

MS-GIST
 Master Projects 2018 Cohort
 Thursday April 25th, 2019 – ENR2 Room S107

Time	Title	Person
6:00-6:20	<u>Winning with Geography: Utilizing Geographic Information Systems to Identify Spatial Patterns of College Football Recruitment Associated with Success for the 2018 Pacific Athletic Conference</u>	Jared Logan
6:20-6:40	<u>Geospatial Analysis and Quality Control of Monsoon Season Precipitation Data from Citizen Reporters near Tucson, Arizona</u>	Gabe McGowan
6:40-7:00	<u>Feature Film Residential Use and Aspirational Depictions of People within Los Angeles, California</u>	Laura Grantham
7:00-7:20	<u>Network Analysis of High-Priority Tucson Police Department Calls and Response Times</u>	Jenna Smith
BREAK		
7:30-7:50	<u>Understanding Bicycle Safety in Tucson Arizona: Perception and Reality</u>	Eric Harrison
	<u>Urbanization and Fog Decline in California's San Joaquin Valley</u>	Dylan Preucil

Title: Winning with Geography: Utilizing Geographic Information Systems to Identify Spatial Patterns of College Football Recruitment Associated with Success for the 2018 Pacific Athletic Conference

Author: Jared J. Logan, jaredlogan@email.arizona.edu

Keywords: College Football, Recruiting, Team Rosters, Pacific Athletic Conference, National Collegiate Athletic Association

Abstract: College football is big money and big entertainment; a competitive arena, where teams with championship aspirations must acquire top talent to fill their rosters. Commonly relegated to online tables or event programs, rosters contain untapped geographic information regarding the origin of a team's athletes. Geographic Information Systems (GIS) can exploit such

information; they can reveal recruiting trends and capabilities, painting a unique picture of each team's recruiting geography. The purpose of this project was to visualize recruiting geography, and then associate spatial patterns with success. Limited to the Pacific Athletic Conference, twelve 2018 football team rosters were analyzed by geolocating player hometowns and schools, and running geospatial analysis on their location datasets. Through GIS analysis, spatial patterns of recruitment were identified for each team: a unique, geographic summary displaying movement of athletes, the ability to attract talent, and identifying areas exploited or avoided for recruits. When compared with seasonal performance, successful teams exhibited different spatial patterns, suggesting the presence of other, unaccounted, variables influencing team performance. However, these results do illustrate how a variety of spatial patterns of recruitment, work well for specific teams given their school's geography – e.g., proximity to talent or competition. An expanded study - including more teams or spanning multiple seasons - may offer additional insight and comparison. With such information, a less successful team could replicate the recruitment trends of successful teams with similar geography, adapting to overcome their team's geographic recruiting challenges, while increasing performance and the likelihood of success.

Title: Geospatial Analysis and Quality Control of Monsoon Season Precipitation Data from Citizen Reporters near Tucson, Arizona

Author: Gabriel E. McGowan, gmcgowan@email.arizona.edu

Keywords: precipitation, monsoon, bias, quality control, Tucson

Abstract: Half of annual precipitation in Southern Arizona falls in convective thunderstorms associated with the North American monsoon season (June 15 to September 30). Monsoon precipitation varies widely over distances (several km to less than one km) equal to or smaller than the spacing of government rain gauges and the resolution of precipitation raster products (roughly 4 km). A detailed spatial characterization of monsoon precipitation is desirable for emergency responders and flood planners. Denser point precipitation data are available in Arizona through the Rainlog citizen rain gauge network. A geospatial comparison was conducted between daily monsoon precipitation data for the Tucson area from Rainlog stations, the NWS ALERT gauge network, and PRISM rasters to determine the fitness of Rainlog data for direct comparison with institutional data. Data harvesting, quality control and storage in an open-source geodatabase were scripted, and SQL was used within the database to perform spatial queries and regressions. A rule-based algorithm was developed using PRISM raster values at gauge locations to address report timing and other errors in the Rainlog data. The cleaned Rainlog data were subsequently compared with data from nearest neighbor stations and neighborhoods of nearby stations, from both gauge networks, to allow for additional quality control testing. Bias and root

mean squared error between data from neighboring gauges were found to be similar for the Rainlog and ALERT gauge networks, provided an adequately long history of reporting by the Rainlog stations. Rainlog data represent a valuable supplement to institutional data in characterizing monsoon precipitation.

