THURSDAY OCT 8

8:00 AM - 9:15 AM PLENARY BREAKFAST
RIVER VIEW ROOM
Annual society business meeting

9:30 AM - 11:00 AM SESSIONS

FRESNO ROOM
I. DESIGN WITH THE USER IN MIND (Chair: Barbara Buttenfield)
⁂ Justin March and Mathew A. Dooley, University of Wisconsin-River Falls, "Exploring the effectiveness of tweening in cartographic animation"
⁂ Carolyn Fish and Kirk Goldsberry, Michigan State University, "The effects of smooth transitions in animated choropleth maps on human change detection"
⁂ Megan Lawrence, Matthew E. Millett, Lindsay Naylor, and Amy Lobben, University of Oregon, "Egocentric perspectives in map search"

EL DORADO / DIABLO ROOM
II. VISUALIZING HISTORY (Chair: Max Baber)
⁂ Chester Harvey, Anne Kelly Knowles, Toral Patel, and Alex Yule, Middlebury College, "Evolutions of the camp system: The challenge of visualizing historical change"
⁂ Whitney Berry, Erik Steiner and Zephyr Frank, Stanford University, "Terrain of History: 19th century Rio de Janeiro's Property Market"
⁂ Ruth Askevold, San Francisco Estuary Institute, "Reoccupying historical maps to recreate historical landscapes."

11:15 AM – 12:45 PM SESSIONS

FRESNO ROOM
I. MAPPING THE PHYSICAL LANDSCAPE (Chair: Aileen Buckley)
⁂ David Asbury, Center for Ecosystem Management and Restoration, "Prioritizing restoration opportunities for steelhead/rainbow trout (O. mykiss) in coastal watersheds of central and southern California"
⁂ Charlie Frye, ESRI, "Infusing choropleth maps with geography"
⁂ Paul Fyfield, Mattye Dahl, and Jim Rounds, Bureau of Land Management, "The Pacific Northwest Recreation Map Series"

EL DORADO / DIABLO ROOM
II. INNOVATIVE ATLASES (Chair: Virginia Mason)
⁂ James E. Meacham, Esther Jacobson-Tepfer, and Alethea Steingisser, University of Oregon, "Archaeology and landscape in the Mongolian Altai: Development of an atlas and an integrated website"
⁂ Elbie Bentley, Ohio University, "A historical expedition atlas in narrative form"
⁂ John V. Ward, University of Wisconsin-Parkside, "Utilizing geospatial technology to map community assets in the River North District of Racine, Wisconsin"

12:45-2:15 PM LUNCH ON YOUR OWN

1:15-2:15 PM MEETING
EL DORADO / DIABLO ROOM
U.S. National Committee to the International Cartographic Association

2:15 PM - 4:15 PM SESSIONS

FRESNO ROOM
I. PRACTICAL MAP LIBRARIANSHIP (Chair: Terri Robar)
⁂ Tsering Wangyal Shawa, Princeton University, "A Map Scanning Workflow from Start to Finish"
⁂ Terri Robar, University of Miami, "Map Librarianship for the Non-Librarian"
⁂ Brandon Plewe, Brigham Young University, " 'Mappifying' the Digital Library"
⁂ Open discussion and planning forum for future practical map librarian day events

EL DORADO / DIABLO ROOM
II. EMERGING VISUALIZATIONS (Chair: Amy Griffin)
⁂ Mark Harrower, David Heyman, Zachary Forest Johnson, Ben Sheesley, and Andrew W. Woodruff, Axis Maps LLC, "Indiemapper"
⁂ James Robertson, University of Montana, "Interactive mapping - the open source route"
⁂ Andy Szybalski, Google, "Maps give you superpowers: lessons from Street View"

4:30 PM - 6:00 PM SESSIONS

FRESNO ROOM
I. CRITICAL CARTOGRAPHIES (Chair: Margaret Pearce)
⁂ Jörn Seemann, Louisiana State University, "A plea for regional cartography and mental maps"
⁂ Mark Denil, National Naval Ice Center, "What is a radical cartography?"
⁂ Karen M. Tifonoff, Bloomsburg University, "The map poems of Richard Hugo"

EL DORADO / DIABLO ROOM
II. "THE BUSINESS OF CARTOGRAPHY: STORIES OF START-UPS, STUMBLES, SURVIVAL and SUCCESS"
Hans van der Maarel and Derek Tonn, organizers & moderators
Panelists: Hans van der Maarel, Red Geographics; Derek Tonn, mapformation; Dennis McClendon, Chicago CartoGraphics; and Alex Tait, International Mapping

6:30 PM NACIS NIGHT OUT
RIVER CITY BREWING COMPANY

FRIDAY OCT 9

8:30 AM - 10:00 AM CARTOGRAPHIC PERSPECTIVES PANEL
FRESNO / EL DORADO / DIABLO ROOM
Fritz Kessler, Frostburg State University; and Scott Freundschuh, National Science Foundation, moderators. Panelists: Tanya Buckingham, University of Wisconsin-Madison; Amy Griffin, University of New South Wales @ ADFA; Mark Harrower, University of Wisconsin-Madison; Nick Springer, Springer Cartographics.

10:15 AM - 12:15 PM SESSIONS

FRESNO ROOM
I. CARTOGRAPHY AND INSTITUTIONAL HISTORIES (Chair: Brandon Plewe)
⁂ Tsering W. Shawa, Princeton University, "Mapping of Tibet"
⁂ Leo Dillon, U.S. Department of State, "Cartography meets foreign policy: 23 years of mapmaking at the U.S. Department of State"
⁂ Christopher Kotecki, Archives of Manitoba, "The Cumins Map Company: 1917-1932"
⁂ Bruce Hicks, Ed Symons, and Ada Cheung, Center of Geographic Sciences, "New model for delivering geomatics training at the Center of Geographic Sciences"

EL DORADO / DIABLO ROOM
II. INTERFACE DESIGN AND TECH (Chair: Amy Griffin)
⁂ Jeremy White, University of Wisconsin-Madison, "Multi-touch interfaces for map navigation"
⁂ Michael Wurtz, University of the Pacific Library, "A new way to search old maps"
⁂ Alex Tait, International Mapping, "Designing physical map models to serve both sighted and visually impaired users"
⁂ Kiichi Takeuchi and Patrick Kennelly, Long Island University, "Maps for apps"

12:00 NOON - 2:45 PM NACIS BOARD MEETING
RIVER VIEW ROOM

12:15 PM - 1:45 PM LUNCH ON YOUR OWN

1:45 PM - 3:15 PM SESSIONS

FRESNO ROOM
I. INDIGENOUS CARTOGRAPHIES (Chair: Michael Hermann)
⁂ Noel Ring, Geographer, Retired; Lois Wardell, Latitude Engineering; and Elaina Hyde, University of Amsterdam, "Northeast stone star maps: An Indigenous enigma"
⁂ Eliana Macdonald, Ecotrust Canada, "Maps for Living Proof"
⁂ John Cloud, NOAA, "Following the trails of the Kohklux map"

EL DORADO / DIABLO ROOM
II. MAKING AND MAPPING MULTI-SCALE DATA (Chair: Patrick Kennelly)
⁂ Barbara P. Buttenfield, University of Colorado - Boulder; Cynthia Brewer, Pennsylvania State University; and E. Lynn Usery, USGS Center for Excellence in Geospatial Information Science, "Place still matters: Generalizing the National Hydrography Dataset by local terrain and climate"
⁂ Aileen Buckley, ESRI, "Soil cartography: Phase 2"
⁂ Cynthia Brewer, Barbara P. Buttenfield, and E. Lynn Usery, "Designing The National Map produced by USGS for multi-scale online use"

