



Conference Program  
**NACIS 2008**  
October 8–11

# Welcome to NACIS 2008

NACIS Hospitality Suite: Room 425

*First-time NACIS attendees can be spotted by the globes on their name badges. Make them feel welcome!*

*Next year in Sacramento!  
October 7–10, 2009*

## Exploring Downtown Missoula

*see map on back cover*

### **A Carousel for Missoula**

This entirely hand-built carousel opened in 1995, and can be enjoyed by everyone of any age. Located in Caras Park, about 2 blocks west of the Holiday Inn, along the river. Hours: 11:00 am to 5:30 pm.

### **Brennan's Wave**

This man-made, engineered whitewater play pool is in the Clark Fork River and named for a world-class kayaker who died in 2001 at age 32. Located just below the viewing deck in Caras Park along the river.

### **Hike the "M"**

The M Trail, which offers a stunning panoramic view of Missoula from the top of the M, is the most heavily used hiking trail in the state. In 0.75 mi. you will gain 620 feet in elevation while negotiating 11 switchbacks. Location: the trail begins on the University of Montana campus at the southeast end of the football stadium.

### **Greenough Park**

Hiking paths wind along Rattlesnake Creek as it flows through this 42-acre park at the mouth of the Rattlesnake

Valley. The park is a bird habitat donated to the City of Missoula in 1902 by the Greenough family. Location: Go east 0.3 mi. on Front St., then go 0.2 mi. north on Madison. At "T" turn right for 0.1 mi. and follow road under the interstate to the Park entrance.

### **Kim Williams Trail**

This 2.5 mile converted rail-trail heads east through Hellgate Canyon along the south bank of the Clark Fork. You can usually see an abundance of birds along the way. The Trail begins past the University of Montana campus along the river and connects to the south riverfront trail in town.

### **Saturday Morning Markets and Craft Fair**

On Saturday mornings from May through mid-October several downtown locations host local markets and a craft fair. The food markets are 1 block west of the Holiday Inn in Caras Park, and at the corner of Pattee and Alder. The craft market is located at the corner of Pattee and Pine in front of the Adventure Cycling Association office.

WEDNESDAY, OCTOBER 8

# Practical Cartography Day

Share techniques and discuss production questions with other working cartographers at PCD.

8:30 am

Welcome

*Alex Tait and Tom Patterson*

Adobe Illustrator CS4

*Colin Fleming and Ian Giblin, Adobe Systems*

Adobe Illustrator Type Selection Filters

*Nathaniel V. Kelso, The Washington Post*

## Break

Adobe Photoshop CS4

*Zoranna Gee and Terry Hemphill, Adobe Systems*

ESRI Online Mapping

*Aileen Buckley, ESRI*

Mapping at *National Geographic*

*Martin Gamache*

12:10 pm–1:30 pm

## Lunch

1:30 pm

Vue (3D software)

*Alex Tait*

Visual Nature Studio 3

*Hans van der Maarel*

Natural Scene Designer Pro 5.0

*Tom Patterson*

Solid Terrain Models

*Lawrence Faulkner, President, Solid Terrain Models*

Break

**Hands-on hour.** All PCD presenters plus Mark Muse, NPS color management specialist, will give informal demos and consult at laptop “stations” in the meeting room. Attendees are free to wander between the stations.

Cartastrophes

Closing comments

*Alex Tait and Tom Patterson*

2:45–5:30 pm

NACIS Board Meeting

WEDNESDAY, OCTOBER 12  
CONFERENCE OPENING EVENTS

7:00 pm

# mapgiving

In the NACIS spirit of sharing and collaboration, this new event offers the chance to see how a handful of the most talented cartographers in our field will collaborate under deadline to produce a high-quality map for a deserving client, chosen based on its mission and need for a map.

If you're at the hotel on Tuesday, follow the signs to watch the event unfold live between 4 pm Tuesday and 4 am the next morning. At Wednesday evening's Opening Session, the results of this high-energy mapspectacular will be unveiled! Follow the planning: [www.mapgiving.blogspot.com](http://www.mapgiving.blogspot.com)

## **Opening reception and poster session**

Check out the poster sessions and vendor displays with old friends and new.

## **POSTER DISPLAYS**

*Coordinated by Patrick J. Kennelly, Long Island University*

### **Apollo 17 in the Taurus-Littrow Valley**

*Roy Nalazek, Ohio University*

### **Battle of Bunker/Breeds Hill**

*Charlie Frye, ESRI*

### **The Bois Brule: River of Presidents**

*Steve Baisden, University of Wisconsin–River Falls*

### **Boston in 1775**

*Charlie Frye, ESRI*

### **Choropleth Maps: Interpretation of Relative vs. Absolute Data**

*Julia Siemer, University of Regina*

### **Colonial New England**

*Charlie Frye, ESRI*

### **The Driftless Area**

*Sean-William Raleigh, University of Wisconsin–River Falls*

### **Eighty Years of Landscape Change: Lil'wat Nation Traditional Territory**

*Eliana Macdonald, Ecotrust Canada*

### **Fire History in the Northern Rockies**

*Craig Comstock, National Center Fire and Landscape Analysis*

### **Glacial Lake Missoula**

*Kevin McManigal, Adventure Cycling Association*

### **Humboldt Redwoods State Park**

*Nick Ramirez and Colin Leslie, Humboldt State University*

**Inyo National Forest, California**

*Brian Moran, Sanborn Solutions; US Forest Service*

**Kentucky's Frontier Trails**

*Jeff Levy and Dick Galbreath, University of Kentucky–Lexington*

**Lifeless Mountains of America**

*Karla Sanders, Ohio University*

**Madagascar: Change in natural forest cover 1990–2000–2005**

*Mark Denil, Center for Applied Biodiversity Science*

**Making a New Statewide Bicycle Map With ESRI Cartographic Tools**

*Nick Martinelli, University of Oregon InfoGraphics Lab*

**The Making of the Crow River Watershed Atlas**

*Birgit Mühlenhaus, Macalester College*

**The most promising San Francisco estuary streams  
for steelhead restoration**

*David Asbury, Center for Ecosystem Management and Restoration*

**Montana Wall Map**

*Benchmark Maps & Mapping Specialists*

**NorCal vs SoCal: A State of Confusion**

*Bryan Conant, Maps.com*

**Older Moms Deliver**

*Richard Lycan, Portland State University*

**The Pacific Northwest Recreation Map Series**

*Jim Rounds, Mattye Dahl, and Paul Fyfield, Bureau of Land Management–Oregon*

**The Safari Campaign: The Great War in East Africa**

*Mehmet Berker, University of Minnesota*

**Steelhead/Rainbow Trout resources of the Eel River watershed**

*David Asbury, Center for Ecosystem Management and Restoration*

**The United States Bicycle Route System**

*Casey Greene, AdventureCycling Association*

**The True Cost of Coal in a Power Hungry World**

*Karla Sanders, Ohio University*

**Vector Approaches to Generalizing Faults and Polygons  
in 1:24,000 Geologic Maps**

*Craig McCabe, Penn State University*

**When a Mountain Falls to Coal**

*Karla Sanders, Ohio University*

**Where are the Oldest Trees?**

**Mapping Tree Longevity in the American West**

*Mathew Dooley, Erika Wise, and Troy Knight, University of Wisconsin–River Falls*

