

A detailed topographic map of the Grand Canyon region, showing the intricate, branching patterns of the canyon walls and the surrounding plateau. The map uses a color gradient from light tan to dark brown to represent elevation, with the deepest parts of the canyon shown in the darkest brown. The text is overlaid on the lower portion of the map.

# **Mapping Grand Canyon Conference**

**February 28 – March 1, 2019**

**Arizona State University | Tempe, AZ**

# Table of Contents

## Welcome

A Note from the Conference Director .....	4
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## Schedule

Thursday, February 28 .....	5
Friday, March 1 .....	6

## Panel Information

Opening Remarks   Day 1 .....	7
Introduction   Mapping Grand Canyon — Over 150 Years of Cartographic Change   Part 1 .....	8
Keynote   Mapping Grand Canyon National Park.....	9
Legislating the Boundaries: Redrawing the Map in 1925.....	10
Creation of the Matthes-Evans Topographic Map of the Grand Canyon.....	11
How Washburn Mapped the “Heart of the Grand Canyon”.....	12
Footprints on the Sands of Time: Retracing Harvey Butchart’s Exploration of the Grand Canyon through His Annotated Matthes-Evans Maps.....	13
Geologic Mapping of Grand Canyon, 150 Years and Counting.....	14
Tracing the History of Native American Communities in Relation to the Grand Canyon .....	15
John Wesley Powell and Crew’s 1869 Grand Canyon River Mapping: What Did They Know and When Did They Know It?.....	16
Grand Canyon Student Map Competition Award Ceremony.....	17
Day One Closing Remarks .....	18
Opening Remarks   Day 2 .....	19
Introduction   Mapping Grand Canyon — Over 150 Years of Cartographic Change   Part 2 .....	20
Keynote   Cartoon Maps of Canyonland .....	21
The 1923 Birdseye Expedition: First Maps of the Colorado River Through Grand Canyon.....	22
Mapping the Colorado River Corridor in Grand Canyon for Ecosystem Monitoring .....	23
Celebrating with Archives: Building “100 Years of Grand” .....	24
Mapping Death in Grand Canyon.....	25
Place-Based Teaching and Learning at Grand Canyon: In-Person and Virtual .....	26
Mapping Grand Canyon for Conservation.....	27
Conference Closing Remarks.....	28

# Table of Contents

## Presenters

Paul Hirt, PhD.....	29
Matthew Toro.....	30
Tom Patterson .....	30
Ed Oetting.....	31
Jonathan Upchurch, PhD.....	31
Michael Fry .....	32
Peter Runge .....	32
Karl E Karlstrom, PhD.....	33
Dori Griffin, PhD .....	33
Theresa Avila, PhD .....	34
Mark Manone.....	35
Kenneth Field, PhD.....	35
Richard David Quartaroli .....	36
Matt Kaplinski .....	36
Nikolas Smilovsky, PhD .....	37
Steven Semken, PhD .....	37
Stephanie Smith.....	38
Rob Spindler .....	38

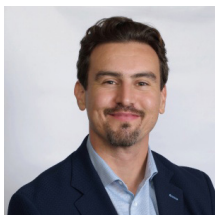
## Competition Judges

Dori Griffin, PhD .....	39
Barbara Trapido-Lurie.....	39
Ellen Murray Meissinger.....	40
Karina Wilhelm .....	40
Jill Sherwood.....	41
Shea Lemar .....	41
Stephanie Deitrick, PhD.....	42

## Sponsors

Kaibab Plateau partners.....	43
Granite Gorge partners.....	43
Colorado River partners.....	43
ASU partners.....	44

# Welcome



Welcome! After much planning and preparation, we've arrived at the historic, unprecedented Mapping Grand Canyon Conference!

The initial justification for convening such a conference is an historical one. We're marking the convergence of two milestones on the Grand Canyon timeline: the centennial (1919-2019) of the legislation that led to portions of the region gaining protection as a US national park, and the lesser-known sesquicentennial (1869-2019) of John Wesley Powell's famous first expedition and mapping survey through the canyons carved by the Colorado River, including, of course, what became known as the Grand Canyon.

But this meeting isn't solely about history, at least not in any strict sense. Most fundamentally, we are gathered to discuss cartography, that quintessentially human act of mapping and making sense of geography. Moreover, we've significantly narrowed our focus by clearly defining the geography in question. This is a conference about the history of mapping the Grand Canyon region of northern Arizona.

One might think that an event with such a specialized, strictly defined scope would be of interest only to an equally esoteric audience. Not in this case, though — not when the focus is on maps, those tools that so captivantly inform our conceptualizations of geographic space. And certainly not when that space is Arizona's Grand Canyon — nothing short of a global landscape icon. The Mapping Grand Canyon Conference is for everybody.

Through the generous support of our ASU and community partners we're proud to be hosting this event openly to the public and entirely free of charge. Additionally, through the diligent work of our organizers to reduce the event's ecological footprint, we're especially proud to have gained gold-level status as an ASU certified sustainable event.

We've assembled an impressive and truly transdisciplinary lineup of presenters to explore all facets of Grand Canyon mapmaking and geographic knowledge production. We've also organized a Grand Canyon student map competition to inspire the next generation of mapmakers to continue standing on the proverbial cartographic shoulders of giants.

I personally thank all of you for participating in this historic celebration of the history, art, science, and practice of Grand Canyon cartography. Enjoy the maps!

Matthew Toro  
Conference Director



## Thursday, February 28

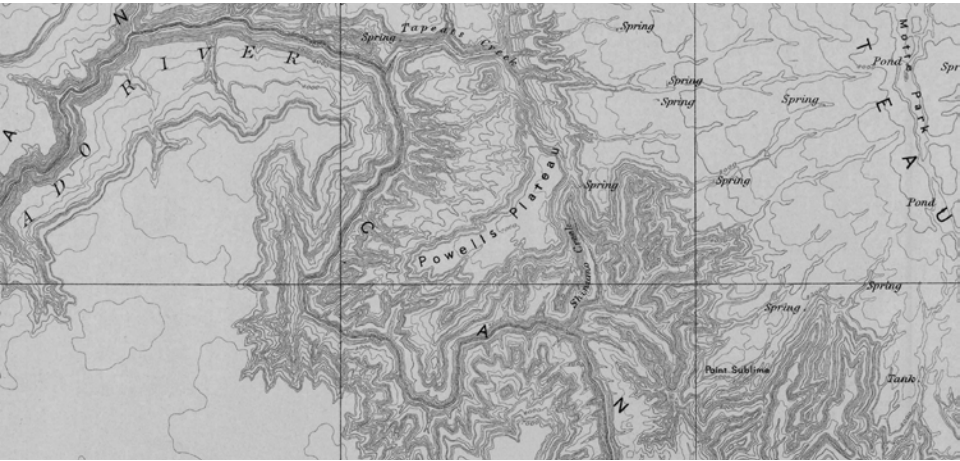
Time	Panel
8:00	Morning Reception   Demos, Exhibits, Activities   Info Booths
9:00	<b>Opening Remarks</b>
9:15	<b>Introduction   Mapping Grand Canyon   Part 1</b>
9:30	<b>Keynote   Mapping Grand Canyon National Park</b>
9:45	
10:00	
10:15	
10:30	Morning Break   Demos, Exhibits, Activities   Info Booths
10:45	<b>Legislating the Boundaries: Redrawing the Map in 1925</b>
11:00	
11:15	<b>Creation of the Matthes-Evans Topographic Map of the Grand Canyon</b>
11:30	
11:45	<b>How Washburn Mapped the “Heart of the Grand Canyon”</b>
12:00	
12:15	Lunch Break   Demos, Exhibits, Activities   Info Booths
1:45	<b>Footprints on the Sands of Time: Retracing Harvey Butchart’s Exploration of the Grand Canyon through His Annotated Matthes-Evans Maps</b>
2:00	
2:15	<b>Geologic Mapping of Grand Canyon, 150 Years and Counting</b>
2:30	
2:45	Afternoon Break   Demos, Exhibits, Activities   Info Booths
3:00	
3:15	<b>Tracing the History of Native American Communities in Relation to the Grand Canyon</b>
3:30	
3:45	<b>John Wesley Powell and Crew’s 1869 Grand Canyon River Mapping: What Did They Know and When Did They Know It?</b>
4:00	
4:15	<b>Grand Canyon Student Map Competition Award Ceremony</b>
4:30	<b>Day One Closing Remarks</b>
4:45	Demos, Exhibits, Activities   Info Booths

