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Nota di contenuto	Title Page; Copyright; Table of Contents; Dedication; Preface; About the Companion Website; List of Acronyms; Part I: GIS, Geocomputation, and GIS Data; Chapter 1: Introduction; 1.1 What is geocomputation?; 1.2 Geocomputation and water resources science and engineering; 1.3 GIS-enabled geocomputation in water resources science and engineering; 1.4 Why should water resources engineers and scientists study GIS; 1.5 Motivation and organization of this book; 1.6 Concluding remarks; Conceptual questions; References; Chapter 2: A Brief History of GIS and Its Use in Water Resources Engineering 2.1 Introduction2.2 Geographic Information Systems (GIS)-software and hardware; 2.3 Remote sensing and global positioning systems and development of GIS; 2.4 History of GIS in water resources applications; 2.5 Recent trends in GIS; 2.6 Benefits of using GIS in water resources engineering and science; 2.7 Challenges and limitations of GIS-based approach to water resources engineering; 2.8 Concluding remarks; Conceptual questions; References; Chapter 3: Hydrologic Systems and Spatial Datasets; 3.1 Introduction; 3.2 Hydrological processes in a watershed

3.3 Fundamental spatial datasets for water resources planning: management and modeling studies3.4 Sources of data for developing digital elevation models; 3.5 Sensitivity of hydrologic models to DEM resolution; 3.6 Accuracy issues surrounding land use land cover maps; 3.7 Sensitivity of hydrologic models to LULC resolution; 3.8 Sources of data for developing soil maps; 3.9 Accuracy issues surrounding soil mapping; 3.10 Sensitivity of hydrologic models to soils resolution; 3.11 Concluding remarks; Conceptual questions; References; Chapter 4: Water-Related Geospatial Datasets; 4.1 Introduction
4.2 River basin, watershed, and subwatershed delineations4.3 Streamflow and river stage data; 4.4 Groundwater level data; 4.5 Climate datasets; 4.6 Vegetation indices; 4.7 Soil moisture mapping; 4.8 Water quality datasets; 4.9 Monitoring strategies and needs; 4.10 Sampling techniques and recent advancements in sensing technologies; 4.11 Concluding remarks; Conceptual questions; References; Chapter 5: Data Sources and Models; 5.1 Digital data warehouses and repositories; 5.2 Software for GIS and geocomputations; 5.3 Software and data models for water resources applications
5.4 Concluding remarksConceptual questions; References; Part II: Foundations of GIS; Chapter 6: Data Models for GIS; 6.1 Introduction; 6.2 Data types, data entry, and data models; 6.3 Categorization of spatial datasets; 6.4 Database structure, storage, and organization; 6.5 Data storage and encoding; 6.6 Data conversion; 6.7 Concluding remarks; Conceptual questions; Hands-on exercises; References; Chapter 7: Global Positioning Systems (GPS) and Remote Sensing; 7.1 Introduction; 7.2 The global positioning system (GPS); 7.3 Use of GPS in water resources engineering studies
7.4 Workflow for GPS data collection
