



## Wednesday

*Practical Cartography Day (PCD)  
Practical Map Librarian Day (PMLD) Field Trip  
Opening Session and Reception*

Schedule at a Glance	2-3
Abstracts	4-5

## Thursday

*Annual Business Meeting, Practical Map Librarian Day, Paper Sessions, NACIS Night Out*

Schedule at a Glance	6-7
Abstracts	8-13

## Friday

*Paper Sessions, Banquet, Interactive Map and Poster Competition awards, GeoDweeb Jeopardy*

Schedule at a Glance	14-15
Abstracts	16-20

## Saturday

*Workshop, Field Trips*

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### Welcome to St. Petersburg, it's going to be a great few days together.

NACIS has provided an outlet for new partnerships and collaboration for years. In the spirit of fostering connections there are few things we hope you will participate in this year.

- 1. Lunch Bunch** – If you are interested in joining fellow NACISers for lunch on Thursday and Friday, there will be a sign up at the registration area.
- 2. Questionnaires** – At the end of every session there will be small slips of paper with questions on them. Please take the a few moments to provide some feedback.
- 3. As always** please allow your conversations to spill over into the **Hospitality Suite**, room number 1510.

A special thanks to all of the people who have helped pull together all of the details for a great program, Lou Cross (Executive Director, Annual Meeting Operations), Susan Peschel (Business Manager), Local Arrangement team: Chris Anderson and Nonie Castro, Past Presidents who have lent support and advice, NACIS Board for continued input and brainstorming, Daniel Huffman for the extra set of eyes, Mike Bricknell program maps, all of the session chairs, presenters and attendees.

*NACIS Annual Meeting Program Chair,  
Tanya Buckingham*

*feel free to drop questions to me throughout the conference,  
via email, if you cannot find me: [tanya@nacis.org](mailto:tanya@nacis.org)*

**7:30 AM–5:00 PM**

**REGISTRATION**  
REGISTRATION AREA

**9:00 AM–12:00 PM**

**PRACTICAL CARTOGRAPHY DAY (PCD)**  
ST. PETERSBURG II

**Welcome**

Sam Pepple, National Geographic Magazine  
Neil Allen, Allan Cartography/Benchmark Maps

**One-Way Arrows**

Nat Case, Hedberg Maps

**Creating Thematic Maps with Action Script 3**

Andy Woodruff, Axis Maps  
Zach Johnson, Axis Maps

**Georeferencing in Geocart 3**

daan Strebe, Mapthermatics

**ShadedRelief Archive dot com**

Tom Patterson, National Park Service  
Bernhard Jenny, Institute of Cartography, ETH Zurich

**Photo Composite Oblique Views in Photoshop and Maya**

Steve Tyson, US Government

**12:00–1:30 PM**

**PCD LUNCH**  
GRAND BAY BALLROOM SOUTH

**1:30–5:00 PM**

**ScaleMaster**

Chelsea Hanchett, The Pennsylvania State University

**Ortelius' Community-based Symbol Collection**

Jill Saligoe-Simmel, Ortelius Map Illustration Software

**Flash-based Traffic Maps for Television**

Hans van der Maarel, Red Geographics

**Researching the Thematic Section of the  
NG 9th Ed. Atlas of the World**

Kaitlin Yarnall, National Geographic

**A New Flow Map for The NG 9th Ed. Atlas of the World**

Sam Pepple, National Geographic Magazine

**Photoshop Tips for Practical Cartographers**

Alex Tait, International Mapping

**Manual Meets Digital: Collaborating to Create Evocative  
Cartography**

Martin Gamache, National Geographic Magazine

**Closing Remarks**

Sam Pepple, National Geographic Magazine  
Neil Allen, Allan Cartography/Benchmark Maps

**Laptop Sessions**

Hospitality Suite, sponsored by Avenza Systems, Inc

**7:00–8:30 PM**

**OPENING SESSION**  
ST. PETERSBURG I & II

**Welcome**

Margaret Pearce, NACIS President

**KEYNOTE SPEAKER: Eric Sanderson**

Wildlife Conservation Society, *Mannahatta Project*

**8:30–9:30 PM**

**RECEPTION & POSTER GALLERY OPENING**  
GRAND BAY BALLROOM NORTH



**11:30 AM–5:00 PM**

**PRACTICAL MAP LIBRARIAN DAY (PMLD)  
TAMPA BAY HISTORY CENTER**

This regional museum allows you to explore 12,000 years of history in the Tampa Bay area. After lunch (on your own) at the Columbia Café, we will receive a guided tour of the Witt Research Center which focuses on Florida history and features a diverse collection of books, maps, periodicals, microfilm, photographs, subject files and family histories. In particular, we will learn about the Touchton Collection of Florida Cartography. These maps and charts include many of the unusual views of Florida that map-makers have created over the past 400 years. There should be time for you to explore the museum and its store on your own before we return to the hotel. [www.tampabayhistorycenter.org](http://www.tampabayhistorycenter.org)

**NACIS BOARD MEETING  
BAYBORO**

**2:30–5:00 PM**

Newly elected Board Members are invited to attend this Board Meeting to observe.

Eric W. Sanderson is a Senior Conservation Ecologist at the Wildlife Conservation Society. His work has been featured in the *New York Times*, *National Geographic Magazine*, *CNN*, *NPR*, and *The New Yorker*. He is also the director of The "Mannahatta Project," an effort to reconstruct the original ecology of Manhattan Island at the time of European discovery in the early seventeenth century.

**Case, Nat** (Hedberg Maps)  
*One-Way Arrows*

Why did older street maps not show one-way arrows? Why are they such a pain to make work? Very briefly, we explore a few approaches to making directionality work graphically.

**Gamache, Martin** (National Geographic Magazine)  
*Manual Meets Digital: Collaborating to Create Evocative Cartography*

Combining manually rendered map art with computer data presents an opportunity to exploit a wider array of tools and techniques that can make a map more successful. Recent collaborations with watercolor artist Mike Reagan and Rob Wood have provided NGM with an opportunity to illustrate maps with techniques that we may not be able to execute on staff. Though the process can be more time consuming and somewhat more complicated once a workflow that can accommodate this kind of collaboration has been settled upon it opens the door to wonderful collaborations. I'll be showing and discussing my collaboration with artists Mike Clelland, Mike Reagan, Rob Wood and Fernando Baptista.

**Hanchett, Chelsea** (The Pennsylvania State University)  
*ScaleMaster*

We describe development of a multi-scale design for The National Map, lead by the United States Geological Survey, which covers scales from 1:24,000 to 1:1,000,000. Map content and symbolization must change with decreases in scale for maps to remain readable, necessitating a way to decide the threshold scales at which these changes take effect. Our decisions were guided by the creation of a project-specific ScaleMaster, an organizational tool for multi-scale mapping developed by Brewer, Buttenfield, and Frye. The development of this tool and how it tracks the interactions of data and symbol use over multiple scales will be discussed. Additionally, the ScaleMaster for this project will be reviewed, with attention to the symbolization, selection, and generalization operations for each data layer encoded in the diagram. The ScaleMaster summarizes the project both concisely and visually.

**Patterson, Tom** (National Park Service)  
*ShadedRelief Archive dot com*

We will introduce ShadedReliefArchive.com, a Website containing manual shaded relief art from the twentieth century that today's digital mapmakers can use. The goal of our project is twofold: giving cartographers a high-quality alternative to generic digital relief, and scanning manual relief that still has production value before it is permanently lost. We are in a race against time—mapping organizations having now gone digital are discarding photomechanical production materials, including manual shaded relief. Much of this beautiful art deserves to be used by future mapmakers.

**Pepple, Sam** (National Geographic Magazine)  
*A New Flow Map for The NG 9th Ed. Atlas of the World*

I created a new flow map for the National Geographic Atlas of the World. This talk is about the process.

**Saligoe-Simmel, Jill** (Ortelius Map Illustration Software)  
*Ortelius' Community-based Symbol Collection*

Map symbol collections serve to inspire, educate, and provide time-saving templates for iterative work. We will set up a new project design template. A variety of map styles and symbols will be created using Ortelius' advanced style components. We will see how to use existing symbols as new symbol templates, create special symbols such as shields and sequence markers, and build complex styles using hatches and pattern fills. The iterative nature of the visual design process will be discussed and techniques applied. Upon completion, the process of sharing a symbol collection directly from the Ortelius Library Manager will be demonstrated as a foundation for community-based symbol collections.

**Sanderson, Eric** (Wildlife Conservation Society)  
*Keynote Address*

The Wildlife Conservation Society's *Mannahatta Project* is a decade-long effort to rediscover the lost ecology of Manhattan Island, at the moment of European discovery on September 12, 1609. We used representations of that moment to reflect on the ways that the landscape has changed over the last 400 years, and to imagine how it will continue to change over the next 400. Visualizing the landscape through a diverse set of cartographic strategies—from computer generated images to network visualizations to Google-maps based mash-ups—has been key to helping New Yorkers, and other people who might know New York only from what they seen in movies or television, explore how nature fits in the city and how the city fits into nature.

**Strebe, daan** (Mapmathematics)

*Georeferencing in Geocart 3*

Geocart can reproject raster imagery from any projection to any projection available in the program. This tutorial shows how to set up an image for reprojection and how then to project it to the needed projection. Included are tips and considerations for attaining the best results given the source material.

**Tait, Alex** (International Mapping)

*Photoshop Tips for Practical Cartographers*

Adobe Photoshop is a widely used by mapmakers for working with and creating raster-based graphics. I will explore techniques for using Photoshop with geographic images and data. Topics will include: improving remotely sensed images, storyboarding animations, effective layering, modifying elevation data and improving shaded relief. Adobe has recently released Photoshop CS5 (version 15) and I will look at some of the newest features.

**Tyson, Steve** (US Government)

*Photo Composite Oblique Views in Photoshop and Maya*

Brief intro to CIA cartography with demonstrations to follow.

**van der Maarel, Hans** (Red Geographics)

*Flash-based Traffic Maps for Television*

We've built a dynamic Flash map that is used for traffic reports on TV. The client wanted to be able to set up short sequences with as much accuracy and timeliness as possible. Aesthetics were key throughout.

**Woodruff, Andy and Zach Johnson** (Axis Maps)

*Creating Thematic Maps with Action Script 3*

Demonstrate how to use ActionScript 3 code for dynamically loading a shapefile and dbf data, reprojecting and drawing the geodata, and from it generating a simple thematic interactive Flash map. The demonstration will follow an easy-to-use code package that we will provide on the Web to be available to the audience and the public.

**Yarnall, Kaitlin** (National Geographic)

*Researching the Thematic Section of the NG 9th Ed. Atlas of the World*

This session will discuss the intricacies of identifying sources, gathering data, selecting visualization techniques, and implementing GIS and production.

