contamination in space and time within and between the three aquifers at the site. The models were an exceptional visualization tool for illustrating extent, volume, and quantitative amounts of uranium and nitrate contamination in the subsurface to regulatory decision-makers in regard to site decommissioning issues, including remediation concerns, providing a perspective not possible to achieve with traditional 2D maps. The geohydrologic framework model provides a conceptual model for consideration in flow and transport analyses.

ED31E-08 1205h

GeoWall-2 : a Scalable Display System for the Geosciences

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The first generation of the GeoWall was targeted at providing affordable 3D stereoscopic visualization of small- to modest-sized Geoscience datasets. Continuing the trend to take advantage of the commodity computing, GeoWall-2 is designed to cost-effectively serve Geoscience applications that require greater display resolution and visualization capacity. The full GeoWall-2 consists of 15 LCD panels tiled in a 5x3 array comprising a total resolution of 8000x3600 pixels. Each LCD panel is driven by a single PC with a high-end graphics card such as Nvidia's Quadro FX3000, at least 250GBytes of disk space, 2.5-3GHz CPU, and Gigabit Ethernet networking. The GeoWall-2 is scalable in that smaller or even larger versions can be built by adjusting the number of LCDs and computers. Applications of the GeoWall-2 include the visualization of large remote sensing, volume rendering imagery, mapping, seismic interpretation, museum exhibits and other applications that require a large collaborative screen area. GeoWall-2 was developed with support from the National Science Foundation, and the Office of Naval Research.

URL: http://www.evl.uic.edu/cavern/optiputer/

ED32A MCC: Level 2 Wednesday 1330h

Scholarly Journals in the Digital Age Posters

Presiding: **D J Boccippio,** NASA Marshall Space Flight Center

ED32A-1189 1330h INVITED POSTER

Re-Launching a "Dormant" Electronic Journal: The Experience of "Earth Interactions"

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Earth Interactions, an electronic journal published by the American Geophysical Union (AGU) and the American Meteorological Society (AMS), in collaboration with the American Association of Geographers (AAG), has been recently "re-launched" with a new Editorial Team and a new scientific focus. For the past six months, we have worked very hard to revitalize Earth Interactions, and to establish it as a top-notch publication venue for interdisciplinary earth and environmental sciences. So far, the results have been outstanding. Our submission rate has increased dramatically, while the overall quality of articles remains extremely high. Furthermore, articles in Earth Interactions are now among the most sought-after articles in the AMS electronic publication system, and we believe they will have tremendous impact. Earth Interactions continues to seek excellent papers that explore the interactions among the biological, physical and human components of the earth system. We consider a wide variety of manuscript styles, including the following: original research articles; review articles; brief "data reports" and "model reports"; and special collections of papers from conferences and workshops In this presentation, I will describe how Earth Interactions has been re-launched, and the challenges facing this electronic publication.

URL: http://www.earthinteractions.org

ED32A-1190 1330h POSTER

The G^3 Experience with Electronic Publishing: An Editor's Perspective

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G^3 (*Geochemistry, Geophysics, Geosystems*) is an all-electronic journal published jointly by the AGU, the Geochemical Society, and the European Association of Geochemistry. G^3 publishes original scientific contributions pertaining to understanding the Earth as a system, including relevant observational, experimental, and theoretical investigations of the solid Earth, hydrosphere, atmosphere, and biosphere. The journal was initiated as a result of a grass roots effort with the following goals in mind: a copyright policy designed to enhance, rather than inhibit, the dissemination of scientific information (for example, allowing authors to post electronic reprints on their web sites), provide a means of publishing, in immediately useable formats, large data sets, provide a means for ready dissemination of computer modeling and analysis tools, and provide a forum where authors could use novel ways of illustrating both data and models (e.g., formats such as movies, virtual reality images, sound, mathematical models, etc.), and finally to reduce costs and speed publication. In most respects, G^3 has been enormously successful and has met most of its goals. G^3 began publishing in December of 1999; in the subsequent 3 1/2 years 625 papers have been submitted to it and 325 have been published. It currently has over 600 institutional and personal subscribers. Papers are submitted through the web (a variety of formats are accepted, however, Microsoft Word is most common) and are converted to Adobe pdf format for peer review. Except that it is fully electronic using the web and e-mail, the peer review process is traditional, which insures the quality of the papers published. Accepted papers are copyedited and converted to SGML for archival purposes. HTML and Acrobat pdf versions are then generated from the SGML and published as they are ready on the G^3 web site (www.g-cubed.org). Large data sets are routinely published in digital formats that can be readily downloaded by readers and immediately imported into programs such as Excel. Numerous animations and movies have been published in animated GIF, Apple Quicktime, Macromedia Flash, and Wolfram Research Mathreader formats. Computer models and tools have been published as Excel Macros and MATLAB Scripts. Full color, high resolution images allow superior publication of detailed maps and photographs. While G^3 is a success by most measures, the process of pioneering electronic publication has at times been painful and frustrating. Early on, there were problems and delays in converting files, particularly graphics, to pdf format for both review and final publication. Costs have been higher than anticipated - primarily due to the cost of file conversion and formatting. The time from acceptance to publication (currently 10 weeks), although improving, it still longer than the goal, again because of the time required for copy-editing and formatting. Automation of this process in the future is the primary opportunity to both reduce cost and further speed publication. Authors have been slow to take advantage of the new illustration formats, with most relying on tradition figures instead. This will likely change slowly in the future, as these new formats, and the software tools to create them, become more familiar.