## Friday, March 1

Time	Panel
8:00	Morning Reception   Demos, Exhibits, Activities   Info Booths
9:00	<b>Opening Remarks</b>
9:15	<b>Introduction   Mapping Grand Canyon   Part 2</b>
9:30	<b>Keynote   Cartoon Maps of Canyonland</b>
9:45	
10:00	
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10:30	Morning Break   Demos, Exhibits, Activities   Info Booths
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3:00	<b>Place-Based Teaching and Learning at Grand Canyon: In-Person and Virtual</b>
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3:45	
4:00	<b>Conference Closing Remarks</b>
4:15	
4:30	Demos, Exhibits, Activities   Info Booths



# Panel Information



## Opening Remarks

*Thursday, February 28*

9:00 a.m.–9:15 a.m.

### **Paul Hirt, PhD**

*Professor of History*

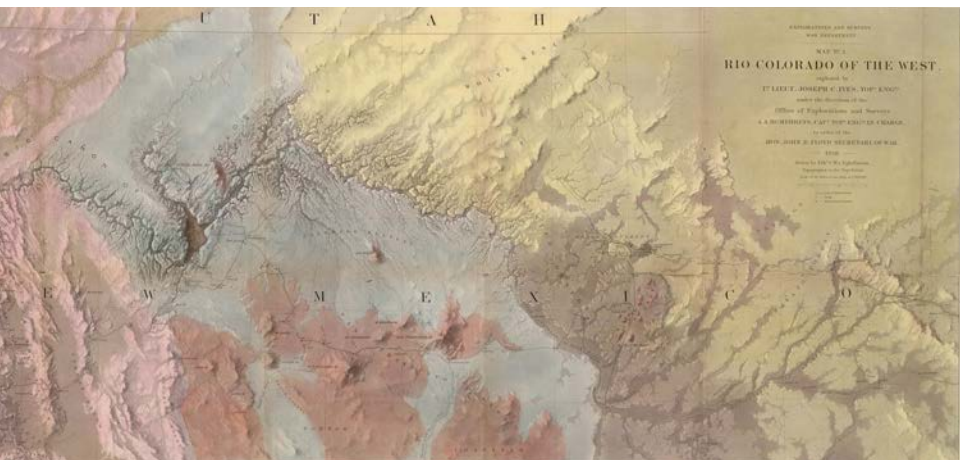
Arizona State University

### **Nikolas Smilovsky, PhD**

*Instructor and Geospatial Consultant*

Arizona State University

# Panel Information



## Introduction | Mapping Grand Canyon — Over 150 Years of Cartographic Change | Part 1

*Thursday, February 28*

9:15 a.m.–9:30 a.m.

### Matthew Toro

Prior to the 1850s, no large-scale maps of the Grand Canyon existed. Maps covering the region were predominantly small-scale products, crudely generalizing vast swathes of territory. Most maps relegated the location of the Grand Canyon itself to a conspicuous “blank space”. In the mid-19th century era of US territorial expansion, fueled by the ideological imperatives of Manifest Destiny, such glaring omissions of cartographic detail demanded a corrective filling-in. A map drawn by the pioneering cartographer Frederick Wilhelm von Egloffstein as part of the 1857-1858 Ives survey marked the first successful effort to map the Colorado River, and, by extension, its Grand Canyon, in any meaningful detail. A decade later, in the summer of

1869, a one-armed Civil War veteran named John Wesley Powell famously led a group of nine men to explore and conduct a more thorough topographic survey of the still mysterious lands abutting the river. In the decades following the Ives and Powell surveys, the motivations for mapping the Grand Canyon have changed, as have the technologies, the techniques, and the very maps themselves. From maps of increasing topographic accuracy, to fancifully illustrated pictorial maps, to National Park Service maps, to geologic maps, to interactive 3D web maps, and everything in between, the geography of the Grand Canyon region has been the subject of a multitude of diverse manifestations of cartographic representation.



# Panel Information



## Keynote | Mapping Grand Canyon National Park

*Thursday, February 28*

9:30 a.m.–10:30 a.m.

### Tom Patterson

Four recently published maps of Grand Canyon National Park that owe their design inspiration to renowned mapmakers of the twentieth century, a relationship that I will explore.

The first map, the “South Rim Pocket Map,” targets the majority of visitors who go only to the South Rim and stay there for four hours or less. I based this map on the 1972 “New York Subway Map” by Massimo Vignelli, which distorts geography in order to squeeze information into tight geographic areas. Out of necessity I did likewise for the “South Rim Pocket Map,” which had a print run of three million copies last year.

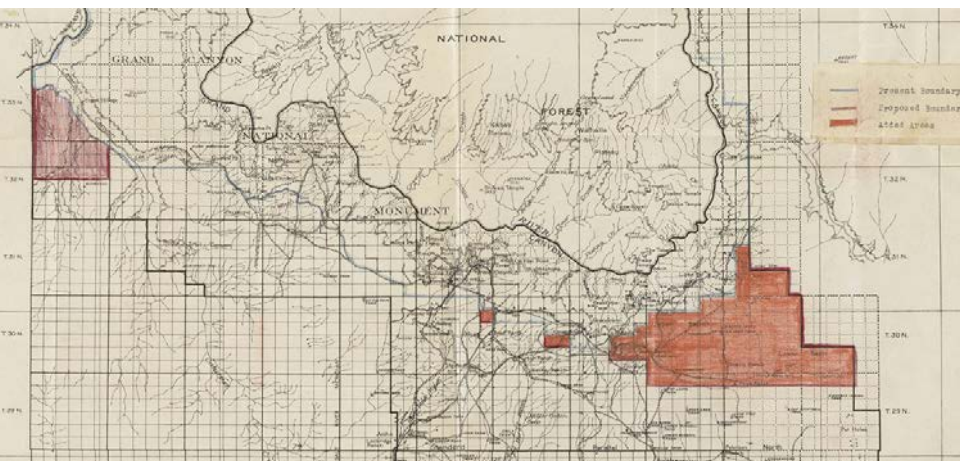
My next map, “Hiking Below the Rims,” draws inspiration from Brad Washburn’s “Heart of the Grand Canyon” published in 1978 by National Geographic.

I used a digital technique called texture shading to mimic the Swiss-produced rock hachuring found on Washburn’s map.

Up next in my talk is a map of the entire canyon made for the official park brochure. It features natural colors similar to those developed in the 1950s by USGS cartographer, Hal Shelton.

I will wrap things up with a panorama of the Grand Canyon that borrows a clever idea from late Austrian panoramist, Heinrich Berann. I warped a digital elevation model on a convex arc to create a hybrid 3D scene featuring a conventional map in the foreground and a panorama in the background. You can decide if it works.

