Center for Applied Spatial Analysis | CASA

Annual Report 2021 - 2022

by
Dr. José R. Díaz-Garayúa, Ph.D.
Dr. Alison McNally, Ph.D

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Letter from the co-Directors

Colleagues and Friends,

We are thrilled to report on the Center for Applied Spatial Analysis' (CASA) achievements for the Academic Year 2021 – 2022. This brief report provides information about CASA's initiatives and activities that have been contributing to Stanislaus State's Mission, Vision & Values.

This report on both physical and applied human geography accomplishments assures to the Stan State community and its leadership CASA's *raison d'être*:

- Service – providing programs to the university & general community
- Teaching – as a source of extracurricular workshops
- Research – producing and publishing project-related works
- External Funding – attracting revenues to invest in our students

This academic year CASA has again secured external funds from Stanislaus County Health Services Agency to develop a preliminary study on Park Use that will be use to implement programs to benefit the community. This work was led by Drs. Díaz-Garayúa and Logan (Anthropology). The external funds, close to $30,000, were mostly used to hire students Research Assistants that contributed on this work while gaining applied experience.

In addition, Dr. Díaz-Garayúa and Dr. Anna V. Song (NCPC - UC Merced, Psychology) worked on a grant proposal of the Tobacco-Related Disease Research Program (TRDRP). Dr. Meggan Jordan (Sociology) joined this initiative that will fund 15 students from 2022 – 2025. This project secured $1,400,000 to fully fund three cohorts of students that will be advocates for tobacco control through education, research, and field experience as well as applying spatial analysis (GIS). It is worth to mention that CASA Office becomes the headquarters of these scholars.

These and other accomplishments are summarized in this report. This is a continuation of CASA's growth and progress: a very important stage for the advancement of our Geography Program.

We profoundly thank the support of our Advisory Board:

- Dr. Peggy Hauselt, Director of Geography and Chair of the Department of Anthropology and Geography.
- Dr. Meggan Jordan, Associate Professor of Sociology & Representative for the College of the Arts, Humanities, and Social Sciences.
- Dr. Melanie Martin, Professor of Computer Science and Representative for the College of Sciences.
- Mr. Darrell Cordova, Manager of Triple C Farms, LLC and a Community Member.

We also want to extend our most sincere gratitude to Norma Cordova. Likewise, we thank Mr. Cameron Pallotta, M.S., who is the Keck Computer Lab Manager and has supported the GIS Instructional Laboratory and CASA's initiatives. Similarly, we thank Mrs. Ericka Sweitzer Dores for her constant administrative support. In addition, we want to recognize with our deepest appreciation the continuous support of Dr. James Tuedio, Dean of the College of the Arts, Humanities, and Social Sciences as well as Provost Ogle and President Junn.

Best wishes,

José R. Díaz-Garayúa

José R. Díaz-Garayúa, Ph.D.
Associate Professor of Human Geography
Director of Geographic Information Systems
Co-Director of CASA

Alison McNally

Alison McNally, Ph.D.
Associate Professor of Physical Geography
Co-Director of CASA

Mission Statement

The Center for Applied Spatial Analysis (CASA) at California State University, Stanislaus offers geospatial consulting services to the campus and regional community. In this capacity, it also serves as a conduit for outreach to our larger regional community. CASA coordinates internships, facilitates grant development, and conducts projects in partnership with campus and community members. These projects improve student learning by providing applied experiential learning and professional development opportunities.

Purpose of CASA

A) PURPOSE OF THE UNIT:

CASA offers an alternative space, with the potential for self-sustainability, to foster applied spatial analysis in the Central Valley and beyond, stimulates transdisciplinary and collaborative geospatial research among faculty members, research, and professional experience for undergraduate and graduate students, and a venue to attract external funding through grant writing proposals and the offering of professional services for both public and private sectors that are key to the development of student service learning. In addition, CASA will offer support to local community groups who can benefit from geospatial application and analysis.

B) NEED FOR THE UNIT:

Our campus currently lacks a dedicated center for faculty, staff, and students to request research assistance as it relates to geospatial analysis (including maps and other graphic displays of geographic data). CASA will offer the organizational structure to support such research requests, as well as requests from our six-county service region. CASA will also offer the much-needed flexibility to integrate student Service Learning opportunities with these research programs, thus strengthening ties with our campus and local community.