3:30 PM - 5:30 PM SESSIONS

FRESNO ROOM
I. RETHINKING TRADITIONAL TECHNIQUES: EVALUATIONS AND SOLUTIONS (Chair: Mathew Dooley)
⁂ Janelle Payne, University of Redlands, "GIS tools for cartographic representation of spatial data uncertainty"
⁂ Anthony C. Robinson, Robert Roth, and Alan M. MacEachren, Pennsylvania State University, "Developing standards for map symbology"
⁂ Judith Tyner and Deborah Hann, California State University-Long Beach, "Which way is north: Projections and north arrows in elementary school workbooks"
⁂ Andrew W. Woodruff, Axis Maps LLC, Robert E. Roth, Pennsylvania State University, and Zachary Forest Johnson, Axis Maps LLC, "Value-by-alpha mapping: An alternative to cartograms"

EL DORADO / DIABLO ROOM
II. NEW TOOLS FOR NEW CARTOGRAPHIES (Chair: Mathew Dooley)
⁂ Jeremy White, James Burt, University of Wisconsin-Madison; and Greg Allord, USGS, "Automated georeferencing of scanned historical USGS quadrangles."
⁂ Stuart Miller, Star-Apic, "Producing quality mapping quickly and efficiently with Mercator"
⁂ Nick Martinelli, TerraSeer, "Spatial analysis and visualization on the web"
⁂ Michael Braymen, Pennsylvania State University, and Fritz Kessler, Frostburg State University, "A GIS tool for evaluating distortion of projections"

6:00 PM - 9:00 PM BANQUET
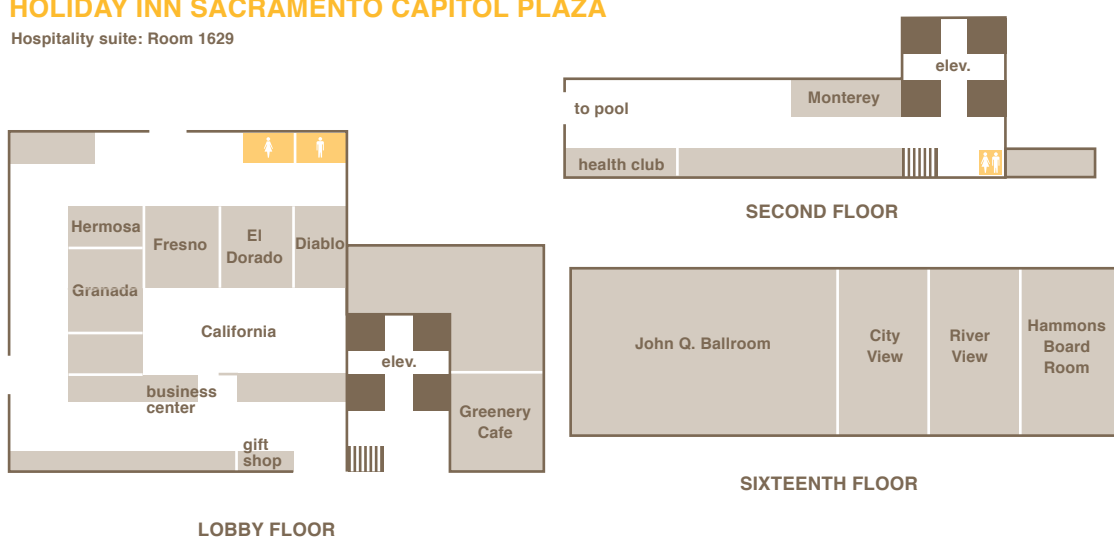**CALIFORNIA / BALBOA / CALAVERAS ROOM**
DINNER & CASH BAR
PECHA KUCHA (Host: Virginia Mason)
GEODWEEB GEOPARDY! (Host: Dennis McClendon)

HOLIDAY INN SACRAMENTO CAPITOL PLAZA

Hospitality suite: Room 1629

elev.
to pool   Monterey
health club
SECOND FLOOR

Hermosa Fresno El Dorado Diablo
Granada
California
business center   elev.
gift shop   Greenery Cafe
LOBBY FLOOR

John Q. Ballroom | City View | River View | Hammons Board Room
elev.
SIXTEENTH FLOOR

WEDNESDAY OCT 7

8:30 PM - 5:00 PM PRACTICAL CARTOGRAPHY DAY
FRESNO / EL DORADO / DIABLO ROOM

Opening Remarks
Nick Springer, Springer Cartographics
Neil Allen, Allan Cartography/Benchmark Maps

Natural Earth Vector Data (a multi-scale global data product)
Tom Patterson, National Park Service
Nathaniel Kelso, Washington Post

Creating Multi-Scale Online Maps in ArcGIS
Mamata Akella, ESRI, Inc.

Adobe InDesign for Atlas Page Layout Design
Alethea Steingisser, InfoGraphics Lab, University of Oregon

From Arc to Illustrator:
A practical workflow for production cartography
Kevin McManigal, Adventure Cycling

Demonstration of Ortelius: an alternative GIS
Jill Saligoe-Simmel, Ortelius

Extending the Google Maps API for Event Animation Mashups
Robert E. Roth, Kevin S. Ross, GeoVISTA Center, The Pennsylvania State University

Open Source GIS
Alex Mandel, OSGF

Introducing the ArcGIS Bump Mapping Tool
Aileen Buckley, ESRI, Inc.

Indiemapper Demonstration
David Heyman, Axis Maps, LLC

Ideas for Creating Smaller Interactive Map File Sizes in .swf Format
Derek Tonn - Founder and CEO, mapformation, LLC

Closing Remarks
Laptop Sessions

12:00 NOON - 1:00 PM PRACTICAL MAP LIBRARIAN DAY
DEPARTS FROM LOBBY @ 12 NOON
Lunch at University of California-Davis

1:00 PM - 5:00 PM
Tour of Map & GIS Data Collection, Shields Library
Kathy Stroud, Map & GIS Librarian, University of California-Davis

Searching OPACs using geographic coordinates
Marcy Bidney, Maps Library, Pennsylvania State University

6:00 PM Return to Holiday Inn Sacramento Capitol Plaza

2:45 - 5:30 pm NACIS BOARD MEETING
JOHN Q. BALLROOM

7:00 PM OPENING SESSION
CALIFORNIA ROOM
KEYNOTE SPEAKER
⁂ Michal Migurski, Stamen Design, "Read/Write Mapping"

OPENING RECEPTION
Renew friendships over drinks and hors d'ouvres!

8:30ish PM STUDENT POSTER COMPETITION
HERMOSA ROOM
⁂ Paulo Raposo, Kamran M. Khan, and David Andrew Janes, The Centre for Research on Inner City Health, St Michael's Hospital, Toronto / University of Toronto. *Bio.Diaspora Cartography - Visualizations of Potential Pandemic Spread by Global Air Traffic.*
⁂ Jillian Bolino, Ohio University. *Building Up, Crumbling Down and Moving Out: Real Estate Trends in Our Recession.*
⁂ Anne McTavish, San Francisco State University. *C. Hart Merriam's boundaries of the Wintoon Indians in Northern California.*
⁂ Travis M. White, University of Kansas. *Cultural Transit Map of the Conterminous United States.*
⁂ Tim Stallmann, Maribel Casas-Cortes, Sebastian Cobarrubias, Craig Dalton, Liz Mason-Deese, and Lan Tu, UNC-CH Counter-Cartographies Collective. *disOrientation 2.0: your guide to UNC-CH.*
⁂ Timothy J. Johnson, Mark M. Smithgall, Adam C. Thomas, and Robert E. Roth, The Pennsylvania State University. *From Print to Screen: Redesigning the Penn State University Campus Map.*

⁂ Jesse Nett, University of Oregon. *Housing History: Greater Yellowstone Region.*
⁂ Kevin McGrath, University of Wisconsin-Madison. *The Moon.*
⁂ Daniel M. Bochman, University of Wisconsin - River Falls. *Physical Map of Yellowstone National Park.*
⁂ Mark Smithgall, The Pennsylvania State University. *A Political Map of Alaska.*
⁂ Sayoko J. O. Wu, Humboldt State University. *Road and Trail Closures Due to the Halema'uma'u Crater Eruption.*
⁂ Daniel P. Huffman, University of Wisconsin Cartography Lab. *Rising Skyline.*
⁂ Robert E. Roth and Jin Chen, The Pennsylvania State University. *US Cervical Cancer Mortality 2000-2004: New Methods and New Findings.*
⁂ Mike Boruta, Ohio University. *The Million Dollar Highway.*