# Panel Information



## **Legislating the Boundaries: Redrawing the Map in 1925**

*Thursday, February 28*

10:45 a.m.–11:15 a.m.

### **Ed Oetting**

It is a truism that maps cannot exist without boundaries, whether those boundaries are the borders of the map itself or the geographic coordinates circumscribing the limits of the physical space being mapped. Grand Canyon National Park, like all national parks, has written and legislated descriptions that form the basis

for mapping the evolving nature of the park. The year 1925 saw the first significant re-writing of the legal boundaries of Grand Canyon National Park since its legislative creation in 1919. This presentation will discuss the “sausage-making” involved in re-writing the borders of Grand Canyon National Park.

# Panel Information



## Creation of the Matthes-Evans Topographic Map of the Grand Canyon

*Thursday, February 28*

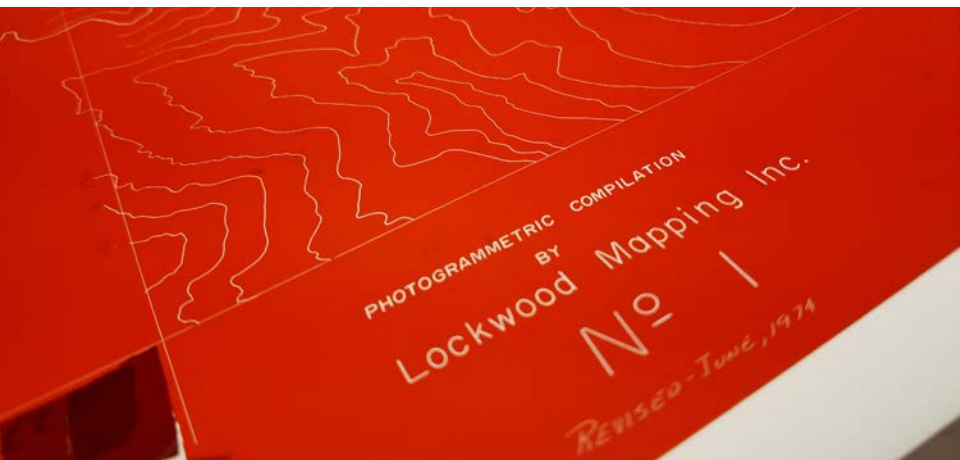
11:15 a.m.–11:45 a.m.

### Jonathan Upchurch, PhD

Creation of the Matthes-Evans United States Geological Survey topographic map of the Grand Canyon was a herculean effort. It was the most impressive mapping activity to ever take place at the Grand Canyon, considering the surveying tools that were available at the time. Field work on the Matthes-Evans map began in 1902, but publication of the map did not occur until 1927. This was a 25 year effort, facing extremely challenging field conditions.

This presentation will describe the surveying methods and tools used, and the field work required to prepare the Matthes-Evans Map. Extremely challenging terrain and climate made field work quite difficult. Matthes and others produced firsthand accounts that provide a historical record of the mapmaking effort and some of the trials and tribulations encountered by the surveyors. These sources, plus the author's onsite visits to triangulation stations and benchmarks provide the basis for the story of the map's creation.

# Panel Information



## **How Washburn Mapped the “Heart of the Grand Canyon”**

*Thursday, February 28*

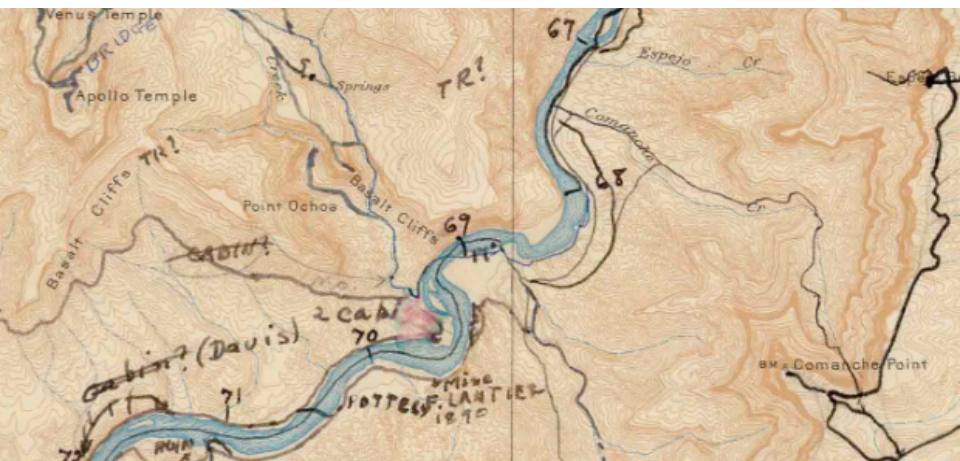
11:45 a.m.–12:15 p.m.

### **Michael Fry**

When renowned cartographer and mountaineer Brad Washburn visited the Grand Canyon in 1969, he discovered that existing maps of the area were “inadequate” for either popular or scholarly use. Never one to be deterred, Washburn set about making one. This is the story of his 7-year-long effort, done

in close collaboration with the National Geographic Society, Switzerland's Federal Office of Topography, and scores of supporting characters, to satisfy his desire to produce the best map of the canyon — more precise, more detailed, more beautiful — than anything that had come before.

# Panel Information



## Footprints on the Sands of Time: Retracing Harvey Butchart's Exploration of the Grand Canyon through His Annotated Matthes-Evans Maps

*Thursday, February 28*

1:45 p.m.–2:15 p.m.

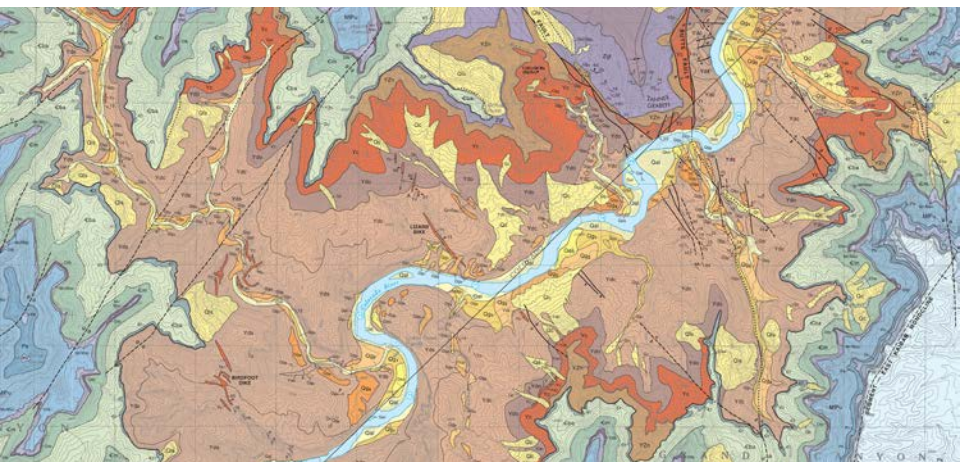
### Peter Runge

John Harvey Butchart was a mathematics professor at Northern Arizona University from 1945 to 1973. From 1945 to 1987, he spent considerable time in the Grand Canyon, hiking established trails, exploring obscure routes, and discovering new routes. In all, Dr. Butchart spent over 1,000 days in the Grand Canyon and traveled over 12,000 miles in the Canyon. Dr. Butchart kept journals on his explorations and complemented

those notes with a heavily annotated copy of the 1927 Francois Matthes and Richard Evans East Half, West Half topographic maps of the Grand Canyon. Embedded in Butchart's annotated Matthes-Evans maps are compelling stories of adventure, discovery, triumph, and heartbreak. This presentation will highlight selections of those stories and the impact this map has had on subsequent hiking exploration in the Canyon.



