

As of July 19, 2022

The USC Spatial Sciences Institute (SSI) is now accepting applications for undergraduate student researchers to work with SSI faculty on their research projects for the 2022-2023 academic year.

We seek USC students who have excellent academic records, show interest in participating in cutting-edge research projects at SSI, and are eager to take advantage of the opportunity to work directly with faculty on their research projects.

Priority will be given to SSI students (Dornsife minors in GIS and Sustainability Science, Human Security and Geospatial Intelligence, and Spatial Studies, and majors in GeoDesign, Global Geodesign, and Human Security and Geospatial Intelligence). However, applications from all majors, minors, and academic programs throughout the University are encouraged. Students of all class standing (including incoming freshmen or transfer students) are welcome to apply. **Applicants must be enrolled as full-time USC students in good standing during the research semesters.**

The projects generally are structured for an average of 5 – 10 hours/week. **Accepted students will work out their specific work schedules for the semester with the supervising faculty or staff member and will be expected to honor the weekly time commitment for the duration of the semester.**

SSI student researchers are expected to submit their research work for presentation. Venues for presentations include such the SSI's [Los Angeles Geospatial Summit](#) on Friday, February 24, 2023 at the USC Hotel; the [USC Provost's Undergraduate Symposium for Scholarly and Creative Work](#) held in April on the USC campus; and the [Map Gallery of the Esri User](#) Conference held in July in San Diego. Students also are encouraged to submit their work to appropriate student research competitions, such as the 2022 [USC Esri Innovation Program Student of the Year Competition](#) and the annual United State Geospatial Intelligence Foundation [GEOINT Symposium](#).

Past student researchers have presented their results at international conferences such as the [Annual Meeting of the American Association of Geographers](#), [the GIS-Pro Conference of URISA](#), and the [AMC SIGSPATIAL conference](#), and have co-authored [published research](#).

The Great Redwood Trails Project, well on its way, proposes to repurpose 320 miles of railroad track into a continuous walkable and bikeable trail beginning in Marin County and ending in Humboldt County. It has the potential to revitalize small towns in Northern California, draw crowds to bed-and-breakfasts and bakeries, and allow locals and tourists alike to enjoy the splendor of the redwoods of Northern California. This project could benefit individuals, families, local economies and ecosystems.

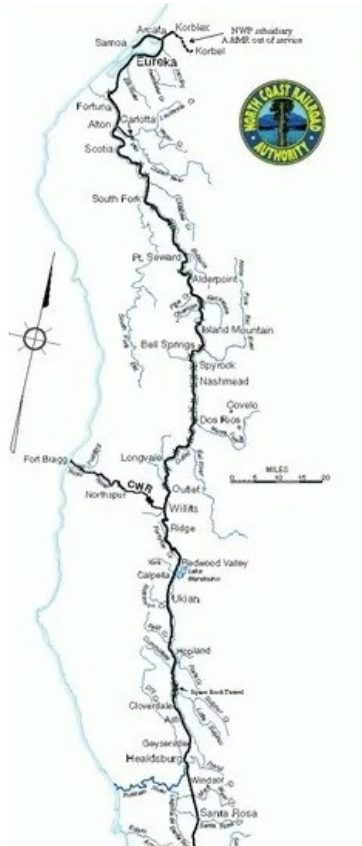


Fig. 1: Proposed GRT map¹

Caryl Hart, a member of the California Coastal Commission, summarized it well.

“The vision of the Great Redwood Trail is simple: to transform an obsolete and dysfunctional railroad right-of-way into the longest rails-to-trails route in the country, creating an inspirational and transformational economic engine and huge recreational draw not just for the North Coast, but for all of California and beyond.”²

Description of the research projects or collaborations in which the individual undergraduate students will participate.

¹ Active NorCal. Feb. 9, 2019. “Northern California’s Great Redwood Trail Gets off to a Fast Start”. *Active NorCal*. <http://activenorcal.com/northern-californias-great-redwood-trail-gets-off-to-a-fast-start/>

² The Great Redwood Trail. Home. Great Redwood Trail. <http://www.thegreatredwoodtrail.org/>

This project provides an opportunity for students to be involved in a truly historic project. In this initial year of the URAP, the primary goal is to establish a working partnership with the Great Redwood Trail Alliance (GRTA) and the California Coastal Conservancy (CCC), with most of the managerial support being provided by the GRTA. This partnership has been established by the PI via two meetings and additional individual conversations. Based on conversations with members of the GRT team, two projects have been targeted as high priority that would benefit students and the project alike.

