

**.WSU Five-Year Program Review (7 Years for Geography)
Self-Study**

Cover Page

Department/Program: **Geography, Environment & Sustainability**

Semester Submitted: **Spring 2024**

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Brief Introductory Statement

(Should align with or compliment the Annual Strategic Planning Report)

Weber State University's Geography, Environment & Sustainability Program supports and strengthens the University's [Amplified Strategic Plan](#) as well as the [mission and initiatives of Academic Affairs](#), and stands as a fine example of comprehensive education in the field of geography, environment, and sustainability. Weber State's Geography Department offers a curriculum that is both diverse and rigorous. Students are introduced to the earth's natural environments and complex human societies, equipping them with the tools and knowledge necessary to address some of the planet's most pressing challenges.

The program offers a variety of majors, minors, and certificates, each designed to cater to the unique interests and career goals of students. With an average student-to-teacher ratio of 13:1, learners receive personalized attention, ensuring that they not only absorb the material but also apply it practically. Field trips are an integral part of the curriculum, providing students with hands-on experience in locations like Canyonlands and Moab, enhancing their understanding of geographical concepts in real-world settings.

The department offers students a number of advantages:

- **Employment:** a diverse and growing list of careers both locally and globally has made the geography job market its best in 40 years.
- **Technology:** the U.S. Department of Labor recently named Geospatial Technologies (GIS) one of the three most important of the 21st century.
- **Internships:** many of our students gain real-world experience, pay, and college credit through internships.
- **Flexibility:** geography students enjoy a choice of seven emphases, more electives than any major, and day, evening, on-line classes, and courses at our satellite campuses.
- **Faculty:** top-notch faculty mix their research and publishing with field trips and classroom teaching in a personal educational environment.

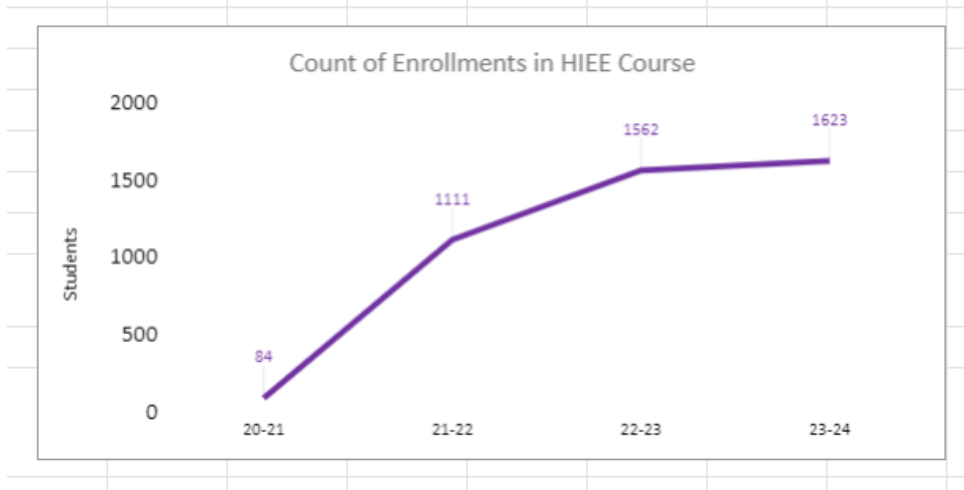
Weber State's commitment to sustainability is evident in its course offerings and research opportunities. The program prepares students for a future where sustainability jobs are projected to grow exponentially. Graduates of the program have found successful careers in various sectors, thanks to the practical skills and knowledge gained through their studies. With a median geographer salary nationwide standing at \$85,430 as of 2020, the program not only fosters intellectual growth but also promises a rewarding career path.

The Geography Department at Weber State is dedicated to fostering a learning environment that encourages exploration, innovation, and global awareness. Whether scaling the highest peaks, tackling environmental issues, or uncovering hidden wonders, students are prepared to become leaders in their field. For those looking to make a tangible impact on the world, Weber State's Geography Program offers the foundation to start that journey.

As noted in our most recent Strategic Planning Report (May 13, 2024):

We'll continue to offer and expand HIEE opportunities. One that is especially promising is the collaboration with [Harmony Ranch](#) in the Ogden Valley. This partnership and future education center will allow for everything from soil testing to sustainable building to water conservation, outdoor recreation, and food production. We're particularly proud of how quickly we've added students to our HIEE courses as we've tailored them to deliver solid high-impact experiences (see Appendix L).

Geography HIEE Course Growth in Students



With the new Gen. Ed. requirements, like every other department, we'll need to once again rearrange our curriculum. Of particular concern is what to do with a student's sophomore year? We have essentially no 2000-level classes in Geography. So, do we elevate some of our 1000-level courses, or drop down some 3000-level courses? The liability of the latter strategy is that it won't help students reach the 40-credit hour upper division graduation requirement.