# Panel Information



## **Geologic Mapping of Grand Canyon, 150 Years and Counting**

*Thursday, February 28*

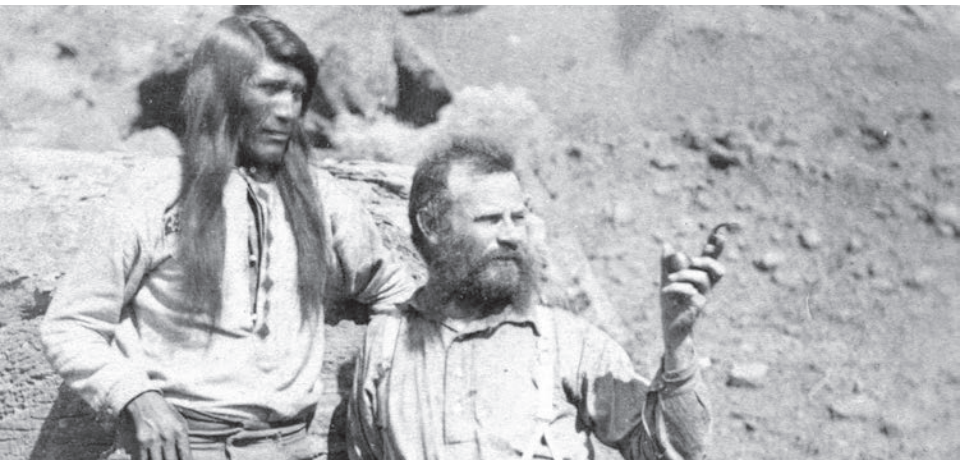
**2:15 p.m.–2:45 p.m.**

### **Karl E. Karlstrom, PhD**

Geologic maps are to geologists what equations are to mathematicians; they symbolically and compactly encode many layers of hard-won scientific knowledge for those who know how to read them. The best ones also are beautiful. There have been great challenges and great progress in geologic mapping of Grand Canyon over the past 150 years. Dutton era (1886) maps represent major advances in cartography and geology. The Huntoon et al., (1996) 1:62,500 "Dragon Map" of Eastern Grand Canyon is the best-selling geologic map of all time; it was produced by offset printing and is now out of print. The Timmons and Karlstrom

(2012) Geologic Map of Eastern Grand Canyon at 1:24,000 is the most detailed available for large areas; it has been digitized and is being converted to GIS files. The Billingsley's USGS maps of the entire Grand Canyon region are available at 1:100,000 as GIS files online. Next challenges are to incorporate multiple scales in Google Earth-style zooming in interactive 3-D geologic portrayals. This requires higher detail boots-on-the-ground geologic mapping than is currently available in many areas as well as innovative ideas for 3-D visualizations. Imagery and visualization technologies are available such that this "Grand Challenge" is within reach.





## **Tracing the History of Native American Communities in Relation to the Grand Canyon**

*Thursday, February 28*

**3:15 p.m.–3:45 p.m.**

### **Theresa Avila, PhD**

Historical narratives of the United States often disregard indigenous communities, and typically describe the colonization of the Americas through the lens of European explorers and US westward expansion as Manifest Destiny. Case in point, Arizona history typically starts in the year 1912 when statehood was granted, as if nothing of relevance to the region occurred prior. However, if we are to genuinely (re)examine the complex history of the development and representation of the Grand Canyon then we are must consider the relationship and representation of indigenous communities within the context of this site.

To gain a better understanding of how images affect our concepts of nature,

and citizenship this paper analyzes illustrations of both the Grand Canyon and indigenous communities of the region. Moving away from traditional concepts of mapping, this paper traces the representation of indigenous communities of the Grand Canyon within a range of mediums including maps, prints, and photographs. The scope of images considered here will be select and limited to “known” or “famous” images of the Grand Canyon. A review of the development of the Grand Canyon as a national monument and park, as well as of US policies on indigenous communities serve to contextualize the images examined here.



## **John Wesley Powell and Crew's 1869 Grand Canyon River Mapping: What Did They Know and When Did They Know It?**

*Thursday, February 28*

**3:45 p.m.–4:15 p.m.**

### **Richard David Quartaroli**

The intent of the 1869 river expedition of Major John Wesley Powell was to map the course of the Green River to its junction with the Colorado River, and then through the Grand Canyon, ending at Callville, Nevada, filling in somewhat terra incognita of the plateau country of the southwestern United States. Starting at Green River Station, Wyoming Territory, one of the four boats wrecked in the Cañon of Lodore, resulting in one crew member leaving the trip at the Uinta River. Weather, rapids, hard work portaging and lining boats and supplies, and other time-consuming activities curtailed much of the needed survey and mapping work. Loss of the maps due to wetting caused the need for them to be recreated. Even with that, plus broken barometers and wet chronometers and watches, at least one map remained so that

Powell's return river trip of 1871-72 could carry it with them, compare it with their longer-term surveying, and update the 1869 results. However, by the time they reached about river mile 240 in the Grand Canyon, Powell still could not tell how far west they had boated or how close they were to Callville. Because of that and other reasons, three men left the party at what has been named Separation Rapid and up Separation Canyon on the north rim. Powell and the remaining men exited Grand Canyon soon thereafter at the mouth of the Virgin River, not far above Callville; the three men perished somewhere on the Arizona Strip. This talk will cover how the men used their scientific instruments to survey and map, and speculate about what they knew of their location along their trip, focusing specifically on Grand Canyon.



## **Grand Canyon Student Map Competition Award Ceremony**

*Thursday, February 28*

**4:15 p.m.–4:30 p.m.**

### **Best Artistic Map**

### **Best Data Driven Map (static)**

### **Best Data Driven Map (dynamic)**

#### *Competition Judges*

#### **Jill Sherwood**

*Geospatial Data Analyst*  
Arizona State University

#### **Ellen Meissinger**

*Professor*  
ASU School of Art

#### **Dori Griffin, PhD**

*Assistant Professor of Graphic Design*  
Ohio University

#### **Karina Wilhelm**

*Map Specialist*  
ASU Library

#### **Shea Lemar**

*GIS Project Manager*  
ASU Geospatial Research  
and Solutions

#### **Stephanie Deitrick, PhD**

*Director, MASGIS Program*  
Arizona State University  
*Enterprise GIS and Data Solutions*  
*Manager*  
City of Tempe

#### **Barbara Trapido-Lurie**

*Research Professional*  
ASU School of Geographical Sciences  
and Urban Planning

# Panel Information



## **Day One Closing Remarks**

*Thursday, February 28*

4:30 p.m.–4:45 p.m.

### **Matthew Toro**

*Director of Maps, Imagery, and  
Geospatial Services  
ASU Library*



# Panel Information



## Opening Remarks

*Friday, March 1*

9:00 a.m.–9:15 a.m.

### **Paul Hirt, PhD**

*Professor of History*

Arizona State University

### **Nikolas Smilovsky, PhD**

*Instructor and Geospatial Consultant*

Arizona State University



## Introduction | Mapping Grand Canyon — Over 150 Years of Cartographic Change | Part 2

*Friday, March 1*

9:15 a.m.–9:30 a.m.