8:30ish PM MAP GALLERY
HERMOSA ROOM
⁂ Tom Harrison, Tom Harrison Maps. *Beyond the Printed Map.*
⁂ Stephen Engle, Center for Community GIS. *Community Cartography.*
⁂ Michael Fournier, US Board on Geographic Names/Census Bureau, Meredith Westington, National Oceanic and Atmospheric Administration, and Dan White, U.S. Forest Service. *Introduction to the US Board on Geographic Names.*
⁂ Elbie Bentley, Ohio University. *A Narrative Atlas of the Gunnison-Beckwith Survey for the Pacific Railroad, 1853-1954.*
⁂ Mike Boruta, Ohio University. *Walk with the Ancients: Mapping a Modern-Day Pilgrimage on the Great Hopewell Road.*
⁂ Mike Boruta, Ohio University. *Mouths Wide Open: Words Overheard in Athens, Ohio, Autumn 2008.*

⁂ Brian Greer, Xing Liu, Travis Clark, Pascal Akl, Timothe Vincent, and Robert Mazur, Michael Baker Jr. Inc. *Sacramento River Watershed Master Plan.*
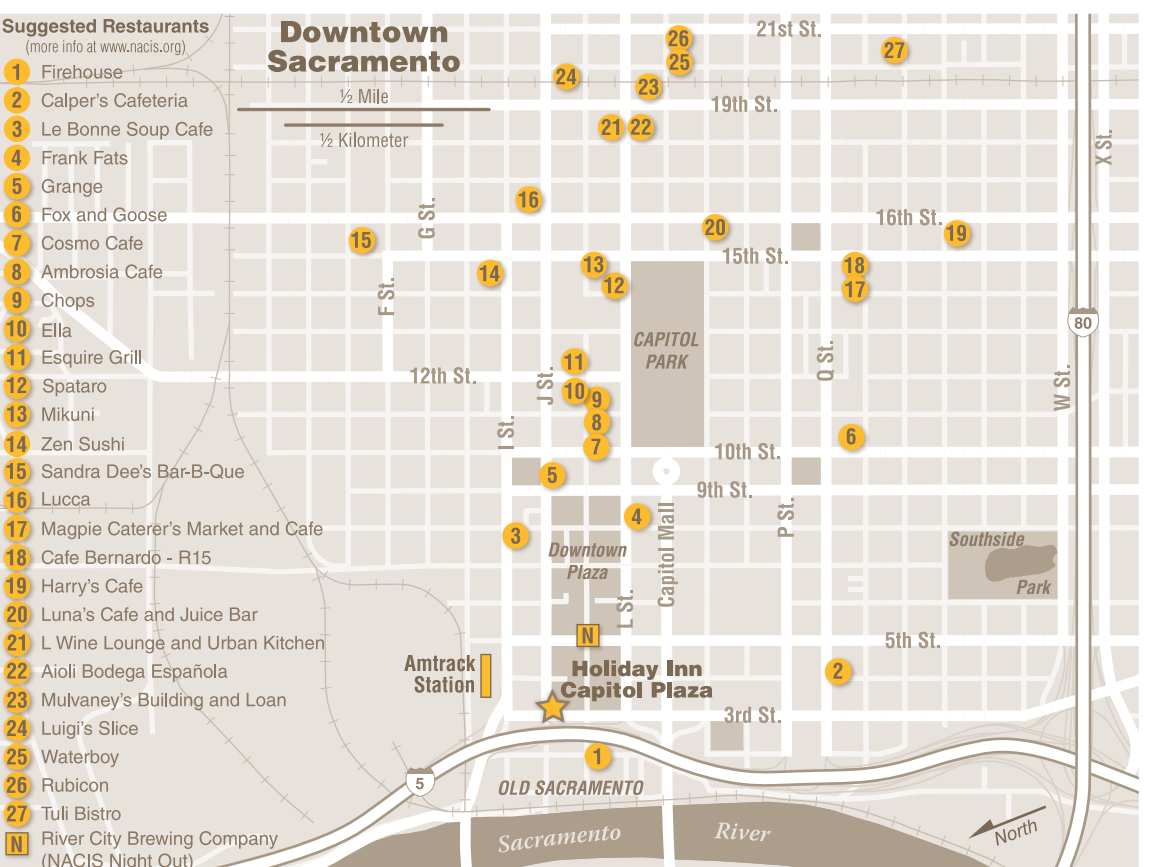⁂ Kathy Harris, Stanford University Spatial History Lab. *The Spatial History Project.*
⁂ Hans van der Maarel, Gemeente Apeldoorn / Red Geographics. *Stadsplattegrond Gemeente Apeldoorn.*
⁂ Tom Patterson, U.S. National Parks Service. *Cross-blended Hypsometric Tints.*
⁂ Amy Cohen, The Everglades Foundation. *Old is the New New: Transforming an historic map of the Florida Everglades for GIS compatibility.*
⁂ Stuart Allan, Benchmark Maps. *The new look of California.*

Suggested Restaurants
(more info at www.nacis.org)

1. Firehouse
2. Calper's Cafeteria
3. Le Bonne Soup Cafe
4. Frank Fats
5. Grange
6. Fox and Goose
7. Cosmo Cafe
8. Ambrosia Cafe
9. Chops
10. Ella
11. Esquire Grill
12. Spataro
13. Mikuni
14. Zen Sushi
15. Sandra Dee's Bar-B-Que
16. Lucca
17. Magpie Caterer's Market and Cafe
18. Cafe Bernardo - R15
19. Harry's Cafe
20. Luna's Cafe and Juice Bar
21. L Wine Lounge and Urban Kitchen
22. Aioli Bodega Española
23. Mulvaney's Building and Loan
24. Luigi's Slice
25. Waterboy
26. Rubicon
27. Tuli Bistro
N. River City Brewing Company (NACIS Night Out)

Downtown Sacramento
½ Mile
½ Kilometer
21st St. · 19th St. · 16th St. · 15th St. · 12th St. · 10th St. · 9th St. · 5th St. · 3rd St.
G St. · F St. · Q St. · P St. · N St. · L St. · J St. · I St. · H St. · X St. · W St.
CAPITOL PARK
Downtown Plaza
Southside Park
Amtrack Station
Capitol Mall
Holiday Inn Capitol Plaza
OLD SACRAMENTO
Sacramento River
North
5 · 80

Asbury, David (Center for Ecosystem Management and Restoration) *Prioritizing restoration opportunities for steelhead/rainbow trout (O. mykiss) in coastal watersheds of central and southern California.* Salmonid populations in central and southern California are among the most endangered in the United States. With limited funds to restore these populations, identifying and prioritizing locations for restoration are essential, and we have done so for steelhead (*Oncorhynchus mykiss*) in coastal California watersheds from the Golden Gate south to the border with Mexico. Our work analyzed hundreds of available references regarding these populations and their rearing habitat in the 331 named watersheds draining to the Pacific Ocean within the study area. Using linear referencing we quantified stream-miles of rearing habitat, and we then used this measure as a proxy for a watershed's potential to sustain a healthy, productive population. Over the course of the project we also enhanced locational accuracy of barriers to migration and identified active restoration projects. Analyzing these combined parameters provides a method for ranking restoration opportunities. Our approach will focus restoration efforts upon the region's most promising locations, helping ensure the conservation of steelhead for future generations and providing an effective mechanism for watershed management.