7:30 AM-5:00 PM

REGISTRATION  
REGISTRATION AREA

8:00-9:15 AM

BREAKFAST, ANNUAL SOCIETY BUSINESS MEETING  
GRAND BAY BALLROOM SOUTH

9:30-11:00 AM

PAPER SESSION A  
ST. PETERSBURG I

## Hands-on scripting

**CHAIR:** Adam DuVander

*Hands on Map Scripting* - Adam DuVander, Mapstraction

Bring a laptop and follow along, as Adam takes you from zero to mapping in 90 minutes.

11:15 AM-12:15 PM

## Projects: challenges and solutions

**CHAIR:** Chris Anderson

*Mapping the Paris Underground* - Ginny Mason, National Geographic

*The Florida Boating and Angling Guide Series*

- Chris Anderson, Florida Fish and Wildlife Conservation Commission

12:15-1:45 PM

LUNCH  
ON YOUR OWN

1:45-3:15 PM

## Practical solutions and applications for mapmakers

**CHAIR:** Carolyn Fish

*Sharing Your Maps Online* - Mamata Akella, Esri

*Cartes et Données: A Powerful Thematic Mapping Software* - Kazimierz J. Zaniewski, University of Wisconsin-Oshkosh

*Dataset Development at the National Atlas of the United States* - John Hutchinson, USGS (Sioux Falls)

3:30-5:00 PM

## Making the most of new technologies

**CHAIR:** David Asbury

*Managing CanVec Data in ArcGIS: A Programming Approach Using Python* - Joe Fraser (Centre of Geographic Science in Nova Scotia)

*Exploring HTML5 and the Canvas Element* - Jeremy White, University of Wisconsin-Madison

*Designing and Compiling Maps for the Web* - Aileen Buckley, Esri



RED MESA  
CANTINA  
& LUCHA BAR

7:00-9:00 PM

NACIS NIGHT OUT  
RED MESA CANTINA, 128 3rd. St. South 33701

## PAPER SESSION B ST. PETERSBURG II

### Alternate cartographies

**CHAIR:** Tanya Buckingham

*Practical Counter-mapping* - Tim Stallmann and Craig Dalton, 3Cs Counter-Cartographies

*"Dutch Seacoast": Space and Time in Kenneth Slessor and Joan Blaeu* - Adele J. Haft, Hunter College of the City University of New York

*Cartography in Thread: Map Elements on Hmong Pa 'ndaus* - Judith A. Tyner, California State University Long Beach

### Mobile maps

**CHAIR:** Mamata Akella

*Trends in the Smart Phone Market and the Challenges of Preparing Maps for Mobile Delivery* - Andrew Johnson, GalaGPS

*National Geographic Mobile Applications* - David Lambert and Matthew Johnson, National Geographic Maps

## PAPER SESSION C HARBOR VIEW

### Practical Map Librarian Day

**CHAIR:** Terri J. Robar

*Creating an Online Map Cataloging Website: Status and Future Enhancements* - Paige Andrew, Penn State University

*I've Got a Map for That: Breathing New Life into Historic Sanborn Fire Insurance Maps* - Lanell James, MSI, ProQuest

*Maps to MARC: Converting GIS footprint indexes into sheet level MARC Records* - Abraham Kaleo Parrish, Yale University Library

### Practical Map Librarian Day

*Improving Online Access to Historic Aerial Photographs of Florida: Development and Implementation of the Final Phase of "From the Air"* - Carol P. McAuliffe, University of Florida Map & Imagery Library

*Development and Testing of an Open Source Web Application for the University of Wisconsin's Historic Air Photo Collection* - Howard Veregin, Jaime Stoltenberg, AJ Wortley, Michael Bricknell, University of Wisconsin

## Public participation

**CHAIR:** Jenn Milyko

*Public Participatory GIS* - Wansoo Im, VERTICES, LLC

*Integrating GPS and Health Data with Participatory Web Mapping: Technologies Designed for Analyzing Bicycle Racing Fitness* - Fritz Kessler, Frostburg State University

*Methods of Mapping Perceptions of Landscape Values from Forest Recreation* - Christopher A. Badurek, Appalachian State University

## Interpreting the map

**CHAIR:** Chris Badurek

*Theoretical Frameworks for the Study of Journalistic Maps: South American Borders in Brazilian Press* - André Reyes Novaes, Universidade do Estado do Rio de Janeiro

*How Map-Minded Can You Be? (Hi)Stories of Cartography, Map Immersion, And Cartotalks* - Jörn Seemann, Louisiana State University/Universidade Regional do Cariri

## Tools and methods for representing unique data

**CHAIR:** Hans van der Maarel

*Mapping Wilderness Proposals at Congressional Request* - Mattye Dahl, Jim Rounds, Paul Fyfield, Bureau of Land Management

*Twenty-three U.S. Censuses and Still Counting: Confronting the Challenges of Mapping Them All* - Jonathan Schroeder, Minnesota Population Center

*Mapping UFO Sighting Data: Pitfalls & Possibilities* - Mathew A. Dooley and Ian Muehlenhaus, University of Wisconsin-River Falls

## New Solutions

**CHAIR:** Patrick Kennelly

*GIS in K-12 Education: Serving Communities and Learning GIS* - Wansoo Im, VERTICES, LLC

*A Discussion on the Use of PDF and Maps* - Ted Florence, Avenza Systems, Inc.

**Akella, Mamata** (Esri)  
*Sharing Your Maps Online*

In this presentation, I discuss the potential for sharing your maps and related work with others using new capabilities available via the Web. I'll start by describing what I mean by "sharing," which can involve distributing all of your map, part of your map, or even a Web map service. I'll be focusing my discussion on map making with ArcGIS software as there is some new functionality in the latest release that allows users to expedite the sharing process. I'll consider various reasons why sharing your maps with others in the cartographic community and beyond is beneficial to all involved. I'll then explain how you can create different types of products that let you share your maps or parts of them, including layer packages, map packages, map templates, and Web map services. I'll show you some of the ways ArcGIS Online is being used to share these products through resource centers and ArcGIS.com, a Web site Esri developed specifically to allow users to share their work and collaborate in an online environment. Sharing your maps will benefit cartographers as well as other map makers who want to learn better cartographic practices.

**Anderson, Chris** (Florida Fish and Wildlife Conservation Commission)  
*The Florida Boating and Angling Guide Series*

In 1991, the Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWRI) produced the first Boating and Angling Guide to Tampa Bay (BAG). Since then, FWRI has produced over 2.5 million BAGs for 26 areas around Florida. These guides provide a wealth of information that boaters and anglers can use to when engaged in water activities. The map side of the BAG provides locations of public-access boat ramps, fishing piers, artificial reefs, marinas, and aids to navigation. Water depth, bottom type, bridge type and heights, and managed area boundaries are also shown. The text side of the guide provides information about boating safety, native habitats and animals, popular sport fish, proper catch-and-release techniques, and a resource directory with accompanying phone numbers. FWRI works with local partners to provide information pertinent to boaters and anglers within each BAG's extent. BAGs are a very popular publication for FWRI. They are distributed at bait-and-tackle shops, marinas, tax collectors offices, and fishing shows. In addition to providing information to boaters and anglers, BAGs are used in a variety of ways not originally intended; including oil spill response. This presentation will cover all aspects of BAGs from creation to use.

**Andrew, Paige** (Penn State University)  
*Creating an Online Map Cataloging Website: Status and Future Enhancements*

Over the past couple of years I have been slowly constructing a new Website focused on map cataloging in general, with specific cataloging procedures and illustrations and an aim towards turning it into a self-directed training site. The ride to getting the Website to where it is now, recently "published" and online for public use, has been a long and bumpy one, though the first goal has been met. This Website contains documents and illustrations to guide both the novice map cataloger and the experienced one who only occasionally needs guidance on specifics. It includes short "how to" video clips, separate pages illustrating different types of maps and also the way scale can be provided by the map's creator, and a host of other helpful documents. The next phase of this Website is to establish it with enough content to become a self-guided training site, possibly even substituting many years of face-to-face map cataloging Websites with an online version. The goal is to meet the needs of fellow professionals looking for either a "ready reference" site on the topic of cataloging maps or for more formal training. Feedback on Website content is welcome, as well as all other suggestions for changes and additions.

**Badurek, Christopher A.** (Appalachian State University)  
*Methods of Mapping Perceptions of Landscape Values from Forest Recreation*

The Wilson Creek River Corridor is a popular destination for numerous land and water-based recreation activities in western North Carolina. Currently, the USFS is responsible for Wilson Creek's river management plan. While the plan aims to provide direction for forest and recreation management, there are no identified methods to create maps of landscape values from affected local and regional communities. Previous studies have provided participants the opportunity to annotate maps provided in surveys with a point and particular landscape value, such as aesthetic, biological, learning, or spiritual. Analysis of survey responses allows creation of "hot spot" maps indicating relative density of mapped landscape values in aggregate as well as by stakeholder subgroup. This study compares and tests stakeholder landscape value mapping methodologies for reliability and replicability. Survey responses are scanned and geo-referenced to enable visualization and analysis with Esri's ArcGIS platform. Scanned responses are used to create raster surfaces including the values, uses, and locations indicated by respondents. These surfaces are then used to identify hotspots of specific landscape values and areas of high use according to respondents. A pilot Google Earth application is also used to gather and map this data via the Web.

**Buckley, Aileen** (Esri)  
*Designing and Compiling Maps for the Web*

This presentation focuses on the types of cartographic decisions that are governed by the fact that you will ultimately be publishing your map on the Web. We'll start with a definition of what we mean by a "Web map," which we consider to be not only the Web map service but also the interface used to presented it as well as any functionality delivered with the map, such as map elements, querying elements, and reporting elements. This conceptualization of a Web map will influence your various map making decisions. We consider a variety of Web



maps, including single or multi-scale maps, cached versus dynamic map services, and stand-alone or mashed up maps. With these types of Web maps in mind, we discuss design decisions that result in the highest quality cartographic display onscreen, including issues that relate to color, type, and symbology. We also give careful consideration to design of the Web map application and how map readers expect and can benefit from viewing the map in an online environment. Although the focus of this presentation is on map design and compilation rather than the publishing process, we will touch on publication to the extent that you will know what types of decisions present themselves and how you can best address them.

**Dooley, Matt A. and Ian Muehlenhaus** (University of Wisconsin-River Falls)  
*Mapping UFO Sighting Data: Pitfalls and Possibilities*

Many UFO sighting maps can be found on the Internet, however the majority of these maps have limitations in terms of usability, visualization, and data exploration. This phenomenon presents unique cartographic challenges, including: data reliability, spatial accuracy, and variable clustering. This paper presents the results of our attempt to make a UFO sighting map and interface that allows users to explore UFOs as a cultural and geographic phenomenon.

