Mark Adams, madams3@une.edu, U.S. Forest Service Pacific Northwest Research Station and Susan Charnley U.S. Forest Service Pacific Northwest Research Station

Mapping the environmental justice implications of U.S. Forest Service hazardous fuel reduction activities. Hazardous fuel reduction (HFR) is a central part of the U.S. Forest Service's efforts to mitigate the trend towards increasing size and intensity of wildfires in the western U.S., and an important tool for forest landscape restoration. HFR also has the potential to reduce the risk of losses from catastrophic wildfire in communities adjacent to national forests. Federal agencies have a mandate to analyze the potential environmental justice consequences of their activities, yet the environmental justice implications of Forest Service programs and policies, including HFR, are poorly understood.

To address this gap we are using GIS to assess whether the benefits associated with HFR treatments on national forests are equitably distributed among nearby populations, particularly minority and low-income populations. This paper presents the approach we are using to integrate socioeconomic data from the U.S. Census with Forest Service HFR management activity data, including methodological challenges and results of a pilot test of our methods in central Oregon. The approach enables direct comparison of the spatial distribution of Forest Service HFR activities and the social vulnerability characteristics of affected populations. Our goal is to provide a tool that helps managers incorporate environmental justice considerations into decision-making about where to conduct HFR.

Sanchayeeta Adhikari, sadhikari@csun.edu, California State University, Northridge; Emily Johnson, Peter Matison, Marshall Glenn, Jessica Steel

Spatial and Temporal Change Analysis of St. Croix Watershed: A Remote Sensing Approach. Multi-temporal satellite imagery change detection analysis helps in understanding landscape dynamics. The present study focuses on the St. Croix River Watershed (SCRW) situated in the states of Minnesota and Wisconsin, USA, an area rich in wildlife, vegetation, water bodies, and wetland. Nonetheless, the region has experienced immense land cover and land use changes in the last few decades. Changes in forest cover, agricultural land abandonment, changes in wetland, infrastructure and built area development are a few of the transformations taking place in this basin. The close proximity of the watershed to the Twin-Cities of Minneapolis and St. Paul further adds to the concern of urbanization and its impact on the natural resources of the basin. Mapping the historical land changes provides a method to observe, assess and monitor the effects of changing land-uses and land-covers on SCRW’s natural resources and assist in making conservation plans. The present study uses multi-temporal Landsat TM and ETM+ satellite imagery (1981-2011) to measure the rate and extent of spatial and temporal change in the watershed.

Stuart Aitken, saitken@mail.sdsu.edu, San Diego State University

Erasure and Precarious Youth. With this paper I discuss the curtailment of minority young people’s spatial and developmental rights in the face of the transformation of Slovenia away from state socialism and towards seemingly free and open neoliberal statehood. The case of Slovenia’s erased minority populations was recently raised as one of
the worst human rights abuses in contemporary Europe. I highlight the privations and struggles of Izbrisani (‘Erased’) youth from the mid-1990s to the present day using stories and other data collected by the Ljubljana Peace Institute, and interviews that I conducted over a 7-month period, 2013-2014. In the first part of the paper, I look at some of the spatial and cultural effects of the erasure, including the trauma of families forced apart and children locked-in-place, deprived of human rights including health and education. The second part of the paper focuses on the Izbrisani’s ongoing fight for recognition and justice, and how their collective struggle for legal status changes young people and their culture, and creates the potential for what Slavoj Žižek calls radical ethical acts.

Matthew Anderson, manderson22@ewu.edu, Eastern Washington University; Damon M. Hall, St. Louis University; Jamie McEvoy, Montana State University; Susan J. Gilbertz, Montana State University; Lucas Ward Rocky Mountain College. Defending Dissensus: Participatory Governance and the Politics of Water Measurement in Montana’s Yellowstone River Basin. The role of a particular aspect of collaboration, dissensus, in stimulating critical reconsideration of ‘prior appropriation’, a historically hegemonic condition related to water rights in the western United States, is examined via a collaborative planning effort in Montana. Consensual support for a water-use measuring proposal was undermined by strong libertarian resistance to governmental regulation, and an unwavering embrace of the status quo. However, based on insights from scholars engaged in the ‘post-political’ dimensions of contemporary forms of rule – dissensus – understood as the manifestation of consensus-forestalling disagreement articulated between oppositional voices – is revealed as a condition to be actively nurtured, rather than purged. This case reveals how dissensus can open discursive spaces for hegemony disrupting modes of inquiry, alternative perspectives, and innovative possibilities, even among sanctioned participant voices operating within otherwise established, depoliticized governing arenas. The study thus deepens our understanding of the complex political dynamics of participatory water planning.

Jasmine Arpagian, jaarpagian@gmail.com, San Diego State University. Effects of Forced and Voluntary Mobility on Young Families. Since the mid-1990s, Romanian families evicted from previously nationalized houses are the collateral damage of post-communist Romania’s transitional justice policies. Prevalent are accounts of food and income insecurity, as well as the uncertainty of alternative housing in the event of an eviction. For this project, I rely on stories collected from families who were, are or may be on the move, either as a result of forced displacement or voluntary migration. This paper considers the impossibility of remaining in place as a source of the insecurity and uncertainty characteristic of “precarity” (Waitt 2011) and takes a special look at family and children’s experiences of relocation.

Daniel D. Arreola, arreolad@asu.edu, Arizona State University. The Matchbook Cover Mexican Restaurant. Researching the cultural and historical geography of the Mexican restaurant in America requires a willingness to consult unconventional sources. The American matchbook is one such source. The matchbook—common during an earlier era when smoking was popular—is a miniature surface that accommodates advertising for a business. Hotels and restaurants especially used matchbooks to promote themselves. Addresses, phone numbers, and the names of restaurant proprietors were typically part of the matchbook cover but a cover would also usually include interesting graphic art about the restaurant suggesting how an eatery created an identity about itself. Inside the matchbook cover, restaurants sometimes included maps showing the locations of establishments in an urban setting or descriptions of the food items popularly served. The prospect of this unusual source for geographic research is discussed through a visual exploration of the anatomy and cultural imagery of the matchbook cover Mexican restaurant.
Deborah Ayodele, debbyodel@gmail.com, Arizona State University and Kelli L. Larson Arizona State University. Water Governance Transitions in the Prescott Management Area, Central Arizona. No water system in the world has achieved sustainable water governance, although many are transitioning to more sustainable modes. Water governance transitions is an emerging field that studies how societies transform toward sustainability. Because it is a newer field, only a few studies have investigated specific cases of water governance transitions. Therefore, this paper assesses the transition of Prescott Management Area (Arizona) to safe yield, which is its primary water policy goal. A case study methodology was adopted involving the triangulation of documents, qualitative interviews, direct observation, and archival records. Textual data (particularly documents and in-depth interview transcripts) were analyzed using initial and focused coding techniques from grounded theory. Preliminary results show that there is insufficient collaboration and coordination among governance actors in the study area towards the goal of safe yield. Thus, the study area is currently not transitioning to safe yield. Overall, this study reveals that integration, coordination, and collaboration, both vertically and horizontally, among the region’s water governance actors are crucial for transitions.

David Banis, dbanis@pdx.edu, Portland State University; Alexa Todd, Portland State University; Rebecca McLain, Portland State University; and Lee Cerveny, US Forest Service. Toward the use of sociocultural PPGIS data: Travel management analysis for national forests. To account for insufficient funding to maintain the National Forest road system, in 2005 a Travel Management Rule was passed that required all national forests to analyze their road system by 2015. These travel analyses provide a detailed evaluation of road conditions and maintenance costs, susceptibility to erosion, floods and landslides, wildlife habitat, vegetation, hydrology, and access for logging. However, it is unclear how social uses of the forest factored into the analysis. In this paper, we draw on our involvement in the public engagement process for travel planning for the Mt Baker-Snoqualmie National Forest. We analyzed spatial data provided by community workshops and an online survey and developed a number of methods to provide a nuanced look at how the roads are used by the public. Methods developed included density calculations for road use and destinations, a calculation of the diversity of uses for road segments, and a method to compare destinations from mapped data with that collected as text descriptions online. These outputs provide ways that forest planners can actually incorporate sociocultural data into their existing analyses in a manner comparable to how they incorporate physical characteristics of the road system.

Clare Beer, clarebeer@g.ucla.edu, University of California, Los Angeles. Land Conservation as Environmental Statecraft: A State-theoretical Approach to Biodiversity Protection in Chile. National states practice land conservation to mitigate species loss, land degradation and other ecological tensions produced in and by the nature-capital relationship. Though state monopoly of conservation planning has been undercut in recent decades by a variety of non-state actors operating their own private protected areas, conservation decision-making at the global level is still predominantly influenced by national governments and state-based agencies. This paper draws on archival research conducted in Chile in summer 2015 to argue that land conservation is a useful way to examine the nature of the Chilean state and the inherent environmentalism of state power more broadly. Using land conservation as a lens, it develops the concept of ‘environmental statecraft’ to explain how and why national states manage their territorial environments to strategic effect. Through historical analysis of Chilean state conservation behavior and engagement with capitalist state theory, land conservation is framed as a selective practice aimed at (re)producing state interests as much as (if not more than) advancing biodiversity protection. In developing the idea of environmental statecraft, the paper argues that it is conceptually and politically necessary to see nature as both constitutive and consequential of the state and state power.
Heather Lene (Ream) Benson, hream@csustan.edu, University of Nevada, Reno and Jennifer Helzer, California State University, Stanislaus. Central Valley Culinary Landscapes: Ethnic Foodways of Sikh Transnationals. Central Valley Sikhs are an understudied ethno-religious group. This study explores the “Americanization” process, based on the degree to which cuisine has evolved and consumptive patterns have changed since their arrival in California's Central Valley. Drawing on insight from cultural geography and anthropology, this research examines the ethnic foodways of Sikh transnationals. This study contends that migrants experience foodway assimilation differently based on location, age at arrival, and current age. The study combines a number of methods; intensive field research, open-ended questionnaires, participant observation, in-depth personal interviews, and mapping. Because contact with American cultures has resulted in exposure to new types of foods, understanding which traditional foodways have resisted change will help one understand the process of acculturation. This study also reveals the role that spatial relationships play in maintaining a traditional diet. The foods consumed by Central Valley Sikhs constitute fundamental components of ethnic/cultural and geographical identity.

Diane Besser, dtbesser@pdx.edu, Portland State University. MAPPING FOR MANAGERS: BARRIERS & OPPORTUNITIES IN THE USE OF PPGIS IN NATIONAL FOREST PLANNING. The burgeoning field of PPGIS offers numerous methodologies and tools for collecting socio-spatial data useful to planners and land managers as they struggle to understand human-environment interactions and balance environmental, social, and economic values and objectives. However, there is little information about how PPGIS and socio-spatial data are being effectively and consistently applied in land management decisions. This presentation focuses on preliminary results from a study that seeks to identify challenges and barriers in integrating socio-spatial data into national forest planning. U.S. Forest Service implementation of a new forest planning rule – with its emphasis on cultural services, public involvement and environmental justice – provides a robust case study in which to analyze the extent to which PPGIS tools are being utilized and socio-spatial data are being applied in the development of national forest management plans. Thematic analysis of semi-structured interviews with U.S. Forest Service employees offers insight into structural, organizational, perceptual and external factors that represent barriers to using PPGIS tools in planning decisions as well as potential avenues for overcoming barriers and facilitating the use of these tools and data in planning contexts.

Kristine Bezdecny, kbezdec@calstatela.edu, California State University, Los Angeles. Social Justice and the Fractalization of Space in the City. Urban spaces provide a nexus between the global and the local. Cities such as New York, Los Angeles, and San Francisco are command and control centers in the ongoing processes of capitalist globalization, while simultaneously sites of contestation over local power and local rights to the city-space. This complicates the pursuit of social justice within these highly unevenly geographically developed urban spaces, as those seeking to affect institutional change must confront power differentials at several scales simultaneously. This paper explores what it means to contest the unevenness of urban social justice across/within the interbedded power differentials and inequities of the city through the lens of the fractalization of space. This represents processes with recursive similarities within a space across multiple scales simultaneously, collapsing toward a single reinforced/ing pattern, making struggles for achieving social justice and deconstructing existing power differentials that much more difficult. Global dynamics in urban spaces seek to maintain not only command and control over space, but also over the scales interbedded in that space. Determining where sites of localized gaps and moments of potential subversion exist in these patterns could upset this balance in the struggle to achieve social justice in the city.
Kelly Biedenweg, kelly.biedenweg@oregonstate.edu, Oregon State University; Bessie Schwartz, Yale University; Jacqueline Delie, Oregon State University. What do managers prioritize?: Evaluating the impact of PPGIS data on Shoreline Master Planning. For many, the goal of collecting PPGIS data is to inform natural resource management. The questions still remains, however: how do these data actually inform managers? Particularly with respect to social data, we know that there are plenty of heuristics and biases that influence the ability of individuals (including managers) to accept new information and re-organization their thinking accordingly. For this study, 14 people at different levels of management were interviewed within one year of making a decision on their Shoreline Master Plans. We used cognitive mapping to understand their priorities associated with making this decision and how they cognitively organized those priorities in their mental model. They then explored an interactive web-based tool that represented PPGIS data collected from residents across the Olympic Peninsula about values they associated with specific areas. Following this interaction, they were welcomed to add any items to their SMP considerations. This presentation will present the original priorities for resource managers and the changes that were made immediately following access to PPGIS social data.

Soheil Boroushaki, soheil.boroushaki@csun.edu, California State University Northridge. Entropy-based Weights for MultiCriteria Spatial Decision-Making. Geospatial multicriteria decision-making (MCDM) problems typically involve a set of spatially feasible alternatives that are evaluated on the basis of multiple and conflicting evaluation criteria that vary in importance to the decision-maker(s). However, often in complex spatial decision-making problems the decision-maker(s) may not be able, or not willing, to provide cohesive and exact numerical judgments regarding the relative importances or weights of criteria. Unlike traditional subjective weighting methods of MCDA, entropy-based object weighting scheme determines the weights for a set of criteria by quantifying the amount of information within the decision matrix and based on evaluation criterion values. Information entropy is a measure of the degree of disorder within a system. It can quantify the amount of expected and useful information content within criterion values and measures the contrast intensity among a set of spatial criteria. This paper will present the implementation of entropy-based weights within a vector-based spatial problem for calculating Heat Vulnerability Index with San Fernando Valley, California.

Dylan Brady, dbrady@uoregon.edu, University of Oregon. Rail Culture on the Amtrak Cascades: Ethnographic Notes. The scholarship on large-scale infrastructural systems has established that they are constituted as much by social as by physical components: without the skillful operation of personnel (and passengers as well), a railway is not a railway. In my doctoral fieldwork, beginning in the fall of 2016, I will be examining the ways that rail culture serves to produce and propagate a certain kind of national territory among riders of the Chinese rail system, one of the world’s largest and busiest rail networks. Part of this project involves conducting a traveling ethnography of Chinese rail on board the trains. In preparation for this research, I piloted my methods during my weekly commute between Portland and Eugene. This presentation will summarize my findings and critically reflect on the methodology’s strengths and weaknesses.

Barbara Brower, browerb@pdx.edu, Portland State. Wolves vs Sheep: France vs Western US. Wolves have reappeared in Europe and the western US following protections and programs introduced over the last several decades—to the delight of conservationists, and consternation of hunters and ranchers. Though sheepherders in the US and France share in consternation over the return of the arch-nemesis predator, the states and stakeholders differ in their responses. These commonalities and differences are manifest in perception, policy, practice, and the outlook for long-term coexistence with people and this charismatic, problematic predator. This presentation is a first effort to sort through the shared and
divergence reaction by sheepherders to wolves in the western US (particularly Wyoming and Oregon) and the southern Alps of France.

Margaret Bruckner, bruckner17@up.edu, University of Portland. **Novel Drone and Tethersonde Systems for Measuring Vertical Temperature Profiles.** Atmospheric temperature soundings obtained through use of radiosondes and radar techniques do not provide adequate spatial or temporal detail for analyzing important features like boundary-layer temperature inversions that can play roles in urban air pollution. This study therefore designed new inexpensive unmanned aerial vehicle (drone) and tethered weather balloon (tethersonde) systems for use in collecting detailed soundings of the lowest layers of an urban atmosphere. During a five week period in the summer of 2015, this study tested these systems in an area of Portland, Oregon, USA where residents often complain about air pollution, especially atop a bluff 40 meters above a nearby industrial area. Temperature and altitude measurements were collected by an instrument package suspended from the drone and tethersonde. Within 20 meters of the bluff top, all soundings display at least a weak (<0.5 Celsius) inversion, while some soundings include an inversion of 1 Celsius or greater. These inversions appear to play roles in local air quality. Applications of the methods this study developed and tested include democratization of vertical temperature profile data that a wide variety of stakeholders can collect at low cost to investigate air pollution events and other atmospheric phenomena in many areas worldwide.

Mario Bruzzone, bruzzone@wisc.edu, University of Wisconsin–Madison. **Punitive visualities: Seeing, and not seeing, US-Mexico border deaths.** A clear set of repeated images dominate both scholarly and media accounts of the US–Mexico border regime in a time of multitudinous unauthorized overland crossings. These are the desert, the wall, migrants’ belongings, footprints, and so forth. Some border scholars have argued that, in the context of this imaginary, the deaths occasioned by the border regime are “hidden”—that in fact state violence is hidden. Since the deaths are expected outcomes of the longstanding US government policy of “prevention through deterrence,” an imaginary that excludes death does political work. A second set of scholarship has thought of the US government tactics as presenting a border “spectacle” to legitimate state violence. Representations of the border as dangerous generate border militarism as socially necessary, within a US political system that values images over concrete policies. By contrast, I argue that the place of border deaths in the visual field of the border operate differently from both theses. It is not that deaths are (made) absent, but that they are present but not salient. This paper excerpts a longer argument on the visual economy of the US-Mexico border regime, drawing on—and to an extent reconstructing—Foucault’s provisional theorizations of the “punitive.”

Monika Puscher Calef, mcalef@soka.edu, Soka University of America and Anna Varvak Soka University of America. **Unequal distribution of human influence on fire ignitions in Interior Alaska.** Interior Alaska is characterized by extensive boreal forest that not only is responding to rapidly rising temperatures but also to human activity. This is most obvious in changes to fire frequency, intensity and extent. While human fire suppression has been reducing area burned near settlements and major highways, region-wide annual area burned has been increasing probably due to a warmer and drier climate, aging vegetation due to the logging history, and fuel build up due to past suppression. Analyses of future carbon emissions, risk to human life and property, and vegetation dynamics are based on the assumption of a homogeneous and pristine Interior Alaska. But we increasingly find that this is not correct. Therefore, we focused our analysis on the irregular spatial distribution of fire ignitions in proximity to human settlements and highways. We found that population, fire ignitions, and suppression efforts are concentrated in the Fairbanks area to an extent that this small subregion
influences regional averages. This indicates that the homogeneity assumption is not entirely correct but how do we account for that in future predictions and modeling?

