40 vertical levels forced by synoptic fields allows for the evaluation of interbasin, interhemisphere, and intergyre transfers.

Cross-Frontal Fluxes

Cross-frontal fluxes strongly influence the characteristics of STMW and North Pacific Intermediate Water, two integral components of the North Pacific circulation. Initial analyses of KESS data reveal at least three potential cross-frontal mesoscale processes: Frontal waves nearly always propagate along the current, steep crests and troughs develop intermittently, and rings detach episodically after the regime transition. While cross-frontal fluxes associated with frontal waves are weakest from event to event compared with the other processes, their influence could be large due to their prevalence. Frontal waves are aliased in altimeter sea surface height owing to their rapid propagation (25 kilometers per day) and short wavelengths (160 kilometers).

Subtropical Mode Water Formation and Evolution

STMW forms during winter when the surface mixed layer cools and deepens. As summer progresses, a seasonal thermocline forms and isolates STMW from the atmosphere. Subsequent erosion occurs. Air-sea fluxes are important; yet ocean preconditioning also affects STMW formation. The stable regime's low eddy energy level and strong recirculation gyre facilitated this formation [*Qiu et al.*, 2007].

Our understanding of STMW erosion continues to be refined. Internal wave breaking and lateral eddy advection are likely suspects contributing to enhanced mixing [*Rainville et al.*, 2007]. Whether internal wave energy is driven by regular predictable internal tides or by episodic storm-driven inertial energy, as well as how background circulation traps, focuses, or refracts internal wave energy, remains to be determined by KESS investigators.

This article highlights two facets of the KESS program. The Web site http://uskess.org offers a comprehensive program description. KESS scientists work closely with the U.S. CLIVAR Western Boundary Current Ocean-Atmosphere Interaction Working Group.

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MEETING

Geodetic Observations Help Scientists Understand Geohazards and Mitigate Disasters

The GGOS Contribution to GEOSS and an Observing System for Geohazards and Disaster Prevention; Frascati, Italy, 5–6 October 2007

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Modern space-geodetic observations have revolutionized our understanding of geohazards, and these observations have a great potential for further scientific discovery and applications, including early warning.

To discuss this, about 50 scientists from the geodetic and geohazards communities took part in a workshop organized by the Global Geodetic Observing System (GGOS) of the International Association of Geodesy (IAG) as a contribution to the intergovernmental Group on Earth Observations (GEO). Highest-level representatives of space agencies (European Space Agency, NASA, and Agenzia Spaziale Italiana) emphasized the fundamental importance of the geodetic reference frames for satellite missions and Earth observation. Although high, the present accuracy of these reference frames still is a key limitation in quantifying global change processes such as changes in ice sheets and sea level. Improvements of the reference frame are a pivotal step toward a better understanding of these processes and their impact on society. The representative of GEO identified GGOS as a core element in the Global Earth Observation System of Systems (GEOSS), which aims to integrate Earth observations in order to better serve users in a number of societal benefit areas, including disasters.

Several speakers emphasized that major scientific and technological challenges for GGOS are consistency across the three areas of geodesy (geometry, gravity, and rotation) and consistency between observations and models. At seasonal timescales, mass redistribution in the fluid envelope of the Earth is well constrained by geodetic observations, but understanding the driving processes requires a combination of different parameters (surface displacements, gravity changes, Earth rotation perturbations). Global change and geohazards phenomena are inherently linked with the reference frame, and meeting attendees proposed that the integration of physical models with geodetic observations may be required for a better understanding of these phenomena.

Systems aimed at prediction of geohazards and early warning systems work best if they are mutually informed and consistent. GGOS has the necessary bandwidth to cover both roles and for scientific and practical reasons should play both roles. Speakers illustrated the versatility of interferometric synthetic aperture radar (InSAR) for the early detection of hazardous areas, thus providing a basis for informed decisions on where to invest in dedicated monitoring systems. GPS has revolutionized the understanding of tectonic processes. Other speakers noted that remote sensing of newly discovered seismic waves in the atmosphere and ionosphere, and of tsunamis, from space seems possible with geodetic techniques and

could contribute to early warning systems for tsunamis. The Gravity Recovery and Climate Experiment (GRACE) space mission appears to sense gravity signals associated with large seismic events, and gravity observations from space might help to mitigate the lack of geodetic infrastructure on the ocean floor. It was also demonstrated that geodesy contributes to tsunami early warning systems in several ways, and there is still a significant additional potential to be exploited.

In summary, the workshop underlined the broad contribution of geodetic observations to Earth science and practical applications in the field of geohazards, including early warning. Nonetheless, meeting participants stressed the need to complement the highly accurate measurements with improved models and to better link the providers (GGOS and the geodetic community) to users in geohazards assessment, mitigation, early warning, and disaster prevention and recovery. For more information on the workshop, see http://geodesy.unr.edu/ggos/ggosws_2007/.