**DuVander, Adam** (Mapstraction)  
*Hands on Map Scripting*

It's easier than ever to get a map on your Website with one of the many APIs provided by Google, Microsoft, MapQuest and many others. Adam DuVander, author of *Map Scripting 101*, will show you how in this workshop. Using Mapstraction, an open source wrapper library, you can write code once for a dozen different map providers. No previous programming experience is required, as you alter examples already written. Learn to: customize your map with your own markers and map imagery, convert addresses to latitude/longitude coordinates, so you can turn user input into data, and find your user's location no matter what the browser—even a mobile phone. Bring your laptop and follow along, as we get from zero to mapping in 90 minutes.

**Florence, Ted** (Avenza Systems, Inc.)  
*A Discussion On The Use of PDF And Maps*

In an age in which paper maps are being used less and less frequently and an increasing number of maps are being used digitally on GPS devices, cellular phones and in-car navigation systems the challenge for all map publishers, whether academic, public sector or commercial, is how to address this new market and medium and to ultimately continue the life of their map assets and products within these new media platforms. This presentation/discussion will focus on new spatial PDF technology and how it is changing the cartography industry. There will also be a demonstration on how PDF technology is currently being used in cartography, which software can produce and read them, and how it can be incorporated into your own workflow.

**Fraser, Joe** (Centre of Geographic Science in Nova Scotia)  
*Managing CanVec Data in ArcGIS: A Programming Approach Using Python*

Assembling base data quickly is a priority for geographic data users. Natural Resource Canada's CanVec dataset is an important topographical resource for many in the geomatics industry. The Esri product catalogue has a number of tools available that makes using this data simple. This paper outlines a method of creating a geodatabase to interpret the fields within the CanVec dataset using custom software tools. Ways of editing the geodatabase's XML structure using ArcGIS Diagrammer and ArcCatalog are discussed. Most important is the use of Python-based scripts to populate the CanVec geodatabase, as well as a method to symbolize the data using cartographic representations. With these tools, a 1:50,000 map sheet can be produced in minimal time for any area in the country.

**Fyfield, Paul, Mattye Dahl, and Jim Rounds** (Bureau of Land Management Oregon State Office)  
*Mapping Wilderness Proposals at Congressional Request*

The Mapping Sciences team of the Bureau of Land Management's Oregon State Office has many functions. One of the most important is creating maps at the request of a United States Senator or Congressman. These maps are often in support of legislation creating a special designation such as a wilderness area or wild and scenic river. By their nature these maps are sensitive and access to them must be strictly limited. The maps also must be completed within very short time frames. However, it is also important that they be as accurate as possible, especially regarding acreage calculations that will be included within the text of the legislation. This presentation describes the process by which these maps are created, beginning with data usually provided by an organization outside the BLM, continuing through the mapping process where the geometry of the boundaries is, when possible, derived from data of known reliability. After the legislation has been introduced, the BLM is required to maintain a corporate layer complete with metadata. These data also contain attributes describing the original intent of the boundaries, which will be used when the area is ultimately surveyed.

**Haft, Adele J.** (Hunter College of the City University of New York)

***"Dutch Seacoast": Space and Time in Kenneth Slessor and Joan Blaeu***

"Dutch Seacoast," by the acclaimed Australian poet Kenneth Slessor (1901-1971), is the centerpiece of "The Atlas," the five-poem sequence opening his 1932 collection *Cuckooz Contry*. Like the other poems, "Dutch Seacoast" pays tribute to cartography's "Golden Age." Toonnel der Steden van vereenigde Nederlanden is the poem's epigraph and the title of Joan Blaeu's first volume of *Townbooks of the Netherlands* (1649). Focusing on Blaeu's exquisitely ordered map of Amsterdam, Slessor makes us imagine that he is gazing at the map described by his poem and invites us to consider how poets and cartographers represent space and time. An intensely visual poet, Slessor was also attracted to lyrical descriptions of objects: his inspiration for "Dutch Seacoast" was a particularly poetic, but sparsely illustrated, catalog of maps and atlases. My paper traces the birth of "Dutch Seacoast" in Slessor's poetry notebook, the evolution of the poem's placement within "The Atlas," and the complex relationships between the poem, the catalog, and Blaeu's atlas. Comparing Blaeu's idealistic view of Amsterdam with that city's dominance during the "Golden Century," and Slessor's darker obsessions with the poem's ending, we come to understand why "Dutch Seacoast" remained for the self-effacing poet one of his eight "least unsuccessful."

**Hutchinson, John** (USGS, Sioux Falls)

***Dataset Development at the National Atlas of the United States***

The National Atlas of the United States® has hundreds of data layers available for display and download at [nationalatlas.gov](http://nationalatlas.gov)™. In 2010 and 2011, the top priority of the National Atlas is to assemble and integrate 1:1,000,000-scale cartographic framework datasets, including coastlines, boundaries, transportation, and hydrography. This session will feature an overview of the National Atlas approach to dataset development, with examples of the problems encountered in compiling and generalizing water bodies data at 1:1,000,000 scale.

**Im, Wansoo** (Vertices, LLC)

***GIS in K-12 Education: Serving Communities and Learning***

The GIS for Kids program was launched with the help of volunteers from New Jersey and a number of other states throughout the country to promote the use of GIS in K-12 education. Despite the enthusiasm of our volunteers and their efforts to make GIS a continuous part of the core curriculum in schools, GIS projects often ended as one-time semester projects. The short-lived role of GIS in K-12 education was determined to be the result of limited funding for the GIS projects. While it is important to develop successful case projects utilizing GIS, our goal is to have GIS incorporated into the annual curricula for K-12 students, as well as into after school programs. In this presentation, we would like to share some of our previous projects with schools and after school programs. It is our hope, that our program will teach high school students how to use GIS, while serving communities and encouraging the development of curricula that emphasizes real-life application and volunteering. This presentation will also suggest ideas on how GIS professionals can be involved in community projects with K-12 students.

**Im, Wansoo** (Vertices, LLC)

***Reshaping PPGIS: Empowering Environmental Communities using Google Maps API***

Issues of affordability, accessibility, and technical expertise have been major obstacles to non-profit environmental advocacy groups when utilizing GIS. In recent years these obstacles have been slowly, yet significantly, diminished with the advent of Web 2.0 and open-source/open-access technologies. The advances and opportunities continue to grow but many non-profit organizations still have difficulty implementing these new approaches. In this study, we explore how non-profit environmental organizations are using GIS. We reviewed and analyzed each of the Websites of water conservation organizations throughout the state. The Websites were examined within the context of whether they use GIS, how they use GIS, and what kinds of technology they used. We also review how Google Maps affects PPGIS practices, its current implications, and future concerns by using several case studies of water resource protection organizations utilizing Google Maps.

**James, Lanell** (MSI, ProQuest)

***I've Got a Map for That: Breathing New Life into Historic Sanborn Fire Insurance Maps***

Innovations in geospatial technology have created exciting new research opportunities. This session will explore how GIS technology can be applied to historical content to enrich a researcher's experience of time and place. Through case study, session participants will examine a recent ProQuest initiative that employed GIS technology to georeference a prominent collection of historic Sanborn® Fire Insurance Map images.

**Johnson, Andrew** (GaiaGPS)

***Trends in the Smart Phone Market and the Challenges of Preparing Maps for Mobile Delivery***

In the last two years, around half a billion handheld computers have been manufactured and sold. From Blackberries and Androids, to iPhones, Pads, and Pods, "smart phones" have spread to every corner of the Earth. The massive production of cheap, often GPS-enabled, handheld computers has spurred a revolution in mapping.

The sale of old-style GPS handhelds are in decline, sales of paper maps are flattening, and much of that market share is migrating to smart phone platforms. In this session, we will discuss statistics and trends in the smart phone market, particularly related to GPS and mapping applications. We will talk about the challenges of preparing maps and software for mobile delivery. We will also show sales numbers across a number of mapping applications on both Android and iPhone and extrapolate market size from these.

**Kessler, Fritz** (Frostburg State University)

***Integrating GPS and Health Data with Participatory Web Mapping: Technologies Designed for Analyzing Bicycle Racing Fitness***

Participatory Web mapping (PWM) combines the Internet, World Wide Web, and specialized mapping applications to provide novice map makers a new medium in which to create and share their maps. Using small compact Global Positioning Service (GPS) devices novice map makers can collect their own data, upload it to several mapping applications (e.g., Google Maps and MapMyRide) and overlay the data onto existing base information creating a custom map. These maps are specifically intended to share personal experiences to a wider but sometimes specialized community of users. The numerous portable communication devices available, accessibility of wireless networks, and number of mapping applications have collectively expanded the viewing and interaction capabilities with personal mapped data. Thus, PWM has empowered individuals to "participate" in the free exchange of geospatial information without the intermediary of a professional cartographer. Cartographers have also acknowledged this important shift, but have yet to engage in a systematic and critical evaluation of these open source systems. Using a portable GPS collection device, this presentation will explore the process of data collection and the challenges that users face when incorporating the data into various mapping applications. While data collection is rather simple, the accuracy of these hand held devices is questionable and the process to upload the data can be confusing. Issues with map design in these mapping applications will also be discussed: Many mapping applications are eye catching, but their map design is poor and generally lacks any user control. Last, the presentation will provide an overview of the available level of user interaction when using and viewing these mapping applications. While these mapping applications are seemingly an interesting idea, the end user can be very frustrated in the lack of user control that is available.

**Lambert, David and Matthew Johnson** (National Geographic Maps in Evergreen, Colorado, specializing in Trails Illustrated recreation maps)

***National Geographic Mobile Applications***

Over the course of the last year, National Geographic Maps has been in the process of developing mobile applications, utilizing the popular world political maps. More recently, the applications have begun to include the Trails Illustrated recreational map series. The mobile apps are able to provide map users with more functionality than the traditional paper maps by incorporating multiple zoom levels, current GPS location, and additional search options. We will discuss the production process and challenges of redesigning the maps for this new use.

**Mason, Ginny** (National Geographic)

***Mapping the Paris Underground***

Most are familiar with Paris's above-ground landscape, with the gothic architecture of Notre Dame, wide garden promenades of the Avenue des Champs-Élysées, and popular landmarks such as the Eiffel Tower. But the lesser known geography of Paris lies underneath, with the several hundred kilometers of intricate tunnels and rooms where one can find remnants of medieval aqueducts, war-time bunkers, and millions of skulls and bones contained in the ossuaries of the catacombs. Paris has a rich history in underground mapping: a necessary means to systematically maintain the integrity of Paris's urban infrastructure. After centuries of quarry extraction that threatened the stability of the very ground that Paris was built upon, cartography is an essential component in managing the after-effects. This presentation will discuss the history of Paris's underground cartography and will give a sneak peak at the early research and design process of our maps and graphics coverage of Paris Underground for National Geographic Magazine.

