THE IRIS DATA MANAGEMENT SYSTEM: OPEN ACCESS TO SEISMIC DATA FROM GLOBAL, NATIONAL, REGIONAL, AND PORTABLE DEPLOYMENTS

Tim Ahern (IRIS Data Management Center), Rick Benson (IRIS Data Management Center), Rob Casey (IRIS Data Management Center)

The IRIS Data Management System manages data from approximately 100 permanent seismic networks, in addition to thousands of sensors deployed as part of temporary networks. Built around a standardized data model and the SEED format developed by the International Federation of Digital Seismographic Data (FDSN), the IRIS DMC manages roughly 75 terabytes of data from a vast array of sensor types, predominantly broadband seismic. Since 2002, over 90% of the data from permanent networks are received in real time from international partners, and immediately made available through near real time delivery methods. The data are robustly preserved (archived) in a facility located in Seattle, accompanied by an active backup facility located at the IRIS PASSCAL facility in Socorro, NM. Data from permanent networks spanning 1970 to current are openly available, and are truly globally distributed.

Most remarkably, the amount of data that the IRIS DMC distributes annually is nearly twice as much as the volume of data that it receives annually, creating an incredibly active archive. This attests to the broad use of the IRIS DMC by the international seismic community. This poster will describe the data holdings of the IRIS DMC and highlight a variety of methods through which any individual can access all of the data the DMC manages. The DMC offers its services free of charge and without restrictions other than a proprietary period for data acquired by individual researchers.

POSTER 34

TRANSFERRING KNOWLEDGE VIA THE PASSCAL WEBSITE

Annalisa Aguilar (University of New Mexico), PASSCAL Staff (PASSCAL Instrument Center)

We are undertaking a complete redesign at www.passcal.nmt.edu. The current site shows its age in style, function, content, and upkeep. To be successful the new site must be "transparent," not only for Principle Investigators, but also for PASSCAL employees. Indeed, the website should be enjoyable to use. Principle Investigators must find information instinctively; PASSCAL employees must author experiment and instrument documentation, as well as manage instrument-scheduling information. We present screenshots from the design specification along with those scenarios they are likely to be used. The guiding mantra for the project is "form follows function".

Everyone recognizes the Internet as the ideal support platform for the far-flung, multiple-time-zone IRIS Community, but websites are flexible to a flaw. The paradox is sites designed with an implementation model are hamstrung by their underlying code-structures. Also, sites drawing solely upon printed documents and general information result in "brochure-ware"; these sites are notoriously difficult to navigate and expensive to maintain because they are structured by unrelated lists. These approaches do not effectively accommodate users since user-context is not considered.

One successful design method effectively harnesses collaboration between experts in web technology and geophysical knowledge. That method is Persona-driven Interaction Design. Emerging web technology and information architecture are mapped to day-in-the-life workflow patterns and user scenarios, as described by PASSCAL staff, through the vehicle of a persona archetype. This process revealed an experiment-centric mental map familiar to all geophysicists: the "experiment journal". This powerful metaphor informs the website interaction.

The above outlined approach provides the new PASSCAL site with a more appropriate scaffolding, enabling it to evolve into a dynamic knowledgebase and thereby promote PASSCAL's governing objective to transfer knowledge while serving the IRIS community.

POSTER 35

EVALUATION OF FLEXIBLE ARRAY STATION PERFORMANCE USING TWO YEARS OF CONTINUOUS RECORDINGS FROM THE CAFÉ EXPERIMENT

Marcos Alvarez (IRIS), Eliana Arias-Dotson (New Mexico Institute of Mining and Technology), Jim Fowler (IRIS)

Within NSF's funded Earthscope's USArray program, the Flexible Array is a pool of campaign seismic instruments for Principal Investigator driven studies to augment the Transportable Array footprint in imaging key targets at higher resolution. In this study we evaluate the station performance using data recorded from the CAFÉ experiment in western Washington. Using this unique data set, we create a reference point on how well portable broadband stations perform for an extended continuous period when all instrumentation is essentially new, of the same type and deployed using a uniform installation technique.