## THURSDAY, OCTOBER 9

8:30 am–10:00 am

### **PLENARY BREAKFAST**

Welcome all attendees to NACIS 2008  
with a breakfast buffet

State of the Society  
President's message  
Business meeting

10:15 am–11:45 am

### **DESIGN TECHNIQUES**

Effective Use of Transparent

Map Symbols

*Patrick Guiberson*

Mapping Soil Orders and Suborders

*Aileen Buckley*

ScaleMaster.org:

Multi-scale mapping made easy

*Robert Roth, et al*

Highly Stylized Maps

*Dennis McClendon*

### **PRACTICAL MAP LIBRARIAN WORKSHOP**

Future directions for NACIS  
and map librarianship

*Paige Andrew*

Issues in Digital Cartographic  
Collections

*Jon Jablonski and Edith Scarletto*

11:45 pm–1:45 pm

**LUNCH** *on your own, 90 minutes*

## THURSDAY, OCTOBER 9

1:45 pm–3:15 pm

### DESIGN CHALLENGES

Evaluating the Effectiveness  
of 2D vs. 3D Trailhead Maps

*Tom Patterson and David  
Schobesberger*

Creating NPS Media for People  
with Visual Disabilities

*Lori Simmons*

Lessons Learned from the Digital  
Galaxy Project

*Dennis Davidson*

### RESTORATIVE CARTOGRAPHIES

The View Through the Keyhole

*John Cloud*

Champlain's Travels in Canada 1603-  
1616, a Restorative Cartography

*Michael Hermann and  
Margaret Pearce*

The great map that wasn't:

Remaking John Snow's Broad Street

*Tom Koch*

3:30 pm–5:30 pm

### DESIGNING GEOVISUALIZATIONS

Animating Dorling Cartograms:  
Visualizing Population Change  
in Africa

*Matthew E. Millett*

Line-of-Sight Visualization Strategies

*Jed Marti*

Comparing Shape and Color  
in Starplot Maps

*Frank Hardisty and Alex Klippel*

Highlighting Methods for  
Geovisualization

*Anthony C. Robinson and Frank Hardisty*

### HISTORIC MAPS I

Maps and Math in

19th Century Geography Textbooks

*Karen M. Trifonoff*

John Bachmann and the

American Bird's-Eye View Print

*Nat Case*

Maps for the Blind

*Leah Thomas*

A Cartographic Grand Tour of

18th Century Rome

*Erik Steiner and James Tice*

6:30 pm

### NACIS NIGHT OUT

Montana Food and Music at the Palace, 147 W. Broadway

# FRIDAY, OCTOBER 10

8:30 am–10:00 am

## **GIS-BASED DESIGN**

Building Land Cover Textels  
for Base Maps

*Matthew Hampton*

GIS Methods for Visualizing Change  
in Areal Units

*Chris Badurek*

Sports Fields on Maps

*Jaynya W. Richards*

## **USING MAPS**

Analyzing How Maps  
Articulate Space

*Ian Muehlenhaus*

Decision-Making with  
Signal Detection Theory

*Amy Griffin*

A Map's A Map For A' That

*Mark Denil*

10:15 am–11:45 am

## **MAPPING WATER**

Whaddya Mean, Water?

*Stuart Allen*

Modifying Water Feature Details  
by Shape and Texture

*Barbara Buttenfield,*

*Jochen Wendel, Charlie Frye*

Water is Wet or

The Practice of map MAKING

*Steven Holloway*

## **PANEL: HISTORICAL CARTOGRAPHY**

*Erik Steiner*

*Brandon Plewe*

*Charlie Frye*

*Mike Hermann*

*Margaret Pearce*

11:45 am–1:15 pm

**LUNCH** *on your own, 90 minutes*

**WALKING TOURS** *to Adventure Cycling Association and  
Missoula Art Museum Steven Holloway exhibition*

1:15 pm–2:30 pm

## **MAPPING HUMANITARIAN AID AND DEVELOPMENT**

Mapping Internally Displaced  
Persons in Colombia

*Patrick Florance*

Mapping Water Sources in Rwanda

*Max Baber*

## **NEXT-GENERATION ARCHIVES**

The North Carolina  
Geospatial Data Archiving Project

*Jeff Essic*

Mashing Up A Digital Map Library

*Brandon Plewe*



FRIDAY, OCTOBER 10

2:45 pm–3:45 pm

**NOT YOUR GRANDPA'S  
WEB MAPS**

Maker! Mapping the World's Data  
*Mark Harrower, David Heyman,  
Ben Sheesley, Andy Woodruff*

Wired Maps  
*Rex Cammack*

**CARTOGRAPHY IN THE  
UNIVERSITY**

20 Years of Innovation at the  
UO InfoGraphics Lab  
*James E. Meacham*

A Survey on Teaching Cartography in  
Canada  
*Sally Hermansen*

2:45–5:30 pm

NACIS Board Meeting

4:00 pm–5:30 pm

**GOVERNMENT MAPPING**

Mapping with Census Data  
*Richard Lycan*

New Canadian Topographic Maps  
*Eva Siekierska*

Introduction to the  
Board on Geographic Names  
*Mike Fournier*

**HISTORIC MAPS II**

Butte, Montana  
Reflected in Cartography  
*Patrick Kennelly*

Maps in Bicycle Travel Literature  
*Judith Tyner*

The McPhillips Brothers:  
Cartographic Entrepreneurs  
1871-1913  
*M. Christopher Kotecki*

6:30 pm

**BANQUET**

**Speaker:** Phil Condon, University  
of Montana, reading from his book,  
*Montana Surround: Land, Water,  
Nature, and Place*

Geodweeb Geopardy! to follow

**Student Web Mapping Competition**  
*Coordinated by Erik Strandhagen*

# Presentations THURSDAY, OCTOBER 9

10:15 am–11:45 am

## DESIGN TECHNIQUES

### Effective Use of

### Transparent Map Symbols

*Dr. Patrick Guiberson, University of Nevada, Reno*

Transparency is an intuitive symbol form. We think of it as a logical choice for mapping layers of information occupying the same spatial extent, or for phenomena which occur with spatial or temporal uncertainty, or for the construction of multivariate or multidimensional map symbols. Until recently however, it has not been possible to design affordable and effective transparent map symbols. Recent technological advances have changed this. It is now possible, and even commonplace, to construct and use transparent map symbols. As a relatively new symbol form, a closer and more cartographic scrutiny of its use and usability is warranted. This paper explores the effective use of transparency as a symbol for the communication of spatial data.

