world, both informally and through many appointments to advisory committees. Both Professor Keller and Dr. Baru are also Principal Investigators on the GEON (Geoscience Network) project that is a major effort funded by the National Science Foundation. While early geoinformatics programmes focused on database creation and on the development of highly functional software tools, these have since been merged with other efforts, such as high-performance computing and integrated earth-system modeling, to create a more extensive cyberinfrastructure for the geosciences. Dr. Baru’s work at the San Diego Supercomputer Center has involved cyberinfrastructure activities across a range of scientific subject areas, while Professor Keller’s research has focused on applications specific to the geosciences.
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