

Geographic Information Systems DEPARTMENT & PROGRAM REVIEW (2025-2026)

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Section 1: Report on Previous Goals & Requests

	Previous APR Goal	What Happened (support with data/evidence)
Access	Make GIS technology available to any student interested in taking a GIS course or pursuing a GIS-related program.	Although an Amazon Web Service solution to accessing GIS software was implemented in AY 2021-2022, students did not have a good user experience due to what they described as “sluggish” behavior. We have instead worked closely with IT and the Library to make laptops loaded with GIS software including the ArcGIS site license (\$4,000 value) and QGIS available for students to borrow.
Access	Ensure the GIS program allows seamless access to other educational programs at four-year colleges.	Our new AS in Geospatial Science is now in place and available to students looking for seamless transition to a four-year college program, with special emphasis placed on the Geography and Geospatial Science program at Oregon State University.
Access	Align the GIS program with the GIS&T Body of Knowledge and make students aware of the many workforce opportunities related to GIS.	Based on the GIS&T BoK, Geospatial Technology Competency Model, and GIS Certificate Institute frameworks, we have worked with part-time instructors to revise Student Learning Outcomes and curricula for all our GIS courses in the last five years. We use GEOG 101 to introduce the foundations of geography and GIS to our students.
Diversity	Diversity of students in our GIS programs - lack of female students.	GIS graduates over the past five years show 37.9% (11/29) identify as female. This is a moderate increase from the 67%/33% male/female ratio over the previous 15 years reported in the last report (APR 2021). GIS course enrollment over the past five years shows 29.4% of students enrolled in GIS courses and 29.9% of GEOG 101 students identify as female. This is moving toward industry data that puts the male/female ratio at approximately 57/40%. [GPN Salary Report 2024]
Diversity	Diversity of students in our GIS programs - underrepresented students.	GIS graduates over the past five years show 19.4% (6/31) are from underrepresented (BILAPOC) students. This is a sharp increase from the previous report (APR 2021) where 5% identified as underrepresented students. It seems to be consistent with the underrepresented population of Central Oregon overall.
Diversification	Diversify the GIS offerings to include a program designed for transfer students.	With the addition of the new degree program, we now feel we meet the needs of students in Central Oregon who want to transfer to a four-year college (AS Geospatial Science), earn a two-year CTE degree (AAS GIS), or gain new technical skills for career advancement (GIS Certificate).
Diversification	Diversify the GIS offerings to support continuing education.	Nothing to report.

Section 2: Fulfilling Your Mission

The implicit mission statement of the GIS program is to guide students interested in geography, technology and geospatial science along clearly navigable and accessible course-ways to success in the workforce and four-year college programs.

We have worked toward fulfilling this mission by connecting with high school students interested in geography and offering a foundations course that serves as a general introduction to the discipline while also increasing GEOG course enrollment. We have defined, implemented, and assessed program-level learning objectives for career and technical education programs that emphasize proficiency with GIS software, procedures and data modeling, using GIS to address real-world issues, communicating ideas with maps, and explaining science and technology concepts to stakeholders. Additionally, we provide degree and certificate options for both traditional and non-traditional students that lead to workforce opportunities and four-year degree programs, deliver our programs in a hybrid format, and have built and successfully retained a team of part-time instructors with decades of ongoing GIS industry experience. We have also worked to make our programs more accessible to low-income students through financial support and actively place students in jobs and internships.

Section 3: College Goals and Initiatives

In the table below, we map ways in which the GIS Program contributes to the Values and Goals of the [COCC Mission, Vision and Values](#). Details on the most important of these contributions can be found in this report's **Section 5: Strengths and Accomplishments**.