The two projects are:

- Research, review, and write an assessment of other US-based rails-to-trails projects, including their economics, regulatory framework, development process, and ecological and community impact. This document will provide a guide for individuals and organizations both within and beyond the GRT project as to the means of managing rails-to-trails projects cost-effective, expedient, environmentally sound, and sensitive to community needs; and;
- Create an interactive web-based map and mobile application showing the areas of the GRT that are already open to the public. The idea of a web/mobile application has been discussed with the Steering Committee and is a priority. While it is well-recognized that this is a long-term project, there is some “low hanging fruit” with respect to the sections of trail that have already been constructed. This would be considered a pilot project, wherein students would present the GRTA and CCC with options for a more permanent interactive map. The end product would consist of one or more prototypes, not necessarily a final and publicly available tool, depending on the outcome and needs of the participating organizations. However the database structure established in creating this application would undoubtedly be of use.

For students, this would be an incredible opportunity to use industry standard programming tools (e.g. Esri’s ArcGIS suite) to develop an interactive map and mobile application with a real-world user base. Even should the project serve as more of a learning experience for students than a deliverable, the development of the database would needed for the application would be a huge step forward in and of itself. Once completed, early enthusiasts of the trail could begin to investigate either physically or digitally, thus achieving the microgoals of the GRT’s proponent as the longer-term steps are established.

Background

The economy of the North Coast of California was previously based on the extraction of timber. While economic interested valued these trees as commodities, others were attracted their inherent value left standing. From very early on, conservation of these cathedral-like forests was its own industry, as urbanites drove north on Highway 101 to experience Redwood National Park, Humboldt Redwood State park, and Prairie Creek Redwood State Park, amongst others. The volume of lumber being removed from the region dropped dramatically in the 1980’s, as a combination of environmental regulations, globalization, and a lack of inventory converged into a “perfect storm”. While this enabled the region to revitalize ecologically, the economic transition

has not come as easily. On one hand, a forceful restoration economy has emerged. On the other hand, the region remains behind the so-called “redwood curtain”, namely the isolated rural region that constitutes a vast majority of coastal Northern California..

The Great Redwood Trail is a vision of converting obsolete railroads to biking and hiking trails. This would connect Marin County, Sonoma County, Mendocino County, and Humboldt County via 320 miles of trail corridor. The project has been enabled via Senate Bill 1029, supported by Senator Mike McGuire. In the summer of 2021, McGuire announced that nearly \$17 million dollars had been dedicated to the Great Redwood Trail Fund. This will include the development of a master plan, the legal aspects of turning rails into trails, and typical expenditures such as signage. This project is in its infancy—it will take three to four years, estimates McGuire, to simply put together the Master Plan, given the number of agencies, counties, and interest groups involved. The hope is that this project will facilitate the outdoor recreation industry and help address the consequences of the slow decline of the timber industry. It has the potential to revitalize the landscapes and communities of Northern California given the increased reduction of extractive industries.

The URAP project would include the following two components.

Stage 1: Rails-to-Trails Background Research

The GRT Steering Committee has expressed a desire for materials that chronicle the evolution of other rails-to-trails projects. Most broadly, rails-to-trails projects seek to address a number of social and environmental issues. To start, rail travel has become increasingly less used in the United States, leaving both challenges and opportunities for land use planners, ecologists, transportation advocates, and community members. On one hand, these right-of-ways have already been established and for many communities and states are no longer economically viable to manage and maintain. Thus, a rails-to-trails project can provide a means of meeting many goals simultaneously- an opportunity for safe non-carbon-based transportation, a means of increasing accessibility, and encouraging access and understanding of a landscape (and thus preservation) by a number of user groups. Also critically important is the way in which local communities can benefit from the California recreation economy. As California continues to boom, especially with respect to the people who want to and can afford to access wild open spaces with access to San Francisco, this provides a huge opportunity for local owners, small businesses, and conservation organizations to be able to monetize the eagerness of the state to pursue local recreational pursuits.

Stage 2: Web-based and mobile App

The most important concrete deliverable, for both USC students and GRT the committee, is a web and mobile app that would enable current potential users to access and navigate the trail.

