Sabbatical Report for Spring 2022
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Project Title: Restructuring & Modernizing Ventura College's Geographic Information System (GIS) Program

Synopsis: During the sabbatical, I researched and outlined an approach to revamp our GIS Program. See the Ventura College GIS Program Revamp/Expansion planning document developed as part of this sabbatical (It is included at the end of this sabbatical report. It includes an Executive Summary.)

Sabbatical Project Details: I used my spring 2022 sabbatical to achieve a few interrelated tasks.

#1: Revaluate and Restructure the GIS Program

This was the bulk of my activity. I did extensive research and comparison of GIS courses and programs in other community colleges and at universities, including face-to-face GIS lab-based courses, Hybrid/Remote options, and field-based learning. A key resource was the GeoTech Center in Texas (https://www.geotechcenter.org/) which ironically is an outgrowth of the Education Project Management activities I led at UCSB in the 1990s.

I conferred and met with colleagues both local and national (including face-to-face time in the area and at conferences). We discussed the layout of an expanded program including flexible, shorter-term (1.5-2 unit) courses that would address various technical and implementation aspects of professional GIS.

This led to the realization that a Certificate of Achievement in GIS should be under the CTE umbrella. I discussed the practical implementation of this at VC with Felecia Duenas, CTE Dean. We would keep our two C-ID Geography courses (co-listed as GIS) as part of our Geography AA, but new courses (and our current Project courses, GEOG/GIS V28A & 28B) would be branded as CTE GIS program courses. Evidently we could manage the program from within the Science Division, but with CTE aspect help from the CTE Division.

By restructuring, we envisioned building in Hybrid learning opportunities (and fully distanced learning options, too) though as noted below, there is still significant benefit to on-campus GIS lab-base courses. The instructor who covered my two Spring GIS courses, ended up having to start in remote mode, but then had students rejoin him in the classroom later in the semester. While not a well-planned class length hybrid, it did provide a sense of being both on campus and remote for the course. This term we are having that same instructor who no longer is in the area teach the two spring courses remotely. At the end of the term we'll be evaluating the advantages and disadvantages of having some/all of a GIS class remote. My current instinct it that some classes will work best with full (or near full) campus GIS Lab-based instruction, but others may work well in Hybrid mode. Some may also function in full remote mode, but having students work side-by-side in the lab on the large monitors cannot be easily replicated

#2: Faculty Growth

I participated in a number of webinars (which often are offered when I am in class, so the sabbatical made this engagement possible). Many of these were put on by Esri (the leading GIS software company).

As indicated in my proposal, I was able to attend (virtual last spring) the full Esri Geodesign Summit. In the past I would race down to Redlands after my last class on the Thursday of that meeting, catching only that evening and the Friday session (there are full day Wednesday and Thursday sessions). This meeting informs both general GIS teaching, but more specifically provides ideas for one or more of the new courses suggested in the Program Plan (below).

Attendance in the Geodesign Summit continues a loose connection with Univ. of Southern California's Spatial Science program. I have investigated with their faculty transfer opportunities for our students into their Geodesign undergraduate program or Masters in GIS.

I also was also able, as a wrap-up to my spring sabbatical activities, to attend the large (15K in person and 60K+ virtual attendee) Esri Users Conference last summer. I met in-person with a number of folks, including those who I had been discussing our program revamp with. It was a very valuable and productive 4 days.

#3: New Courses, Certificates, and Degrees
I developed a new Intermediate GIS course, GIS V27, which is in front of the curriculum committee right now.

In the attached Program Plan, you will see the general overview of possible new courses. They were identified through the extensive exploration I did along with the input of a number of experienced GIS professionals and educators I met with in person or by phone. Some of these individuals may help develop the details and perhaps teach these courses. Some are local and some farther afield (but may be able to teach remote sections).

The Program Plan lists not only the possible courses, but also degree pattern and scheduling plans. Some of these courses may be offered as hybrid or fully remote classes, but as noted above, on-campus GIS lab-based courses are likely to be the dominant modality for instruction.