### Matthew Toro

Prior to the 1850s, no large-scale maps of the Grand Canyon existed. Maps covering the region were predominantly small-scale products, crudely generalizing vast swathes of territory. Most maps relegated the location of the Grand Canyon itself to a conspicuous “blank space”. In the mid-19th century era of US territorial expansion, fueled by the ideological imperatives of Manifest Destiny, such glaring omissions of cartographic detail demanded a corrective filling-in. A map drawn by the pioneering cartographer Frederick Wilhelm von Egloffstein as part of the 1857-1858 Ives survey marked the first successful effort to map the Colorado River, and, by extension, its Grand Canyon, in any meaningful detail. A decade later, in the summer of

1869, a one-armed Civil War veteran named John Wesley Powell famously led a group of nine men to explore and conduct a more thorough topographic survey of the still mysterious lands abutting the river. In the decades following the Ives and Powell surveys, the motivations for mapping the Grand Canyon have changed, as have the technologies, the techniques, and the very maps themselves. From maps of increasing topographic accuracy, to fancifully illustrated pictorial maps, to National Park Service maps, to geologic maps, to interactive 3D web maps, and everything in between, the geography of the Grand Canyon region has been the subject of a multitude of diverse manifestations of cartographic representation.



# Panel Information



## Keynote | Cartoon Maps of Canyonland

Friday, March 1

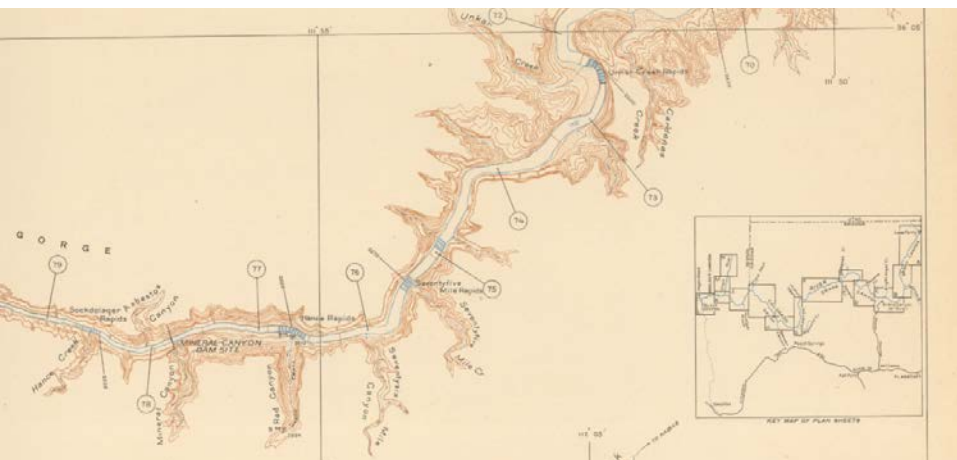
9:30 a.m.–10:30 a.m.

### Dori Griffin, PhD

Shortly after the Grand Canyon became a national park in 1919, commercial artists began mapping the region for tourist audiences. Beginning around 1930, many of these maps used a cartoon style, populating the landscape with natural wonders, talking animals, cheerful tourists, quirky locals, and timeless “natives” (in the language of their day). These illustrated maps facilitated only the most basic navigational tasks, but they performed a great deal of work as cultural narratives, shaping viewers’ concepts and expectations of the Grand Canyon as a tourism destination. From reinforcing a standardized menu of iconic sites to perpetuating popular mythologies of indigenous culture, cartoon maps dealt

in stereotypes. Yet they also offered a surprising level of detail and most were based in careful research. Several of the artists who made cartoon maps of the Grand Canyon were well-known as commercial cartographic illustrators, including Ruth Taylor White, Jo Mora, and Arizona Highways art director George Avey. They brought their own signature styles to a geographic region made famous by John Wesley Powell’s 1869 expedition and the Fred Harvey Company’s popular tours. “Cartoon Maps of Canyonland” showcases the rich visual history of mapping the Grand Canyon for tourists and unpacks the complex, evolving stories told by these engaging but imperfect maps.

# Panel Information



## The 1923 Birdseye Expedition: First Maps of the Colorado River Through Grand Canyon

*Friday, March 1*

11:00 a.m.–11:30 a.m.

### Mark Manone

In 1923 an expedition left Lees Ferry with the intent of making an unbroken level survey line 251 miles through Grand Canyon. This expedition was led by the Chief Topographic Engineer of the USGS, Claude Birdseye. His handpicked crew consisted of four boatman, a rodman and a cook, who navigated four boats over 74 day to complete this remarkable task. Birdseye and his men also ran survey lines up prominent side canyons and were charged with perhaps the most

important aspect of the mission, locating potential dam sites. The level line that was produced from this expedition and the accurate maps of eight potential dam sites started a dialogue that would frame and potentially tame the wild Colorado River running through the West. These maps were ultimately used to aid in the creation of multiple dams and water diversion projects. Today researchers continue to utilize several maps, photographs and survey points almost 100 years after they were collected.



## **Mapping the Colorado River Corridor in Grand Canyon for Ecosystem Monitoring**

*Friday, March 1*

11:30 a.m.–12:00 p.m.

### **Matt Kaplinski**

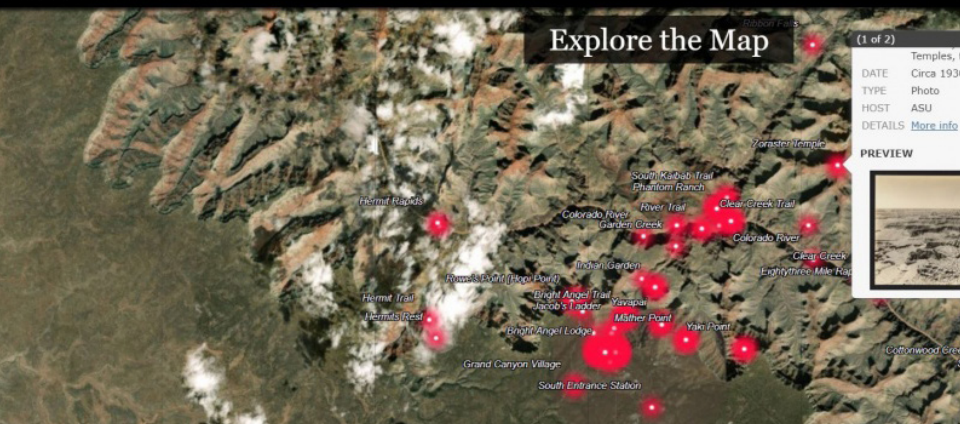
The passage of the Grand Canyon Protection Act (1992) and the completion of the Glen Canyon Dam Environmental Impact Statement (1996) ushered in a new era of environmental monitoring and research of the Colorado River corridor in Grand Canyon. Technological advancements in surveying and mapping systems over this period have made it possible to map larger areas with an increasing level of precision and accuracy. All of these mapping efforts rely on an accurate geodetic control network along the rim and inner canyon corridor. Examples of mapping efforts include

aerial photographic, topographic, and bathymetric missions. Aerial overflights of the entire canyon corridor have been conducted in 2002, 2009, and 2013 and the high-resolution orthophotographs and photogrammetrically-derived topography form the base data set for a number of investigations. From 2009 to 2017, over 160 miles of channel have been mapped using multibeam bathymetry. The bathymetric maps reveal the form of the Channel bed and allow researchers to assess flow operations from Glen Canyon dam on the sediment resources within the Colorado River ecosystem.

# Panel Information

100 Years of Grand

Start Overview How to Use the



## Celebrating with Archives: Building “100 Years of Grand”

*Friday, March 1*

1:30 p.m.—2:00 p.m.

