

Groundwater In Geologic Processes

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Introduction to Hydrogeology David Deming 2002 This book is an introduction to hydrogeology and assumes that students have had one year of basic college calculus (differential and integral calculus). It's applicable for hydrogeology, geohydrology, groundwater and geologic fluids courses taken by juniors and seniors, and may also

find application in graduate courses which emphasize the role of fluids in geologic applications. The primary goal is to emphasize the geologic aspects of hydrogeology -- the text is not designed solely for those who desire to specialize in hydrogeology. Fluids are intimately involved in nearly all geologic processes, and this text is designed to introduce the average

student to that world.

Geological Aspects of Hazardous Waste Management

Stephen M. Testa 1993-11-18
Geologic Aspects of Hazardous Waste Management brings together technical, legislative, regulatory, and business aspects of hazardous waste issues as they pertain to preventing, assessing, containing, and remediating soil and groundwater contamination. The book emphasizes how subsurface geologic and hydrogeologic conditions affect the decision-making process, and it focuses on critical issues facing industry, government, and the public. The book is excellent for consultants, project managers, regulators, geologists, geophysicists, hydrologists, hydrogeologists, risk assessors, environmental engineers, chemists, toxicologists, and environmental lawyers.

Hydrogeology Kevin M. Hiscock
2021-10-18 HYDROGEOLOGY Hydrogeology:

Principles and Practice provides a comprehensive introduction to the study of hydrogeology to enable the reader to appreciate the significance of groundwater in meeting current and future environmental and sustainable water resource challenges. This new edition has been thoroughly updated to reflect advances in the field since 2014 and includes over 350 new references. The book presents a systematic approach to understanding groundwater starting with new insights into the distribution of groundwater in the Earth's upper continental crust and the role of groundwater as an agent of global material and elemental fluxes. Following chapters explain the fundamental physical and chemical principles of hydrogeology, and later chapters feature groundwater field investigation techniques in the context of catchment processes, as well as chapters on groundwater quality and contaminant

hydrogeology, including a section on emerging contamination from microplastic pollution. Unique features of the book are chapters on the application of environmental isotopes and noble gases in the interpretation of aquifer evolution, and a discussion of regional characteristics such as topography, compaction and variable fluid density on geological processes affecting past, present and future groundwater flow regimes. The last chapter discusses future challenges for groundwater governance and management for the long-term sustainability of groundwater resources, including the role of managed aquifer recharge, and examines the linkages between groundwater and climate change, including impacts on cold-region hydrogeology. Given the drive to net-zero carbon emissions by 2050, the interaction of groundwater in the exploitation of energy resources, including renewable resources

and shale gas, is reviewed. Throughout the text, boxes and a set of colour plates drawn from the authors' teaching and research experience are used to explain special topics and to illustrate international case studies ranging from transboundary aquifers and submarine groundwater discharge to the hydrogeochemical factors that have influenced the history of malting and brewing in Europe. The appendices provide conversion tables and useful reference material, and include review questions and exercises, with answers, to help develop the reader's knowledge and problem-solving skills in hydrogeology. This highly informative and accessible textbook is essential reading for undergraduate and graduate students primarily in earth sciences, environmental sciences and physical geography with an interest in hydrogeology or groundwater topics. The book will also find use among practitioners

in hydrogeology, soil science, civil engineering and landscape planning who are involved in environmental and resource protection issues requiring an understanding of groundwater.

Geology for Engineers and

Environmental Scientists Alan E. Kehew

2021-12-29 The fourth edition of Geology for Engineers and Environmental Scientists provides students with a basic foundation in the principles of geology, along with an illustration of how engineers must design and build their projects with natural geologic materials and protect them from potentially hazardous geologic processes. Kehew introduces engineering topics including soil and rock mechanics with a quantitative approach that will give students a head start in more advanced engineering courses. The book is prefaced with a discussion of engineering and environmental challenges that our society must face in the current

century, such as population growth, scarcity of water and mineral resources, transition to renewable energy, and effects of climate change. Numerous examples of engineering and environmental applications ranging from short descriptions to extensive case histories, such as the “Big Dig” in Boston to the effects of Hurricane Katrina and reconstruction afterward, are included in every chapter. A full chapter is devoted to subsurface contamination and cleanup technologies. For the first time, a large color insert will highlight geological features in the field.

