INCORPORATED RESEARCH INSTITUTIONS FOR SEISMOLOGY

IRIS AT A GLANCE 2010

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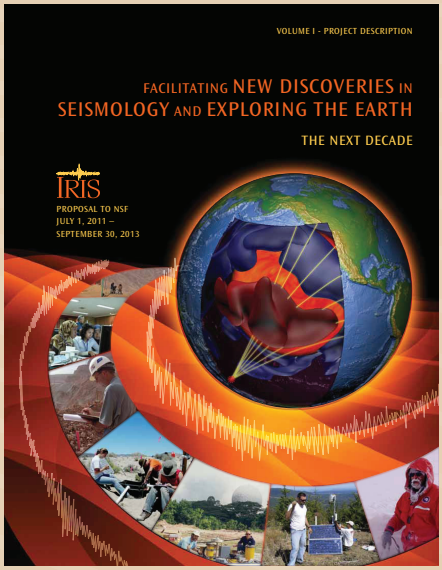
During my last year chairing the IRIS Board of Directors, IRIS and the community have been busy pushing forward on a number of exciting fronts. The proposal for the IRIS core support, submitted to NSF in late August, was strongly tied to "Seismological Grand Challenges in Understanding Earth's Dynamic Systems". The IRIS proposal required a major effort and I want to thank the community, the IRIS Board of Directors, the IRIS staff, and Brian Stump (Editor) for all their work on the proposal. I urge everyone to look at the proposal, with the truly amazing one-pagers.



I hope you will join me in welcoming James Gridley, the new PASSCAL Program Manager, who joined IRIS last August. The Board instituted important changes in the IRIS management with a coordinated Instrument Services—GSN, PASSCAL, and USArray—led by Bob Woodward. Bob, along with the Program Managers, will better coordinate all of the instrument programs and work toward increased synergies across IRIS. Tim Ahern continues to lead Data Services with the emphasis not only on the high quality data archive but also on data products, and John Tabor continues to lead Education and Outreach with continued emphasis on undergraduate education and public outreach. GSN has initiated some new and improved data quality measures (including a new website for the community on GSN Data Quality) to ensure that the GSN stations are producing the highest quality data possible. The roll out of the new Q330 data loggers is going well with over 75 GSN stations upgraded!

This past year, a devastating earthquake in Haiti and a magnitude 8.8 earthquake in Chile refocused the world on earthquakes. The NSF and USAID funded IRIS to organize a Middle America Workshop, with an aim to develop a sustained international partnership of monitoring agencies and academics. With NSF funding, the IRIS community deployed 58 portable broadband seismic stations as part of an international response to the Chile earthquake. PASSCAL provided major support for the six-month deployment along the aftershock zone and I urge everyone to take advantage of this amazing data set, which is available from the DMC. In addition, IRIS partnered with the University of Chile in an NSF MRI project to install 10 permanent geophysical observatories with broadband seismic stations in Chile to provide open data for a wide range of scientific studies.

As always, I welcome comments and ideas from the community as we move seismology forward. I thank all of the partners that work with IRIS, committee members, IRIS staff, and NSF program managers for another successful year. I have truly enjoyed chairing the IRIS Board of Directors and I want to thank David Simpson and the entire staff for an exciting three years.

Susan Beck

PASSCAL

The State of New Mexico built and expanded the Instrument Center at New Mexico Tech.

The Program for Array Seismic Studies of the Continental Lithosphere facilitates portable array seismology worldwide for diverse scientific and educational communities with end-to-end experiment support services, state-of-the-art portable seismic instrumentation, and advanced field and database management tools. Over its history, PASSCAL has supported deployment of more than 5000 stations in over 600 experiments to image plate boundaries, cratons, orogenic systems, rifts, faults, and magmatic systems. By integrating planning, logistical, instrumentation and engineering services and supporting the efforts with full-time professional staff, PASSCAL has enabled seismologists to mount large-scale experiments throughout the U.S. and around the globe. The access to professionally supported state-of-the-art equipment and archived, standardized open data has revolutionized the way that geophysical research is conducted. PASSCAL influences international academic seismology by providing instrumentation to spur or augment collaborations and by pioneering standards and facilities that have been adopted by organizations worldwide.