VALUES	WAYS IN WHICH GIS PROGRAM CONTRIBUTES
Empowering Students	• New AS Geospatial Science degree. • NSF S-STEM grant initiates Industry Speaker series.
Championing DEI&B	• Increased enrollment of BILAPOC students. • Moderate increased enrollments of female students. • Funding to support enrollment of low-income students.
Support Colleagues	• With the support of the President, VPAA, Dean, Chair, Administrative Assistant, and a Part-time faculty member, the Program Director was able to enrich his life and teaching. He was the lead faculty for the Barcelona Study Abroad program in Fall of 2025 and worked with The Nature Conservancy in Tanzania as part of his sabbatical in the Fall of 2024.
Achieving Excellence	• AAS GIS students employed in the GIS industry. • AS Geospatial Science students pursuing four-year degrees.
Embracing Environmental Sustainability	• The GIS Capstone project served as a service-learning project for COCC to maintain its Tree Campus USA status. • GEOG 101 is a Sustainability Designated course. • Remote/hybrid and online courses decrease the environmental footprint.

Fostering Communication		● Announcements on industry speakers and professionalism workshops are communicated with all GIS and CIS students. ● AP Human Geography ensures communication with high school teachers and students interested in geography.	
Advancing Fiscal & Operational Sustainability		● Anyone with a COCC email can now have an ArcGIS license ● The NSF S-STEM and GIS STEP grants provide hundreds of thousands of dollars of funding to COCC students who might otherwise not be able to afford to study at COCC	
GOALS		WAYS IN WHICH GIS PROGRAM CONTRIBUTES	
Student-Ready College		● Inclusion of GEOG 101 as a Trailhead course, providing educational and career pathway information to students. ● Financial support for GIS students.	
Access		● Program Director worked with Part-time Instructors, the GIS Tutor and an alumnus to design Open Educational Resources (OER) for GEOG 101 and GEOG 211. ● Single sign on (SSO) implemented to allow anyone with COCC email to access ArcGIS software. ● The ability to borrow GIS laptops for online or hybrid students. ● Financial, academic, and interpersonal assistance for low-income students. ● Hybrid GIS programs for rural students.	
Community Engagement		● The GIS Advisory Board is an important and active partner in the success of the GIS Program. ● Community partners in the GIS industry helped with the recent placement of eight interns. ● Part-time instructors in GIS and Geography work full-time in GIS for seven different organizations in Central Oregon. ● Two part-time instructors contributed to this DPR report.	
Workforce Development		● Curriculum has recently been updated and our GEOG 285 course, which has been renamed Web-Based GIS. ● Working with students to develop the interpersonal (soft) skills needed to succeed in the workforce.	
College Sustainability		● The program closely considers sustainable pipelines into and out of the program with respect to the community. For entry, we have added AP Human Geography to the College Now offerings. Completing our new AS Geospatial Science degree ensures students have a clear path to a four-year degree.	