Title: Feature Film Residential Use and Aspirational Depictions of People within Los Angeles, California

Author: Laura Grantham, legrantham@email.arizona.edu

Keywords: Cinema geography, residential, feature films, Los Angeles

Abstract: Feature films and other visual media are well known for not showing realistic portrayals of how people live but rather for depicting an aspirational reality in which the way people are portrayed to live does not match with their social-economic circumstances. This project seeks to probe this phenomenon by examining residential locations used for feature film productions between 2008 and 2011 in Los Angeles County. This project uses GIS analyses and Business Analyst to answer the following question: What residential locations are most prominently depicted in the Greater Los Angeles region in feature films in 2008-2011? More specifically I focus in on which neighborhoods, and homes in those neighborhoods, are used most frequently for feature film production. The project examines the socio-demographic characteristics of the neighborhoods and homes most frequently used in the greater LA area to find what could be called a Hollywood aspirational view of Los Angeles: what it is, where is it located, and what are the predominate socio-demographic makeup of those regions predominantly portrayed.

Title: Network Analysis of High-Priority Tucson Police Department Calls and Response Times

Author: Jenna N. Smith, jnsmith4@email.arizona.edu

Keywords: Tucson Police Department, response times, Network Dataset, Network Analysis

Abstract: As the population in Tucson continues to grow, the responsibility for the well-being and safety of the constituents in Tucson falls in-part onto the Tucson Police Department (TPD); however, TPD response times for 911 calls are not always optimal. The purpose of this study is to evaluate whether TPD response times for high-priority calls (i.e. Priority 1) could have been more in-line with Priority 1 response time standards during 2018, as well as to identify where the least ideal response times are located throughout Tucson. Priority 1 calls consist of a preferred

allotted response time of 5 minutes or less to the scene of an event (i.e. a 911 call). The small amount of police substations and the geographical layout of the few TPD districts are some of the factors in the less than optimal response rates. This study addresses these issues through the creation and utilization of a Network Dataset (ND) and Network Analysis (NA). The ND is a model for what TPD response rates could have been, and the results of this model are closer to the allotted response time than the actual data. The NA will then address the frequency of districts pulling officers from outside their own districts in for assistance on Priority 1 calls, and then will compare this frequency between the four TPD districts. A Closest Facility Analysis, from the NA, will illustrate where the new TPD district boundaries could be drawn by using basic methods of digitization.

Title: Understanding Bicycle Safety in Tucson Arizona: Perception and Reality

Author: Eric M. Harrison, ericharrison@email.arizona.edu

Keywords: Tucson, Bicycle safety, Collision, University of Arizona.

Abstract:

Tucson is home to a significant and growing community of bicyclists who form an integral part of the city's identity, culture, and economy. Unfortunately, as bicycling has become more popular, collisions have become more common. During the past seven years, Tucson has averaged 167 reported bicycle collisions annually, peaking at 223 in 2017. To minimize collisions between bicyclists and motor vehicles, it is crucial to answer several fundamental questions about bicycle safety: Where are collisions occurring? Where are bicyclists choosing to ride? Moreover, what do bicyclists perceive as dangerous? The purpose of this study is to identify the most dangerous intersections for bicyclist based on accident data and rider's perception. Several datasets were assembled to address these questions: bicycle usage from the Pima Association of Governments (PAG), bicycle collisions from the Tucson Police Department (TPD), and survey data from a sample of the local cycling community. The survey prompted participants to indicate where in Tucson they ride, areas they thought of as dangerous, and basic demographic data. First, the TPD and PAG datasets were analyzed to classify intersections with the highest number of collisions relative to usage; afterward, those intersections were compared to the survey responses. Preliminary analyses identified intersections along Grant, Alvernon, Speedway near the University of Arizona, and downtown, as hotspots for bicycle collisions. Survey results indicated that although the perception of safety varies significantly between individuals, the understanding of dangerous areas forms a consensus that generally aligns with the quantitative analyses.

Title: Urbanization and Fog Decline in California's San Joaquin Valley

Author: Dylan J. Preucil, djp29@email.arizona.edu

Keywords: Climate Change, Radiation Fog, San Joaquin Valley, Urbanization, Land Cover

Abstract: There are many local and regional issues that arise from natural weather and climatic phenomena such as hurricanes, tornadoes and severe droughts. Perhaps, what's less obvious is that of a disappearance of a regional phenomenon that is directly related to drought: Radiation Fog. I believe that the increase in urbanization and spreading outward of towns and metropolitan areas, could also be yet a more impactful reason behind why we are seeing less radiation fog in the San Joaquin Valley that in the past. To find out why there seems to be a decline in radiation fog, I am using 10 weather station in cities throughout the San Joaquin Valley and finding a count of Fog Event data throughout the years of 2001 – 2011 and spanning the months of November, December, and January. Also, I'm incorporating three levels of Fog Severity Indices that I created, to further enhance the measures needed to count potential instances of fog per day. Lastly, I have three different Land Cover rasters to compare change in urbanization with fog events data for each weather station location throughout the San Joaquin Valley. My hope is to find that as urbanization increases in the form of developed classification areas seen in the Land Cover images that radiation fog events decrease in turn. This research hopes to further illuminate the need for assessing the impacts of continual land change use and if it is best to designate specific areas for agricultural production moving forward.