The implementation of this revamped and expanded program could be greatly aided by grant support. The primary program for creating and updating GIS programs is the National Science Foundation's Advanced Technology Program. In the late 1990s I was the PI on one of the first of the projects granted under this program. The program has grown and modified over the years, but would be an excellent mechanism to enable us to establish this expanded program. I was able to confirm this with a colleague from years ago who is has been involved with this NSF program for the last two decades. These grants are typically 2-3 years up to 350K. I was getting ready to write a grant application as the fall semester was starting for an Oct. 6, 2022 submission deadline, but found out that the lead time for the college and district was well over a month. There wouldn't have been plan. This spring (2023), I will explore with the colleagues who might be involved including those on campus (Department, Division, Executive Team) the possibility of developing and submitting this grant (and have it be prepared well in advance of the October 2023 deadline so it has time to go before the district.)

#4: Collaboration with the GIS Community
As a co-founder of our regional GIS consortium (the Channel Islands Regional GIS Collaborative aka CIRGIS), I have close relations to the key GIS professionals in the region. I was able use the time afforded by the sabbatical to begin to create and engage an advisory group including CIRGIS to help guide and validate the changes to our GIS program.

As we (CIRGIS) emerged from our COVID limitations, we were able to hold face-to-face meetings at Ventura College last spring and summer and also hold our annual GISDay Conference. The sabbatical freedom made all of that more possible.

End Note:
It is hard to overstate the value of a sabbatical to give new life and freedom to instructors to explore new directions and to find balance that benefits them as they return to their regular task mode. I am very appreciative of the opportunity this sabbatical provided to both grow and develop professionally and create pathways for our GIS program. In addition it was a great time to recover mentally from the COVID blahs, deal with family loss that happened at the very end of 2021, take on personal projects, and for a Geographer do meaningful international travel (that provides new life to all my classes … Chile, England, and East Africa this time with quick en route stops in Miami, Doha, Frankfurt, Montreal, and Vermont!)

Ventura GIS Program Revamp/Expansion Plan

Executive Summary:
Ventura College has offered Geographic Information Systems (GIS) courses since the first one was offered in fall 1998. Within a few years, 3 more GIS classes were added and were the core of a campus-based Proficiency Award that students have been earning for over 20 years. This PA has served as an excellent entry point into careers in Geospatial Technologies (GIS and related technologies).

Over the years, interest in Ventura College offering additional GIS courses and certification has been high, but expanding the program has not happened due to faculty time constraints and other barriers such as staffing, support for development of new courses, and ensuring adequate student population. The program leader, Steve Palladino's spring 2022 sabbatical provided time to rethink and prepare to expand the program.

An initial offering in this expanded program is the *GIS V27 Intermediate GIS* course that has been submitted in Fall 2022 to the Ventura College Curriculum Committee. Other potential short courses with specific GIS skill sets are outlined in this document as well as a structure for a state-level Certificate of Achievement (CA).

It has become apparent that the new, advanced courses envisioned, with their applied skills career orientation, would best be connected to the Career Technical Education (CTE) division. While the two introductory courses co-listed as Geography/GIS, will continue to be part of the Geography transfer degree, the rest of the courses could be part of a new CTE CA in GIS.

We will need to submit our intent to develop a CTE program to the South Central Coast Regional Consortium (SCCRC) and do a Labor Market Inventory (this LMI is in progress). Being a CTE offering will require an Advisory Committee. Fortunately, there are past GIS instructors, GIS professionals, and the many members of Channel Islands Regional GIS Collaborative (Ventura College GIS helped found CIRGIS in 1999) who have been providing input and will be natural candidates for an Advisory Committee.

A key advantage of CTE designated classes is the opportunity to have GIS professionals from a variety of disciplines teach the new courses (except the two introductory courses that will be necessarily taught by those with a MA in Geography or equivalent). The minimum qualification of a Geography MA has been a barrier.