C) NATURE AND SCOPE OF ACTIVITIES:

CASA and its partners will work to develop project proposals, workflow activities, and deliverables for each project the Center is involved with. Projects may include any of the following, according to specific needs of the project:

I. Cartography and Visualization (traditional, internet, etc.): CASA would work with partners to determine appropriate deliverable cartographic products for the proposed project. These products may include traditional paper maps, online or web mapping, animations or 3-D visualization, or other products. CASA will work to ensure that proper cartographic methodologies are adhered to when developing these products and to ensure publication or reproductive suitability.

II. Remote Sensing Data Preparation and Analysis: Remotely sensed data, including multispectral and hyperspectral satellite data, aerial imagery, LiDAR data, UAV data, and GPS data, is being utilized across disciplines (e.g. geography, agricultural studies, biology, ecology, hydrology, etc.) and for a variety of applications (e.g. land use change, climate studies, urbanization, crop health, irrigation management, etc.). Applications and use of remotely sensed data are expected to increase as larger and more robust remotely sensed data are widely available often times at no cost. Processing of remotely sensed data requires the use of image processing software and a specialized set of training/skills to interpret and produce accurate

results. CASA would provide the skills and training necessary to collect and analyze remotely sensed data.

III. Spatial Statistics and Analysis: Analysis of spatial relationships is a key component of geographical research because it allows for analysis of various phenomena that occur over geographic space and time, and considers how these variables are related. Because variables may be related, a special set of statistical tests are employed to correctly recognize and analyze spatial data. Spatial data are often collected and stored in various formats, which presents a potential problem for data manipulation and exchange. CASA will work with partners to provide the expertise and skills necessary for collection, storage, management, and appropriate analysis of geospatial data.

IV. GIS Database Development and Design: Data involved in geospatial analysis can take many formats, thus the potential for improper data analysis exists. Geospatial data, in particular, must be managed in a database that has the ability to integrate easily into GIS software. Collection and maintenance of spatial databases requires a proficiency with GIS software, and knowledge of how geospatial data is integrated into other software systems. CASA can provide geospatial database support, and/or provide guidance necessary for data acquisition.

V. 3D Visualization and Spatial Modeling: 3D visualizations can play a key role in communicating geospatial data to a varied audience. Spatial scenarios given a set of particular conditions. Recent applications of 3D visualization and spatial modeling include climate change scenarios, habitat analysis for endangered species, population growth, land use conversion, and changing agricultural cropscapes. CASA will work with partners to develop visualizations and/or modeling tools that allow for analysis of geospatial data.

VI. Preparation and Analysis of Field Data: CASA will assist partners in collection, processing, and/or maintenance of a variety of field data. These field data may include those data collected with GPS and other sensors. CASA can provide skills necessary to integrate these field data into a database suitable for geospatial analysis.

D) CURRICULAR OFFERINGS:

Short Courses and Instructional Modules: CASA recognizes the importance of specialized training, especially on a University campus. CASA will be available to develop custom instructional material for short courses, workshops, and other types of training sessions (see listings below). Curricular offerings will not compete with courses already incorporating geospatial technologies in their curriculum, but rather will serve as an introductory exposure to similar technologies.

1. Short courses/workshops – short courses to inform campus and community members of readily available resources such as open source or proprietary toolkits (ArcGIS Pro, R, etc.), general instructions for using GPS devices and downloading acquired data will be offered. Additionally, short term workshops can be setup to guide the campus community when they are setting up projects that involve geographic research components (concepts, methods, technical application etc.)2. Studio/seminar courses – formal courses will be structured for current students (as CASA consultants) to share consulting experiences, up-to-date application and education material that could further enrich geographical education and research on campus.

CASA's Achievements

1. PEOPLE SERVED AT WORKSHOPS, SHORT COURSES, OR TRAININGS

Number of students, faculty, and staff served in workshops, short courses, or trainings.

During this Academic Year 2021 – 2022, CASA facilitated **1 workshop**:

1) This workshop, originally planned for Spring 2019 after a collective mapping initiative of CASA & the WCCC but cancelled due to the pandemic, started CASA's ***in person*** programmatic events for our campus. This *Applied Human Geography* workshop combined Geography, Linguistics, and GIS. The workshop "**Stanislaus State's Language Scape**" was led by **Dr. Díaz-Garayúa** on April 7, 2022 and served **4 students**, **2 faculty members, and 2 staff members**. This workshop took place at the GIS Instructional Laboratory located in LX2 and also was made possible with the support of the Warrior Cross Cultural Center, led by **Carolina Alfaro**.