URL: http://www.g-cubed.org

ED32A-1191 1330h POSTER

A step beyond simple keyword searches: Services enabled by a full content digital journal archive

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The problems of managing and searching large archives of scientific journal articles can potentially be addressed through data mining and statistical techniques matured primarily for quantitative scientific data analysis. A journal paper could be represented by a multivariate descriptor, e.g., the occurrence counts of a number key technical terms or phrases (keywords), perhaps derived from a controlled vocabulary (e.g., the American Meteorological Society's Glossary of Meteorology) or bootstrapped from the journal archive itself. With this technique, conventional statistical classification tools can be leveraged to address challenges faced by both scientists and professional societies in knowledge management. For example, cluster analyses can be used to find bundles of "most-related" papers, and address the issue of journal bifurcation (when is a new journal necessary, and what topics should it encompass). Similarly, neural networks can be trained to predict the optimal journal (within a society's collection) in which a newly submitted paper should be published. Comparable techniques could enable very powerful end-user tools, all premised on the view of a paper as a data point in a multidimensional descriptor space, e.g.: "find papers most similar to the one I am reading", "build a personalized subscription service, based on the content of the papers I am interested in, rather than preselected keywords", "find suitable reviewers, based on the content of their own published works", etc. Such services may represent the next "quantum leap" beyond the rudimentary search interfaces currently provided to end-users, as well as a compelling value-added component needed to help bridge the print-to-digital-medium gap, and help stabilize professional societies' revenue stream during the print-to-digital transition.

ED32A-1192 1330h POSTER

Going Online With Ocean Drilling Publications

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In 1999, the Ocean Drilling Program (ODP) transitioned from a print publication format to a hybrid print/electronic format of its Initial Reports (IR) series. A year later, the Scientific Results (SR) series joined the electronic era. Our mandate was to produce a fully functional electronic publication in HTML and PDF formats that would also function as a professionally typeset printed publication. The IR series disseminates the preliminary scientific knowledge gained during each ODP cruise, whereas the SR series is a venue for publishing independent research conducted after each cruise and often includes extensive data sets and many color images. Although both series are published as a print/CD-ROM hybrid and on the Web, the IR online version follows publication of the CD, whereas the SR online version precedes it. This unique format–neither all print, all electronic, or print with electronic replica of print–led to interesting challenges that few other publishers had to grapple with when going electronic. ODP's formal transition from print to electronic publication was concentrated in a 2-year period, but fortunately, staff members had honed many valuable online editing and production skills prior to that time as a cost-saving means of publishing hardcover books. This made the transition rather seamless for the staff; however, issues pertaining to multiplatform publications still had to be addressed. These included word choices that made sense regardless of whether the material was being viewed on paper, on CD, or on the Web; the creation of alternative citation formats; policies on revising already published electronic material; etc. In our experience, the advantages for publishers and readers have outweighed the growing pains of moving to electronic publishing. For example, SR authors typically see their manuscripts published 4-5 months after acceptance, whereas it used to take 7-9 months. The accessibility of the online publications has significantly widened distribution. And the CD-ROM product allows ODP to enhance the electronic resources available to researchers by including an index of all published IR/SR volume pairs on each CD, detailed site maps, movies, unlimited color images, and other supplementary data sets provided by authors. Our next venture is to digitize the older printed ODP volumes and the Deep Sea Drilling Project (DSDP) series and make these publications available online in HTML and PDF formats as well. This will provide the scientific community with more than 30 years of marine earth science research at

the click of a mouse, a legacy that will be built upon by the Integrated Ocean Drilling Program (IODP) in the near future.

