



California State University
SAN MARCOS

Proposal to Complete and Launch:

The Certificate in Applied Geographic Information Systems

Submitted to:

THE CSU COMMISSION ON THE EXTENDED UNIVERSITY
2015-2016

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Project Abstract:

The Department of Liberal Studies' new certificate in applied Geographic Information Systems is a perfect candidate for 2015-2016 funding from the Commission on the Extended University (CEU). The certificate shares many of the objectives identified in the report *Planning Tomorrow's Future: A New Framework for Action* and in the CSU system strategic plan, *Access To Excellence*. Geographic Information Systems(GIS) are digital tools for analyzing spatial data in a whole range of fields from local planning and fire protection to international aid. The purpose of this new program is to provide training in GIS to meet the state's workforce and development needs and to expand access to educational opportunities by reaching out to broader constituencies. Labor force data shows that GIS remains a growing field in the state. The certificate is targeted towards students, people changing careers or on the job market, and employed GIS professionals in need of higher level skills and continuing education. The program therefore represents a CSUSM effort to creatively develop new programs and alternative instructional delivery systems using self-support. By providing training in GIS, the program provides lifelong learning opportunities and could very well support international educational experiences as GIS is widely used internationally and the program intends to build cross-border relationships. The program is planned as a cohorted, two semester, evening course of study and so by design makes effective use of university resources during off-peak times. Thus the program aligns with many of the core evaluation criteria outlined in this year's RFP such as:

- Meeting California's economic and workforce development needs
- Increasing access to educational opportunities by serving broader constituencies
- Creatively developing new programs, and
- Providing personal and lifelong learning opportunities

Project Description:

Geographic Information Systems are digital tools for analyzing spatial data in a whole range of fields from local planning and fire protection to international aid. At CSUSM, much of the GIS instruction has focused on providing opportunities for various disciplines to experiment with using GIS in course work. The Department of Liberal Studies collaborated with the geography program at Palomar College, and successfully competed for a multi-year National Science Foundation grant to progress “GIS across the curriculum.” Yet there is a need to provide additional applied training in our service region through the certificate program which has support from faculty on the campus and from our partners.

The intent of the new program is to provide advanced training in *applying* GIS to the analysis of complex problems that professionals face on a daily basis. Typically GIS training involves technical and applied training in geographic information science. The technical training involves learning how to use the software associated with Geographic Information Science; in our service area, Palomar College already has a well-respected program providing such technical training. There are two opportunities for CSUSM on the applied side. The first is to provide GIS professionals, students and job-seekers with added value through the acquisition of higher level analytical skills in applying GIS tools to specific issues and problems. For it is one thing to be able to technically operate a GIS software package; it is another thing to understand and develop GIS data that is appropriate for a given field, conduct analysis that is appropriate for the specific topic, and be able to present information and results in a useful fashion.. The second is to develop this certificate as a stackable set of certificates that add value to baccalaureate degrees beyond the usual undergraduate degree.

The labor market data for such training is quite promising. People with GIS training are expected to see a 14% increase in job opportunities nationally through 2022, according the Bureau of Labor Statistics. California's prospects are somewhat better than this; it is expected to see 16% growth over the same period. These professionals map and analyze diverse data for county planning departments tracking parcel data, fire prevention agencies conducting preparation and planning, and disaster planning departments assessing social vulnerability, among others. With the increase in jobs comes as well an increase in the use of maps and the data necessary to build them. Thus graduates and existing employees with higher level GIS training are going to be attractive to a variety of local, state and federal agencies, non-profits and the private sector as they seek or seek to maintain staff on the cutting edge of GIS. Additionally, completion of the certificate will count towards fulfillment of the standards for GIS-Professional certification offered by the national GIS Certification Institute. Also noteworthy is the recent finding that social science graduates double their job opportunities through acquisition of technical training like GIS. In short, the certificate in applied GIS is aimed at providing existing students and professionals with training and retraining as the case may be that will enable them to be competitive on the labor market over the next several years.

Program Implementation:

Over the past two years, the Department of Liberal Studies has worked with CSUSM Extended Learning to develop the certificate. The certificate is a four class, two semester course of study in the advanced application of GIS, using a cohort model. The courses are: Geog 320 Patterns of San Diego County, Geog 340: GIS Across the Curriculum, 430: Geovisualization, and the capstone course, Geog 435: Research in Geographic Information Systems. Students take the 300 level courses concurrently before doing the same with the 400 level courses. These courses

are specifically designed to move the student from high intermediate to advanced level skills to use in their work places. The program is not for introductory GIS by design. The courses have been approved by the College Curriculum Committee and the certificate awaits Academic Senate approval this Spring.