Over 63 stations, 47 of which are broadband equipped with Guralp CMG 3T and Reftek R130's, the remainder equipped with short period Guralp CMG 40T1Hz and the same data acquisition system are analyzed. The information used for this evaluation is derived from three sources; detailed service field notes provided by the PI's (Ken Creager, Stephane Rondenay, Geoff Abers), data reports from the IRIS Data Management Center, and the time series data itself. Data return statistics are computed and compared to the co-located Transportable Array stations for the same time period. The various failures through time are segregated into logical categories where trends in deployment techniques and equipment failures can be quantified.

Additionally, ambient noise levels are computed using McNamarra's Probability Density Function technique for all stations and compared to nearby Transportable Array stations. Both data return and low noise performance in the vertical component compare favorably with the Transportable Array stations in the same region.

POSTER 49

50 YEARS OF GLOBAL SEISMIC OBSERVATIONS

Kent Anderson (IRIS GSN), Rhett Butler (IRIS GSN), Jon Berger (UCSD-IDA), Pete Davis (UCSD-IDA), John Derr (USGS-ASL), Lind Gee (USGS-ASL), Bob Hutt (USGS-ASL), Bill Leith (USGS), Jeffrey Park (Yale University), Xiaodong Song (University of Illinois Urbana)

Seismological recordings have been made on Earth for hundreds of years in some form or another, however, global monitoring of earthquakes only began in the 1890's when John Milne created 40 seismic observatories to measure the waves from these events. Shortly after the International Geophysical Year (IGY), a concerted effort was made to establish and maintain a more modern standardized seismic network on the global scale. In the early 1960's, the World-Wide Standardized Seismograph Network (WWSSN) was established through funding from the Advanced Research Projects Agency (ARPA) and was installed and maintained by the USGS's Albuquerque Seismological Laboratory (then a part of the US Coast and Geodetic Survey). From the IGY to the present, the network has been upgraded (High-Gain Long-Period Seismograph Network, Seismic Research Observatories, Digital WWSSN, Global Telemetered Seismograph Network, etc.) and expanded (International Deployment of Accelerometers, US National Seismic Network, China Digital Seismograph Network, Joint Seismic Project, etc.), bringing the modern day Global Seismographic Network (GSN) to a current state of approximately 150 stations. The GSN consists of state-of-the-art very broadband seismic transducers, continuous power and communications, and ancillary sensors including geodetic, geomagnetic, microbarographic, meteorological and other related instrumentation. Beyond the GSN, the system of global network observatories includes contributions from other international partners (e.g., GEOSCOPE, GEOFON, MEDNET, F-Net, CTBTO), forming an even larger backbone of permanent seismological observatories as a part of the International Federation of Digital Seismograph Networks.

50 years of seismic network operations have provided valuable data for earth science research. Developments in communications and other technological advances have expanded the role of the GSN in rapid earthquake analysis, tsunami warning, and nuclear test monitoring. With such long-term observations, scientists are now getting a glimpse of Earth structure changes on human time scales, such as the rotation of the inner core, as well as views into climate processes. Continued observations for the next 50 years will enhance our image of the Earth and its processes.

(Previously presented at AGU Fall 07)

POSTER 40

ANALYSIS OF LARGE SEISMIC NETWORK PERFORMANCE USING SPECTRAL PROBABILITY TECHNIQUES

Kent Anderson (IRIS GSN), Rhett Butler (IRIS GSN), Chad Trabant (IRIS DMC), Marcos Alvarez (IRIS PASSCAL), Dan McNamara (USGS)

Calculating the power spectral densities from every station in a particular network and aggregating the spectra using the probability density function (PDF) technique described in McNamara and Buland (2004), we have developed a method to characterize the overall performance of a seismic network in the frequency domain in a probabilistic sense. Analyses of the network aggregate PDF plots allows us to determine relative performance of various types of instruments, geologic settings, installation techniques or any other common set of station characteristics, relative to the overall network performance. We will also use this technique to determine whether enhancement of a particular station is justified to improve the data quality by viewing it's performance against a network "standard", or more appropriately, a standard of similar station types. In addition, we are able to compare various seismic networks. For this experiment, we have produced a set of aggregate PDFs for the Global Seismographic Network (GSN), the ANSS Backbone Network, and the EarthScope USArray Transportable and Flexible arrays. Comparisons between these networks gives us an idea of the relative performance between the stations of these networks. Although each were designed with different goals, instrumentation types are fairly standardized (all using very broadband seismometers and data acquisition systems). Differences in the network spectral noise characteristics reflect the network design goals (i.e. global, regional or local monitoring).