### Mapping Soil Orders and Suborders

*By Aileen Buckley, ESRI*

Creating pleasing communicative maps of soils is impeded by two major factors: most people do not understand much about soils, and most people do not find soils all that interesting. Mapping soils is complicated by the method used to collect and store soil data. The mapping unit is really a composition of soils with different characteristics; therefore, presence/absence, dominance, percentages, or some other method must be used to display the attributes of the unit. As a result, maps of soils tend to be misunderstood or even disregarded. This paper explains a method developed to display soil orders and suborders. The first publication of this method appeared in the Atlas of Oregon, though the approach has now been applied to data for the entire United States. This paper also explains tools for the conversion of STATSGO soils data into formats useful to cartographers. These tools can be used to map other soil characteristics, such as hydric soils or land capability.

### ScaleMaster.org:

### Multi-scale Mapping Made Easy

*Robert E. Roth (presenter), Michael Stryker, Douglas Schoch, and Cynthia A. Brewer, Pennsylvania State University; Carolyn Fish, Michigan State University*

ScaleMaster.org (in development) is an online, interactive cartographic tool for organizing multi-scale mapping projects. The ScaleMaster.org tool provides two modules with the interconnected purposes of multi-scale mapping education (the Learn module) and assistance for multi-scale mapping practice (the Create module). The Learn module provides both textual and visual explanations of multi-scale mapping operators available for maintaining legibility when changing scale using an example multi-scale mapping project in Portland, Oregon. This educational content allows the user to interactively learn (1) what multi-scale mapping operators are available and what they mean, (2) what the ScaleMaster diagram is and how multi-scale mapping operators are organized in it, and (3) how multi-scale mapping operators improve map legibility. The Create module allows the user to apply this knowledge, facilitating the construction of a ScaleMaster diagram specific to a user's multi-scale mapping project. The user can add new categories, feature types, and decisions points or adjust existing ones. We will demonstrate use of the two modules and describe their development in advanced cartography courses at Penn State.

### Highly Stylized Maps

*Dennis McClendon, Chicago CartoGraphics*

Sometimes dismissed as merely decorative—and very much at odds with today's GIS-dominated production methods—highly stylized maps can be valuable ways to focus the reader's attention on the foreground information to be conveyed, with less distraction from the background geographic information. We'll take a look at various intriguing examples.

# Presentations THURSDAY, OCTOBER 9

10:15 am–11:45 am

## **PRACTICAL MAP LIBRARIAN WORKSHOP**

*Organizer: Paige Andrew, Pennsylvania State University*

### **Issues in Digital Cartographic Collections**

*Jon Jablonski, University of Oregon  
Edith Scarletto, Kent State University*

Digital materials are now ubiquitous. Research shows that students, faculty, and other users of library materials turn to the open Internet before any library resources. Librarians are now confronted with the task of discovering, collecting, describing, and managing access to digital media in a multitude of formats. These include online maps, online GIS data and data centers, government information in the form of websites or CD/DVDs of maps and GIS data. They may also include digital and digitized material obtained both from outside the institution as well as inside. This presentation/discussion will highlight the major issues faced by map/GIS librarians with regard to digital collections. We will touch on many aspects of access, from description and organization, to reference and archiving. Major points of interest for transitioning to digital cartographic collections will be addressed, and best practices from professional standards and the current literature will be commented upon.

1:45 pm–3:15 pm

## **DESIGN CHALLENGES**

### **Evaluating the Effectiveness of 2D vs. 3D Trailhead Maps**

*Tom Patterson, U.S. National Park Service  
and David Schobesberger, University of Vienna*

Both 2D and 3D maps have their advantages for trailhead mapping. Many cartographers assume that inexperienced map users can more easily understand 3D maps because they present the landscape in a realistic manner and mimic what people see while on a trail. One of the undisputed advantages of 2D maps is that they require less time and money to produce

than 3D maps. These factors call up the central question: are 3D maps really more understandable and are they worth the extra expense to make? Seeking to answer this, in September 2006 we conducted a user study at Zion National Park, Utah, evaluating the effectiveness of 2D hiking maps compared to 3D trailhead maps for communicating of trail information to park visitors. Collection of data occurred on two popular hiking trails from a large sample of park visitors who had gone on a hike. The user study aimed to find out which map type imprints itself better as a mental map in the mind of hikers, communicating geographic information faster and more effectively. The paper will give an overview of the design and implementation of the user study and will introduce the key findings.

### **Creating National Park Service Media for People With Visual Disabilities**

*Lori Simmons, U.S. National Park Service*

The National Park Service recently produced two alternative format prototypes for reaching a larger audience. The first project created a large print brochure with maps for the Chesapeake and Ohio Canal National Historical Park. The second project created tactile maps with Braille on wayside exhibits for Gulf Islands National Seashore.

Large print formats involve far more than increasing the type size. People with low vision often read with their eyes up against the paper. Being able to follow the text and being able to actually see the type, pictures, and map features are important to the reader. Type size, font, leading, color, and contrast are just the basics of the needed specifications. The brochure maps not only have large print, but the colors were adjusted for the largest colorblind group (red-green).

### **Lessons Learned from the Digital Galaxy Project**

*Dennis Davidson, State University of New York at Albany*

The accumulation of large and comprehensive datasets across a range of scientific disciplines, such as astronomy,

# Presentations THURSDAY, OCTOBER 9

geography or genomics, represents a growing and valuable resource. However, the value of these datasets is often determined, at least in part, by how different exploratory tools are employed and configured within a viewing environment. Just as data visualization can reveal previously unseen patterns in a dataset, so can the form, scale and presentation qualities of a display space serve a similar purpose. This talk will focus on the architecture of the viewing environment, the configuration of its components, and design considerations, using NASA's Digital Galaxy Project as a topical case study.