Earth and Environmental Sciences

Imran Ahmad Dar 2011-12-07 We are increasingly faced with environmental problems and required to make important decisions. In many cases an understanding of one or more geologic processes is essential to finding the appropriate solution. Earth and Environmental Sciences are by

their very nature a dynamic field in which new issues continue to arise and old ones often evolve. The principal aim of this book is to present the reader with a broad overview of Earth and Environmental Sciences. Hopefully, this recent research will provide the reader with a useful foundation for discussing and evaluating specific environmental issues, as well as for developing ideas for problem solving. The book has been divided into nine sections; Geology, Geochemistry, Seismology, Hydrology, Hydrogeology, Mineralogy, Soil, Remote Sensing and Environmental Sciences.

Science for Decisionmaking National Research Council 1999-10-20 The coastlines of the United States are beautiful places to live, work and play. But, they are also very fragile areas whose ecosystems are vulnerable to mismanagement. There are many complex issues facing the ocean

science community at the federal, state and local levels - this report reflects the conclusions and recommendations of the National Academies drawing on discussions with USGS as well as input from potential users, clients and collaborators of the Coastal and Marine Geology Program.

Hydrogeology and Simulation of Groundwater Flow in Cedar Valley, Utah County, Utah Juliette Lucy Jordan 2013-01 This CD contains a 125-page comprehensive study of the hydrogeology of Cedar Valley, Utah County, located in north-central Utah. The report includes 72 figures; two plates, one of which is a potentiometric map of the basin-fill, bedrock, and several perched aquifers; and seven appendices of data. Field investigations included groundwater chemistry sampling, regular water-level monitoring, and multiple-well aquifer testing. The field data were incorporated into a 3D digital groundwater flow model

using MODFLOW2000. Seventy percent of the recharge to the Cedar Valley aquifer system is from precipitation in the Oquirrh Mountains. Groundwater generally flows from west to east and exits the aquifer system mostly as interbasin flow through bedrock to the northeast and southeast. The groundwater model showed a 39-year (1969-2007) average recharge to the Cedar Valley groundwater system of 25,600 acre-feet per year and discharge of 25,200 acre-feet per year. A significant volume of precipitation recharge (perhaps 4300 acre-feet per year) does not interact with the basin-fill aquifer but travels within bedrock to discharge to adjacent valleys or as bedrock well discharge. 125 pages + 2 plates

Crustal Permeability Tom Gleeson
2016-11-30 Permeability is the primary control on fluid flow in the Earth's crust and is key to a surprisingly wide range of

geological processes, because it controls the advection of heat and solutes and the generation of anomalous pore pressures. The practical importance of permeability – and the potential for large, dynamic changes in permeability – is highlighted by ongoing issues associated with hydraulic fracturing for hydrocarbon production (“fracking”), enhanced geothermal systems, and geologic carbon sequestration. Although there are thousands of research papers on crustal permeability, this is the first book-length treatment. This book bridges the historical dichotomy between the hydrogeologic perspective of permeability as a static material property and the perspective of other Earth scientists who have long recognized permeability as a dynamic parameter that changes in response to tectonism, fluid production, and geochemical reactions.

Gravitational Systems of Groundwater

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Flow József Tóth 2009-04-16 This book recognises groundwater flow as a fundamental geologic agent, and presents a wide-ranging and illustrated overview of its history, principles, scientific consequences and practical utilization. The author, one of the founding fathers of modern hydrogeology, highlights key interrelationships between seemingly disparate processes and systems by tracing them to a common root cause - gravity-driven groundwater flow. Numerous examples demonstrate practical applications in a diverse range of subjects, including land-use planning, environment protection, wetland ecology, agriculture, forestry, geotechnical engineering, nuclear-waste disposal, mineral and petroleum exploration, and geothermal heat flow. The book contains numerous user-friendly features for a multidisciplinary readership, including full explanations of the relevant

mathematics, emphasis on the physical meaning of the equations, and an extensive glossary. It is a key reference for researchers, consultants and advanced students of hydrogeology and reservoir engineering.

