Program

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Table 1. Web Addresses for IGBP Projects and ESSP Partners and Projects

IGBP Projects	*Web Address*
AIMES	www.aimes.ucar.edu
PAGES	www.pages-igbp.org
IGAC	www.igac.noaa.gov
SOLAS	www.solas-int.org
Ocean Project	see GLOBEC www.globec.org and IMBER www.imber.info
LOICZ	www.loicz.org
GLP	www.glp.colostate.edu (and LUCC www.geo.ucl.ac.be/LUCC)
iLEAPS	www.atm.helsinki.fi/ILEAPS
ESSP Partners and Projects	*Web Address*
DIVERSITAS	www.diversitas-international.org
IGBP	www.igbp.net
IHDP	www.ihdp.org
WCRP	www.wmo.ch/web/wcrp
GCP	www.globalcarbonproject.org
GECAFS	www.gecafs.org
GECHH	no Web site as yet
GWSP	www.gwsp.org
START	www.start.org

overarching strategy for observing the climate and atmosphere, oceans and coasts, land surface, and Earth's interior. The IGOS partners, which include space agencies, in situ observation programs, IGBP, and WCRP, build upon the strategies of existing international programs to improve observing capacity and to deliver more coherent and integrated observations in a cost-effective and timely manner.

IGBP's role within IGOS is to assess how well research requirements are currently being met and to suggest how they could be met in the future through improved integration and optimization of remote sensing and in situ systems. For example, IGBP led the development of the Integrated Global Carbon Observation (IGCO) theme and contributes to the themes on the hydrological cycle, atmospheric chemistry, the coastal zone, and the land.

For more information on IGBP (including on IGBP-sponsored open science meetings), contact the IGBP projects or the IGBP Secretariat via the Web sites listed in Table 1.

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AGU JOURNAL HIGHLIGHTS

New observations of Yellowstone volcanic activity The volcanic activity in and around Yellowstone National Park results from the Earth's crust moving over a hotspot in the mantle. Characterizing the shape and dynamics of the partially molten rock that comprises the hotspot helps scientists understand historic and future volcanic activity in the region. Using a subsurface imaging technique, *Yuan and Dueker* observed a column of partially molten, upward-moving rock extending 500 km below the Yellowstone volcanic caldera. The plume of hot rock was 100 km in diameter and tilted 20 degrees to the northwest. The authors also discerned an adjacent area of relatively rapidly downward-moving rock that extended 250 km below Wyoming's Wind River basin. They speculate that a "pond" of hot rock located 700 to 1000 km beneath the western United States might be the source of the plume they observed below Yellowstone. They speculate that the downward-moving rock under Wind River basin might be balancing the upward movement of rock under Yellowstone. (*Geophys. Res. Lett.*, doi:10.1029/2004GL022056, 2005)

Breaking the mantle plume mold The conventional image of a mushroom-shaped deep mantle plume may be too simplistic. *Farnetani and Samuel* investigate how plume shape and dynamics can be modified by chemically denser material at the base of the Earth's mantle and by factors influencing the plume's journey to the surface. Mantle plumes modeled under complex conditions such as the phase transition at 660 km depth and the mantle "wind" exhibit a variety of shapes and sizes. These weird shapes are consistent with recent seismic images of plumes and superplumes in the deep mantle. In these simulations the plume arrival at the surface also presents some surprises: rather than the expected head-first, tail-last scenario, in some cases only a narrow plume tail reached the surface. In this way a volcanic chain generated by a deep mantle plume may lack the initial flood volcanism associated with the large plume head. The authors also show that the internal structure of the plume tail is more complex than expected. (*Geophys. Res. Lett.*, doi:10.1029/2005GL022360, 2005)

Ocean cycling depends on small salinity differences A computer simulation suggests that circulation of the world's oceans, known as the "global conveyor," may depend on slight differences in salt concentrations between the North Atlantic and the North Pacific oceans. In their experiments, *Seidov and Haupt* modeled the movement of ocean waters over 10,000 years. The only thing that varied between the five different simulations they ran was the movement of freshwater, through evaporation and precipitation, to and from the ocean surface waters. The simulation in which the surface waters of the Northern Pacific Ocean were set to have slightly higher salinity resulted in the best approximation of the world's current ocean circulation pattern. The authors conclude that salinity differences between the North Atlantic and North Pacific played a key role in the development of the global conveyor, and that movements of fresh water in the Southern Hemisphere have less influence on this process. They point out that if, as recent evidence suggests, the Atlantic Ocean is becoming less salty, it may affect future patterns of global ocean circulation. (*Geophys. Res. Lett.*, doi:10.1029/2005GL022559, 2005)

Antarctic glaciers shrinking due to ice shelf collapse New research shows that glaciers on the west Antarctic Peninsula are shrinking following the collapse of the Wordie Ice Shelf. The study used mass and velocity measurements taken from 1995 to 2004 from satellites and airplanes to determine if the glaciers were growing or shrinking. *Rignot et al.* found that loss of glacier mass from melting and movement into the ocean exceeded snowfall accumulation for several glaciers on the peninsula. While decreased snowfall and increased melting probably play a part, the researchers believe that the collapse of the Wordie Ice Shelf, which used to block the glaciers' movement into Wordie Bay, is the most important factor in their decreasing size. The ice shelf weakened and broke up between 1974 and 1996 due to dramatic increases in air temperature in the region. Antarctic Peninsula glaciers were previously excluded from studies to determine the effects that melting glaciers have on sea level. The authors propose that as the region continues to warm, the Wordie Bay glaciers will melt more quickly causing sea level to rise. (*Geophys. Res. Lett.*, doi:10.1029/2004GL021947, 2005)