1:45 pm–3:15 pm

## RESTORATIVE CARTOGRAPHIES

### The View Through the Keyhole

*John Cloud, NOAA*

We inhabit a world constructed, increasingly, through cascades of readily available geospatial data, served by ever more sophisticated Internet-based applications, and coupled to a ubiquitous rhetoric of “transparency.” The opacity of this transparency will be examined in the history of Google Earth. The foundation of this was Google’s purchase, in 2004, of Keyhole Corporation. Keyhole came out of the classified world with funding through In-Q-Tel, which is essentially a private equity and investment firm controlled by the Intelligence Community—but based on public funds. Google Earth is a fascinating tool, but what the public sees is literally the restricted view through a keyhole, in a thoroughly locked door. Certain implications will be discussed.

### Champlain in Canada

#### A Restorative Cartography

*Mike Hermann, University of Maine and Margaret Pearce, Ohio University*

Samuel de Champlain’s travels through what would become New France have been extensively documented and mapped by geographers and historians today. These contemporary maps focus on the locations of Champlain’s routes with dates of arrivals

and departures, at a small scale, across a hydrographic base map empty of human habitation. As conventional cartographic depictions of the routes of a European explorer and colonizer, these maps portray the complex details of Champlain’s journeys but omit the First Nations’ storied geographies through which Champlain moved and upon which he relied for his success. The uniformly small scales of the maps are also unable to portray the depth of story occurring in small places over time. In our map, we restore the indigenous voices conventionally omitted from maps of explorer’s routes, and we reawaken the local places shaped by Champlain’s experiences using sequential cartographic narratives. In so doing, we re-imagine historical cartography for the representation of place rather than space by focusing on narrative technique.

### The Great Map That Wasn’t:

#### Remaking John Snow’s Broad Street

*Tom Koch, University of British Columbia*

Everybody knows John Snow and his famous map of the Broad Street cholera outbreak in 1854. It is the map, they say, that proved cholera was waterborne, the map that made medical cartography real. It is the design that everyone interested in map design teaches. And yet, the map was a failure. It did not convince Snow’s contemporaries of his theory of waterborne cholera. Here the map is revisited not as an example of design success but as an example of experimental failure. Snow’s map is critiqued from the perspective of his contemporaries and then remade to answer their question. The result provides a new look at the Snow map, new insights into its limits rather than its strengths, and thus the manner in which issues of map design too often take precedence over informed cartographic argument.

# Presentations THURSDAY, OCTOBER 9

3:30 pm–5:30 pm

## DESIGNING GEOVISUALIZATIONS

**Animating Dorling Cartograms:  
Visualizing Population Change in Africa**  
*Matthew E. Millett, University of Oregon*

When mapping population changes over time, cartographers often opt to symbolize their data using choropleth, proportional-symbol, dot or dasymetric techniques. Cartograms, however, have often been deemed less desirable because they distort spatial reality and can thus be more difficult to understand. However, advances in dynamic mapping offers a possible solution to these problems. Using techniques such as roll-overs and hyperlinks, cartographers now have the ability to add additional information onto the map (country names, population figures, and other identifiers) to make cartograms easier to understand.

**Line-of-Sight Visualization Strategies**  
*Jed Marti*

Computer simulations and geographic analyses frequently require calculating the line-of-sight between two locations. We generalize this problem to include radio frequency communication and lines that follow curved trajectories. This presentation examines some techniques for display visibility overlays on high-resolution digital data. We examine several different analyses problems, visualization techniques that work, and some that are less desirable.

**Comparing Shape and Color  
in Starplot Maps**  
*Frank Hardisty and Alex Klippel,  
The Pennsylvania State University*

Starplots are one of the few viable strategies for visualizing a large number of variables at once. Starplots rely on shape to symbolize information. Using shapes is the most powerful means of providing distinguishing information, according to Marr and others. Surprisingly, using shape to convey meaning in a multivariate spatial data space has not received detailed scrutiny. We are addressing this lack by a series of experiments in which similarity

ratings are employed to assess the underlying conceptual knowledge that is associated with a specific shape. We tested the effect of varying axes, of varying the scenario given to those using the starplot maps, and compared color with shape as a carrier of meaning. We hope to distinguish, and compare, the effect of shape and of color in map symbols.

**Highlighting Methods  
for Geovisualization**

*Anthony C. Robinson and Frank Hardisty,  
The Pennsylvania State University*

Interactive highlighting is often used in geovisualization to identify specific bits of spatial data across multiple views. Highlighting is a transient visual effect, lasting only as long as the user places the mouse cursor over a particular observation. With few exceptions, highlighting is implemented in current geovisualization tools using a color outline around a point, line, or polygon. We propose that in addition to color, the use of transparency, depth of field, leader lines, and contours may also be used for highlighting data across views in a geovisualization. In this presentation we describe our typology of visual techniques for highlighting, and we demonstrate the application of these techniques in a prototype version of the GeoViz Toolkit.

3:30 pm–5:30 pm

## HISTORIC MAPS I

**Maps and Math in Nineteenth-Century  
Geography Textbooks.**

*Karen M. Trifonoff,  
Bloomsburg University*

An improvement in printing technology in the late nineteenth century resulted in an increase in the number of maps and graphics in geography textbooks. Even though authors and publishers struggled to develop innovative map activities, they often borrowed methods from other school subjects, such as spelling and arithmetic. Proper spelling of place names became paramount, as did an understanding of the mathematical properties of maps.

# Presentations THURSDAY, OCTOBER 9

This paper focuses on three mathematical activities related to maps and mapping found in late nineteenth century geography textbooks. First is the study of “mathematical geography” which focused on the spherical geometry associated with latitude and longitude. A second map/math activity involved comparative sizes, with a rectangle of a specified size (e.g. 400 square miles) superimposed over various landmasses for the comparison of areas. Third, map-drawing activities were math intensive and involved the use of scale, measurement of angles, and the construction of perpendiculars. All of these activities emphasize the important role of mathematics within both geography and the nineteenth century elementary school curriculum.

## **John Bachmann and the American Bird’s-Eye View Print** *Nat Case, Hedberg Maps*

A biography and overview of the work of John Bachmann (c.1814–1891), whose work was the seed that formed the basis of the American bird’s-eye view print as a genre. Based on original research, the paper reveals the formerly mysterious Bachmann as a second-rate Swiss-German lithographer whose work blossomed in America, but whose successes were intermittent, as he failed to come to terms over the long term with the shifting American print market.

## **Maps for the Blind** *Leah Thomas, Library of Virginia*

Whenever new maps for the blind are issued, someone is credited with having invented them anew—as though such maps did not previously exist. Perhaps the service that is being offered is new, but maps for the blind certainly are not. I will present a history of maps for the blind, focusing primarily on the early development and use of these maps. Examples of some of the early maps that I would cover are relief maps, “raised maps,” and wooden dissected maps from the 18th to the early 20th centuries. Some of the inventors and pioneers would include R. Weissenburg, S.G. Howe, L.R. Klemm,

Margaret Rockwell Pfanstiehl, Joseph Wiedel, John Clinton Sherman, among others. The institutions and groups of influence that I would also review are the American Printing House for the Blind in Louisville, Kentucky, various lighthouses, Committee for Men Blinded in Battle, among others. Emphasis will be placed primarily on maps for the blind in the U.S. but will include mention of international influences.