Section 4: Diversity and Inclusion Insights

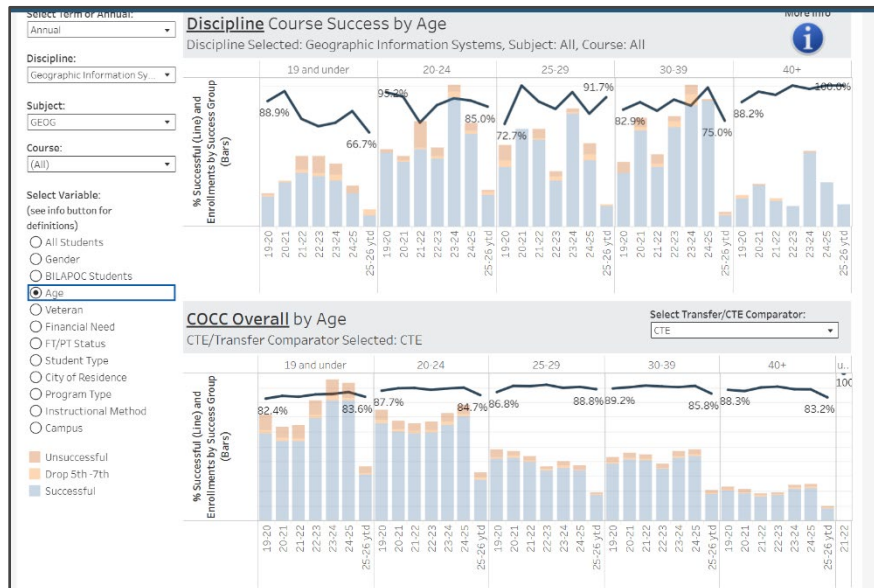


Figure 1. Course success by age reveals a higher success rate in non-traditional students (25+).

A primary strength of the GIS program is our success with non-traditional students (aged 25+) as seen in Figure 1. These students represent a higher proportion of our enrollment compared to the COCC average and consistently achieve greater academic success. Many are "career-switchers" leveraging our hybrid course model to balance education with full-time work and family obligations. This flexibility, bolstered by a partnership with the library to provide ArcGIS-capable laptop loans, ensures that technical requirements do not become a barrier to entry.

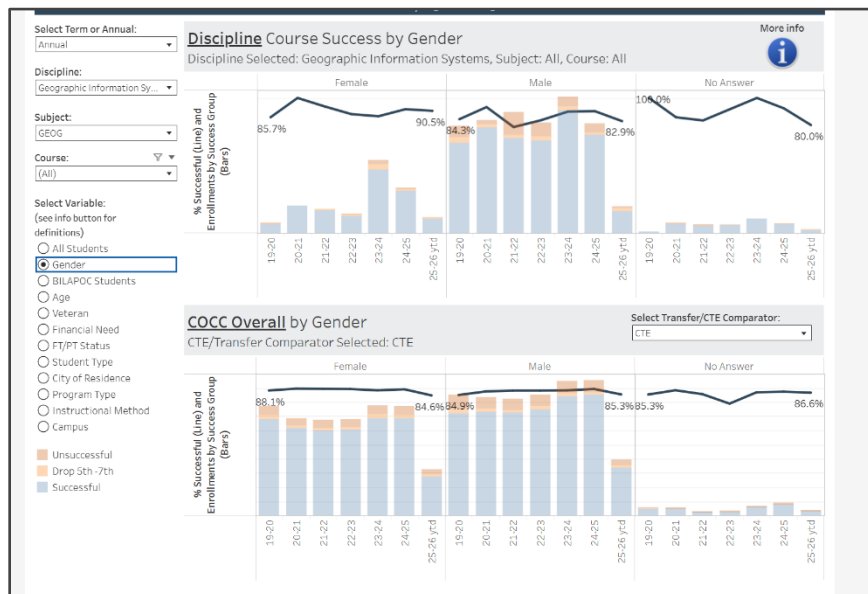


Figure 2. Course enrollment by gender showing the upward trend of female students in GIS.

We have also made significant strides in racial and gender representation. BILAPOC enrollment Increased from 5% to 19% since the last DPR, a growth we attribute to the broader reach we have

experienced by offering courses on the north campuses, as well as hybrid and online offerings. Female representation in course enrollment grew from 33% to 39% shown in Figure 2. While still trailing some national industry benchmarks, this upward trend is supported by the success of female students in GIS, who now meet or exceed the COCC average success rate. Veterans in the GIS and UAS programs demonstrate an increasingly high success rate compared to the general student population, finding a clear vocational path in these technical fields. The trends are visible in Figure 3, gaining from 73.4% in 2019-20 to 100% in 2025-26 (YTD).