Geography will continue to be a leader in interdisciplinary collaboration as we share students, grants, laboratories, and (the first on campus) a shared faculty member between two departments and colleges. Our work in SPARC, Honors, Ethnic Studies, Planning, and Geospatial Programs are by definition cross-disciplinary endeavors. Furthermore, we are heavily engaged in work with the surrounding community, local, state, and Federal agencies, and private businesses.

In support of all these initiatives, we remain committed to weave a lengthy KSA-Set (Knowledge, Skills, and Abilities) through every class we teach. This will include spreadsheets, data collection, presentations, E-portfolios, GIS and Remote Sensing, descriptive statistics, collaborative documents, teamwork, analytical thinking, etc. We're working on a *Certificate of Environment and Sustainability* and have enjoyed celebrating our first graduates with a *Certificate of Sustainable Planning*. Lastly, our All-Online Track in Geography is beginning to take shape.

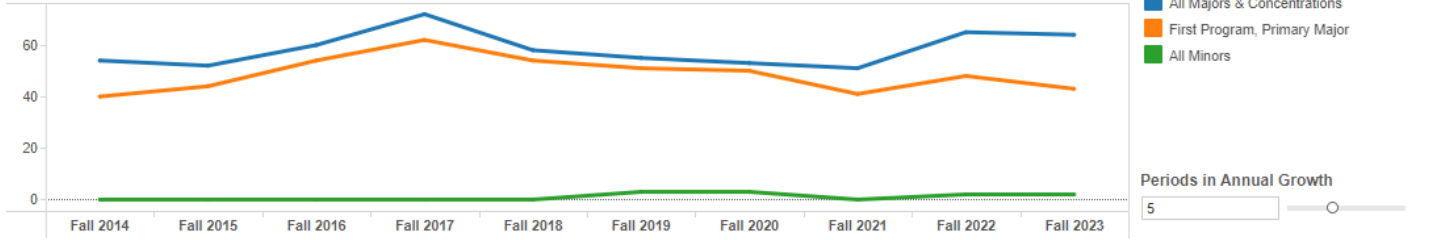
Despite Covid, rising tuition, low unemployment (and thus less demand for higher education), the shift to online instruction, taking more years to graduate, and other factors that have reduced majors, especially in the Social Sciences, Geography has remained fairly steady in majors over the last decade.



Select Semester: Select Academic Unit (WSU Overall, College, Departme...: Select Student Body: Select Degree Level:

To see Program level Data, Select appropriate Department and view Program Specific data in the "Additional Unit Breakdown."

Geog, Environment & Sustain Matriculated, Degree-Seeking



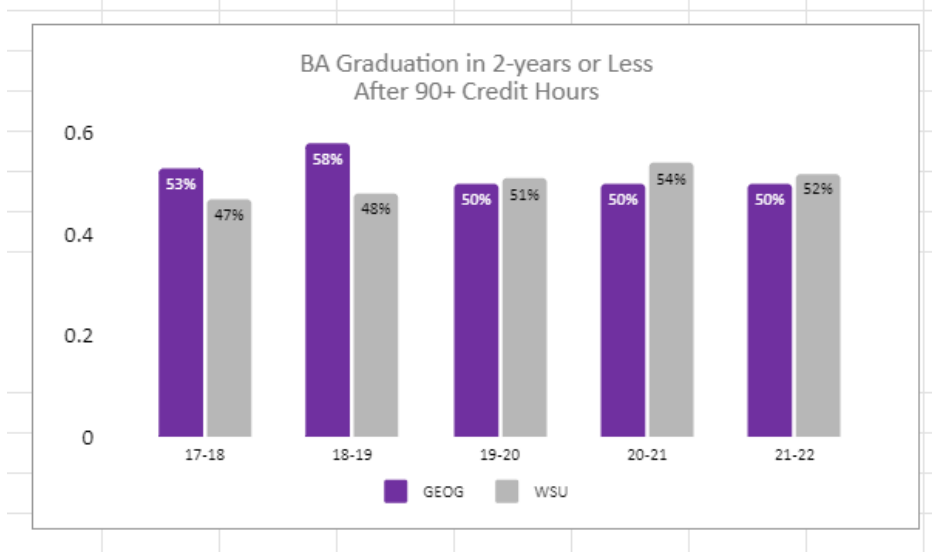
Geog, Environment & Sustain Degree Seeking Students Details

	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
First Program, Primary Major	40	44	54	62	54	51	50	41	48	43
All Majors & Concentrations	54	52	60	72	58	55	53	51	65	64
All Minors	0	0	0	0	0	3	3	0	2	2

% Avg. Annual Growth (Intermittent data may result in inaccurate growth rates):
 -5.5% (Red bar)
 2.5% (Green bar)
 -3.5% (Red bar)

