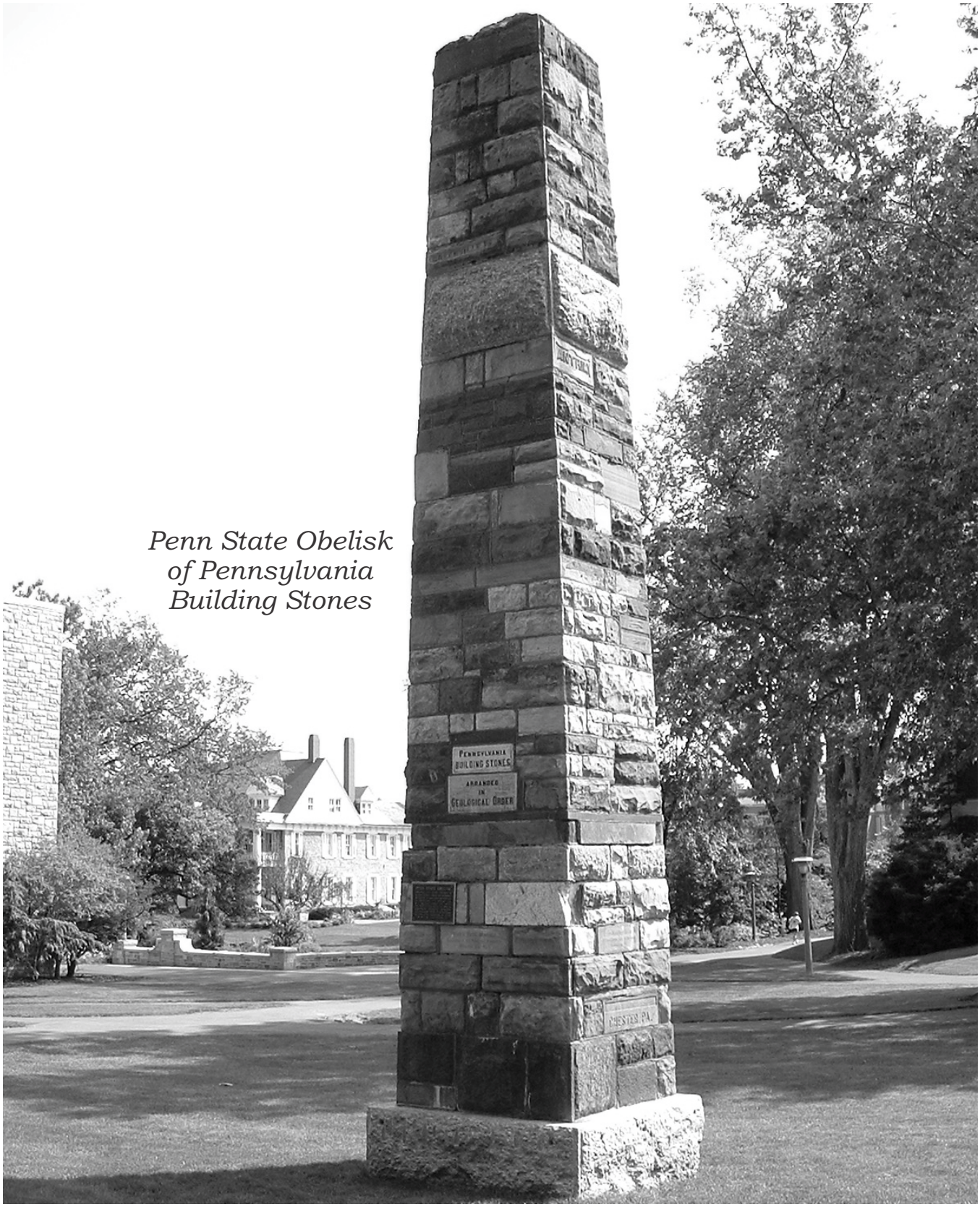
THE PENNSYLVANIA GEOGRAPHICAL SOCIETY

2014 ANNUAL MEETING

NOVEMBER 7, 2014
HOSTED BY THE PENNSYLVANIA STATE UNIVERSITY
STATE COLLEGE, PENNSYLVANIA

MEETING PROGRAM



Penn State Obelisk of Pennsylvania Building Stones

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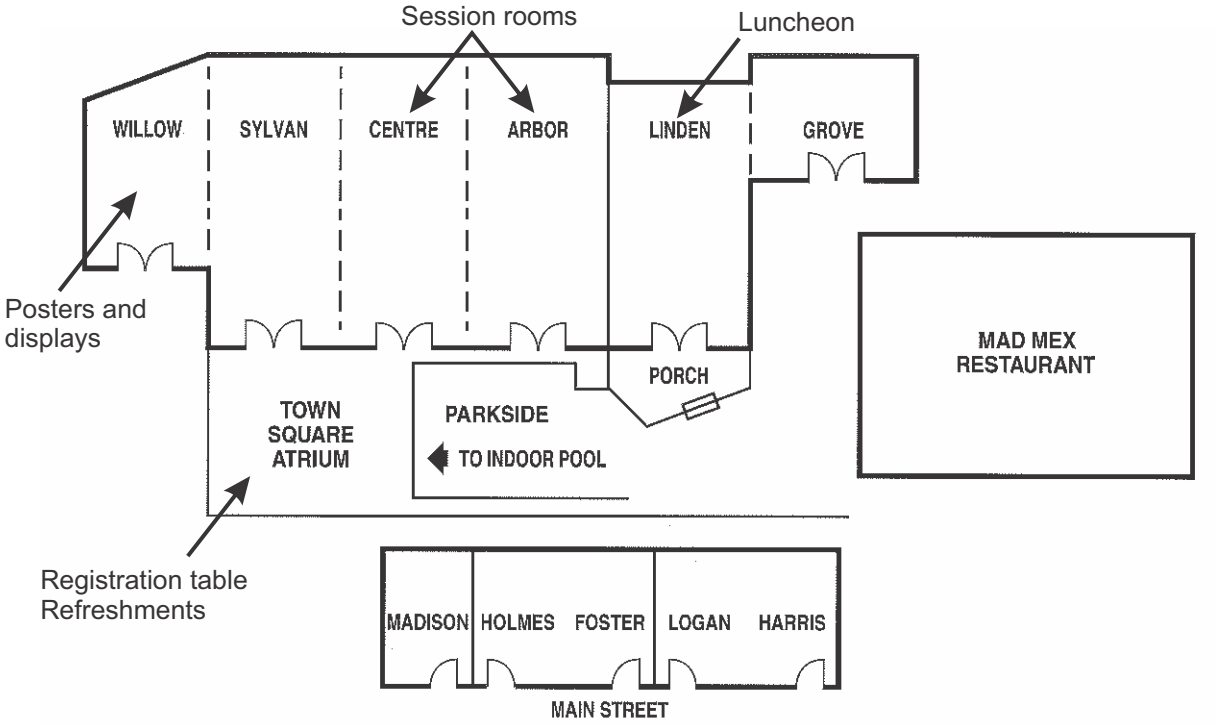
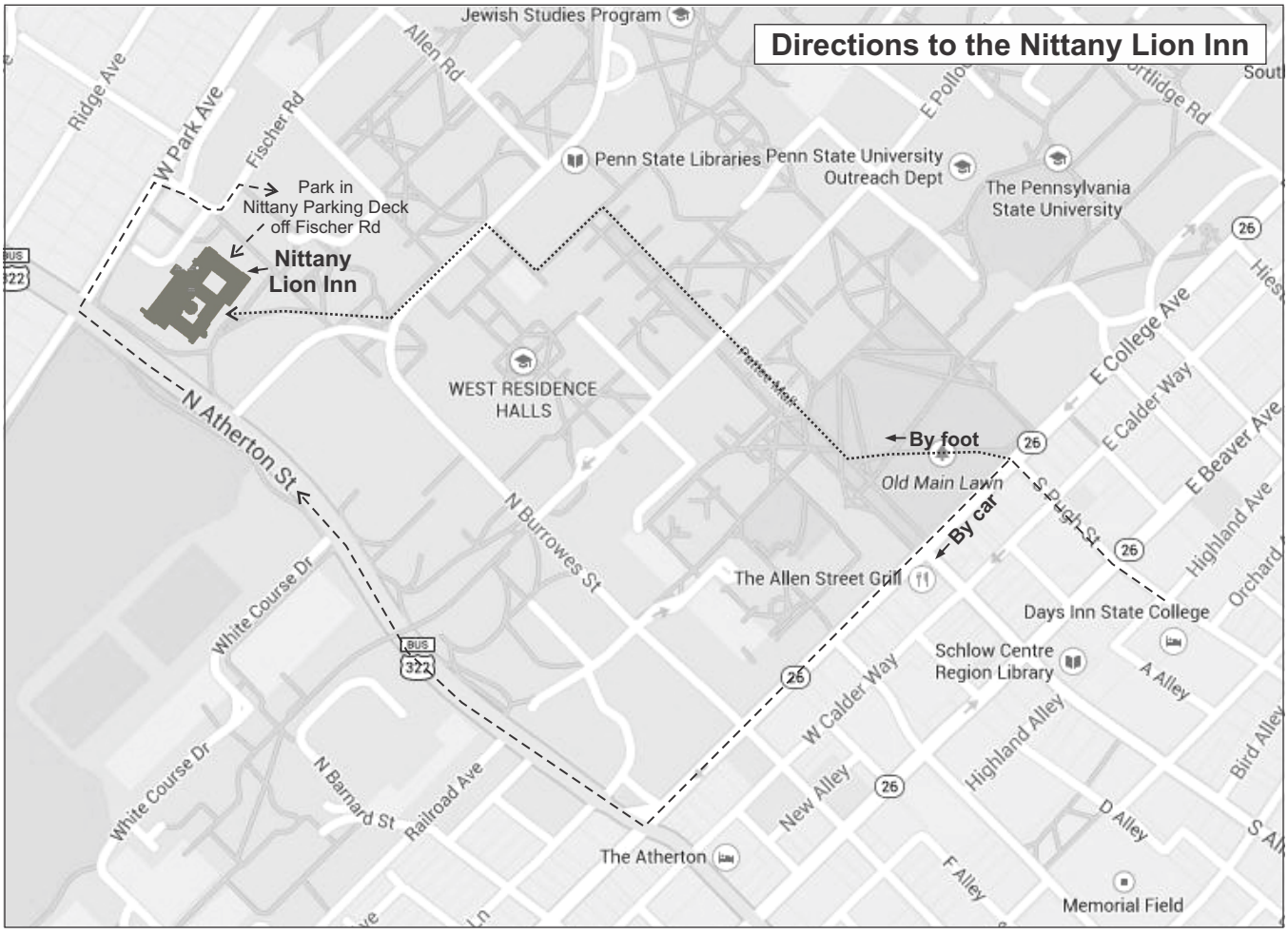
HELD AT THE DAYS INN PENN STATE IN STATE COLLEGE

2014 Meeting Arrangements Committee

Jodi Vender, Penn State University
Brent Zaprowski, Salisbury University
Ola Johansson, University of Pittsburgh at Johnstown
Joseph Zume, Shippensburg University

Floor plan - Days Inn Penn State





2014 ANNUAL MEETING OF THE PGS

SCHEDULE OF EVENTS

Time	Event	Location
Friday, November 7th		
7:45 am-3:00 pm	Registration table	Atrium
9:00 am-3:00 pm	Posters and Maps on Display	Willow Room
8:00-9:10 am	Paper Session 1 - GIS	Centre Room
9:00-11:00 am	Morning Coffee Break	Atrium
9:15-10:25 am	Paper Session 2 - Urban Geography	Centre Room