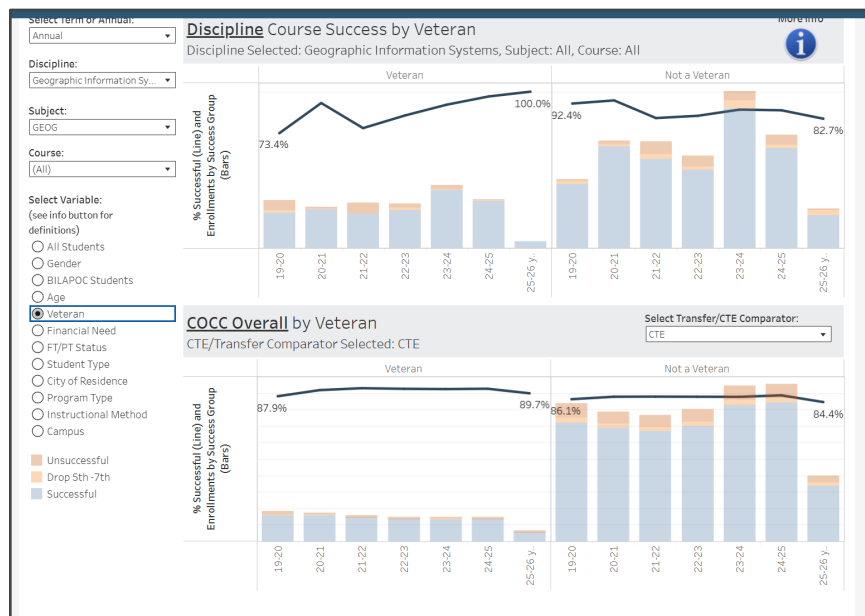


Figure 3. Course success by veterans reveals an above average success rate.

Despite these gains, challenges remain in supporting our youngest learners. Data indicates that students aged 19 and under face the most difficulty in GIS courses. For example, the success rate in GIS courses over the last two academic years averages 81.5%, compared to 86.5% for COCC students overall. This could be due to several considerations, and one focus is improving access to and assistance with the technology for those students who may have had the least lifetime exposure to desktop software. For access, we will continue to make students aware of the Barber Library's loaner laptops and continue to look for funding to increase the number of laptops available. For assistance with technology for some who may be accessing it for the first time, instructors and the GIS Tutor continue efforts to address the many individual technical issues that arise each term. Furthermore, while BILAPOC enrollment is rising, the small sample size makes it difficult to establish a definitive success trend compared to college-wide data, requiring more granular tracking. To address financial equity gaps, we have secured substantial external funding. Through the NSF S-STEM Scholarships Pell-eligible AAS students can access up to \$10,000 annually for three years to cover tuition and living expenses. With the success of the GIS STEP Program (in partnership with OSU and BMCC), we provided significant paid internship funding in 2025 and 2026, ensuring that low-income students do not have to choose between a paycheck and career-relevant experience.

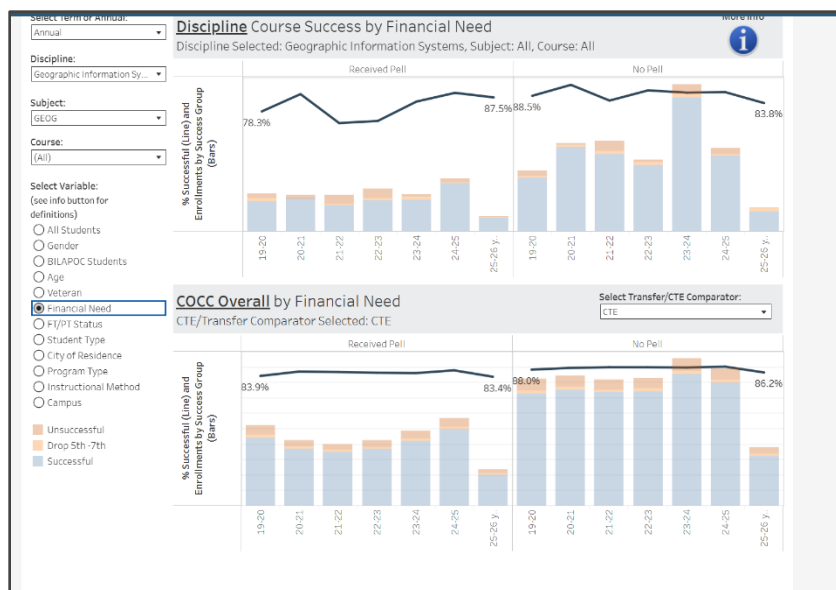


Figure 4. Students with financial aid are more successful. GIS program success rates are higher than COCC.