FIGURE 1. PARTICIPANTS AT THE LANGUAGE SCAPE WORKSHOP
PHOTO: CAROLINA ALFARO

2. NUMBER OF COMMUNITY MEMBERS AND ORGANIZATIONS SERVED AT PROGRAMMATIC EVENTS

Number of community members served through campus programming.

During this Academic Year 2021 – 2022, CASA facilitated **two programmatic events**: 1) *The Geography Awareness Week & GIS Day* and 2) *Science Day*.

1) The **2021 Geography Awareness Week** took place during the week of November 15 to 19, 2021 and the **GIS Day** on Wednesday 17 of the same week. Since all in person activities were restricted during that semester, three webinars were organized:

- **Language & the Right to Public Space**, with Dr. Jhonni Carr
- **Experiences of a GIS professional**, Mr. Gene Barrera, Mrs. Kaley Lopez, and Mrs. Kristi Kelechenyi
- **Thinking Geographically: Making "Known" Research Problems Unique**, Dr. Ana Sánchez

Following the 2019 and the 2020 presentations, the 2021 Geography Awareness Week and GIS Day will be fully available online for the general community and available with both English and Spanish subtitles at www.csustan.edu/geography/gis-day.

The presentation *Language & the Right to Public Space*, was co-organized by **Dr. Ortiz-Loyola** (Modern Languages) and welcomed **73 people** from 60 different zip codes in 31 cities, and 2 states. The Panel, *Experiences of a GIS professional*, attracted over **40 viewers** from 27 cities and 3 countries. Dr. Sánchez-Rivera's lecture received an **audience of over 40 attendees** from 32 different zip codes, 18 cities, and 3 states. In total, The Geography Awareness Week and GIS Day, organized by **Dr. Díaz-Garayúa**, **served 153 persons**.

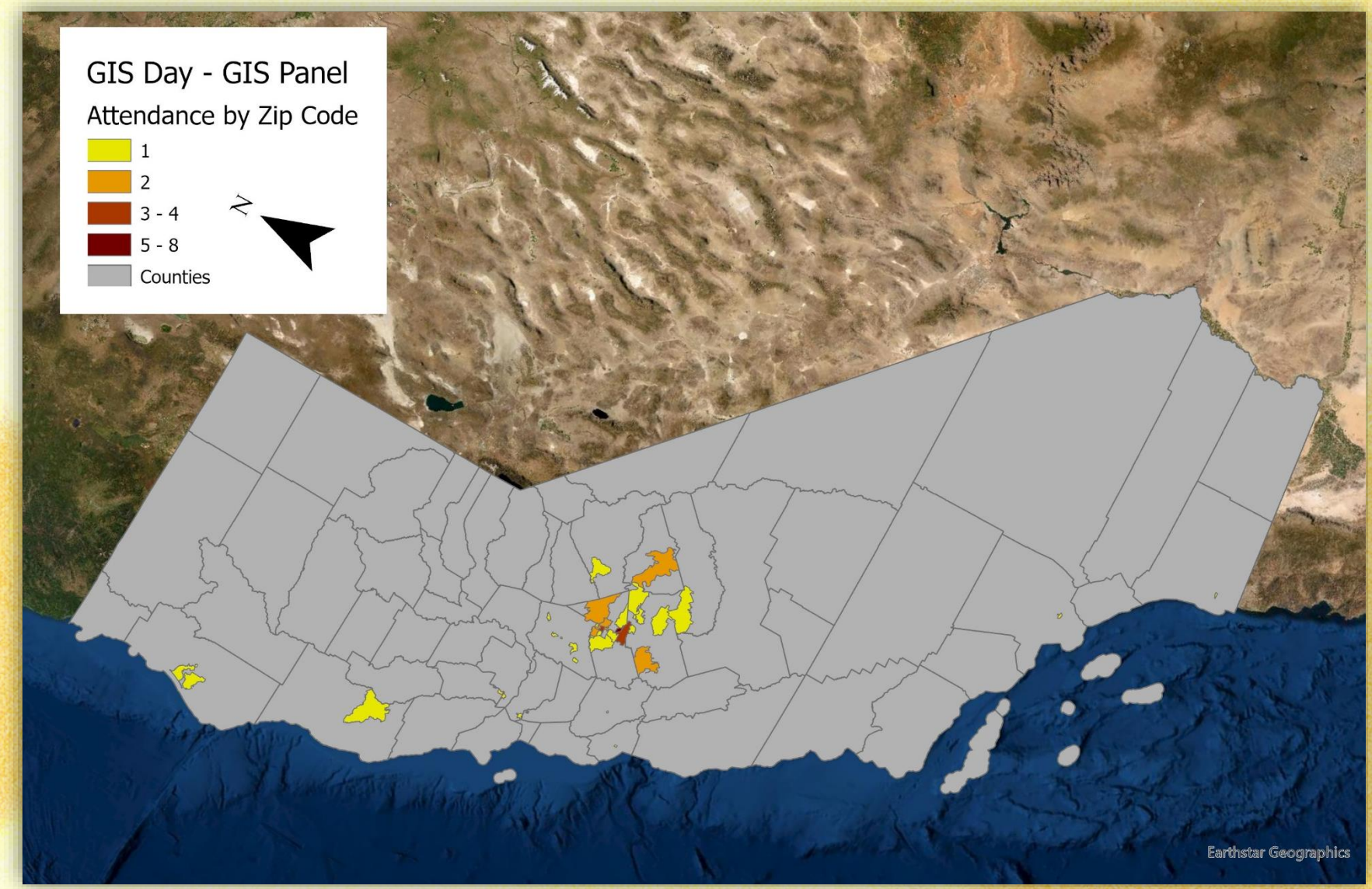
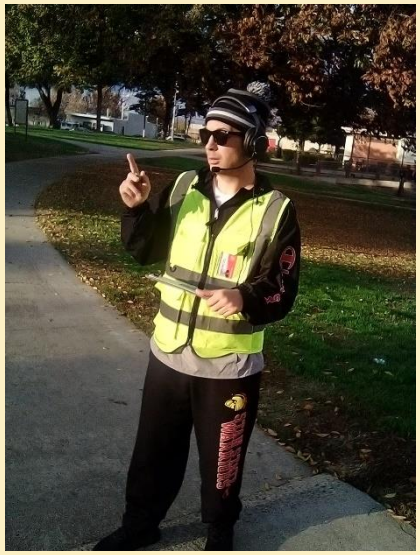