	Paper Session 3 - Physical Geography	Arbor Room
10:30-11:40 am	Paper Session 4 - Environmental Geography	Centre Room
	Paper Session 5 - Human/Economic Geography	Arbor Room
11:45-1:15 pm	PGS Luncheon	Linden Room
12:15-1:00 pm	Luncheon Guest Speaker: Dr. Clio Andris	Linden Room
1:00-1:15 pm	PGS Business Meeting	Linden Room
1:20-2:50 pm	Paper Session 6 - Session 6 - Natural Gas in Pennsylvania	Centre Room
1:30-2:30 pm	Map/poster presenters available for questions	Willow Room
2:15-3:30 pm	Afternoon Cookie Break	Atrium
3:10-4:20 pm	Paper Session 7 - Political/Cultural Geography	Centre Room
2:30-3:25 pm	Special Presentation: The Master of Science in Integrated Scientific Applications at Millersville University	Arbor Room
3:30-4:30 pm	Panel Presentation: Career Opportunities for Geographers	Arbor Room
4:45-5:15 pm	Student Awards Presentation	Arbor Room
6:00-9:00 pm	2014 PGS Annual Banquet and Awards Ceremony - Guest Speaker: 2014 Distinguished Geographer Award Winner Dr. Petra Tschakert	Nittany Lion Inn