(Preliminary work presented at SSA 08 – Santa Fe, NM)

POSTER 39

INTRODUCTION TO NEW TOOLS AND A NEW IN-HOUSE QUALITY CONTROL SYSTEM FOR PASSCAL DATA

Eliana Arias-Dotson (IRIS/PASSCAL), George Slad (IRIS/PASSCAL), Lisa Foley (IRIS/PASSCAL)

PASSCAL Instrument Center (PIC) staff assists principal investigators (PIs) to meet their obligation to archive PASSCAL experiment data with the IRIS Data Management Center (DMC). For both regular PASSCAL and USArray Flexible Array experiments these services include initial processing, meta-data quality, evaluation, troubleshooting, tracking, delivery to the DMC and confirmation of archived data. In addition to these, the Data group at the PIC is responsible for full processing and archiving of SEED and assembled data sets (SEGY) for USArray Flexible Array experiments.

The Data and Software groups at IRIS/PASSCAL continue to develop tools to facilitate data processing and archiving. A continual challenge is to develop forward-looking tools to handle the increasing number of experiments and more ambitious arrays. In our attempt to fulfill these demands, the PIC Data group continues to write new documentation and integrate software tools that provide a robust support for data collection under different environments for the wide variety of users.

A recent accomplishment is the implementation of a New In-House Quality Control system. This system addresses the challenge to perform an efficient and extensive evaluation of the mseed data and metadata before being delivered to the DMC. A detailed in-house tracking system achieves better productivity and establishes a well-organized historical record of each. Eventually this tracking system will be available to PIs to help them keep track of the progress of their data progress, issues, and reports. An introduction to improved tools for submission of data to PASSCAL and delivery of SEED data to the DMC are also introduced as part of a more flexible new data flow.

POSTER 36

PIC KITCHEN, CONTROLLED SOURCE DATA SUBMISSION USING HDF5

Steve Azevedo (IRIS/PASSCAL PIC), Sandy Strome (IRIS/DMC), Mary Edmunds (IRIS/DMC), Bruce Beaudoin (IRIS/PASSCAL PIC)

Current archiving methods for controlled source experiments are cumbersome and inefficient. The current system depends on the principal investigator suppling the IRIS Data Management Center (DMC) with a tar file of SEG-Y gathers. Additionally, a report describing the meta-data needs to accompany the tar file. One of the shortcomings of the current archival method is that the stored data is static and not tied into common DMC search methods. Corrections, additions, and re-calibrations are almost impossible without creating a new version of the data set and re-archiving it. The costly allocation of resources needed to support the interactive nature of creating SEG-Y gathers and getting them archived is another serious determent in the current archival method.

To mitigate the worse flaws in the current archival system, the PIC developed an archival processing package called "PIC KITCHEN". It is based on the HDF5 data format, and moves past the limitations of the current system by providing a solution to the above mentioned weaknesses.

The PIC KITCHEN organizes data and meta-data for an experiment into PASSCAL HDF5 format (ph5). This is quickly and easily transferred to the DMC. Future or last minute updates, corrections, or additions can be folded into small text files, sent and incorporated with the original data set at the DMC. This process allows the data to be submitted to the DMC, fresh from the field. Corrections to the meta-data can be made directly in the archive. Tedious "down loading", " up loading" and "re-archiving" is eliminated. Data can also be requested from the DMC in a variety of formats. The intact, raw data and meta-data is extracted from the HDF5 file and converted to the desired format via a web form.

The current system provides a way to convert RefTek texan data and RefTek rt-130 data to ph5 format, verify the validity, apply changes, and extract data in SEGY trace files as well as standard SEG-Y gathers. Another enthusiastic endorsement of the HDF5 format is it's expandable nature. The database-like environment of HDF5 allows for several future additions in which include, data QC, viewing, manipulating, statistical collections, and data output formats.