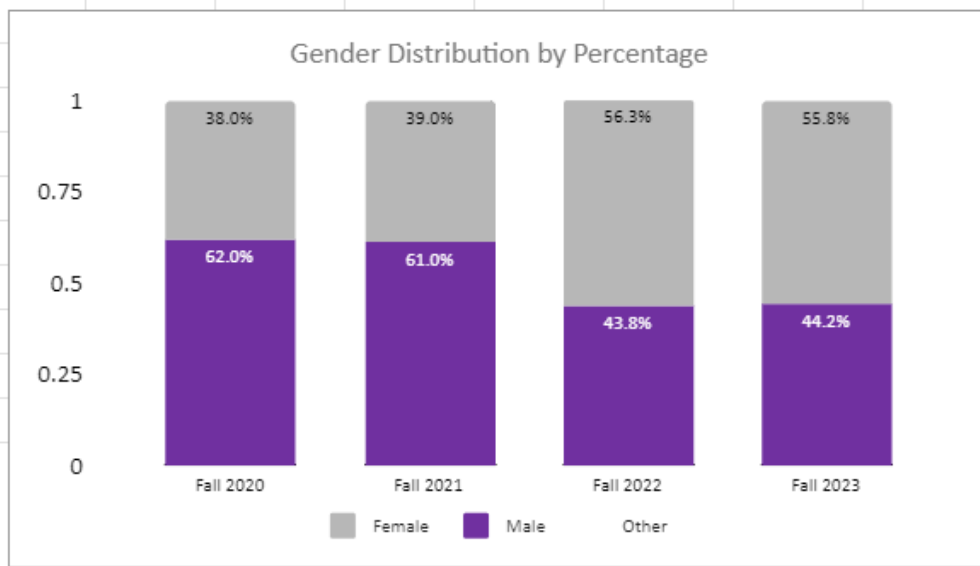
We've also matched our exceeded Weber State's Rate of Graduation in two years or less after earning 90 or more credit hours.

Geography and Weber State Graduation Rates after 90 credit hours

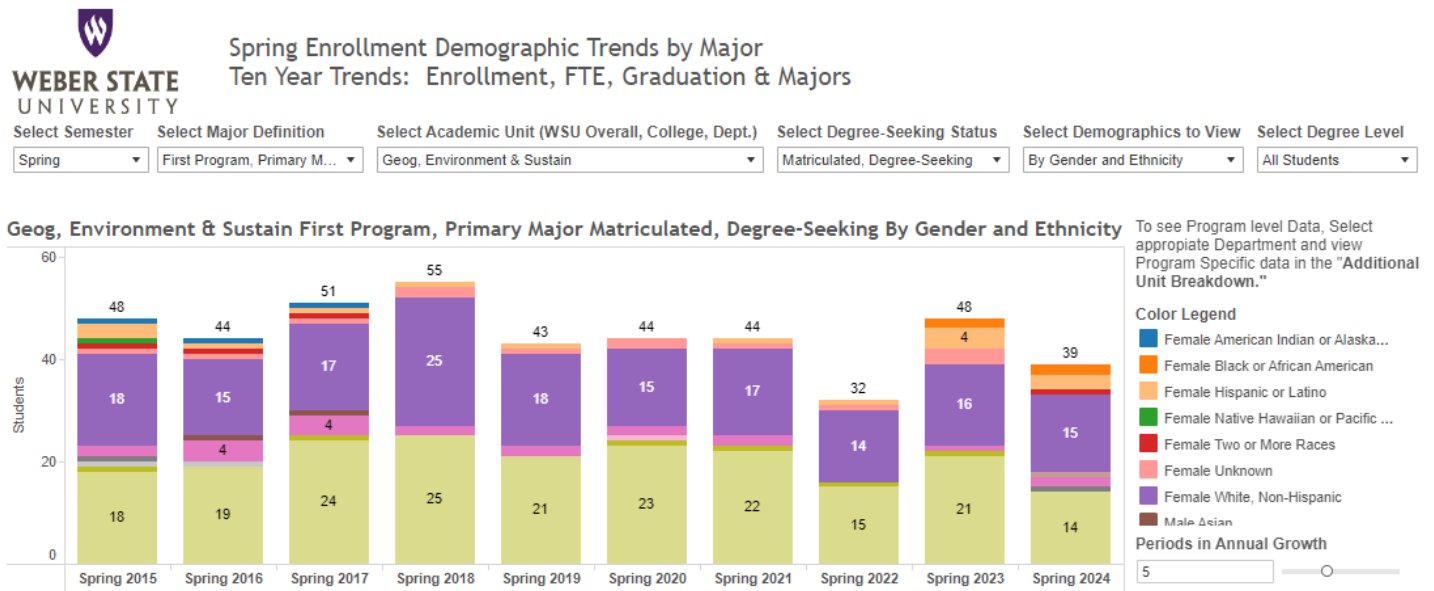


Lastly, and a measure that we're especially proud of, is Gender Distribution among Geography Majors. As long as the discipline has been around, male students have been the majority. Not anymore.

Gender Distribution for Geography Majors



The department is also benefitting from a modest increase in Ethnic Diversity.