2014 ANNUAL MEETING OF THE PGS

SUMMARY OF PAPERS AND PRESENTATIONS

Friday, November 7th	
	Centre Room
8:00-9:10 am	**Session 1 - GIS** Chair: Thomas Mueller 8:00 - Thomas Mueller, Megan Boger, and Kyle Snyder - FEMA and Cal U searching for local data: An analysis of county level data for HAZUS 8:20 - Charles Geiger - GIS Data Management Issues 8:40 - *Anthony DiBiase, Jeff Brunskill, Chris Podeschi, Ty Gambler, and Steven Staats - A Geographical and Sociological Study of Parking Patterns in Bloomsburg, Pennsylvania **9:00-9:10 Questions**
9:15-10:25 am * student paper contest entrant	**Session 2 - Urban Geography** Chair: Donald W. Buckwalter 9:15 - Megan Heckert - Spatial econometric modeling of the impact of greening on property values 9:35 - Donald W. Buckwalter - Empirical Realities of Urban Structure in the Pittsburgh MSA 9:55 - *Terri Hoover and Alison E. Feeney - Consumption Geography in Harrisburg, Pennsylvania: Consignment shops, thrift stores, and firsthand clothing outlets in relationship to U.S. Census demographic **10:15-10:25 Questions**
10:30-11:40 am	**Session 4 - Environmental Geography** Chair: Wayne Brew 10:30 - Zhongwei Liu - Land use/cover and water quality analysis in the Middle Allegheny-Redbank watershed, Southwestern PA 10:50 - Scott Drzyzga - Mapping and monitoring dam removal projects: a report from the field. 11:10 - Wayne Brew - The Mystery of Rocky Spring: The Transport of Polychlorinated Biphenyls (PCBs) in a Karst Setting, Letterkenny Army Depot, Chambersburg, Pennsylvania. **11:30-11:40 Questions**
11:45-1:15 pm	**PGS Annual Luncheon - Linden Room**
12:15-1:00 pm	Guest speaker - Dr. Clio Andris, Assistant Professor of Geography at Penn State Title: Launching Census 2.0 in Pennsylvania
1:00-1:15 pm	PGS Business Meeting

2014 ANNUAL MEETING OF THE PGS

SUMMARY OF PAPERS AND PRESENTATIONS

Friday, November 7th	
	Arbor Room
9:15-10:25 am	**Session 3 - Physical Geography** Chair: Gary Coutu 9:15 - Chad Kauffman and Katie L. Mercadante - Our Changing Climate: A new E-textbook 9:35 - Gary Coutu - Predicting Sea Level Rise in Stone Harbor, New Jersey 9:55 - Gregory E. Faiers - Extreme Daily Rainfall in Arkansas by Synoptic Weather Type **10:15-10:25 Questions**
10:30-11:40 am * student paper contest entrant	**Session 5 - Human/Economic Geography** Chair: Ola Johansson 10:30 - *Mark Simpson and Alexander Klippel - Quantifying spaces, understanding minds 10:50 - *Rachel Applebaum - Spatial Manifestation and Trends of Cremation in Pennsylvania 11:10 - *Joe Tokosh - Declining Retail Establishments: The Case of Century III Mall **11:30-11:40 Questions**

2014 ANNUAL MEETING OF THE PGS

SUMMARY OF PAPERS AND PRESENTATIONS

Friday, November 7th	
	Centre Room
1:20 - 2:50 pm * student paper contest entrant	**Session 6 - Natural Gas in Pennsylvania** Chair: John Benhart, Jr. 1:20 - *Kelsey Kilhoffer and Joseph Zume - Establishing a baseline groundwater chemistry database for evaluating future impacts of hydraulic fracturing (fracking) on groundwater quality in Bradford County, Pennsylvania 1:40 - John Benhart, Jr. - Exploratory Spatial Analysis of Unconventional Natural Gas Extraction in Pennsylvania 2:00 - Brian W. Okey - Application of Stream Dataloggers near Shale Gas Developments 2:20 - Sudeshna Ghosh, Robert Begg and Corey Fisher - Impacts of Marcellus Shale-based economic activities in Southwest PA **2:40-2:50 Questions**
3:10 - 4:20 pm * student paper contest entrant	**Session 7 - Political/Cultural Geography** Chair: Francis A. Galgano 3:10 - *Carolynne Hultquist - Criminalization of Indian Politics in Uttar Pradesh 3:30 - Francis A. Galgano - Ungoverned Space: ISIS and the New National Security Geography 3:50 - Clarissa Confer and John Confer - Shared Boundaries: Nature, Culture, and Justice **4:10-4:20 Questions**

6:00-9:00 pm	**2014 PGS Annual Banquet at the Nittany Lion Inn** Guest Speaker is 2014 Distinguished Geographer Award Winner Dr. Petra Tschakert, Associate Professor of Geography and Earth-Environmental Systems at Penn State Title: Examining Impacts, Vulnerabilities, and Risks under Climate Change: A Key Role for Geographers

2014 ANNUAL MEETING OF THE PGS

SUMMARY OF PAPERS AND PRESENTATIONS

Friday, November 7th	
	Arbor Room
2:30-3:25 pm	**Special Session - The Master of Science in Integrated Scientific Applications at Millersville University** Presented by Eric Hout This special session provides prospective students and stakeholders with information on the Master of Science in Integrated Scientific Applications (MSISA) program at Millersville University. Topics covered include program description, motivation, curriculum, and post-graduation opportunities. The MSISA program provides individuals the opportunity to acquire a master's level education that combines a specific science specialization with the business, technological, and professional skills highly valued by employers. The MSISA addresses the critical need for a workforce trained beyond the baccalaureate degree with an extended set of skills necessary for innovation, collaboration, and decision-making in the business environment. Upon completion of the program, students will enter the workforce with advanced cross-disciplinary scientific and technical expertise coupled with strong business acumen to manage complex projects in the earth and environmental sciences. The MSISA program is designed as a more efficient and effective alternative to a traditional master's program in science, and engages partners in the mid-Atlantic and Northeast U.S. for internship opportunities. Specializations are offered in Environmental Systems Management, GeoInformatics, Weather Intelligence and Risk Management, and Climate Science Applications.
3:30-4:30 pm	**Panel Presentation: Career Opportunities for Geographers** Lead Panelists: William B. Kory, Ola Johansson and Gregory E. Faiers The panel will address the topic of job opportunities for geography graduates and focus on the current status of the field of geography in the country. Geography major graduates work in the private sector, many are employed in local, state and federal governments, others are engaged in the field of education and others serve as consultants. Members of the panel will briefly discuss their experiences in school and on the job and we welcome the members of the audience to share their school and work experience with us. Everybody attending the session is encouraged to participate.
4:45-5:15 pm	**STUDENT AWARDS PRESENTATION**

PAPER ABSTRACTS

Applebaum, Rachel (Indiana University of Pennsylvania), *Spatial Manifestation and Trends of Cremation in Pennsylvania*

As America progresses towards a more personalized approach to death, the traditional burial becomes less popular in the face of cremation. In Pennsylvania, cremation still accounts for less than half the total dispositions in the state but has shown a marked increase over the last 20 years. What drives this continual increase in cremation rates in Pennsylvania? This study seeks to explore cremation rates in Pennsylvania in conjunction with statistics of income, race and religion, all factors known to be important in the decision of cremation. Comparative techniques will reveal spatial patterns in the distribution of cremation in Pennsylvania.