In the past few years, the increased support for distance education and, now, faculty/student familiarity with remote learning tools provide more options for modes of instruction. While face-to-face classes in our GIS lab will still be part of the program, we can now explore Hybrid and fully Remote options. This both helps with instructor availability and student recruitment.

Over the next couple years, we can continue working on creating the new CTE-based program with new GIS courses and a Certificate of Achievement (and possibly a technical career GIS Associates Degree like that at Rio Hondo College).

Steps to accomplish the new program goals include confirmation from campus leaders to move forward, notifying SCCRC, the LMI, engaging an Advisory Committee, fleshing out courses already identified (and any others that we are advised to develop), and, perhaps, seeking a grant to help with this effort.

Department/Division Issues:
As part of a new CTE GIS program, classes other than our two Geography Associates Degree for Transfer (ADT) GIS courses, GEOG/GIS V22 and GEOG/GIS V26 will be labeled as only GIS (including the current V28A and V28B and the new V27). This will mean a dual division interaction (SCI and CTE) for the two introductory courses, but the remaining courses and program will be under CTE.

Current Support Structure:
Steve Palladino, the full-time Geoscience professor who has guided the GIS program from the beginning, will continue to lead this process and do some of the teaching in GIS. Initially, additional part-time faculty will help teach the bulk of the new courses (some will be repeat instructors and other will be new to the program). In a few years, we may consider a full-time GIS program lead especially in light of the future retirement of professor Palladino (not immanent but on the horizon). Being able to have GIS professionals from outside of Geography (some with their GISP certification) help teach will be very crucial to staffing and also for providing students access to those with a variety of GIS skill sets.

We have an established GIS Lab with 22 computer seats (in SCI 106, shared with Engineering). This lab has been well supported by the Ventura College IT staff. We have annual maintenance for the key GIS software programs (Esri products) in the department budget (this is a campus-wide license). With expansion, we will likely need additional resource (GPS units, field data gathering devices, support for faculty), but that will be determined by the program and the advisory committee and may be aided by both CTE funds and a grant.

Existing Classes:

GEOG/GIS V22 – Fundamentals of Mapping and GIS
Description: This course provides an introduction to mapping and geospatial technologies. This is the foundation course for the use of GIS software. It covers the history, structure, uses, hardware and software requirements, as well as the basic operations of GIS. It also examines the use of other geospatial technologies (paper and digital maps, aerial photography, remote sensing, and global positioning systems (GPS)). Examples will be presented for the uses of these technologies in a number of fields including business, city planning, natural resource management and scientific research. This course is recommended for anyone who is using or anticipates using any of the many types of data that can be mapped.

GEOG/GIS V26 – Introduction to GIS Software
Description: This course is a hands-on computer-based mapping course covering the elements and procedures of using a Geographic Information Systems (GIS) software package (ArcGIS Pro, ArcGIS Online) to learn GIS concepts. It covers all of the basic concepts and skills needed for operating GIS software including creating and editing digital maps, database access and editing, basic cartographic principles, and introductory GIS analysis. It also reviews various application areas that use GIS.

GEOG/GIS V28A – GIS Project Development (in the future GIS V28A)
Description: This course is an exploration of various Geographic Information Systems (GIS) techniques and concepts through an active learning approach. Students will define, propose, design, and execute a project that will incorporate GIS skills and knowledge.

GIS V28B – GIS Advanced Project Development (in the future GIS V28B)
Description: This course is follow-up to the project development work done in GEOG/GIS V28A. Various advanced Geographic Information Systems (GIS) techniques and concepts will be explored through an active learning approach. Students will define, propose, design, and execute a project which will incorporate advanced GIS skills and knowledge.