Standard A - Mission Statement

Weber State University's Amplified Strategic Plan Mission: Weber State University provides transformative educational experiences for students of all identities and backgrounds through meaningful personal connections with faculty and staff in and out of the classroom. The university promotes student achievement, equity and inclusion, and vibrant community relationships through multiple credentials and degree pathways, experiential learning, research, civic engagement, and stewardship.

College of Social and Behavioral Sciences Mission: (The CoSBS aims to) provide learning experiences that transform lives and empower students to explore new horizons and discover their potential to build a brighter future.

The Mission of the Geography Department is to prepare students to engage in the processes that create more sustainable environments and communities throughout the world.

- We offer students the highest quality geographic education through innovative teaching, interactive field experiences, and integrative research.
- We provide students with foundational geographical knowledge and skills that focus on the interconnection and interdependency of Earth's complex natural systems and diverse human societies.

Consistent with the mission, the department strives to achieve the following objectives/learning outcomes:

1. To provide students with knowledge about the earth's natural environment and its relationship to society.
2. To provide students with knowledge about the world's peoples, nations, cultural environments and spatial organization.
3. To provide students with a good grounding in the modern technical skills of the discipline, including computer cartography, spatial analysis, spatially oriented quantitative methods and techniques and geographic information systems.
4. To provide interested students with training that emphasizes a comprehensive grasp of the planning profession and issues related to that field.
5. To instill within each student an appreciation for the great variety of cultural forms and ways of thinking throughout the world and to help students formulate a worldview that uses this appreciation to become responsible citizens in America.

Meeting these objectives prepares students to function within American society as informed and engaged citizens by equipping them with specific job skills that help them gain employment and/or admission to graduate schools.

Standard B - Curriculum

Curriculum Map and Learning Outcomes for Geography's Core Courses

Table 1. Geography Learning Outcomes Key for all classes: I = Introduced, E = Emphasized, M = Mastered, NA = Not Applicable, P = Peripherally Addressed

Geography Curriculum Grid Master : Sheet1					
	To provide students with knowledge about the earth's natural environment and its relationship to society	To provide students with knowledge about the world's peoples, nations, cultural environment, and spatial organization	To provide students with a good grounding in the modern technical skills of the discipline, including computer cartography, spatial analysis, spatially-oriented quantitative methods and techniques, and geographic information systems	To provide (some) students with training emphasizing the understanding of the planning profession and issues related to that field	To instill within each student an appreciation for the great variety of cultural forms and ways of thinking throughout the world, and to help students formulate a world view that uses this appreciation to become responsible citizens in America.
1000	E	I	I	NA	I
1005	E	I	I	NA	P
1002	I	I	E	NA	P
1300	I	E	I	NA	E
1500	E	I	I	NA	I
1520	I	I	I	NA	E
1790	P	P	E	I	N/A
2400/4400	P	P	E	I	N/A
2790	I	I	I	I	I
2840/4840	P	P	E	I	N/A
2850/4850	P	P	E	I	N/A
2920	N/A	N/A	N/A	N/A	N/A
2950	N/A	N/A	N/A	N/A	N/A
3050	M	P	P	NA	P
3060	M	P	P	P	E
3070	M	P	P	N/A	P
3080	M	P	P	NA	P
3090	M	P	P	NA	P
3210	P	M	P	NA	E
3300	E	M	P	NA	E
3360	E	M	P	NA	E
3500	E/M	E/M	P	NA	E/M
3540	E/M	E/M	P	NA	E/M
3590	E/M	E/M	P	NA	E/M
3790	E/M	E/M	P	N/A	E/M
3640	E/M	E/M	P	NA	E/M
3740	E/M	E/M	P	NA	E/M
3780	E/M	E/M	P	NA	E/M
4410	M	E/M	E	M	E
4420	M	E/M	E	M	E
4800	E/M	E/M	E/M	NA	E/M
4890	E/P	E/P	M/P	M/P	E/P
4950	E/M	E/M	E/M	P	E/M

Sheet1

Standard C - Student Learning Outcomes and Assessment

At the end of their study at WSU, Geography students in this program will

1. To provide students with knowledge about the earth's natural environment and its relationship to society.
2. To provide students with knowledge about the world's peoples, nations, cultural environments and spatial organization.
3. To provide students with a good grounding in the modern technical skills of the discipline, including computer cartography, spatial analysis, spatially oriented quantitative methods and techniques and geographic information systems.
4. To provide interested students with training that emphasizes a comprehensive grasp of the planning profession and issues related to that field.
5. To instill within each student an appreciation for the great variety of cultural forms and ways of thinking throughout the world and to help students formulate a worldview that uses this appreciation to become responsible citizens in America.