Christine Carolan, ccarolan@uoregon.edu, University of Oregon. The limits of environmental justice in the context of a peace process: Examining environmental discourses related to natural resource management in post conflict Northern Ireland. Using the analytical framework of environmental justice, I describe inequities in the distribution of environmental goods, and the denigration of people, and place, in relation to ownership, and governance of the United Kingdom’s largest fresh water lake, and Northern Ireland’s (NI) main source of drinking water. An examination of the rhetoric employed by community groups arguing for better management of this water body reveals an absence of the discourses commonly used in environmental justice movements. This paper investigates this absence, and reveals that if activists hope to encourage cross community involvement in environmental activities in a region with ongoing ethnonational tensions, they are precluded from using the vocabulary of environmental justice. I describe how one organization has found a way to overcome these limitations by jumping scale, shifting the rhetoric from local issues, and the parochial politics of NI, to problems that have global resonance. In doing so this organization simultaneously seeks to improve cross community relations.

Carla Cerda, cerdac18@up.edu, University of Portland; Nicole Statler, University of Portland; and Amanda Adams University of Portland. Optimizing Rooftop Photovoltaics and Ratios of Solar to Vegetated Roof Systems. This study calculated optimal tilt angles for photovoltaics in the US Pacific Northwest using insolation data to account for clouds and multiple scattering. Using these results, we modeled the energy and monetary savings for vegetated roofs and roofs covered in varying numbers of photovoltaic panels, accounting for installation costs, loan costs, proposed carbon taxes, stormwater management discounts, and other relevant factors. In addition, we modeled the optimal ratio of photovoltaics to vegetated roof area for newer and older buildings, along with returns on investments. Our results quantify how, in the US Pacific Northwest and similar locations, photovoltaics produce higher return on investment than do vegetated roofs for new office buildings, while vegetated roofs produce a better return on investment than do photovoltaics for older buildings, whether used as offices or residences. This is important because in many areas, buildings have photovoltaics when a vegetated roof would have been more cost and energy efficient, while other buildings have vegetated roofs when photovoltaics would have been more cost and energy efficient. Potential applications include modifying incentive programs and other policies to properly account for building age, use, and other relevant factors to ensure building owners make the most energy-efficient decisions.

Heejun Chang, changh@pdx.edu, Portland State University; Hue Duong, Portland State University; Lumas Helaire, Portland State University; Stefan Talke, Portland State University. Urban flood risk management in a changing climate. Climate change is expected to shift the volume and the intensity of rainfall on earth. In the Portland metropolitan area, hourly precipitation intensity has increased in the past 20 years, increasing the risk of urban flood. Additionally, rising air temperature is likely to increase earlier snowmelt and the occurrence of rain-on snow events, which will further increase flows from upstream areas. Potential sea level rise is also expected to exacerbate the flood risk in the Portland metropolitan area as the area is under tidal influence. To address the potential impacts of climate change in urban flood risk management, we worked with the City of Portland practitioners and interdisciplinary scientists to create synthetic flow and sea level rise scenarios and simulate the effects of each scenario on flood risk in the City of Portland portion of the mainstem Willamette River using the Delft 3D model. The simulation results show that flood risk is more affected by the increase in upstream
flow rather than sea level rise. With explicit engagement of city practitioners, several possible alternative flood management strategies have been explored to mitigate urban flood risk.

**Michael Childers**, michael.childers@uni.edu, *University of Northern Iowa*. **Appropriate use in Yosemite National Park.** In May of 2015, base jumpers Dean Potter and Graham Hunt launched off Taft Point into Yosemite Valley. Within seconds of jumping, both men collided with a granite fin below and died. The tragedy of their deaths reignited the fight over the appropriateness of base-jumping and other such “spectacles” within national parks, particularly within Yosemite National Park. Yosemite’s history is full of debates over what are, and are not, appropriate uses of the park. Fights over issues as varied as the inundation of the Hetch Hetchy Valley to the cancelation of the Firefall have pit the park service’s expectations, based upon Frederick Olmstead’s suggestion in 1865 that Yosemite’s primary use be the contemplation of its natural scenes, against visitors’ changing recreational demands. Which in turn, further exacerbated the very real problems of growing visitation within the park. This paper will briefly trace how Yosemite’s earliest visitor experiences defined subsequent visitor expectations within the park, and how such expectations shaped debates over appropriateness of use within Yosemite National Park.

**Sandra Childers**, san2158344@maricopa.edu, *Mesa Community College*. **The Giant of Big House: A Brief Overview on Casa Grande Mountain.** For millennia, humans have been drawn to the peaks that they neighbor. Whether it was to consider them to be of great importance to their religion; to symbolize them as icons of their socio-economic status, or to conquer Mother Nature herself, humans have interacted with these higher elevations in such a way that it has shaped their cultural geography. In this brief overview of Casa Grande Mountain, located halfway between Phoenix and Tucson, Arizona, I will examine how humans have affected this beautiful landscape of the American Southwest and in turn how that landscape has affected them. By utilizing interviews with the local population, field observation, and document analysis, I will demonstrate the realities of the cultural landscape of this small and often overlooked site.

**Julie Cidell**, jcidell@illinois.edu, *University of Illinois*. **The role of local government in urban sustainability: evidence from Chicago and Melbourne.** Sustainability work is increasingly being done at the level of local government for three reasons. For one, national governments are failing to act on major issues such as climate change. At the same time, local governments are thought to be closer and more responsive to citizens’ needs and wants. Finally, local governments provide many of the services that are key to a more sustainable future, including waste removal, water and energy provision, land use regulation, and dealing with stormwater runoff. In qualitative research comparing Chicago, IL, and Melbourne, VIC, I found that these three motivations correspond to three conceptualizations of the appropriate relationship between citizens and local government. On the one hand, local government can play a major role in educating and engaging citizens in sustainability issues, especially when city staff consider an issue to be important that the community has not taken up. On the other hand, there may be citizen activists who are asking for change, and the city’s role is to respond to their requests. Finally, the city’s role as service provider means it may have the opportunity to make changes without citizen input, changing infrastructure and/or practices in more subtle but far-reaching ways.

**Jessie H. Clark**, jessieclark@unr.edu, *University of Nevada Reno* and *Jessie Clark University of Nevada Reno*. **Place and precarity in Turkey’s Kurdish conflict.** This paper examines the Turkish state-Kurdistan Worker’s Party (PKK) violence that began in July 2015 in Southeast Turkey (Northern Kurdistan) through the lens of critical place studies and the concept of ‘precarity’ (Butler 2006, 2009). I focus on Kurdish youth whose bodies became a symbolic focal point of the conflict, cast as the purveyors – whether as
“terrorists” or “freedom fighters” or “passive victims” – of a new chapter in an old story of ethnic violence. And, I focus on the urban neighborhoods where conflict originated. Political movements are formed at the dynamic meeting point between bodies and place. I explain how Kurdish youth are narrated in the media and how these stories conceal the reasons young people began building barricades in their neighborhoods in 2013. Rather, a critical focus on place – the place of conflict neighborhoods – situates and historicizes recent violence within the lived and spatially embedded experiences of displacement, economic and social dispossession, and political marginalization as they have unfolded over the last several decades. Historicizing and embodying the place of the neighborhood also fulfills feminist concerns to understand “corporeal vulnerability” (Butler, 2006) and how bodies and places are linked through common social, political and economic processes (Katz 2001). In “linking fates” (Hyndman, in Jones & Sage 2010), I carry forward Butler’s project that sees ‘precarity’ as an implicit part of being and a potentially powerful tool for working towards more just worlds.

Emma Colven, emmacolven@ucla.edu, University of California, Los Angeles. Understanding the Allure of Big Infrastructure: Jakarta’s Great Garuda Sea Wall Project. In response to severe flooding in Jakarta, a consortium of Dutch firms has designed the “Great Garuda Sea Wall” project. The master plan proposes construction of a giant sea wall to enclose the city, protecting it from coastal flooding. Over one thousand hectares of land will be reclaimed from Jakarta Bay in the shape of the garuda, a mythical bird and Indonesia’s national symbol. This land will be developed into a new waterfront city, promising to realize the world-class city aspirations of Indonesia’s political elites. Heavily reliant on hydrological engineering expertise, hard infrastructure, and private capital, the project reflects a contemporary trend in water management in which big infrastructure projects are becoming increasingly prominent. Drawing on fieldwork in Jakarta and the Netherlands, I examine the forms of universalized expertise, relations of power, and politico-economic forces that underpin, and generate institutional support for the project. I illustrate how the master plan is driven, and shaped by the localized context of Jakarta, in addition to a broader trend in water management in which private capital plays a central role. The prominence of big infrastructure projects therefore cannot be understood without attention to both the particularities of localized contexts, and broader politico-economic structures.

Presley Conrad, presleyconrad@nevada.unr.edu, University of Nevada, Reno. Effects of Light Pollution at Night on Birds. Light pollution can be seen from every angle on this planet. It’s visible when people look into the night sky and can no longer see the Milky Way. Outdoor lighting in parking lots and gas stations make these places twenty times brighter than they used to be. Although energy efficient light bulbs have are required in some places outdoors, roughly half the light used never reaches the ground. Birds are one of many animals whose biological patterns are influenced by lights at night. What once used to be a safe period to travel for birds has become more dangerous. Lights distract birds, causing them to collide with buildings, cell towers, or virtually anything lit up in the night, and many die as a result. Not only are bird migrations threatened, but their circadian rhythm has changed due to the diminishing darkness of night skies. This presentation examines the effects of artificial light at night on the migrations and circadian rhythms of song birds. Birds rely on the changes of lighting between night and day to migrate and sing in association with their secretion of melatonin. These natural processes are being disrupted by increasing light pollution.

Cynthia Davis, davic331@csu.fullerton.edu, California State University, Fullerton. How Temporary Communities Helped Anime Succeed in the United States. Anime, Japanese animation, started to fill a niche in the American entertainment industry as early as the 1960’s. Anime started to grow popular in these early years despite a complete lack of support from the Japanese animation industry. There was, and continues to be, a great amount of American fan involvement, with the creation of zines, VHS
distribution of shows, fan-dubbing, and convention organization. American fans eventually proved to the Japanese industry that it was worth the effort to officially distribute anime titles in the United States. In my thesis I am exploring the cultural differences between American and Japanese animation. In the early 1920s, American animation became focused on children’s entertainment. Meanwhile in Japan, animation adapted to a variety of roles. I am also exploring the role that fan anime conventions have in modern-day America. Fan conventions keep growing, despite the modern-day anime fan’s ability to access content and interact with like-minded individuals on the internet. Why do fans travel, sometimes great, distances to meet at conventions? What do they get out of attending a convention? What are these “temporary communities” that seem to form in convention and festival spaces?

M Kathryn Davis, kathryn.davis@sjsu.edu, San Jose State University. A Passion for Adventure: American Women Explorers, 1900-1940. During the first half of the 20th Century American women contributed to our store of geographic knowledge through their travel and exploration. Many traveled alone, some were sponsored by museums and even the American Geographical Society. Gertrude Emerson Sen traveled extensively in India, writing three major books. Delia Akeley spent 6 months alone with the Mbuti Pygmies of the Ituri rainforest in the Congo in 1926. Louise Arner Boyd, Arctic explorer, advised the U.S. military on Arctic strategy during WWII. In the 1930s she led several scientific expeditions to the Arctic and wrote three important books. Harriet Chalmers Adams traveled extensively around the world, and was one of National Geographic's most prolific writers and most popular speakers. They wrote articles, books, brought back thousands of photographs, and, in the words of Adams, "never found my sex a hinderment; never faced a difficulty which a woman, as well as a man, could not surmount; never felt a fear of danger; never lacked courage to protect myself." This paper is an exploration of the important work of these women and their fellow female explorers, and an argument for their prominent inclusion in the history of geographical knowledge and exploration.

Jhasmine Rae De Los Angeles, jdelosangeles@nevada.unr.edu, University of Nevada, Reno. The Effect of Colombia’s Civil War on Migration and the Country's Political Landscape. Guerrilla groups such as the Revolutionary Armed Forces of Columbia (FARC) and the National Liberation Army (ELN) have been in conflict with the Colombian government since the 1950s over land. While civil war has been ongoing for 60 years, peace negotiations offer the prospect of creating change. A historic cease fire between the FARC and the Colombian government may bring an end to a civil war that estimates to have displaced millions of the citizens of Colombia. One major effect of the civil war has been war-related migration, as many people have been displaced, forced to move to different parts of the country or even to different countries around the world. Based on information from peer-reviewed literature and from national and international organizations, this paper addresses the historical geographies of displacement and migration associated with the civil war as well as examines the contemporary situation of Colombia’s impending post-war political landscape.

Vincent J. Del Casino, Jr., vdelcasino@email.arizona.edu, University of Arizona and Lily House-Peters University of Arizona The Birth of the (Robotic) Clinic. In the first two decades of the twenty-first century, two of the most significant projects arising from the ‘big data revolution’ are the mapping and eventual synthesizing of the human genome and the associated emergence of precision medicine. These endeavors are only made possible by robots and robotic technologies, which have the capacity to not only collect, but increasingly to learn from massive amounts of data. We argue that such projects constitute a new era of medical possibility, one that Foucault was not yet prepared to interrogate. Using the framework of Michel Foucault’s Birth of the Clinic, we suggest that the future of medical and health geography is intimately tied to our robotic futures. Robots and robotic technologies not only enable and expand upon Foucault’s three spatializations, they also embody a new spatialization emerging from the
relocalization of the disease from the messy corporeal spaces of the human body to the crisp genetic and computer codes that are increasingly subject to medical gaze and intervention. Rather than interrogating the question of when robots will become integrated into our medical futures, we ask, how will they be further enrolled in and ultimately transform those futures?

Elvin Delgado, Elvin.Delgado@cwu.edu, Central Washington University. Achieving Energy Independence: Socio-Environmental Impacts Associated with Fracking Activities in Northern Patagonia, Argentina. This presentation explores the political economy of hydraulic fracturing in the Vaca Muerta Shale deposit in the Province of Neuquén in northern Patagonia, Argentina. In particular, this presentation studies the socio-environmental impacts associated with hydraulic fracturing in the region, especially the rural community of Añelo, where the large majority of the infrastructure to support fracking activities is being developed. In doing so, this presentation critically analyzes the socio-environmental consequences of fracking activities and political economic strategies used to control underground deposits in the region. By analyzing the relationships between national strategies to secure energy sovereignty, provincial government responses to adapt to these changes, and everyday lives of citizens in Argentina’s community of Añelo, this extensive, empirically grounded analysis will illuminate the myriad complexities inherent to issues of access to and control over unconventional deposits, the commodification of shale gas, and the socio-ecological impacts associated with their extraction in a changing energy landscape. The presentation is based on four months of intensive fieldwork in the summers of 2015 and 2016 in Buenos Aires, Neuquén, and Añelo and uses a mix of qualitative methods such as archival work, document analysis, semi-structured interviews, and participant observation.

Dennis J. Dingemans, djdingemans@ucdavis.edu, University of California Davis. Ernest Callenbach’s Ecotopia (1975): Biographical and Geographical Perspectives On the Making of A Utopian Vision. This presentation reviews origins and significances of the utopian novel Ecotopia. Callenbach’s life (1929 -- 2012) began in rustic Pennsylvania where his father farmed and taught Poultry Husbandry. At Hutchins’ iconoclastic University of Chicago for six years, Ernest (“Chick”) proved a provocative thinker. He pursued film studies and international political movements during a year in Paris. Transformative was his move to Berkeley in 1955 to edit a film journal and environmental publications at UC Press. Rejected by 20 publishers (“merely ephemeral ecological thinking”), Callenbach self-published. Ecotopia’s plot line portrays Bay Area places, the countercultural1960s, emerging 1970’s environmentalism, and the political turmoil of a de-colonializing world. Ecotopia embodies sustainable living with internalized values mandating recycling, energy-efficiency and non-polluting technologies. It is a tech-smart society with 20-hour workweek. Ecotopia’s secessionist movement was rooted in the economic and social identity of the tri-state Pacific Northwest. A feminist work as well as environmental, gender roles are in flux; a women’s party dominates internal politics and foreign affairs. An underlying question asks whether Callenbach anticipated society’s directions or whether Ecotopia, in selling a million copies, significantly advanced environmentalism as a social movement. The discipline of geography provides sympathetic context for this book in Vance’s 1972 “California and the Ideal” and in Meining’s 1979 “Symbolic Landscapes.”

Kevin Donohue, kdono2@pdx.edu, Portland State University and Rebecca McLain Portland State University. Wayfinding in the Cully Neighborhood of Portland, Oregon: Using Community Feedback to Connect People to Neighborhood Parks. Participatory mapping provides a qualitative approach for researchers collecting information about the built environment. Utilizing this data can help organizations fix existing systems or better inform future developments. By collecting community feedback using spatial data the researcher has an additional tool for further understanding the spatial connections between people, places, and groups. This research focuses on Portland’s Cully neighborhood and the
role participatory mapping played in the development of a wayfinding system for navigating to parks. Cully’s late addition to the city resulted in inadequate transportation infrastructure and connectivity issues throughout the neighborhood. Participatory mapping and wayfinding workshops provided important feedback on transportation barriers throughout the neighborhood and ultimately assisted in the design process of the wayfinding system. Cully’s transportation network still has many barriers and the hope is that tools like participatory mapping can help improve the neighborhood by providing safe navigation to parks.

Ted Eckmann, eckmann@up.edu, University of Portland. **Visualizations of Global Land-Cover, Oceanic, and Atmospheric Changes Using MODIS Data.** The Moderate-Resolution Imaging Spectroradiometer (MODIS) sensors aboard NASA’s Terra and Aqua satellites have covered the entire Earth multiple times each day since 2002 (for Aqua) and 2000 (for Terra). As their missions continue, these MODIS sensors have now amassed a record of global change well over a decade long, which deserves reexamination using present-day technology and computational processing power that was not readily available when the sensors first launched. For example, the static images traditionally employed to analyze MODIS data cannot adequately portray all the complex spatiotemporal phenomena present in the MODIS record. This study therefore developed new methods for high-resolution spatiotemporal interpolation to analyze changes on a variety of scales in cloud properties, aquatic chlorophyll concentrations, snow coverage, vegetation phenology, and wildfire behavior. The resulting visualizations reveal important phenomena for research in land-cover/land-use change, fire management, oceanography, ecology, cryospheric studies, and more. These results also demonstrate how the methods this study developed could produce similarly useful products from other satellite sensors.