Estimating Groundwater Recharge

Richard W. Healy 2010-09-30 Understanding groundwater recharge is essential for successful management of water resources and modeling fluid and contaminant transport within the subsurface. This book provides a critical evaluation of the theory and assumptions that underlie methods for estimating rates of groundwater recharge. Detailed explanations of the methods are provided - allowing readers to apply many of the techniques themselves without needing to consult additional references. Numerous practical examples highlight benefits and limitations of each method. Approximately 900 references allow advanced practitioners

to pursue additional information on any method. For the first time, theoretical and practical considerations for selecting and applying methods for estimating groundwater recharge are covered in a single volume with uniform presentation. Hydrogeologists, water-resource specialists, civil and agricultural engineers, earth and environmental scientists and agronomists will benefit from this informative and practical book. It can serve as the primary text for a graduate-level course on groundwater recharge or as an adjunct text for courses on groundwater hydrology or hydrogeology. For the benefit of students and instructors, problem sets of varying difficulty are available at http://www.brr.cr.usgs.gov/projects/GW_Unsat/Recharge_Book/

Geology Stanley Chernicoff 1999 To effectively introduce core concepts, this first-year survey text shifts the focus from

learning terminology to understanding--and observing--the range of earth's geologic processes. The Third Edition retains all the features which have made the text popular among students, while integrating new or enhanced elements and material including a significantly revised art program and a suite of technology supplements. The pedagogical aids which appear throughout help students to assimilate the material and continually reassess their progress. At the end of every chapter, new On-the-Web activities encourage the use of web resources, Learning Actively exercises challenge students to apply their knowledge to their surroundings, and Chapter Summaries are now shorter to allow for faster review. New! The revised art program presents a level of detail appropriate for introductory students, and demonstrates naturalism as well as technical accuracy--ensuring that the basics are skillfully communicated. New! Geology

at a Glance sections act as quick, visual reference tools summarizing difficult ideas using figures, photos, and flow charts. New! Highlight boxes are now divided into three categories to actively illustrate the relevance of abstract geologic principles to students' daily lives: Environmental, Earth System Science, and Application/Everyday Interest boxes. New! A strong technology package facilitates learning through interactive tutorials and a web site with ACE self-tests, lab simulations, and a link to www.geologylink.com, Houghton Mifflin's award-winning site for the geology community. Instructors may access PowerPoint slides on the web site, as well as additional classroom resources.

Geologic Processes at the Land Surface
Howard Gordon Wilshire 1996

[The Web of Geological Sciences](#) Marion Eugene Bickford 2013 "This volume covers many of the important advances in the

geological sciences from 1963 to 2013. These advances include understanding plate tectonics, exploration of the Moon and Mars, development of new computing and analytical technologies, understanding of the role of microbiology in geologic processes, and many others"--Provided by publisher.

Selected Water Resources Abstracts 1990
New Publications of the U.S. Geological Survey 1998

Introduction to Environmental Geology
Edward A. Keller 2002 This text presents geologic processes in context with their impact on humans, our lives and societies. The author's goal is to both create informed citizens and nurture an understanding of geologic science. Part I introduces philosophy and fundamental concepts, the structure of the Earth and plate tectonics, and the origin and significance of rocks and minerals. Part II addresses the major natural

hazards including earthquakes, volcanic activity, rivers and flooding, landslides, and coastal processes. Part III discusses the major natural resources associated with the geological environment and the subject of pollution. Part IV presents the important topic of global change, environmental management, and relationships between the environment. For individuals looking for an environmental perspective on physical geology.

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Imran Ahmad Dar 2011-12-07 We are increasingly faced with environmental problems and required to make important decisions. In many cases an understanding of one or more geologic processes is essential to finding the appropriate solution. Earth and Environmental Sciences are by their very nature a dynamic field in which new issues continue to arise and old ones often evolve. The principal aim of this book

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Managing the Nation's Public Lands

United States. Bureau of Land Management 1982

Practical and Applied Hydrogeology

Zekâi Şen 2014-08-23 Applications in Hydrogeology for Geoscientists presents the most recent scientific developments in the field that are accessible yet rigorous enough for industry professionals and academic researchers alike. A multi-contributed

reference that features the knowledge and experience of the field's experts, the book's chapters span the full scope of hydrogeology, introducing new approaches and progress in conceptualization, simulation of groundwater flow and transport, and progressive hydro-geophysical methods. Each chapter includes examples of recent developments in hydrogeology, groundwater, and hydrology that are underscored with perspectives regarding the challenges that are facing industry professionals, researchers, and academia. Several sub-themes—including theoretical advances in conceptualization and modeling of hydro-geologic challenges—connect the chapters and weave the topics together holistically. Advances in research are aided by insights arising from observations from both field and laboratory work. Introduces new approaches and progress in hydrogeology,

including conceptualization, simulated groundwater flow and transport, and cutting edge hydro-geophysical methods Features more than 100 figures, diagrams, and illustrations to highlight major themes and aid in the retention of key concepts Presents a holistic approach to advances in hydrogeology, from the most recent developments in reservoirs and hydraulics to analytic modeling of transient multi-layer flow and aquifer flow theory Integrates real life data, examples and processes, making the content practical and immediately implementable