**McAuliffe, Carol P.** (University of Florida Map & Imagery Library)

***Improving Online Access to Historic Aerial Photographs of Florida: Development and Implementation of The Final Phase of "From the Air"***

The project "From the Air: a photographic record of Florida's lands" encompasses three LSTA grants from the State of Florida to digitize and make accessible the historic aerial photography collection held within the Map & Imagery Library. The third and final phase digitized the remaining 15,000 aerial photographs from 1971 - 1990 and created a Google Maps API based search interface to access and download the images. As part of the project, the interface also went through usability testing in schools and within the library community. The result is a freely available state-wide resource that can be used by researchers, the general public, and educators which will also provide a starting point for the future development of a state-wide repository of Florida historic aerials.

**Parrish, Abraham Kaleo** (Yale University Library)

***Maps to MARC: Converting GIS Footprint Indexes into Sheet Level MARC Records***

The time consuming task of cataloging series maps at the sheet level often leaves librarians to settle for a series level record for most of their series maps. However, by synthesizing a series level MARC record with a GIS footprint index, it is possible to generate sheet level records within a fraction of the time it takes to catalog them sheet by sheet. ArcGIS software can be used to quickly generate a footprint index, automate select fields, and quickly populate the fields from the series level record that remain consistent. MarcEdit software can then be used to automate the creation of substantial sheet level MARC records from a tabular format that include bounding coordinates and links to digital images of the map sheets.

**Reyes Novaes, André** (Universidade do Estado do Rio de Janeiro)

***Theoretical Frameworks for The Study of Journalistic Maps: South American Borders in Brazilian Press***

This paper discusses how theoretical frameworks for the study of silences and secrecy in the history of cartography can be applied in the study of journalistic maps. Among the different concepts used by geographers and cartographers to study the influence of cultural meanings on maps, two theoretical frameworks are particularly emphasized: iconography and semiotics. Harley's and Blakemore's monograph on concepts in the history of cartography (1980) is a good example for the use of these two theoretical frameworks in cartography, especially the chapters 6 and 7 that discuss the use of art history methods in cartography and explore how the linguistic analogy "offers the most appropriate underlying structure for the history of cartography" (p.87). In the light of these contributions, this paper analyzes the use of iconography and semiotics as theoretical approaches to explore silences and secrets in Brazilian journalistic maps that represent South American borders. Historically, Brazilian borderlands are situated far away from the major centers of political decision-making and the major cities that are mainly concentrated on the coast. Borderlands, as a kind of terra incognita for the majority of the population, are frequently imagined as distant, empty and potentially dangerous. The aim of this paper is explore Brazilian popular imaginative geographies concerning South American borders, following Harley's and Blakemore's theoretical reflections in order to find out "how exactly has cartography helped to structure conceptions of place and space?" (p.103).

**Schroeder, Jonathan** (Minnesota Population Center, University of Minnesota)

***Twenty-three U.S. Censuses and Still Counting: Confronting the Challenges of Mapping Them All***

This presentation provides an overview of ongoing efforts to facilitate efficient and effective mapping of historical U.S. census data at the Minnesota Population Center. The center's National Historical Geographic Information System (NHGIS) already provides online access to aggregate statistics and boundary files for censuses from 1790 through 2000. This greatly simplifies the task of mapping historical demographic patterns, but many hurdles remain. First, new data from the American Community Survey and Census 2010 must be integrated into the NHGIS, a task complicated by upgraded TIGER census boundary data, which diverge from the older NHGIS data. Then, to map changes across censuses, it is still necessary to identify comparable variables from each census and harmonize data from altered geographic units. An ongoing project at the Minnesota Population Center, the Integrated Spatio-Temporal Aggregate Data Series (ISTADS), aims to address these problems by facilitating the assembly of census time series. I will report on the current progress and expected outcomes of this project and also demonstrate some novel mapping and data visualization techniques that can be uniquely effective when illustrating census time series.

**Seemann, Jörn** (Louisiana State University/Universidade Regional do Cariri, Brazil)

***How Map-Minded Can You Be? (Hi)Stories of Cartography, Map Immersion, and Cartotalks***

The ways and forms through which individuals and societies understand, use, and draw maps are still a widely overlooked topic in cartographic research. In the past, geographers such as J.K. Wright and William Balchin mulled over the map-mindedness of societies in order to determine their degree of map engagement and cartographic literacy. More recently, Susan Schulten and Martin Brückner have investigated the development of geographic awareness and national identity in the United States, whereas Denis Wood has discussed the differences between mapping and mapmaking and the characteristics of map-immersed societies. However, research is mainly focused on the Anglosphere and does not explore more qualitative and ethnographic methods. The aim of this paper is to present findings from a case study in Northeast Brazil that included a set of interviews on spatial identity, perception of place, and the drawing of regional maps. The interviewees revealed a wide range of different strategies to engage with maps and mappings, from the use of maps as discourse or as spiritual worldviews to cartographic biographies. The results of this study can be a contribution to the broader debate on maps in society and the cultures of map use within a cross-cultural perspective.

**Stallmann, Tim and Craig Dalton** (3Cs Counter-Cartographies)  
*Practical Counter-mapping*

Counter-mapping, counter-cartography, and indeed our own work as 3Cs have all been variously praised and attacked at past NACIS conferences. We'd like to set the record "straight," as it were, and give a presentation discussing our perspective on what constitutes counter-cartography, giving some examples of interesting counter-mapping projects from across the world, and discussing some practical techniques we use as counter-mappers. Our hope is to excite the broader NACIS community about the potentials of counter-mapping as a technique, while also helping to build more bridges between traditional cartographers and counter-mappers.

**Tyner, Judith A.** (California State University—Long Beach)  
*Cartography in Thread: Map Elements on Hmong Pa 'ndaus*

The Hmong people have their origins in the hills of Southern China and migrated southward into Laos; in the 1970s and 1980s, many fled to Thailand and then to the United States. Their written language (if one existed) was lost and, like many non-literate peoples, their history was passed to succeeding generations orally. The Hmong have a tradition of embroidered and appliqued textiles called pa 'ndaus or "flower cloths" and beginning in the 1970s after the end of the second Indo-Chinese War, they began supplementing oral histories with a form of pa 'ndaus, the story cloth. These textiles represent the recent Hmong history—fighting in the "secret war" in Laos, their exodus from Laos into Thailand, life in refugee camps, and leaving Southeast Asia in planes bound for the United States. The story cloths have many map elements in that they show spatially the travels of the Hmong during a significant period in their history. Surprisingly, there has been little scholarly study of these artefacts and much that is available is in the form of children's books and elementary school lesson plans. This paper is a look at story cloths from a cartographic point of view.

**Veregin, Howard, Jaime Stoltenberg, AJ Wortley, and Michael Bricknell** (University of Wisconsin-Madison)  
*Development and Testing of an Open Source Web Application for the University of Wisconsin's Historic Air Photo Collection*

The University of Wisconsin-Madison has an extensive collection of historic air photos, including a rare collection of U.S. Department of Agriculture photos from 1937-1941 that covers almost the entire state. This collection is in constant demand and serves as a critical baseline for understanding changes to Wisconsin's landscape over the last 70 years. This presentation describes our efforts to develop a digital archive and interface for Web-based search and retrieval of these photos. In 2008, teams in the Department of Geography and University Library Digital Collections embarked on a three-year project funded through the Baldwin Endowment at UW-Madison to scan, catalog, and develop Web-based access for the collection. In the course of the project over 38,000 photos were scanned and processed. Metadata were collected for each photo to provide search and cataloging capabilities. We developed a Web interface based on the open source GeoMoose/OpenLayers application framework for display and distribution of the photos. This system includes a commercial tiled basemap, on which are superimposed necessary reference layers along with photo center points and footprints. We are in the process of testing this interface to evaluate the ease with which users can select, preview and download images. This presentation discusses some of the major steps in the development of the digital collection and interface.

**White, Jeremy** (University of Wisconsin-Madison)  
*Exploring HTML5 and the Canvas Element*

New features within HTML5 enable cartographers to create rich, interactive maps without the use of browser plug-ins such as Flash and Silverlight. The canvas element can now be utilized through a full set of JavaScript drawing functions, which facilitates the interactive design process. This presentation will highlight several benefits of HTML5 and the canvas element, along with some working examples of common cartographic tasks.

**Zaniewski, Kazimierz (Casey) J.** (University of Wisconsin-Oshkosh)  
*Cartes et Données: A Powerful Thematic Mapping Software*

Although major GIS software packages (ArcGIS, MapInfo) have some thematic mapping capabilities, there are several less well-known but equally, if not more, powerful mapping software programs designed for generating high quality thematic maps. One of them is Cartes et Données (C&D), a product of the French company Artique Informatique. This mapping software is capable of producing choropleth, proportional symbol, bar graph, several types of pie chart maps as well as cartograms, flow, vector, prism and 3-D surface maps. It also has a set of powerful statistical tools for producing regression and trend surface maps. The C&D tools for creating maps can be grouped into three categories: source tools for importing boundary (all major formats) and data (Excel and other tabular formats) files, operator tools for performing statistical and cartographic functions, and display tools for displaying thematic maps and graphs. The C&D cartographic output is of very high quality and can be exported to illustration software for final touches. A companion to C&D is Cartes et Données Num, an equally powerful boundary creation and processing software. This presentation highlights cartographic and statistical capabilities of C&D by examining recent demographic trends in the United States at the state and county levels. It also discusses the software's capabilities.

**7:00-8:15 AM**

**CARTOGRAPHIC PERSPECTIVES EDITORIAL BOARD MEETING**

**7:30 AM-5:00 PM**

**REGISTRATION**  
 REGISTRATION AREA

**8:30-10:00 AM**

**PAPER SESSION A**  
 ST. PETERSBURG I

## **New Mapping Technologies from Google**

CHAIR: Mano Marks

*New Mapping Technologies from Google* - Mano Marks, Google

**10:15-11:45 AM**

## **Opportunities in diversification**

CHAIR: Chris Anderson

*Why the Switch From Paper Topographic Maps to Digital Topographic Maps at This Time?* - John C. Phillips, Carlson Library

*Online boating and angling guide to Tampa Bay* - Chris Anderson, Florida Fish and Wildlife Conservation Commission

*Diverse Opportunities to Compile and Share Maps: Lessons Learned through the Esri User Conference Mapping Experience* - Aileen Buckley, Andrew Skinner, Alex Yule, Craig McCabe, Esri

**11:45 AM-1:15 PM**

**LUNCH**  
 ON YOUR OWN

**1:15-2:45 PM**

## **Rethinking bike maps panel**

MODERATOR: Dennis McClendon

*Rethinking the Urban Bike Map* - Nat Case, Hedberg Maps, Inc.