Daniel Ervin, dervin@umail.ucsb.edu, UC Santa Barbara. **Twin Gods: A Mixed-Method Investigation of Diet Change in Latino Immigrants.** Many Latino migrants moving to the United States (U.S.), and rural-to-urban migrants in Mexico undergo significant dietary changes in their destination place. Migrants often eat more processed food, more prepared food, more meat, more dairy, and more sweeteners. This mirrors the ‘nutrition transition’ process that has unfolded across the developed world and is now occurring in developing countries. This presentation will review my dissertation, which measures the health effects of this dietary change among recent migrants from Mexico to California and migrants to Tijuana, Mexico. We examine the dynamics that contribute to diet change and diet related health outcomes in these populations through three distinct data collection methods: A survey, anthropometric measures of health, and stable isotope ratio analysis (SIRA) of hair samples as measures of corn, sugar, and animal product consumption. We examine the relationship between socio-economic indicators, demographics, immigration history, current living conditions, indigenous status, and diet with outcomes such as body mass index (BMI), waist circumference, blood pressure, and blood glucose. Initial results indicate significant relationships between personal characteristics and health outcomes.

Bryant Evans, bryant.evans@hccs.edu, Houston Community College. **Improving Water Efficiency on College Campuses.** Sustainability has become an important priority for many citizens and institutions across American society, and college campuses around the United States represent a microcosm of some of the initiatives taking place in the effort towards “going green”. Utilizing water in more efficient ways is often a strategic component of university sustainability programs. This paper explores a specific example of the movement towards more efficient usage of water within campus communities. The research behind this paper provides background on waterless and high-efficiency flush urinals located and utilized on college and university campuses around the United States. Various dimensions of waterless and high-efficiency flush urinal technologies are examined here. Survey results conducted
along with this study further reveal information about the implementation, use, and satisfaction levels related to these innovations specifically on campus settings.

Maria Fadiman, mfadiman@fau.edu, Florida Atlantic University and Michael Thomas, University of Hawaii. The Ngasech (First Born) ceremony: globalization and tradition in Palau. Although globalization affects cultures throughout the world, researchers are particularly interested in the current and historical influence of the United States on the Pacific Islands. This paper addresses results of outside influences in Micronesia, specifically Palau. Much of the research already written on this region focusses on the high rate of diabetes among islanders. This health issue relates to their food dependency on the United States. To survive the long trip, processed items are popular, such as canned meat like SPAM. This paper looks at the role of globalization beyond just food tradition, addressing cultural retention and what this means for the social and ecological environment of the Islands. One of the few customary ceremonies that the Palauans still celebrate is the Ngasech (First Born) ceremony, held after a woman has her first child. This paper look at the globalization of this ritual in relation to: plant use, attire, gender roles, economic transactions, ceremonial hut construction and the role of diaspora. The findings show that the myriad changes coupled with a deep rooted continuation of historical tradition, form a syncretic event demonstrating the fluidity of culture in today’s changing world, and the importance of these far reaching effects.

Tiana Fain, tiana.fain@student.csulb.edu, California State University - Long Beach. Desert Space, Place, & Art: Site-Specific Art Installations in California Desert Communities. Place-making has long been pivotal in terms of attracting tourism and development to desert communities. In more recent years, some desert communities are gaining notoriety for their collections of installation art. Installation art is different from most other art works in that they are often created to be site-specific. This makes the art heavily location-based and often incorporates the surrounding environment and local flavor into the piece, or inspire a theme for a series of pieces. A binary classification system will be used to organize the installations observed. Preferably, ‘formal’ will be defined as installations commissioned by local government or private organizations and placed through city planning commission decisions; while ‘informal,’ will be defined as the contributions by artists themselves on personal property or what has not passed through any city officials to be installed on the current site. The study area of interest will be communities in the Mojave and Sonoran deserts, within the state of California. This research is aimed at discovering place-making patterns that installation art may form for an audience of both tourists and local residents, as well as the effect it can have on local pride, tourism economies and overall area development and opportunity.

Ashley Fent, ashleyfent@ucla.edu, UCLA. The Politics of Defining the “Local” Population in a Zircon Mining Controversy in Casamance, Senegal. The literature on “scale jumping”—more generally around issues of environmental justice as well as specific cases addressing mining projects—shows that activists often “scale up” local resistance to incorporate international connections. Ethnographic research on a controversy over a proposed mining project in Casamance, Senegal, interpreted through a scalar structuration approach, amends this literature in two ways: first, the boundaries of the “local” itself are reshaped in the process of opposition; and second, the scale of the region has also come to be entangled in this process. The mining controversy became one way of articulating strained relationships between the (imagined) Casamance region and the Senegalese nation-state. The first part of this paper examines how activists strategically expanded the notion of the “local population,” drawing in villages throughout the district. The second half contrasts this strategy with how state actors and the mining company’s consultant “scaled down” the controversy, restricting the spatial imaginary of the mine’s environmental impact and the impacted population. Through various practices, the state reinscribed
divisions between villages and sought to limit the definition of the “local population,” re-opening a series of historical debates about land ownership, ethnic origins, and settlement.

Kali Fermantez, kdf5@byuh.edu, BYU-Hawaii. **Re-creational Regionalism: Polynesia at the Cultural Center in Hawaii.** The Polynesian Cultural Center (PCC) in Laie on the North Shore of the island of Oahu is one of the preeminent tourist attractions in Hawaii. Long an artifact of the Western gaze, the Polynesian culture region has been created and re-created in ways that highlight the arbitrary nature of regional boundaries. The PCC has not only redefined the culture region in specific ways since its establishment in the early 1960s as part of the tourism boom, but it has also reinforced popular representations of the region. This paper will analyze not only how PCC re-creates Polynesia for the tourist gaze, but also the ways in which island peoples themselves identify with and make meaning out of these regional boundaries.

Aquila Flower, aquila.flower@wwu.edu, Western Washington University. **Three Centuries of Synchronous Forest Defoliator Outbreaks in Western North America.** Insect outbreaks often occur synchronously across large spatial scales, but the mechanisms behind this phenomenon are not well understood. In this study, I use a widespread lepidopteran defoliator native to western North America—the western spruce budworm—as a case study to explore patterns of and causes for synchronous population fluctuations. Analyses of synchrony are typically severely limited by the short historical records available for many species. To overcome this limitation, I compiled multi-century dendrochronological reconstructions of western spruce budworm outbreaks from across much of the species' range. This allowed me to analyze synchrony at a sub-continental spatial scale over the last three centuries. I found statistically significant synchrony among regional outbreak records across much of the species' range and identified numerous inter-regionally synchronous outbreak periods. I quantified spatial and temporal associations between climate and inter-regionally synchronous outbreak periods using paleoclimate reconstructions. My results suggest that climatic variability has played a key role in synchronizing western spruce budworm population fluctuations in disjunct forests across western North America for at least the last three centuries.

Richard Francaviglia, francaviglia2002@yahoo.com, Willamette University. **Milestones in Mapping the Atacama Desert.** For nearly five centuries, the name "Atacama" has been used to denote a sparsely-populated, hyper-arid portion of western South America. This presentation showcases several key maps by cartographers from varied countries, including Spain, France, Germany, England, Peru, Bolivia, Chile and the United States. Maps prepared from the 1500s onward help explain the process of exploration, discovery, colonization, and exploitation. At first, the Atacama was designated as "Despoblado" (unpopulated), later becoming known as "el Desierto" in reference to its aridity. After about 1815, nationalism became an important force, and mapmakers working on behalf of Chile, Peru, and Bolivia played a role in delineating this desert. Scientific expeditions were especially important in articulating the Atacama Desert as a unique and mineral-rich region. Following Chile's victory in the War of the Pacific (1879-1884), that nation now controlled virtually all of the Atacama Desert. Map-making facilitated Chile's rise to prominence as Latin America's major minerals and metals exporter. Maps are also being used to help Chileans come to grips with the Atacama as a burial ground for "The Disappeared" (victims of the 1973 Pinochet coup d'etat).

Summer Grandy, grandy18@up.edu, University of Portland; Brooke Holmes, University of Portland; Zoë Shaw, University of Portland; and Georgia Hastie University of Portland. **Developing New Substrates to Improve Ecoroof Performance in the US Pacific Northwest.** Ecoroofs, also known as green roofs, provide multiple benefits for urban environments, such as reducing the urban heat island effect,
reducing and cleaning storm-water runoff, and aiding in reconciliation ecology. In 2009, The University of Portland in Portland, Oregon (USA) implemented an ecoroof atop a campus building comprised of a monoculture of sedum species. By 2014, the ecoroof had been outcompeted with invasive grasses. To improve ecoroof performance, this study designed three new substrates and planted five sedum species native to the US Pacific Northwest in each to determine optimal combinations for Portland’s climate. This two-year study monitored ecoroof performance by measuring soil moisture and plant spectra, and calculating vegetation indices including NDVI (Normalized Difference Vegetation Index) and SAVI (Soil Adjusted Vegetation Index). This study also developed a vegetation index to account for color variations in sedums called SGRVI (Sedum Green Roof Vegetation Index). Results show Sedum album in a soil with good drainage had the largest SGRVI increase during the study, indicating that this combination would be the most effective on ecoroofs in Portland, Oregon. Applications include improving ecoroof design in Portland and other similar climates, increasing plant survival and cost-effectiveness.

Steven Graves, steve.graves@csun.edu, California State University, Northridge. An Analysis of Officer Involved Shootings in Los Angeles. Nearly 400 people were shot by law enforcement officers in Los Angeles County from 2010 to 2015. An outsized number of the victims were young men of color, and in gangs; but a significant number were also unarmed, mentally ill or apparently very unlucky. A statistical analysis of the spatial distribution of these shootings is offered. Among the findings is a peculiar spatial mismatch between the location of African-American shooting victims and predominantly black neighborhoods, and a spatial mismatch between the pattern of officer involved shootings and the violent crime rate. The implications of these findings for media narratives surrounding racism within the LAPD and LA Sheriff’s Department are discussed.

Lisa M. B. Harrington, lbutlerh@ksu.edu, Kansas State University. Virtual rurality: Agriculture and the countryside in American popular culture. An affection for agrarian livelihoods and rural and small town environments has long been held by residents in many of the world’s ‘more developed’ countries, although the proportion of rural populations in these states has shrunk to a minority over the last century. Attachment to rural idea(l)s can be considered as attachment to (idealized conceptions of) a type of place. This paper provides illustrative examples of applications of conceptions of rural and agrarian ideals, described as forms of ‘virtual rurality.’ Based on literature, computer searches, data from the U.S. Census of Agriculture, and field observation, several forms of connection to rural environments or landscapes apparent in popular culture have been identified. These include rural and agricultural tourism, small scale farming and large-lot rural subdivisions, urban agriculture, farmers’ markets and community-supported agriculture, creation of housing developments around farm activities, rural-named housing and business developments, and naming and imagery associated with consumer goods (particularly food).

John Harrington Jr, jharrin@ksu.edu, Kansas State University. Precipitation Skewness: A Comparison of Marine and Continental Locations. The vast majority of climatology studies addressing precipitation have used measures of central tendency and variability statistics to characterize the nature of the phenomenon. As anthropogenic driven climate change continues and with more moisture present in the atmosphere, precipitation extremes are more likely. Examination of a frequency distribution histogram for precipitation indicates a physical limit; it is not possible to have a total less than zero. In continental climate locations, this physical limit provides a scientific rational for positively skewed distributions. But, the degree of positive skewness decreases as the time period of analysis increases from months, to seasons, to a year. In the marine climates of coastal Washington and Oregon, negative skewness occurs in the fall. This paper explores in greater detail the nature of precipitation skewness for climate divisions and individual weather stations in western Kansas and for coastal Oregon and Washington.
Southern Annular Mode drives multi-century wildfire activity in southern South America.

The Southern Annular Mode (SAM) is the main pattern of climate variability at mid-to-high latitudes in the Southern Hemisphere(1, 2) affecting wildfire activity which in turn pollutes the air and contributes to human health problems and mortality(3), and potentially has a strong feedback to the climate system through emissions and land cover change(4). Here we develop the largest annually-resolved tree-ring fire history network (Supplementary Table S1) of 1767 fire-scarred trees from 97 sites (from 22 to 54° latitude S) in the southern hemisphere to quantify the coupling of SAM and regional wildfire variability using recently created multi-century proxy indices of SAM for the period 1531 to 2010 AD. We show that at interannual time scales in seven (out of eight) study regions as well as at multidecadal time scales across the 37 to 54oS latitudinal gradient elevated wildfire activity is synchronous with positive phases of the SAM over the period from 1665 to 1995 AD. Positive phases of the SAM are primarily associated with warm conditions in these biomass-rich forests in which widespread fire activity depends on fuel desiccation. Climate modeling studies indicate that greenhouse gasses will force SAM into its positive phase even if stratospheric ozone returns to normal levels, so that climate conditions conducive to widespread fire activity in southern South America (SSA) will continue throughout the 21st century.

The Birth of the Robotic Clinic: An Archaeology of Algorithmic Medical Perception.

In the first two decades of the twenty-first century, two of the most significant projects arising from the ‘big data revolution’ are the mapping and eventual synthesizing of the human genome and the associated emergence of precision medicine. These endeavors are only made possible by robots and robotic technologies, which have the capacity to not only collect, but increasingly to learn from massive amounts of data. We argue that such projects constitute a new era of medical possibility, one that Foucault was not yet prepared to interrogate. Using the framework of Michel Foucault’s Birth of the Clinic, we suggest that the future of medical and health geography is intimately tied to our robotic futures. Robots and robotic technologies not only enable and expand upon Foucault’s three spatializations, they also embody a new spatialization emerging from the relocalization of the disease from the messy corporeal spaces of the human body to the crisp genetic and computer codes that are increasingly subject to medical gaze and intervention. Rather than interrogating the question of when robots will become integrated into our medical futures, we ask, how will they be further enrolled in and ultimately transform those futures?

Suburban occupation: constructing 'home' in West Bank settlements. There are currently an estimated half million Israeli Jews living in the occupied West Bank, in approximately 100 authorized settlements and another 100 unrecognized settlement outposts. While these communities are located in an area under military occupation and are surrounded by indigenous Palestinians fighting for their self-determination, residents give a surprising answer for why they have chosen to live here: it is a good, safe place to raise a family. At the same time, these residents experience frequent violence at the hands of local Palestinians, and seem to accept that terror attacks against settler families are inevitable. In order to address this apparent contradiction, in this paper I distinguish between four discourses, or conceptual frameworks, that settlers use to make sense of
themselves and their lifestyle in this dangerous place: Torah/Return, Pioneering/frontier spirit, Quality-of-life, and Jewish community and identity. Through these discourses settlers are constructing a sense of “home” in the occupied West Bank that seems to endure through the generations.

**Marissa Isaak**, misaak@email.arizona.edu, *University of Arizona*. **Is desalination good for the environment? Notes from Israel.** Desalination holds the promise of a reliable, high quality water source unaffected by changing climate or shifting geopolitics, thereby solving one of the world's most intractable problems: freshwater scarcity. Some environmentalists hail the techno-fix as the ultimate solution to water shortages and others call it a boondoggle that will destroy marine and coastal environments. As desalination plants are built around the world at an increasing rate, I ask: how can this singular technology raise both the praise and condemnation of self-proclaimed environmental advocates? Drawing on qualitative field work conducted in Israel, a country that has built the largest seawater reverse osmosis desalination plants in the world, in which I interviewed desalination policymakers, journalists, industry officials, and scholars, I chronicle how desalination came to be understood by the environmental community as more than an inevitable necessity. Today it is widely promoted by those with an environmentalist agenda as a way to protect fragile natural streams. The Israeli case can be understood as an ecomodernist testing ground, wherein an overwhelmingly techno-optimist population attempts to reconcile the popularly-accepted need for desalination and an environmental ethic.

**JERILYNN JACKSON**, jerilynn@uoregon.edu, *University of Oregon*. xxx. Glaciology models predict that Icelandic glaciers will lose 25-35 percent of present volume over the next fifty years, largely as a result of global climatic change. This development is increasingly visible on the south coast of Iceland, were locals strive to adapt to the changing landscape. Icelanders and glaciers have been interacting since the island’s settlement in the ninth century, and the south coast is one of the few places in the world where people live in extreme proximity to glaciers. Their history, culture, economy, relationships and conceptualizations with and of the landscape are deeply entangled with the ice. As such, this research reports the findings of 9 months of completed qualitative fieldwork in Höfn, Iceland, investigating glacier narratives in the region—in short, attempting to understand how glaciers matter to people and vice versa. This case study reveals the intensely human experience of glacier change at multiple scales, how conflicting spatial perceptions of climate change result in different local change narratives, and the critical implications of local narratives for understanding vulnerability, adaptation, and resilience within global environment change research.

**John Paul Jones, III**, jpjones@email.arizona.edu, *University of Arizona*. **The Work of the Non-Human in Scientific Visualization.** This paper extends our earlier work (Woodward et al., *Annals of the AAG*, 2015) on the role of technology in collaborative geovisualization by considering one of the first scientific representations produced by the Advanced Visualization Laboratory (AVL) at the University of Illinois at Urbana. The research project was an effort to understand how artists engaged with scientists in order to enable the invisible aspects of nature to become visible. In collaborations among a graphic artist, a computer scientist, and an agricultural entomologist, the small European corn borer larvae inserted itself into the technical evolution of visualization at AVL; its problematic nature also led to new understandings of how collaboration should work within and beyond the organization. As in previous work focused on AVL’s high-end visualizations of large data sets, here we deploy Gilbert Simondon’s concepts of technical objects and collective individuation to analyze the development of AVL’s corn borer simulation. The results show that collaborations can be inflected by the more-than-human dimensions they incorporate, as they have the capacity to transform such collectives through the unique problems they present.
David Kerr, dkerr@pyramid.net, University of Nevada, Reno. **Repeat Imaging at Fort Churchill, Nevada.** This project is an investigation based on the pen and ink drawings of Elwood Decker that were created May through October 1935 at Fort Churchill, Nevada. These images were drawn while Decker was a member of the Civil Conservation Corps (CCC) working on stabilizing and restoration the Fort. These drawings will be used as the base measurement for an observation of the change in the Fort’s landscape using repeat imaging. The intent of this project is to show how the landscape has changed under the last 80 years. This project will include: a brief biography of Elwood Decker; an analysis of Decker’s drawings to identify the physical location where the artist drew the images that will rely on USGS resources along with physical verification of the site. Once that location has been verified digital images will be taken. Followed by a comparison between the 1935 artist rendering and current digital images to discern changes in the geographical landscape. Repeat imaging is an important tool. From it we can learn how the landscape of the past has changed.