Benhart, Jr., John (Indiana University of Pennsylvania), *Exploratory Spatial Analysis of Unconventional Natural Gas Extraction in Pennsylvania*

This paper focuses on exploratory spatial analysis of unconventional natural gas production in the Commonwealth of Pennsylvania from 2008 to present. Many trace the inception of the unconventional gas "play" in Pennsylvania to Range Resources' successful Renz exploration well in Mount Pleasant Township, Washington County during 2003-2004. Since then, more than 2 trillion cubic feet (TCF) of natural gas has been extracted from beneath the Commonwealth. This study utilizes unconventional gas well production data from the Pennsylvania Department of Environmental Protection (PADEP) and the Carnegie Museums Powdermill Nature Reserve to analyze the distribution of natural gas extraction, waste production, and operator violations during the study period. Among the major goals of the research is to analyze and document the spatial distribution of positive and negative externalities associated with the unconventional gas industry in Pennsylvania.

Brew, Wayne (Montgomery County Community College), *The Mystery of Rocky Spring: The Transport of Polychlorinated Biphenyls (PCBs) in a Karst Setting, Letterkenny Army Depot, Chambersburg, Pennsylvania*

Letterkenny Army Depot (LEAD) is located in south-central Pennsylvania in Franklin County, 5 miles north of the Borough of Chambersburg, Pennsylvania. LEAD was established in January 1942 as an ammunition storage and industrial facility in response to the military needs brought on by World War II. Rocky Spring, which has a flow rate between 500 to 1500 gallons per minute, was the initial water supply for the base. Rocky Spring was replaced by an off-base reservoir in the 1950s when more water was needed to support the growing industrial mission of the base. During environmental investigations polychlorinated biphenyls (PCBs) were found in the discharge of Rocky Spring. The "mystery" was how were they getting there? This presentation will discuss the geology of LEAD and how it relates to the transport of PCBs in a karst setting from a source area distant from Rocky Spring.

Buckwalter, Donald W. (Indiana University of Pennsylvania), *Empirical Realities of Urban Structure in the Pittsburgh MSA*

This paper uses a case study of Pittsburgh to illustrate methodological issues in the analysis of urban structure. The study uses a map analysis methodology and focuses on six counties including Allegheny and five topological neighbors. It uses choropleth maps to compare

alternative units of study: census tracts, census block groups, and census blocks. Traffic Analysis Zones (TAZs) are eliminated from consideration for theoretical reasons and because they tend to be geometrically irregular in the context of southwestern Pennsylvania. Census block groups yield the best results for analysis at the metropolitan scale while census tracts are too general and census blocks present methodological difficulties. The Bogart and Ferry employment center thresholds of 5,000 employees per square mile and 10,000 total employees yield credible results when an additional minimum of 2,000 per square mile constrains inclusion of contiguous census block groups. The "edgeless" and "decentralized" hypotheses appear to be irrelevant as employment centers maintain densities distinctly higher than surrounding areas. Future work should focus instead on the variety of agglomeration effects that create different types of centers, on the dynamics of density, and on the consequences of polycentric structure for traffic flow, accessibility, and humanistic livability.

Confer, Clarissa and **John Confer** (California University of Pennsylvania), *Shared Boundaries: Nature, Culture, and Justice*

When Americans reflect on the treasures of our national parks they rarely consider Native Americans. Yet, one quarter of national park units have a physical connection with indigenous nations. These come from either shared borders or treaty designated land holdings internal to the park. Many native peoples have spiritual or cultural connections to areas now designated as federally protected lands. This has never been an easy situation as native nations struggled to protect sovereignty while federal managers sought to protect property. The dynamics of these relationships have changed in last few decades as both groups updated their outlook for 21st century realities. The vigorous exercise of tribal sovereignty coincides with the federal government's greater recognition of the value of tribal views to create opportunities to redefine the boundaries. This is not always a smooth or harmonious process as centuries of distrust lurk in the background of any discussions. However, the concept of shared, possibly dynamic geographic boundaries is both exciting and critical to the future of the parks and native nations.

Coutu, Gary (West Chester University), *Predicting Sea Level Rise in Stone Harbor, New Jersey*

The SLAMM Model (Sea Level Affecting Marshes Model) was used to predict sea level rise upon Stone Harbor, New Jersey. This presentation provides an overview of sea level rise modeling, an overview of the SLAMM results, and use of model outputs. This presentation will also discuss collaboration with The Wetlands Institute in Stone Harbor.

DiBiase, Anthony, Jeff Brunskill, Chris Podeschi, Ty Gambler, and **Steven Staats** (Bloomsburg University of Pennsylvania), *A Geographical and Sociological Study of Parking Patterns in Bloomsburg, Pennsylvania*

The purpose of this project was to study parking patterns in downtown Bloomsburg, Pennsylvania to provide the Bloomsburg police department, business owners and residents with information on where people are parking and why they are parking there. In small towns like Bloomsburg this topic is important because parking is limited, particularly for patrons of downtown businesses. When local residents or employees occupy metered parking spaces, potential patrons are forced to walk farther to get to a business. This may deter them from shopping and hurt the viability of the downtown zone. To study the parking patterns, global positioning system (GPS) units were used to collect license plate and parking permit data during hourly sweeps of the downtown zone for six days from 8 AM until 9 PM in the fall of 2013. The

GPS data were processed and analyzed using Microsoft Excel and ArcGIS 10.2 to investigate if cars with different permit attributes were parking in their designated lots or if they were violating rules related to the duration spent parked in a metered space. In addition to the data collected using the GPS receivers we surveyed visitors and employees in the downtown zone to determine first-hand where they parked, why they parked there, and what their purpose was in visiting downtown. We also obtained information regarding what they thought about the parking situation in downtown Bloomsburg. The results of the study suggest that there is parking available in the downtown area, but it may not be available when and where people want to park. In addition, we found that the number of people violating permit and meter regulations seems to be relatively low, meaning only small portion of the people parking downtown are doing so in a way that impedes patrons from frequenting a business. Future work will study the patterns of these individual violators and the businesses that they are affecting.