No longer offered/active:
GIS V24 – Introduction to GPS (some of this content may be part of the proposed GIS in the Field course)

New Classes (submitted Fall 2022):

GIS 27 Intermediate GIS Software – Vector and Raster based analysis (2 units, 8-weeks?)
Description: This course continues the hands-on computer-based learning in Geographic Information Systems started in GEOG/GIS V26. It specifically covers more detailed methods of spatial analysis in both Raster and Vector data models utilizing tools such as ArcGIS Spatial Analyst and 3D Analyst. The main platform is Esri's ArcGIS Pro, but other software from Esri and other companies may be covered.

Tentative New Classes (Proposed):*

"G3A" Geospatial Data Analytics – Dashboards/ArcHub/Database development & integration (2 units? 8 weeks)
Description: TBD with Advisory Group

"G3B" Cartographic Design and Visualization – Cartographic/Visualization theory, methods, labeling, and map production. (2 units, 8 weeks)
Description: TBD with Advisory Group

"G3C" GIS Programming – Python/ArcPy/software & database integration? (2 unit class, 8- weeks? Pre-requisite ... programing class/or tutorial ... Python/C++/C# /Java/Java Script)
Description: TBD with Advisory Group

"G3D" GIS for Planning –ArcGIS Urban/Indoors/City Engine/GeoPlanner, Geodesign Overview (2 units 8 weeks)
Description: TBD with Advisory Group

"G3E" Geospatial Imagery Integration– Remote Sensing details, image processing, and image integration into GIS, including point cloud, optical sensor network, and oblique/street level imagery S (2 units, 8 weeks)
Alt title: Remote Sensing and GIS
Description:

"G3F" GIS in the Field – Basic GPS use, review of Drone apps (Drone3Map), ArcGIS Field Maps/Collector/Survey 123 (1.5 unit, 4 weekend class? Friday night Zoom/Async/campus, Saturday on Campus? Summer?)
Description: TBD with Advisory Group

* The "G3Letter" designation is a place holder. These future advanced classes may be designated GIS V31, GIS V32, GIS V33, etc. They are not fully "fleshed out" as both we will be seeking the input of the future Advisory Group and specific topic specialists to help build the content/structure of these courses. Others may be added such as Geospatial for Agriculture (a part of Precision Agriculture), Implement and Manage Enterprise GIS, and GIS for Public Safety (Fire/Police/Public Health/Disaster Preparation/Recovery).

Initial Proposal: VC GIS version "2.0" (courses with units/suggest length/teaching mode/schedule)

Current (and continuing) Offerings:

GEOG/GIS V22 – Fundamentals of Mapping and GIS (C-ID code GEOG 150) – 3 units, 13-weeks

GEOG/GIS V26 – Introduction to GIS Software (C-ID code GEOG 155) – 2 units, 8-weeks

GIS V28A – GIS Project Development – 1.5 units, 8-weeks [List this as only CTE GIS, drop GEOG designation]

GIS V28B – GIS Advanced Project Development – 1.5 units, 8-weeks (Co-taught with G28A) [CTE GIS only]

Possible Future Offerings: (The ones with the G3Letter will likely be courses numbered GIS31, GIS32, etc.)

GIS V27 Intermediate GIS – Vector and Raster based analysis (2 units? 8-weeks?), Spatial & 3D Analyst

G3A Geospatial Data Analytics – Dashboards/ArcHub/Database development & integration, IoT data integration (2 units, 8 wks)

G3B Cartographic Design and Visualization – Cartographic/Visualization theory, methods, labeling/annotation, and map production. (2 units, 8 weeks)

G3C GIS Programming – Python/ArcPy/software & database integration? (2 unit class, 8- weeks? Pre-requisite ... programing class/or tutorial ... Python/C++/C#/Java/JavaScript/Rest API/MS SQL)

G3D GIS for Planning – ArcUrban, ArcIndoors, Geodesign Overview (2 units 8 weeks)

G3E Geospatial Imagery Integration – Remote Sensing details, image processing, and image integration into GIS, including point cloud, optical sensor network, and oblique/street level imagery (2 units, 8 weeks)

G3F GIS in the Field – Basic GPS use, review of Drone application, ArcGIS Field Maps/Collector/Survey 123 (1.5 or 2 unit, 4 weekend class? Friday night Zoom/Async/campus, Saturday on Campus? Summer?)