Cheryl King, cherylk618@gmail.com, California State University, Fullerton. **ADVOCATING FOR GEOGRAPHY LITERACY IN K-12 EDUCATION FOR COLLEGE AND CAREER READINESS IN GLOBAL CITIZENSHIP.** The challenge of coordinating geography classes in a K-12 setting is that the constituent elements are split artificially between two separate courses (physical and social sciences), which are never taught in conjunction. Unfortunately, finding a complete geography course in standardized education complicated because geography is interrelated with so many subjects and thus can easily find itself divided between a number of superficially similar topics. In this study, I will attempt to pinpoint geography’s ideal position in K-12 curriculum, and determine where and if the standards are being taught. Though current national standards are nonexistent and California state standards call only for geography to be taught to a level of “college and career readiness,” I argue that college and career readiness are substandard expectations and that we should be preparing American youth to become global citizens.

Marti Klein, mklein@fullerton.edu, California State University, Fullerton. **Remembering the Mexican-American War in Illinois.** Although the Mexican-American War of 1846-1848 (also known as the War of Intervention or, in the American Midwest, as the Mexican War) was fought in the "United States of Mexico," which at that time included California, very few Californians know that it took place, with the exception of a small minority who believe that California, and perhaps other states, were illegally seized by the U.S., and are still part of Mexico. In contrast, the war remains an important part of the collective memory in the American Midwest. Although their military regiments fought in the war, the ultimate outcome had little effect on the states in which they lived. However, it is memorialized in toponyms which are still used, by veteran’s groups which still exist, in numerous monuments, and in contemporary exhibits in prominent institutions. Perhaps cognitive dissonance, a psychological process involving rationalization to resolve inconsistencies between one’s thoughts and behavior – in this case, endangering one’s life for a cause which didn’t directly affect their states after the war -- caused them to become so personally invested that they needed to find ways to memorialize their contributions through veterans’ organizations, toponyms, and monuments which serve as permanent remembrances for future generations.

William A. Koelsch, wkoelsch@cox.net, Clark University (Emeritus). **The First American Geography Doctorate: A Detective Story.** William Koelsch, wkoelsch@cox.net, Clark University. The First American Geography Doctorate: A Detective Story. This search examines four late 19th century scholars who undertook graduate study in the late nineteenth century and are believed to have written geography dissertations before 1900. Using Sherlockian lens, I examine the evidence in detail and, using some
sleight-of-hand from the history half of my brain, I arrive at a solution that overturns claims made for eighty years in the literature of American geography.

Martin Lafrenz, lafrenz@pdx.edu, Portland State University; Catherine de Rivera, Portland State University; and Sarah Eppley, Portland State University. The Resilience of Oregon Salt Marshes to Sea Level Rise. No Abstract

Paul Loikith, ploikith@pdx.edu, Portland State University; Alex Sweeney, Portland State University and Benjamin Lintner Rutgers University. Characterizing Large-Scale Meteorological Patterns and Associated Temperature and Precipitation Extremes over the Northwestern United States using Self Organizing Maps. Ongoing and projected anthropogenic climate change is driving demand for climate information at scales relevant to societal and environmental impacts. Projecting climate at such scales presents modeling and computational challenges, especially in regions of complex topography and high climatic heterogeneity like the northwestern United States (US). This challenge is amplified when focusing on extreme events, which are often associated with the most severe climate impacts. Here we present a first step towards obtaining information at societally relevant scales, using existing observational and climate model data, by focusing on the large-scale meteorological patterns (LSMPs) associated with temperature and precipitation and their extremes at local scales. LSMPs are defined as patterns of atmospheric circulation in the lower, mid, and upper troposphere. By employing the method of self-organizing maps (SOMs), we demonstrate the ability to characterize the LSMPs associated with extremes in temperature and precipitation across the northwestern US in winter and summer over the last 35 years. In particular, we use SOMs to identify characteristic LSMPs (the nodes) for the Northwest and from the assignment of individual days to nodes, we relate extreme event occurrence to LSMPs. Our results suggest that the SOMs approach captures the range of circulation patterns and associated temperature and precipitation impacts for plausible physical reasons, especially in winter and for places most dominated by large-scale meteorology. This work lays the foundation for using SOMs to evaluate the fidelity of climate models in capturing the key circulation patterns associated with extremes across the Northwest in current climate and as a way to assess future extreme event occurrence under enhanced greenhouse warming.

Christopher Lukinbeal, chris.lukinbeal@arizona.edu, University of Arizona and Laura Sharp University of Arizona. Cinematographic Scale and the Topographer’s Gaze. In recent years research on cinema and cartography has burgeoned, focusing mostly on mapping film narratives, production, and reception. Less work has attended to the commonalities and differences underlying the two mediums’ visual structure. Responding to this second area of inquiry, in this paper we argue that, owing to the historical traditions of scale upon which the two mediums rely, the visuality and experience of each is fundamentally different. Scale can be characterized by three conceptual developments. The first was the use of scale as an embodied experience of an individual’s spatial relationship through understandings of size, distance, and proportion. The second was the application of these embodied experiences onto the social relationships of individuals with others through anthropometric measures to facilitate economic and cultural exchange. The third development was scale as a representational practice that transforms three-dimensional space into two-dimensional space. In this final conceptualization of scale the body has been completely removed, leaving only a disembodied and dehumanized edifice. Whereas cartographic scale derives from the more recent, dehumanized conceptualization of scale, cinematic scale is the product of the earlier and more embodied forms of scale.

Richard Lycan, lycand@pdx.edu, Portland State University. Maps in Excel. I do population modeling in Microsoft Excel and have long wanted to map my results in my spreadsheet. There are some add-ins
that let you do this, but these entail costs or require the user to access Arc GIS On Line. While searching mindlessly on line I discovered the website ClearlyandSimply which explains how to make maps from an ESRI shape file and provides demonstrations. Consider the example of a map of US state polygons for which you want to map population density. If you create a map of state polygons in ArcMap, you then can export the polygons as an EMF vector file and open that file as a picture in Excel. It happens that the labeling order of shapes for the states in Excel is the same as the user ID’s in ArcMap. This allows you to link (using Visual Basic code) the Excel shapes to a table that contains population density and to use those values to color the map. The presentation will illustrate how this is done and demonstrate its use in visualizing forecasts from Portland Metro’s Metroscope forecasting model.

**Casey Lynch**, caseylynch@email.arizona.edu, **University of Arizona.** Urban Technological Sovereignty and More-than-Human Political Collectives in Barcelona, Spain. At a summit of European city governments in May 2016, the delegation from Barcelona called for a “green and digital ‘New Deal’” for Europe, led by the cities and based on the principles of “technological sovereignty.” In a direct criticism of the neoliberal, techno-utopian model of “smart city” development, the notion of technological sovereignty critically reconceptualizes the potential role of technology in the city and in democratic processes, and challenges the reliance of cities and citizens on private technology firms. This paper explores how actors within the broader “technological sovereignty” movement in Barcelona, Spain understand the role of the non-human in constituting essential socio-spatial relations and processes—and in turn, how this understanding leads to a different kind of political praxis. I argue that the movement’s attentiveness to the constitutive role of non-human actors is integral to a political praxis that challenges overly-simplistic “dematerialization” and “deterritorialization” theses common in conversations around technology and space (Mitchell, 2003). Instead, technological sovereignty actors find in entangled human-technical relations a site from which to contest hegemonic power structures and imagine different localized urban futures.

**Eric Magrane**, emagrane@email.arizona.edu, **University of Arizona.** The Sonoran Desert: A Literary Field Guide. “Forget what you think you know about deserts—or field guides. This is something entirely unexpected and entirely necessary,” wrote John T. Price about The Sonoran Desert: A Literary Field Guide (University of Arizona Press, 2016). This hybrid book blends the form of bioregional literary anthology with field guide, melding art and science. It combines poetry and prose by more than sixty authors with species descriptions by editors Eric Magrane and Christopher Cokinos and illustrations by science illustrator Paul Mirocha. Meant to reach a broad audience around issues of biodiversity, place, and human-nature relationships, both its form and content are relevant to current discussions in the geohumanities. Magrane will share excerpts from the book, discuss the conception of the “literary field guide,” and point to its possible use as a pedagogical tool in teaching habitat studies, biodiversity, and place-based natural history courses. “A book of delights for the mind and spirit, this is what a field guide ought to be. What better way to truly see a place than through the unblinking eyes of literature? What better way to truly love a place than through the embrace of ecology?” wrote Kathleen Dean Moore about the book.

**Melanie Malone**, memalone@pdx.edu, **Portland State University.** A Critical Physical Geographical Analysis of Soil Quality in an Agricultural Setting. A variety of conservation trends have gained and lost favor throughout the years in agriculture, with U.S. Farm Bills often influencing what conservation practices are implemented by farming communities throughout the U.S. (Service, 2007). This paper focuses on the unintended consequences of conservation management techniques and programs in Wasco County, Oregon. Specifically, I seek to address how variations in the practice of no-till and direct seed have affected soil quality through the increased use of herbicide that has arisen with these
agricultural conservation management practices. In this paper, I focus primarily on the chemical component of soil quality, because the chemical component of soil quality is the most vulnerable to degradation by conservation practices in the county and is currently the most overlooked. An understanding of human contributions to soil-making is critical for resolving issues with conservation programs in agricultural systems (Engel-Di Mauro, 2014, Richter, 2007). Soil and landforms have no pre-determined destiny in the presence of humans and as such, soil acts as a historical record of management techniques (Swidler, 2009). Using a framing based in critical physical geography, I will address both the biophysical factors and social structure that have co-produced the soils in the county at present.

Sallie Marston, marston@email.arizona.edu, University of Arizona and Harriet Hawkins University of London. Geoaesthetics, feminist geopolitics and climate change. Climate change requires that we rethink the global order of politics; no longer can the illusions of hyper-separation and mastery persist. Climate change knowledge and action should, it is increasingly recognized, begin from an appreciation that humans are in and of the world, not on it. In response to the challenges this formulation poses for geopolitics, this paper builds a feminist geopolitics of climate change based on a post-humanist politics of the self. While there are many possible routes for a feminist geopolitics of climate change, here we follow Gibson-Graham and others in seeking a project of connection between humans and non-humans as the means through which to reconfigure the global political order. We build our project of connection by way of the geoaesthetics of climate change explored through the work of Cape Farewell, an arts organization dedicated to ‘instigating a cultural response to climate change’ primarily through the conduct of Arctic voyages that enable artists and scientists to travel to the polar regions. Our empirical materials concern both the Arctic experiences of artists as well as an analysis of exhibitions and participatory events they produced.

Rebecca McLain, mclainrj@pdx.edu, Portland State University and Zuriel Rasmussen University of Portland. You want what? Developing an interactive online mapping and survey tool for the Deschutes and Ochoco National Forests – Part 1. Thanks to the widespread popularity of interactive web maps, many organizations now want to use such tools to engage the public and collect data, even if they are not sure exactly what they want the tool to do, what questions should be asked, and how it would actually function to collect the desired data. This two-part paper describes the development of an online mapping and survey tool for collecting data about public values, forest uses, and ecosystems services in support of forest plan revisions for the Deschutes and Ochoco National Forests in central Oregon. We describe the pitfalls and lessons learned in the development of this data collection tool, a focus that is notably absent from the work of most participatory GIS scholars, who focus on reporting their results and analyses, but rarely describe in any detail their data collection methods.

Part 1 describes the intent of the public engagement process, wordsmithing the survey, how the survey questions linked to the mapping application, and the development of a protocol for the visually impaired.

John A. Menary, jmenary@csudh.edu, California State University - Dominguez Hills. Place Wars: Are Place & Resentment Redefining Urban-Rural Political Geography? Argued Neil Smith, “the construction of the new urban frontier... is a political geographical strategy of economic reconquest’. The strategy he identified as ‘gentrification’ would become equated with ‘colonialism. Gentrification serves as an example of a public policy aiding more than one social group but also impacting another. A central mechanism within numerous gentrification policies was ‘sense of place’. Cramer [2016] suggests a basic
sense of place and belonging to a community is now operating in rural communities but place is anchored by a political geography of resentment. Urbanormativity is being challenged by rurality claim some urban and rural researchers and policy-planners! However, such challenges have arisen before only to become opportunities. Now one difference with past urban-rural encounters is a political strategy to deploy the logic embedded in gentrification as a reasoning device. A goal is to refocus and relocate public discourse away from the urban malaise to focus instead on the suburbs, metropolitan areas, and rural areas. This paper examines the geographical significance played by ‘resentment politics’ and ‘resentful places’ in explaining this policy shift.

Kevin Mercy, kmercy@usc.edu, University of Southern California; Nolan Luevano, Su Jin Lee and Lynn Dodd, University of Southern California. Analysis of Spatial Characteristics of Freshwater Springs Using Geospatial Technologies. Catalina Island in California has been experiencing extreme drought so that Catalina Stage Three water rationing is being instituted. Hence, freshwater sources play an even more important role in sustaining Catalina Island. We collected reported locations of freshwater springs using Trimble Nomad GPS units and analyzed characteristics of terrain parameters, geology, and landscape (e.g., visible flora) using ArcGIS. Parameters such as elevation, slope, aspect, land cover, and geology were analyzed and provide preliminary data for an assessment of the relationship between terrain parameters and spring locations here. For instance, observations of flora, such as the presence of juncus (juncus acutus) and cattail (typha latifolia) are understood as indicative of surface water or spring location. Currently, ArcGIS is being used to delineate the watersheds in which the freshwater springs are located in order to better understand the relationship between spring location and flow accumulations in the watersheds within which the springs are situated. Along with the ongoing effort to identify locations of submarine groundwater discharge, these data assist in the creation of a fuller understanding of the water balance and hydrological systems on Santa Catalina Island; and moreover these data are valuable in modeling human settlement, past, present, and future, on this island.

Edward Miller, edwardmiller45@nevada.unr.edu, University of Nevada Reno. World War One’s Effect on the Physical Landscape of Verdun, France. The physical landscape of Verdun was drastically effected by the battle that took place there in World War One. The heavy amount of shelling scarred the land and unearthed limestone and spewed it on the undamaged areas. Heavy rainfall in that area during and after the battle contaminated the land and made it unusable. There also remains a large amount of unexploded ordinance that makes complete restoration challenging and rebuilding improbable. Today, much of the land is still uninhabited and several destroyed villages were never rebuilt because France considers Verdun unsafe for civilians, however, recent studies show that the soil in Verdun may now be safer and that restoration may be possible. This study will examine the long-lasting effects of the battle of Verdun on the physical landscape and the condition of the area today. Using existing research that examines the effects that the artillery shells had on the landscape of Verdun and at the soil quality in shelled areas with comparisons to unshelled areas, this study looks at the actions of the French government involving the land since World War One.

Olivia Molden, omolden@uoregon.edu, University of Oregon and Katie Meehan, University of Oregon. Moving Beyond Water Insecurity in the Kathmandu Valley: Springs, Spouts, and Nagas. As the Kathmandu Valley faces growing water insecurity, efforts to supplement and fix the water grid system come at the cost of existing water networks. Ancient spout systems, which date back at least 1,500 years, have become particularly vulnerable to urbanization. In addition to providing vital public water sources for some of the Valley’s most vulnerable, these spout systems are also important sites of cultural meaning and collective action. Drawing on analyses of survey data, interviews, archival
materials, and policies this research questions the contemporary use and management of stone spouts in relation to other water systems. From these findings, this paper argues that accounting for both the functional and cultural dimensions of water and water infrastructure are vital to ensuring mountain water security.

Heather Monteleone, hmonte1@csu.fullerton.edu, Cal State University, Fullerton. Assessing Archipelago Wolves: Risk and Viability in a Fragmented Landscape. Long regarded as one of the last frontiers of wild lands in the country, Alaska’s Alexander Archipelago is an expansive island chain with diverse and distinct animal populations found nowhere else on the planet. Old growth forests, a dynamic, rugged landscape, and genetic isolation have allowed for extensive speciation to occur in the region, ushering in conservation concerns over the resilience of species diversity in wake of reintroduced logging operations. This paper will analyze unique ecosystems of the archipelago by discussing the physical geography of the islands, the overall significance of the old growth Tongass National Forest, introduce challenges to island conservation, give a historical and current framework of Alaska’s timber industry on the islands, and analyze the interconnected population dynamics of the black-tailed deer, Odocoileus hemionus, and the Alexander Archipelago Wolf, Canis lupus ligoni, and how these keystone species are being negatively impacted by the resurgence of the Alaska timber industry. In an already heavily fragmented ecosystem, the Alexander Archipelago and its apex predator C. lupus ligoni faces unprecedented risk of extinction, which would be the catalyst for a detrimental trophic cascade in the entire island chain. Food chain dynamics and home range shifts are the major ecological challenges that are being reintroduced to the Inner Passage with the re-emergence of a large scale timber industry in southeast Alaska.

Monica Moreno-Espinoza, mm3725@humboldt.edu, Humboldt State University. Mediterranean Refugee Crisis: Italian Student Attitudes Towards Political Migrants. The recent influx of political refugees into Europe is an increasing global concern, particularly in states bordering the Mediterranean. This study investigates the attitudes of Italian university students towards political refugees. A total of 844 surveys revealed positive sentiment towards political refugees, strong opinions towards other EU countries’ responsibility for assisting Italy in aiding refugees, and mixed attitudes on other issues such as Italy’s capacity for refugees and governmental intervention of refugee flow.

Don Morrill, tahoemorrill@gmail.com, University of Nevada Reno. The Tangled History and Future of India’s and Pakistan’s Territorial Dispute over Kashmir. The province of Kashmir, located in the Central Himalayas has provided resources for the establishment of one of human history’s earliest civilizations. Throughout the recorded past, Kashmir has borne the effects of major religious movements, cultural shifts, and conquering armies from foreign and distant lands. In Kashmir, periods of prosperity and enlightenment have alternated with times of oppression and decimation. Presently, India and Pakistan, whose differing religious beliefs and a quarrelsome past, have aspirations of annexing and controlling the region. The possibility exists that tensions could escalate between India and Pakistan, who both have nuclear weapon capabilities, into a conflict of disastrous proportions. This paper examines this conflict, which is considered the second-most volatile worldwide territorial dispute, and is, at the very least, displacing hundreds of thousands of refugees and is contributing to global insecurity. Using a decades-old agreement on water rights between the two countries as an example, an end to hostilities could be reached offering hope for a vibrant and livable future.