New views of an earthquake's "rotational" ground movement Seismologists usually describe the shaking caused by earthquakes in terms of north-south, east-west, and up-down movement of the ground. For a long time, they have theorized that rotational motions of the ground occur as well, but existing instruments lacked the sensitivity to observe the motions. *Igel et al.* report the first consistent recordings of rotational ground motion, taken during a strong earthquake that occurred off the southeast shore of the northern Japanese island of Hokkaido in September 2003. The recordings were taken at a seismic station near Wetzel, Germany, using a ring laser gyroscope, a device originally developed to measure tiny variations in the Earth's rotation rate. In this case, the sensor used seismic waves from an earthquake to measure rotational motion. The authors compared the observed rotational movements with those predicted by theoretical models and found that they generally agreed. The authors suggest that the ability to measure rotational motion may help researchers better understand the causes and consequences of earthquakes. (*Geophys. Res. Lett.*, doi: 10.1029/2004GL022336, 2005)

BOOK REVIEW

The Volcano Adventure Guide

ROSALY LOPES
Cambridge University Press; ISBN 0-521-55453-5; x + 352 pp.; 2005; $50.

Adventure travels to volcanoes offer chance encounters with danger, excitement, and romance, plus opportunities to experience scientific enlightenment and culture. To witness a violently erupting volcano and its resulting impacts on landscape, climate, and humanity is a powerful personal encounter with gigantic planetary forces. To study volcano processes and products during eruptions is to walk in the footsteps of Pliny himself. To tour the splendors and horrors of 25 preeminent volcanoes might be the experience of a lifetime, for scientists and nonscientists alike.

In *The Volcano Adventure Guide*, we now have the ultimate tourist volume to lead us safely to many of the world's famous volcanoes and to ensure that we will see the important sites at each one.

The book is divided into two parts: I, Choosing a volcano to visit, and II, Guides to volcanoes. Part I provides general information in five chapters on volcanoes of the world, basic facts about volcanoes, volcanic eruptions, volcano safety, and, last but not least, planning a "volcano adventure." The chapter on volcanoes of the world is a rather whirlwind discussion with many significant omissions. But with so many potentially active volcanoes in the world (600–700, depending on your definition of "potentially"), these omissions are forgiven. The chapters on basic facts and eruptions are fundamentally understandable and up to date without being tedious.

The chapter on volcano safety is relatively thorough and follows common sense. But listed survival rules are unnecessarily broken into two groups (volcano survival and eruption survival) that could be combined into a single heading. The author's rules are complete but do not mirror the wording and order of safety guidelines provided by organizations such as the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI). The chapter on planning also follows common sense and has advice on essentials from forecasting eruptions to proper footgear. Reference is made to appendices of information on volcano activity, etc., and on formal tours, and there is a very useful section on successful volcano photography.

Part II presents detailed tourist guides to specific volcanoes of Hawaii (Kilauea, Mauna Loa, and Haleakala), the continental United States (Lassen, St. Helens, Sunset Crater, and Yellowstone), Italy (Vesuvius, Vulcano, Stromboli, and Etna), Greece (Santorini), Iceland (Krafla, Heimaey, and Hekla), Costa Rica (Arenal, Poas, and Irazu), and the West Indies (Pelee and Soufriere Hills).

Beautiful color photographs of erupting volcanoes, hot springs, and volcanic deposits are generously sprinkled throughout these chapters. Each primary destination has a discussion of volcanic and tectonic background, practical information on transportation, lodging, maps, and safety, a listing of the major and minor sites to be visited, other local attractions, and, where appropriate, archeology and cultural lore.

The volcanoes described in *The Volcano Adventure Guide* reside in countries with plenty of tourist infrastructure; many are in national parks or monuments. With few exceptions, it is unlikely that most travelers would ever deal with unusual safety issues because of government restrictions and regulations, especially during increased activity or eruptions.

Having personally worked on or visited most of the volcanoes described in the book, I found the sections in part II to be relatively informative, accurate, and enjoyable. But part II doesn't present tours to the fabulous and easily accessible volcanoes of Japan, New Zealand, and Ecuador. Nor does it present tours to truly remote and adventuresome volcanoes in Alaska, Kamchatka, Indonesia, the Philippines, and the South Pacific.

The Volcano Adventure Guide is not a book for those planning a scientific expedition to an active volcano. Because of its size (nearly 23 x 28 cm, and 1 kg), it is unlikely that one would carry this book during extensive treks or in backpacks. On the other hand, the book is definitely for those planning a knowledge-able vacation to any of the described volcanoes. It would make an interesting addition for anyone who collects volcanology texts and would also make a superb gift to professionals and nonprofessionals who have an interest in volcanoes.

—FRASER GOFF (retired), Los Alamos National Laboratory, Los Alamos, N. Mex.