FIGURE 2. GIS DAY ATTENDANCE BY ZIP CODE TO THE PANEL EXPERIENCES OF GIS PROFESSIONALS

2) This year' Science Day took place on April, 2022 in its virtual format. The Science Day, established and principally directed by Dr. Grobner, is oriented to expose young students and visitors to a variety of fields in science, especially in the area of STEM. Geotechnologies is a STEM area recognized by the Nation Science Foundation. Dr. McNally has been working on this event for years and has been able to increase the attendance. The 2022 Science Day event GIS activity was organized and led by **Dr. McNally** and served **84 persons**.



Joseph Flores, Criminal Justice (CJ)

Elissa LaComb, Geography & CJ

FIGURE 3. RESEARCH ASSISTANTS: PARK USE PROJECT

3. NUMBER OF PROJECTS PARTNERSHIPS, GRANTS, & CONTRACTS

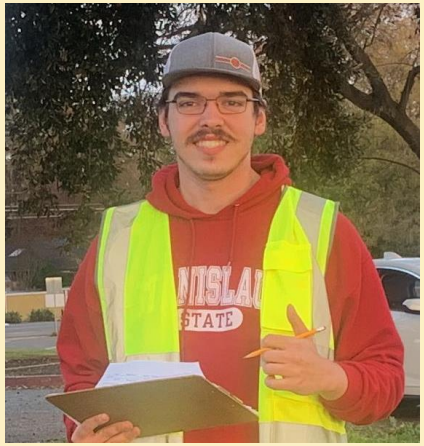
Number of projects that included student researchers.

During the Academic Year 2021 – 2022, CASA has secured **one contracts** with the Stanislaus County Health Service Agency, it has been working on three other **projects** for Research Development. Two of these three project are intended to be developed for the search of external funds.

1. The Stanislaus County Health Services Agency commissioned **a work** on Park Use. These Applied Human Geography projects consisted on the digitalization of parks, interviews and others to assess of park use. This project, led by **Dr. Díaz-Garayúa (PI)** and **Dr. Ryan I. Logan** (co-PI), with **10 (paid) Research Assistants** and **1 (volunteer) Intern** across campus (see Figure 2 and 3).