Drzyzga, Scott (Shippensburg University), *Mapping and Monitoring Dam Removal Projects: A Report from the Field*

"Field Techniques in Geography" is an immersive, upper-level undergraduate course at Shippensburg University that, for the last seven years, has focused students' attentions on the new era of dam removal and stream restoration projects in America. Pennsylvania leads that nation in the number of dam removal projects. Learning occurs at a site between Chambersburg and Gettysburg, PA, and once known as Pennsylvania's most dangerous dam. The first cohorts established a set of baseline data representing pre- and post-removal stream and valley characteristics. The later cohorts have investigated subsequent landscape change. This paper reports how geotechnology is being used in the field to collect, organize, and share information generated about landscape processes and change after dam removal.

Faiers, Gregory E. (University of Pittsburgh at Johnstown), *Extreme Daily Rainfall in Arkansas by Synoptic Weather Type*

Partial duration series of extreme daily rainfall were extracted from data between 1948 and 2010 for eleven sites scattered across the state of Arkansas. While frontal events were responsible for the vast majority of heavy rainfall events, extreme rainfall caused by tropical systems and upper air lows accounted for a disproportional number of the most extreme events. In addition to a location-by-location analysis of the data, particularly unusual events are highlighted.

Galgano, Francis A. (Villanova University), *Ungoverned Space: ISIS and the New National Security Geography*

The post–WWII strategic division of the world dominated the national security landscape for forty years. In that era, the national security landscape was relatively simple: global geo–strategy was bipolar, dominated by two superpowers. That all changed following the end of the Cold War. Today the national security landscape is characterized by a new set of geographic realities. The traditional national security geography was state–centric at its core. The seminal national security predicament of the modern age is that we now live in a multi–centric word: national security is influenced equally by traditional states and violent non–state actors. Moreover, issues of governance and effective sovereignty present a difficult set of problems, which we now observe in Syria and Iraq. A geographic analysis of this problem is compelling because there is an immutable link between geography and national security because it is about the content of space. Because geographers characteristically employ an integrating approach to their inquiries,

they are cognizant of the variety of processes affecting a place, and thus, military geography offers an unusually important and relevant vantage point from which to examine and explain matters of national security.

Geiger, Charles (Millersville University), *GIS Data Management Issues*

ArcGIS users have wrestled with data management for years, as have users of other "information systems." ArcCatalog helps, but of course the problems have more to do with human behavior than software availability. Several different "best practices" suggestions will be compared. Finally, a question of more long-term significance will be raised: how should data be archived and maintained for future generations?

Heckert, Megan (West Chester University), *Spatial Econometric Modeling of the Impact of Greening on Property Values*

This presentation details the use of a spatial difference-in-differences approach for measuring the impact of a vacant land greening program in Philadelphia, PA on nearby property values. Vacant land is a ubiquitous problem in US cities, and many have recently begun to explore greening programs as an interim management strategy for vacant lots, in the hopes that they will reduce the negative influence of vacancy and help to spur neighborhood development. The methods used here draw on previous approaches to modeling impacts of greening on property values, but expand on them to explore means of incorporating spatial relationships and spatial nonstationarity. Spatial methods are used not only to derive data and choose appropriate observations but also to compare global and local versions of the analysis to assess spatial patterns and differences in outcomes across the study area. Ultimately, the analysis revealed that while property values throughout the city increased during the study period, properties surrounding greened lots enjoyed a greater increase in value than properties surrounding controls, but that these effects were not felt evenly across the study area, a result that may have significant implications for continued implementation of the program.

Hoover, Terri and **Alison E. Feeney** (Shippensburg University), *Consumption Geography in Harrisburg, Pennsylvania: Consignment Shops, Thrift Stores, and Firsthand Clothing Outlets in Relationship to U.S. Census Demographic*

This study examined the location of secondhand retail within 20 miles of Harrisburg, Pennsylvania. A total of 121 clothing locations were identified, with 41% of the retail locations selling secondhand goods. Retail types were categorized into one of six groups (malls, single standing boutiques, discount outlets, supersized discount department stores, consignment shops, and thrift stores) and mapped in a GIS with 2010 United States Census demographic data. While secondhand retail has filled the vacancy of downtown smaller cities, it is highly integrated with all other types of retail in Harrisburg's main shopping district. Economically, the same number of consignment shops and thrift stores are located in high median income census tracts that are found in the lowest median income tracts. Accessibility of secondhand retail was found to be located in close proximity to higher densities of families, higher populations of female head of households, and younger median age groups.

Hultquist, Carolynne (The Pennsylvania State University), *Criminalization of Indian Politics in Uttar Pradesh*

Political criminalization is an issue facing many states of India as political candidates often have a current criminal record. Indian data websites, such as myneta.info, make candidate data available to the public for awareness of criminal activities of candidates and public government officials. The data shows that across India there is a statistically greater likelihood of winning a political victory with declared criminal cases on record than without it. This study uses spatial statistics to examine political candidates and winners from the most populated state in India. In the Legislative Assembly 2012 elections in Uttar Pradesh, 19% of the ballot had declared criminal cases with 9% of candidates having serious cases against them. Of the 396 winners of the 2012 elections, there are 45% with declared criminal cases with 22% of candidates having serious cases against them. This means that criminals are 3.27 times more likely to win in the election than non-criminals, even without attaining higher education, but especially in economically growing constituencies and with the support of dominant parties.

Kauffman, Chad and **Katie L. Mercadante** (California University of Pennsylvania), *Our Changing Climate: A New E-Textbook*

Geosciences and geography textbooks, like the rest of the publishing world, is undergoing a dramatic shift to digital offerings. The American Meteorological Society (AMS) is similarly altering their instructional resources to fit the needs of its students and instructors across the myriad of digital platforms that currently exist. The author recently completed a comprehensive revision of the AMS climate textbook, called “Our Changing Climate,” which was specifically designed for a digital interface. Climate science is rapidly evolving and digital formats allow for more efficient updates in the future. This paper will address the challenges encountered in authoring diverse and sometimes divisive content related to climate science in an e-textbook format.

Kilhoffer, Kelsey and **Joseph Zume** (Shippensburg University), *Establishing a Baseline Groundwater Chemistry Database for Evaluating Future Impacts of Hydraulic Fracturing (Fracking) on Groundwater Quality in Bradford County, Pennsylvania*

Over the past few years, there have been serious concerns about the potential for hydraulic fracturing (fracking) to contaminate surface and groundwater sources in Pennsylvania. But the question of whether fracking has actually contaminated water sources remains unanswered due to lack of pre-drilling baseline data. This study was an attempt to collect and document baseline groundwater chemistry in Bradford County. The choice of Bradford County was motivated by the current high rate of gas exploration activity in the county. Altogether, 30 samples were collected from domestic water wells and sent to ALS Laboratories in Middletown, PA for chemical analysis of methane, bromide, chloride, aluminum, arsenic, barium, iron, manganese, sodium, and strontium. In addition, a multi-parameter water quality probe was used at each site to conduct in-situ quality indicator assessments of the well water. Parameters tested included dissolved oxygen, temperature, conductivity, pH, total dissolved solids, and ORP (oxidation-reduction potential). The baseline data, which would soon be available on the Shippensburg University website, would provide a valuable missing link in the quest to understand the potential impacts of fracking on water quality.