Askevold, Ruth (San Francisco Estuary Institute) *Reoccupying Historical Maps to Recreate Historical Landscapes.* Recent discourse has replaced the notion of a map's objectivity with the need to understand a map's inherent biases. However, if maps are biased, then how are they to be used in geographic research and analysis? This presentation examines the ways in which the Historical Ecology Program at the San Francisco Estuary Institute (SFEI) uses maps to reconstruct historical landscapes, necessitating a deep understanding of a map's cultural and technical constraints. SFEI georeferences historical maps and textual data (explorer's narratives, newspaper accounts, and related map attributes), allowing for multiple interpretations of multiple sources as maps are combined and recombined in a GIS. Through examples from various San Francisco area watershed-based projects—including mid-19th century *diseños* and land grant confirmation maps; historical US Geological Survey quadrangles; privately published atlases; and General Land Office surveys and plat maps from the 1850s and 1860s—I show how we consider a map's cultural and social context, as well as assessing a map's technical constraints. Methods to make our own biases transparent are also presented.

Bentley, Elbie (Ohio University) *A Historical Expedition Atlas in the Narrative Form.* The scientific exploration and documentation of the Pacific Railroad Surveys of the nineteenth century is a subject that has received little attention in historical cartography. Of the surveys, the Gunnison-Beckwith expedition produced a particularly intriguing report containing adventure, illustration, and topographic presentation. However, the intensity of the stories and the beauty of the artistic products contained within the reports remain largely unknown. Drawing on Denis Wood's concept of the atlas as a narrative form, this research explores the representation of this significant historical event in an atlas organized to be read like a novel. In doing so, this narrative is further structured to reflect the cartographic language of the nineteenth century topographic explorers in order to recreate their world of incorporated illustrations, observation, and text within each map. This research also explores cartographic and atlas design techniques developed during atlas production.

Berry, Whitney, Erik Steiner, and Zephyr Frank (Stanford University) *Employing Visualization to Reveal the Slave Market in 19th Century Rio de Janeiro, Brazil.* The market for slaves in Rio de Janeiro underwent a series of major transformations over the course of the nineteenth century. Prior to 1831, slaves poured into the city during the period of the legal Atlantic slave trade. Tens of thousands more Africans landed in Brazil's imperial capital before the illegal Atlantic trade was finally suppressed in 1850. Thereafter, buying and selling slaves shifted to a local market typified by individual sales. This project maps detailed transaction data about individual slave sales throughout the city in the year 1869. By representing the origins and destinations of slaves in this system, we can highlight the ubiquity of slavery in Rio de Janeiro and the movement of the slaves themselves in and out of new environments. These changing experiences can be reflected spatially and through other variables, such as through the wealth and social experiences of the buyers and sellers caught up in this system.This presentation will also touch on the broader development of a historical GIS for 19th century Rio de Janeiro, and show how historians are using these tools to reveal the experience of living in the city in the mid-1800s.

Black, Landon (OpenJUMP) *Creating and Editing Vector Data with OpenJUMP.* OpenJUMP is an open source desktop GIS program written in the Java programming language. This presentation will examine how it can be used with other open source software and low cost tools to create and edit vector data for cartographic map production. The use of OpenJUMP to create vector data for the Open Street Map project will be examined as a case study.

Braymen, Michael (Pennsylvania State University) **and Fritz Kessler** (Frostburg State University) *A GIS Tool for Evaluating Distortion of Projections.* Many users of GIS products have difficulty understanding the distortion inherent in a map projection. This difficulty impacts selecting an appropriate projection for specific mapping situations. Although Tissot's indicatrix can be used to assess the distortion properties of a projection, the calculations use distinct formula for each projection. In addition, most GIS products do not include built-in capability of displaying Tissot's or other distortion metrics. Using the built-in functionality of a GIS and the principles of Tissot's Theorem, we have programmed a tool that calculates an approximation of Tissot's indicatrix. Specifically, our tool permits the distortion of angles, scale and area to be both quantified and visualized which will enhance the understanding of distortion ultimately assisting in selection of appropriate projections for GIS projects. Our tool uses sets of lines radiating from the central point of a series of Azimuthal Equidistant projections centered on random points throughout the area of interest. Next, these points and lines are projected to a projection of interest. These resultant lines are then used to calculate angular and scale distortion at each point. These calculations are then be used to quantify the distortion in the geographic area of interest. Areal distortion is analyzed by projecting a grid of features covering the area of interest from an equal area projection to a projection of interest. We will demonstrate the use of the tool described.

Brewer, Cynthia A. (Pennsylvania State University), **Barbara P. Buttenfield** (University of Colorado–Boulder); and **E. Lynn Usery,** (USGS Center for Excellence in Geospatial Information Science) *Designing The National Map produced by USGS for multi-scale online use.* USGS no longer prints traditional topographic maps. Federal topographic map production has moved to digital delivery modes. Digital spatial datasets that are the basis for The National Map allow users to work at multiple scales. We report on one effort to prepare designs for topographic multi-scale mapping. This effort complements electronic topo and ortho-photo map production in progress at USGS (starting with U.S. coastal regions), maps-on-demand development work at USGS, new viewer development for The National Map at USGS, ESRI services that offer federal data for the country in new designs through scale, and consumer services such as Google Maps that offer U.S. mapping in varied designs through scale. The designs in development that we discuss were strictly from federal framework data with automated geoprocessing to produce generalized hydrography for scale change with stream hierarchies symbolized, automated labeling, point locations for cultural and emergency-response features, and terrain shading integrated with selected land cover and land uses. The audience will be encouraged to critique the design work which will still be in progress when we meet.

Buckley, Aileen (ESRI) *Soil Cartography: Phase 2.* Last year I talked about creating a multi-scale online soils map to be viewed in a Web map service. That presentation was largely speculative – what did I anticipate I would have to do and how would I do it? This year I can report on what I actually did and how it was done! Actually, as a veritable novice, it took about a year to sort out the intricacies of making this map. It also required sponging off the expertise of those around me working on similar projects. Now I am able to explain the major design and production considerations of my experience to you. I'll describe how we used soils data from global to county scales to make a multi-scale map that ranges from global to local scales. I'll discuss how we designed the base map that provides the geographic context for the soils data. I'll talk about how all these data were organized and symbolized to make a multi-scale map that could be viewed in a Web map service. And I'll explain how we took advantage of the Web as a medium to provide interactive query and reporting capabilities as well as connections to other resources.

Buttenfield, Barbara P. (U. Colorado – Boulder); **Cynthia A. Brewer** (The Pennsylvania State University); **E. Lynn Usery,** (USGS Center for Excellence in Geospatial InformationScience)*Place Still Matters: Generalizing the National Hydrography Dataset by Local Terrain and Climate.* This paper reports on continued progress with generalizing reduced scale versions of hydrographic data for a multi-resolution national data set. Previous NACIS presentations demonstrate that tailoring a generalization sequence to specific geometric parameters such as feature size, shape and texture can produce appropriately simplified versions. We called this "differential generalization", a strategy to modify parts of a feature class uniquely to preserve regionalized geometric characteristics. This year's work extends previous work to demonstrate that knowledge about varying terrain (mountainous, hilly or flat) and varying climate (arid or humid) can support decisions about algorithms, parameters, and command sequences to create generalized data versions which preserve distinct hydrographic patterns in these regions. We work with six sub-basins of the National Hydrography Dataset (NHD) which provide a sample of terrain and climate characteristics. We are using two NHD levels of detail, a high resolution version compiled for 1:24,000 mapping scale, and a medium resolution version compiled for 1:100,000. Specifically designed generalization sequences are used to create simplified versions of the high resolution data. Results are compared to the medium resolution NHD, using metric measures as well as visual comparison using standardized topographic symbol designs.

Cheung, Ada, Bruce Hicks, and Ed Symons (Center of Geographic Sciences) *New Model for Delivering Geomatics Training At The Centre of Geographic Sciences.* The Centre of Geographic Sciences (COGS) is undertaking a review of its educational programs and is set to offer a new Diploma in Geographic Sciences this fall. Geographic sciences include a diverse set of disciplines that deal with the spatial dimensions of human-environment interactions. Our world is now more crowded, more polluted, more urban, more biologically stressed and warmer than ever before in recorded history. Geographic science is central in helping us understand our world and our place in it and in supporting a broader, more informed approach to decision making. The new diploma will consist of a foundation year followed by students opting for concentrations in Cartography, Community and Environmental Planning, Geographic Information Systems, Remote Sensing and an option for interdisciplinary studies. The program will be largely focused on applying modern geomatics solutions to these fields. This paper will review some of the highlights from industry and alumni studies related to geomatics education and it will also introduce the new diploma. We will also discuss a new model of program offerings. The new model is designed to provide pathways for students from various levels of education and background and also provide continuing education for geomatics professionals.