POSTER 45

A SCIENTIFIC WORKFLOW WORKBENCH

Roger Barga (Microsoft Research), Jared Jackson (Microsoft Research), Nelson Araujo (Microsoft Research), Dean Guo (Microsoft Research), Nitin Gautam (Persistent Systems)

Scientific workflows are proving to be a useful vehicle for enabling science at a large scale, where the scale is measured in terms of the scope of the scientific analysis and its complexity as well as in terms of the number of scientists and the number of organizations that collaborate in the process. Workflows provide a useful representation of complex analyses composed of heterogeneous steps This representation not only facilitates overall creation and management of the computation but also builds a foundation upon which results can be analyzed and validated.

Workflows are also useful for bringing sophisticated analysis to a broad range of users. Experts formulate workflows, set parameters of individual components, annotate components or the overall workflow, and validate the result. Once this is complete, the workflow can be shared with members of the community, other experts or even researchers and students that are not familiar with all the details of the analysis to the point where they can set all the necessary parameters themselves, but are fully able to make use of the workflow.

In this demo we present Trident, a scientific workflow workbench that is implemented on top of Windows Workflow Foundation. Trident provides an environment in which scientists can visually design workflows by specifying the desired sequence of computational steps and appropriate data flow, from sensors, to data cleaning and processing pipelines to the final data products such as visualizations.

Trident allows a scientists to explore and visualize data in real-time; compose, run and catalog experiments from a web browser; add custom workflows and data transformations for other researcher to discover and use. Other features in Trident for data intensive research include: automatic provenance capture, “smart” rerun of different versions of a workflow, on-the-fly updateable parameters, monitoring of long running tasks, and support for fault-tolerance and recovery from failures.

POSTER 37

2007-2008 ACTIVITIES AT THE IRIS PASSCAL INSTRUMENT CENTER

Bruce Beaudoin (IRIS PASSCAL), Rick Aster (New Mexico Tech)

In 2007 the IRIS PASSCAL Instrument Center (PIC) supported 59 new experiments and roughly 35 ongoing experiments. In 2008 the PIC will support 3 large controlled source experiments, increase its efforts in support of polar science, and field several large PASSCAL and EarthScope USArray Flexible Array broadband experiments. Additionally, the PIC supports the Transportable Array with roughly 18 constructions and 18 installs per month, and field logistics support through the TA Coordinating Office.

To accommodate this busy schedule we continue to strive for improved methods and efficiencies to support field efforts, data handling and delivery, and in-house maintenance. The PIC Data Group helps to archive ~2TB of data a year from both controlled source and passive experiments. A new in-house data delivery system and a new format for controlled source archives (HDF5 based) have improved our efficiency in data archiving. In 2007 the PIC Sensor Group tested/retested over 800 broadband sensors on PASSCAL piers and shipped approximately 700 broadband stations for PASSCAL and EarthScope USArray experiments. To better support the attendant high volume of sensor pier testing, the PIC is constructing an additional pier facility and is developing a more automated system for sensor evaluation. The PIC Hardware Group's development efforts have focused on improving our ability to support large controlled source experiments. Two efforts specifically addressing the needs of such experiments include a mini-bridge for the Texans that allows for in-field offloading and programming, and a GPS Texan locator that inserts GPS locations into the raw Texan files. PASSCAL's Polar Program now has a pool of 40 cold-hardened broadband seismic stations. Twenty of these polar specific stations are currently deployed in both western and eastern deep Antarctica. PASSCAL is also a partner in the pending GLISN proposal to establish a 15 station real-time network monitoring the Greenland ice sheet. Underlying many of the aforementioned efforts is support from the PIC Software Group, who continues to advance efforts directly related to data archiving, data delivery, and meta-data handling.

An ongoing initiative that we expect to be of particular interest to the user community is a complete redesign of the PASSCAL website. PASSCAL has contracted an Interaction Designer to help evolve the PASSCAL website into a dynamic knowledgebase to promote knowledge transfer to the IRIS community.