## **A Cartographic Grand Tour of 18th Century Rome** *James Tice and Erik Steiner, University of Oregon*

This presentation demonstrates a cartographic geodatabase and website that references the work of two 18th century masters of Roman topography: Giambattista Nolli, who published the first accurate map of Rome, and his contemporary and collaborator Giuseppe Vasi, who comprehensively documented the city and its monuments through 250 perspective engravings the same era. Both Nolli and Vasi excelled at describing the city of Rome in geospatial terms, one through scientific measurement and the ichnographic plan, the other through close observation and pictorial views. At its core, our research explores innovative methods for relating these two distinct visual traditions that have been used to describe the city of Rome. These two methods are intrinsically related, yet no means exists to connect these two methodologies in such a way that preserves and enhances their historical value while still permitting them to be compared with ease and accuracy. Our presentation will illustrate our attempt to bridge this gap, and to place their work in the context of the modern city through contemporary satellite imagery and photography. By georeferencing Nolli and Vasi and by combining their distinct methods, we hope to be better equipped to understand the profound geospatial structure of the Eternal City.

# Presentations FRIDAY, OCTOBER 10

8:30 am–10:00 am

## GIS-BASED DESIGN

### Building Land Cover Textels for Basemaps

*Matthew Hampton, Metro Regional Services, Portland, Ore.*

Recent advancements in cartographic realism are typically labor intensive and often created manually which can become cost and time prohibitive. Using NLCD data and applying textures and graphical techniques, the author has developed an automated cartographic workflow to produce a map series that adheres to tenets of cartographic realism.

### A Comparison of GIS Methods for Visualizing Change in Areal Units

*Christopher Badurek, Appalachian State University*

As information graphics scholar Edward Tufte explains, effective methods for visualizing change are crucial to our understanding of spatial processes. Most GIS analyses of change require juxtapositions of images, such as through the use of “small multiples,” making analysis of spatiotemporal trends in large urban areas relatively difficult. While dynamic maps using sliders or animation make it easier for map users to view the results of change, they do not aid map readers in making meaningful comparison of change in attribute values. A means to more efficiently query spatiotemporal dynamics eliminates this burden and enables GIS users to make direct comparisons of change similarity in urban data across varying spatiotemporal scales.

This study uses crime data for São Paulo, Brazil urban districts over a two-year time interval as a case study for comparison with animation methods of visualizing change in areal units. Maps of spatial change similarity measures are integrated with a matrix-based visualization at varying time intervals and compared to rate change and relative risk values. Results may inform improved visual approaches for analyzing the interrelatedness of urban place histories.

### Sport Fields on Maps

*Jaynya W. Richards, ESRI*

Keeping to simple generic shapes as polygon fills on a map often results in a bland solution for attempting to highlight what is supposed to be a fun recreational area. Symbolization of specific activities, their associated resources and the nature of the recreation, becomes a way of adding back visual excitement to the experience of reading a sports related map. Among those specific activities included are those performed on or found on baseball fields, tennis or basketball courts, soccer and hockey fields. In this presentation, I will demonstrate one of a series of scalable sport field templates and the various sports symbols created for use in ArcGIS. My goal is to show you how you can use the new templates and symbols to court the map reader’s attention.

8:30 am–10:00 am

## USING MAPS

### Analyzing How Maps Articulate Space

*Ian Muehlenhaus, University of Minnesota*

All maps are subjective, but some appear more subjective than others. Though research has illustrated that maps are rhetorical tools, less is known about what makes some maps seem more outspoken than others. This article outlines an attempt to establish a new methodological framework with which we can answer the following questions. First, what visual and cartographic techniques make some maps appear propagandistic or, alternatively, objective? Second, can we establish a framework conducive to a longitudinal and comparative study of mapping techniques? Finally, how can we move away from using anecdotal methods of analysis (i.e., description and deconstruction) to instead establish a framework that allows for the quantification, comparison, and replicability of the different visual and cartographic techniques found in all maps? I will illustrate the potential of using quantitative content analysis to help us explain what makes some maps seem more

# Presentations FRIDAY, OCTOBER 10

subjective than others by comparing “maps of war” from different sources and eras.

## **Decision-Making with Signal Detection Theory** *Amy L. Griffin, University of New South Wales*

Signal detection theory is a framework used by psychologists to study decision-making under uncertain conditions. In the context of seeking to identify patterns in a dataset (i.e., data exploration), this uncertainty may relate to the level of confidence a user had in his or her ability to see a pattern in a particular form of visual representation (i.e., whether s/he saw the pattern or not). As a discipline, geovisualization tries to design visual representations that promote users’ abilities to see signals (real patterns generated by a known or unknown process) and suppress noise (patterns generated by chance). It is therefore important that we attempt to compare the effectiveness and efficiency that different forms of visual representation afford for identifying a variety of types of space and space-time patterns. This paper presents an example of applying signal detection theory to a dataset derived from an experiment that examined two representations that were designed to support a particular geovisualization task: visual cluster detection. The signal detection framework provides a methodology for quantifying and describing a map reader’s ability to discriminate between signals and noise, as well as the difficulty of the task and the strategies that the map reader used to complete the task.

## **A Map’s A Map For A’ That** *Mark Denil, Conservation International*

Recent decades have seen a variety of talks and articles on cartographic theory, stirring up teapot tempests, tedious controversies, and arguments back and forth; largely amongst theoreticians. In response, people who consider themselves (sometimes quite rightly) the core practitioners of the cartographic craft have come to question

the value of these sometimes seemingly esoteric and cheese-paring disputes. If we make maps every day, and have done so for some time, what value or utility can there be in teasing the activity apart? Especially so, when we can see that the active theoretic disputants display such sweeping disagreement amongst themselves?

The fact is, that even a cartographic practice ostensibly purely practical is rooted in theory; a theory of practicality. The transparency of the theoretic grounding is a feature of its pretense of utility. This talk will attempt to discover ways of exposing the hidden ideological/theoretical underpinnings of “normal” “practical” cartographic practice, while showing how a test for judging theoretic innovation may be conceived.