Section 5: Strengths and Accomplishments

The GIS Program has accomplished much over the last five years. Our strengths build upon our community-based approach and our focus on students and their needs.

We have successfully launched GEOG 101, a foundation course for GIS and Geography. This course is designed to align with curriculum at Oregon State University, utilizes Open Educational Resource developed in collaboration with part-time faculty and others with OER funding, has been offered on all campuses and online, is a Sustainability Designated (SD) course, and is currently being added as a Trailhead course. The demand for this science lab offering makes it one of two GIS courses offered more than once per year (along with GEOG 265), and on its own accounts for 23% of enrollment in the GIS discipline since the last APR report.

Our program now operates under a versatile hybrid GIS framework. With course offerings in GIS divided approximately evenly among classroom-hybrid, remote-hybrid, and fully online, the program can meet the educational needs of our students, including US Veterans requiring in-person classes for the GI Bill housing allowance and individuals completing their degree or certificate remotely. Classroom-hybrid courses typically offered late in the afternoon have also allowed us to meet the needs of our working students and Part-time Instructors, who are nearly all pursuing GIS careers during normal business hours.

The recent launch of a new Associates of Science (AS) Geospatial Science degree provides students the opportunity to complete the first two years of coursework at COCC before pursuing a four-year degree and is part of a Dual Partnership program with OSU for its BS in Geography and Geospatial Science. We are also building relationships to recruit Central Oregon high school students potentially interested in pursuing a four-year Geography degree, specifically by making Advanced Placement Human Geography (AP HuG) offerings at Summit and Redmond High Schools part of the College Now program.

We have secured tuition funding and paid internships for our students. With the National Science Foundation (NSF) Scholarships in Science Technology Engineering and Mathematics (S-STEM) grant, we can offer students in GIS or Computer Information Systems (CIS) scholarships designed to meet financial need, beginning in 2022 and running through 2028. This can be critical funding for the 22% of our GIS students that are Pell eligible. Also, with Future Ready Oregon funding passed through the Higher Education Coordinating Commission, we are able to provide tuition and money for textbooks to recipients, as well as offering paid internships with multiple workplaces in Central Oregon, including the Bureau of Land Management, the Deschutes County Roads Department, the City of Redmond, Sunriver Owners Association, Central Electric Coop, Midstate Electric Coop, and LinkOregon during academic years 2024-25 and 2025-2026.

We are growing healthy and diverse enrollments that reflect the demographics of Central Oregon and the GIS workforce. Average annual headcounts over the last five years have increased by more than 50% since the last APR report (75.2 vs 114). Comparing the same periods, underrepresented students have increased from 5% to over 19%, with the latter reflecting the overall demographics of Central Oregon, and female to male students have increased from 33% to 38%, similar to the overall GIS industry gender ratio.

Building on efforts begun 30 years ago by former GIS Program Director Art Benefiel, COCC students, alumni, instructors, advisory board members, and friends of the program continue to serve as the backbone of the Central Oregon GIS network. An example would be recent graduates securing full-time employment at the City of Bend, Avion Water, and Central Electric Coop, where COCC has GIS alumni or Advisory Board members. Another example would be our success in recruiting part-time instructors, despite nearly all holding full-time GIS jobs in the industry. Employers include Esri, Bureau of Land Management, US Forest Service, Oregon Department of Energy, Crook County, Central Electric Coop, Sunriver Owners Association, TRC Companies, and Bowman Consulting.