- Isabella Cardenas, Geography (Research Assistant), 2021
- Joseph Flores, Criminal Justice (Research Assistant), 2021
- Jamie Foltz, Sociology (Research Assistant), 2021
- Katelin Foster, Anthropology (Research Assistant), 2021
- Sara Hollingsworth, Anthropology (Research Assistant), 2021
- Samantha Keiser, MA Student in Social Work (Research Assistant), 2021
- Elissa La Comb, Geography & Criminal Justice (Research Assistant), 2021
- William Ladine, Social Sciences (Research Assistant), 2021
- Aida Monique Meza, Health Sciences (Intern), 2021
- Vanessa Padilla, Geography (Research Assistant), 2021
- Cynthia Salinas, Child Development (Research Assistant), 2021

Cynthia Salinas, Child Development



William Ladine, Social Sciences

FIGURE 4. RESEARCH ASSISTANTS: PARK USE PROJECT

2. A collaboration between **Maureen McCorry**, instructor for HONORS 2850 and **Dr. Díaz-Garayúa**, has facilitated a new initiative on GeoHumanities with two students. This project stamps immigrant experiences through time and space on a Story Map. This project will be available through CASA's website.

   - Ashley Mendez, English & Theater (Intern), 2022
   - Guadalupe Vicente, English (Intern), 2022

   A collaboration between **Maureen McCorry**, instructor for HONORS 2850 and **Dr. Díaz-Garayúa**, provided an intern to continue with the RRC project started on 2019 after a subvention from the Froba family.

   - Bradley Magnussen, Biology (Intern), 2022

3) In Fall 2021, Biology major Laura Plascencia reached out to **Dr. Díaz-Garayúa** looking for research opportunities. Planning started in November and the research was initiated in Spring 2022. This project examined urbanization and front yards. This work has benefitted from the expertise and collaboration of **Dr. Andrew Gardner**, chair of the Department of Biology, and **Dr. Austin Avwunudiogba** (Geography). Laura's work will be used to search and apply for externally funded grants to support our students.

   - Laura Plascencia, Biology (Research Assistant)
     - Individual Undergraduate Research Project
       - Pilot Study – Neighborhoods & Front Yard Survey
       - Pilot Study to be used to apply for external funding

FIGURE 5. LAURA PLASCENCIA WORKING ON A PROJECT

4. EXTERNAL FUNDING

Number of grants, contracts, and fundraising.

During this Academic Year 2021 – 2022, CASA has secured **one contract** with the Stanislaus County Health Service Agency for Park Assessments. In addition, CASA, in partnership with the UC Merced's Tobacco & Cannabis Policy Center (TCPC), has **secured $1.4 million from the Tobacco-Related Disease Research Program** (TRDRP). Stanislaus State will be the recipient of over 73% of the funds over the next 3 years to work on a tobacco control pipeline that will include coursework, research experience at UC Merced, and field work with a Public Health Agency at an assigned county.

1. 2021 – 2022, Contract, Stanislaus County Health Services Agency, **Dr. Díaz-Garayúa (PI)** & **Dr. Logan I. Ryan** (co-PI).
   Amount: **$29,344.17 (granted)**.
2. 2022 – 2025, Grant, Tobacco-Related Disease Research Program, **Dr. Díaz-Garayúa (PI), Dr. Anna V. Song** (co-PI), UC Merced, and **Dr. Meggan Jordan** (Sociology) (Co-PI).
   Amount: **$1,400,000 (granted)**, around 73% for CSU, Stanislaus.