Standing Committee

Richard Allen (Chair)	University of California, Berkeley
Paul Davis	University of California, Los Angeles
Jesse Lawrence	Stanford University
Lee Liberty	Boise State University
Doug MacAyeal	University of Chicago
Beatrice Magnani	University of Memphis
Seth Moran	USGS, Cascadia Volcano Observatory
Arthur Rodgers	Lawrence Livermore National Labs
Lara Wagner	University of North Carolina, Chapel Hill

GSN

The next-generation data acquisition system – a commercial data logger and custom interface boxes – at the GSN station in Saudi Arabia.

The Global Seismographic Network is a permanent telemetered network of state-of-the-art seismological and geophysical sensors. A forefront source of free and open data for seismological research and Earth Science education, the GSN is also a principal global source of data for earthquake locations, earthquake hazard mitigation, earthquake emergency response, and tsunami warning. Installed to provide broad, uniform global coverage of Earth, 153 GSN stations are now sited from the South Pole to Siberia and from the Amazon basin to islands in the Indian Ocean, in cooperation with over 100 host organizations and seismic networks in 71 countries. The GSN is primarily operated and maintained through the USGS Albuquerque Seismological Laboratory and through the University of California at San Diego IRIS/IDA group, and managed by IRIS. Twenty two GSN-Affiliate stations and arrays contribute to the network, including the nine-station USGS Caribbean Network. The GSN coordinates closely with other international networks through the FDSN, of which IRIS is a founding member, and participates in the Global Earth Observing System of Systems.

Standing Committee

Xiaodong Song (Chair)	University of Illinois at Urbana-Champaign
Caroline Beghein	University of California, Los Angeles
Colleen Dalton	Boston University
Adam Dziewonski	Harvard University
Gavin Hayes	U.S. Geological Survey
William Leith	U.S. Geological Survey
Jeff McGuire	Woods Hole Oceanographic Institution
Meredith Nettles	Columbia University, Lamont Doherty Obsv
Gerardo Suarez	Instituto de Geofisica, UNAM

PASSCAL

Number of Experiments during 2010

New starts	70
Continuing experiments	40

Data Logger Inventory

Three-channel data loggers	928
“Texans” (UTEP facility)	542
Multichannel	13

Sensor Inventory

Broadband	508
Intermediate period	105
Short period	168

USArray

Transportable Array Stations (as of October 29, 2010)

Stations commissioned	1039
Stations operating	469
Stations removed	570

Flexible Array Systems

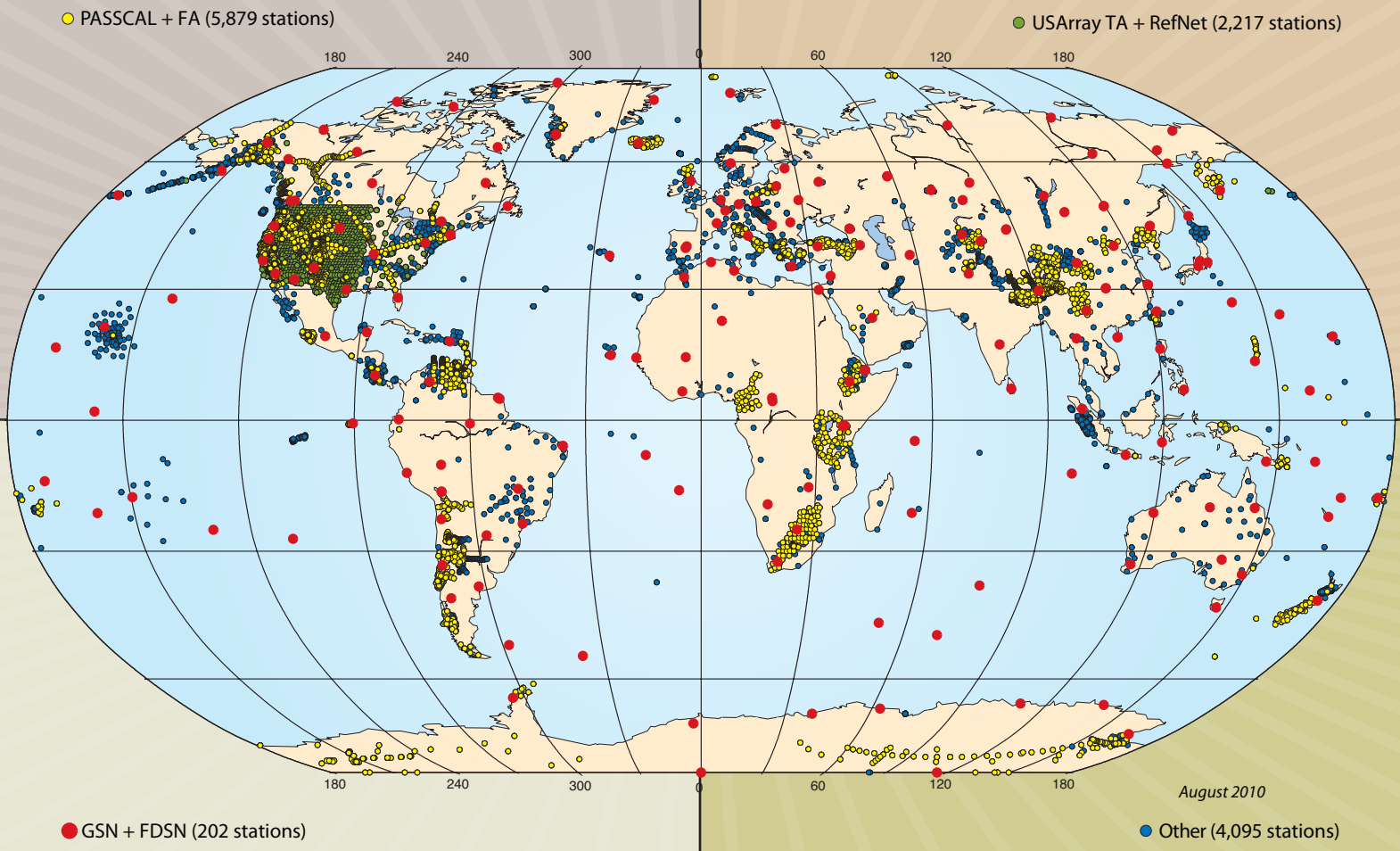
Broadband systems	346
Short period systems	141
Single channel systems (Texans)	1699