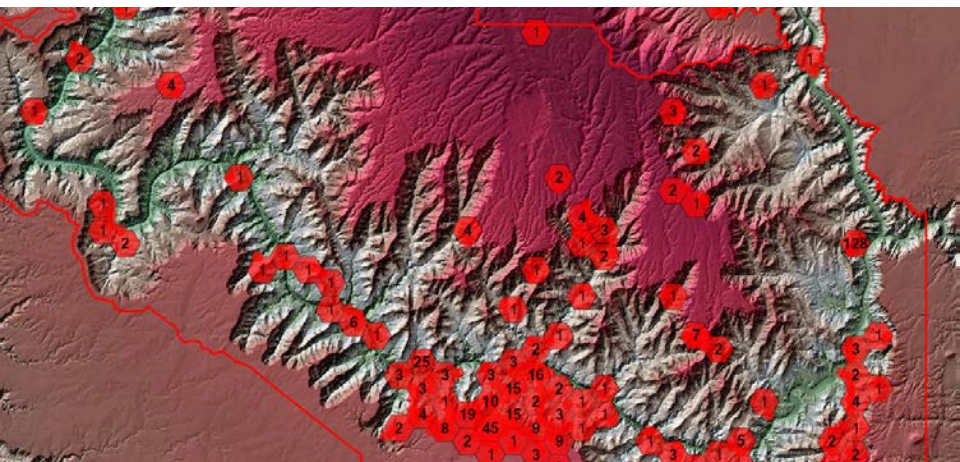
### Robert Spindler

In this presentation, Spindler will describe the work of designing and building the 100 Years of Grand collaborative digital archive and the associated challenges of item selection,

description, copyright, and project coordination. He will also demonstrate the digital archive and present examples of key items of Grand Canyon history.



# Panel Information



## Mapping Death in Grand Canyon

*Friday, March 1*

2:00 p.m.–2:30 p.m.

### **Kenneth Field, PhD**

Over 700 known deaths have occurred in Grand Canyon from the first river exploration by John Wesley Powell in 1869 to present day. Causes range from suicides to accidental drownings, heatstroke, snake bite, flash floods, aircraft collisions, crashes and even murder. Based on the book 'Over the Edge: Death in Grand Canyon' by Michael Ghiglieri and Thomas Myers, this map illustrates the geography of deathly incidents. It uses a pan-sharpening technique to create a crisp, vibrant combination of layer tints and hillshades. The colours are defined to allow the map to be viewed in normal two dimensional viewing but in 3D when viewed using chromadepth glasses.

The map provides a dramatic, visually engaging illustration of a unique dataset and maintain the first geocoded display of the complete record of deaths in Grand Canyon. In so doing, it illustrates the development and application of novel cartographic approaches. Vignettes describing the incidents bring the quantity of death into perspective through the telling of short individual stories, some fantastic, some tragic. The presentation will discuss the map's creation in 2012, a recent update, and also the response to its publication. There were some very real issues faced in portraying an often sensitive subject matter, and some of the failures in this respect and the lessons learned will be explored.

# Panel Information



## Place-Based Teaching and Learning at Grand Canyon: In-Person and Virtual

*Friday, March 1*

3:00 p.m.–3:30 p.m.

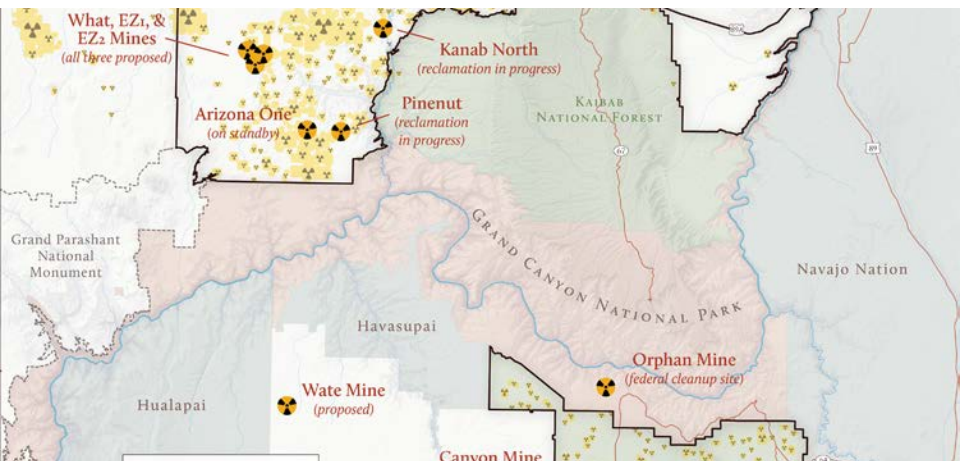
**Steven Semken, PhD**

Grand Canyon is a dynamic natural landscape that encodes nearly two billion years of geological history, and which is also situated within a cultural landscape that encodes the names, experiences, and lives of people from ancestral Native Americans to American explorers and settlers to modern visitors from across the nation and around the world. Place-based ways of teaching integrate the natural and the cultural attributes of a place or region such as Grand Canyon to facilitate learning. For the last century, Grand Canyon National Park has offered interpretive programs and resources to visitors that hew to this place-based philosophy, enabling millions of Park visitors to make intellectual and emotional connections to the landscape and its natural and cultural history. Geological and

educational research have contributed to the interpretive mission of the Park with new research-based resources such as the Trail of Time Exhibition. Even more recently, advances in visualization and instructional technology have brought the pedagogical power of Grand Canyon to the online realm through immersive, interactive virtual field trips (iVFTs), which have the potential to enable many millions more to explore and learn from the natural and cultural landscapes of Grand Canyon, including its most physically inaccessible places. Current research is directed toward rendering iVFTs ever more authentic and place-based, while also enhancing the accessibility and effectiveness of in-person field experiences for visitors and students at Grand Canyon.



# Panel Information



## Mapping Grand Canyon for Conservation

*Friday, March 1*

3:30 p.m.–4:00 p.m.

### Stephanie Smith

In 1985, Arizona Governor Bruce Babbitt and several others officially registered the Grand Canyon Trust as a non-profit organization dedicated to defending the natural integrity of the Grand Canyon. But the Trust realized early on that issues don't stop at the boundaries of Grand Canyon National Park. So in 1987, we expanded the scope of our work to encompass the entire Colorado Plateau, of which the Grand Canyon stands as the centerpiece. GIS at the Trust helps tell the historic and current conservation story through advanced cartography,

interactive web mapping, and spatial analysis. Using art and science, we design maps that illustrate physical characteristics, cultural values, proposals and conservation actions, and vulnerabilities across the Colorado Plateau. Our work reaches a broad audience including policy-makers, constituencies, government agencies, and our supporters. This presentation will highlight some of our most recent work in and around Grand Canyon, challenges we face as geographers, and how our maps have been used to further protect the Grand Canyon.

# Panel Information



## Conference Closing Remarks

*Thursday, February 28*

4:00 p.m.–4:30 p.m.

### **Matthew Toro**

*Director of Maps, Imagery, and  
Geospatial Services  
ASU Library*

# Presenters

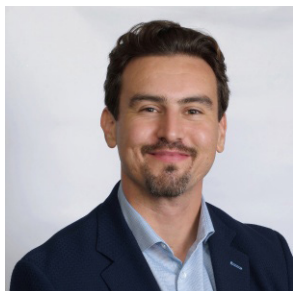


**Paul Hirt, PhD**  
*Professor of History*  
Arizona State University

Paul Hirt is a historian specializing in the American West, environmental history, environmental policy, and sustainability studies. Professor Hirt has authored more than two-dozen articles and book chapters on environmental and western history and policy. His current research projects include collaborative interdisciplinary research on energy transitions, water use and conservation, urban growth and sustainability in southern Arizona, and adaptive management in the Colorado River Basin.