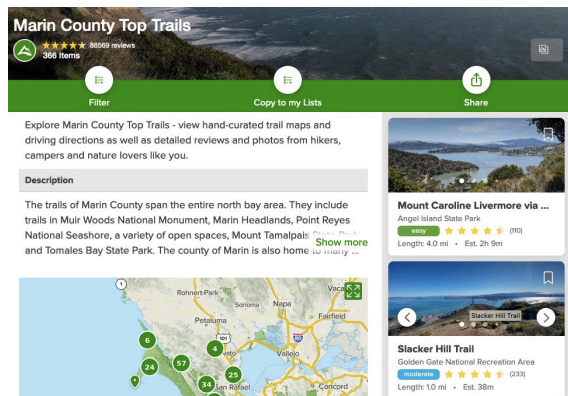
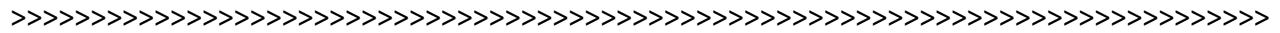


Fig. 2: Example of AllTrails Web/Mobile Application³

While there is a lot about the GRT that has yet to be established, there are many sections of the trail that are open and incorporated. Critical towards establishing the momentum of the project, in addition to establishing basic accessibility, is a means of making sure that users can safely and intelligently navigate the trail. This is a space in which USC SSI students, given the offerings of the undergraduate curriculum, can contribute to this project. Dr. Jennifer Swift, a member of this project, currently teaches web and mobile applications, and has 10+ years of history facilitating student success in this research space. She was also involved in the last two years of the URAP initiated by the PI, achieving great success in mentoring students in the technical aspects of geospatial modeling and development. Whether or not contributing to an already established app (such as Alltrails) or establishing a new app would be something that would need to be considered based on the needs of users. Regardless, students would establish a database that would provide the baseline for this project moving forward. All of this would be open access. Students would come away with an extremely marketable skill set that will enable the facilitation of environmental goals in their academic and professional future.

The students will largely work independently, with regular engagement with the PI and co-PI's (one or more times per week). Should we be funded for two student researchers, we would hope that they would establish a collegial relationship and work together on mutual project goals. The PI and other faculty could and would coordinate and facilitate their engagement.

³ Alltrails. N.d. Marin County Top Trails. *Alltrails*. <https://www.alltrails.com/lists/marin-county-top-trails>



Analyzing Urban Change and Inequality in India, China and Africa

Jefferey Sellers, Ph.D., Professor of Political Science and International Relations and Spatial Sciences

This project, supported by the Provost’s Undergraduate Research Associateship Program and other sources, employs a variety of geocoded data from diverse sources to analyze spatial inequality in the rapidly developing urban areas of India. Soon to be the largest country in the world, India is undergoing a remarkably fast transition to an urban society. As the Subcontinent urbanizes, the juxtaposition of new development with rural settlement is creating dramatic disparities in the built environment between upscale development clusters and emerging slums. The project combines online real estate listing data, remote sensing images, other geospatial data and a variety of administrative, planning, electoral and demographic data. The analysis includes comparison of Indian regions with a parallel selection of urban regions in China, elsewhere in Asia, and Africa.

This project is part of a wider research program that analyzes spatial data on social, economic, political and spatial change in urbanizing regions around the world. The aim of the project will be to compare patterns of urban settlement and its development, with an emphasis on the expansion of urban settlement into rural areas, the role of informal settlement and the survival of rural village structures. The project revolves around analysis of high and middle resolution remote sensing images to compare matched urbanizing districts in selected cities of each country. The project builds on previous research that has generated comparative citywide metrics of urban form in China and India (Sellers et al. 2020), classifications of the built structures in urbanizing neighborhoods, and analyses of real estate listings data (Sellers and Wang 2018; Sellers and Li 2019). This project will draw on newly available data, including high resolution satellite imagery and the Global Human Settlements Layer, to analyze and compare urban expansion among several Indian regions, and extend the methods to urban regions in China and beyond.

Preferred credentials: GPA of at least 3.5, basic knowledge of statistics and familiarity with geographic information systems and one or more related programs (Arc/GIS, Python, Google Earth, Ecognition, Excel, and Stata, SPSS or R). Knowledge of comparative international politics, urban issues, developing country settings (particularly India or China), or Mandarin a plus but not essential.