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10:15 am–11:45 am

## **MAPPING WATER**

### **Whaddya Mean, “Water”?** *Stuart Allen, Allan Cartography*

Drainage and water body data bases conform to the Cartographic Subsection of Murphy’s Law: compilation scale, generalization, and classification categories are never quite suitable for the mapping project at hand. We examine readily available data sets for two extremes, the Virginia–North Carolina border area and portions of the California–Nevada Great Basin, and illustrate the impact of various cartographic treatments on the resulting representation of “water.”

### **Modifying Water Feature Details by Shape and Texture** *Barbara P. Buttenfield and Jochen Wendel, University of Colorado; and Charlie Frye, ESRI*

When changing map scale, feature details must be modified, and hydrography is one of the most sensitive data themes to generalize. This is due in part to the cartographic importance of integrating stream channels, ponds, etc. with terrain, which is another scale-sensitive data layer. It is also a consequence of the need to preserve the visual character of water



# Presentations FRIDAY, OCTOBER 10

features. On one level, this is accomplished by preserving three geometric properties: overall length of channel lines and polygon boundaries; overall size of simple and aggregated features; and relative concentration of local detail. On a higher level, one also wants to retain distinguishing elements of the feature, such as the frequent right-angle bends in a trellised watershed, the regularized sinuosity of meanders and oxbows, the vein-like network of a braided channel, or the pattern of small depressions in a swampland. Regularized shapes and recognizable textures help to characterize features visually, but have proven elusive to formalize for automated generalization. We've been able to automate distinguishing shape characteristics for hydrographic polygons in a number of physiographic regions, and are currently working toward automatic distinctions on the basis of texture. We'll report on what's worked, what hasn't, and lessons learned.

## **Water is Wet or The Practice of map MAKING** *Steven R. Holloway*

This presentation focuses on my experience of mapping the Clark Fork River. In an effort to better understand the river that I had dearly loved and enjoyed for over two decades I made over 140 visits between 21:June 2000 and 21:June 2001; walking the entire river between old Harper's bridge and the former site of Milltown dam. Over the course of one year I stopped to make direct observations, got cold, hot and wet, wrote and painted in a journal, took thousands of medium format photos and, in the end quit cartography in favor of map making and art. The experience led to the authoring the broadside Right MAP Making and starting toMake Press.

10:15 am–11:45 am

## **PANEL: HISTORICAL CARTOGRAPHY**

### **The Historical Cartographer: A panel on mapping for historical research**

*Moderator: Brandon Plewe,  
Brigham Young University*

*Erik Steiner, Stanford University*

*Charlie Frye, ESRI*

*Margaret Pearce, Ohio University*

*Mike Hermann, University of Maine*

With the rise of the “new” field of Spatial History, historians and historical geographers seem to have rediscovered the value of maps as a tool in historical research, as well as a publication medium. This panel will focus on the unique opportunities and challenges that history and historians pose for cartographic design and production. The panelists have had a variety of experiences in historical cartography, including atlases, maps for historical books, and collaborative research. Issues discussed could include:

- Working effectively with historians
- Getting historians to think spatially
- Maps as a research medium
- Mapping from source documents
- Design issues specific to historical information
- Historical GIS and Historical Cartography
- Interactive and Web opportunities and challenges
- Getting funding for historical cartography
- Scholarly review/editing of maps

## Presentations FRIDAY, OCTOBER 10

1:15 pm–2:30 pm

### **MAPPING HUMANITARIAN AID AND DEVELOPMENT**

#### **Mapping Internally Displaced Persons in Colombia**

*Patrick Florance, Tufts University*

In an effort to facilitate the development of better quality information on urban IDP populations in conflict-affected countries, IDMC commissioned a study of three urban locations: Khartoum (Sudan), Abidjan (Cote d'Ivoire) and Santa Marta (Colombia). The primary objective is to gather reliable data on urban IDP populations to find out more about their social and economic integration and their assistance and projection needs. The research project will generate recommendations which will feed into a broader effort to engage humanitarian actors in improving operational activities targeting IDPs in urban environments.

A variety of geospatial technologies such as GIS, maps, spatial statistics, remote sensing, virtual globes (Google Earth), and GPS were employed to facilitate the operation and management of the urban surveys. The integration of these geospatial technologies proved vital in conducting the surveys and in allowing the information to be used in a meaningful way to researchers. The integration of these methods also revealed several key issues in the use of geospatial technologies for humanitarian assistance such as the need for improvements in: spatial data infrastructure, approaches to data modeling, education and training regarding spatial information literacy, and incorporation of geospatial technology and techniques in the initial budgeting and planning stages.

#### **Mapping Water Sources in Rwanda**

*R. Maxwell Baber, Katherine Noble-Goodman, and Jayaram Reddi, The University of Redlands*

The University of Redlands Environmental Studies and MS GIS Programs—in partnership with the Millennium Villages Project (MVP) and the Centre for Geographic Information Systems at the

National University of Rwanda (CGIS NUR)—are using Geographic Information System (GIS) and Global Positioning System (GPS) technologies to compile a database and explore characteristics associated with community water supply in the Mayange sector of Rwanda. The project team field digitized water access point locations, collected water usage information via personal interviews, and recorded spatial dimensions of land use characteristics. Collected field data was added to a regional database composed of environmental and governmental GIS data layers provided by MVP and CGIS NUR. Spatial analysis was performed at the University of Redlands by students in the MS GIS Program, developing a model revealing spatial dimensions of relative access to good quality water within the focused study area. The model supports MVP identification of suitable locations for water source improvement projects. Additional GIS services were provided to MVP while in the field, extending original project objectives to include boundary truthing and spatial data inventory support.

1:15 pm–2:30 pm

### **NEXT-GENERATION ARCHIVES**

#### **The North Carolina Geospatial Data Archiving Project**

*Jeff Essic, North Carolina State University*

NCGDAP is a joint effort of the North Carolina State University Libraries and the North Carolina Center for Geographic Information and Analysis focused on the collection and preservation of digital geospatial data resources from state and local government agencies. NCGDAP began in 2005 as a partnership with the Library of Congress under the National Digital Information Infrastructure and Preservation Program (NDIIPP). Digital geospatial data consists of GIS data sets, digitized maps, remote sensing data resources such as digital aerial photography, and tabular data that are tied to specific locations. State and local data resources, which are generally more detailed and more current than data

# Presentations FRIDAY, OCTOBER 10

available from federal agencies, are often not included in federal, state, or local archival efforts. Project progress with respect to the range of organizational and technical challenges and NCGDAP solutions will be reported. Also included will be a discussion of future study needs in the areas of archiving cartographic products, software project files, and dynamic web content.