Alexander B. Murphy, abmurphy@uoregon.edu, University of Oregon and Anna Moore University of Oregon Repositioning Central Asia: Moving Beyond the Western Geopolitical Imagination. Dominant Western (particularly Anglo-American) understandings of Central Asia’s place in global politics reflect a
geopolitical scripting of the region that casts it as a marginal, unstable space with the potential to destabilize surrounding realms. This scripting reflects a Western perspective rooted in a view of the region as one of potential danger, which can best be addressed through efforts to assert influence. This “danger-influence” trope is notably different from what might be termed the “opportunity-influence” view of the region emanating from China or the “security-influence” perspective coming from the Russian political elite. China’s Silk Road initiative in particular recasts Central Asia as a space at odds with the dominant Western geopolitical conception of the region; indeed it arguably encourages a broadened understanding of the geopolitics concept itself. Expanding on that idea, this paper draws on Heathershaw and Megoran’s (2011) argument that the Western/Anglo-American “danger-influence” trope reflects and reinforces a view of Central Asia as an “obscure, oriental, and fractious” place—terminological signifiers that have influence but that ignore fundamental dynamics at play in the region. Writings on Central Asia emanating from China and Russia draw on different signifiers to capture their alternative geopolitical scriptings of the regions. From the Chinese perspective, the operative signifiers might best be described as “disconnected, destabilizing, and potential,” whereas for Russia they might be “vulnerable, backward, and interconnected.” Understanding the interplay of signifiers emanating from different places, and considering what these generalizations reveal and what they obscure, is critical to understanding Central Asia’s contemporary geopolitical positioning and the challenges that positioning presents for the peoples living there.

Samuel Nowak, nowaks@ucla.edu, University of California, Los Angeles. The (Thin) Blue Line: Police and the Politics of Mobility in Los Angeles, California. During the 1990s, heavy and light rail development took on renewed importance in entrepreneurial urban governance, as American cities sought to cultivate a world-class image and promote transit-oriented real estate markets for urban renewal. Existing research in mobilities and urban political economy has well documented the ways in which this surge of rail infrastructure has been productive of, and produced by, unequal mobilities of race and class. Much less attention, however, has focused on the ‘politics of mobility’ in the regulation and policing of that infrastructure. Drawing on a case study of the Blue Line in Los Angeles, California, this paper examines the ways in which the regulatory environment of public transit—institutional logics, codified law, security systems, and policing practices—structures differential and relational transit mobilities. Through archival research, this paper shows that, concomitant with investment in rail infrastructure, the Los Angeles transit authority developed new mechanisms of social control to police the mobility of ‘risky’ subjects. I argue that these responses formed a new regulatory environment for transit mobilities in Los Angeles—one that relied heavily on law and police power to secure the new transit system in uneven ways, shaping the production of differential mobilities.

Kerri Jean Ormerod, kormerod@unr.edu, University of Nevada, Reno. Uncommon sense: the future of planned potable water recycling in the Southwestern United States. Despite public discomfort, long-term water planners increasingly consider proposals for potable water recycling safe, sustainable, and cost-effective. This article employs Q Methodology and Gramscian theory to identify the common sense preferences of stakeholders who participate in water recycling operations or planning in the U.S. Southwest. Two competing perspectives emerged from the analyses, which I describe as neosanitarian and ecosanitarian. Drawing upon tenets established in the Progressive Era, neosanitarians strongly believe that potable water recycling is a feasible and appropriate way to expand urban water supplies. Drawing upon tenets established in ecology, ecosanitarians are not opposed to potable water recycling, however they are also interested in radical alternatives to the sanitary status quo. Both neosanitarians and ecosanitarians want to see a more sustainable approach to water planning, yet they disagree on what a more sustainable approach actually looks like in practice. For example, neosanitarians favor
microfiltration and advanced wastewater treatment, while ecosanitarians prefer composting toilets and preventative actions.

**Elliot Pearson**, epearson@mail.sdsu.edu, *San Diego State University*; **Tom Herman**, *San Diego State University*; and **Stuart C. Aitken**, *San Diego State University*. *Exploring Diversity in an Immigrant & Refugee Neighborhood in San Diego*. In the course of publishing a community story map authored by a classroom of 11th grade students at a high school in San Diego, we found that students and community members expressed ambivalent thoughts and attitudes of varying intensity about their community. Unlike many other high schools in San Diego, all students in the classroom, and most at the school, were young people of color from diverse cultures (refugees and immigrants), with precarious and uncertain futures. In the classroom, students reported experiencing cultural diversity within their community as challenging, rewarding, and normal. They discussed formal and informal ways that they negotiate cultural differences at school and in their community, particularly with regard to language. As part of our project, students conducted interviews covering a broad range of topics, reflecting students' and community members' interests in education, food, safety, accessibility, community organizations, housing, identity, trust, employment, sports, hobbies, and hanging out. Many students reported that the process of story mapping introduced them to new ideas and perspectives, and produced a more holistic representation of their community than commercial media. Several have expressed a desire to continue the project as advisors themselves in another classroom in the near future.

**Roger Pearson**, rwpearson@alaska.edu, *University of Alaska Fairbanks* and **Gregory Weissenberg**, *Kenai Peninsula College University of Alaska, Anchorage*. *The Imperial Russian Imprint on Alaska Today*. 2017 will mark the sesquicentennial (150 years) of the transfer of Alaska from Imperial Russia to the United States. Historians have focused on two features that have marked the continuing presence of Russian influence on the geographic landscape of Alaska—international political boundaries and the Russian Orthodox Church. This paper examines those geographic features as well as a third feature—geographic place names or toponyms. A special emphasis will be on the place names of Alaska’s major volcanic arc which includes the Aleutian Islands and the Aleutian Range.

**Denielle Perry**, deniellep@hotmail.com, *University of Oregon*. *A Political Ecology of Federal River Conservation: 50 years of the Wild & Scenic Rivers Act*. Climate change and increased societal demands for water resources make ecosystem protection urgent. Rivers are particularly vital for sustaining biodiversity and human development. Nonetheless, rapid rates of freshwater species' extinction indicate current conservation practices are failing. Overall, less attention is directed at protecting ecosystems than developing water infrastructure for economic growth. This disparity is indicative of the 'nature as resource' versus 'conservation of nature' paradigm. Today, however, new attention is centering on conservation as a climate change adaptation strategy. Policies protecting rivers are recommended for contending with more intense storms and flooding, increased resilience for species, forests, and agriculture, and fostering some forms of water security. Creating, implementing, and managing adaptation policies will require a strong state presence in water governance, yet the nature as resource paradigm hinders conservation policymaking. Therefore, understanding how conservation policy has been negotiated, applied, and managed is critical to advancing climate adaptation policy. Drawing on spatial and temporal analysis of a GIS database as well as content and discourse analysis of archival research and semi structured interviews, this paper illuminates the drivers, priorities, and spatial dimensions of river conservation policy against the backdrop of the federal Wild & Scenic Rivers Act of 1968.
Brian Petersen, brian.petersen@nau.edu, Northern Arizona University. Reimagining Wilderness in the 21st Century. For some time now debates over wilderness have taken an acrimonious tone. Long a contested term, wilderness has both ardent defenders and staunch opponents. By the end of the last century a raging debate pitted those who viewed wilderness as nothing more than a social construction against those who, for various reasons, valued and supported the wilderness ideal. Although the debate simmers and a rift persists, constructive dialogue has not materialized. Despite this lull in the conversation, the questions regarding wilderness, ideological and practical, become ever more important as we move further into the 21st century. Bridging the divide requires a more nuanced view of the ideological positions of critics and supporters. To that end, this paper identifies variants within both constructivist and realist positions on wilderness. From this more nuanced understanding of the perspectives within each camp, the paper proposes three paths to reimagine wilderness to contribute to a more effective and ethical environmental practice. These include wilderness as a counter public, wilderness as a marker of social connection, and wilderness as a site of ecological justice.

Dusty Pilkington, pilkingtod@cwu.edu, Central Washington University and Megan Walsh Central Washington University. Two Holocene Fire Records at the Sagebrush Steppe/Ponderosa Pine Ecotone in the Wildland-Urban Interface, Eastern Cascades, WA. Washington’s wildland-urban interface (WUI) of the eastern Cascades is experiencing larger wildfire events. To place large fires into perspective, long-term fire histories covering the past 14,000 years are needed. The goal of this study is to evaluate climatic and human influences on Holocene fire frequency, with emphasis on the past 100 years of fire suppression. During the summers of 2012 and 2015, lake sediments cores spanning 14,000 years were recovered from Green and Campbell lakes in the recently burned sagebrush steppe environments of Okanogan County, WA, near Omak and Twisp. Macroscopic charcoal analysis is underway to reconstruct fire history by quantifying input rates of charcoal fragments in each lake. Green Lake results suggest high fire frequency from 12,000-8,000 calendar years before present (cal yr BP), with a decline from 8,000-4,000 cal yr BP. After 4,000 cal yr BP, fire frequency increased overall, but declined in the early 20th century with fire suppression. Green Lake’s frequent fires complicated separating charcoal peaks from background levels during the late Holocene. Preliminary results at Campbell Lake are similar to those at Green Lake, but with higher magnitude charcoal peaks relative to background levels, suggesting that further analysis will better identify fire events.

Brian Pompeii, bmpompeii@calpoly.edu, Cal Poly - San Luis Obispo. Unmet recovery needs in a creeping hazard: The Great California Drought in Tulare County, CA. The Great California Drought experienced between 2012-2014 was the driest period in the state in the last 1200 years (Griffin and Achukaitis 2014). As the most productive agricultural region in the United State the San Joaquin Valley, which includes Tulare County, is particularly vulnerable (Faunt 2009). Ninety-five percent of water usage in the SJV is used for agricultural purposes (Zelezny et al. 2015). A majority of this water-use comes from groundwater sources. Groundwater withdraw in the California Central Valley has significantly increased during recent drought years (2003-2010) (Famiglietti et al. 2011). The pressures of the drought are further magnified by regional climate change models that project that the “exceptional” conditions of the Great Drought are likely to increase in probability in the near future (Diffenbaugh et al. 2015). Social vulnerability in the SJV involves economies dependent on groundwater, a limited understanding of groundwater availability and usage, and a disparity between who is benefiting and who is neglected in the current water provision paradigm. In anticipation of future drier conditions in the SJV this project identifies the unmet needs of the most vulnerable populations during drought disaster response.

Michael Pretes, mjpretes@una.edu, University of North Alabama. Frederick S. Dellenbaugh: Geographer, Explorer, and National Park Artist. Frederick Samuel Dellenbaugh (1853-1935) was an
American explorer, artist, and geographer. He was (at the age of 17) a member of John Wesley Powell’s second expedition down the Colorado River and through the Grand Canyon, and was the first person to draw and paint the canyon from the river. Dellenbaugh was also part of the expedition party that set out to explore southern Utah, and that group (led by Almon Thompson) was the first to explore and name the last unnamed mountains and river in the United States. Dellenbaugh later painted the Grand Canyon and Zion, helping to promote these places as potential national parks. This paper examines Dellenbaugh’s contributions to painting, exploration, and geography with a particular focus on his national park art.

Sean Pries, sjpries@ucdavis.edu, University of California, Davis. Magic Marijuana Money Trees?. As the cannabis industry continues to grow, academic interest in the topic increases. A session at the 2016 AAG was dedicated to discussing how, where and by what means researchers are approaching the topic. The majority of studies focus on outdoor cultivation. Studies of the effects of guerilla growing on public lands dominate, but more research is needed on all aspects of the industry. What seems to be missing at this point, for obvious reasons, are case studies of growers that examine practices. This paper looks at the economic realities of indoor and green house cultivation on private property as well as chemical usage, power demands, water consumption, and perceptions regarding the impending legalization vote as reported by a small number of cannabis growers in and around Placer County. Cannabis growers operate in, and extract their livelihood from, a multi-billion dollar industry which functions in a legal gray area that places investments, income and personal freedom in constant, precarious position. Rather than an easy path to wealth, small-scale cannabis production requires growers to navigate a multitude of biological, technological, entrepreneurial and legal challenges.

Barbara Quimby, bquimby@mail.sdsu.edu, San Diego State University; Stephen Crook, San Diego State University; Karly Miller, University of California, Santa Barbara; Jorge Ruiz Linares, Universidad Pedagogica y Tecnologica de Colombia and University of California Santa Barbara; David Lopez-Carr, University of California Santa Barbara. Pier Fishing in Santa Barbara County: A Socioeconomic Study. Pier fishers are an often overlooked, and potentially vulnerable, fishing community along California’s coast. While they are active participants in the local coastal social-ecological system, they may be less integrated into regional outreach and management than other types of fishers due to their informal status. This lack of inclusion could contribute to public health issues and potentially undermine coastal conservation efforts. To address this, we have conducted an exploratory study of pier fishing in Santa Barbara County. This study examines the perceptions, practices, motivations, and characteristics of local pier fishers with data from interviews and surveys conducted at Goleta Pier and Sterns Wharf. We focus on four key areas: 1) who is engaging in recreational pier fishing; 2) what species are they targeting; 3) are they meeting a cultural, subsistence, and/or income need with their activities; and 4) what is their knowledge and perception of coastal conservation issues and policies. Preliminary results suggest that many anglers are traveling from outside Santa Barbara County, and targeting mackerel for personal consumption. This study provides novel insight into the informal fishing practices and potential health risks and food insecurity of Central Coast residents, that may help to inform coastal conservation and fishing policies.
Beyond the Banana Republic: African Oil Palm Cultivation in Honduras. Since the late nineteenth century, the political, economic, and social landscapes of Honduras have been dominated by the large-scale cultivation of tropical fruit, especially bananas, as well as the influence of the international corporations that controlled the "banana republic". One of the lesser-known legacies of this era was a concerted effort to supplement banana cultivation with additional commodities, with companies such as United Fruit investing heavily in agricultural experiment stations to research and field test a wide range of potentially valuable tropical crops, including the African oil palm (*Elaeis guineensis*). First introduced at the Lancetilla research station near Tela, oil palms have subsequently diffused along the North Coast of Honduras, supplanting bananas as the dominant agricultural commodity. This paper traces the introduction and diffusion of the African oil palm into Honduras from the first third of the twentieth century to its prominent role in the narrative of contemporary Honduras, with emphasis on the reshaping of cultural and economic landscapes on the North Coast. Oil palm cultivation is now a ubiquitous part of the landscape, linked to settlement, agrarian reform, political conflict, and emerging environmental concerns in the region.

Managing Urban Transportation using GIS. Planning, managing and maintaining roads and public transportation in urban communities can use up many resources. The use of a Geographical Information System (GIS) in recent years has become a valuable tool that can help with maintaining and managing roadways by keeping track and effectively displaying collected data. Within GIS, data can be used to create visuals such as tables, maps, or graphs. This paper examines the aspects of GIS that are important in modeling road system planning and maintenance. GIS is a tool that facilitates the analysis of spatial and non-spatial data, to support areas such as urban transportation planning and operation in an efficient manner. On a day-to-day basis, GIS is able to assist in managing such things as equipment use, maintenance, facilities, and routes. A study suggests that using GIS as a managing system can lead to improving the efficiency in managing road maintenance. This paper will examine how GIS is used in transportation, planning, management at a local level.

Building total system health outcomes through Indigenous on-country enterprises. Total system health is an emerging science field which applies a systems-based analysis of the social, political, cultural and ecological causes of health and disease problems. In this paper I report on a program of research in Northern Australia that is opening up new ways to build total system health outcomes from Indigenous-led environmental and biosecurity surveillance activities. These outcomes include building better knowledge systems to tackle contemporary landscape management issues, jobs for Indigenous people, and positive human health and well-being outcomes. This research program is engaged in innovative collaborations with industry, government and Indigenous communities across Northern Australia. It is focused on the design of employment opportunities, collaborative partnerships, and payments for environmental service schemes that can deliver healthy outcomes for the environment and for Indigenous people.

You want what? Developing an interactive online mapping and survey tool for the Deschutes and Ochoco National Forests – Part 2. Thanks to the widespread popularity of interactive web maps, many organizations now want to use such tools to engage the public and collect data, even if they are not sure exactly what they want the tool to do, what questions should be asked, and how it would actually function to collect the desired data. This two-part paper describes the development of an online mapping and survey tool for collecting data about public values, forest
uses, and ecosystems services in support of forest plan revisions for the Deschutes and Ochoco National Forests in central Oregon. We describe the pitfalls and lessons learned in the development of this data collection tool, a focus that is notably absent from the work of most participatory GIS scholars, who focus on reporting their results and analyses, but rarely describe in any detail their data collection methods. Part 2 describes the creation of a custom multiscale map for the forests, the issues associated with customizing the map application, and taking the map and survey applications offline.

Angela Sakrison, asakriso@asu.edu, Arizona State University. A Schizophrenic Clattering of the Jaws: Encountering Process Philosophy in the Nonhuman. Henri Bergson said that the present is “simply what is being made,” but what does it mean to be made differently in the era of climate change? If, as Deleuze argues, difference is not the departure from an original or model, but the manifest identity of a continually differentiating being, then how do we account for an undeniable sense of alteration when we encounter an ecosystem in crisis, a “ruined” environment, or a destroyed landscape? This paper responds to a call to uncover ways in “which the relational, processual, and affective materialities of space and place might be apprehended” (McCormick 2010) by examining an encounter with dying oysters in the “dead zone” of Hood Canal, WA. Warmer waters and ecosystem shifts led to a thinning of the oysters, and dead oyster shells that had developed three holes in the shape of screaming faces were arrestingly scattered everywhere. The rupturing presence of these oyster faces is used to consider whether or not there is room for “agents of destruction” (Colebrook 2016) or a concept of alteration within process metaphysics. This work illustrates how the nonhuman can communicate a different accumulation of difference, and our own role in the process of emergence.

Christiana Saldana, csaldan@calstatela.edu, California State University, Los Angeles. Loftification. If walls could talk, they would tell a tale of de-industrialization and social un-rest that led Downtown Los Angeles into a spell of poor equity, access, community and economy in the 1990s. The adaptive reuse of historical buildings was suggested by the Downtown Strategic Plan published in 1994 as a key strategy in combating these poor conditions. The reclamation of historical buildings to create new residential property was a priority, highlighted by the creation of the Adaptive Reuse Ordinance in 1999. Los Angeles as a case study exemplifies the unforeseen consequences of implementing laws that provide incentive to reutilize the valuable space historic buildings can provide. The renovation process has become simpler for property owners and proved to be a challenging situation for those who can no longer afford their once un-desirable home due to loftification. Loftification is the renovation of a historical building into a modern, up to code, mixed-use residential compound that exemplifies the combination of gentrification and preservation by marketing the historical façade to a new influx of economically specific consumers. This presentation will show that what is seemingly the restoration and preservation of historical resources, is little more than a refurbished form of the gentrification dynamic.