*Harriet Tubman was Here: Inter-institutional Collaboration and the Mapping of the Underground Railroad Bicycle Route* - Joy Santee, Utah Valley University

*Rethinking Bike There! 2010: Collaboratively Changing the Semantics and Semiotics of Portland Metro's Heritage Bike Map* - Matthew Hampton, Portland Metro

*New Jersey Bike Map approach to design* - Steve Spindler, Steve Spindler Cartography

**3:00-5:00 PM**

## **Quality control panel**

MODERATOR: Alex Tait

*Ensuring Quality Control on Maps of Foreign Areas*

Leo Dillon, Department of State's Office of the Geographer and Global Issues, U.S. Board on Geographic Names Foreign Names Committee

*Quality Control/Quality Assurance Plan For Millions of 2010 Census Maps* - Suzanne McArdle, US Census Bureau

*2010 Census Web-Based Control Systems for Map Production and Quality Control* - Meghan E. Smith, US Census Bureau

*Quality Control in a Custom Mapmaking Shop* - Scott Zillmer, XNR Productions

*High Volume, Short Deadlines and No Mistakes Allowed* - Mike Podolny, CIA Cartography Center

**6:00-9:00 PM**

**NACIS ANNUAL BANQUET**  
 GRAND BAY BALLROOM SOUTH

**KEYNOTE SPEAKER: Susan Cerulean**  
 Florida writer, naturalist and activist

**PAPER SESSION B**  
**ST. PETERSBURG II**

**Design**

CHAIR: Gordon Kennedy

*Map Practical: A Blog Where "Cartography Gets Done!"* - Kevin McManigal, University of Montana

*Beyond Balance and Contrast—a Look at the Other Principles of Graphic Design in Cartography* - George F. McCleary, Jr., University of Kansas

*Designing to Teach Design* - Jeff Howarth, Middlebury College

**Map communication: symbols and text**

CHAIR: Daniel Huffman

*A Web-Based Symbol Store for Sharing Map Symbolology* - Anthony Robinson, Pennsylvania State University

*The Pansemic Pushpin Problem* - Tim Wallace, University of Wisconsin-Madison

*Achieving Publication Quality Text Placement in a Batch Mapping Process* - Andrew G McIntire, US Census Bureau

**Terrain representation**

CHAIR: Aileen Buckley

*A New Technique for Depicting Terrain Relief* - Leland Brown

*Generalizing and Deforming Digital Terrain Models* - Bernhard Jenny, Helen Jenny ETH Zurich; Anna Leonowicz, University of Zurich

*Illuminating Terrain Using Sky Sampling Models* - Patrick J. Kennelly, Long Island University; James Stewart, Queens University

**Histories and cartographies**

CHAIR: Jörn Seemann

*Arabic Contributions to Cartography in The Middle Ages* - Naeema Al Hosani, United Arab Emirates University

*The Genesis of a Place Name: Jay, Maine: Are the Historians Wrong or is it Just a Big Coincidence?* - Mike Fournier, US Bureau of the Census

*George Washington's America: A Biography Through His Maps* - Barnett Schecter, Independent Historian

*Mapping the Moral Topography of the Civil War* - John Cloud, NOAA



**11:00 AM–1:30 PM**

**NACIS BOARD MEETING**  
**BAYBORO**

Newly elected Board Members are required to attend this Board Meeting.

**BANQUET ORDER OF EVENTS**

**6:00–9:00 PM**  
**Dinner & Cash Bar**

**STUDENT WEB MAPPING AWARDS**  
David Heyman, Axis Maps

**STUDENT POSTER AWARDS**  
Patrick Kennelly, Long Island University

**2011 ANNUAL MEETING**  
**TRAILER MADISON**  
Tim Wallace and Jeremy White

**LOOKING FORWARD**  
Tanya Buckingham

**KEYNOTE SPEAKER**  
Susan Cerulean

**6TH ANNUAL GEODWEEB**  
**GEOPARDY COMPETITION!**  
Host: Dennis McClendon



**Al Hosani, Naeema** (United Arab Emirates University)  
*Arabic Contributions to Cartography in the Middle Ages*

This paper describes Arabic contributions to the advancement of cartography throughout the Middle Ages. It discusses the factors that led the Arabs to study geography and write geographical texts, illustrating them with maps. It also considers the transmission of Arab cartography to the Western world and its influence. The research discussed here draws upon Arabic primary sources and other relevant literature. While the paper concerns Arab geographers of the Middle Ages in general, it focuses on one individual who had a great impact on the evolution of Arab cartography, the remarkable geographer, cartographer, scientist, and writer, Al-Idrisi. The paper also mentions Al-Idrisi's great collaboration with the European king, Roger II of Sicily, in 1154 A.D. to create the most accurate map of the world as then known, a map that served to illustrate his geography book (Book of Roger). It concludes by showing how the Arabs were innovators in geography, and cartography and points out their significant contributions.

**Anderson, Chris** (Florida Fish and Wildlife Conservation Commission)  
*Online Boating and Angling Guide to Tampa Bay*

In 1991, the Fish and Wildlife Conservation Commission's Fish and Wildlife Research Institute (FWRI) produced over 2.5 million Boating and Angling Guides (BAGs) for 26 areas around Florida. These guides provide a wealth of information that boaters and anglers use when engaged in water activities. FWRI regularly receives questions about the availability of BAGs on the Web. In 2009, at the request of the general public, FWRI produced the online Boating and Angling Guide to Tampa Bay. The goal for this Web site was to provide textual and graphical information on the printed BAGs in a format that can be easily viewed and updated when information, such as phone numbers, are changed. Additional enhancements were also added, including a detailed description of natural resources, a list of local paddling trails, up-to-date fishing regulations, and detailed and interactive maps. Response from the general public is extremely positive, and they have provided many ideas to make the product better. FWRI is enhancing the online BAG to Tampa Bay and has plans for creating similar Web sites for the Florida Keys, Duval County (Jacksonville), and Charlotte Harbor. This presentation will discuss the creation of the online BAG to Tampa Bay and the future on online BAGs around Florida.

**Brown, Leland**  
*A New Technique for Depicting Terrain Relief*

Relief shading based on hillslope is commonly used for visualization of topography from digital elevation models, especially in mountainous regions. But hill shading suffers two drawbacks: anisotropy, and an emphasis on local detail that makes overall elevation trends and major landforms harder to recognize. Techniques such as adaptive illumination, relief generalization, and resolution bumping exist to address these issues, and small-scale maps often add hypsometric tints to show elevation differences. A new algorithm for shading of terrain texture will be described, which simultaneously eliminates anisotropy and improves the clarity of features across a wide dynamic range, highlighting the drainage structure of the terrain. This is achieved using only grayscale shading, leaving the other color dimensions available for overlaying additional information such as vegetation or geologic features. The method also has a scale independence advantageous for multiresolution applications. The underlying mathematics relies on combining a fractional Laplacian operator with an interpolation kernel, both applied as Fourier multipliers. Sample results will be presented that illustrate benefits of the new texture shading.

**Buckley, Aileen, Andrew Skinner, Alex Yule, and Craig McCabe** (Esri)  
*Diverse Opportunities to Compile and Share Maps: Lessons Learned through the Esri User Conference Mapping Experience*

For this year's Esri International User Conference we offered to compile new maps for the pocket agendas that are distributed to all attendees. This quickly mushroomed into a project that included the compilation of a number of additional maps for a mix of media. Print maps included 3.5" by 6" page maps showing multiple floor levels of the three buildings used for the conference. We then created A size (8.5" by 11") versions of these, as well as maps at this size for two special events held during the conference. We also compiled a map of nearby restaurants offering discounts that was posted on the Web in PDF format so it could be downloaded and printed. We then began work on a Web map application that allowed users to find rooms and route between them. This was mashed up onto the world topographic map that is available on ArcGIS Online. The Web map application included scale ranges from ~1:18,000 to ~1:1,000, with interior building views at ~1:4,000, ~1:2,000 and ~1:1000 for each of the floor levels. Additionally, a 3D interior building model was created for the convention center, and an iPhone application for routing and room finding was developed in conjunction with our work. This rich set of maps in such diverse formats provided an excellent learning opportunity for us. In this presentation, we will share some of the lessons we learned about the data compilation, routing application development, Web map application creation, 3D building model construction, and more.

**Case, Nat** (Hedberg Maps, Inc.)  
*Rethinking the Urban Bike Map*

As urban bikeway systems become truly integrated networks, the nature of mapping for bicyclists is maturing too. Bike maps from earlier eras tended to be based on existing street map styles, but the relationship of biker to street is quite different from that of a motor vehicle driver. Hedberg Maps this year found itself in the midst of three different sorts of bike mapping projects, which brought home how differences in scale radically change the experiential meaning of maps. Several examples of design differences based on scale will be shown, as well as some ideas on making urban bike maps clearer and more relevant to bikers' experience on the pavement.



**Cerulean, Susan** (writer, naturalist, activist)  
*Banquet Plenary Address*

Creating a sense of place—whether through storytelling, map-making or the visual arts—is an essential part of developing a sustainable human presence on the planet. In north Florida and along the Gulf Coast, we have set about defining and “re-storying” our bioregions. Listen to the process one group of artists and writers undertook to celebrate and preserve their place on Earth.

**Cloud, John** (NOAA)  
*Mapping the Moral Topography of the Civil War*

In the 19th century the US Coast Survey, the oldest scientific agency in the federal government, evolved as an unusual hybrid agency composed of top leadership and associated Army and Navy officers attached to the Survey who came from the top echelon of American political society, along with recent European immigrants, especially polytechnically trained German scientists and artisans, who brought new skills and also new political sensibilities to federal service and to American society in general. These old and new constituencies in the Coast Survey grew closer in increasingly active response to the expansions of slavery in the decade before the Civil War. The Survey, a civilian agency, became a major instrument to fight for the abolition of slavery scientifically. In the late 1840s, the Survey began a major transformation in cartographic production processes in the anticipation that the new science of photography would transform all elements of cartography. They anticipated that photography would allow re-scaled photographic versions of engraved maps and charts to be transferred to the lithograph stone. But the graphic conventions for conveying topography via hachures and shaded relief were entirely different for intaglio printing and lithography. So the Survey spent a decade devising ways to transform European hachure conventions, which came out of military geography and ranked slopes graphically by slope angle class, to density shaded choropleth area classes for lithography. Then, on the eve of the Civil War, the Survey took their new system for conveying physical topography, and applied it to the novel application of mapping slave population densities in the counties of the slave- holding states, with data from the new 1860 Census. The Coast Survey's slavery maps created a sensation, as they effectively elided from physical topography to moral and political topography. The Survey's slavery maps were both a key weapon in the nascent war, and landmarks in the evolution of statistical cartography.