Geologic Framework of the Regional Ground-water Flow System in the Upper Deschutes Basin, Oregon Kenneth E. Lite 2002

A geology for engineers Francis George Henry Blyth 1998

Essentials of Medical Geology Olov Selinus 2005-02-08 This authoritative

reference volume emphasizes the importance and interrelationships of geological processes to the health and diseases of humans and animals. Its accessible format fosters better communication between the health and geoscience communities by elucidating the geologic origins and flow of toxic elements in the environment that lead to human exposure through the consumption of food and water. For example, problems of excess intake from drinking water have been encountered for several inorganic compounds, including fluoride in Africa and India; arsenic in certain areas of Argentina, Chile, and Taiwan; selenium in seleniferous areas in the U.S., Venezuela, and China; and nitrate in agricultural areas with heavy use of fertilizers. Environmental influences on vector borne diseases and stormflow water quality influences are also featured. Numerous examples of the environmental

influences on human health from across the globe are also presented and discussed in this volume. * Covers recent advances and future research topics at the intersection of environmental science and public health * Developed by 60 experts from 20 countries and edited by professionals from the International Working Group on Medical Geology * Includes 200+ color photographs and illustrations * Organizes information in a highly structured format for easy reference * Written for a broad audience, ranging from students, researchers, and medical professionals to policymakers and the general public

Groundwater R. Allan Freeze 1979 The authors perceive a trend in the study and practice of groundwater hydrology. They see a science that is emerging from its geological roots and its early hydraulic applications into a full-fledged environmental science. They see a science

that is becoming more interdisciplinary in nature and of greater importance in the affairs of man. This book is their response, and they have provided a text that is suited to the study of groundwater during this period of emergence.

Ground-water Resources of the Middle Rio Grande Basin, New Mexico James R. Bartolino 2002

Groundwater in Geologic Processes Steven E. Ingebritsen 2006-05-04 An extensively revised 2006 second edition of the well received and widely adopted textbook on groundwater.

Uncertainties in Long-term Repository Performance Due to the Effects of Future Geologic Processes A. L. Sjoeren 1984

Groundwater in Geologic Processes Steven E. Ingebritsen 2006-05-04 The 2006 second edition of this well received and widely adopted textbook has been extensively

revised to provide a more comprehensive treatment of hydromechanics (the coupling of groundwater flow and deformation), to incorporate findings from the substantial body of research published since the first edition, and to include three new chapters on compaction and diagenesis, metamorphism, and subsea hydrogeology. The opening section develops basic theory of groundwater motion, fluid-solid mechanical interaction, solute transport, and heat transport. The second section applies flow, hydromechanics, and transport theory in a generalized geologic context, and focuses on particular geologic processes and environments. A systematic presentation of theory and application coupled with problem sets to conclude each chapter make this text ideal for use by advanced undergraduate and graduate-level hydrogeologists and geologists. It also serves as an invaluable reference for

professionals in the field.

Hydrogeology William Back 1988 Discusses hydrogeology from the geological perspective. After describing the major features of 28 hydrogeologic regions of North America, the volume devotes eight chapters to discussion of the comparative hydrogeology of kinds of different bedrock regimes and surficial deposits; seven chapters to geologic processes including karstification, diagenesis, tectonics, ore deposits, and hydrocarbon migration intimately involved with ground water; and two concluding chapters to a look at future scientific and societal problems related to ground water.

Groundwater in Geologic Processes S. E. Ingebritsen 1998 Groundwater in Geologic Processes first develops the basic theory of groundwater motion, solute transport, and heat transport. The second section applies flow and transport theory in a generalized

geologic context and focuses on particular geologic processes and environments. The systematic presentation of theory and application makes this book ideal for graduate-level hydrogeologists and geologists with backgrounds in calculus and introductory chemistry. It will also be an invaluable reference for professionals in the field.