POSTER 41

PQLX: A SOFTWARE TOOL TO EVALUATE SEISMIC STATION PERFORMANCE AND META-DATA QUALITY

Richard Boaz (Boaz Consultancy), Daniel McNamara (USGS)

We present new developments on PQLX, a tool that allows users to evaluate seismic station performance and noise characteristics by providing quick and easy transitions between visualizations of the frequency and time domains. The software is based on the probability density functions (PDF) of power spectral densities (PSD) (McNamara and Buland, 2004). The computed PSDs are stored in a database, allowing users to access specific time periods of PSDs (PDF subsets) and time series segments through graphical user interface (GUI). The power of the method and software lies in the fact that there is no need to screen the data for system transients, earthquakes or general data artifacts since they map into a background probability level. In fact, examination of artifacts related to station operation and episodic cultural noise allow us to estimate overall station quality, meta-data accuracy and a baseline noise models at each site.

The output of this analysis tool is useful for both operational and scientific applications. Operationally, it is useful for characterizing the current and past performance of existing broadband stations, for conducting tests on potential new seismic station locations, for detecting problems with the recording system or sensors, and for evaluating the overall quality of data and meta-data. Scientifically, the tool allows for mining of PSDs for investigations on the evolution of seismic noise.

The PDF algorithm and initial software were developed by the USGS as a part of the ANSS/GSN data and network QC system. Further development, supported by the IRIS Data Management Center, integrated the PDF algorithm into the IRIS QUACK system. The newest version, PQLX, combines the PDF system with the PQL time series viewing tool developed with support from IRIS DMC and IRIS PASSCAL. Currently, PQLX is operational at over 20 institutions including the IRIS DMS, the USGS NEIC for routine monitoring on over 500 real-time stations, and the Albuquerque Seismological Laboratory (ASL) for long-term meta-quality assessment and microseism research.

POSTER 42

SITING OUTREACH ACTIVITIES FOR EARTHSCOPE'S TRANSPORTABLE ARRAY

Perle Dorr (IRIS Consortium), Robert Busby (IRIS Consortium), Jenda Johnson, Kelly Reeves (IRIS Consortium), John Taber (IRIS Consortium)

One of the goals of EarthScope is to actively engage students who will become the next generation of Earth scientists. The Transportable Array has supported this goal by employing university students to conduct site reconnaissance for future seismic stations. The Student Siting Program is a 10-week effort that begins with a multi-day workshop to introduce selected students and their faculty sponsors to seismic station requirements and a variety of mapping tools. In addition to presentations on topics such as siting criteria and communications options, the training includes a day in the field to provide students an opportunity to evaluate actual sites and to gain experience using GPS units, cameras, cell phones, and other field equipment and techniques.

Once assigned a geographic working area, each 2-person team uses GIS-based suitability maps to identify potential locations for further investigation. The team then travels to these sites to determine the best location for the seismic station. An important aspect of the students' task involves interacting with landowners. The students also prepare detailed reconnaissance reports for each site to document their findings and recommendations. USArray reconnaissance staff later verifies each site and obtains the permit from the landowner.

This program has proven to be an efficient way to locate a large number of sites for Transportable Array stations. It also provides an exciting learning opportunity for students and involves participation of universities within the region. From 2005 to 2007, 38 students conducted site reconnaissance for more than 300 sites in Oregon, Washington, Arizona, Utah, Idaho, Montana, Wyoming, Colorado, and in the Big Bend area of Texas. Approximately 325 sites throughout North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas will be identified this summer by 32 students.

USArray also conducts other outreach activities, including several in collaboration with the EarthScope National Office and PBO. The onSite newsletter informs station hosts and the general public about the status of EarthScope and exciting science discoveries, and a DVD of earthquake-related educational materials has been created for teachers. In addition, teachers are introduced to EarthScope via workshops focusing on the use of EarthScope-related data. EarthScope-specific pages for the Active Earth Display are currently in development and one- and two-page publications are prepared, as needed, that address siting-related topics and EarthScope technology.