Student responsibilities and supervision

As Provost’s Undergraduate Research Associates, students working on the project will be expected to carry out some combination of the following responsibilities:

- map, catalogue and analyze the built environment and its evolution in selected sites on the urbanizing periphery of selected cities.

first Sustainability Tracking, Assessment & Rating System (STARS) report and earned a STARS Silver rating.⁴ The university also announced that it will freeze investments to and divest current investments from the fossil fuel industry⁵. Ongoing structural efforts include construction of “purple pipe” systems to maintain landscaping with recycled water, LEED certification of all buildings constructed since 2010, and a stormwater retention and filtration system installed at USC Village⁶. Socially, we hold zero-waste events and incentivize public transit use with a subsidy for employees. Refilling stations help people on campus stay hydrated with sustainable water bottles rather than single-use plastic purchases, and recycling bins for paper, plastics, and other recyclables are widely available across campus.⁷

The USC Sustainability Hub is a one-stop shop for spatial data – data that can be mapped – that relates to sustainability at USC. It which will be updated regularly as more data sets are developed on campus. Appendix A, compiled by USC’s Office of Sustainability, lists the types of data that will be included in the Hub, categorized by the UN Sustainable Development Goal (SDG) that the data speaks to. The UN SDGs lay out goals for development that promote human and environmental well-being, such as access to clean water (SDG 6), access to affordable and clean energy (SDG 7), and responsible consumption (SDG 12).⁸ Users of the USC Community will have access to the Hub and, after receiving approval, be able to access the sustainability data it contains.

Experiential learning is a key part of a Dornsife education. It is the goal of Dornsife’s Office of Experiential and Applied Learning for each Dornsife student to take part in at least one experiential learning project before they graduate.⁹ These “learn by doing” projects can take a variety of forms, but they always involve direct student involvement in a project, rather than indirect learning about it after the fact. The USC Sustainability Hub supports experiential learning in two ways. First, the students who are supported by a URAP award will work first-hand on this project to build out the architecture, content, and data of the Sustainability Hub. Second, all USC students will benefit from the Hub as it will give them access to spatial data about USC campuses that they can then directly study and analyze.

In the prior year, three URAP students helped create a first iteration of the Hub and prepared five spatial data sets which are ready for sharing with the USC Community when the Hub goes live to the USC community. These include data on trees on the UPC campus and energy use in

⁴ Association for the Advancement of Sustainability in Higher Education. The Sustainability Tracking, Assessment & Rating System, University of Southern California. <https://reports.aashe.org/institutions/university-of-southern-california-ca/report/2021-07-29/>

⁵ Polakovic, G. 2021, February 17. “USC ups commitment to sustainability with new, fossil fuel-free investment strategy”. USC News. <https://news.usc.edu/182493/usc-sustainability-fossil-fuel-free-investment-strategy/>

⁶ Lindberg, E. 2019, January 15. “USC’s green guru tackles myths about sustainability”. USC News. <https://news.usc.edu/153302/uscs-green-guru-tackles-myths-about-sustainability/>

⁷ USC’s Office of Sustainability website describes the variety of sustainability initiatives across campus. See <https://green.usc.edu/programs/>

⁸ United Nations, Department of Economic and Social Affairs, Sustainable Development. 2018. “The 17 Goals”. <https://sdgs.un.org/goals>

⁹ Anderson, T. December, 2019. Introductory letter for Experiential Learning Newsletter, Issue 1. USC Dornsife Office of Experiential and Applied Learning

UPC buildings. The students attended weekly meetings with SSI faculty and staff and met with the Office of Sustainability staff three times. They completed a poster that will be presented at the Spatial Science Institute's LA Geospatial Summit and the USC Undergraduate Symposium for Scholarly and Creative Work this semester.

Work in the coming year will focus on moving from a draft site to a live Hub, ready for access by the USC community.

For the URAP students, this will involve:

- taking part in weekly meetings with faculty and staff of the Office of Sustainability and the Spatial Sciences Institute,
- brainstorming types of data that either show USC's sustainability work or could be used to create a more sustainable university,
- researching whether such data exists by communicating with potential source offices, such as Facilities Planning and Management,
- if such data exists, collaborating with source offices to learn about and gain access to the data,
- filtering, cleaning, and prepping data as needed for sharing,
- creating spatial data sets that do not yet exist,
- communicating with the USC Office of Culture, Ethics and Compliance and USC ITS Office of Information Security to assess safety and ethics issues related to sharing each dataset,
- if necessary, filter, or modify data to address any safety or ethics issues prior to sharing with the broader USC community,
- drafting metadata for each data set that contains a data dictionary of the data's attributes and information about the temporal and spatial quality of the data,
- drafting text for the Hub that describes what each data set contains and what it might be used for,
- mapping each data set to visualize its spatial extent and support understanding by Hub users of what the data contains.