Magnetotelluric Systems

Backbone operating	7
Transportable sites occupied to date	255

Reference Network

Operating	114



GSN

GSN Stations with

Broadband primary seismometers	153
Secondary broadband/HF seismometers	124
Strong-motion sensors	127
Borehole sensors	50
Microbarographs	69
Real-time communication	149
GSN Stations Serving as IMS Auxiliary Stations	33

GSN Stations during 2010

New stations	1
Next Generation System (NGS) upgrades to date	80

DMS

Data Archived (as of September, 2010)..... 121.6 terabytes

PASSCAL	34.1
GSN	16.8
EarthScope	16.9
FDSN	9.4
US Regional	37.2
Other	7.2

Data Shipped (projected to end of 2009)..... 84.4 terabytes

Customized from Archive	44.8
Real Time Data Distribution	28.9
DHI (BUD/POND/Archive)	10.7

USArray

Operation and maintenance of USArray includes "rolling" the Transportable Array eastward across the U.S. Field crews construct, install and remove about 18 stations each month, and have moved well across the Great Plains. The Reference Network provides a fixed "reference frame"; most of these stations are operated and maintained by the USGS, but it includes 20 long-term TA stations which provide more uniform coverage. The Array Operations Facility, located at the PASSCAL Instrument Center, supports high-resolution Flexible Array deployments that address EarthScope's scientific goals; over the last five years, the NSF has supported 16 major experiments that collectively have occupied thousands of sites. Magnetotelluric observations complement seismic tomography; seven permanent MT observatories span the U.S. and more than 255 temporary sites in the Pacific Northwest have been occupied by USArray's campaign instruments during the past five summers. Siting Outreach facilitates siting of USArray stations and works with numerous state and local organizations to raise awareness of EarthScope and USArray.

Hosts for Transportable Array Station J32A near Parkston, South Dakota, pose with neighbors at their newly installed seismic station in July 2010.