Plan Overview:

As part of outcomes assessments for General Education courses in geography (GEOG 1000, GEOG 1300, GEOG 1500, and GEOG 1520), full time faculty have collectively crafted a standardized set of topics and skills that we expect all instructors (full-time and adjunct) to deliver whenever those courses are offered. For example, in GEOG 1000, students should always be exposed to Plate Tectonics, Biogeographic Processes, Weather and Atmospheric Dynamics, Geomorphology, the Hydrologic Cycle, Human-Induced Climate Change, Soils, Concepts of Sustainability, the Scientific Method, etc. This will insure that any student who takes a general education class in our department (whether on campus, off campus, at night, online, or in person), will have been exposed to what the geographic community widely considers the standards of the discipline. What we expect students to know will be consistent with the General Education Course learning outcomes and objectives as well as our Departmental Learning Objectives.

A set of standard exam questions will form the basis of our assessment, and will be tied to outcomes. Assessment methods will vary from course to course as noted in the Assessment Plan matrix above only for non-general education classes. The assessment of introductory level General Education Courses will be based solely on analysis of individual test item results. We chose a minimum of 70% on scores for test items as the bottom threshold for demonstrating mastery since the lowest grade accepted for the geography major is a C, or 73-74%. Exam copies with assessment results will be kept by the department chair and/or with the instructor who taught the course along with other evidence of learning "artifacts" as part of program review documentation. Once fully deployed, we can gather the question results through Canvas in every section and in every semester. We did struggle somewhat as the University made the switch from Chi-Tester to Canvas Quizzes; much of our historic outcomes assessment data was lost. Full examples of our Assessment Results can be found in Appendix G.

The two required core lower division courses (GEOG 1790 and 2790) are new after our curriculum overhaul, and are only just now being evaluated and assessed. The two required core upper division geography courses (GEOG 3790 and 4990) are assessed as part of an ongoing process using more

diverse methods (exams, research papers and projects, and homework assignments) by individual faculty who typically teach these courses (see Assessment Plan matrix above). Upper-division geography elective courses will also be assessed periodically, although the department's focus at this time is on general education classes and our common core geography courses.

Assessment Results for GEOG 3790 and 4990 (both required of all majors), and for additional Geospatial Courses.

Course: Course [GEOG 3790] Research Methods in Geography

Semester taught: Spring 2020, 2021

Sections included: 2

Course: **GEOG 3790**

Program Outcome 1	Required Core Course for all Geography Majors.		
Aligned Course Outcome(s):	<ul style="list-style-type: none"> • Demonstrate a broad conceptual understanding of research methods used in geography • Demonstrate critical thinking skills – especially in experimental design and analysis • Demonstrate knowledge of ethical concerns in research • Write a research proposal in your area of interest in the field geography • Integrate knowledge of statistics into research design 		
Method(s) of measurement:	Assignments	10 total	30%
	Attendance and Participation	Attendance will be taken	10%
	Final Full Written Proposal	OUR proposal submittal	40%
	Proposal Presentation	Oral presentation in class	20%
	Total:		100%
Target Performance:	Development and finalization of a research proposal during the semester.		
Actual Performance:	Developed and finalized a research proposal during the semester.		
Interpretation/Reflection on findings:	Student Proposals with respect to significance, appropriateness, time invested, and overall quality varied individually, but overall performance was high.		
Action Plan/Use of Results:	This is to be expected in a class of 10-15 majors with differing abilities and ambitions.		
Intended evaluation of plan (closing the loop):	This course to now includes a full range of research methods including qualitative, not just quantitative methods. Students develop skills in survey methodologies, and about half of the course participants gather primary survey data to complete their thesis research.		

Course: Course [GEOG 4990] Senior Seminar

Semester taught: Fall 2019, 2020

Sections included: 2

Course: **GEOG 4990**

Program Outcome 1	Required Core Course for all Geography Majors.
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Aligned Course Outcome(s):	<ul style="list-style-type: none"> • Further develop your critical thinking skills through course participation and assignments. • Refine oral and written communication skills through regular class discussions and assignments. • Explore what opportunities exist following graduation. • Understand what professional documents that will be needed following graduation (e.g., resume, cover letters, curriculum vitae).
Method(s) of measurement:	Complete and Present Senior Thesis Project
Target Performance:	<ul style="list-style-type: none"> • Generate clear and thoughtful analytical commentary in the form of dialogue and writing. • Conduct in-depth analysis of and explore possible solutions to geographic problems while demonstrating effective written and oral communication skills – this will be accomplished through the “Senior Thesis” project. • Develop a plan for the next step following graduation. • Craft a solid resume that will be utilized after graduation, plus learn the art of writing effective cover letters and curriculum vitae.
Actual Performance:	A Completed and Presented Senior Thesis Project
Interpretation/Reflection on findings:	Student Projects with respect to significance, appropriateness, time invested, and overall quality varied individually, though overall class performance was high. This is to be expected in a class of 10-15 majors with differing abilities and ambitions.
Action Plan/Use of Results:	Future thesis presentations will be recorded at the request of the student, and electronic copies of these are kept on record for future class references.
Intended evaluation of plan (closing the loop):	The department of geography continually monitors our Senior Seminar results as it prepares students for careers, graduate school, and community service.