POSTER 38

THE EARTHSCOPE USARRAY ARRAY NETWORK FACILITY (ANF): METADATA, NETWORK AND DATA MONITORING, QUALITY ASSURANCE AS WE START TO ROLL

Jennifer Eakins (Univ. of California, San Diego), Frank Vernon (Univ. of California, San Diego), Luciana Astiz (Univ. of California, San Diego), Vladislav Martynov (Univ. of California, San Diego), Taimi Mulder (Univ. of California, San Diego), Trilby Cox (Univ. of California, San Diego), Robert Newman (Univ. of California, San Diego)

The Array Network Facility (ANF) for the Earthscope USArray Transportable Array seismic network is responsible for: the delivery of all Transportable Array stations (400 at full deployment) to the IRIS Data Management Center, collection of regional network stations which contribute data to the Transportable Array (currently Anza, SCSN, UNR, UUSS, and UNSN); station command and control; verification and distribution of metadata; providing useful interfaces for personnel at the Array Operations Facility (AOF) to access state of health information; and quality control for all data. To meet these goals, we use the Antelope software package to facilitate data collection and transfer, generation and merging of the metadata, monitoring of dataloggers, and analyst review of individual events. Metadata transfers of dataless SEED and Virtual Network Definitions (VNDs) have been simplified by the use of orb transfer technologies at the ANF and receiver end points. Extensions to the software package have been contributed to help with data center operations.

As part of the quality control process, automatic processing and daily analyst review associates arrivals against available regional network bulletins. Through the end of April 2008, there have been 33,048 events recorded with over 1.5 million arrivals reviewed. Despite multiple analyst reviews, there are currently 2790 events with 10 or more picks which have no regional network bulletin association.

Visit http://anf.ucsd.edu for more information on the project and current status.

POSTER 44

A BIBLIOGRAPHY OF IRIS-RELATED PUBLICATIONS

Betim Muco (Consultant, Rockville, MD), David Simpson (the IRIS Consortium, Washington, DC)

In order to maintain support from NSF and the research community, it is important to document the continued use of IRIS facilities in basic research programs. IRIS maintains a database of articles that are based on the use of IRIS facilities or which reference use of IRIS data and resources. Articles in this database have been either been provided to IRIS by the authors or selected through an annual search of a number of prominent journals. The total database (both journal publications and abstracts) includes more than 3000 entries for 1990-2007. A text version of the full bibliographic database is available on the IRIS website and a version in EndNote format will also be provided.

To provide a more complete bibliography and a consistent evaluation of temporal tends in publications, a special annual search began in 2000 which focused on a subset of key seismology and Earth science journals: Bulletin of Seismological Society of America, Journal of Geophysical Research, Seismological Research Letters, Geophysical Research Letters, Earth and Planetary Science Letters, Physics of the Earth and Planetary Interiors, Tectonophysics, Geophysical Journal International, Nature, Science, Geology and EOS. Using different search engines as Scirus, ScienceDirect, GeoRef, OCLC First Search, EASI Search etc. for online journals and publishers' databases, we searched for key words (IRIS, GSN, DMS, PASSCAL etc) in titles, abstracts and text. Most of the selections found by this method were confirmed by reading through online texts or original journals. This bibliography of peer-reviewed articles (excluding abstracts) identified in these key journals for 2000 – 2007 includes approximately 1000 entries.

All researchers who use IRIS facilities and resources are asked to review the existing database for completeness and are encouraged to routinely provide references to articles as they are published, so that they can be included in this bibliography. As part of the current upgrade to the IRIS website, we intend to provide an on-line tool to allow for easy submission of bibliographic information.

POSTER 33

IRIS EDUCATION AND OUTREACH PROGRAM PRODUCTS AND ACTIVITIES

John Taber (IRIS Consortium), Michael Hubenthal (IRIS Consortium), Jenda Johnson (Volcano Video Productions), Kelly Reeves (IRIS Consortium), Matt Toigo (IRIS Consortium), Russ Welti (IRIS Consortium), Lindsay Wood (IRIS Consortium)

The IRIS E&O Program continues to develop new products and refine existing activities for teachers of grades 5-12, undergraduate students, faculty and the general public. This summer marks the 10th year of our undergraduate internship and the third year of an expanded program where 10 interns take part in a one-week orientation at New Mexico Tech and then travel to IRIS institutions throughout the US to conduct their research under a seismologist's supervision. The interns keep in contact with each other and with an alumni intern mentor throughout the summer via blogs and other virtual means and then meet again at the fall AGU meeting to present the results of their research.