We are proud of our accomplishments and look forward to building on our success in the coming years.

Section 6: Challenges

One challenge is preparing students for a rapidly evolving workforce. One of the most effective ways we do this is by requiring an internship for all AAS GIS students. We propose in Section 7 adding this requirement to the GIS Certificate program and considering how industry project-based work could be incorporated into the AS Geospatial Science program. Another way in which the workforce is evolving is the use of Artificial Intelligence. We propose in Section 7 codifying this into our program and course level outcomes to ensure our students have received some preparation in this regard.

A second challenge of the program is unpredictable enrollment from year to year. We are trying to address this concern in many ways, such as raising awareness of the field of Geography in local high schools via including AP Human Geography in our CollegeNow program. Nevertheless, the ability for some GEOG courses to be offered will continue to depend on two current policies of the Administration, which we see as critical. One is allowing 200-level courses required for the program and offered once a year to run. This is needed to help students finish our programs in a timely manner. Another is allowing introductory GIS courses to run on our north campuses with low enrollment. This allows us to recruit outstanding Part-time Instructors and raises awareness of GIS in smaller and more rural communities throughout Central Oregon.

A third challenge recognized in our report is that our BILAPOC success rate is lower than that of non-BILAPOC students. Although this is based on a small sample of students, we plan to take further steps such as more detailed discussions with students to better understand their situations, working closely with the Office of Equity and Well-Being, etc.

Section 7: New Goals and Resource Needs

Goal	Timeline for achieving goal	Resources needed
1. Expanding internships in the GIS programs. Build on the success of the required internship for AAS GIS students by requiring internships for GIS Certificate students as well. Explore methods by which transfer students in the AS Geospatial Science program can gain project-based GIS industry work experience.	Year 1: Modify program curriculum for the GIS Certificate to require GEOG 280 (Coop Work Experience). Build on GIS STEP grant program to offer industry internships. Years 2 - 5: Explore how AS Geospatial Science students can participate in meaningful project-based work in the GIS industry.	Grant resources: Continue to work with the Grants office, OSU and BMCC to look for opportunities like the GIS STEP program that provide funding for paid internships. Program Director resources: Provide PD with load release toward exploring industry partnerships.
2. Integrating UAS and GIS across our disciplines, building on the strengths of the GIS and UAS programs.	Year 1-2: Add lessons, exercises, labs to GEOG courses designed specifically to collect UAS data and integrate it into GIS. Possible classes include Data Collection and the Capstone course. Year 3 - 5: Work with Aviation to incorporate GIS into UAS coursework. Possible approaches include building on AV 273, a project-based course that includes UAS data collection.	Software resources: Include a permanent line item for Esri's Drone2Map Advanced in the GIS budget. Hardware resources: High tier computers with remote access to process large datasets collected with UAS and processed in GIS. Online Storage: Imagery server storage for online mapping applications.
3. Prepare GIS students for the workforce where Artificial Intelligence is becoming increasingly important.	Year 1: Update course learning objectives for courses already using AI, such as Spatial Analysis. Year 2: Revisit and update program learning objectives to address AI. For example, PLO #4 currently states "Create procedures for using GIS and modeling data." Update other CLOs as the curriculum is updated. Year 3-5: Adjust in an agile manner to changes in the use of AI while continuing to update curriculum and the associated course and program level learning objectives.	Industry resources: Continue to leverage the industry resources available to the GIS program, including part-time instructors working in the industry, the GIS Advisory Committee, the NSF S-STEM Industry Speaker series, guest lecturers in individual courses, etc. College resources: Use college resources to recognize the importance of individuals from industry and their contributions to our success. One past example was recognizing Mike Rich as COCC Part-time Instructor of the Year. Leverage work of the AI Committee and others in adapting.

		Other resources: Explore free and paid courses, training, etc. to familiarize students with GeoAI (Esri, OSU, etc.)
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