Cloud, John, (NOAA) *Following the Trails of the Kohklux Map.* In 1867, on his first visit to what was still Russian America, now Alaska, George Davidson, head of the west Coast Survey, met a Tlingit leader named Kohklux. They met again in 1869, when Davidson returned to observe a total solar eclipse from a spot outside Kohklux's village on the Lynn Canal. As a part of the exception friendship between them, and the experiences they shared, Davidson and Kohklux made a cartographic potlatch. Davidson prepared a painting of the eclipse at totality; Kohklux and his two wives made a series of sophisticated maps of the complex

geography and ancient trade routes from the Alaskan coast over mountain passes inland and down to the Yukon River. The region and its traditional people were changed utterly in the Klondike gold rushes that soon followed. Now, as part of the cultural re-emergence of coastal Alaskan American Indians and Canadian First Nations in the Yukon, the Kohklux maps are subjects of intense and productive geographical and linguistic analysis, as a landmark of 19th century cartography still contributes to 21st century life and culture.

Denil, Mark (National Naval Ice Center)*What is a Radical Cartography?* We have all seen the labels and titles: a Radical Cartography; a Counter-Cartography; an Alternative Cartography. What, or how, could such a thing be? Why would it exist, and what character would it have? These questions spring immediately to mind when confronted with such adjectival terms, and the answers are not easy to glean from the works, so adjectivally labeled, themselves. This is likely thus, at least in part, because there seem to be as many, or more, definitions of these descriptors as there are examples. It would seem reasonable that we should be able to establish at least some general parameters for understanding and judging a cartography that is truly radical, counter, and / or alternative. For instance; it seems clear that a comprehensive definition would necessarily go to the heart of the question of what any cartography might or not be, because any cartography must perforce have some resemblance to all others. From there, we should be able to sketch out the unique nature of a radical or alternative form. This is because in order to be a special cartography, there must be something that makes it different and special from others that are not radical, counter, and / or alternative. This talk will attempt to explore the phenomenon of a radical, counter, and / or alternative cartography, and to place it in a perspective useful to interpreting and understanding it.

Dillon, Leo (U.S. Department of State) *Cartography Meets Foreign Policy: 23 Years of Mapmaking at the U.S. Department of State.* What happens when you misrepresent a sensitive boundary on an official U.S. Government map? What do you do when a senior policymaker asks you to cartographically stretch the truth to make a political point? How do you treat disputed territories on an official U.S. Government map when you know you can't please both sides of the dispute? And why would the Secretary of State call you at home when you're throwing a party to demand the exact location of a rock off the coast of Morocco? This presentation will discuss a cartographer's experience of working at the State Department in Washington, from the dying days of both the Soviet Union and pen and ink cartography to the current era of emerging and failed states and GIS-derived mapping in support of foreign policy disputes.

Fish, Carolyn and Kirk Goldsberry (Michigan State University) *The Effects of Smooth Transitions in Animated Choropleth Maps on Human Change Detection.* Computer animation enables cartographers to visualize time-series data as never before; we can build dynamic map sequences that congruently depict change over time. However, readers have difficulty comprehending changes within these animations, and viewers of animation often fail to detect important changes between adjacent scenes, called change blindness. These potentially overwhelming perceptual burdens threaten the effectiveness of animated maps because several important changes can occur simultaneously throughout the display during a single scene transition. One potential cartographic solution for this problem involves graphic interpolation between display frames, also known as "tweening." Tweening smoothes transitions and lengthens the duration of change between scenes in an animated map series. Preliminary results from an experiment with human-subjects are presented. Subjects viewed animated choropleth maps utilizing three types of transitions. Subjects were evaluated on their abilities to detect changes between scenes in these animations. Results from this study will allow cartographers to create more effective animated maps with tweened transitions allowing map users to better perceive changes in the map displays. In this way, we cartographers can generate more effective animations and reduce change blindness in animated choropleth maps.

Frye, Charlie (ESRI) *Infusing Choropleth Maps with Geography.* Thematic maps, particularly choropleth maps, have suffered for too long from the lack of sufficient base geography. The minimalist choropleth map has been the enemy of communication for too long. The fear that an excess of reference information will obstruct a map reader's ability to discern geographic patterns is a convenient rationalization. This presentation explores the notion of adding essential geographic context to choropleth maps. The ability to recognize the meaning of the mapped distribution (that is, whether a pattern of colors or shaded values is meaningful or not) depends on one's ability to relate theabstract choropleth map to one's own mental map. In my undergraduate days, a professor showed my class a "naked" choropleth map of U.S. counties and explained the relevant patterns, justifying them as "relevant" based on his geographic knowledge. I learned a bit about U.S. geography from that. I would have remained ignorant if not for the professor (the map to me contained no geographic message but his explanation of the patterns based on his geographic understanding did) Today there are too many maps, and too few professors, so our maps need as much geography as they can hold and still function well. Our maps must change lest the geographically illiterate percentage of our population continue to expand. As a society we cannot afford to have our ability to think geographically ensconced in the ivory tower.

Harrower, Mark, David Heyman, Zachary Forest Johnson, Ben Sheesley, and Andy Woodruff (Axis Maps, LLC) *Indiemapper.* Thanks to cloud computing and web-based services, the era of expensive desktop software is coming to an end. Axis Maps has created Indiemapper (indiemapper.com) an online mapmaking service that allows folks to create data-rich, highly customizable thematic and reference maps using a real-time visual editing approach. Indiemapper is what happens when people who make maps for a living think about what they really need and build it: We were tired of altering our mapping work-flow to fit expensive software designed for graphic designers or GIS-technicians. We're not alone. Map-makers, novice and professional alike, are frustrated with their existing choices. We thought 'why can't these tools better reflect the way we actually work?' By starting with a clean slate (and not being hostage to decades-old legacy code or UI) we were able to take a fresh look at how maps actually get made in the 21st century. This talk will demo Indiemapper and highlight the speed and ease of the visual-editing approach, the philosophy and architecture of the underlying system, the power of Webservices over traditional desktop approaches, and the kinds of thematic maps you can make with version 1.0 of Indiemapper. Audience members are encouraged to bring their laptops so they can follow along and make their own maps during the talk.

Harvey, Chester, Anne Kelly Knowles, Toral Patel, and Alex Yule (Middlebury College) *Evolution of the Camps System: The Challenge of Visualizing Historical Change.* Researchers at the U.S. Holocaust Memorial Museum are painstakingly documenting the history and location of the thousands of places, collectively called camps, that the Nazis used to confine, punish, and murder civilian prisoners during World War II. This presentation shows what the authors have been able to learn about the evolution of the concentration camps system by refining, enriching, and analyzing a spatio-temporal database developed by the Museum's camps encyclopedia project. Of the many questions this database enables one to ask, one of the most basic is how "main" camps – such as Auschwitz, Matthausen, and Dachau – were related to their associated subcamps, many of which weresites of manufacturing and resource extraction employing camp prisoners as slave labor. Attempting to describe and analyze those relationships in a historical GIS raises many other questions, however, beginning with the challenge of how to capture historical change in a digital database so that a dynamic, complex phenomenon can be accurately represented and interrogated visually.

