

Spatial Structures in the Social Sciences 2023 Winter GIS Institute

Final Presentation Program

January 20, 2023

PSTC Seminar Room (Mencoff Hall 205)
68 Waterman Street, Providence RI 02912

10:15 – 10:20 am	Breakfast & Opening Remarks
10:20 am – 11:40 pm	Session I: GIS and Health
11:45 am – 1:00 pm	Lunch
1:00 – 2:00 pm	Session II: GIS in Environment and Society
2:00 – 2:15 pm	Certificate Presentation & Closing Remarks

PARTICIPANTS

David Cutts (Physics)

Grace Oh (School of Public Health)

Chloe Perel (Environmental Studies)

Brock Polnaszek (Division of Biology and Medicine)

Matthew Schaelling (Economics | Population Studies and Training Center)

Joshua Wortzel (The Warren Alpert Medical School)

Eric Yang (Division of Biology and Medicine)

PROGRAM

SESSION I:

GIS AND HEALTH

[10:20am] Brock Polnaszek, *Maternity hospitals in Rhode Island by neighborhood deprivation: A proof of concept geospatial accessibility access analysis*

[10:40am] Grace Oh, *Dialysis facility participation in Medicare Advantage networks in 2021*

[11:00am] Joshua Wortzel, *Exploring the impacts of ambient temperature on suicidality in children*

[11:20am] Eric Yang, *Evaluation of the association between tanning bed access and melanoma incidence*

LUNCH BREAK, 11:45AM – 1:00 PM

SESSION II:

GIS IN ENVIRONMENT AND SOCIETY

[1:00pm] Chloe Perel, *Land suitability of tea production in Nepal and catalyzing social change for Nepali tea farmers*

[1:20pm] Matthew Schaelling, *The Spatial Distribution and Impact of Oregon's "Housing Choice" Legislation*

[1:40pm] David Cutts, *Enabling Effective Land Conservation Efforts*

PRESENTATION ABSTRACTS

David Cutts – Enabling Effective Land Conservation Efforts

Loss of natural habitat due to direct human activity is driving a major species extinction event. This loss, coupled with the effects of human-caused climate change, threatens the Earth's very ecosystem. Land conservation serves to preserve and protect remaining natural areas and thus mitigate species extinction and the real threat to our biosphere. Non-profit land trusts exist throughout the U.S. to facilitate land conservation, providing legal entities that can hold conservation easements on lots that will protect them from development in perpetuity. Land trusts generally have limited resources, and thus must focus their efforts on land whose conservation is most important. Sakonnet Preservation Association (SPA) in Little Compton is Rhode Island's oldest land trust. A tool for prioritizing lots for conservation efforts by SPA is presented. Data exist to identify existing conservation areas, remaining natural areas, natural coverage, important species habitat, location of wetlands, streams, and watersheds, areas of high resilience to climate change and to sea level rise, and other important features. With this tool SPA can explore various combinations of features to reach the balance that most effectively supports their conservation efforts.

Grace Oh – Dialysis facility participation in Medicare Advantage networks in 2021

The 21st Century Cures Act in 2021 permitted previously ineligible individuals with end-stage renal disease (ESRD) to enroll in Medicare Advantage (MA), leading to a substantial growth in enrollment. MA plans may constrain the network and types of dialysis facilities available to beneficiaries. Using data from Dialysis Facility Compare, Centers for Medicare & Medicaid Services, and the US Census Bureau, we examine the geographic variation in dialysis facilities network participation rate (that is, for what proportion of MA contracts in a county is the facility in-network). Further, using spatial regression, we assess the association between county characteristics and dialysis facility network participation rates.

Chloe Perel – Land suitability of tea production in Nepal and catalyzing social change for Nepali tea farmers

Nepal's unique terrain and environmental conditions contribute to an equally unique tea flavor associated with the nation's production. The eastern sector of the country currently supports the majority of their tea production, however the overall topography and soil of Nepal suggests that significantly more can be utilized in cultivation. Tea is an important contributor to Nepal's agricultural sector which dominates a third of the country's GDP which suggests positive economic benefits if more land were to be attributed towards tea cultivation. Simultaneously, there is potential to increase international awareness of Nepali tea as a unique and luxurious commodity. My research aims to 1. Analyze the economic importance of tea production as a potential driver of socioeconomic change for Nepali farmers 2. The potential land suitability for expanding tea production in Nepal through examining the country's precipitation, temperature, elevation, and soil trends.

Brock Polnaszek – Maternity hospitals in Rhode Island by neighborhood deprivation: A proof of concept geospatial accessibility access analysis

Maternity deserts are on the rise across the country. Adding to this deprivation, reproductive choice has also become limited geographically. In Rhode Island alone, there are only a handful of Maternal Fetal Medicine physicians and three perinatal genetic counselors. Therefore, as a proof of concept, we used geospatial analysis to perform an accessibility analysis based on the maternity hospitals and population density in Rhode Island. We further added the neighborhood deprivation index to see how space and place contributed to this accessibility.

Matthew Schaelling – The Spatial Distribution and Impact of Oregon’s “Housing Choice” Legislation

In 2019, the Oregon state legislature passed a bill focused on increasing housing choices. House Bill 2001 required most Oregon communities to allow two or four units per parcel of land in residential neighborhoods currently zoned for single-family zoning. However, this policy was subject to specific population cutoffs. I analyze the spatial distribution of impacted cities using 2020 Census data and look at patterns in building permits requested and issued in Portland area before and after the legislation.

Joshua Wortzel – Exploring the impacts of ambient temperature on suicidality in children

Suicide is the third leading cause of death for youths in the USA. Hotter ambient temperatures are associated with increased frequency of attempted suicide, and preliminary evidence suggests that young people are especially vulnerable. As global warming progresses, understanding the relationship between ambient temperature and pediatric suicide will be essential. Although evidence supports the relationship between ambient temperature and suicide, the proposed study is the first to assess whether ambient heat is associated with recurrent suicidality in vulnerable adolescents. While other studies have utilized city-wide or zip code-wide temperature data, this study is the first to use geospatial analysis to identify daily temperatures at the home address level and derive other covariates, such as greenspace exposure, at the time of reported suicidality. This study utilizes data from adolescents psychiatrically hospitalized for suicidality (n = 196) at Bradley Hospital over a 5-year period. In my presentation, I will review background information on the relationship of temperature and suicide, outline the analysis that I was able to complete during the GIS Institute, and discuss plans for the continued analysis in the months following the Institute.

Eric Yang – Evaluation of the association between tanning bed access and melanoma incidence

Over the past 50 years, the incidence of melanoma has markedly increased. Factors including family history of melanoma, sunburns, fair skin, UV exposure, and number of nevi are well-known to increase melanoma risk. Although melanoma accounts for less than 5% of all skin cancers, it is highly fatal and results in the majority of deaths attributed to skin cancer. On average, individuals who die from melanoma lose an average of 20.4 years of life as compared to 16.6 years for other cancers. Melanoma treatment accounts for \$3.3 billion in healthcare spending annually, and is predicted to rise drastically. Identification of at-risk populations can help us understand how to target limited resources to reduce the morbidity and mortality burden of this fatal malignancy. Indoor tanning has been associated with an increased risk of melanoma. We aim to evaluate whether the density of tanning beds within a county can be used as a proxy to identify geographic clusters at higher risk of developing melanoma.