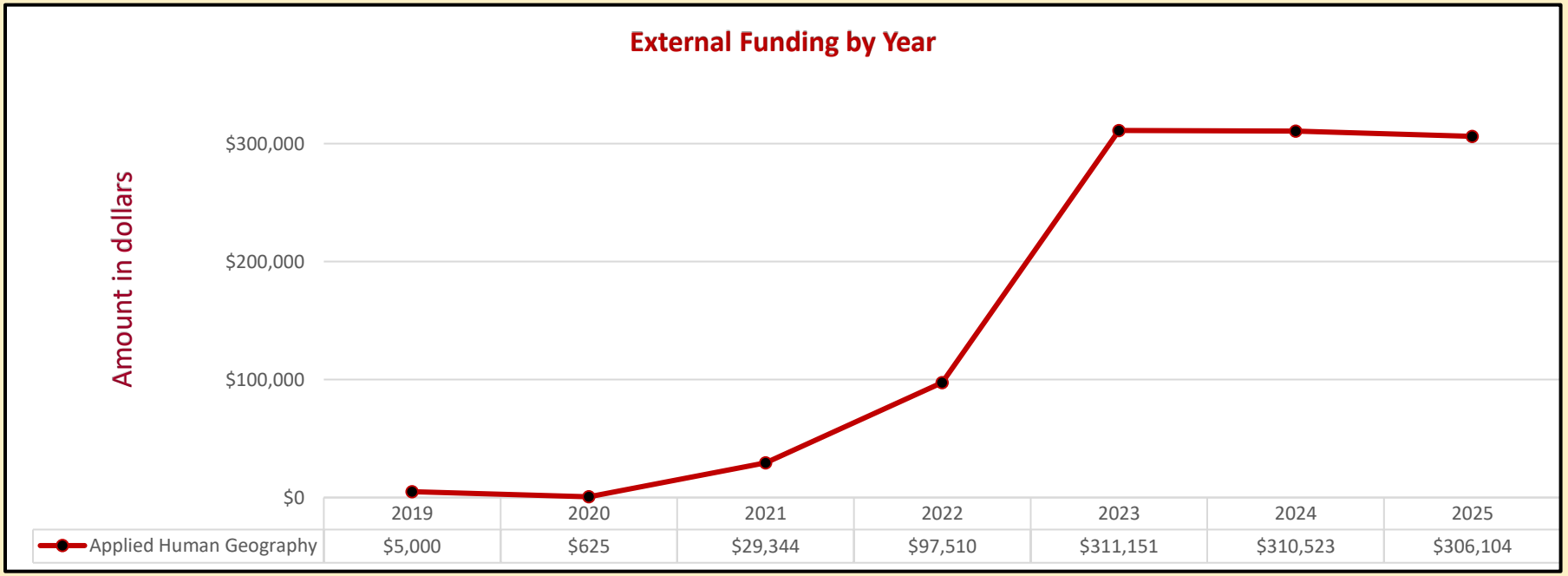


FIGURE 6. EXTERNAL FUNDING: APPLIED HUMAN GEOGRAPHY

3. 2021 – 2022, subcontract through collaboration with UC Davis, the Urban Wildlands Group, and the US Fish and Wildlife Service, **Dr. McNally**.
   Project: Captive Rearing and Release to Support Recovery of Lange's Metalmark Butterfly at Antioch Dunes National Wildlife Refuge
   Amount: **$1,250 (funded)**.

4. 2021 – 2022, subcontract through collaboration with the Community Equity Research Center (CERC) and the Community Foundation of San Joaquin, **Dr. McNally**.
   Amount: approximately **$30,000 (in process)**.

5. 2021 – 2022, Five Star and the Urban Water Restoration Program **Dr. McNally**.
   Amount: **(under development)**.

6. 2021 – 2022, exploreCSR, **Dr. McNally**.
   Amount: **(under development)**.

FIGURE 7. WORKS AT ANTIOCH DUNES NATIONAL WILDLIFE REFUGE, ANTIOCH, CALIFORNIA

5. OTHER ACCOMPLISHMENTS

Other accomplishments include but are not limit to Networking, Service Learning, Community Service, Professional Development, etc.

CASA's work is not limited to the previous four categories. CASA extends it work according to its capacity. Below a list of other achievements that have permitted the development of professors, students, and the Geography Program while serving at local, regional, national, and international level.

1. **Dr. Díaz-Garayúa** | Collaboration with **Dr. Anna V. Song** from the Nicotine & Cannabis Policy Center at UC Merced.
   - Research Affiliate
   - Partnership Opportunities
   - External Funds Search Partnership

2. **Dr. Hauselt** & **Dr. Díaz-Garayúa** | Panelist (Community Service) for Rural Initiatives Strengthening Equity, North Coast.
   - Tobacco Product Waste Learning Institute
   - Panelist in the 2nd Annual Toxic Tobacco Trash Webinar

3. **Dr. Díaz-Garayúa**, **Dr. McNally**, **Dr. Hauselt** | Networking with **Anysia P. Mayer** the Community Equity Research Center (CERC), CERC Partner's Meeting, and posterior meetings.
   - Partnership Possibilities