The full text of this meeting report can be found in the electronic supplement to this Eos issue (http://www.agu.org/eos_elec/).

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ABOUT AGU

What Motivates Member Donations to the Union?

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In the fall of 2007, the AGU Development Board commissioned the development staff to survey the approximately 1200 AGU supporting members to learn why these members give $100 to AGU each year—many give much more—to fund activities in education, public affairs, public information, the sections, and the focus groups. (A recent list of supporting members was published in *Eos, 88*(49), 544–545, 2007.) With supporting membership having more than doubled since 2003, the development staff and the Development Board wanted to find out more about the individual motivations underlying this trend. We also were trying to identify new incentives for members to support the Union's special projects and programs.

The survey, which consisted of a dozen multipart questions, was mailed electronically in early October 2007. By the end of the year, 425 responses had been received. This large response rate alone indicates a strong sense of personal commitment. Underscoring this sense was the response to a question that asked respondents to pick the top three reasons why they became supporting members. More than 94% of the respondents reported that they support the Union to advance AGU and/or to have an effect on the future of science. Only 41% indicated that one of their three top motivations was to derive the benefits of being a donor. Support of section activities was mentioned by 39% of respondents, while leadership opportunities in the science community motivated only 12%. Clearly, the vast majority of donors feel, first and foremost, that the values the Union represents need and deserve their support.

Not surprisingly, most supporting members also belong to organizations other than AGU. In this sample, about 31% of respondents listed the American Association for the Advancement of Science and 30% listed the Geological Society of America. The American Meteorological Society was listed by 19% and the European Geosciences Union by 12%. Apparently, AGU supporting members are also providing fiscal support to those organizations at rates generally similar to their support for AGU.

AGU's communication regarding the use of donated funds does not get high marks. More than 50% of respondents feel that AGU performs only adequately in this area, while approximately 25% believe that the Union does a poor job in this regard. AGU must communicate more clearly to the members about why the Union needs and wants discretionary resources. Over the next year or so, the Development Board and development staff expect to use both *Eos* and the revamped AGU Web site to send clearer messages to the members on fund-raising priorities and opportunities.

Additionally, too many supporting members and, by extension, probably most members, do not know much about AGU's ongoing education and outreach programs, including Bright Students Training as Research Scientists (Bright STaRS) and the Geophysical Information for Teachers workshops (GIFT). Two ongoing programs do get high marks: the Congressional Science Fellowship and the student travel grants. The latter has been a major focus for the development staff and the Development Board since 2004. However, all of these programs are continuing priorities, and AGU simply must do a better job of communicating the essence of these programs to the members.

On the survey, one question was somewhat provocative in its wording by design, given the historical ambivalence some AGU members have regarding corporate interactions with the Union: "I agree that corporate sponsorships of AGU meeting events, breakfasts, luncheons, receptions and workshops are consistent with AGU values and mission (yes/no)." Ninety-five percent of the respondents answered this question, with more than 80% responding affirmatively. In 2007, AGU received less than $100,000 from these types of corporate relationships, but the Development Board is working hard to augment that, especially in the area of support for student travel grants.

Clearly, the most important perk of being a supporting member is access to the donor lounge at AGU meetings and the ability to provide lounge passes to colleagues. These lounges have become tranquil havens for quiet conversation, for going through e-mail uninterrupted, and for taking a break from the hectic pace by relaxing with a newspaper, a cup of coffee, and a snack. At the 2007 Fall Meeting, AGU expanded this benefit by offering a supporter's lounge in Moscone South in the convention center and a leadership lounge with enhanced amenities (open to those giving $500 or more per year) in Moscone West. Both lounges were heavily utilized. Many members also found desirable other existing and potential benefits, such as reserved seating at special lectures and events, VIP delivery of meeting packets (i.e., no long waits in registration lines at the meeting itself), and free remote access to office computers from meeting venues.

One open-ended survey question asked respondents to list the three biggest challenges the Earth and space science community will face in the next 5 years. The primary concern, expressed by about 40% of respondents, was that there is insufficient funding for Earth and planetary science research. This response seemed to be focused primarily on the United States. Some respondents expanded their concerns about funding to include all fields of science. The second most expressed concern (about 30%) was the training of the next generation of science leaders. Respondents worried that the AGU community at large is not attracting high-quality students from diverse backgrounds in sufficient numbers to repopulate a rapidly aging workforce. A third concern (about 25%) was the fear that the population of scientifically literate citizens is shrinking and that the public has lost respect and appreciation for the value of using science to solve challenges that face humankind. Other common issues, each expressed by 20% of respondents, were concerns that science is not being used effectively in shaping public policy decisions, and fears about the potential negative consequences