The Liberal Studies department anticipates program launch in 2015/2016. But there are a range of key issues which must be addressed for a successful launch and which require grant support now. These are start-up costs. Successful grant support now will enable long-term program sustainability as the costs identified in the grant are believed to decline over time, which should make this proposal attractive from an evaluator's standpoint; the program will continue after the grant runs out and the grant money will make the delivery, integrity, and viability of the program much improved. The grant funding is aimed at addressing critical needs in staff and curriculum development, partner development, outreach and marketing, professional development and data infrastructure. The program anticipates that provided with sufficient funding, the GIS certificate will launch in Spring 2016 for the first time with a fully developed curriculum and staffing in place to provide a successful and rich course of advanced studies in GIS.

Staff and curriculum development:

This grant will underwrite development of a new model in GIS education. To rollout this new certificate, the department needs to identify, inform, manage and evaluate experienced and knowledgeable part-time faculty, which helps achieve the *Access to Excellence* goal of investing in faculty excellence, and staff and administrative professional growth. Importantly the department will work with new faculty and staff individually to develop course content, to coordinate syllabi, curricula, and the faculty themselves, and to ensure program coherence and broad recognition of the uniqueness, operation and value of the new certificate program. Staff

will participate on the CSU GIS Specialty Board to stay current on the statewide GIS curriculum. This staff development is critical to effective student learning and new program coherence because the field of GIS is a rapidly evolving one.

Partner Development:

At the heart of the new certificate program is significant collaboration with diverse partners which will improve accountability for learning results and help to achieve CSU's responsibilities for meeting the state's post-baccalaureate needs including those of working professionals. To start, the department anticipates coordinating with SDSU, Palomar College, and other feeder institutions as necessary, to ensure our certificate integrates (and thus "stacks") with their existing programs. Dr. Kimberley Knowles-Yanez has been working closely with Palomar's Geospatial Science Advisory Board for years. It has been a key way to ensure the campus remains on top of what GIS professionals in our service area need and want, and led in the past to multiyear NSF funding for GIS in North County. The board is composed of various institutional representatives (governments, NGOs, private firms) who use GIS extensively in our service area. A portion of staff release time is devoted to cultivating and building similar partner relationships that will help guide program development.

Outreach and Marketing:

This grant proposal also seeks funds for development of a comprehensive marketing plan to create program awareness among diverse constituencies. Partner development is also linked to outreach. Collaboration with Palomar College and other institutions will facilitate recruitment of students to enroll in our certificate thus expanding student outreach, another objective of the *Access to Excellence* report. (Palomar students include working professionals seeking retraining

as well as associate degree candidates.) Outreach will also require finding, managing and maintaining internship opportunities and relationships (thereby enhancing opportunities for “Active Learning”). Successful program launch will require time to identify and meet with potential partners about their staff training needs and related issues. These include but are not limited to SANDAG, Employment Development Department, Military outreach, cross-border relationships, San Diego County Sheriff’s office, SDG&E, and similar organizations. The local area is both an avenue to refine the program by ensuring it meets local workforce development needs and a way to identify and attract prospective candidates seeking additional training.

Continuing Education:

Another goal of the grant is to support our own campus staff development through conference attendance and as needed hiring a consultant for additional training. GIS is a constantly changing field with ongoing professional development needs. This is particularly true for GIS Specialist and Lab Manager, Allen Risley, who will need to attend regular workshops at ESRI concerning changes in the field in order to offer training to adjunct faculty as they are challenged to stay on top of changes in GIS technology and applications. Continuing education of CSUSM staff fits squarely with the objectives in the Access to Excellence report’s concerning faculty excellence and administrative and staff professional growth.

Additional Hardware and Supplies:

CSUSM currently utilizes Amazon Web Services to house a GIS server to store data and deliver local GIS web-based maps to the Internet. The certificate program will require an increase in storage and processing capacity to accommodate spatial data, student work, and related staff training material. Specific supplies for the department’s plotter so that students may print out

their work are also needed. These costs are not subsidies to existing state-side resources but rather requirements for what is anticipated to be a popular way for citizens to access GIS educational opportunities available to them at CSUSM.

Program Impact:

Because the intent of the certificate program is to provide advanced skills in applied GIS, we anticipate that the impact of this program will be to help citizens gain employable skills in GIS and to help our region fulfill its workforce needs. Because we are seeking a broad market from existing and transfer students at CSUSM to currently employed professionals seeking additional training, it is expected that the applied certificate will reach a broad constituency as well. In this way, the certificate will provide additional opportunities for continuing education and lifelong learning. We believe that the project will also provide an excellent competitive package of skills for people entering the job market, a market that promises solid paying careers.