4. **Dr. Díaz-Garayúa** | Networking and contract development with **Kyle Fliflet** from the Health Service Agency, Stanislaus County.
   - Internships Opportunities
   - Contract Development

5. **Dr. Díaz-Garayúa** | Professional Development.
   - Office of Research and Sponsored Programs
     - January – December 2022 (**Award**)
   - AAG Session on MSIs (zoom)
     - February 25, 2022 (3:40 PM Eastern) **(Guest)**
   - NEH workshop (UC Merced)
     - January 28, 2021 (zoom)
   - NSF sponsored workshop, Advancing Geography in Minority Serving Institutions, Baltimore, MD.
     - February 18, 2021 (zoom)
     - March 18, 2021 (zoom)
     - October 21, 2021 (face-to-face) (**Award**)

6. **Dr. Díaz-Garayúa** | Collaboration with the California Spanish Working Group.
   - Faculty Lead: **Covadonga Lamar Prieto**, UC Riverside
   - Objective: to create a series of methodologies and pedagogical approaches that can be applied to the sociolinguistic mapping of California Spanish.
   - Participants:
     - UCR, UCB, UCSD, and UCLA
     - CSU, San Marcos, Pomona, SDSU, CSUN, Stanislaus & Bakersfield
     - Loyola Marymount, El Camino College, and Universidad Autónoma de Baja California

7. **Dr. José R. Díaz-Garayúa** | Service Learning (**Jen Sturtevant**) through the course GEOG – 4855 **Urban GIS** serving Student Affairs.
   - Campus Map using Field Maps (Figures 6 and 7)

8. **Dr. Díaz-Garayúa** | Collaboration and Research Development with **Dr. Andrew Gardner**, Biology and **Dr. Austin Avwunudiogba**, Geography.
    - Pilot Study for grant application

9. **Dr. Díaz-Garayúa**, **Dr. McNally**, and **Dr. Avwunudiogba** | Professional Development.
    - Faculty Grant Writing Group (FGWG) Award, ORSP
    - 18 Faculty member campuswide
        - Three (3) Geography faculty members

10. **Dr. Díaz-Garayúa** | Collaboration with **Dr. Wura Jacobs**, Kinesiology).
    - Research Collaboration

11. **Dr. McNally** & **Dr. Díaz-Garayúa** | Networking with Academic Affairs, Program Manager of the *Civic Action Fellows*, **Erin Littlepage** and **Miriam Ureño Moreno**. | **College Corps**
    - **Dr. McNally**, Research Opportunities
    - **Dr. Díaz-Garayúa**, Research Development

12. **Dr. Díaz-Garayúa** | Collaboration with Dr. **Mirta Maldonado**, (English).
    - Research Development