URL: http://www-odp.tamu.edu/publications/

ED32B MCC: Level 2 Wednesday 1330h

The GeoWall in the Earth Science Classroom III Posters

Presiding: **P J Morin,** University of Minnesota**; P van Keken,** University of Michigan**; A Johnson,** Electronic Visualization Laboratory, University of Illinois at Chicago

ED32B-1193 1330h INVITED POSTER

Application Of Geowall Technology To The Analysis Of A Three Dimensional Geologic Map Of The Santa Clara (Silicon) Valley, California

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Geowall, a stereo projection system suitable for meetings and conferences, is being used to visualize, understand, interpret, and test a three-dimensional geologic map of the Santa Clara (Silicon) Valley, southern San Francisco Bay area, California. Geowall*, developed at the Electronic Visualization Laboratory associated with the University of Illinois, uses dual polarized images projected onto a polarization-preserving screen to create the illusion of three dimensions when viewed through polarized glasses. The map of Santa Clara Valley encompasses a 45 by 45 km area, extends to a depth of 14 km, and includes the northern Santa Clara Valley and surrounding hillsides between the active Calaveras and San Andreas faults. It is currently divided by several major faults into tectonic blocks, within which 9 units represent the Cenozoic and Mesozoic sections. Many of these units will be subdivided as the map evolves. The map is being constructed in EarthVision*(TM, Dynamic Graphics, Inc.), a geologic modeling software that includes three dimensional rendering and model manipulation capabilities. Earthvision generates data and model images of which the entire, or only portions of the model, can be viewed in three dimensions. The geowall presentation will explore the datasets and three-dimensional geologic map of Santa Clara Valley and structures defined by geologic mapping, stratigraphy, hydrology, potential field geophysics, seismic reflection, and earthquake seismicity. The map is the result of a collaborative effort among several earth science disciplines, and as such requires the integration of diverse datasets and the communication of diverse ideas. The geowall is particularly effective at promoting group discussion and analysis of the three-dimensional map, because the map can be displayed in a group setting as a 6x6 ft., stereo image. The spatial relationships of the datasets are easily seen, and the map can be deconstructed and particular relationships isolated. For example, trends in scattered clouds of point data are often difficult to perceive in two dimensions. The rendering of earthquake hypocenter data coupled with the ability to view only the fault planes in the map, from any perspective, permits rapid examination of coherent point patterns relative to modeled fault planes. Visualizing hydrologic data simultaneously with geologic data permits scientists to see relationships that were not apparent in two-dimensions or individually. Such concurrent analysis among project scientists is vital to the iterative process of exploring relationships between data sets, hypothesis testing, and model improvement. Another important use of the geowall is the communication of project ideas and results to others. The geowall has proven to be an effective tool for conveying information about Santa Clara Valley to managers, scientific audiences, and local citizens. Managers and scientists are able to grasp the geologic problems quickly and ask targeted questions, whereas citizens with non-earth science backgrounds are able to understand such concepts as pull-apart basins and gain knowledge of the scale of geologic structures. * Any use of trade, product, or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government.

ED32B-1194 1330h POSTER

The CoreWall; Visualization Technology for Core Interpretation and Site Selection

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The CoreWall project addresses the pressing need for the integration of all data associated with the interpretation of geologic cores. The ongoing effort is two-fold: first, a suite of hardware and software is being developed to give users full access to all associated data on a tiled display that can show entire sections of the core, and second, a set of Web based applications will be developed to provide access to the same set of tools on a standard consumer grade computer via the Internet. The suite of software tools includes tools to display lithologic, geophysical, and geochemical information referenced to scans of the split core, tools to include typed and hand written notes and diagrams pinned' to a specific core depth, and collaboration tools which allow technicians and scientists to discuss and interpret in real-time or in a non-linear fashion. All tools will be developed to access preexisting databases already in use by the coring community. Also included is software for the stereo visualization of topographic and bathymetric visualization of drilling sites. Global 30-meter resolution SRTM elevation data will be available for terrestrial sites as well as coarser bathymetric data augmented by high-resolution site surveys.