## **Mashing up a Digital Map Library** *Brandon Plewe, Scott Eldredge, and Nic Johnson, Brigham Young University*

Digital library collections seem to be popping up everywhere, and a growing proportion of those collections include georeferenceable materials, such as historic maps and photographs. However, these collections tend to only be accessible using traditional keyword search and result lists that are not very useful. Recent developments in interactive web technologies provide an opportunity to make searching and browsing geospatial digital libraries more productive and more engaging. A prototype system under development combines traditional interfaces with interactive maps and timelines to visualize, browse, search, and retrieve a digital collection of historic maps and photographs.

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2:45 pm–3:45 pm

## **NOT YOUR GRANDPA'S WEB MAPS**

### **Maker! Mapping the World's Data** *Mark Harrower (presenter), David Heyman, Ben Sheesley, and Andy Woodruff, Axis Maps*

Thanks to cloud computing and web-based services, the era of expensive desktop software is coming to an end. Concurrently, there has also been a revolution in how data are created (e.g., sensor nets), distributed (e.g., social networking), and viewed (e.g., mash-ups), resulting in an explosion in the amount of data that is available to be mapped (e.g., volunteered geographic information) and in how many people are making maps

and sharing them (democratization of cartography). However, two issues remain: how to find useable data and how to make the best possible maps quickly, even if users have little-to-no formal training. While data are plentiful, they are often hard to import. Worse, while free mapping tools exist, they offer no guidance on how one might map those data well (and why) and provide little more than “pushpin” cartography.

Axis Maps ([axismaps.com](http://axismaps.com)) and FortiusOne have partnered to create Maker!, an online mapmaking service that allows the public to easily create data-rich thematic and reference maps, drawing from the vast, user-created GeoCommons data repository, and to share and publish those maps anywhere on the web. Our motto was ‘great looking maps, fast.’ Building on the Map Brewer concept of guided, smart mapping systems, Maker! brings powerful mapping tools to a very wide audience, sets higher design standards for web-based maps, and improves cartographic education and literacy. This talk will demo Maker!, highlight some of its more powerful features, discuss designing the UI, reverse engineering commercial map services to create harmonious templates, insights from usability testing, and the challenges inherent in creating an application that can accept any spatial data. Audience members are encouraged to bring their laptops so they can load their own data (or search for data) and make their own maps in real time.

### **Wired Maps** *Rex Cammack, University of Nebraska–Omaha*

In 1993, a new magazine called *Wired* started publication. *Wired's* thematic focus is on technology and how it affects both cultural and economic activities. The magazine uses a cyber-culture design style and covers a wide range of topics. During its history of publication *Wired* has covered many technology that have influenced cartography and used maps to display spatial concepts. This research will look at all the maps designed by *Wired*

# Presentations FRIDAY, OCTOBER 10

magazine and compare them to traditional approaches of mapping. This research examines the following questions. Are the maps in *Wired* design more based on the overall magazine design style? Which cartographic principles has *Wired* ignored in the name of style? What is the rate of map use in number and size per issue? A detailed examination of each map designed for the magazine will be compiled. The result of this analysis will be the basis for the conclusion drawn about cartography use in the cyber print media.

course offerings. The findings suggest that cartography is in fact reestablishing itself in academia, both in terms of its traditional courses of foundations and principles, and in terms of advanced courses which deal with new methods of visualizing spatial data.

2:45 pm–3:45 pm

## CARTOGRAPHY IN THE UNIVERSITY

### 20 Years of Innovation at the UO InfoGraphics Lab

*James E. Meacham, University of Oregon*

Since the UO InfoGraphics Lab was founded in 1988, cartographers have seen a major transition in tools, methods, and designs. This presentation looks at that change through the lens of two areas of the Lab's work: campus mapping and atlas creation. These projects include both print and interactive products. Key threads in the talk include the integration of geographic data handling and graphic design tools, and the comparison of earlier and recent designs.

### A Survey on Teaching Cartography in Canada

*Sally Hermansen, University of British Columbia*

Canada Cartography has gone through many technical revolutions which have affected its discipline and its teaching. We have come through the technical revolution of GIS, where cartography as a discipline struggled to survive, and yet where cartographers have multiplied by the thousands as general users of spatial data through GIS and Google Earth. What this paper offers is a brief historic overview of academic cartographic teaching and research, and where it stands today, by presenting the results of a 2007 survey of Canadian university cartographic

4:00 pm–5:30 pm

## GOVERNMENT MAPPING

### Mapping with Census Data

*Richard Lycan, Portland State University*

Most of us have used Census data in our maps. You may recall that there are (or were) two main decennial census products: (1) data from the "short form" questionnaire that went to every household with the seven basic questions on age, sex, race, and housing occupancy and tenure and (2) the "long form" questionnaire that went to about one in six households, providing socioeconomic detail on topics such as education, income, and car ownership. The "long form" census is no more; RIP. We will only get basic counts of persons and households from the 2010 Census. Instead, the Census Bureau has instituted the American Community Survey, or ACS. The ACS survey instrument is similar to that for the "long form" census, but the survey proceeds on a continuing basis, covering about three percent of households in the course of a year. We currently are receiving 2006 data from the ACS for geographies with at least 65,000 persons. In late summer of 2008 we will begin receiving data for places with at least 20,000 persons. This paper will describe some of the opportunities and some of the problems involved in using the ACS data, particularly for mapping applications, based on our experiences in the Oregon Census State Data Center. Suggestions will be presented on how to map with the ACS, how to explain issues related to its use to clients, and when to say no.

# Presentations FRIDAY, OCTOBER 10

## **New Canadian Topographic Maps** *Eva Siekierska, Natural Resources Canada*

Recently, significant changes have been introduced to the topographic mapping of Canada. A program called Topographic Mapping Initiatives has been created to update and publish new topographic maps for various areas across the country, the first significant effort to update topographic maps since 1993. This new series of maps will be generated using the most current topographic data collected within the GeoBase initiative, enhanced by information obtained from satellite imagery. Geographic areas to be updated will be determined through input from map resellers, by analysis of the historical demand for topographic maps, and according to the needs of other federal departments. Over 900 map sheets are planned to be published over the next three years. The new map series will be produced using automated Map Generator system, currently in implementation in the Center for Topographic Information.

The use of digital databases and automated generation of maps necessitates changes in map production procedures, map content and map design. This presentation will inform about the new approach to digital production of topographic maps from national databases, and will discuss the challenges facing the national mapping agency.

## **Introduction to the Board on Geographic Names** *Mike Fournier, US Bureau of the Census*

The U.S. Board on Geographic Names (BGN) is a Federal body created to maintain uniform geographic name usage throughout the Federal Government. The Board comprises representatives of Federal agencies concerned with mapping and geographic information, population, ecology, management of public lands, foreign affairs, and national security. The Board promulgates official geographic feature names with locative attributes as well as principles, policies, and procedures governing the use of domestic names, foreign names, Antarctic names, and undersea feature names.