Urban Watersheds Daniel T. Rogers 2020-06-05 Understanding that the natural world beneath our feet is the point at which civilization meets the natural world is critical to the success of restoration and prevention efforts to reduce contaminant impacts and improve the global environment because of one simple fact – contaminants do not respect country borders. Contaminants often begin their destructive journey immediately after being released and can affect the entire planet if the release is in just the right amount, at just the right

location, and at just the right time. Taking an interdisciplinary approach, *Urban Watersheds, Geology, Contamination, Environmental Regulations, and Sustainability, Second Edition* presents more than 30 years of research and professional practice on urban watersheds from the fields of environmental geology, geochemistry, risk analysis, hydrology, and urban planning. The geological characteristics of urbanized watersheds along with the physical and chemical properties of their common contaminants are integrated to assess risk factors for soil, groundwater, and air. This new edition continues to examine the urban environment and the geology beneath urban areas, evaluates the contamination that affects watersheds in urban regions, and addresses redevelopment strategies. Features of the Second Edition: Examines contaminants and the successes of

environmental regulation worldwide and highlights the areas that need improvement Describes several advances in investigation techniques in urban regions that now provide a huge leap forward in data collection, resolution, and accuracy Explains the importance of understanding the geological and hydrogeologic environments of urban and developed regions Provides new and enhanced methods presented as a sustainability model for assessing risks to human health and the environment from negative human-induced contaminant impacts Includes a new chapter that surveys how environmental regulations have been successful or have failed at protecting the air, water, and land in urban areas Suitable for use as a textbook and as a professional practice reference, the book includes case studies on successful and unsuccessful approaches to contaminant remediation as well as practical methods for environmental

risk assessment. PowerPoint® presentations of selected portions of the book are available with qualifying course adoption.

Daniel T. Rogers is currently the Director of Environmental Affairs at Amsted Industries Inc. in Chicago, Illinois. His writings address environmental geology, hydrogeology, geologic vulnerability and mapping, contaminant fate and transport, urban geology, environmental site investigations, contaminant risk, brownfield redevelopment, and sustainability. He has taught geology and environmental chemistry at Eastern Michigan University and the University of Michigan.

Earthquakes and Water Chi-yuen Wang 2010-01-11 Based on the graduate course in Earthquake Hydrology at Berkeley University, this text introduces the basic materials, provides a comprehensive overview of the field to interested readers and beginning researchers, and acts as a

convenient reference point.

Physical Geology Steven Earle 2019 "Physical Geology is a comprehensive introductory text on the physical aspects of geology, including rocks and minerals, plate tectonics, earthquakes, volcanoes, glaciation, groundwater, streams, coasts, mass wasting, climate change, planetary geology and much more. It has a strong emphasis on examples from western Canada, especially British Columbia, and also includes a chapter devoted to the geological history of western Canada. The book is a collaboration of faculty from Earth Science departments at Universities and Colleges across British Columbia and elsewhere"--BCcampus website.

Simulating Regional Groundwater Flow in Layered, Faulted Sedimentary Basins

Claire Gassiat 2013 "Groundwater plays an important role in a wide range of geologic processes. Sedimentary basins are

heterogeneous, layered and faulted which strongly impacts regional groundwater flow. An important concern is how anthropogenic alterations such as groundwater or shale gas development affect these complex systems. Heterogeneities are likely to impact groundwater age and affect geologic processes that depend on groundwater or solute fluxes. They may also enhance long term contamination of shallow aquifers from the fracturing of the target shale unit, as contaminants may migrate from the shale to shallow aquifers through preferential pathways such as faults. We use numerical modelling to study the effect of a layered system on distribution of groundwater age in a regional groundwater basin and the impact of hydraulic fracturing in a generic faulted sedimentary basin on potential contamination of a shallow aquifer. First, we show that high age zones with predictable locations occur in layered geologic systems

across a wide range of hydraulic gradients, basin geometries and permeabilities. The zones of older groundwater result from two mechanisms: low groundwater velocities in the low permeability layer; and the rejuvenation of the groundwater through mixing of different flow paths near discharge zones. Second, we show that hydraulic fracturing leads to the transport of contaminants along the fault and long-term contamination of a shallow aquifer in some specific, realistic cases. The location of the hydro-fractured zone relative to the fault zone and the top of the shale is the most critical factor controlling contaminant transport potential." --

Geology: Earth in Perspective Reed Wicander 2019-08-07 Comprehensive yet succinct, Wicander/Monroe's *Geology: Earth in Perspective*, 3rd edition, delivers a complete overview of introductory geology in an engaging, student-friendly format.