Zia Salim, zsalim@fullerton.edu, California State University, Fullerton and Ray Young, California State University, Fullerton. The Provision of Affordable Rental Housing by Nonprofits: An Examination of Orange County, California. Within California’s major metro areas, renters constitute nearly one-half of all households. The most serious and continual challenge for a majority of this market segment is meeting their high monthly rent payments - Census Bureau surveys reveal that 56 percent of California’s urban renters pay more than 30 percent of their monthly incomes for housing, a figure 10 points above the national average. This study examines the role of nonprofits in providing affordable rental housing in Orange County, California. We find that a small number of nonprofit developers and managers engage in providing affordable rental housing. Our results indicate that engagement of these nonprofits is typically small scale and highly localized, despite strong state policy mandates about municipal responsibilities for affordable housing. By comparing a number of nonprofit rental housing providers, we explore the ways
in which nonprofits act to assist rent-burdened households and the factors that hinder and/or help them. We conclude that an understanding of the role of nonprofits acting in this sector contributes to broader discussions of rent burden and affordable housing supply.

Katherine G Sammler, ksammler@gmail.com, California State University - Maritime. The Whale and the Kauri Tree: New Zealand Environmental Governance from Mountains to Sea. Aotearoa New Zealand has taken the lead in constructing legislative frameworks for governing emerging activities within the offshore territories granted under the UN Law of the Sea treaty. Passing the Foreshore and Seabed Act in 2004, the government claimed all submerged lands and associated resources as property of the Crown. This controversial law become a focal point for friction between two clashing worldviews: one embracing a western land/sea binary; the other based in indigenous Māori cosmologies, which do not recognize this division, but believe in customary rights from mountains to sea. Māori discourses of cosmology understand land and sea, human and more-than-human as coproduced and emerging relationally. This is demonstrated by the Māori origin accounts of whales and kauri trees as kin, the whale gave the kauri his oily skin as protection from the corrosive ocean, where they would be reunited. The ontological rift exposed by the offshore legislation fractured New Zealand society. In the midst of ambitions towards seabed mineral development, it forced reorderings of the ambiguous and unique legal seascape of English customary law, historical possession, and the Treaty of Waitangi. While this Act was eventually repealed, struggles continue over the status of ocean spaces and resources. This paper will engage alternative ontologies and environmental activism in the sea to suggest new possibilities for imagining and managing offshore spaces, seabed resources, and oceanic life.

Noriyuki Sato, nsato2@csuchico.edu, California State University, Chico and Ryan G. Miller California State University, Chico. Physical Geography for Our Reality: Preliminary Findings from a GE Course Redesign. Over the last 25 years, public higher education faculty in the United States have been forced to come up with cost savings. Despite apparent drawbacks, online technologies and delivery platforms have been key to delivering instruction affordably to increasing numbers of students. Even traditionally field-oriented subjects such as physical geography are facing increasing pressure to adapt to this model of higher education. The growing popularity of CSU Chico’s introductory physical geography course in the face of resource constraints has prompted our department to explore methods of adapting this course to a partially online environment. We present a case study of a hybridized physical geography lab which, while undertaken with some reluctance, may also hold benefits for student learning. By re-imagining the traditional two-hour activity section as a concise hour of applied, instructor-led activities in the classroom followed by an hour of self-guided reflective questioning deployed online, students may gain an enhanced understanding of various subject matters and subsequently perform better in the corresponding lecture section. We will present issues regarding the course redesign, our initial thoughts, intended goals, and upcoming assessment plans.

Annamarie Sawyer, annamarielsawyer@gmail.com, University of Nevada Reno. Can new transit plans affect the Spokane community by positively influencing economic development and sustainability?. The city of Spokane has had a 15.7% increase in growth of population from 1990 to 2000. Due to the growing population, Spokane’s region has had a 300% increase in traffic congestion since 1990. To provide for alternatives to automobile transportation, urban planners have turned to sustainable development. Sustainable development focuses on both the needs of today, as well as future generations by integrating environmentally sound and economically-feasible lifestyles. This paper focuses on the residents of Spokane, Washington who ride light rail train each day and their preference about whether the changes to the transit routes have helped economic development, as well as community development within the area, all while keeping sustainability within the new plans.

In 1959, oil was discovered in the Niger Delta region of southern Nigeria and production began soon after. Over the years, oil production practices of multi-national oil corporations and the Nigerian government would go on to aid the region’s environmental decimation. In particular, both entities may directly be responsible for the region’s demise. In addition, the Niger Delta is exposed to a serious geographic vulnerability: its intricate water stream network that can become further compromised in the event of a major oil spill. Prior acts have showcased negative effects on the environment which have resulted in the formation of militias and the outward migration of marine-life. This presentation will identify the initial primary key factors that have started the region’s environmental transformation. It will be achieved by pinpointing both the Nigerian government and oil companies’ primary involvement in this transformation. This research will uncover some of the poor governing and business dealings between both entities that has helped lead to the region’s distress. These findings will bring more awareness to corruption practices of both entities that continues to degrade the Niger Delta region.

Current Initiatives to Address the Effects of the 1913 South Africa Native Land Act.

The Native Land Act of 1913 resulted in land dispossession for the African Natives in 1913 by reserving the majority of South African land for whites or Europeans. The 1913 Native Land Act resulted in more long-term environment injustices than the mid 20th century apartheid laws. This Act was designed to retain African Natives on commercial farms, but as workers rather than owners. As a consequence, thousands of Native Africans became landless. In the mean time, commercial farming and agriculture were thriving. This paper examines how commercial farming, mining, and factories that whites and Europeans created as a result of the 1913 act degraded the land and contributed to extreme inequality, along with current initiatives designed to ameliorate these effects. For example, commercial farming practices had a negative effect on the soil and agriculture quality, but today the South African government has environment programs to clear alien invasive plants and restore ecological function to the environment along with providing jobs for the unemployed. Land tenure reforms are also ongoing, through land redistributions. So while extreme inequality and injustice still occurs today, much of it is a result of land confiscation and commercialization, efforts are underway to address these long-term environment injustices.

Cinematographic Scale and the Topographer’s Gaze.

In recent years research on cinema and cartography has burgeoned, focusing mostly on mapping film narratives, production, and reception. Less work has attended to the commonalities and differences underlying the two mediums’ visual structure. Responding to this second area of inquiry, in this paper we argue that, owing to the historical traditions of scale upon which the two mediums rely, the visuality and experience of each is fundamentally different. Scale can be characterized by three conceptual developments. The first was the use of scale as an embodied experience of an individual’s spatial relationship through understandings of size, distance, and proportion. The second was the application of these embodied experiences onto the social relationships of individuals with others through anthropometric measures to facilitate economic and cultural exchange. The third development was scale as a representational practice that transforms three-dimensional space into two-dimensional space. In this final conceptualization of scale the body has been completely removed, leaving only a disembodied and dehumanized edifice. Whereas cartographic scale derives from the more recent, dehumanized conceptualization of scale, cinematic scale is the product of the earlier and more embodied forms of scale.
Terry Simmons, terry@environment-lawyer.com, Center for Global Policy Studies. Military Geography of Terrorism on the Pacific Coast. Terrorism is not a single traumatic event. Terrorism is asymmetrical, attritional guerrilla warfare. On September 11, 2001, four large, jet fuel missiles, disguised as passenger airplanes, crashed into the World Trade Center, the Pentagon or a Pennsylvania field. Suddenly, the civilian population of the United States was at war globally with al-Qaeda, ISIS and other radical Islamic jihadist groups. No foreign troops landed on the beaches of Manhattan. Instead of conventional warfare, North Americans learned about shoe bombers, and barefooted TSA inspections. ISIS professional soldiers put San Bernardino on the terrorist map. In the last year, terrorist wannabes were convicted in Santa Ana, Sacramento, and Vancouver. One was killed before he could bomb a shopping center, and another died after he knifed fellow students at U.C. Merced. Students from U.C. Berkeley and San Jose State were murdered in Paris, Dhaka, and Nice. Radical Islamic jihadists are seventh century religious absolutists at war with the modern Moslem and Western worlds. Jihadists are vicious war criminals. The enemy relies upon fear, cowardly politicians, political propaganda, sabotage, and general uncertainty to weaken resistance. The challenges of risk assessment, tactical security measures, and counterintelligence are enormous. Terrorism is multidimensional warfare.

Logan Simpson, simpsonl18@up.edu, University of Portland; Samantha G. Wright University of Portland; and Joe L. Walker University of Portland. Analyzing Winds and Spatial Patterns to Identify Sources of Industrial Odors in Portland, Oregon. Residents in North Portland, Oregon (USA) frequently complain about industrial odors there but the Oregon Department of Environmental Quality has failed to clearly identify sources of these odors. This year-long study installed an automated weather station to measure winds in the area at five-minute intervals, and measured odors using methods from the American Society of the International Association for Testing and Materials. These standardized techniques also placed odors into categories such as "paint," "food preparation," and "exhaust." Results quantify how winds vary with season and time of day when industrial odors were observed versus when they were not observed, and show spatial and temporal patterns in these odors. Results show that paint odors were detected most frequently to the northwest of a facility that paints semi-trucks, almost exclusively when winds blew from the southeast, suggesting the facility is a likely source for much of this paint odor. Applications include information to mitigate industrial odors in the area by reducing emissions from the source, or altering schedules so that emissions only occur when winds would not push these odors towards the residential area. This study also created a framework for identifying sources of industrial odors that could be applied elsewhere.

Kira Smith, kirabrookesmith14@gmail.com, Portland State University. Perceptions of collaborative governance in the Klamath River Basin. Though all resource conflicts are unique in their perspective outcomes, actors, histories, and cultures, the Klamath Basin has been titled the ‘poster child’ of western water conflict because the struggles of its communities are indicative of those experienced by many west of the Rocky Mountains. The media attention and emblematic character of the Klamath “Water Wars” and the subsequent collaborative stakeholder processes make it an attractive topic of academic study. Recently published work by Berry, Horagic, and Wall (2016) investigate what factors determined stakeholder participation in collaborative management in the Klamath River Basin(KRB). Their findings suggest a range of variables play a central role in determining participation, including past experiences with negotiations and solidarity between communities who had experienced hardship as a result of water shortages. My research presented in this paper builds upon these findings by investigating participation in the context of the current political climate in the KRB and the concurrent changes in water management using discourse analysis of semi-structured interviews and secondary data sources. In addition to evaluating the current state of collaborative governance in the Klamath River Basin, I am
interested in placing these developments in the context of neoliberalization in environmental governance.

**Martin Swobodzinski**, swobod@pdx.edu, Portland State University, Department of Geography.

**Applications of immersive visualizations in geography.** Since the deployment of a first prototype in the 1960s, personal virtual-reality (VR) and augmented-reality (AR) technologies have been successfully deployed in various domains. The appeal and availability of VR/AR technologies to end consumers, however, remained constrained due to technological shortcomings related to visual fidelity, comfort, performance, and cost. Over the last few years, a new generation of personal VR/AR products has reportedly overcome most shortcomings which reignited discourses on the disruptive potential that these technologies bear regarding future interactions with digital media. Despite a significant increase of activities and efforts around VR/AR in the industry, systematic academic investigations into the effect of personal VR/AR technologies on the human experience are largely missing. Geographers, in particular, are well equipped to make significant contributions to the study of immersive visualizations. In this context, I report on a conceptual framework for a study that aims at assessing the capacity of personal, off-the-shelf VR/AR technologies for individual stress relief. I am optimistic that the study will evidence the large potential of immersive visualizations in recreational and therapeutic settings related to stress management and mental well-being.

**Jesse Tenenbaum**, jessetenenbaum@nevada.unr.edu, University of Nevada, Reno. **A Comparative Study of Linguistic Nationalism: Quebec, Canada and Catalonia, Spain.** There are many dimensions that contribute to create a national identity, but a key factor is language. Language is one of the most obvious markers of cultural, ethnic, and social identity. That being said, many nations do not have just a single language spoken within their territories. This paper examines two multilingual countries: Canada and Spain, and compares their language policies, especially the cases of the bilingual provinces Quebec and Catalonia. The dichotomy between urban and rural areas in each of these provinces is noted as a geographic influence on which languages are used where. Studies that have been conducted linking language use to feelings of nationalism are drawn upon. Parallels and differences between language policies, such as favoring the use of a specific language (or more than one language) for educational, judicial, and media purposes by the Canadian and Spanish federal and regional governments are highlighted. In addition, tensions or lack thereof – past and present - are addressed as they relate to regional differences based on language. This paper attempts to determine whether policy is an effective tool for preserving a unified national identity within multilingual states.

**Jenna Tilt**, tiltj@oregonstate.edu, Oregon State University; **Amir Sheikh**, University of Washington; and **Lee Cerveny**, US Forest Service Pacific Northwest Research Station. **Using Participatory GIS to Understand Outdoor Space Visitation Patterns.** We use a PGIS approach to gather data and analyze the relationship between residential location and public use of outdoor space. We collected data that reflected outdoor space visitation patterns from residents of King County, Washington by attending public markets county-wide. Participants completed a questionnaire to determine favorite outdoor spaces to visit; frequency of visits, duration of visits, and the activities they engaged in. Participants noted the cross-streets identifying their primary residence and placed stickers on a map to indicate favorite outdoor locations, allowing a measure of distance travelled. We found that residential location along the urban-to-rural continuum can influence the distance traveled to a public open space, the frequency of visits, duration of use, and the activities engaged in. By integrating our dataset with existing county datasets, we were able to relate overall visitation patterns with open space management. Kernel Density and Optimized Hotspot Analysis were also used to identify key clusters of favorite outdoor spaces and visitation patterns. Employing a PGIS approach provided new insights and
challenges to our data collection strategy, data analysis, and interpretation of the results. We will discuss lessons learned and recommendations for future studies and strategies to effectively communicate PGIS results to practitioners.

Ivan Townshend, towni0@uleth.ca, University of Lethbridge. Changing Segregation Dynamics of Two Vulnerable Populations in the Divided City: Canadian Examples. The Divided Cities literature has theorized new forms of sociospatial differentiation and rising socioeconomic polarization since the 1980s. In Canada, the “Three Cities” model of Toronto has captured some of these divisions based on changing incomes. This paper explores the segregation of two vulnerable populations (Seniors aged 65+, and Visible Minorities). The Dissimilarity Index (D) is decomposed to isolate each Census Tract and each region’s contributions to D, and investigate how the three “cities” are associated with levels of segregation in 1981 and 2006. It is hypothesized that both groups’ increasing ubiquity should produce declining levels of segregation overall, but that the economic vulnerability of each group may have increased their concentrations in income-declining (i.e. City 3) areas. Findings are presented for 8 metropolitan areas, with a focus on Calgary, Alberta. Results show that despite increasing ubiquity (compositional effect on segregation), levels of segregation for seniors declined, and levels of segregation visible minorities increased, in all metro areas. Results point to complex and changing roles of the “three cities” regions, in part supporting the divided cities literature, and in part illustrating that new post-1980s suburban areas are crucial for understanding the new geographies of seniors and visible minority segregation.

Susan M. Walcott, smwalcot@gmail.com, University of North Carolina Greensboro. Tweed and Silk: Economic Globalization and Commodified Identity. Textile production displays cultural and economic processes, examined in this study of contemporary global connections of Harris Tweed mills on the remote Isle of Lewis once owned by Opium War taipan James Matheson. Viability of legally mandated home looming – an important cultural icon - rests with one mill selling mostly to China, one selling primarily to Japan, and another surviving on Chinese Outward Foreign Direct Investment. This study examines the modernization role of the textile industry in these and three more Asian countries to discuss the impacts of agency, structure, and globalization shifts on their development. Methods including archival research, site visits and interviews examine how transition from traditional ways to technological modernity, came full circle from initial industrial innovation begun in Britain, carried westward via emigration and imperialism, and led to the contemporary rise of Asian outward investment targeting iconic declining firms in the West.

Suzanne Walther, swalther@sandiego.edu, University of San Diego. Project-based GIS for undergraduates: a synthesis of geographic learning. Project-based learning provides an opportunity for students to apply their skills to solving a problem for a local group, entity, community, or organization. Through a project-based second semester GIS course, students have contributed to collecting, mapping, quantifying, and monitoring data for a variety of State, municipal, and private organizations. The course is divided into thirds, consisting of 1) new skill development, 2) a group project, and 3) an individual project. The projects vary and are selected based on networking and opportunities that arise. In three years of teaching the course this way, students have engaged in projects with the following: Utah Geological survey, Utah Rivers Council, City of San Diego, and University of San Diego facilities management. In each case, the product of the student’s efforts has been published or used to further policy, in restoration efforts, and for the assessment of regulation compliance. For most students, the opportunity to be a part of something “useful” and contribute to something “meaningful” is a key part in pushing themselves and their knowledge and skills, and in raising their confidence. This course will
continue to develop, maintaining a project-based design, and incorporating new opportunities and possibilities for service-learning.

**Emily Webb**, emkatwebb@yahoo.com, *California State University, Sacramento*. **Reconstructing Climate History in Northern Sierra Nevada.** The lakes of the Sierra Nevada are critical gauges of climate change, mirroring fluctuations in temperature and precipitation regimes. They are also time capsules, storing records of past climatic changes in their sediments. Analysis of lake sediments can reveal how natural systems responded to past droughts. This study examines sediment cores from Silver Lake and Gold Lake, part of the Feather River Basin. Methodology includes a gravity coring device, charcoal counts, magnetic susceptibility, and loss on ignition techniques. Results show increases in fire activity and lake surface temperatures that may represent a period of warm and dry conditions known as the Medieval Climate Anomaly. Radiocarbon dating links a significant local disturbance to the last “megadrought” in California, approximately 1350 AD. This study and other climate reconstructions provide crucial insight into what we can expect as California faces the possibility of another prolonged drought.