Evaluation:

The new program will be evaluated by assessing how graduates fare on the job market upon completing the program. We intend to follow our graduates to ascertain if the certificate contributes to their employment success and make adjustments as necessary. We will evaluate how our program reaches out to broader communities by analyzing which constituencies are contacted through the marketing plan, through student surveys and through interviews with stakeholders. We will evaluate how our hybrid model of advanced GIS training provides innovative curriculum by surveying our community partners, and seeking external data on similar GIS programs.

Dissemination:

The department will work with CSUSM Extended Learning and partners to develop and implement a comprehensive marketing plan. The program development and results may also be presented at CSU commission and extended learning events. The development of the certificate is also likely to lead to articles about program development and results in such publications as The CSU Geospatial Review, among others. This publication in particular is targeted towards sharing knowledge among those within the CSU working with GIS.

Proposed Budget: Applied Geographic Information Systems (GIS) Certificate

	CEU Grant Funding Request	CSUSM Extended Learning	Project Total
Salaries:			
Program Director	\$6,300.00	\$2,100.00	\$8,400.00
Program Director Benefits	\$1,720.00	\$574.00	\$2,294.00
Faculty Stipends	\$18,000.00	\$6,000.00	\$24,000.00
GIS Consultant	\$6,000.00	\$2,000.00	\$8,000.00
Travel:			
Local Travel (advisory board, industry partners, etc.)	\$2,250.00	\$750.00	\$3,000.00
3 GIS Conferences	\$2,381.00	\$794.00	\$3,175.00
Supplies:			
Server	\$2,250.00	\$750.00	\$3,000.00
Plotter ink, map paper, etc.	\$1,500.00	\$500.00	\$2,000.00
Miscellaneous:			
Marketing & Recruitment	\$6,000.00	\$2,000.00	\$8,000.00
Totals	\$46,401.00	\$15,468.00	\$61,869.00

Budget Narrative:**Project Director:**

Dr. Greig Guthey, Associate Professor of Public Policy and Planning, will lead the GIS certificate project. He will be recruiting, coordinating and evaluating faculty, managing up curriculum development, and importantly conducting the outreach and partner development that will be critical to the success of the certificate program.

Faculty Stipends:

The faculty stipends are based on internal course releases. Faculty will receive a course release each semester to develop the specific course content and lab modules for two subsequent courses which will then be handed over to instructors as the program launches. The plan is to stage development of the courses so the content is developed the semester before it is first offered. Thus the Spring 2016 curriculum will be developed in its entirety in Fall 2015, and the Summer curriculum will be completed in Spring 2016.

Consultant:

The grant includes \$8000.00 for a consultant to conduct staff training during the initial launch of the program. The cost includes travel and hotel.

Travel:

The grant includes local travel for partner development and for conference attendance at the ESRI User Conference in San Diego this summer.

Conference fees

The grant includes three conference fees for training and professional development of Allen Risley, GIS Coordinator at CSUSM.



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To whom it may concern,

I am writing this letter in support of CSUSM's proposal to launch the Certificate in Applied Geographic Information Systems (GIS). As the Director of the GIS program at Palomar College and the Assistant Director of the NSF-funded National Geospatial Technology Center of Excellence, I fully appreciate the importance of applied training and active learning in the field of Geospatial Science. I will like to applaud the proposed CSUSM program for addressing these needs in partnership with Palomar College. From my own survey and group interviews with industry leaders in the geospatial field within the San Diego regions, a consistent theme that emerged is the importance of internship or real-world experience in the field. I believe that the capstone course and the research in GIS course in the present CSUSM proposal will help to address this need.

As a Certificate program designed for upper division students, I fully support CSUSM's program as a venue for (1) Palomar College students who have completed technique-oriented lower division courses at the College, or (2) industry professional with experience in the geospatial field and will like to learn more about the research applications of GIS. In particular, I am most supportive of CSUSM's intent to create educational pathways for Palomar College GIS graduates through its stackable certificate and bachelor's degree program. Specifically, it is my understanding that Palomar GIS graduates (certificate and associate's degree holders) will be able to "stack" their Palomar credentials with the coursework for CSUSM's Certificate in Applied GIS and related fields to complete a bachelor's degree. This arrangement is of paramount importance for graduates, because my past interviews with employers have revealed that a bachelor's degree can increase the competitiveness of a GIS graduate in the job market.

I am happy to advise and help guide the development of the Certificate in Applied GIS program at CSUSM. Palomar College and CSUSM have a long history of collaboration, which includes grant projects funded by the NSF (GIS-Liberal Studies), NIH (Bridges), NSF (STEP), and the Dept. of Education (STEM). I believe that this Certificate will further the collaborative relationship between our institutions, and will be of great importance for Palomar students who seek to complete upper-division coursework or obtain advanced training in GIS applications at CSUSM.

Sincerely,

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