Kessler, Fritz (Frostburg State University) **and Scott Freundschuh** (NSF), moderators; **Tanya Buckingham** (University of Wisconsin-Madison), **Amy Griffin** (University of New South Wales @ ADFA), **Mark Harrower** (University of Wisconsin-Madison), and **Nick Springer** (Springer Cartographics). In January 2009 Cartographic Perspectives (CP) conducted its first readership survey. Over 250 NACIS members participated offering numerous suggestions on how to improve CP. While the readership generally enjoys reading CP, competition from other sources, timeliness of 'print' delivery, and some of the journal's current content were points of concern. In order to present the results of the readership survey, respond to the main points, and gain further input from the NACIS community a panel session will be offered. This panel session's goal is to have a frank discussion on six main issues. First, an overview of CP 's current status will be presented. Second, ideas on how CP may better reflect the readership's expectations and possible ways on how this can be fulfilled will be reviewed. Third, a special all digital version of CP focusing on cartographic techniques will be discussed as a possible 'model' for future special issues of CP. Forth, a possible configuration where CP, CaGIS, and Cartographica merge into a single journal will be offered. Fifth, thoughts on how CP can become better connected with those in both academic and professional settings. Sixth, gain a perspective on how CP can better meet the needs of those in the professional map making arena. While these items will be the focus of the session ample time will be available for discussion and input from those in attendance.

Kotecki, Christopher (Archives of Manitoba)*The Cumins Map Company: 1917-1932.* Oliver F. Cumins, born in Ontario, graduated from the University of Toronto in 1911 with a Diploma in Civil Engineering from the Faculty of Applied Science and Engineering. In 1913, he moved to Regina, Saskatchewan, to establish his engineering career. In 1917, he published a series of rural directory maps for Saskatchewan and in 1918, he published a series of maps for Manitoba, Saskatchewan, and Alberta. These were followed by map series for Ontario and Prince Edward Island. The maps were to some extent in emulation of thecounty atlases published in Ontario between 1875 and 1881. More importantly, they were a response to the Henderson Directories Company Limited of Winnipeg ceasing production in 1908 of its annual commercial rural directories for Western Canada and thereafter producing only urban directories. The directories listed the rural residents and gave the legal description of the farm by quarter section. The Cumins map series as often sold as individual sheets to the farmers but they were also a replacement for the Henderson's Directory for commercial interests. Cumins' associate was Melville S. Arneil, a draftsman who became the manager for the company running the day to day end of the business, especially as Cumins' business interests expanded in the engineering and construction industry in the 1920's and 1930's. This paper will examine the development of the Cumins Map Company, the maps it produced and Oliver F. Cumins' various business initiatives. Note: The views and opinions expressed are those of the author and do not necessarily reflect those of the Archives of Manitoba or the Government of the Province of Manitoba.

Lawrence, Megan, Matthew E. Millet, Lindsay Naylor, and Amy Lobben (University of Oregon) *Egocentric Perspectives in Map Search.* Many world maps produced in the United States are produced using a central meridian of 0° longitude, with North and South America appearing in the left part of the map, Europe and Africa at the center and Asia, Australia and Oceania at the right. Subsequently, the United States, with its placement in the upper left corner, can be argued to occupy a visually dominant space. Does the location of the U.S. in this position draw more attention to it than other map areas? Or, are there other variables at play such as egocentrism? That is, when asked to identify an area of interest on a choropleth map (of the world, do Americans tend to first look at the United States? This project investigates if the U.S. is dominantly chosen in different map-search conditions in order to understand how map layout and egocentric perspectives play into visual search strategies.

van der Maarel, Hans (Red Geographics), **Derek Tonn** (mapformation), **Dennis McClendon** (Chicago CartoGraphics), **and Alex Tait** (International Mapping)*The business of cartography: Stories of start-ups, stumbles, survival

and success. Running a small cartographic business, or being a freelancer in the field, generally takes more than just being a good cartographer. This round table discussion will cover various practical aspects on thebusiness side of cartography, from freelance to solo proprietorship to running a small company. Topics discussed will include promotion and marketing, pricing, project management and business relations.This round table is intended for people who are either considering taking this step or have recently done so.

Macdonald, Eliana (Ecotrust Canada) *Maps for Living Proof.* My presentation will describe the process of creating maps for Living Proof, a sequel to Chief Kerry's Moose, written by Terry Tobias. Living Proof will be the definitive word on legally-defensible use and occupancy map surveys. The book contains a large variety of maps. I was responsible for the cartography for 38 maps indicating the use and occupancy in traditional territories of six Canadian First Nations and two Australian Aborigine groups.While creating the cartography for Tobias' book I came across some interesting issues including; creating a unique style for each nation, very few of which I had visited; icon issues, including creation, style and colour; and using leader lines for crowded data points while respecting the privacy issues of large scale mapping. I will address these issues as well as the challenge of creating maps using indigenous data in a culturally sensitive and appropriate manner in my presentation. My presentation will also discuss the process of creating a manual that addresses best practices for mapping. Although Tobias' book is an excellent methodology for collecting hard copy data, it does not delve into the best practices to create digital data from the maps. For this reason I created a manual detailing my method of digitizing to accompany the book. This manual is available on the Aboriginal Mapping Network's website.

March, Justin and Mathew A. Dooley (University of Wisconsin – River Falls) *Exploring the Effectiveness of Tweening in Cartographic Animation.* Tweening animation, as opposed to frame-by-frame animation, involves the technique of generating temporally interpolated images between slices of time when data are available. While tweening provides smooth-looking transitions, cartographers have recognized that there are several disadvantages to showing map readers data frames that may or may not reflect reality. Tweening, however, may provide an effective tool for data exploration, especially when data are sampled at coarse temporal intervals, or when changes that occur between individual data frames are more important than the frames themselves. The purpose of this paper is to examine the effectiveness of tweening for exploring changes in size and extent. To this end, we consider the preliminary results of user testing that involved asking students to identify how the perceived size of continents changed throughout the Renaissance Era. Our preliminary results suggest that frame-by-frame and tweened animations perform similarly in helping map readers assess changes in size and extent. However, our data may also suggest that tweening is a more effective visualization technique when interpretive tasks are difficult.

Martinelli, Nick (TerraSeer) *Spatial Analysis and Visualization on the Web.* Traditional desktop applications continue to be replaced or supplemented by web based applications. TerraSeer (www.terraseer.com) is augmenting its desktop application, ClusterSeer, with a web based version called ClusterSeer Web. The web based application has been developed to utilize the power of ClusterSeer's existing analytical methods as well as server technology to give users a lightweight and accessible web based analysis and visualization tool. ClusterSeer Web's visualization tools have been developed to provide interactive and attractive graphics that present data in a clear and focused format. ClusterSeer is a desktop application that examines events for the presence, significance, and location of clusters through space and time. It is primarily used for the analysis of disease events, but can be utilized for other events such as crime or sales. ClusterSeer provides geographic and data visualizations of the target data and analysis results. The web based version of ClusterSeer is designed to be a full featured version of the desktop application. Users will expect the same analysis capabilities and the same or better visualizations. Because the application is online, users expect the graphics to be interactive. A major design challenge for the web is to provide interactivity that is useful. ClusterSeer Web is meant to provide useful interactivity without overwhelming the user with cartographic controls. The development of ClusterSeer Web highlights the challenges of online cartography and data visualization. What choices are cartographers making, and what choices should be left to the user? How does online analysis add to the power of online visualization? ClusterSeer Web is a specific, directed application focused on cluster analysis. In this way, ClusterSeer Web differs from more general online mapping tools in its focus and user base. Because of the specific focus on cluster analysis, ClusterSeer Web lends itself to more directed visualizations.

Meacham, James E., Esther Jacobson-Tepfer, and Alethea Steingisser (University of Oregon) *Archaeology and Landscape in the Mongolian Altai: Development of an Atlas and an Integrated Website.* The Mongolian Altai Inventory project is dedicated to the creation of four reference resources that focus on the mountainous region of far northwestern Mongolia. These resources include 1) an extensive geodatabase of archaeological monuments and petroglyphs; 2) a related digital photographic archive, including between 2,000 – 3,000 images; 3) an interactive website combining the rich GIS and photographic databases; and 4) a printed atlas. The interactive website allows scholars and cultural resource managers to access monuments types through an interactive map and query the extensive photographic archive database. The printed atlas includes pages detailed with integrated thematic maps, photographic materials, and extensive narration for use by scholars and others interested in understanding the region, its physical character, its cultural history, and the interrelationships of monuments and landscape. This presentation will include some background on the project and the region, and then focus on aspects of the creation process and descriptions of the final cartographic products.