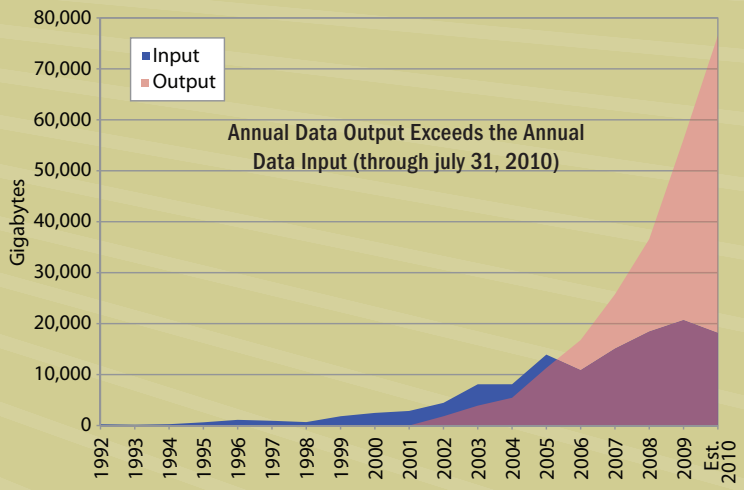
Advisory Committee

Matt Fouch (Chair)	Arizona State University
Larry Brown	Cornell University
Karl Karlstrom	University of New Mexico
Charles Langston	The University of Memphis
Maureen Long	Yale University
Guy Masters	University of California, San Diego
David Snyder	Geological Survey of Canada
Joann Stock	Caltech
Rob van der Hilst	Massachusetts Institute of Technology
Chester Weiss	Virginia Tech

DMS

The Data Management System is one of the largest scientific archives of globally distributed observational data in the world, with data from more than 100 networks operated by U.S. agencies and partners in more than 60 countries. Archiving and managing GSN and PASSCAL data is the core mission, but collecting other seismological data remains important. The year, new datasets were received from seven FDSN members, three permanent networks in the U.S., and eight temporary deployments independent of PASSCAL and EarthScope.

The DMS offers a wide and growing variety of services that Earth scientists rely on worldwide – researchers outside of the U.S. request roughly 20% of the data distributed. Almost all of these data are available within seconds of real time. Tens of concurrent requests to the archive can be supported, speeding over 30,000 responses per month. The popular request tools jWeed and VASE were improved, and web services and workflows are being developed that eventually could provide customized products.



Standing Committee

Keith Koper (Chair)	Saint Louis University
Harley Benz	USGS , Denver, CO
Elizabeth Cochran	University of California, Riverside
Matt Fouch	Arizona State University
Mike Ritzwoller	University of Colorado, Boulder
Catherine Snelson	National Center for Nuclear Security
Bill Walter	Lawrence Livermore National Labs
Dayanthie Weeraratne	California State University, Northridge

Education and Outreach

Standing Committee

Glenn Kroeger (Chair)	Trinity University
Bob Butler	University of Portland
Maggie Benoit	The College of New Jersey
Kaz Fujita	Michigan State University
Juan Lorenzo	Louisiana State University
Gary Pavlis	Indiana University
Wayne Pennington	Michigan Technological University
Suzan van der Lee	Northwestern University
Christa von Hillebrandt	University of Puerto Rico

The Education and Outreach program is committed to advancing awareness and understanding of seismology and geophysics while inspiring careers in Earth science. The program draws upon the seismological expertise of IRIS Consortium members and combines it with the educational and outreach expertise of E&O staff to create engaging products and activities. These products and activities are designed to impact 6th grade students to adults in a variety of settings, ranging from self-directed exploration using a computer, to an interactive museum exhibit, a major public lecture, or in-depth exploration of the Earth's interior in a formal classroom.

The past year has seen a considerable increase in the impact of the E&O program through the initiation of Teachable Moment slide sets for use in college and school classrooms within a day of major earthquakes, new animations and videos, new content for the Active Earth Display, and expanded use of social media. Summer undergraduate interns conducted research at 11 different IRIS member institutions. A new poster was produced that highlights the propagation of seismic waves across the Transportable Array.

International Development Seismology

IDS Committee

Anne Meltzer (Chair)	Lehigh University
Susan Beck (Board Liaison)	University of Arizona
Sergio Barrientos	Universidad de Chile
Noel Barstow	PASSCAL Instrument Center
Karen Fischer	Brown University
Art Lerner-Lam	Columbia Univ., Lamont-Doherty Obsv.
Andy Nyblade	Penn. State University
Eric Sandvol	University of Missouri
Niyazi Türkelli	Kandilli Observ., Bogazici Univ., Turkey

International Development Seismology is an interface between IRIS's NSF-sponsored scientific mission and the Consortium's goal to ensure that scientific progress enables socially important outcomes. While IRIS programs and the scope of IRIS member activities have been international from the earliest days, the Consortium is now committed developing the partnerships, technical infrastructure, and human capacity required for effective international cooperation – not only as an instrument to accelerate scientific progress through collaboration with technologically equal partners but also as an essential element of U.S. foreign engagement with developing countries. The potential to return greater scientific and societal benefits was widely recognized in responding to the 2005 Sumatra and 2010 Haiti earthquakes. IRIS has built on this potential through training programs, long-term loans of reconditioned instruments, and organizational workshops. These activities promote strategies that simultaneously support fundamental research and contribute to reducing global population vulnerability to seismic hazards through broad education.

