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

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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

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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

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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 predominant socio-demographic makeup of those regions predominantly portrayed.

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

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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.