Miller, Stuart (Star-Apic) *Producing quality mapping quickly and efficiently with Mercator.* Initially designed to meet the demands of National Mapping Agencies and publishers, the Mercator product is also available to those involved in all forms of map production. With over 40 large customers since Mercator's product launch in 1990 we are in changing times with cartographic use and also map creation now in the hands of the digital 'consumer'. Consumers are not fully aware of cartographic principles, rules and constraints - but they still make maps. As a consequence of the market containing both professional and consumer mapmakers, the commercial and service offerings have to evolve. What are the trends and what are we hearing in the marketplace and what do cartographic specialists need to embrace to remain relevant? STAR-APIC are firmly engaged in our ongoing Mercator product development and are listening to the changing market to enable the continual creation of quality mapping, quickly and efficiently.'

Payne, Janelle (University of Redlands) *GIS Tools for Cartographic Representation of Spatial Data Uncertainty.* Maps created in geographic information systems (GIS) are typically rendered with precisely defined features, but experienced GIS practitioners recognize that spatial data has varying measures of relative error that are not always apparent to map readers. Limited awareness among many geographic information users regarding the associated error of the data leads users to view and analyze data without regard for relative uncertainty. Tools and methods supporting map designer abilities to graphically convey quantifiable uncertainty associated with spatial data have not been readily available. Environmental Systems Research Institute (ESRI) recognizes a need for user abilities to display quantity and characteristics of relative uncertainty associated with spatial data affected, via cartographic representation. There exists considerable scholarly research on methods used for illustrating spatial data uncertainty. Application development for this project synthesized a number of prominent research recommendations to provide map designers with custom symbology accessed via a toolbar to automate ArcGIS user abilities to convey relative data uncertainty with scientifically tested symbolizations. The ultimate goal of this development project is increased efficiency of map designers in illustrating data uncertainty, and likewise extending the conversation about GIS tools for representing spatial data uncertainty to a wider audience.

Ring, Noel (Geographer, Retired); **Lois Wardell** (Latitude Engineering); **Elaina Hyde** (University of Amsterdam) *Northeast Stone Star Maps: an Indigenous Enigma.* Seventy stars in three unique constellation designs replicated in stone punctuate landscapes at a dozen sites in New England and maritime Canada. First discerned in Vermont via aerial photography, each relict complex encompasses two wedges and a kite-shaped feature outlined by boulders often linked by stone walls. Northeastern Indigenous star lore offers only partial analogies to portions of the lithic celestial maps, many under land development threats. Nothing in recorded European cosmological cartography or colonial cadastral traditions provide precedence. Fueled multidisciplinary research by a team of scientists and Native American scholars will help determine the age and origin of the massive star charts. Use of lidar, pattern recognition software and high resolution satellite imagery may aid in mapping geographic distribution of these likely largest maps on earth.

Robertson, James (University of Montana) *Interactive mapping – the open source route.* Rapidly developing web mapping technologies provide the means to turn raw data into useful, interactive tools. An open-source spatial data rendering engine called Mapnik allowed The University of Montana to create a low cost and highly customized interactive campus map: (http:// map.umt.edu). Working from AutoCAD and other data sources on campus, the finished product allows users to zoom, pan, toggle themes, and quickly access campus information and resources. Utilizing Mapnik XML markup, the IT department at UM was able to create a highly detailed basemap to represent its campus. This presentation will describe the process UM took to create the map, provide a look into the ever-expanding array of webGIS toolkits from the open-source software community, and demo how to create beautiful cartographic output using Mapnik.

Robinson, Anthony C., Robert Roth, and Alan M. MacEachren (The Pennsylvania State University) *Developing Standards for Map Symbology.* Large organizations often struggle with the task of creating and adopting standards for map design and symbology. Mapping conventions that hold map information can be widely disseminated and efficiently communicated. We have recently begun work with the U.S. Department of Homeland Security (DHS) to study the use of an ANSI point symbol standard that was originally developed for emergency management and hazard mapping tasks. Stake- holders at DHS indicate that the standard has not been widely adopted by all DHS agencies. Failure to adopt a common standard has made it difficult for DHS agencies to effectively collaborate with each other. In this talk we will report the results of surveys, interviews, and a focus group conducted with map designers and map consumers of several DHS agencies to identify the operational, technical, and organizational factors influencing the use of the current ANSI point symbol standard. We will also summarize ideas participants have for an improved symbol standard development process – a process we will evaluate in the next phase of our research.

Seemann, Jörn (Louisiana State University/Universidade Regional do Cariri, Brazil) *A Plea for Regional Cartography and Mental Maps.* With the cultural turn in geography and cartography two major topics have grown increasingly unpopular on the general research agenda: mental maps have been eschewed by poststructuralist researchers and postcolonial theorists due to their overly and overly positivist use as a method in quantitative behavioral science, while regional cartography has failed to accompany the discussions on regional discourse and identity and the conception of regions as vague or even borderless "mentefacts". How can regions be mapped when their boundaries are uncertain, and regional planners, politicians and the local population alter different regional images in their minds? Within this perspective, the aim of this paper is to point out strategies to reintroduce a combination of these two issues to the fields of academic and professional cartography. I will present results from a case study on culture and maps from Northeast Brazil in which I employ a set of different qualitative approaches, ranging from the interpretation of historical maps and cognitive drawings to cartographic interview techniques and the memory of maps. My main argument is that this cultural- cartographic approach does not only help to

understand the cartographic awareness or "mapmindedness" of a region, but can also complement research projects and official surveys.

Shawa, Tsering Wangyal (Princeton University) *Mapping of Tibet.* The mapping of Tibet is one of the least-researched areas. There are very few scholarly articles or books written on this subject. Tibet's political or cultural boundaries are not properly defined on most maps. This lack of cartographic resources confuses many people about the extent of Tibetan boundaries. This presentation will explore how Tibet was mapped over a few centuries by different cartographers and show examples of Tibet maps over time. The presentation will discuss the first scientific map of Tibet, commissioned by the Qing dynasty of China in 1700s, and how this map was used by the well known French cartographer, Jean Baptiste Bourguignon d' Anville to published an atlas titled "Nouvel atlas de la Chine, de la Tartarie chinoise et du Thibet" in 1737. The presentation will also discuss other country's mapping of Tibet, including maps by the British from the mid-1800s and later. At the end of the presentation I will discuss the present political boundaries of Tibet.

Szybalski, Andy (Google). *Maps give you superpowers: lessons from Street View.* Street View exists at the intersection of maps and the real world, and users of the tool bring expectations from both their experiences using maps and their experiences navigating the physical world. Abilities that seem mundane on a schematic map--for instance, traversing large distances quickly, or visualizing unseen information--suddenly seem superhuman when applied to a more immersive, realistic setting. However, with real world expectations come new design challenges for orientation and navigation. This presentation will chronicle the evolution of the Street View user experience, using examples from early prototypes and changes since the product was launched.

Tait, Alex (International Mapping) *Designing Physical Map Models to Serve Both Sighted and Visually Impaired Users.* Physical maps have great power to inform users about the geography of an area. The combination of a solid physical object with a printed map image is particularly effective and a unique map presentation method that is suited to serve, using a single product, the fully sighted and those who are visually impaired. This presentation will briefly review some of the academic research into tactile maps and models with particular attention to the idea of "tactile variables" equivalent to the visual variables of Bertin. It will also evaluate, using a map model developed for Haleakala National Park as a case study, the practice of cartographic design of the tactile surface of the solid model and the simultaneous design of the visual impact of the map model. The tactilely-enhanced map model presents many challenges to a designer. The presentation will consider the practical design implications of such challenges as: how to utilize tactile variables to effectively display data, how to provide information for visually impaired users without impairing the visual image, how to design the tactile information for use with supplemental audio information, and how to design a tactile map model that is pleasing to the eye as well as to the finger.