Professor Hirt is involved in many public engagement programs focused on the above topics, including the Smithsonian Museum on Main Street traveling exhibit *Water/Ways*, an administrative history of the Glen Canyon Dam Adaptive Management Program funded by the U.S. Bureau of Reclamation, renewable energy development for the Navajo Nation, and various water, energy, and sustainability initiatives of the Global Institute of Sustainability and ASU's Global Drylands Center. For an example of a completed public history project funded by the National Endowment for the Humanities, see [grandcanyonhistory.clas.asu.edu](http://grandcanyonhistory.clas.asu.edu).

# Presenters



## **Matthew Toro**

*Director of Maps, Imagery,  
Geospatial Services  
ASU Library*

Matthew Toro is a research geographer serving as the Director of Maps, Imagery, and Geospatial Services at the Arizona State University Library. He leads programmatic, technology, collections, and research initiatives at the library's Map and Geospatial Hub. An avid hiker, geospatial analyst, and cartographer, Matt loves exploring the Grand Canyon in person at the human scale and then returning to the office to represent the region with maps and geovisualizations at macro scales. Matt is directing the Mapping Grand Canyon Conference.



## **Tom Patterson**

*Cartographer  
United States National Park  
Service (retired)*

Tom Patterson recently retired as Senior Cartographer at the U.S. National Park Service, Harpers Ferry Center. He has an M.A. in Geography from the University of Hawai'i at Mānoa. Presenting terrain on maps is Tom's passion. He maintains the [ShadedRelief.com](https://shadedrelief.com) website and is the co-developer of the Natural Earth cartographic dataset. Tom is Executive Director of the North American Cartographic Information Society and Vice Chair of the International Cartographic Association, Commission on Mountain Cartography.

# Presenters

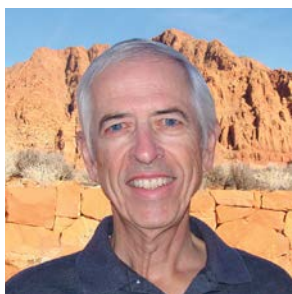


## **Ed Oetting**

*History Liaison Librarian*

ASU Library

Ed Oetting serves as a Liaison Librarian at ASU Library for History and the Barrett Honors College. His academic training is in history and library science with a specialization in archival administration. In addition to his current position with ASU Library, he has worked previously in the field of archives and manuscripts. His current professional activities focus on the use and promotion of historical materials, in particular manuscript material with a focus on Arizona and Southwestern history. In addition, he serves as principal researcher for the 100 Years of Grand project, which celebrates the Grand Canyon National Park Centennial through a massive digitization and curation of archival materials related to the early history of the park.



## **Jonathan Upchurch, PhD**

*Professor Emeritus*

Arizona State University

Dr. Jonathan Upchurch is Professor Emeritus, Arizona State University. The Matthes-Evans topographic map combines his interests in both civil engineering and Grand Canyon history. Jonathan had the opportunity to live at the Grand Canyon for six years and, during his lifetime, he has hiked over 2,400 miles in the Grand Canyon. His historical research has been the basis for four presentations at Grand Canyon History Symposiums.

# Presenters



## **Michael Fry**

*Collection Manager and Senior  
Map Librarian*  
National Geographic Society  
Library

Michael Fry has been a map librarian at the National Geographic Society's Library and Archives since 2010. He began his career in libraries at the University of Maryland, College Park's Government Documents and Maps collection. Michael earned his library degree from Drexel University. He is an Arizona native and graduate of Phoenix Central High School, but he's never been to the Grand Canyon.



## **Peter Runge**

*Head of Special Collections*  
Northern Arizona University

Peter Runge is the Head of Special Collections and Archives at Cline Library (Northern Arizona University) and the former Head of Special Collections and Archives at the Robert E. Kennedy Library (Cal Poly, San Luis Obispo). He is responsible for the administrative oversight of the department and providing vision for the department. He enjoys raising awareness of and increasing engagement with the collections from the Cline Library Special Collections and Archives, which document the human and natural history of the Colorado Plateau.



# Presenters



**Karl E Karlstrom, PhD**

*Professor*

University of New Mexico

Dr. Karl E. Karlstrom is Distinguished Professor of Geology at the University of New Mexico. He grew up in Flagstaff, started his Grand Canyon research when a professor at NAU from 1983-1991, and continues his research today. He initiated the Trail of Time Exhibition with funding from the National Science Foundation. His research contributions to Grand Canyon deal with all time frames and include detailed geologic maps completed with graduate students and collaborators. In addition to mapping, his main research contributions include redefining geochronology of many Grand Canyon rocks, a resolution of the age of Grand Canyon debate, and refining Grand Canyon Cambrian stratigraphy.



**Dori Griffin, PhD**

*Assistant Professor of Graphic Design*

Ohio University

Dori Griffin researches and writes about the relationships between popular visual culture, commercial design practice, and American cultural identity in the first half of the twentieth century. She frequently explores how cartographic illustration plays a role in constructing cultural identity around tourism destinations. The University of Arizona Press published her first book, *Mapping Wonderlands: Illustrated Cartography of Arizona, 1912-1962*, in 2013.



**Theresa Avila, PhD**  
*Assistant Professor of Art  
History and Curator*  
California State University,  
Channel Islands

Theresa Avila earned a Ph.D. in Art History from the University of New Mexico with a focus on Latin American and Latin@x art. She is an Assistant Professor of non-Western Art History at California State University, Channel Islands. Prior to that she managed the Simon Burrow Collection of maps and books for the School of Transborder Studies at Arizona State University. As a Mexican descent citizen of the United States who has and continues to live, study, and work in California, New Mexico, and Arizona she specializes in the history, practices, and systems that impact contemporary Latin@x communities within the U.S. southwest. As a scholar and curator her work focuses on the intersections between the visual and political, on a national and global scale, as she interrogates historiography, nation-building, systems of differentiation, social justice struggles, and civil rights protest. Recent publications include *Making and Being Made: Contemporary Citizenship, Art, and Visual Culture* (2017), which she co-edited; the essay "Icons of the Mexican Revolution: Constructions of Emiliano Zapata in Prints of the Mexican Revolution" in the book *Imprints of Revolution: Visual Representations of Resistance* (2016); and she also co-edited a special issue of *Third Text* (2014) focused on "Art and Revolution in Mexico." She has also curated numerous exhibitions, such as *Greater Arizona: Mapping Place, History, and Transformation* (2017) at Arizona State University; *Legacy of the Mexican Revolution* (2015) for the Maxwell Museum of Anthropology, University of New Mexico; and *Imagined Regions: The Simon Burrow Transborder Map Collection* (2015) for the Mexican Consulate in Phoenix, Arizona. Dr. Avila firmly believes we must activate art in meaningful ways, and she dedicates herself to community oriented projects that engage art as a tool for change.

# Presenters



## **Mark Manone**

*Associate Professor of Practice*  
Northern Arizona University

Mark Manone is an Associate Professor of Practice at Northern Arizona University and the Director of the Geospatial Research and Information Lab. Mark spent fifteen years working in Grand Canyon as a research scientist and field surveyor. Currently, his research is focused on geoscience education through the National Science Foundation Power of Data project.