We seek students who have:

- an interest in sustainability;
- an understanding of key spatial concepts, including data models and spatial data quality parameters;
- experience with ArcGIS Pro, including collection, creation, and processing of spatial data;
- experience on a prior project that involved the bringing together of many types of spatial data;
- experience in assessment of spatial data quality; and
- experience with development of web mapping interfaces with ArcGIS Online, including customization of web mapping templates.

Students will meet weekly with Dr. Sedano and Dr. Loyola. Google Sheets containing project information, including data descriptions, to-do lists, and tasks statuses will be used to provide all

- 3) Epidemiology of social determinants of health measures among children visiting the Children's Hospital Los Angeles
- 4) Access and proximity to green space and risk of obesity among children seen at the Children's Hospital Los Angeles.

The proposed studies URAP students will engage in will expand upon foundational research work that the faculty lead has conducted with his grant supported work from the Anesthesia Patient Safety Foundation and the Foundation for Anesthesia Education and Research. The studies proposed are new studies that will provide the URAP students an opportunity to learn about health systems, electronic health records, and the role that spatial science has toward innovating clinical care delivery. The research will be conducted by spatially linking US Census data, air quality data, the CDC Social Vulnerability Index, and the Child Opportunity Index with electronic health records of pediatric patients. The general steps students involved in these projects will be to:

- 1) Conduct geocoding of electronic health record data and visualize where patients come from
- 2) Spatially link social determinant of health data with individual electronic health records for the purposes of exploration and statistical analysis
- 3) Analyze the spatial epidemiology of social determinant of health factors with pediatric patients
- 4) Create maps to visualize patients in the electronic health record that receive care at a children's hospital to effectively communicate research findings
- 5) Share spatial analysis and visualizations with clinicians and hospital leadership to improve clinical care and operational pathways.

The research that each student will contribute to during the URAP will be critically important to expanding our knowledge of the spatial dynamics that influence health and health care delivery. Under the direction of Dr. Jonathan Tan, three students will be involved in the above research endeavors. One student has been working throughout the Summer 2022 and then two students would work collaboratively with Dr. Tan throughout the academic year (Fall 2022/Spring 2023). Work location is flexible with meetings occurring virtually, on the USC campus, and at CHLA depending on the purpose and need.

Role of the Undergraduate Researcher(s)

As Undergraduate Research Associates, each student will be expected to work both independently and collaboratively with the rest of the supervising faculty member's research team. Some of the responsibilities that students can expect include:

- Fill out the appropriate paperwork and standard hospital clearances to work with patient electronic health records
- Conduct accurate geocoding of patient records
- Spatially link US Census, environmental exposure, and CDC data with patient clinical data for the purposes of statistical analysis and spatial exploration

- Create maps and analyze socioeconomic and environmental factors in the context of clinical care
- Present research updates in our interdisciplinary team meetings
- Contribute their experience, education, and problem-solving skills in individual and group collaborative research planning sessions with the goal of improving pediatric health care delivery
- Improving their analytical skills, problem solving skills and communication skills as they build a portfolio of work for future endeavors
- Collaborate on poster presentations and on a manuscript for publication
- Present research at regional and national scientific conferences

Expectations of hours for each student can be flexible depending on the work and stage of research.

For the undergraduate researcher involved in the academic semesters, each of the undergraduate researchers will be expected to average 8-10 hours/week with some of the work carried out remotely.