**Denis White**, capeblanco@peak.org, *Oregon State University*. **A Philosophical Analysis of Ecological Regions.** Many systems of biophysical regions have been developed over the years dating back at least to Herbertson’s “natural” regions of 1905. In recent decades many such regional systems have been called ecological regions. Because there are many approaches it is useful to understand how they differ philosophically in purpose, defining criteria, methods, and validity, as well as in their applications to problems. Basic philosophical questions about ecological regions include the following. Do such regions exist, or are they mental constructs? Are ecological regions unique objects, or instances of general laws or patterns? Should ecological regions be determined deductively from general principles, or inductively from data and map patterns? Are ecological regions made of biophysical processes that can be analyzed as separate components, or are they holistic objects or concepts that are more than the sum of their parts? Should ecological regions include the effects of human actions? Systems developed by Holdridge, Bailey, Omernik, Hargrove, and Sayre are analyzed and compared.

**Claire Wieszczyk**, cgwieszczyk@gmail.com, *Pacific Gas & Electric and TJ Houle, UDC Inc*. **Integrating ArcGIS and SAP for the Utility Industry.** The value of geospatial analysis and GIS applications in providing quality integration between enterprise asset management systems. Post-project dissection of initial integration between an enterprise management system, SAP, and a newly implemented GIS. This paper will discuss the following topics: referencing existing SAP Asset Registry for data validation, updating of the GIS data model to align with SAP attribution and data collection, and prioritizing data quality over number of assets integrated to limit disruption of work in production system.

**Katherine Williams**, katherine.williams@oregonstate.edu, *Oregon State University*; **Kelly Biedenweg Oregon State University; and Lee Cerveny US Forest Service Pacific Northwest Research Station; Deconstructing recreation for its values.** Most environmental conflict stems from opposing values ascribed to a place; thus, understanding the values and uses associated with natural areas is critical for long term, sustainable management. For this reason, values mapping is commonly used in natural resource planning. Recreation is an oft-cited value people attach to natural areas. However, recreation itself is not a value by psychological definition. This study seeks to identify which values are associated with the concept of recreation to better inform natural resource planning. Students in 2 natural resource courses at Oregon State University, students at Western Carolina University, and trail users at Bent Creek Recreational Area were given maps of their area. Along with providing demographic information, participants marked 5 places they found meaningful on the map and indicated values they
attributed to each selected location based on a set list. Participants were randomly assigned either a list including recreation as a value or one excluding recreation.

Randall Wilson, rwilson@gettysburg.edu, Gettysburg College. Yellowstone as America’s Backyard. Why is it that time and again Yellowstone stands at the epicenter of our national debates over nature? Since the late 19th century, this far removed place has consistently served as our national backyard; a public meeting place where we hash out our questions, feelings and differences regarding nature. This paper employs the concept of place making to document and explore the evolution of Yellowstone from a distant landscape into a national icon that has profoundly shaped environmental conservation in the United States.

Lydia Wood, lydpw86@gmail.com, San Diego State University / University of California, Santa Barbara. Rejecting ‘damage-centered’ narratives: Indigenous Youth Articulations of the Health of their Communities. San Diego, the ancestral territory of the Kumeyaay people is home to a diverse Native American urban community and twenty-three reservations. Centuries of settler-colonialism have not only diminished Native American communities’ connections and access to ancestral territory, but have also led to a range of well-documented health struggles, from diabetes, to poor mental health associated with historical and intergenerational trauma. While there have been many studies exploring the health outcomes of Indigenous communities and that connect these outcomes to colonization, few studies have tried to understand health from the perspectives of Indigenous youth. In this presentation I discuss the findings from my ongoing research that examines the social, historical, and geographic factors that shape Indigenous youth health and well-being in San Diego. In particular, I explore the apparent paradox between public health statistics and Indigenous youth articulations on the “health” of Indian Country. I discuss the ways in which “damage-centered” approaches to understand Indigenous health perpetuates deficit narratives that haunt Indigenous youth and reinforce the precarity of their everyday geographies (Tuck 2009, 416). Furthermore, these deficit narratives obscure the survivance of Indigenous communities and the vital role that youth have in creating hopeful spaces that nurture well-being and health for themselves and their communities.

Keith Woodward, kwoodward@wisc.edu, University of Wisconsin-Madison; Emma Lawlor University of Arizona; Casey Lynch, University of Arizona; and Carley Nichols University of Arizona. The Metaphysics of Constitution. Among theoretical and critical geographies of the past half-century, no notion wields more power – and more ambiguity – than “constitution.” Already a common term in regionalist formalism and Marxist socio-spatial dialectics, it became central to the discipline’s critical language during its feminist and epistemological turns, for which discourse constituted not only regimes of knowledge and their attendant powers, but the very ground of subjectivity. The more recent return to ontology has used the notion to fuel questions about the nonhuman, affectivity, assemblages, sites, object relations, and so on. Yet, almost without exception, these many lines of inquiry have taken the nature of constitution itself as granted. If it has fruitfully oriented multiple regimes of epistemological and ontological inquiry, “constitution” has done so while remaining largely vague and undefined. In this paper, we consider constitution as a metaphysical problem in its own right for geographical and social theory. In so doing, we seek to shift it from its status as a pre-theoretical “given” to a properly theoretical concept. For past geographies, constitution has offered a spectrum of implicit meanings. Here, we offer a differential account that retains the concept’s utility in a range of metaphysical contexts, but introduces the necessity of articulating its theoretical contribution and limits in each instance.
Scott Wright, scott.s2hf@gmail.com, University of Nevada, Reno. **Alternative Design and Planning Systems: A Comparison of Burning Man and Permaculture Design Principles.** This paper compares and contrasts two alternative design and planning systems: Burning Man’s Ten Principles and Permaculture’s Twelve Principles. Both Burning Man’s and Permaculture’s principles were created to guide people through an interpretation of a consciously laid-out set of guidelines. Nonetheless, Permaculture’s principles were created for landscape design and Burning Man’s principles were crafted for cultural involvement as a member of society, and both sets of principles were generated at different time periods on different continents. The similarities and differences between both principles will be evaluated along with their origins and dispersal throughout the world. Both the principles of Burning Man and Permaculture are being applied at different scales and both individual sets of guidelines are often loosely interpreted, generating the notion as to what degree each guideline is used and how that can create similarities or contradictions in their connections to one another. Joining these two sets of principles will allow us to see whether or not they can be used together in their involvement in planning as a whole, from site specific to regional and beyond.

Wei Yang, yang474@usc.edu, University of Southern California. **Spatial and Temporal Analysis of Depression among Twitter Users.** Depression is one of the greatest challenges facing public health experts and the general public. Major depressive disorder is the most common type. Few research analyzed spatiotemporal patterns of depression, such as climate zones, holiday versus non-holiday, day of week and hour of day due to the limitations in traditional data collecting methods. An advanced text mining algorithm – Non-negative Matrix Factorization was adopted to detect tweets related to depression from more than 300 million tweets in half a year time period in the U.S. Geospatial methods, threshold search and statistical methods were leveraged to analyze the spatiotemporal patterns. We found significant spatial clusters depression rates at county level. The risk factors of depression are different and varied geographically. The expected values of depression rates are significantly higher during holidays, nights and the first half of a week with an interesting recliner-shaped temporal pattern. Our analysis provides a valuable alternative approach to health study, overcomes shortcomings in traditional data collecting methods, and reveals spatiotemporal patterns and variations that might be overlooked. The proposed approach semi-automatically predicts depression before its onset. Furthermore, the study can benefit the general public in early disease detection and prevention in near real-time.

Terence Young, tgyoung@cpp.edu, Cal Poly Pomona. **Yosemite and the Origins of America’s National Parks.** Most scholars identify Yellowstone as America’s first national park because Hot Springs was a reservation and not scenic while Yosemite, in the words of John Ise, was a “sort of state park.” I do not disagree with this characterization of Hot Springs, but grounds exist for debating the role of Yosemite. In 1948, Hans Huth argued that it was the Yosemite Park, ceded to California in 1864, rather than Yellowstone, that was the first public natural park of national significance. In Huth’s view, it “would have been something of a miracle” for the idea of the national park, purportedly born in September 1870 during the Washburn-Doane expedition to the Yellowstone region, to have resulted in the Yellowstone park by March 1872. Instead, he argued, the earlier setting apart of Yosemite had conditioned public opinion to the idea of national parks. In this presentation, I will build on Huth’s contention by arguing that in addition to fostering the idea of national parks, Yosemite’s initial level of protection and subsequent management were inadequate to the task of nature protection, creating the conditions that fostered the emergence of a federally-run, rather than state-run, series of national parks.

Yolonda Youngs, PhD, younyolo@isu.edu, Idaho State University. **Historical Geography of National Parks: New Approaches to 3D Visualizations of Cultural Resources in Grand Teton National Park.** This
paper presents the early research findings of a project that offers innovative ways to blend historical geography with 3D visualization techniques to preserve, document, and interpret cultural resources and museum collections in national parks. Through a collaboration between National Park Service (NPS) museum and cultural resource staff, Native American Tribal Representatives, and university faculty and students, our team created a series of high-resolution 3D scans of Native American ethnographic objects in the David T. Vernon Collection from Grand Teton National Park, Wyoming. The collection of 1,416 objects includes representations of social and cultural objects used by tribes across America created from 1830 to 1940. By creating 3D scans of a sample set of these objects, we are initiating a new phase of interpretation and preservation for these objects, opening novel avenues for extending their display beyond traditional museum exhibits, and providing greater public access to rare and valuable pieces of cultural and human history in our national parks. The project builds upon collaboration with affiliated Native American Tribal to connect the geographic and historical context of objects with their tribes. Project funding provided by the NPS National Center for Preservation Technology and Training Award #P15A00095.

Yi Yu, yutouyuyi1990@gmail.com, University of Oregon. Institutional Mother, Professional Caregiver—The Biopolitics of Affective Labor in State-owned Social Welfare Institutions in China. Over the past 20 years, international non-governmental organizations (INGOs), specifically adoption agencies, have brought attention to the large number of orphans (525,179 in 2014) raised in Chinese social welfare institutions (SWIs). INGOs engage in various initiatives in collaboration with SWIs to “produce” orphans who are desirable for transnational adoption. Instead of focusing on the orphans, however, INGOs have directed their attention to female caregivers, closely managing their practices and instructing them to assume the role of mothers. As a result of these processes, a form of institutionalized motherhood has become embedded within the conditions of employment for professional caregivers, challenging caregivers to develop emotional connections with orphans, while still maintaining boundaries. By gathering ethnographic data from caregivers in various SWIs, INGOs, and national and local state agencies in China, this research explicates the intersection of the affective labor and certain techniques of power. In this case, the dual subjectivity is co-constructed under the state-INGO nexus, where institutional mother and professional caregiver coexist with, and contradict each other. This research contributes to the geography of transnational adoption, the global care chain, state-INGO nexus, and the affective labor in contemporary China.

POSTER ABSTRACTS

Gabriella Alvarez, galvar02@calpoly.edu, California Polytechnic University, San Luis Obispo. A Patchwork of Assistance: Tulare County’s Response to California’s Historic Drought. California is currently in the fifth year of the state’s worst drought of the last 1200 years (Griffin & Anchukaitis, 2014). The lack of a satisfactory snow pack in the Sierra Nevada mountain range for the past four years has left much of California susceptible to both water quality and quantity issues (CADWR, 2016). With the dissipation of the anticlimactic El Nino event and the forthcoming La Nina, conditions can be expected to worsen. California Governor Jerry Brown declared a state of emergency in response to the drought on January 17, 2014, but efforts to conserve water since then have been minimal. Perhaps no other place in California has been more adversely affected than the agriculturally rich Central Valley region. In Tulare County alone, a reported 1,562 domestic wells have failed since reporting began in August of 2014 (Tulare County, 2016). Our research focuses primarily in East Porterville, a small unincorporated community that is largely occupied by socially and economically marginalized groups. It
has been shown that unincorporated communities are particularly vulnerable with regards to environmental hazards. This poster addresses how a network of state and local governments, as well as non-profit organizations have collaborated in response to the drought in Tulare County. Additionally, we explore their successes and shortcomings in combating community vulnerability.

**Gregory Beringer**, gberinger@csu.fullerton.edu, *California State University, Fullerton*. Using GIS to create personal connections: The History of the U.S.S. Sevier and crew member, Richard Hamilton PhM3c. For families of veterans, especially those who are now deceased, there is often a gap in knowledge concerning the travels of their loved ones while they were off to war. Recounting the events of their service can be painful and often impossible for many veterans, and for those who have now passed, only official documents and personal journals are left. The objective of this project was to geovisualize the journey of one World War II (WWII) United States Naval vessel and one of her crew (my grandfather) to help family members understand all the places he traveled to before the age of 21. Using GIS, the official ship’s history of the U.S.S. Sevier, APA 233, and the personal journal of Richard Hamilton a map was created showing every stop the attack transport ship made during its service in the Pacific theater of WWII. The resulting map has evoked many emotions that confirmed the hypothesis that maps created from the personal accounts of a service member can create a connection with family members and a now deceased veteran.

**Chelsea Canon**, canon@nevada.unr.edu, *University of Nevada, Reno*; **Douglas P. Boyle**, *University of Nevada, Reno*; **Scott D. Basset**, *University of Nevada, Reno*; **Benjamin J. Hatchett**, *Desert Research Institute*, and **Christopher B. Garner**, *University of Nevada, Reno*. Using Esri Story Maps to Communicate Climate Futures in the Walker Basin, Nevada. Climate science communication is a balance between explaining complex and contingent information, which often requires a narrative format, and inviting users to actively engage with the material, which requires an interactive format. This is especially true when communicating climate futures to stakeholders at watershed levels, where results from climate studies need to be integrated with local knowledge and existing resource management systems. Further complicating the communication effort is the fact that at the watershed scale, different sources of climate information (e.g. modeled, historical, and paleoclimate) can offer different pictures of what local climate could be like in the future. As part of an ongoing project in the Walker Basin of Western Nevada, a rural and primarily agricultural area surrounding a desert terminal lake in the Great Basin, we have begun using Esri’s Story Map apps to communicate plausible climate futures to residents and resource managers. Story Maps afford the opportunity to blend narrative and interactive communication styles, encourage the application of local knowledge in interpreting the communicated information, and to tell distinct but linked stories which help users consider the range of plausible futures in planning and management activities.

**Dongmei Chen**, dongmeic@uoregon.edu, *University of Oregon*; **José M. C. Pereira**, *University of Lisbon*; **Andrea Masiero**, *University of Padua*; **Francesco Pirotti**, *University of Padua*. Mapping fire regimes in China using MODIS active fire and burned area data. We investigated the fire regimes and their potential drivers, exploiting information extracted from the MODIS satellite. Twelve variables were computed on a regular grid over all of China, to specify fire frequency and its inter-annual variability, fire size, intensity, seasonality, and vegetation types affected by fires. The variables were normalized and clustered to define six fire regimes with distinctive fire attributes. Results show that 68.6% of the land in China has been affected by wildfires. Approximately 3% and 2% of the total burned area had high fire activity, and high fire intensity or large fire size, respectively. Forest fires in northeastern China are relatively large, less frequent, with a short fire season that peaks in non-winter seasons and higher inter-annual variability, implying a higher probability of lightning fires. In contrast, forest fires in southern
China are relatively small, more frequent, with a long fire season that peaks in non-summer seasons and lower inter-annual variability, implying that they might be mostly caused by anthropogenic ignitions. Low inter-annual variability and low fire intensity were associated with cropland fires, whereas grassland fires more likely exhibit the opposite traits. Fire characteristics vary according to a combination of fuel, topography, climate and human activities.

**Alexis Cooley**, cooley@pdx.edu, *Portland State University* and **Heejun Chang* Portland State University*

**Seasonal trend detection in hourly and daily precipitation observations in Portland, OR.** Extreme precipitation events may change in response to climate change. However, the coarse spatial resolution of global climate models means that it is difficult to know where changes will occur. Observational records can help detect regional changes. Hourly precipitation records are often recommended over daily for trend detection, but this has not been well demonstrated. In this study monthly trends in precipitation intensity from hourly and daily precipitation records in Portland, OR are compared. Precipitation intensity is measured on a monthly basis for the period of record (1999-2015), and tested for trends using Kendall’s Tau. Results show that March demonstrated the greatest number of trends in both hourly and daily data, with 75% of hourly records showing increasing trends and 29% of daily records showing increasing trends at the .1 confidence interval. Hourly records always detected a greater number of significant trends than daily, except in July. Hourly records detected trends in multiple months where daily records did not detect any trends (Jan, Jun, Aug, Nov, Dec). These results demonstrate that sub-daily records may have an advantage over daily records for trend detection of changes to precipitation.

**Elizabeth Dengenis**, edengenis@sandiego.edu, *University of San Diego* and **Suzanne Walther* University of San Diego*

**Mapping Sustainable Community Development: An Eco-Endeavour in the Kathmandu Valley.** This research utilizes GIS to spatially analyse humanitarian efforts, working with an eco-foundation that embodies sustainable development. The Kevin Rohan Memorial Eco-Foundation (KRMEF), outside Kathmandu in Nepal, does ecological and community outreach. The organization is well established and has been working with the community since 2008. It added rebuilding and temporary housing efforts since the Gorkha earthquake occurred in 2015. This study includes digitizing the foundation site using high-resolution aerial imagery, as well as mapping the projects they have undertaken in the area. In cataloging and mapping the types and locations of the projects, the foundation will be able to continue its work on a more effective level by visualizing and quantifying the communities they have reached and determining where they can provide assistance in the future. The project involved compiling and mapping the data, ground-truthing the maps, and collecting more data for further research. This information forms a comprehensive database so that the organization can continue to provide not only for its immediate community, but also surrounding communities. By conducting this study, we hope that the foundation and its volunteer teams can utilize the data to better serve people by ensuring that their most pressing needs are met.

**Judah Detzer**, jdetzer@pdx.edu, *Portland State University* and **Paul Loikith* Portland State University.**

**Assessing the Meteorology Associated with Extreme Dust Storms over the Arabian Peninsula: A statistical and dynamical approach.** The Arabian Peninsula (AP) is a major source of atmospheric dust, making it an ideal region for studying the changes in dust storm frequency and magnitude over time. Furthermore, dust storms over the region are associated with severe impacts on the economy, agriculture, transportation, and human health. Recent work indicates that aerosol dust loading over the AP has increased over the first decade of the 21st century, with regional scale drought suggested as a primary source of the increase. Such conditions could become more common under anthropogenic global warming with potentially substantial implications for the future of dust storm events, making an
understanding of the interaction between local and regional scale meteorology and high-end dust storms critical. Motivated by the need to better understand the mechanisms associated with dust storms over the region in the current climate, the work presented here takes a holistic approach to diagnosing the meteorological conditions present during extreme dust storm events. By looking at atmospheric dynamics and by applying a linear regression model, a systematic approach, combining meteorological statistics and atmospheric dynamics is taken to investigate how meteorology plays a role in the occurrence of extreme dust storms. To understand the atmospheric dynamics associated with extreme dust storms (defined as days with aerosol optical depth (AOD) in the top ten percent of the AOD distribution), we construct composites of large-scale atmospheric circulation anomalies (geopotential height and sea level pressure) concurrent with extreme dust storms in NASA’s Modern Era Reanalysis for Research and Application Version-2 data (MERRA-2) reanalysis. Composites are constructed at each grid point over the AP to systematically capture spatial variations in the mechanisms associated with extreme dust events. K-means clustering is then employed to identify regions of similar atmospheric circulation mechanisms across the AP, reducing the dimensionality of point-wise circulation patterns and identifying regions with similar dust storm dynamics. Multiple linear regression (MLR) analysis, based on three variables that have been correlated to high AOD (precipitation, soil moisture, and surface wind) is performed to gain an understanding of the contribution these key meteorological variables have on dust storms. Together, the composite analysis and MLR captures a holistic view of the key meteorological mechanisms associated with extreme dust storms. This work also provides an observational foundation for evaluating model skill at reproducing conditions favorable for extreme dust storms and as a baseline for assessing future changes in such conditions under anthropogenic global warming.