Liu, Zhongwei (Indiana University of Pennsylvania), *Land Use/Cover and Water Quality Analysis in the Middle Allegheny-Redbank Watershed, Southwestern PA*

The Middle Allegheny-Redbank watershed in southwestern PA has been impacted by previous coal mining, urban development, unconventional gas extraction, and agriculture. This study analyzes the land use and land cover changes in the Middle Allegheny-Redbank watershed from 2001 to 2011, and associates the land use with several water quality variables, for example, pH, total alkalinity, calcium, magnesium, phosphorus and nitrogen. Preliminarily analysis shows that forest land use has decreased by over 4500 acres from 2001 to 2006, and over 5600 acres from 2006 to 2011, while grassland has increased by 2600 acres and 2800 acres respectively.

Mueller, Thomas, Megan Boger, and **Kyle Snyder** (California University of Pennsylvania), *FEMA and Cal U Searching for Local Data: An Analysis of County Level Data for HAZUS*

HAZUS is a standardized method for estimating potential losses from earthquakes, floods and hurricanes. HAZUS uses Geographic Information Systems (GIS) technology to estimate physical, economic and social impacts of disasters. However, these estimates are based on survey data. The estimates will be more useful if the data is accurate. Better results help counties to be more prepared for hazards through proper planning. The Federal Emergency Management Agency (FEMA) contacted California University of Pennsylvania about surveying the counties of Pennsylvania on the county's spatial data assets. The survey process had a few challenges and was finally initiated by students and faculty in spring 2014 and completed in fall 2014. This presentation will discuss the implementation of the survey and responses, including the analysis of the results. Finally the next steps will be shared for these results including mitigation plans and education.

Okey, Brian W. (Indiana University of Pennsylvania), *Application of Stream Dataloggers near Shale Gas Developments*

Faculty and student researchers at Indiana University of Pennsylvania are using dataloggers (Solinst Leveloggers) to monitor conductivity in small tributaries of Beaver Run Reservoir, a major public water resource east of Pittsburgh and adjacent to Marcellus Shale gas extraction sites. Conductivity levels may be elevated by dissolved metals and other pollutants mobilized through historic and current energy development activities. Four dataloggers were installed near the mouths of small reservoir drainages situated below gas well pads. The loggers (cylindrical probes) were suspended within PVC tubes anchored to the stream beds and set to record hourly measurements. Seasonality, flow variability, and channel scouring have presented challenges, leading to gaps in the set of observations gathered from 2012 to the present. Data collected thus far do not appear to indicate significant impacts to municipal water from well pads and associated roads and infrastructure; generally, conductivity levels were below 300 µS/cm. Precipitation events appeared to reduce conductivity in several cases, as rainfall diluted stream water. Information provided by the dataloggers serves as one component of a broader monitoring effort under contract with the Municipal Authority of Westmoreland County.

Simpson, Mark and **Alexander Klippel** (The Pennsylvania State University), *Quantifying Spaces, Understanding Minds*

The goal of our research is twofold: first, we aim to create a comprehensive collection of measures that can be used to objectively evaluate spatial characteristics across environment

configurations; second, we plan to evaluate these measures against various behavioral data sources (controlled experiments as well as open source web data). The first measures explored come from space syntax, a set of theories and techniques that quantify the spatial layout. Pioneered by the architecture and urban design disciplines, space syntax has shown some correlation with human spatial behavior. However, the results are often incomplete and occasionally contradictory, indicating there are gaps in the knowledge. It is therefore necessary to combine both controlled experiments, such as those using virtual reality environments, and large scale assessments that utilize social media and crowd sourced information. We will present the current state of our research including the results of space syntax analysis on several artificial environments.

Sudeshna, Ghosh, Robert Begg and **Corey Fisher** (Indiana University of Pennsylvania), *Impacts of Marcellus Shale-Based Economic Activities in Southwest PA*

The recent boom in the natural gas extraction activities from Marcellus Shale formations has been transforming the economies and landscapes of small communities in Pennsylvania (PA). Advancements in hydraulic fracturing and horizontal drilling techniques have made profitable production of natural gas possible, resulting in exponential growth of Marcellus wells in the past 5 years. The objective of this research is to assess the growth and development impacts of Marcellus Shale-based economic activities within small communities of Southwest PA region in the past 6 years: 2008 to 2013. Specifically, this research will analyze the spatio-temporal patterns of new development activities within the County Subdivisions of southwest PA. The broader goal of this project is to develop land use and land cover change models to 1) assess the influence of socio-economic factors driving development activities, and 2) predict the future growth and development patterns within the region. This will provide better understanding of the inadequacies and needs of land use control policies and regulations for sustaining community development activities in southwestern PA.

Tokosh, Joe (Indiana University of Pennsylvania), *Declining Retail Establishments: The Case of Century III Mall*

This study will investigate the relationships between declining occupancy rates at Century III Mall and the socio-economic status of the communities that service the mall. The mall's location is in West Mifflin, PA. The service area of the mall will be determined through a technique called customer spotting. This technique was used by William Applebaum in his study "Methods for Determining Store Trade Areas, Market Penetration and Potential Sales." While Applebaum plotted street addresses obtained from a survey, on an aerial photo, this study will use zip codes of mall patrons. The zip codes will provide the areal extent of the malls service area. Correlation and factor analysis will follow, in which the dependent variable is the change in occupancy of Century III Mall while the independent variables are the changing economies (as defined by the Census data) of the neighborhoods which make up my service area. Census data that will be used in the analysis will include education level, income, housing value, population, age and sex. Factor analysis is necessary to eliminate any multicolinearity between the independent variables. The study is important because the era of building shopping malls in American cities, which happened in the 1970's is long gone and now we are seeing a landscape filling up with dead or dying malls. Homer Hoyt's sector model developed in 1939, suggested that class sectors such as middle and upper class residential expand outward from the city along transportation arteries. The physical geography of Pittsburgh allows for these different socio-economic sectors to develop along its rivers and highways. The malls location in West Mifflin is sitting right in the

middle of a lower income, working class sector. This locational factor can be contributed to the malls decline. On the other hand, malls in upper income sectors like South Hills Village are thriving.