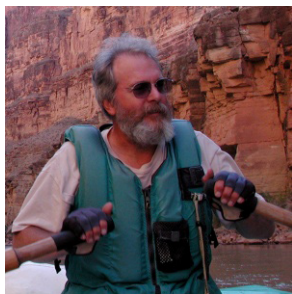


## **Kenneth Field, PhD**

*Professional cartonerd*  
Esri and International  
Cartographic Association

A Brit, Ken holds a Bachelors in cartography and a PhD in GIS. He's a former academic but, since 2011, he talks and writes about cartography, teaches and makes maps at Esri. He has presented, keynoted and published a lot. He blogs, tweets, is past Editor of The Cartographic Journal, and current Chair of the ICA Map Design Commission. He's won some awards for maps, pedagogy and kitchen tile designs. He is author of the best-selling book CARTOGRAPHY and recently taught a cartography MOOC to over 35,000 people. He snowboards, drums, builds Lego and supports Nottingham Forest.

# Presenters



**Richard David Quartaroli**  
*Special Collections Librarian  
Emeritus*  
Northern Arizona University

Richard Quartaroli's first Grand Canyon river trip in 1973 was as a passenger on an 18-day rowing trip. That "trip of a lifetime" led to around 200+ river trips and transitioned to: swamper, boatman, guide, historian, oar- and motor-powered boats, commercial, private, research, resource, educational, and historical. Leading to researching and a Master of Library and Information Science, he was the first research librarian at the Glen Canyon Environmental Studies and The Special Collections Librarian at Northern Arizona University, a past president of the Grand Canyon River Guides, and editor for the Proceedings of the 3rd, 4th, and 5th Grand Canyon History Symposia. He has presented and written about many aspects of Grand Canyon and Colorado River history.



**Matt Kaplinski**  
*Senior Research Associate*  
Northern Arizona University

Matt Kaplinski is a Senior Research Associate at Northern Arizona University and has spent 28 years working in Grand Canyon as a research scientist and river guide. His current research is focused on studying the effects of flows from Glen Canyon Dam on the Colorado River sediment resources.

# Presenters



**Nikolas Smilovsky, PhD**  
*Instructor and Geospatial  
Consultant*  
Arizona State University

Nikolas is an instructor at ASU, teaching classes for the Herberger Institute of Design and the Arts. Currently he teaches classes focusing on geographic information systems, surveying, and other software modeling solutions. His PhD research similarly engages geospatial sciences to explore people's behavioral geographies. Nikolas is also a certified arborist, GISP, and active participant with several local/state run geospatial non-profit organizations. Nik is coordinating the Mapping Grand Canyon Conference.



**Steven Semken, PhD**  
*Professor of Geology and  
Education*  
Arizona State University

Steven Semken is Professor of Geology and Education in the School of Earth and Space Exploration, and Senior Sustainability Scientist in the Julie Ann Wrigley Global Institute of Sustainability at Arizona State University. He is an ethnogeologist and geoscience education researcher who studies influences of sense of place, culture, and affect on modes of teaching, learning, and research in the Earth sciences. He works in geologically and culturally diverse places of the American Southwest, Latin America, and the Caribbean, applying place-based geoscience education to foster improved access and diversity in geoscience, environmental and cultural sustainability, and greater public Earth-science literacy.



# Presenters



**Stephanie Smith**

*GIS Program Director*

*Grand Canyon Trust*

Stephanie joined the Grand Canyon Trust in April 2012 to build the GIS Program. She has a M.A. and B.S. in geography from Appalachian State University with a focus on biogeography and geographic information systems. Prior to joining the Trust, she served as the GIS specialist for the ASU Energy Center and as an instructor for Appalachian State University's Geography Department. She often calls herself the nerd behind the map, but she is much more than that. Her passion is conservation and telling its story. As an avid lover of cartographic design and researcher who seeks to better understand our environment, she transforms data in ways that engage the public and make policy makers stand up and pay attention.



**Rob Spindler**

*University Archivist*

*ASU Library*

Rob Spindler is University Archivist at ASU Library and project director for the 100 Years of Grand project. He holds Bachelors and Masters degrees in History from Boston University and the Master of Information Science from Simmons College. He is a Distinguished Fellow of the Society of American Archivists and has served forever on the Arizona Historical Records Advisory Board.

# Competition Judges



**Dori Griffin, PhD**

*Assistant Professor of Graphic Design*  
Ohio University

Dori Griffin researches and writes about the relationships between popular visual culture, commercial design practice, and American cultural identity in the first half of the twentieth century. She frequently explores how cartographic illustration plays a role in constructing cultural identity around tourism destinations. The University of Arizona Press published her first book, *Mapping Wonderlands: Illustrated Cartography of Arizona, 1912-1962*, in 2013.



**Barbara Trapido-Lurie**

*Research Professional*  
ASU School of Geographical Sciences and Urban Planning

Barbara Trapido-Lurie's work includes the realms of cartographic design, geographic information technologies, and career development. She has created many hundreds of maps to illustrate academic publications, and also works closely with the Arizona Geographic Alliance to produce maps that support geography education in K-12 classrooms. She also teaches cartographic design, and advises graduate students on their mapping efforts.

# Competition Judges



**Ellen Murray Meissinger**

*Professor*

ASU School of Art

Ellen Murray Meissinger joined the Arizona State University School of Art faculty in 1986 as Professor of Drawing and Painting. As a visual artist and scholar, her work explores bridges between perception and information, image-making and meanings, that are formed at the intersection of art, design, science, and society. Her paintings, watercolors, drawings, installations and mixed-media works have been exhibited in more than 150 international and national art exhibitions including the Santa Croce Museum, Florence, Italy; and the National Art Center, Tokyo, Japan. Her artworks have received numerous awards and are part of many important private and corporate collections including IBM, Inc., and McDonalds Corporation.



**Karina Wilhelm**

*Map Specialist*

Arizona State University

Karina is the Map and Geospatial Hub's Map Specialist. She works to make maps and aerial imagery available to library patrons. She also coordinates the annual Creative Cartography exhibit on display each Fall in the Hub. Karina holds a Master of Arts in Information Resources and Library Science from the University of Arizona and a Bachelor of Arts in Art History from ASU.

# Competition Judges



**Jill Sherwood**

*Geospatial Data Analyst*

ASU Library Map and  
Geospatial Hub

Jill is the Geospatial Data Analyst for the Map and Geospatial Hub. Her work involves a dynamic combination of geospatial data (metadata) documentation, processing, curation, collection, and analysis of the geospatial datasets currently in the ASU Geospatial Data Directory. In addition, she leads efforts towards the development of a web-based geospatial data repository. Jill's background in ecology and GIS make it incredibly easy for her to get excited about geeking out over the Grand Canyon and maps about the Grand Canyon.



**Shea Lemar**

*GIS Project Manager*

Geospatial Research and  
Solutions

As GIS Project Manager, Shea provides GIS consultation to students, faculty, staff and private organizations as well as GIS data management, spatial analysis and project management. Her background includes extensive experience in development of GIS for businesses, data collection, GPS, process optimization and project management (both research based and applied). She also excels in spatial analysis and map creation, and teaches graduate and master's level classes at ASU in applied GIS.

# Competition Judges



**Stephanie Deitrick, PhD**

*Director, MASGIS Program*

Arizona State University

*Enterprise GIS and Data*

*Solutions Manager*

City of Tempe

Dr. Stephanie Deitrick is the program director for the Masters of Advanced Study in GIS (MASGIS) Program in the School of Geographical Sciences and Urban Planning. She has nine years university teaching experience including introductory and intermediate GIS, GIS for Planners, cartography and Quantitative Methods.

Stephanie's work focuses on the use of geographic information and visualizations to support public policy decisions.

In her work at the City of Tempe, she is the Enterprise GIS and Data Solutions Manager. Her group supports the city's strategic priorities and data driven decision-making, along with providing GIS data and applications to support city operations and community engagement.



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and Urban Planning**

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