In this age of geographic information systems, the Internet, and homeland defense, geographic names data are even more important and more challenging. Applying the latest technology, the BGN continues its mission. It serves the Federal Government and the public as a central authority to which name problems, name inquiries, name changes, and new name proposals can be directed. In partnership with Federal, State, and local agencies, the Board provides a conduit through which uniform geographic name usage is applied and current names data is promulgated.

This presentation will introduce the role of the BGN and federal agency roles and responsibilities and demonstrate the use of the Geographic Names Information System (GNIS) in mapping applications.

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4:00 pm–5:30 pm

## **HISTORIC MAPS II**

### **Butte, Montana, Reflected in Cartography** *Patrick Kennelly, Long Island University*

The rich natural resources of Butte, Montana have resulted in various mapping efforts throughout its storied history. The earliest of these was conducted by the US Geological Survey and published as an economic geology map in Butte Special Folio #38 (1897), a part of the Geologic Atlas of the United States. The map showed locations of bedrock geology, faults, and surficial copper and silver veins. These base map, surveyed in 1895 (revised/extended in 1904), included roads, railroads, hydrology, buildings, and 20 foot contours. In the first half of the 20th century, the Anaconda Mining Company conducted intensive underground mining beneath Butte. Subsurface mine levels were mapped at approximately 100 foot vertical intervals, with the deepest near sea level. Converting these mine maps to a digital format provides a view of the intensity and three dimensional extent of this undertaking. Open pit mining began in 1955, and resulted in dramatic changes in the landscape of Butte. Examples include transforming Butte Hill into the Berkeley

## Presentations FRIDAY, OCTOBER 10

Pit, upper Silver Bow valley into the Yankee Doodle tailings dam and pond, and the Columbia Gardens into the Continental Pit. Combining old and new topographic surfaces provides visualizations of the associated volumes. The resulting products and displays have been used for research, education, and outreach.

### Maps In Bicycle Travel Literature

*Judith A. Tyner, California State University, Long Beach*

Much has been written on the role maps in fiction, such as mysteries and detective fiction, science fiction, children's literature, and the like. Little has been done on the use of maps in nonfiction. Travel literature is a type of nonfiction where one would consider a map to be a basic requirement; to show the author's routes, modes of transportation, and to allow the reader to follow the trip. But is this the case?

This paper looks at a subset of travel literature—bicycle travel narratives—the role of maps in the accounts, the kinds of maps, and the ways maps are used or not used in such literature. Bicycle narratives are of several types, including travel guides, journeys of geographic discovery, and journeys of personal discovery. One would expect that the types and numbers of maps should vary with the type of narrative, but this is not always the case and there are some surprises.

### The McPhillips Brothers: Cartographic Entrepreneurs 1871-1913

*M. Christopher Kotecki,  
Archives of Manitoba*

George McPhillips, Dominion Land Surveyor came out West in 1871, to participate in the survey of the newly acquired territory of Rupertsland, purchased from the Hudson's Bay Company by the Government of Canada. He was successful in bidding on the survey and/or resurvey contracts for all the river lot parishes of the Red River Settlement and completed surveys of various townships in Manitoba and the North West Territories. He recruited his brother R.C. McPhillips and they formed

the McPhillips Brothers Company Ltd, in Winnipeg, a surveying firm that focused on surveying urban subdivision plans for developers. They produced the McPhillip's Atlas of Winnipeg, which consolidated the subdivision plans being filed with the Land Titles Branch into one uniform product, which was of vital importance to real estate developers, speculators and city administrators. They also produced the first fire insurance plan for the city of Winnipeg in 1880 and commercial maps of the developing city. This paper will examine the development of this company and its various initiatives reflected in the holdings of the Archives of Manitoba.

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6:30 pm

## BANQUET

### Speaker: Phil Condon

Winner of the William Faulkner Award for Creative Writing in 2004, Phil is a nationally-recognized nature writer and professor in Environmental Studies at the University of Montana. Phil will be reading from his book, *Montana Surround: Land, Water, Nature, and Place*.

### Student Web Mapping Competition *Coordinated by Erik Strandhagen*

**Geodweb Geopardy! to follow**

## Coffee Shops

- 1 Break Espresso  
432 n. higgins  
406.728.7300
- 2 Butterfly Herbs  
232 n. higgins  
406.728.8780
- Liquid Planet  
223 n. higgins  
406.541.4541
- 4 Trailhead  
221 e. front  
406.543.6966
- 5 Le Petit Outre  
129 s. 4th W  
406.721.5462

## Bars & Breweries

- 6 Iron Horse Brew Pub  
501 n. higgins  
406.728.8866
- 7 Kettlehouse Brewing Co.  
602 myrtle  
406.728.1660
- 8 The Old Post Pub  
103 w. spruce  
406.721.7399
- 9 Sean Kelly's Brew Pub  
130 w. pine  
406.542.1471

## Breakfast

- 10 Catalyst  
111 n. higgins  
406.542.1337
- 11 Uptown Diner  
120 n. higgins  
406.542.2449
- 12 Dauphine's Cafe  
130 e. broadway  
406.829.8188
- 13 Hob Nob Cafe  
531 s. higgins  
406.541.4622

## Fast Meals

- 14 Worden's Market  
451 n. higgins  
406.549.1293
- 15 Taco del Sol  
422 n. higgins  
406.327.8929
- 16 Pita Pit  
130 n. higgins  
406.541.7482
- 17 Bagels on Broadway  
225 w. broadway  
406.728.8990
- 18 Front Street Pasta  
& Wraps  
247 w. front  
406.728.6655

## Ethnic Food

- 19 El Cazador  
101 s. higgins  
406.728.3657
- 20 Sa Wad Dee  
221 w. broadway  
406.543.9966
- 21 Sushi Hana  
403 n. higgins  
406.549.7979
- 22 La Parrilla  
130 w. broadway  
406.721.2180

## Upscale Dining

- 23 Scotty's Table  
131 n. higgins  
406.549.2790
- 24 RedBird  
120 w. front  
406.549.2906
- 25 Pearl Cafe  
231 e. front St  
406.541.0231

## Other

- 26 Biga Pizza  
241 w. main  
406.728.2579
- 27 MacKenzie River Pizza  
137 w. front  
406.721.0077
- 28 Doc's Sandwich Shop  
214 n. higgins  
406.542.7414
- 29 WhiteWater Bar & Grill  
231 w. front  
406.542.5091

# Downtown Missoula



Map by Casey Greene, Adventure Cycling Association

Kim Williams Trail ▶

University of Montana & M Trail ▶