POSTER ABSTRACTS

Bencloski, Joseph W. (Indiana University of Pennsylvania), *Factors Associated with the Strength of Super Typhoon Haiyan, November 3-11, 2013*

Super Typhoon Haiyan ("Yolanda" in the Philippines) was one of the most intense tropical cyclones ever in the Western Pacific Ocean. The storm devastated parts of the Philippines causing an estimated 10,000 deaths, and 6 billion dollars (U.S.) in property damage. This graphic presentation examines the factors that contributed to the intensity of this powerful tropical cyclone. Those factors include: unusually warm subsurface Pacific waters east of the Philippines, increasing Pacific Ocean temperatures in the 1990s, an optimum Coriolis effect, the storm's fast forward speed, and a "bulge" of warm water in Western Pacific caused by strong Northeast Trade Winds.

Carroll, Michael and **Matin Katirai** (West Chester University Department of Geography and Planning), *An Analysis of Fatal Drinking and Driving Data in Pennsylvania*

This research is a spatial analysis of drinking and driving in Pennsylvania. We seek to identify areas with the highest rates of drinking and driving in the state through hotspot analysis using Geographic Information Systems (GIS). We examine data from the Fatality Analysis Report System (FARS) for a twelve-year period between 2000 – 2012. We also try to understand how different factors such as age, ethnicity, gender, holiday status, and proximity to drinking facilities are related to drinking and driving fatalities in Pennsylvania . Previous research from other states indicates that socioeconomic status and other geographical factors are important determinants of drinking and driving. Based on our findings we make policy recommendations for addressing this complex societal issue.

Defratti, Marissa and **Ross Caruso** (The Pennsylvania State University), *Bushfires in Australia: Adapting to Future Risk*

Australia annually experiences severe bushfire events and is continuously adapting to improve their fire mitigation techniques. Weather plays a large role in facilitating prime conditions for bushfires to spark, and certain severe weather patterns have been correlated with more dramatic wildfire events. As climate change becomes more of a factor, the frequency of these weather patterns becomes more apparent. Some of the worst fires in recent Australian history include the Black Saturday bushfires (2009), and more recently the New South Wales bushfires (2013). To better combat the severity of future bushfires, Australia has implemented various techniques and plans, on a national, state-wide and individual level by utilizing social media and GIS technologies.

Dennis, Aaron (The Pennsylvania State University), *The Plight of the Eastern Hemlock: Mapping Hemlock Woolly Adelgid Spread and Changing Climate*

Hemlock woolly adelgid (Adelges tsugae) is an invasive pest currently threatening the Eastern Hemlock tree. The Eastern Hemlock plays a unique ecological and economic role in our forests

and its loss could have tremendous impacts. Since the initial infestation in Richmond, Virginia, hemlock woolly adelgid is now widespread through 17 states. These maps predict the future range of this pest based on a 5.05 mile annual spread. One factor that could limit the spread of hemlock woolly adelgid is cold winter temperatures, which, if low enough, can cause the adelgid to die off. These maps draw a line at a 16°F average January temperature to approximate the boundary between areas too cold for the adelgid and areas warm enough to be at risk.

Fish, Carolyn and **Kirk Goldsberry** (The Pennsylvania State University; Michigan State University/Harvard University), *Are You Blind to Change? Evaluating the Influence of Change Blindness in Animated Choropleth Maps*

Animated choropleth maps enable cartographers to visualize time-series data in a way that congruently depicts change over time. However, users have difficulty apprehending information encoded within these displays, and often fail to detect important changes between adjacent scenes. Failures of visual experience, such as change blindness, threaten the effectiveness of dynamic geovisual displays, in which several important changes can occur simultaneously throughout the display. Animated choropleth maps require viewers not only to notice changes but also understand symbolic meanings encoded in rapid transitions between scenes. Graphic inter-polation between key frames, also known as “in-betweening” or “tweening,” smoothes transitions and lengthens the duration of the transition between scenes in a dynamic sequence. Previous cartographic literature suggests tweening could be a potential solution for change blindness in the cartographic context. This poster displays results from a human subjects study using signal detection theory to evaluate the differences in change detection abilities with different implementations of tweening in animated choropleth maps.

Hultquist, Carolynne (The Pennsylvania State University), *Machine Learning for Post-fire Burn Severity Assessment in Diseased Forests*

Remote sensing has been widely adopted to map post-fire burn severity over large forested areas. Statistical regression based on linear or simple non-linear assumptions is typically used to link post-fire forest reflectance with the degree of burn severity. However, this linkage becomes complicated if forests experienced severe mortality caused by pre-fire disease or insect outbreaks, which is likely to occur more frequently as a result of rapid climate change. To improve understanding of the relationship between forest reflectance and fire-disease disturbances, this study explored the efficacy of three machine learning techniques, that is, Gaussian process regression (GPR), random forests (RF) and support vector regression (SVR), within a geographic object-based image analysis (GEOBIA) framework to assess burn severity in a forest subject to pre-fire disease epidemics. An airborne sensor was applied to collect relatively high spatial (4 m) and high spectral (50 bands) resolution reflectance data. Results show that RF, SVR and GPR models outperformed conventional multiple regression by 48%, 29% and 27%, respectively. Compared to SVR and GPR, RF not only achieved better performance in burn severity assessment, but also demonstrated lower sensitivity to the application of different combinations of remote sensing variables.

Jacobson, Sam, **Evan Robey, Daniel Harris, Michael Folkoff** and **Mara Chen** (Salisbury University), *Developing a Small Water Bodies (SWB) Geodatabase for Wicomico County*

Our study developed a prototype geospatial database for a sample (n=40) of Small Water Bodies (SWB) in Wicomico County, Maryland including baseline water quality measurements. Their

surprisingly widespread occurrence and importance to surface and groundwater hydrology including stormwater management necessitated the development of an interconnected geographic data model accurately depicting these features across the county. Existing government geodatabases including SWB contain widely varying feature counts as well as significant errors in feature geometry (i.e. shape and size) in comparison with recent high resolution aerial photography. We produced a spatial sample of 40 stormwater retention SWB, stratified by age and land cover and used these features' to measure physical and water chemistry characteristics to develop a prototype geodatabase applicable throughout Maryland counties. Few differences in baseline water quality measures were found due to an abnormally dry summer and the previously unknown interconnected nature of the sampled features. SWB feature geometry within existing government databases was found to significantly underestimate feature size and therefore storage capacity.