Additional narrative (optional – use as much space as needed):

Until very recently, GEOG 3790 (formerly 3600) and GEOG 4990 were the only two other courses (beyond geography gen. eds.) required of our majors. Soon, with our newly redesigned 18-hour Geography Core, we’ll have more classes to evaluate and measure against our departmental learning objectives. The same goes for our new Certificates (Geospatial Technician and Analyst). Because we have offered classes for the certificates for the last two years, I include some assessment data based on the LOs outlined above.

	GEOG 4400	GEOG 2400	GEOG 4400
	Fall 2019	FALL 2020	Fall 2020
	100	90	100
	96.5	100	40.5
	97.5	100	84
	101	0	92.25
	101	100	94.5
	89		89.25
	92.5		72.5
	98.5		90
	68		100.5
	98.5		65.5
	92.5		30.5
	96		101.875
			93
			34.5
			87.5
			90
			88.5
			97
			52.25
			91
			57.375
			51.5
			100.875
			50
Annual Average	94.25	78	77.28645833
	ALL YEARS	AVERAGE	82.33841463

Dr. Ryan Frazier, our Geospatial Expert, wrote this to explain the table and these remarkably good results:

These were from their final projects, all are out of 100 or measured in %. So, 100 = perfect, 90+ =A, 80+=B and so on.

In 2400 they had to gather a three maps series and critique the many decisions and elements the map makers made on each map. They could be a theme (a student did textbook maps of the Aztec, Mayan, and Incan Empires, from three different textbooks), or of the same phenomenon, but three different map makers. It occurs over a 15 minute in-class presentation.

The 4400 projects are from a few items. The first (2019) was an open exploration - they needed to create an original map from scratch and justify everything they did on their map. Map and

justification document were the deliverables. In 2020, they could choose from three projects and a make your own original map (like in 2019). The other three projects were a history of wildfire map in Utah or Idaho, create a better state park map (many choose Antelope Island, and many do better than the state map that is available), and then there is a ridge plot map of either Utah, or a national park. All projects require a justification document that describes their reasons for placing elements and colors, etc. - all the things that are needed to make a map, minus the data processing. I've evaluated on their presentations and what they critiqued and how (2400), and also their map composition (4400) and their cartographic choices (4400). I am looking for them to employ what they learned in the labs and lectures, which essentially prepares them to make these decisions and explain them.

Other programs

a. General Education Outcomes (if applicable)

As noted above, the department offers four General Education courses, two in the Physical Science and two in the Social Sciences. Those courses are continually measured against the Gen. Ed. learning outcomes:

All physical science courses will also meet the following physical science outcomes.

Students will demonstrate their understanding of the following features of the physical world:

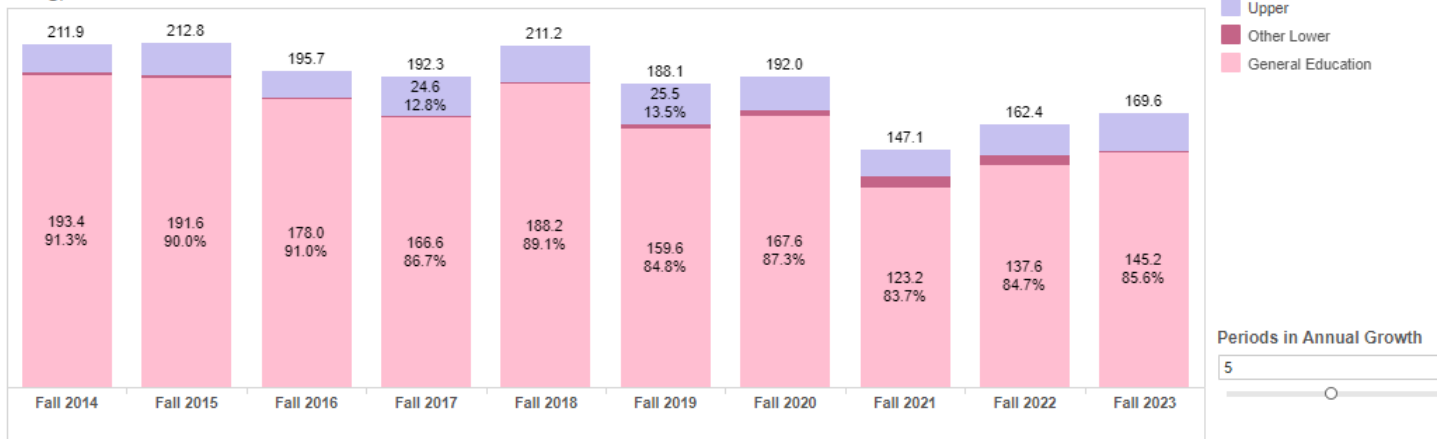
- Organization of systems: The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws.
- Matter: Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales.
- Energy: Interactions within the universe can be described in terms of energy exchange and conservation.
- Forces: Equilibrium and change are determined by forces acting at all organizational levels.