**Dillon, Leo** (Department of State's Office of the Geographer and Global Issues, U.S. Board on Geographic Names Foreign Names Committee)

*Ensuring Quality Control on Maps of Foreign Areas Presents its Own Challenges*

This presentation will demonstrate how acquiring and applying standard cartographic data of foreign areas, particularly of place names and boundaries, is often complicated by conflicting source material, differing contexts, and disputed ideologies.

**Fournier, Mike** (US Bureau of the Census)  
*The Genesis of a Place Name: Jay, Maine; Are the Historians Wrong or is it Just a Big Coincidence?*

In 1912 the Rev. Benjamin Lawrence wrote the history of Jay, Maine. He stated that when Phipps Canada, Massachusetts, District of Maine incorporated on February 26, 1795 it took the name Jay to honor John Jay. Jay was the United States' first Chief Supreme Court Justice who, in November 1794, successfully negotiated the Treaty of London (also known as the Jay Treaty). Cartographers and surveyors tell a different story however. In a map produced around 1720 for the Pejepscot Proprietors (a land speculation company), at the point in the Androscoggin River where its flow turns from west-east to north-south in the present town of Jay, the point of land at the bend is labeled Jay Point. Other contemporaneous documentation and oral history indicates that this area obtained the name “Jay” long before the birth of John Jay. This presentation will examine the evidence available which appears to refute Rev. Lawrence's assertion as to the origins of the name. It will also make the argument that without an examination of relevant maps, errors can and will be made in interpreting historical events.

**Hampton, Matthew** (Portland Metro)  
*Rethinking Bike There! 2010: Collaboratively Changing the Semantics and Semiotics of Portland Metro's Heritage Bike Map*

Metro's 8th edition Bike There! map has recently come off the press. Learn how focus groups, inter-governmental cooperation and co-development informed a full redesign of this regional product. Covering over 1 million acres, this map includes data from 2 states, 5 counties and 30 cities with larger-scale inset maps of critical areas. The new design strips away complex coding and delivers an informative cartography targeted to increase bike use, safety, and discovery of the region. Matthew will show the historical development of Bike There! while exploring how the changes are meant to increase the visual communication of suitable route selection.

**Howarth, Jeff** (Middlebury College)  
*Designing to Teach Design*

A student does not learn cartographic design by understanding the elements of cartography so much as by understanding the interactions between these elements. This makes cartographic design an important framework for teaching cartography. This paper discusses two ways that a design framework may influence the organization of learning materials for cartography. First, it calls for a strategy to define the scope and sequence of design problems that facilitate acquisition of cartographic design concepts. This questions the traditional use of map taxonomy to sequence learning materials and encourages the development of an integrated concept- and task-based framework.

Second, it calls for learning materials that eliminate split attention and redundancy effects in student learning. The taxonomic organization of many textbooks impedes their integration with design problems in the lab. A pattern language adapted for cartography offers one possible model for a text reference that may support the non-linear and generative qualities of cartographic design.

**Jenny, Bernhard, Helen Jenny, and Anna Leonowicz** (ETH Zurich, University of Zurich)  
*Generalizing and Deforming Digital Terrain Models*

Digital terrain models are the basis for topographic 2D and 3D maps; yet, tools for their interactive generalization and editing offer limited cartographic functionality. This paper describes four specialized software applications for manipulating elevation models. Terrain Bender (1) was designed to apply progressive bending to digital terrain models for 3D cartography. It offers interactive tools to add a bent base to digital terrain models, thus allowing the cartographer to show the landscape using a varying viewing angle from steep in the foreground to flat in the background. Terrain Bender II (2) adds new interactive tools for locally warping, enlarging or shrinking terrain features, manipulation techniques inspired by panorama painters like H. Berann. Terrain Sculptor (3) and Terrain Equalizer (4) are two new applications for generalizing terrain models. Terrain Sculptor prepares generalized terrain models for relief shading. It uses a generalization methodology based on a succession of raster operations, where curvature coefficients detect and accentuate important relief features. Terrain Equalizer attenuates or enhances terrain features based on their spatial frequency and internally uses band-pass pyramids that encode terrain features for a specific frequency range. The presented applications offer graphical user interfaces with interactive previews, are open-source and are freely available for download.

**Kennelly, Patrick J.** (Long Island University)  
*Illuminating Terrain Using Sky Sampling Models*

Numerous geographic information systems allow for applying shading to terrain by use of a point source illumination, one of the simplest sky models. Although users can specify orientation of the illuminating vector, using the same sky model for all shaded terrain maps is an artificial and unnecessary constraint. We have developed an application which allows the users to select from the gamut of existing sky models. The application then efficiently samples the chosen sky to determine the number, orientation and weights of discrete point sources required to approximate the illumination provided by such a sky. We show examples of this application and note specific enhancements to the mapped terrain when compared to point source illumination, including softer shadows and higher-contrast shading.

**Marks, Mano** (Google)  
*New Mapping Technologies from Google*

The explosion of geographic content on the Web over the last 5 years has been truly breathtaking. The ease of creating maps and putting them on Websites has given the power of mapping to a wide range of people. Professional developers, GIS professionals, and average citizens alike have mapped their homes, their communities, and the world. This in turn has driven a new openness on the behalf of governments and industry to publish their data in formats that are usable, mappable and accessible. Recently, Google has updated Google Earth, the Maps API, Map Maker and released Fusion Tables, all in an effort to it easier for people to publish data and easily visualize it on a map. This session will discuss these new technologies and how you can use them in your geographic data publishing.

**McCleary, George** (University of Kansas)  
*Beyond Balance and Contrast--a Look at the Other Principles of Graphic Design in Cartography*

Textbooks for cartography have mainly limited their approach to map composition to two principles of graphic design: balance and contrast. These two, along with visual acuity and hierarchical organization, have provided the bases for map composition. While other graphic design principles receive a cursory explication, there are even more design principles to be explored in the graphic arts literature. Increasingly integrating perceptual and cognitive psychology, graphic designers have developed a hierarchical structure for their principles of design. The list begins with unity – "perhaps as close to a "rule" as art approaches" (Lauer, 1979). Working with constraints (e. g., modularity) and, sometimes, enlisting randomness (Lupton and Phillips, 2008), scholar-designers have provided principles for organizing elements (dot, line, shape, tone, color, etc.) into logos, banners, posters, and more. As graphic design has evolved over centuries (in many forms and expressions), the design of maps has been less innovative, less susceptible to the fads and fancies of a particular period (such as Dada, De Stijl, or the Bauhaus – except for the New Typography). If cartographers were more open to innovation, the use (a discovery) of a little known principle of design might yield the creation of an "interesting," "innovative," and even "bizarre" map."

**McIntire, Andrew** (US Census Bureau)  
*Achieving Publication Quality Text Placement in a Batch Mapping Process*

Following the 2010 Census the Census Bureau will produce numerous publication map series to support census data dissemination. Our customers for these maps include members of Congress; Tribal, State, and local government officials; and the general public. An accurate and polished visualization of complex geographic area boundaries and features is a primary goal. Carefully placed text labels, for these boundaries and features, is a key component to achieving the goal. Achieving cartographically good text placement in a totally automated system is a considerable challenge. This presentation discusses how the Census Bureau meets this challenge with an automated text placement software system. Using this parameter driven system consisting of 85 text placement rules along

with basic font characteristics, it is as much an art as it is a science to find just the right combination of rules and attributes to render the desired outcome. I'll describe the system and our process for a text placement design. And I'll illustrate the power of the delicate relationships and interaction of the parameters and rules on the final output display.

**McArdle, Suzanne** (US Census Bureau)

*Quality Control/Quality Assurance Plan For Millions of 2010 Census Maps*

Our mission was to create over sixteen million unique maps for use by a temporary workforce of field enumerators with varying degrees of map use skills to support the 2010 Census data collection operations. Map quality, defined as adequate scale to visualize critical content as well as quality text placement for accurate feature identification and orientation was vital to the success of the operations. Given the production schedule was a mere ten weeks duration, it was clear that there would not be time for much rework. This presentation discusses the four-step quality assurance (QA) and quality control (QC) plan that was implemented for this totally automated map production. The four-step process, consisting of integrated system QA; pre-production QC; independent QC; and output review, was a key factor contributing to our very high success rate.

**McManigal, Kevin** (University of Montana)

*Map Practical: A blog where "Cartography Gets Done!"*

Are you a cartographer or studying to be one? How many tricks have you found that slipped your memory and had to be re-learned? How many hours have you spent on Google looking for that long lost tutorial? Thinking back on my first mapping class, there were so many things that I figured out by trial and error, blindly groping for the right keywords in "Help." There has to be a better way! So, here I am teaching cartography now and thought, "What if all those tips could be in one convenient place?" Well here it is, Map Practical! This will be an ongoing process; a tip a week, a link here, a comment there, and a video tutorial when I find the time. After a semester or two it should be a good resource. Please contribute, and it will only get better.

**Phillips, John C.** (Carlson Library)

*Why the Switch from Paper Topographic Maps to Digital Topographic Maps at This Time?*

USGS topographic mapping began in 1884 and after 126 years and millions of maps printed, topographic mapping is still a very large part of USGS activity. However, a lot has changed since the 1880s. On average, it took 4-5 years to produce one of the USGS 7.5-minute, 1:24,000-scale quadrangle maps by traditional method. This paper considers three plausible reasons for the shift from paper maps to digital ones. Those reasons are the evolution of the changing technology with emphasis on GIS to collect, manage, and express cartographic information; the move from collecting information for maps directly to partnering with states, local governments, and the private sector to provide data for maps and to improve the layers of The National Map; and the downsizing of the USGS workforce through retirements, attrition, and the closings of its National Geospatial Technical Operations Center in Menlo Park, California and Reston, Virginia. Computer-assisted mapping techniques have revolutionized map production and, with digital imaging, provided greater access to and potential use of topographic maps. Since October 2009, the USGS Store has made digital topographic maps available on the Internet through The National Map for free download. Paper copies of topographic maps will no longer be produced.

**Podolny, Mike** (CIA Cartography Center)

*High Volume, Short Deadlines and No Mistakes Allowed*

The Central Intelligence Agency is charged with providing policymakers and military commanders the clearest possible understanding of the security challenges and opportunities facing our nation. The production environment in the Cartography Center is: high volume, short deadlines and no mistakes. Waiting until the end of the process to detect problems is not an option. In order to achieve success, we have to instill quality at every turn -- practicing quality assurance in addition to quality control.