Previous Undergraduate and URAP Success and Experience

In addition to leading a multidisciplinary research team at CHLA/USC, Dr. Tan has a successful track record with working with two previous URAP students (2021-2022). Both URAP students were successful in integrating with our research team, advancing their analytical skills, and have presented their own work at regional and national conferences. They received training in human subject's research, information retrieval and management, and practiced their written and oral scholarly communication skills. Both students were provided CHLA laptops, software, and remote work tools. These are examples of the regional and national presentations that were given with the URAP students as presenting author:

1. Adiwidjaja A, Kim E, Hsu G, Quiroz PA, Tan JM. Spatial Analysis of Telehealth Utilization in a Pediatric Pain Clinic. Society for Technology in Anesthesia 2022 Annual Meeting. January 2022.
2. Adiwidjaja A, Hsu G, Tan JM. Ambient air quality exposure among pediatric anesthesia patients in a children's hospital: An application of spatial analytics and population data linkage. Society for Technology in Anesthesia 2022 Annual Meeting. January 2022.
3. Adiwidjaja A, Kim E, Hsu G, Tan JM. Geospatial analysis of telehealth adoption and utilization in a pediatric pain clinic. Los Angeles Geospatial Summit. February 2022.
4. Adiwidjaja A, Hsu G, Tan JM. Annual ambient air quality exposure among children receiving anesthesia in a children's hospital for elective surgery. Los Angeles Geospatial Summit. February 2022.

Criteria for Selecting Student Researchers

Student researchers will be selected based on having important skills that are necessary for the project. Familiarity and experience with geographic information systems, spatial analysis, and

Building and Expanding the SSI ArcGIS ‘USC GeoHealth Hub’

John P. Wilson, Ph.D., Professor of Sociology and Spatial Sciences, and Beau MacDonald, GIS Project Administrator

USC Spatial Sciences Institute (SSI) interdisciplinary teams encourage undergraduate student researchers to collaborate with faculty and staff to conduct actionable applied research, often with other USC entities as clients. Two years ago, a three-student SSI team launched the successful USC GeoHealth Hub application: <https://usc-geohealth-hub-uscsci.hub.arcgis.com>. Their effort leveraged an open-data platform to create an interactive website to host a variety of spatial and non-spatial data to allow a broad audience to participate in health research, access diverse health-related data, encourage healthy lifestyles, and connect population, health, and place. Students were engaged in site design, UX/UI, data gathering, creation, visualization, and quality control, and consulted with ArcGIS Hub developers and education specialists at geospatial software and services provider Esri, and met with US EPA EnviroAtlas scientists.

Student teams made multiple highly focused presentations critical to securing research funding and support from our GeoHealth Hub partners, including five Centers and Institutes associated with USC’s Keck School of Medicine (KSOM): The Southern California Clinical and Translational Science Institute, Southern California Environmental Health Sciences Center, USC Norris Cancer Hospital, USC Tobacco Center of Regulatory Science, and the USC Institute for Addiction Science. These entities provide funding as well as guidance on which resources to feature in the GeoHealth Hub. We are expanding the Hub to serve the new Community Health Equity Solutions (CHES) team and their community partners, and are excited to plan multiple enhancements in preparation for an NCI-funded conference hosted by SSI and the Norris Cancer Center, taking place in January 2023.

Our technology uses Esri’s ArcGIS Hub Premium software that is part of USC’s Esri site license administered by SSI. The ArcGIS Hub platform provides tools to share open data, create websites, and organize data, tools, and people around initiatives (e.g., student outreach, sustainability and progress on SDGs; clinical trials and cohort studies). Configurable apps to encourage and support engagement include surveys and crowdsourcing, place explorers, interactive stories and infographics. Apps, maps, StoryMaps, dashboards, and charts allow us to share data and stories in intuitive ways and show progress and accountability. Esri provides strong support, appreciates our product feedback, and continually improves Hub architecture and the ability to collaborate.

In the coming year, we will integrate Koop Node.js web-server tools for on-the-fly transformation of geospatial data that will allow us to connect additional spatial APIs to the GeoHealth Hub. The GeoHealth Hub seeks to make research and acquisition of relevant data effective and efficient. Hub additions this past year included new and updated data sets and informative StoryMap presentations for researchers about interactive CDC geospatial tools and about the process of geocoding, and we plan for our student researchers to create several more StoryMaps in the coming year that help other researchers learn to explore different tools and datasets.

Food Systems

John P. Wilson, Ph.D., Professor of Sociology and Spatial Sciences, and Beau MacDonald, GIS Project Administrator

A team of USC scholars in public health, psychology, health policy, data science and geographic information science, including Spatial Sciences Institute research scientists and SSI Population, Health and Place Ph.D. Program graduate students, have been working with the Los Angeles County Emergency Food Security Branch to better understand the risk factors and health consequences of food insecurity in Los Angeles County. Under the leadership of Kayla de la Haya, assistant professor in the department of population and public health sciences at the Keck School of Medicine of USC, the team has met with L.A. County experts on a weekly basis, answering difficult questions about access to food, changes to food insecurity and food assistance programs across L.A. County, as exacerbated by the pandemic, and how answers to these questions vary based on demographics and neighborhood location. Research findings have informed L.A. County's ongoing efforts to raise awareness of financial and food assistance resources for residents in need.