Polar Support Services

Polar Networks Science Committee (joint with UNAVCO)

Doug Wiens (Chair)	Washington University
Sridhar Anandakrishnan	Pennsylvania State University
Meredith Nettles	Columbia University
Mark Fahnestock	University of New Hampshire
Carol Raymond	Jet Propulsion Lab
Mike Ritzwoller	University of Colorado
Leigh Stearns	University of Kansas
Terry Wilson	Ohio State University

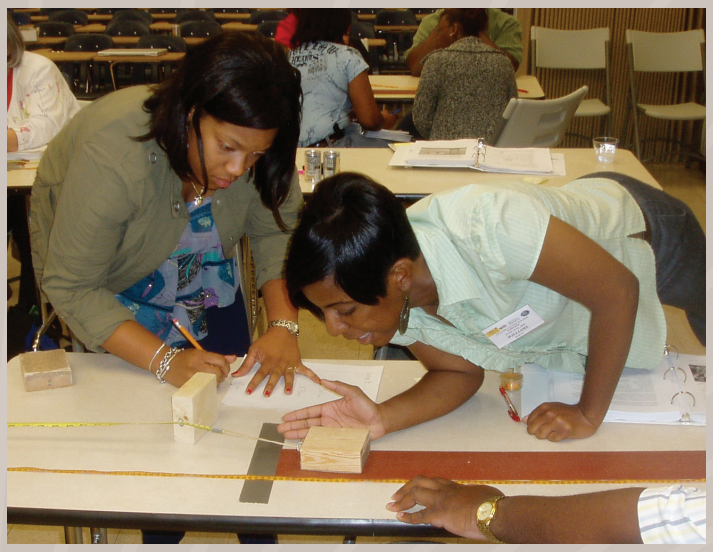
Polar Support Services (PSS) supports fieldwork in both Antarctica and Arctic regions and maintains a pool of specialized equipment required to successfully return data from these challenging environments. Experiments using this pool have returned ~93% of their data this season, a vast improvement over previous years. NSF/OPP supports three FTEs to operate and maintain the pool and operate a cold chamber for testing, all housed at the PASSCAL Instrument Center. The development priorities now are instrumentation for cold/wet environments (glaciers), real time communications and ruggedizing stations for longer-term operations.

PSS also supports the Greenland Ice Sheet Monitoring Network. This international collaboration is establishing permanent observatories with open, real time data to monitor and catalog activity generated by Greenland's glacier systems. This year, seven stations were installed or upgraded. A total of 27 international stations in and around Greenland now contribute open data to the DMS.

E&O

E&O This Year

Minority Recruitment Lectures for Internship Program	3
IRIS/SSA Distinguished Lectures	10
Undergraduate summer research interns	14
Teachable Moment slide sets or information pages	25
Active Earth Displays in use	40
Total AS1 seismographs in schools	190
Teachers and college faculty attending IRIS-run workshops	250
Students taught by IRIS trained teachers	95,000
IRIS Web site visits, unique monthly visitors	4,500,000
Visitors to museums with IRIS/USGS displays	13,000,000



IDS

Rebuilding for Resilience in Haiti, March 2010, Held in Miami

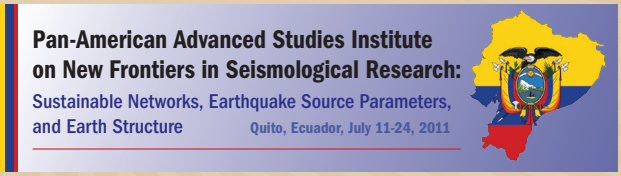
Individual participants	120
Countries represented	10

Geophysical Hazards and Plate Boundary Processes in Central America, Mexico and the Caribbean, October 2010, Held in Costa Rica

Individual participants	81
Countries represented	21

DMS International Data Management Workshop, August 2010, Held in Egypt

Individual participants	37
Countries represented	20



Polar Support Services

Polar Instrument Pool

Broadband stations	64
Intermediate period stations	7
Hydrophones	2
OBS	1
Snow streamer channels	60
Summer-only quick deploy boxes	100
Xeos Iridium modems	40

Polar Experiments

Antarctica	8
Arctic	10

Polar engineer Guy Tytgat installing a seismographic station in Antarctica's Gamburtsev Province.