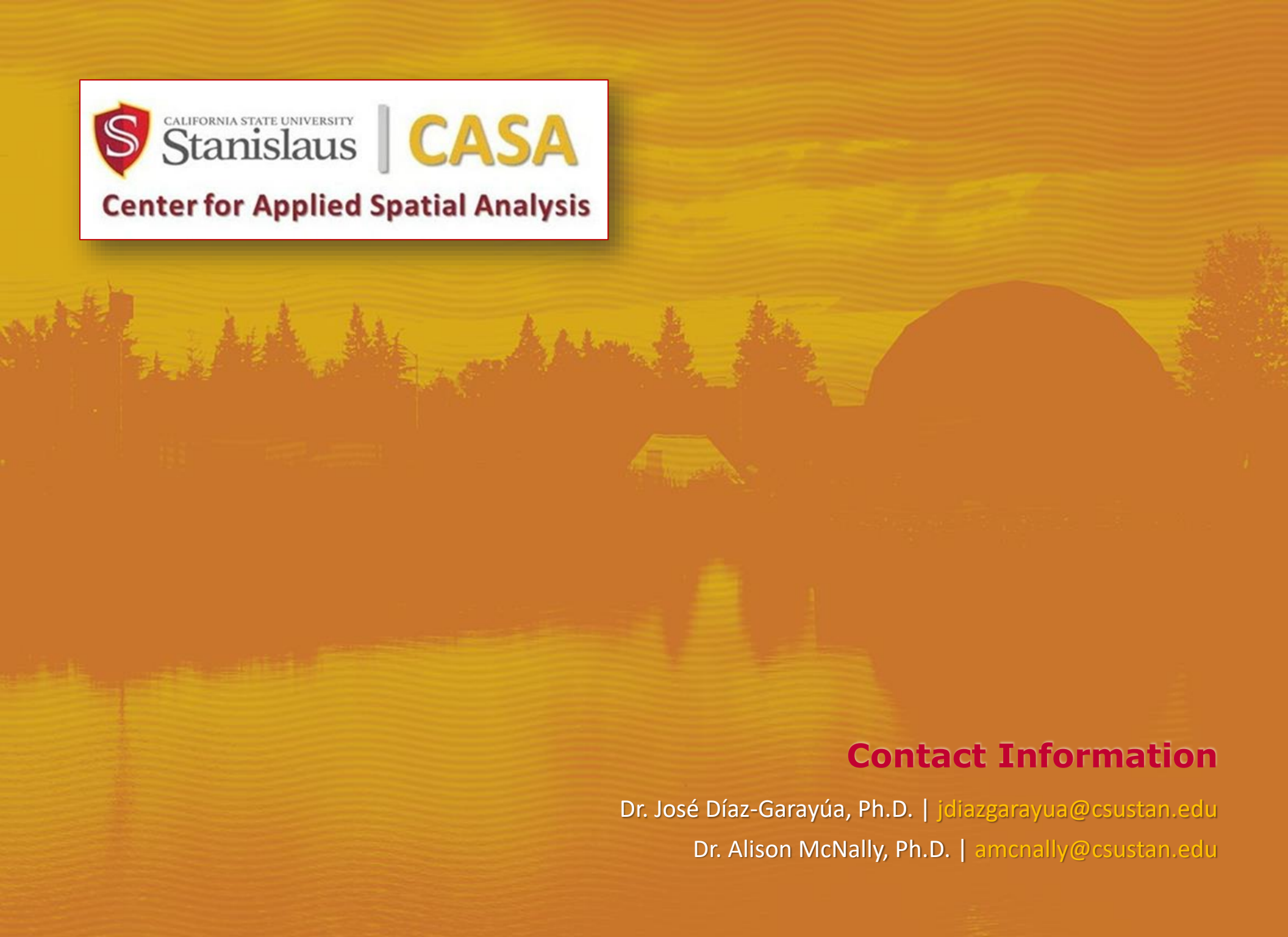
13. **McNally** | Professional Development.
    - GeoCamp Iceland | NCGE (June 28 – July 8)
        - Funded by the Provost's Office and the Geography Program
        - Network with physical geographers and geoscientists in Iceland and the U.S.

14. **Dr. Díaz-Garayúa** | Publication outcome from CASA's initiatives.
    - Hernández-Lara, Oscar Gerardo; **José Díaz-Garayúa**; and Kevin Butler **(2022)** COVID-19 deaths in México: A spatiotemporal analysis in Stanley D. Brunn and Donna Gilbreath (eds.) *COVID-19 and an Emerging World of Ad Hoc Geographies*. Springer.

15. **Dr. McNally** | Service Learning collaboration with Wild Orca, in Washington through the course GEOG – 5852 **Advanced GIS**

16. **Dr. Díaz-Garayúa** and **Mr. Pallotta** have been at the forefront of CASA's office housekeeping by closely supervising the physical facilities. During the last year, a series of problems have been solved. As a result, CASA continue functional to carry on research. Some of the issues that were identified in the physical plant:
    - Heating and Cooling System | August 2021, the Support Office of Facilities fixed the cooling and heating problem.
    - Security problems | Dr. Díaz-Garayúa met with Dr. Hauselt, Chairperson of the Department of Anthropology and Geography. They, met UPD, the Support Office of Planning and Capital Management, and other personnel. After a meeting (November 19, 2021) the problems were greatly reduced.
    - Water leaking | On December 2021, Dr. Díaz-Garayúa identified a water leaking in CASA office. Mr. Pallotta established contact with the Support Office of Facilities on December 13, 2021. The Support Office of Facilities fixed a water leaking.

    In the future, CASA expects to find a solution to a wall vent between LX3.1 (Language Lab) and LX3.2 (CASA). This failure in design cause disruption in both sides and limit the proper use of both spaces.



Contact Information

Dr. José Díaz-Garayúa, Ph.D. | jdiazgarayua@csustan.edu

Dr. Alison McNally, Ph.D. | amcnally@csustan.edu