Certificate of Achievement (9 courses)**

Required Classes	Units
GEOG/GIS V22	3
GEOG/GIS V26	2
GIS V27 (recommended prep G26 or equivalent)	2
GIS 28A (rec prep G26 or equivalent) & GIS 28B (rec prep G27 or equivalent)	1.5+1.5 = 3
Sub-Total Units	*10*

Additional Classes	Units
Pick 2 of G3A-F (and beyond)	3.5-4
Pick 2 Earth/Programming Background Classes (or other G3A-F classes): Geosciences	3.5-8

(GEOG 1/1L – Physical Geog, GEOG 2 – Human Geog, GEOG 5 - Meterology, GEOG 8 – World Regional, GEOL 2/2L Physical Geol, GEOL 11 - Oceanography , AG 4 – Soils) and/or Programming course

Total Units	*17.5-22*

**Possible retention of GIS proficiency Award with slight modification of adding GIS V27 to V22/V26/V28A&B

Teaching Modes: All on-campus, Hybrid (on-campus 1 day/Zoom 1 day OR on-campus 1 day/Asynchronous), Online (all Asynchronous, all Zoom, mix). There is value for many of the classes to have an on-campus component utilizing our GIS Lab.

Course Schedule Options – Fall 1 (first 8 weeks), Fall 2 (second 8 weeks), Spring 1 (first 8 weeks), Spring 2 (second 8 weeks), Summer (4 week intensive, or 8 week), Weekend (Multiple Fri/Sat?)
[Exceptions to 4/8 week, GEOG/GIS V22 is 13 weeks in the Fall semester, Earth/Programming Background optional classes usually full semester.]

Sample schedule for Fall start (1-3 classes per semester):
Year 1 (9.5-16 units)
Fall 1 – GEOG/GIS V22 (3 units)
Fall full – Earth or Programming background class (3-4 units)
Spring 1 – G26 (2 units)
Spring 2 – G28A (1.5units)
        – GIS Elective (G3A-E) (2 units) (optional) OR
Spring full – Mapping or Programming background class (optional) (3-4 units)
Summer – G3F (GIS in the Field) – Weekend class (optional) (1.5 units)

Year 2 (5.5-11.5units)
Fall 1 – G27 (2 units)
Fall 2 – Elective (G3A-E) (2 units) OR
Fall full – Earth or Programming background class (optional) (3-4 units)
Spring 1 – Elective (G3A-E) if necessary (2 units)
Spring 2 – G28B (1.5 units)
        – GIS Elective (G3A-E) if necessary (2 units)
Spring full – Earth or Programming background class (optional) (3-4 units)
Summer – G3F (GIS in the Field) – Weekend class (optional) (1.5 units)

Sample schedule for Spring start (2-4 classes per semester):
Year 1 (5.5-11 units)
Spring 1 – G26 (2 units)
Spring 2 – G28A (1.5 unit)
        – GIS Elective (G3A-E) (optional) (2 units) AND/OR
Spring full – Earth or Programming background class (optional) (3-4 units)
Summer – G3F (GIS in the Field) – Weekend class (optional) (1.5 units)

Year 2 (8.5-16.5 units)
Fall 1 – G22 and G27 (3 units, 2 units)
Fall 2 – Elective (G3A-E) (optional) (2 units) OR
Fall full – Earth or Programming background class (optional) (3-4 units)
Spring 1 Elective (G3A-E), if necessary (2 units)
Spring 2 – G28B (1.5 units)
        – GIS Elective (G3A-E) (if necessary) (2 units) AND/OR
Spring full – Earth or Programming background class (if necessary) (3-4 units)
Summer – G3F (GIS in the Field) – Weekend class (optional) (1.5 units)

Note: We will determine scheduling for individual G3A-F courses in future (likely only one or two/semester)