**Robinson, Anthony C., Scott Pezanowski, Frank Hardisty, Robert E. Roth, Justine**

**Blanford, Alan M. MacEachren** (GeoVISTA Center, Department of Geography, The Pennsylvania State University)

*A Web-Based Symbol Store for Sharing Map Symbolology*

Within a large geo-enabled organization, a wide range of map symbols may be in use at any given time. While current tools like ArcGIS allow users to share pre-defined symbol sets using .style files, there remains a need for flexible, visually-enabled tools to support browsing, sharing, and downloading symbols. Our recent experiences working with mapmakers at the U.S. Department of Homeland Security (DHS) has revealed that while many sub-divisions of the agency have dedicated .style files that define custom symbol sets, there is no easy-to-use mechanism for mapmakers to see which symbols are in use in other divisions or to easily share symbols across divisions. We have recently begun tackling this problem through the design and development of a Web-based Symbol Store. This talk presents our progress toward the goal of creating a usable and useful tool for contributing, browsing, and assembling customized symbol palettes to support mapmakers at DHS.

**Santee, Joy** (Utah Valley University)

*Harriet Tubman was Here: Inter-institutional Collaboration and the Mapping of the Underground Railroad Bicycle Route*

This presentation examines the recent collaboration between the Adventure Cycling Association and the Center for Minority Health and the resulting maps of the Underground Railroad Bicycle Route to determine ways that interdisciplinary scholarship on collaborative writing can inform collaborative mapping projects where at least one

institutional partner has limited experience with map making. Using an interdisciplinary collaborative writing taxonomy developed by Lowry, Curtis, and Lowry, this presentation argues that the way map makers educate their collaborators about the map making process early in the partnership can have positive impact on the project's success. However, communication from the collaborators about what kinds of maps they need is also essential and can change the map making process in unexpected yet effective ways. For this particular collaboration, Adventure Cycling, which normally creates long-distance cycling maps, developed a new type of localized map in response to the Center for Minority Health's request for shorter routes that would appeal to new cyclists, particularly new minority cyclists. This localized map was a result of negotiations in the collaborative process, which can be addressed through current collaborative writing scholarship. Differences between the map types, communication technologies, and document production and publication issues will also be addressed.

**Schechter, Barnet** (Independent Historian)

*George Washington's America: A Biography Through His Maps*

George Washington's America: A Biography Through His Maps, to be published by Walker and Company in October 2010. This is a new hybrid of large-format map book and narrative history (304 pages measuring 10" x 13"), a unique biography of Washington taking as its starting point the maps he used throughout his life. From his teens until his death, the maps George Washington drew and purchased were always central to his work. After his death, many of the most important maps he had acquired were bound into an atlas, which remained in his family for almost a century before it was sold and eventually ended up at Yale University's Sterling Library. Together, the maps and narrative place the reader at the scenes of his early career as a surveyor, his dramatic exploits in the French and Indian War (his altercation with the French is credited as the war's spark), his struggles throughout the American Revolution as he outmaneuvered the far more powerful British army, his diplomacy as president, and his shaping of the new republic. Illustrated with eighteen of the full atlas maps, some two hundred detail views from those maps, and numerous additional maps (some drawn by Washington himself), George Washington's America allows readers to visualize history through Washington's eyes, and sheds fresh light on the man and his times.

**Smith, Meghan E.** (US Census Bureau)

*2010 Census Web-Based Control Systems for Map Production and Quality Control*

Keeping track of an operation that produces over sixteen million unique maps in less than two months can be a considerable challenge. This presentation describes the Web-based control systems that the Census Bureau built to manage source data availability, control the map universe, execute Census internal mapping applications, track production, manage workload balancing, and produce reports to produce millions of maps that supported the field data collection operations for the 2010 Census. These control systems guided fully automated map creation processes, resolution of production problems, and map printing. Automated quality control and pre- and post-production quality checks were also managed by Web-based systems. Quality control systems were engineered to automatically communicate directly with each other to expedite the accurate flow of critical control data. The Web-based format of the control systems allowed decentralized offices to participate in quality control processes and communicate with headquarters. This presentation will discuss the Web-based control systems and how they interact to track and control map production from conception to print.

**Spindler, Steve** (Steve Spindler Cartography)

*New Jersey Bike Map approach to design*

The New Jersey Department of Transportation, like several State DOTs, plans to provide bicyclists with a statewide bicycle map. This presentation will provide an overview of state bike maps, what they are trying to accomplish, and their limitations. Steve will talk about creating a map that fits on a printed page, provides cyclists with useful information for planning a trip and navigating, shows all streets, deals and doesn't overwhelm the user with information and minuscule text.

**Wallace, Tim** (University of Wisconsin-Madison)

*The Pansemic Pushpin Problem*

Recent years have witnessed a surge in Web-based cartography new tools and devices have made it increasingly easy to make maps from anywhere at any time. But while these tools have opened up cartography to new authors, the palette made available to them has remained narrow and deficient. Color choices, line weights, fonts and point symbols are often limited, if not fixed. This can make reading these maps problematic. If the semiotic vocabulary used in a map is misplaced, the map itself can have misplaced meaning or impact. The use of pushpins as point symbols that represent anything and everything that can be mapped is perhaps the most common culprit in such maps. The pushpin as a point symbol is neither associative (unless indicating locations of pushpin maps) nor iconic (unless mapping locations of pushpin distributors). Yet despite being inappropriate for most maps, the pushpin continues to be the one of the most ubiquitous point symbols on the Web. This paper will trace the history of the pushpin from restaurant wall map to Google mashup and attempt to reveal how it has become accepted as a pansemic point symbol for the Geoweb.

**Zillmer, Scott** (XNR Productions)

*Quality Control in a Custom Mapmaking Shop*

Maintaining consistent quality and accuracy in maps produced for a wide variety of clients and publications can become a complex challenge. This presentation will highlight some specific quality control issues encountered by a custom cartography firm, and an overview of the processes and methods we use to address them.

## THE COMMUNITY BASEMAP WORKSHOP – ESRI

8:30 AM - 5:00 PM

The Community Basemap was compiled by Esri as an online multi-scale basemap that users could overlay with their own operational data to create maps specific to various themes of interest. It also provides a wider geographic context as users can zoom in from the global scale to the local. The basemap was compiled for the global extent at thirteen scales from ~1:591,000,000 to ~1:144,000. In the U.S. and Canada, the map was compiled at an additional three scales down to ~1:18,000. In areas where data is provided from local sources, such as Washington, D.C., New York, Yosemite National Park and San Francisco, the map is compiled at four additional scales down to ~1:1,000.

Hosted by Esri on ArcGIS.com, the Community Basemap provides a unified framework that users can contribute their mapped data to (whether it be a site, a city, a county, a state, or another extent), thereby providing users with the best, most authoritative, and most up-to-date map in one online user experience. The Community Map Program helps participants broadcast and showcase their own data and users learn which authorities provide certain types of data for various regions. Come join us on Saturday, October 16th for a one day, hands-on workshop to learn how you can add your data to this map or how to compile a similar multi-scale online map. In The Community Basemap Workshop, you will work with three members of Esri's Mapping Center Team to learn more about:

- the Community Map program,
- the design and production of the Community Basemap,
- map templates and how they are used to more quickly and easily create this and other maps,
- many of the ArcMap techniques used to compile online, multi-scale maps, and
- how to publish your maps using ArcGIS Server.

This workshop is ideal if you are interested in Esri's Community Map program and/or if you want to learn more about creating and serving online, multi-scale maps using ArcGIS.

### FIELD TRIP

6:30 AM - 5:00 PM

#### SWIM WITH MANATEE

Come swim with the State Mammal the Florida Manatee, no need to bring your own equipment, it is included in your registration.