We are providing support for further development of the educational capabilities of SeisMac as well as creating activities for its use in the classroom. The free software, written by Dan Griscom, displays the three component accelerometer output from any recent Mac laptop and allows students to get a physical sense of what a seismogram is. This year saw the launching of the Animation of the Month and the introduction of short educational videos on the IRIS web site. The simple animations quickly demonstrate dynamic Earth processes that otherwise would not be clear. We have completed our third and final year of providing district-wide professional development for the Yuma area school district, based on the needs identified by district educators and supervisors. Following the model established through our work with Yuma, we are partnering with UTEP to deliver professional development to the El Paso Independent School district over the next three years.

The IRIS/SSA Distinguished Lecture series, now in its sixth year, continues to be an effective means of conveying seismology research to public audiences. This year's speakers, Cliff Frohlich and Uri ten Brink, already have 10 lectures scheduled at museums and universities throughout the US. The Active Earth display, our product for small museums, visitor centers and universities, now has over 30 user accounts.

As part of the NSF Cooperative Agreement, the E&O program has been preparing for an external evaluation to be conducted in the summer and fall of 2008. The external evaluator will examine previously collected internal assessment data and will collect and analyze limited new information. The results of the evaluation will be used to develop a new five-year strategic plan for the program.

POSTER 47

IRIS LAUNCHES A NEW WEB SITE

Matt Toigo (IRIS), Rob Woolley (IRIS), Kent Anderson (IRIS), Rick Benson (IRIS), Perle Dorr (IRIS), Ellen Kappel (IRIS), Rob Casey (IRIS), John Taber (IRIS), Marcos Alvarez (IRIS), Bruce Beaudoin (IRIS), Tim Knight (IRIS)

IRIS began development of a new IRIS Website Homepage in the fall of 2007, aimed at delivering web-content presented in a fresh-looking, user-friendly, and technologically updated layout.

A Web re-design committee was formed in the fall consisting of IRIS corporate staff and representatives from each of the core programs.

This committee was responsible for coming up with the final design, structure, and content of this top-level site. It is important to point out that much of the content that is "internal" to each of these IRIS Programs was not within the scope of this committee's charter and will be updated after the rollout of this new look.

The process was initiated when input was solicited from the community (through a web survey) on broad subjects such as what they look for when they visit the IRIS Web site, what features would enhance the value of the IRIS Web site, and what programs or information are difficult to find on the IRIS Web site. This was then drafted into a web page template layout, providing a home page "look and feel" from a detailed set of instructions drafted by this committee.

IRIS staff did all of the remaining Web development and contributed content. The resulting new layout includes a search function that covers the headquarters site, but also the DMC and PASSCAL pages; RSS feeds; a photo gallery; calendar; news on current experiments; and much more.

Please visit the new Web site at the same address: www.iris.edu.

POSTER 43

USARRAY ACTIVITIES AT THE IRIS DMC

Chad Trabant (IRIS Data Management Center), Robert Casey (IRIS Data Management Center), Linus Kamb (IRIS Data Management Center), Peggy Johnson (IRIS Data Management Center), Gillian Sharer (IRIS Data Management Center), Mary Templeton (IRIS Data Management Center), Bruce Weertman (IRIS Data Management Center)