Takeuchi, Kiichi and Patrick Kennelly (Long Island University) *Maps for Apps.* Smartphone applications in general and iPhone applications (apps) in particular present cartographers with challenges in design, as well as opportunities in usability. One of the most apparent challenges is the small viewing area, limited to 3.5 inches represented by 480 x 320 pixels. Simple, uncluttered designs are desirable, especially for interactive maps. Numerous functionalities available with the iPhone, however, can be incorporated into designing maps and allow for enhanced user interaction. For example, Google Earth's iPhone app 1) uses high-speed connectivity to access large datasets online 2) utilizes the multi-touch screen to allow users to pan, zoom, and rotate displays 2) uses the built-in accelerometer to tilt the display between vertical and horizontal, and 3) uses the built-in global positioning system (GPS) to plot the user's current location. We present an example of an app developed for Long Island University which includes maps of its C.W. Post, Brooklyn, and satellite campuses. We provide some utilities similar in function to those in Google Earth, but also take advantage of incorporating only limited campus locations of interest and using existing University web services to target most likely users. Upon opening the app, the built-in GPS unit determines the user's location. If the user is on one of the campuses, the app displays the corresponding campus map with the user's current location. Otherwise, the user can select from the list of campuses. Using the multi-touch display, users can pan and zoom in a typical fashion. A "find" button allows users to search on all campus locations from list of sites grouped by type. Icons are added to the map, either for a particular location, or as a layer containing all such locations. Clicking on the icon provides information about the particular site, such as hours of operation or schedule of events, which are available through and updated as part of our existing web services.

Trifonoff, Karen M. (Bloomsburg University) *The map poems of Richard Hugo.* Richard Hugo (1928-1982), an American poet whose work describes the people and places of the Pacific Northwest, spent his academic life at the University of Montana where he taught creative writing. His poetry is tied to place and focuses on both physical and human landscapes. His physical landscapes evoke the beauty and power of nature, while his human landscapes provide images of abandoned towns, mines, and bars, and are often reminiscent of an earlier era of affluence. In his 1979 work The Triggering Town, he identified two sources for ideas in poetry and creative writing. First is the triggering subject, which is what starts the creative process or causes the poem to be written. The second is the real or generated subject, which is what the poem comes to say or mean. This paper examines maps as the triggering subject for several of Hugo's poems: "A Map of the Peninsula", "A Map of Montana in Italy", and "Topographical Map". In some instances a map draws the reader into the poem and helps create a fusion between self and place. In others the final poem represents a compromise between the landscape of the map, the real landscape, and a potential landscape.

Tyner, Judith and Deborah Hann (CSU Long Beach) *Which Way is North: Projections and North Arrows in Elementary School Workbooks.* In 1961, nearly 50 years ago, Richard Dahlberg wrote "Maps without Projections," which decried the misuse of maps in geography textbooks. Ten years ago, geography and cartography organizations signed a resolution against the use of rectangular projections on popular maps. Cartographers have long pointed out the misuse of compass roses or north arrows on small scale maps. Despite these efforts, maps in geography textbooks and workbooks continue to include maps drawn on the Mercator projection, to provide maps with no grid lines, and to display prominent north arrows on conic projections perpetuating misunderstandings.In this study we focus on geography workbooks available at chain bookstores and teacher supply stores and examine the use of projections and north arrows in conjunction with the types of questions and activities created for students, including how these maps fit with K-8 geography standards.

Ward, John V. (University of Wisconsin-Parkside) *Utilizing Geospatial Technology to Map Community Assets in the River North District of Racine, Wisconsin.* The River North District of Racine, Wisconsin is a neighborhood in need of revitalization. Located on the shore of Lake Michigan north of downtown, this once vibrant part of the city has come upon hard times in recent decades. In order to rejuvenate the area, residents created the Racine River North (RRN) group and began exploring asset-based community development. Recognizing the potential for geospatial technology to support their efforts, RRN enlisted the help of the Spatial Data Analysis Lab in the Department of Geography at the University of Wisconsin-Parkside. Students from three classes utilized Geographic Information Systems (GIS) and Global Positioning Systems (GPS) technology to map community assets and create a neighborhood atlas. Data collection included the acquisition of existing GIS layers, collection of field data using GPS, virtual field work using Google Maps, and the collection attribute data from various sources. The resulting neighborhood atlas contains a series of thematic maps depicting cultural, recreational, historical, demographic, and educational assets. It will be utilized to communicate information about the district's assets and provides a foundation for community developments efforts. Projects such as these expand on student learning by bringing the community to the classroom and the classroom to the community.

White, Jeremy (University of Wisconsin-Madison) *Multi-touch Interfaces for Map Navigation.* The development of the multi-touch interface over the past 25 years has led to its recent adoption into the marketplace. Multi-touch interfaces now allow users to apply several points of contact to a device which may provide novel solutions to existing interface limitations. Publically available multi-touch devices, such as Apple's iPhone and Microsoft's Surface, have introduced the general public to a new form of interaction that will require design considerations in terms of map creation and navigation. This presentation explores different techniques for map navigation using multi-touch interfaces and attempts to explain how these interfaces alter the visual cognition, usability, and overall effectiveness of digital maps.

White, Jeremy, James Burt (University of Wisconsin-Madison) **and Greg Allord** (USGS) *Automated Georeferencing of Scanned Historical USGS Quadrangles.* The Historic U.S. Geological Survey Topographic Map Project is currently in the process of scanning, cataloging and attaching metadata for hundreds of thousands of maps, dating back to the 1890s. The scanned high resolution images create abundant opportunities for analysis and derivative products. However, current geocoding procedures, which require on-screen digitization of control points, will require approximately 46 person-years to process the entire archive. This presentation introduces a new, fully automated georeferencing method that aims to significantly reduce the time required to process all of the scanned maps. Pattern recognition is used to locate the control marks within each map and then a standard rectification procedure is performed. Technical details of the new software will be presented, along with a cost analysis that shows a potential savings of $2.5M compared to the current manual methods.

Wurtz, Michael (University of the Pacific) *A new way to search old maps.* Searching for historic maps and aerial photographs either traditionally or digitally requires the researcher to think textually – using words and numbers to find something that is best spatially represented. I will explore how researchers can use a graphical maps database that skips having to explain with words or search for the exact right word to describe a location that could have vague local geographic names. I will guide the attendees on a tour of a graphical maps database that I created at the Sharlot Hall Museum in Prescott, Arizona in 2001 (http://sharlot.org/archives/maps/index.html). I will then propose to create a similar program at the University of the Pacific's Holt-Atherton Special Collections, I have explored other technologies that might be able to help such as a standard MARC record, Google Earth Community, Rumsey's maps, Wikimapia, and Content DM.

Woodruff, Andrew W. Woodruff (Axis Maps LLC), **Robert E. Roth** (The Pennsylvania State University), and **Zachary F. Johnson** (Axis Maps LLC) *Value-by-alpha mapping: An alternative to cartogram.* The cartogram, or value-by-area map, is a popular technique for visualizing social data. For example, cartograms using the Gastner-Newman method have received much attention as maps of recent U.S. election results. Such maps visually equalize a basemap prior to mapping a social variable (e.g., election voting results) by adjusting the size of each enumeration unit by a second, related variable (e.g., population). However, extracting useable information from cartograms can prove difficult because of necessary basemap shape and/or topology distortions. In this talk we propose an alternative technique called value-by-alpha mapping, which visually equalizes a basemap by modifying the alpha-channel (transparency) of enumeration units, eliminating shape, topology, and size distortions. We introduce the method with examples and theoretical support, demonstrate how it avoids some of the problems inherent in cartograms and discuss its potential weaknesses, and offer design considerations for its effective use. We welcome feedback on the technique and how it might best be employed.