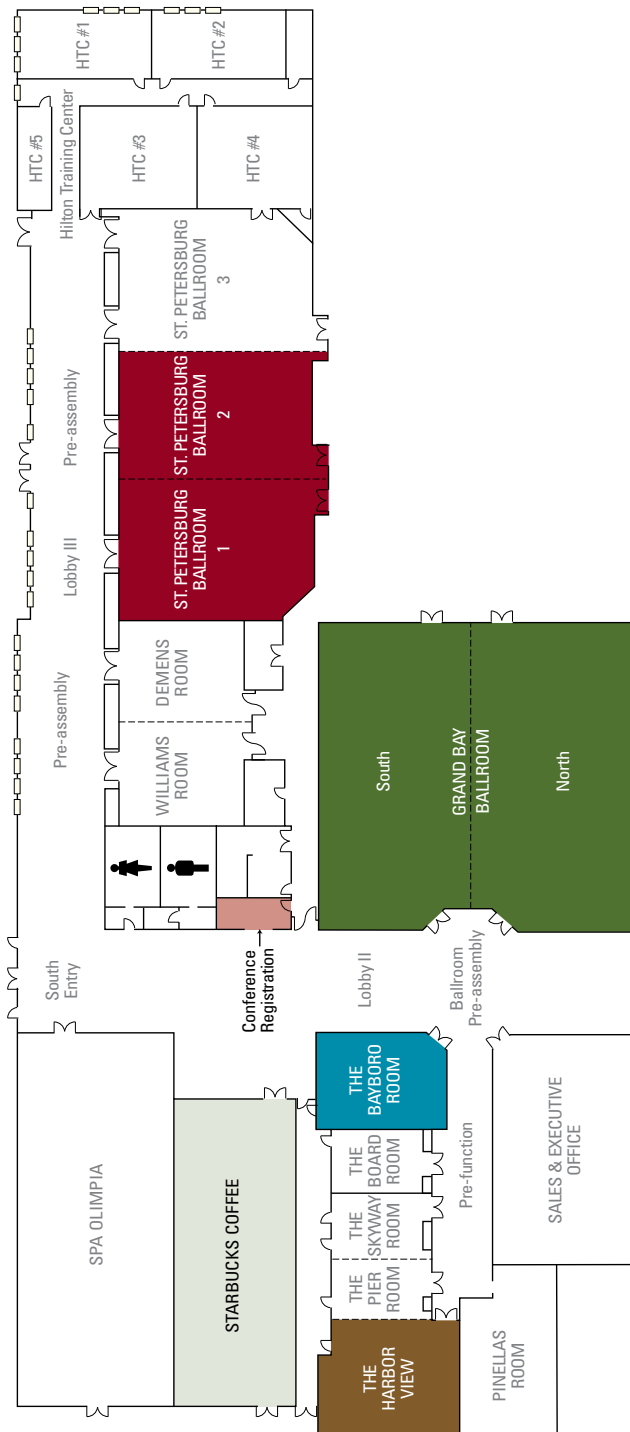
### FIELD TRIP

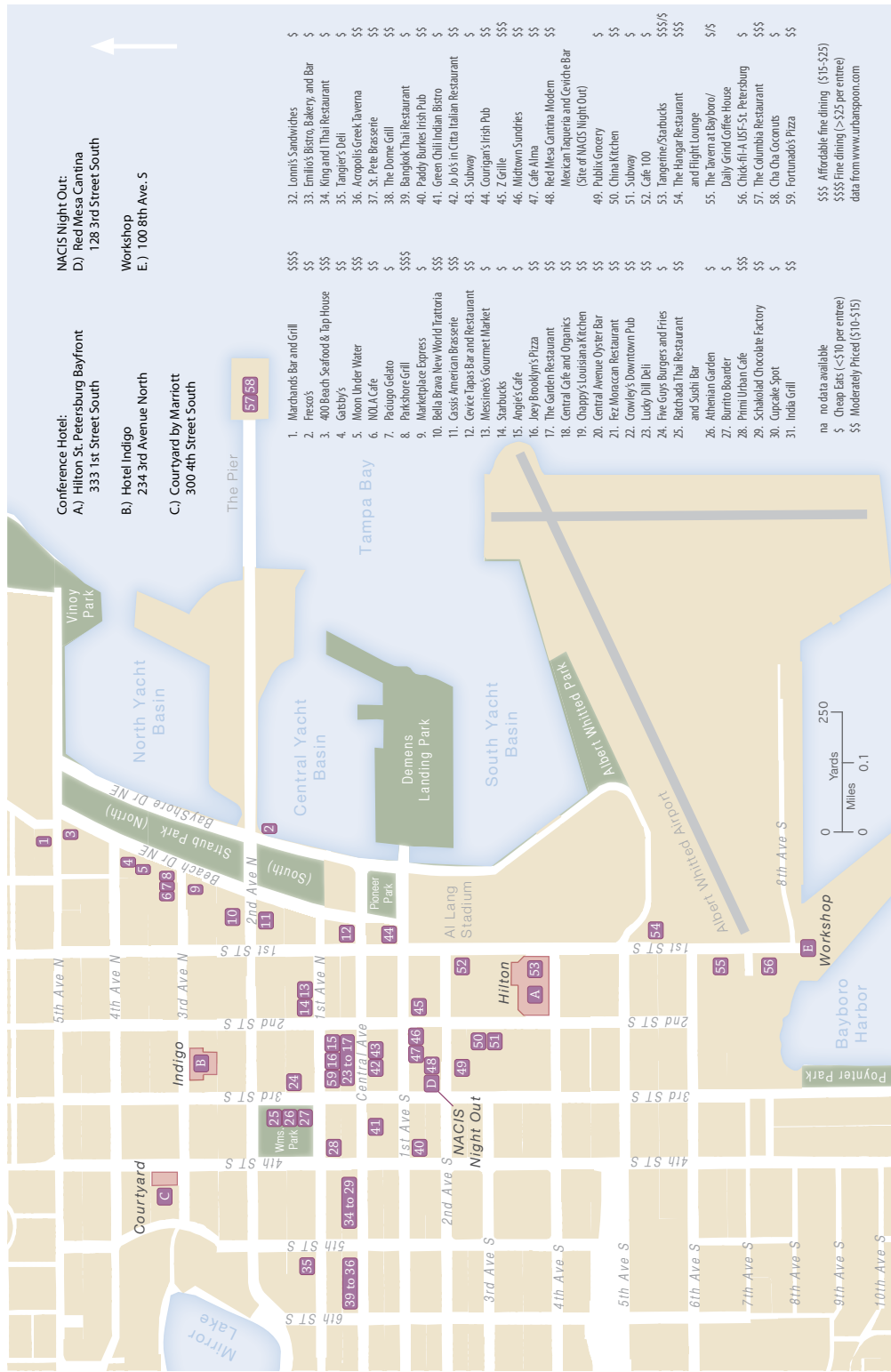
8:30 AM - 3:30 PM

#### TOUR OF HISTORIC YBOR CITY

Visit the morning market, enjoy a walking tour, and explore Florida's Latin Quarter.







1. Marchands Bar and Grill \$\$\$\$
2. Fesox's \$\$\$
3. 400 Beach Seafood & Tap House \$\$\$
4. Gatsby's \$\$\$
5. Moon Under Water \$\$\$
6. NOLA Cafe \$\$\$
7. Pougo Gelato \$\$\$
8. Parkshore Grill \$\$\$
9. Marketplace Express \$\$\$
10. Bella Brava New World Trattoria \$\$\$
11. Cassis American Brasserie \$\$\$
12. George Figas Bar and Restaurant \$\$\$
13. Mesinero's Gourmet Market \$\$\$
14. Starbucks \$\$\$
15. Angie's Cafe \$\$\$
16. Joey Brooklyn's Pizza \$\$\$
17. The Garden Restaurant \$\$\$
18. Central Cafe and Organics \$\$\$
19. Chappy's Louisiana Kitchen \$\$\$
20. Central Avenue Oyster Bar \$\$\$
21. Fes Moroccan Restaurant \$\$\$
22. Crowley's Downtown Pub \$\$\$
23. Lucy Dill Deli \$\$\$
24. Five Guys Burgers and Fries \$\$\$
25. Radhada Thai Restaurant \$\$\$
26. Athenian Garden \$\$\$
27. Burrito Boulder \$\$\$
28. Primi Urban Cafe \$\$\$
29. Schokolad Chocolate Factory \$\$\$
30. Cupcake Spot \$\$\$
31. India Grill \$\$\$
32. Lomita Sandwiches \$\$\$
33. Emilio's Bistro, Bakery, and Bar \$\$\$
34. King and Thai Restaurant \$\$\$
35. Targier's Deli \$\$\$
36. Acropolis Greek Taverna \$\$\$
37. St. Pete Brasserie \$\$\$
38. The Dome Grill \$\$\$
39. Bangkok Thai Restaurant \$\$\$
40. Paddy Burke's Irish Pub \$\$\$
41. Green Chili Indian Bistro \$\$\$
42. Jo Jo's in Citta Italian Restaurant \$\$\$
43. Subway \$\$\$
44. Courtyard's Irish Pub \$\$\$
45. Z Grille \$\$\$
46. Midtown Sundries \$\$\$
47. Cafe Alma \$\$\$
48. Red Mesa Cantina Modern Mexican Taqueria and Gewiche Bar (Site of NACIS Night Out) \$\$\$
49. Public Grocery \$\$\$
50. China Kitchen \$\$\$
51. Subway \$\$\$
52. Cafe 100 \$\$\$
53. Tangerine/Starbucks \$\$\$/\$
54. The Hangar Restaurant and Flight Lounge \$\$\$
55. The Taverna at Barbora/Daily Grind Coffee House \$\$\$
56. Chick-fil-A USF-St. Petersburg \$\$\$
57. The Columbia Restaurant \$\$\$
58. Cha Cha Crocous \$\$\$
59. Fortunado's Pizza \$\$\$

na no data available  
 \$ Cheap Eats (<\$10 per entree)  
 \$\$\$ Moderately Priced (\$10-\$15)  
 \$\$\$\$ Affordable fine dining (\$15-\$25)  
 \$\$\$\$\$ Fine dining (>\$25 per entree)  
 data from www.urbanangpon.com

# *of participants*

- |                                  |                                 |                                       |
|----------------------------------|---------------------------------|---------------------------------------|
| Akella, Mamata 6, 7, 8           | Huffman, Daniel 15              | Podolny, Mike 14, 19                  |
| Al Hosani, Naeema 15, 16         | Hutchinson, John 6, 10          | Robar, Terri J. 7                     |
| Allen, Neil 2                    | Im, Wansoo 7, 10                | Robinson, Anthony C. 15, 19           |
| Anderson, Chris 6, 8, 14, 16     | James, Lanell 7, 10             | Roth, Robert E. 19                    |
| Andrew, Paige 7, 8               | Jenny, Bernhard 2, 15, 18       | Rounds, Jim 7, 9                      |
| Asbury, David 6                  | Jenny, Helen 15, 18             | Saligoe-Simmel, Jill 2, 4             |
| Badurek, Christopher A. 7, 8     | Johnson, Andrew 7, 10           | Sanderson, Eric 2, 4                  |
| Blanford, Justine 19             | Johnson, Matthew 7, 11          | Santee, Joy 14, 19                    |
| Bricknell, Michael 7, 13, 23     | Kennedy, Gordon 15              | Schechter, Barnet 15, 20              |
| Brown, Leland 15, 16             | Kennelly, Patrick J. 7, 15, 18  | Schroeder, Jonathan 7, 12             |
| Buckingham, Tanya 7, 15          | Kessler, Fritz 7, 11            | Seemann, Jörn 7, 12, 15               |
| Buckley, Aileen 6, 8, 14, 15, 16 | Lambert, David 7, 11            | Skinner, Andrew 14, 16                |
| Case, Nat 2, 4, 14, 16           | Leonowicz, Anna 15, 18          | Smith, Meghan E. 14, 20               |
| Cerulean, Susan 14, 17           | MacEachren, Alan M. 19          | Spindler, Steve 14, 20                |
| Cloud, John 15, 17               | Marks, Mano 14, 18              | Stallmann, Tim 7, 13                  |
| Dahl, Mattye 7, 9                | Mason, Ginny 6, 11              | Stoltenberg, Jaime 7, 13              |
| Dalton, Craig 7, 13              | McArdle, Suzanne 14, 18         | Strebe, daan 2, 5                     |
| Dillon, Leo 14, 17               | McAuliffe, Carol P. 7, 11       | Tait, Alex 2, 5, 14                   |
| Dooley, Mathew A. 7, 9           | McCabe, Craig 14, 16            | Tyner, Judith A. 7, 13                |
| DuVander, Adam 6, 9              | McCleary, Jr., George F. 15, 18 | Tyson, Steve 2, 5                     |
| Fish, Carolyn 6                  | McClendon, Dennis 14, 15        | van der Maarel, Hans 2, 5, 7          |
| Florence, Ted 7, 9               | McIntire, Andrew 15, 18         | Veregin, Howard 7, 13                 |
| Fournier, Mike 15, 17            | McManigal, Kevin 11, 15         | Wallace, Tim 15 (2), 20               |
| Fraser, Joe 6, 9                 | Milyko, Jenn 7                  | White, Jeremy 6, 13, 15               |
| Fyfield, Paul 7, 9               | Muehlenhaus, Ian 7, 9           | Woodruff, Andy 2, 5                   |
| Gamache, Martin 2, 4             | Novaes, André Reyes 7, 12       | Wortley, AJ 7, 13                     |
| Haft, Adele J. 7, 10             | Parrish, Abraham Kaleo 7, 12    | Yarnall, Kaitlin 2, 5                 |
| Hampton, Matthew 14, 17          | Patterson, Tom 2, 4             | Yule, Alex 14, 16                     |
| Hanchett, Chelsea 2, 4           | Pearce, Margaret 2              | Zach Johnson 2, 5                     |
| Hardisty, Frank 19               | Pepple, Sam 2, 4                | Zaniewski, Kazimierz (Casey) J. 6, 13 |
| Heyman, David 15                 | Pezanowski, Scott 19            | Zillmer, Scott 14, 20                 |
| Howarth, Jeff 15, 17             | Phillips, John C. 14, 19        |                                       |