After five years of USArray facility construction and operation the IRIS Data Management Center (DMC) has archived nearly 7 terabytes of USArray data and this data set is growing at over 4.6 gigabytes per day. Approximately 4.5 terabytes of data from the newly installed Transportable Array stations, representing the largest portion of USArray, have been shipped to users from the DMC. The data are being shipped predominantly to users within the United States, but also to a number of other countries. The request mechanisms employed by users include all the primary interfaces at the DMC (email/breq_fast, real-time/SeedLink and DHI) with no single mechanism dominating the requests. A number of DMC activities serve to assure the quality of the USArray data set. Automated quality control measurements are applied and a team of analysts reviews the data as it arrives at the DMC. Recent data quality related developments are focused on more advanced processing of the data to identify potential issues. To jointly assess the raw time-series and station metadata, including response information, we are comparing both event and gravitational tide synthetics to the recorded signal. Probability density functions (PDFs) representing the distribution of seismic power spectral density (PSD) are routinely calculated and are extremely useful for characterizing seismic noise. We are further using the base PDF calculations to summarize station noise over time in two different ways: 1) PDF mode color grids which illustrate station noise changes over a wide frequency range with colors indicating differences relative to the Berger, et al. (2004) noise model and 2) PDF mode for select frequencies as time-series indicating noise changes at one day intervals. Daily PDF mode calculations are also being used to summarize noise at stations with shared characteristics such as instrument type and geographic location. In addition to quality assessment developments, the DMC continues to develop improved methods for access to USArray data. The EarthScope portal is a collaborative effort to build a web-based portal system from which a user can access all variety of data produced by the EarthScope facility. The DMC is involved in designing the user-interface for the portal and developing the necessary connections between the portal and the DMC's wealth of EarthScope-related data. EarthScope and USArray specific activities at the DMC: http://www.iris.edu/earthscope/.

POSTER 46

IRIS INTERNATIONAL WORKING GROUP

Raymond Willemann (IRIS Consortium), Arthur Lerner-Lam (Center for Hazards and Risk Research, Lamont-Doherty Earth Observatory)

The IRIS International Working Group (IWG) coordinates activities of IRIS Members that contribute to both the IRIS Mission and the missions of international development agencies, such as US AID, the World Bank, other international development banks, and agencies of the United Nations. Interests of US seismologists are served by encouraging development of modern seismographic systems in countries around the world to collect data that are useful in research as well as hazard mitigation and other national interests. Activities of the IWG to date include ensuring that the World Bank's Global Risk Identification Program (GRIP) includes long-term training in geophysics, coordinating an initiative to leverage retired PASSCAL data loggers through long-term loans, preparing a white paper outlining IRIS capabilities relevant to international development, and conducting a workshop, "Out of Africa", on modernizing geophysical infrastructure in the Americas and Southeast Asia through projects that are closely tied to university education and academic research.

POSTER 48

THE STATUS OF EARTHSCOPE'S USARRAY

Bob Woodward (IRIS), Tim Ahern (IRIS), Marcos Alvarez (IRIS), Bob Busby (IRIS), John Taber (IRIS), Adam Schultz (Oregon State University),

The National Science Foundation-sponsored EarthScope USArray facility consists of four major observatory components: a Reference Network of permanent seismic stations; a Transportable Array (TA) of ~400 seismic stations; a Flexible Array (FA) pool of seismic instruments for use by Principal Investigators (PIs); and a Magnetotelluric (MT) observatory with permanent and transportable instruments. USArray also includes comprehensive data management and siting outreach efforts.

At present, the Reference Network consists of ~80 stations located at ~300 km spacing across the continental US. Most of these stations are operated and maintained by the USGS. A final set of 20 stations is being installed to provide more uniform coverage.

The TA has now occupied over 500 sites in the western United States and continues its multi-year migration towards the Atlantic coast. The stations use a grid-like deployment with 70 km separation between stations. At any given time there are approximately 400 stations operational, and each station is operated for two years.

The FA currently has 257 broadband, 120 short period, and 1700 active source instruments (an additional 69 broadband sensors are on order). All of these instruments are available for PI-driven experiments that address EarthScope program scientific goals. Seven experiments using FA equipment are in the field now.

When completed, the MT component of USArray will consist of a network of seven permanent observatories spanning the continental US, as well as 20 stations that are deployed campaign-style each summer. At present, two permanent sites are fully operational and data have been collected from 110 temporary sites in the Cascadia region.

USArray data are archived and distributed via the IRIS Data Management Center. Nearly seven terabytes of USArray data have been archived to-date, and nearly one terabyte of data have been shipped in 2008.

The Siting Outreach component of USArray facilitates siting of USArray stations and has been working with numerous state and local organizations to encourage the use and understanding of USArray.

EarthScope is nearing the end of its five-year construction phase and will enter the operations and maintenance (O&M) phase beginning in October 2008. We will present an overview of the current status and planned activities for each of the components of USArray.

POSTER 50