Platania, Emily and **Ahmad Massasati** (University of Pittsburgh at Johnstown), *Applied GIS to Student Location of New Admittance from the University of Pittsburgh at Johnstown*

Geographic Information Systems technology can be used as a tool to express data through spatial referencing. Decision makers at the university level would benefit from the knowledge of the location for incoming students. The majority of University of Pittsburgh at Johnstown students comes from Pennsylvania region. Using GIS we can demonstrate precise locations of students within the region. This can help to analyze their choice of the university and aid in future decision making on how to better recruit new students. New students provide their address when applying to the university. This can be transformed into a geographical location through available internet technology. These locations can be placed accurately on a GIS platform. This allows for visualization of location at the point, county, state, or world level. Further analysis could include all university students and additional information such as census data.

Schaney, Christopher and **Jacob Geisel** (Indiana University of Pennsylvania), *Aultman Watershed Association for Restoring the Environment (AWARE) Rail Trail Project: Implementing and Planning a Rail Trail System in Aultman Run Watershed*

AWARE is a watershed association founded in 2000 by local citizens compelled to clean this largely rural area degraded by pollution hazards typical of historic mining activities and illegal dumping. AWARE is now diversifying those efforts to include construction of a rail trail. Rail trails play several important community building and education roles that serve many beneficial functions. Currently, there are 21,312 miles of rail trails across America. These trails are popular for recreational use. In Michigan, the Pere Marquette Rail Trail alone sees 178,000 visitors annually. The goal of this project is to establish a rail trail in Aultman Run Watershed, Indiana County, Pennsylvania. Currently there are 1,753 miles of rail trials in Pennsylvania, with 600 additional miles underway. This project will highlight natural resources in the area, floral and faunal species found along the trail, as well as, transportation, economic and community history within the watershed and immediate area. This project will also bring attention to environmental issues within the watershed including invasive species and coal remediation projects conducted and under way by AWARE. Once completed, it is hoped, the trail will provide the inertia necessary to connect Aultman Run Watershed to other trails within greater southwestern Pennsylvania.

Scholar, Derek, *Municipal Authority of Washington Township PA GIS Water System Project*

With all the advancements and breakthroughs with GIS, there are many different opportunities in which a geographic information system can be very beneficial when properly utilized. Washington Township in Fayette County, Pennsylvania was in need of a GIS system for their waterline infrastructure. After discussing the current state of the township's water system organization platform, it was determined that they needed a mobile system that could map and edit both the feature and attribute information of their water system components in real time on-the-go. Properly utilizing this type of technology would provide them with more in depth organized water system information. After understanding how beneficial the project would be, the Washington Township Authority board members agreed and allowed McMillen Engineering in Uniontown, PA to go forward with the GIS internship project. The result of the project was a mobile ArcGIS software system that can be used by the water authority employees to view, map, and edit any of the water system features on a tablet or smart phone.

Swab, Jack (The Pennsylvania State University), *Whose Hand is on the Tap? Examining the Political Structure of Water Providers in Harford County, Maryland*

Harford County, Maryland is currently contemplating the creation of a countywide water authority that would pull together nine different water suppliers ranging from private providers to the military and local municipalities. While the future of the proposed authority is yet to be determined, an examination of the political histories of the development of these contributing systems reveals a much more complex landscape than meets the eye. Starting in the early 1900's various political and private entities developed and amassed power in the county; this structure changed with the various developmental and environmental challenges that arose in the past century. During that time, water providers have moved from primarily private operations to public operations, however, some vestiges of the old system remain. This, in combination with the political climate of the county, creates a unique situation that will influence the establishment of this authority.

LUNCHEON ABSTRACT

Launching Census 2.0 in Pennsylvania

Dr. Clio Andris, Penn State University

The economic and demographic data we collect about our people in a traditional U.S. Census have some limitations. First, instead of looking at how humans behave, what experiences they have and what opportunities are available to them, we count humans as falling into one of a few categories of gender, race and income. Secondly, most of our data pin citizens to a small Census partition (like a tract), when, indeed, humans around the built environment throughout the day, travel and migrate between places. Third, it's difficult to gauge residents' social capital from Census data, as they do not reflect the benefits of one's relationships, support and trust of community, and quality of social life. We describe how a new type of census can help us explain interesting patterns in Pennsylvania cities that go beyond traditional demographic data. The result is a new potential system that will help us augment the rigid U.S. Census categories in place since the 1700s with information that better describes a more connected society in the 2000s and beyond.

BANQUET ABSTRACT

Examining Impacts, Vulnerabilities, and Risks under Climate Change: A Key Role for Geographers

2014 Distinguished Geographer Award Winner
Dr. Petra Tschakert, Penn State University

Geographers, particularly those who work on human-environment interactions, have made substantial contributions to debates on impacts of climate change on people and ecosystems, ranging from highly localized studies to global integrated assessments. My own experience as a coordinating lead author of a new chapter in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), entitled "Livelihoods and Poverty," provided an intriguing opportunity to assess the state-of-the-art literature on observed impacts on and risks of future impacts of climate change for poor people and disadvantaged individuals and communities. This literature highlights inequalities and vulnerabilities that exist in any society as crucial drivers of impacts and risks. Working now on the AR5 synthesis report allows me to suggest an even stronger role for geographers. We certainly should continue our diverse efforts to document lived experiences and assess future risks based on multidimensional vulnerabilities. More importantly, though, we can do a better job exploring and conveying the value of less visible scales of impacts that are currently not recognized in narrow detection and attribution analyses.

Evaluation form for the
2014 ANNUAL MEETING
PENNSYLVANIA GEOGRAPHICAL SOCIETY
November 7, State College, PA

Your input is most important for future annual meetings and other PGS programs.
Please complete this form and mail it to:
Brent Zaprowski, Department of Geography and Geosciences,
1101 Camden Ave, Salisbury University, Salisbury, MD 21801

1. How would you rate this meeting?	Poor		Neutral		Excellent
	1	2	3	4	5
a. Overall	( )	( )	( )	( )	( )
b. Site/Location of Meeting	( )	( )	( )	( )	( )
c. Meeting Program	( )	( )	( )	( )	( )
d. Hotel Accommodations	( )	( )	( )	( )	( )
e. Meeting Rooms	( )	( )	( )	( )	( )

2. Presentations:	Poor		Neutral		Excellent
	1	2	3	4	5
a. Friday AM	( )	( )	( )	( )	( )
b. Friday PM	( )	( )	( )	( )	( )
c. Maps and Posters	( )	( )	( )	( )	( )
3. PGS Luncheon	( )	( )	( )	( )	( )
Luncheon Speaker	( )	( )	( )	( )	( )
4. PGS Annual Banquet	( )	( )	( )	( )	( )
Banquet Speaker	( )	( )	( )	( )	( )

5. My expectations of the meeting were:	Unmet		Neutral		Met
	1	2	3	4	5
	( )	( )	( )	( )	( )

Why?

6. What would make the Annual Meeting more valuable to you?