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Completely up to date, it includes recent examples of natural disasters, new information on the 2018 eruption of Mount Kilauea, fresh insight on paleoseismology, new details on Hurricane Sandy and Hurricane Harvey, and updated dating techniques that more accurately identify historic climate change periods. GEO-FOCUS boxes in every chapter spotlight headline-generating issues like fracking, while economic and environmental geology topics are integrated throughout. In addition, photos vividly illustrate geologic processes through striking images from recent geologic events. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Groundwater Science Charles R. Fitts
2012-08-20 Groundwater Science, Second Edition - winner of a 2014 Textbook Excellence Award (Texty) from The Text and

Academic Authors Association - covers groundwater's role in the hydrologic cycle and in water supply, contamination, and construction issues. It is a valuable resource for students and instructors in the geosciences (with focuses in hydrology, hydrogeology, and environmental science), and as a reference work for professional researchers. This interdisciplinary text weaves important methods and applications from the disciplines of physics, chemistry, mathematics, geology, biology, and environmental science, introducing you to the mathematical modeling and contaminant flow of groundwater. New to the Second Edition: New chapter on subsurface heat flow and geothermal systems Expanded content on well construction and design, surface water hydrology, groundwater/ surface water interaction, slug tests, pumping tests, and mounding analysis. Updated discussions of

groundwater modeling, calibration, parameter estimation, and uncertainty Free software tools for slug test analysis, pumping test analysis, and aquifer modeling Lists of key terms and chapter contents at the start of each chapter Expanded end-of-chapter problems, including more conceptual questions Winner of a 2014 Texty Award from the Text and Academic Authors Association Features two-color figures Includes homework problems at the end of each chapter and worked examples throughout Provides a companion website with videos of field exploration and contaminant migration experiments, PDF files of USGS reports, and data files for homework problems Offers PowerPoint slides and solution manual for adopting faculty

Inyo National Forest (N.F.), Land and Resource(s) Management Plan (LRMP) (CA,NV) 1988

Publications of the Geological Survey

Geological Survey (U.S.) 1986

Volcanic Unrest Joachim Gottsmann

2018-12-18 This open access book

summarizes the findings of the VUELCO project, a multi-disciplinary and cross-boundary research funded by the European Commission's 7th framework program. It comprises four broad topics: 1. The global significance of volcanic unrest 2.

Geophysical and geochemical fingerprints of unrest and precursory activity 3. Magma dynamics leading to unrest phenomena 4. Bridging the gap between science and decision-making Volcanic unrest is a complex multi-hazard phenomenon. The fact that unrest may, or may not lead to an imminent eruption contributes significant uncertainty to short-term volcanic hazard and risk assessment. Although it is reasonable to assume that all eruptions are associated with precursory activity of some

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sort, the understanding of the causative links between subsurface processes, resulting unrest signals and imminent eruption is incomplete. When a volcano evolves from dormancy into a phase of unrest, important scientific, political and social questions need to be addressed. This book is aimed at graduate students, researchers of volcanic phenomena, professionals in volcanic hazard and risk assessment, observatory personnel, as well as emergency managers who wish to learn about the complex nature of volcanic unrest and how to utilize new findings to deal with unrest phenomena at scientific and emergency managing levels. This book is open access under a CC BY license.

Investigations in Environmental Geology
Duncan Foley 2009 This lab guide helps readers learn to make wise choices for sustainability in a finite, changing, and geologically active world. Eighteen exercises

cover many current issues in environmental geology and are introduced in four sections. Earth's Materials, Geologic Time, and Geologic Processes; Maps, Aerial Photographs and Satellite Images; Measurements, Basic Calculations and Conversions, and Graphs; Volcanoes, Volcanic Products, and Volcanic Hazards; Hazards of Mount St. Helens; Earthquake Epicenters, Intensities, Risks, Faults, Nonstructural Hazards and Preparation; The Loma Prieta Earthquake of 1989, and Forecasting Earthquakes in the Bay Region; Landslides and Avalanches; Subsidence; River Floods; Coastal Hazards; Groundwater Hydrology; Water Quality Data and Pollution Sources; Lake and River Contamination from Industrial Waste; Groundwater and Surface Water Contamination from Resource Extraction; Groundwater Overdraft and Saltwater Intrusion; Geology and Regional Planning; Global Change and Sustainability.

A hands-on reference for anyone who wants to make more informed choices, and review information critically, about the

environment.

Groundwater Geomorphology Charles G. Higgins 1990