URL: http://www.geowall.org

ED32B-1195 1330h POSTER

3-D Visualizations At (Almost) No Expense

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Like most teaching-oriented public universities, San José State University (part of the California State University system) currently faces severe budgetary constraints. These circumstances prohibit the construction of one or more Geo-Walls on-campus. Nevertheless, the Department of Geology has pursued alternatives that enable our students to benefit from 3-D visualizations such as those used with the Geo-Wall. This experience - a sort of virtual virtuality - depends only on the availability of a computer lab and an optional plotter. Starting in June 2003, we have used the methods described here with two diverse groups of participants: middle- and high-school teachers taking professional development workshops through grants funded by NSF and NASA, and regular university students enrolled in introductory earth science and geology laboratory courses. We use two types of three-dimensional images with our students: visualizations from the on-line Gallery of Virtual Topography (Steve Reynolds), and USGS digital topographic quadrangles that have been transformed into anaglyph files for viewing with 3-D glasses. The procedure for transforming DEMs into these anaglyph files, developed by Paul Morin, is available at http://geosun.sjsu.edu/∼sedlock/anaglyph.html. The resulting images can be used with students in one of two ways. First, maps can be printed on a suitable plotter, laminated (optional but preferable), and used repeatedly with different classes. Second, the images can be viewed in school computer labs or by students on their own computers. Chief advantages of the plotter option are (1) full-size maps (single or tiled) viewable in their entirety, and (2) dependability (independent of Internet connections and electrical power). Chief advantages of the computer option are (1) minimal preparation time and no other needed resources, assuming a computer lab with Internet access, and (2) students can work with the images outside of regularly scheduled courses. Both methods have been very popular with both cadres of students, comprehension and performance have measurably improved, and local middle- and high-school teachers now use these methods with their own students.

ED32B-1196 1330h POSTER

A Software Tool for Effective Presentation of Earth Science Data

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A software tool for 3D scientific data analysis and presentation will be reviewed. The tool enables scientists, educators, and outreach coordinators to construct compelling visualizations from many disparate data sets and makes complex data understandable to specialists and non-specialists alike. Capabilities exist that allow presentations to be assembled in which data-based graphics, images, slides and various actions can be sequenced into logical order, creating content suitable for sharing with colleagues, students, or the general public. Data exploration capabilities facilitate further investigation and experimentation. Two case studies will be presented. In the first, undergraduate research students at Norfolk State University used the software to explore differences in the structure and characteristics of the tropospheric and stratospheric layers of the atmosphere. In the second, government scientists from EPA, NASA, and NOAA used the software on a portable GeoWall to present air quality and satellite data to audiences with a wide array of backgrounds.

ED32B-1197 1330h POSTER

GeoWall on the Cheap; Stereo Paper Maps in the Classroom and the Field

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An inexpensive version of GeoWall material has been developed for use in the field. Using freely available USGS DEM and DRG data and public domain software, local stereo topo maps can be easily created and printed on paper for use in the field without computers or projectors. We have used these maps with a broad group of K-12 students through university undergrads to help them learn to read a standard USGS 7.5 minute quadrangle. This enables students to develop a strong three-dimensional conception of their field area. Another important use of the maps is within an informal educational setting. The stereo maps easily convey topographic information to audiences with little or no Earth Science background or map reading skills. Not only are the maps instructive but they provide an engaging field or classroom activity that fosters enthusiasm for map reading. The technique for creating stereo maps will also be presented.

URL: http://www.geowall.org

ED32B-1198 1330h POSTER

Anaglyph Image Technology As a Visualization Tool for Teaching Geology of National Parks

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Anaglyphic stereo viewing technology emerged in the mid 1800's. Anaglyphs use offset images in contrasting colors (typically red and cyan) that when viewed through color filters produce a three-dimensional (3-D) image. Modern anaglyph image technology has become increasingly easy to use and relatively inexpensive using digital cameras, scanners,