Maelynn Dickson, maelynndickson@gmail.com, California State University, Fullerton and Kristy Morehead, California State University, Fullerton. Assessing and Improving Sustainability: Case Study at CSU, Fullerton. As a part of an 8 week-long study, students at California State University, Fullerton participated in a project within the framework of the Campus as a Living Lab model. Campus as a Living Lab is a model that focuses on research projects utilizing the physical or social environments of the university. Facilitating this illustration, students conducted a research project which evaluated the existing conditions of waste management and recycling in one of the oldest buildings on campus. Through combined individual and team-based components, the students found a variety of issues and solutions which could improve the overall sustainable conditions of the structure. By utilizing a diverse set of mixed-methods, a cooperative final presentation and a collaborative report were generated.

Elise Eberhard, elise.eberhard.33@my.csun.edu, California State University Northridge and Valeria Shilova. California State University Northridge Mapping Seasonal Rain Change in California. Human-Induced climate change has been linked to seasonal variability in patterns of longer summers, late arrival of fall and winter, earlier springs and warmer average temperatures across all seasons. In California, the effects of climate change have been felt through sea level rise, record hot temperatures and prolonged dryness in the region. Understanding when and where changes in the rain season have occurred in the last decade will help us to identify new possible trends and will be beneficial for the future of California water management. To determine how climate change has affected the rain season in California we obtained data from National Oceanic and Atmospheric Administration and created an interpolation map that shows precipitation change between 2005 and 2015.

Yael Golan, yaelg@mail.sfsu.edu, San Francisco State University. Gendered Walkability: Building a Daytime Walkability Index for Women in San Francisco. Urban walkability has been linked to many benefits, including increased levels of physical activity, enhanced social cohesion, and increases in real
estate values. The level of walkability in an area is largely influenced by built environment features such as land-use mix, the existence or absence of pedestrian amenities, and proximity to appealing destinations; by pedestrian characteristics like the level of familiarity with the area; and by demographic factors such as race, gender and socio-economic status. Research has shown that some of the factors influencing women’s walking behavior differ from those affecting men’s walking, while other factors influence both genders but affect women more strongly. However, existing walkability-indices generally do not take gender into account and instead compute a uniform walkability score for both genders. To address gender differences in walking behavior and account for women’s specific walking needs, this study aims to create the first walkability index devised specifically for women: Women’s Walking Index (WWI). The WWI will be calculated for the city of San Francisco, and may be expanded by future research into additional geographies. Walkability scores by the WWI will be then validated by on-site pedestrian counts, and compared to Walk Score, the leading walkability index today.

Thadeus Hogan, ghogan@una.edu, University of North Alabama. Tracking and monitoring feral swine (Sus scrofa) behavior in the William Bankhead National Forest, Alabama. The purpose of this project is to document and forecast feral swine (wild pigs) behavior in order to minimize the growth of the feral swine population in the William Bankhead National Forest in Alabama. The project has three goals: 1) to help obtain a cost-effective approach to track feral swine home range patterns, 2) to collect information related to feral swine movements in the Bankhead Forest, and 3) to demonstrate the value of Geographic Information Systems in this process. A telemetric tracking device will be attached to a feral pig and its movements will be monitored for a period of two months. The resulting spatial distribution information will be cross-referenced with pre-engineered data layers in the GIS and will help map predicted pig movement. This study will benefit the USFS, and Bankhead National Forest in particular, with information on feral swine habitat use, home range, and the development of an improved approach towards tracking feral swine.

Katherine Jones, joneska3@oregonstate.edu, Oregon State University and Julia A. Jones Oregon State University Spatio-temporal Patterns of Tree Establishment in the M1 Meadow of H.J. Andrews Experimental Forest. Spatio-temporal Patterns of Tree Establishment in the M1 Meadow of H.J. Andrews Experimental Forest. This study examines temporal and spatial patterns of tree establishment in a montane meadow of the Cascade Range in Oregon. Montane meadows in the Cascades have been declining due to tree establishment since records began. Montane meadow complexes in the H.J. Andrews Experimental Forest shrank by 60 to 75% from 1949 to 2005, but fine scale spatio-temporal processes of tree establishment in these meadows are unknown. In the 4.8-ha M1 meadow in the Andrews Forest, the species and diameter of all trees of any size were measured in seven 20x20 m plots and one 40x55 m plot in August 2015. Trees were clustered at scales of <6 m (Ripley’s K) or <3 m (PCF), clusters were dispersed at scales >6 m, and trees have become increasingly clustered over time (J-function). Given current rates of tree establishment, the meadow will continue to shrink in the future. Because many trees are small, complete tree removal is an initial step toward meadow restoration in this and comparable sites. Future work should combine fine-scale analysis of tree spatial patterns with environmental (light, moisture and soil) data in order to reveal the local environmental drivers of tree establishment patterns in montane meadows.

Su Jin Lee, sujinlee@usc.edu, University of Southern California; Lynn Dodd, Kevin Mercy, Nolan Luevano Analysis on Spatial characteristics of Freshwater Springs using Geospatial Technologies. Catalina Island in Southern California has been experiencing extreme drought so that Catalina Island will officially enter Stage 3 water rationing. Hence, Freshwater springs play an even more important role in sustaining Catalina Island. We collected all reported locations of freshwater springs using Trimble Nomad GPS units
and analyzed spatial characteristics of terrain parameters, geology and landscape (e.g., flora) using ArcGIS.

Guadalupe Maldonado, mald2433@gmail.com, California State University, Fullerton. Satellite Imagery Techniques to Map Accuracy of Mangrove and Saltmarsh Distributions along Baja California. Salt marshlands are a type of wetland that supplies clean water to streams and rivers. While mangroves serve a variety of ecosystem services. There has been little research conducted on the salt-marsh and mangrove distribution on Baja California. Our research questions were as follows: What is the distribution area of salt-marsh and mangroves in Baja California and how can it be determined accurately? Our methods start by using Landsat imagery. Each file will be opened using ENVI, classes of interest will be saved and opened as a map. To verify accuracy we generate random points and test them on Google Earth. We tested the accuracy of our data set, and saw few inaccuracies. Overall we achieved a 90% accuracy. There were more errors in other data sets compared to our data. The significance of our study focuses on using these maps for future studies. We can see change distribution and growth and shrinkage. These results may be used for creating artificial salt marshes to solve water pollution issues in other parts of the world. Aside from coastal areas there may be water treatment facilities that benefit from salt marsh vegetation. Lastly, our maps serve as an accurate reference for conservation organizations.

Kevin Moens, moensk@wwu.edu, Western Washington University. Current State of Community Photovoltaic Production in the United States. The trend of small scale photovoltaic (solar) cooperatives commonly known as community solar, has emerged as a way to increase renewable energy production in a distributed energy system (Heeter, Belyeu, and Kuskova-Burns, 2014). The United States is currently experiencing growing interest and development of community based solar energy. The potential for 100% market accessibility, low investment cost and off site production makes community solar programs a more attainable option to peoples of lower economic status or less than ideal geographic residences (Heeter, Belyeu, and Kuskova-Burns, 2014). As of 2013, there are 19 states with community solar projects totaling 64 programs and producing 40 megawatts of energy (Heeter, Belyeu, and Kuskova-Burns, 2014). However, the current state of community solar projects is hard to determine due to the myriad of state legislation and generally bottom up or “grassroots” project development approaches. This study provides a conclusive spatial account on all community solar projects that are currently producing within the U.S. Detailed in a Geographic Information System (GIS), the study examines large scale spatial patterns, community relationships, and the overall current state of community solar energy development within the U.S.

Deanna Nash, dleignash@gmail.com, California State University - Los Angeles. Spatial and Temporal Variability in Precipitation Characteristics in the Western United States. Climate change will impact the availability of water in the western United States through changes in precipitation characteristics. Satellite data presents the opportunity to study and explore these changes as well as their impact on water resources. While many studies have illustrated the changes in precipitation on global and national scales, this study focuses on precipitation in the western United States. Utilizing the Tropical Rainfall Measuring Mission (TRMM) precipitation data, this study examines the temporal and spatial changes in precipitation characteristics over the western United States between 1998 and 2016. One of the first NASA satellites to detect precipitation, TRMM spans a large spatial and temporal range, making the datasets useful for precipitation climatological studies. This study examines daily and seasonal precipitation characteristics using the 3B42 version 7 gridded daily data set. Statistical analysis is conducted on wet season precipitation to examine the changes in the total, frequency, and daily mean
intensity of precipitation over the 18-year period. Additionally, other atmospheric variables, such as water vapor, are explored with regard to these changes in precipitation characteristics.

Stacey Olson, solson02@calpoly.edu, California Polytechnic State University, San Luis Obispo and Gabriella Alvarez California Polytechnic State University, San Luis Obispo A Patchwork of Assistance: Tulare County’s Response to California’s Historic Drought. California is currently in the fifth year of the state’s worst drought of the last 1200 years (Griffin & Anchukaitis, 2014). The lack of a satisfactory snowpack in the Sierra Nevada mountain range for the past four years has left much of California susceptible to both water quality and quantity issues (CADWR, 2016). With the dissipation of the anticlimactic El Nino event and the forthcoming La Nina, conditions can be expected to worsen. California Governor Jerry Brown declared a state of emergency in response to the drought on January 17, 2014, but efforts to conserve water since then have been minimal. Perhaps no other place in California has been more adversely affected than the agriculturally rich Central Valley region. In Tulare County alone, a reported 1,562 domestic wells have failed since reporting began in August of 2014 (Tulare County, 2016). Our research focuses primarily in East Porterville, a small unincorporated community that is largely occupied by socially and economically marginalized groups. It has been shown that unincorporated communities are particularly vulnerable with regards to environmental hazards. This poster addresses how a network of state and local governments, as well as non-profit organizations have collaborated in response to the drought in Tulare County. Additionally, we explore their successes and shortcomings in combatting community vulnerability.

Brittany Raizada, brittany.raizada.817@my.csun.edu, California State University Northridge and Stephanie Wolf California State University Northridge. Water Scarcity in Africa: Determining the Levels of Urgency for New Technology. Water scarcity is the insufficiency of water resources to meet a region’s demand. It is the result of overuse, poor management, sanitation, pollution and drought. The effects of water scarcity threaten food security, public health and economic development. The issue is aggravated by pressures associated with rising growth rates, conflicts in the region, and level of development. Africa is facing extreme ramifications of water scarcity. An extensive effort is needed in order to provide sustainable access to safe drinking water and basic sanitation to the regions of the world that need it most. The aim of this study is to determine which countries within Africa are in critical need of this assistance. The study brings together multiple factors of each country within Africa that influences water scarcity. The factors include; population with access to clean drinking water, average annual precipitation, Human Development Index, growth rate and the total internal renewable water resources.

Valeria Shilova, valeria.shilova.994@my.csun.edu, California State University, Northridge. Bike Lane Proposal in the San Fernando Valley. No one likes to be stuck in traffic, and lately cities, especially Los Angeles has been promoting other modes of transportation such as public transportation and biking. Biking is increasingly becoming a popular alternative mode of transportation. Many people have decided to start biking for joy or as a way to get to work or school. Cities have responded to this by designating biking lanes on busy streets for the safety of bikers. For this study, San Fernando Valley was chosen as the study area where a new bike lane could be proposed. Data on how many people bike to work along with bike accidents in the SFV was used to create a map that showed where accidents were happening more frequently. In result, this study was able to determine a road that would benefit bikers with a new bike lane in SFV.

Emily Slinskey, slinskey@pdx.edu, Portland State University; Paul C Loikith, Portland State University; Duane E Waliser, JPL and Cal Tech. Towards an Event Based Indicator for Monitoring Change in

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Extreme Precipitation in Support of the US National Climate Assessment. Extreme precipitation events are associated with numerous societal and environmental impacts. Recent observational analysis suggests increasing trends in precipitation intensity across portions of the Continental United States (CONUS) consistent with expectations associated with anthropogenic climate change. Therefore, a spatial understanding and intuitive means of monitoring extreme precipitation over time is critical. In support of the ongoing efforts of the US National Climate Assessment (NCA), we present a gridded climate indicator, based on high-resolution gridded NASA satellite-based precipitation data from NASA’s Tropical Rainfall Measuring Mission (TRMM) and the Global Precipitation Measurement (GPM) product, to monitor and track extreme precipitation events over the CONUS. The indicator is based on categorized storm totals over the CONUS defined as 3-day total accumulated precipitation events, ensuring a spatially and temporally balanced regional representation of synoptic-scale and short-duration storm events alike. A precipitation categorization scheme mirroring that of the widely understood Saffir-Simpson hurricane intensity index is assigned to each 3-day precipitation event with each precipitation category referred to as a P-Cat. The magnitude of each event lies between P-Cat 1, the lightest category of storm totals, and P-Cat 5, the heaviest, allowing for easy interpretation and visualization. With all precipitation events assigned to a P-Cat, point-wise statistics are computed across the CONUS including the maximum P-Cat, the mean P-Cat, and the frequency of each P-Cat at each grid point providing a comprehensive climatology of precipitation event intensity and a baseline for monitoring change. A novel aspect of this indicator is that it will accurately display discernible spatial variations with regional specificity in extreme precipitation event frequency and intensity over relevant temporal scales. Changes in variability will be observable at various finite temporal scales due to natural climate variability, offering a platform to monitor changes at long-term climate scales associated with anthropogenically forced change as well. Additionally, the indicator provides a foundation for evaluating climate model simulation and projection output in future work.

Douglas Thalacker, douglas.thalacker@gmail.com, Portland State University and Andres Holz, Portland State University. Biophysical facilitators of conifer encroachment on the Muddy River Lahar, Mount St. Helens, WA. Identifying legacies that support resilience and predisposing factors that favor stochastic vs. deterministic configurations provides a framework for anticipating when disturbances may trigger abrupt shifts in forest ecosystems, and when forests are likely to be resilient. The 1980 eruption of Mount St. Helens (MSH) and subsequent winter rainfall events (1996) created a landscape mosaic of growing conditions and successional stages, including lahars that carved forests and left remnant but distinct forest patches on either end of the lahars and in small islands of remnant trees (or kīpukas) within the lahars. We used these lahars to understand the role of top-down climatic conditions and bottom-up fine-scale topographic settings on primary succession. Specifically, this study aims to 1) determine the spatio-temporal patterns of conifer establishment and tree-ring growth across the lahars, and 2) use biophysical conditions and plant traits to predict tree recruitment into and growth in the lahars. A combination of remotely sensed imagery analysis and field data providing composition, structural, and tree recruitment dates will be used. Fieldwork was conducted during the summer of 2016, and encompasses 181 plots within the lahar and 8 plots in each of the remnant forests.

Joshua Yarno, josh.yarno@gmail.com, Irvine Valley College. The Dispute in the South China Sea. The purpose of this map is to compare the countries with conflicting claims of sovereignty to the South China Sea (SCS) in the light of their cultural differences, current economic growth, and preferred methods of dispute resolution. The Cultural Dimensions created by Professor Geert Hofstede are compared to various economic factors in the Central Intelligence Agencies World Factbook, and to Professors Hans Rosling’s Gapminder Database. This map is limited in coverage to the countries concerned in the dispute consisting of: Brunei, China Indonesia, Malaysia, the Philippines, Taiwan,
Thailand, and Vietnam. China and the Philippines are the most vocal parties disputing regions of the SCS. Cultural Dimensions show strong alignment in most factors in addition to near parity with economic factors. Energy consumption is the area of clear divergence and this suggests room for both countries to compete in an economic landscape versus a physical one. As the U.S. increases diplomatic engagement with Asia it will be critical to recognize the significance behind economic differences and how they influence bilateral and multilateral dispute resolution. Constraints imposed by culture and geography must be integrated into diplomatic calculations in order for the U.S. to maintain its historic role of neutrality in the dispute.
Panel Discussions

Gender Equity and Diversity in Higher Education: Strategies for Action
Organizers: Katharine Meehan, meehan@uoregon.edu, University of Oregon and Jessie H. Clark, University of Oregon.
Panelists:
Kate Berry, University of Nevada, Reno
Harriet Hawkins, University of London
Amy Lobben, University of Oregon.

In 1984, the APCG Women’s Network was founded – by past APCG President Dr. Margaret Trussell and colleagues – with the goal of transforming an academic culture that featured abysmally low numbers of women in the geographical sciences. Since then, the Women’s Network and similar efforts nation-wide and internationally have helped to increase the participation, contribution, and visibility of women geographers in scholarship, teaching, and leadership. Yet challenges remain, at the level of departmental culture to broader structural barriers in higher education. This panel brings together mid-career and senior female faculty in geography and related fields to discuss challenges and offer advice and strategies for action. Speakers will draw on their own experiences -- as professors and mentors of early career faculty -- and offer their insights on gender equity, diversity, and inclusion in geography and academia.

Faculty Perspectives on Assessment
Organizer and Chair: Shaun Huston, Western Oregon University
Panelists:
Karen Arabas, Willamette University
Ken Carano, Western Oregon University
Elvin Delgado, Central Washington University
Christina Friedle, Portland Community College
Leslie McLees, University of Oregon

Demands for faculty to perform, and report out, formal assessments of teaching and learning are virtually universal across college and university campuses in the U.S. However, what “assessment” means, what it’s for, and how it’s governed and implemented, may vary greatly from place to place. On this panel, faculty from a variety of institutions and positions, in geography and allied fields, will share their experiences and open a discussion on how faculty are, and should, respond to calls for increasingly formal and regular(ized) assessments of teaching and learning in U.S. higher education.