Please see "More LA County Residents are Hungry during the Pandemic" on the SSI website <https://spatial.usc.edu/more-la-county-residents-are-hungry-during-the-pandemic/> and the "USC Food Insecurity in Los Angeles" webpage <https://publicexchange.usc.edu/food-insecurity-in-la-county/> for links to multiple reports that the team has produced.

As our reports detail, the COVID-19 pandemic created a crisis in the U.S. food supply chain, made disparities in food access worse and led to widespread food insecurity and hunger, which are severe threats to population health and national security. During this crisis, it became particularly difficult for policy makers and community stakeholders to identify populations at risk for food insecurity. Waves of job and income loss during the pandemic meant some households did not have enough money to purchase food. This was coupled with failures in the food supply, such as food shortages and food outlets that closed or had limited hours, and a spike in grocery prices not seen in decades. In parallel, people lost access to school meals, restaurants, and social support networks, and faced challenges to safely and cost-effectively get food from stores and delivery services. Safe-at-home orders, social distancing strategies, and the closure of businesses, schools and community organizations are all important to stop the spread of the virus; however, these policies can also make it difficult to get food.

Our research team continues to evaluate the state of food insecurity in L.A. County and examine the impact of assistance programs. We integrate innovative data sources that reflect our food system's various features to identify dynamics in population food behaviors, food access, food security, and food distributions in L.A. County. Together, this novel integration of different data sources helps us paint a picture of the resiliency and failures of the local food system and help chart a path for long-term strategies for food.

This year we will incorporate a series of dashboard-type data visualizations and interactive applications for the County of Los Angeles. These new resources we will develop will allow L.A.

Health Equity

John P. Wilson, Ph.D., Professor of Sociology and Spatial Sciences, and Beau MacDonald, GIS Project Administrator

The Southern California Center for Chronic Health Disparities in Latino Families and Children aims to reverse obesity and obesity-related chronic diseases in Latinos with culturally sensitive solutions. USC, in partnership with Children's Hospital Los Angeles, recently won a \$24.5 million NIH grant to launch a center aimed improving Latino health across Southern California, fighting obesity and related chronic diseases in Latino children and families across Southern California. This new regional center established a consortium across 10 counties, home to nearly 11 million Latinos who represent 45.2% of the population. The consortium brings together universities, hospitals and community groups; the goal is to develop and test culturally sensitive, family-based interventions to the complex mixture of early-life nutrition, environment and social factors that set kids up for risk of obesity and obesity-related chronic diseases for the rest of their lives.

Spatial Sciences Institute researchers led by Dr. John Wilson will conduct geospatial assessments and provide technical expertise in social and environmental determinants of health to support and build the research enterprise as part of the Methods and Data Sub-Core for the new Center. The project was envisioned by Michael Goran, a professor of pediatrics at the Keck School of Medicine of USC and director for diabetes and obesity at the Saban Research Institute at Children's Hospital Los Angeles (CHLA), a national leader in pediatric research. Goran, who has focused his research career on the causes and consequences of obesity, especially in Latino children, will co-lead the effort with Lourdes Baezconde-Garbanati, a tenured professor in the department of population and public health sciences at the Keck School of Medicine and an expert in community engagement. The community outreach and engagement offices at both the Southern California Clinical and Translational Science Institute and the USC Norris Comprehensive Cancer Center will play a central role in engaging various partners in Southern California in outreach to Latinos.

USC researchers seek interventions tailored to the Latino community. According to Baezconde-Garbanati, "parents are always very eager to do what they can to improve the health of their children, but interventions can't be one-size-fits-all. What's going to make these interventions easy to adopt is they are very culturally- and language-specific. They are developed with community input, and that makes all the difference." For example, the center will test new strategies such as the idea of "food prescriptions," or affordable grocery delivery accompanied by meal plans tailored to Latino culture led by a team at Kaiser Permanente, as well as parent training via telehealth on topics such as reducing sugary drinks in women and infants led by a team at the University of California, San Diego. Promotores de salud, or community health workers, will disperse the center's findings.