Students completing a social science general education course will demonstrate their understanding of the following three outcomes:

- Interactions between individuals and society: Students will describe how individuals and groups influence and are influenced by social contexts, institutions, physical environments and/or global process.
- Application of concepts, theories, and methods: Students will apply basic social science concepts, theories, and/or methods to a particular issue and identify factors that influence change.
- Diverse perspectives: Students will identify an argument about a social phenomenon and understand alternative explanations.

Also, as noted above, Gen. Ed. courses make up the bulk of our SCHs (well over 80%), and with the reduced Gen. Ed. hours from 37 to 30 or 27 credit hours, service department like Geography are going to suffer mightily in terms of total students and ability to recruit new majors. This graphic summarizes this liability.

Geog, Environment & Sustain Fall FTE 10 Year Enrollment



- b. Concurrent Enrollment (if applicable)
- c. Other interdisciplinary work

Geography engages in a wealth of interdisciplinary work, particularly with the Department of Earth and Environmental Sciences in the College of Science. Not only do we share a faculty member (Dr. Ryan Frazier, hired in 2019 as a Geospatial Technology Expert), we collaborate on two Certificates of Proficiency, share a National Science Foundation Grant (NSF DUE – 1304888), and coordinate for many students taking classes in both departments. We even occasionally teach each other’s classes (Dr. Maria Groves has offered GEO 1130, Intro. to Meteorology several times). Dr. Frazier’s new faculty line was the first two-department and two-college hire in University history.

Geospatial Technology, now all-online, 19 credit hours

Course Requirements for Certificate of Proficiency

Geography Courses Required (6 credit hours)

- GEOG 1790 - Exploring Our World Through Geospatial Technology Credits: (3)
- GEOG 2400 - Cartography and Map Design Credits: (3)

Earth and Environmental Science Courses Required (12 credit hours)

- GEO 1710 - Introduction to Geographic Information Systems (GIS) Credits: (4)
- GEO 1720 - Geospatial Analysis Credits: (4)
- GEO 2200 - Geospatial Data Acquisition Credits: (4)

Select at least 1 hour from the following:

GEO 2840/ GEOG 2840 INT - Geospatial Internship (1-3)

GEO 2850/ GEOG 2850 - Geospatial Capstone (3)

Additional information pertaining to the Northern Utah Geospatial Technology Education Program (NUGeoTec) may be found at: <https://www.weber.edu/nugeotec> or <http://weber.edu/geography>.

Geospatial Analysis, now all-online, 22 credit hours

Course Requirements for Certificate of Proficiency

Geospatial Courses Required (22 credit hours)

Required courses are offered in two departments: Earth and Environmental Sciences (GEO) and Geography (GEOG).

- GEO 3710 - Introduction to Geographic Information Systems Credits: (4)
- GEO 3720 - Geospatial Analysis Credits: (4)
- GEO 3840 - Remote Sensing: Principles and Methods Credits: (4)
- GEO 4200 - Geospatial Data Acquisition Credits: (4)
- GEOG 4400 - Cartography and Map Design Credits: (3)
- GEOG 4600 - Geospatial Programming and Online Methods Credits: (3)

Elective Geospatial Courses (1-3 credit hours)

Select one elective course in the Earth and Environmental Sciences Department (GEO-even years) or the Geography Department (GEOG-odd years), depending on the year, from the following:

- GEO 4840 INT - Geospatial Internship Credits: (1-3) taught even years
- GEO 4850 - Geospatial Capstone Credits: (3) taught even years

Our Geospatial Technology and Analysis were built collaboratively, have enjoyed fantastic recent success (see figures below), and have attracted a diverse group of students (post-baccalaureate, non-traditional, first gen., etc.). They also are guided by a robust set of learning outcomes.

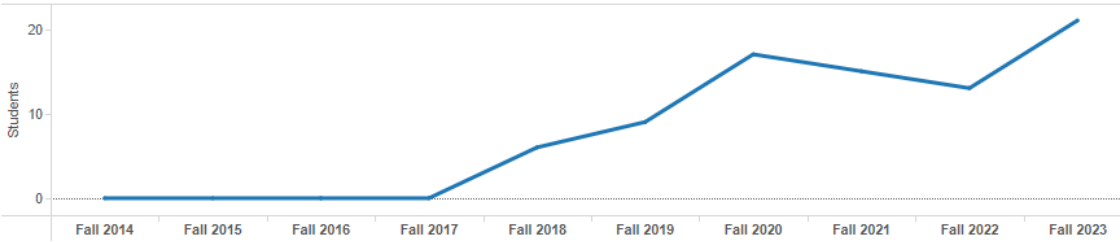
Students completing the Geospatial Analysis Certificate will demonstrate the following outcomes:

1. Students will demonstrate how to effectively create and communicate geospatial data/results to others through cartographically accurate maps/dynamic products, technical reports, and multimedia presentations.
2. Students will demonstrate understanding of basic geospatial concepts, such as data models, spatial databases, data projections and coordinate systems, topology, digitizing spatial data, metadata, and quality control.
3. Students will demonstrate understanding of geospatial analysis that can be performed on vector and raster data collected from various platforms such as satellites / drones (Remote Sensing), GPS instruments, field maps. They will demonstrate the ability to perform multiple types of analysis, including spatial overlay, raster processing, statistics, terrain and hydrologic analysis, transportation networks, modeling, and Python programming.
4. Students will demonstrate the ability to work in a team environment to complete a set of geospatial tasks or a geospatial project that includes project objectives, methods, data collection, analysis and reporting results in a professional format through completion of a geospatial internship or capstone course.



Select Semester: Major Definition: Select one or more Specific Major(s): Select Degree Level:

All Majors & Concentrators Degree Seeking Students



Color Leg... ■ All Majors & Conce...

Top 6 Majors Selected

Periods in Annual Growth

All Majors & Concentrators Details

Major Definition	Fall 2014	Fall 2015	Fall 2016	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
All Majors & Concentrators	0	0	0	0	6	9	17	15	13	21

% Avg. Annual Growth

(Intermittent data may result in inaccurate growth rates)

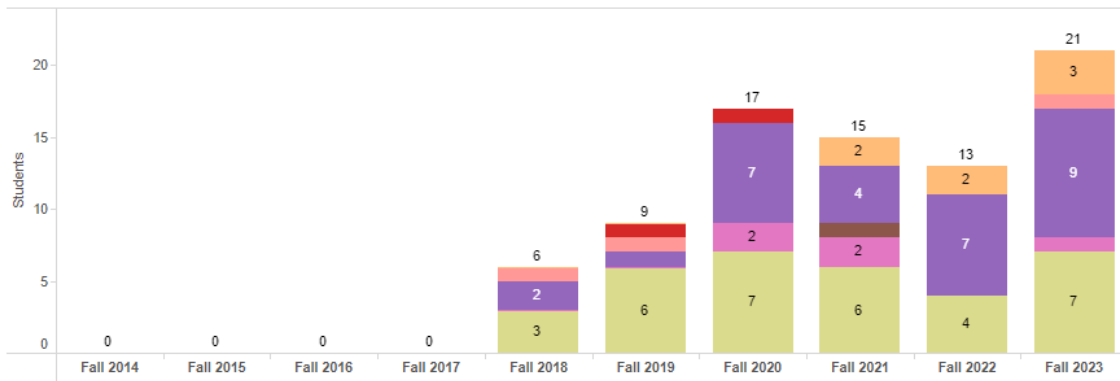


Select Demographics

By Gender and Ethnicity

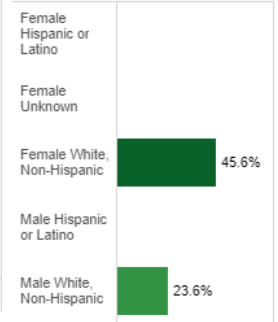
Select Count or Percent

Distinct Count



% Avg. Annual Growth

(Intermittent data may result in inaccurate growth rates)



- Female Hispanic or Lat...
- Female Unknown
- Male Asian
- Male Two or More Races
- Male White, Non-Hispa...
- Female White, Non-His...
- Male Hispanic or Latino
- Male Unknown

C. Five-year Assessment Summary (Excerpts from Geography's Assessment Reports):

2017

- 1) Based on your program's assessment findings, what subsequent action will your program take?
 - As noted above, the Geography Department completed its 5-year Review in 2016-17, and the Program Review by the Office of Institutional Effectiveness was delivered September 29, 2017. Thus, we are only just beginning to implement these recommendations. We are also engaged in a top-to-bottom evaluation of the department. With a new department Chair, Office Administrator, and a new home in an old building, this seemed like a logical time to look at everything we're doing as a department. Already, we've written a new mission statement, sharpened our departmental objectives, and begun the process of looking at course titles and content, curriculum, major emphases or tracks, and our bachelor's, teaching, and minor degrees. This process, we hope, will come together in a department retreat scheduled for finals week at the end of this semester.
 - As far as this particular annual assessment is concerned, the department feels like it is doing a good job of measuring and evaluating our general education physical science courses, but that we could greatly improve our social science general education and core major class assessment. We plan to begin those improvements this term.
 - Our overall assessment allows us to endorse this statement from our last full assessment report: "Overall, the assessment results give the faculty confidence that we are preparing our students for careers in geography and related fields. Furthermore, high impact, service learning course projects are assisting both students and community organizations with research that can be applied in a 'real world' setting."

- 2) We are interested in better understanding how departments/programs assess their graduating seniors or graduate students. Please provide a short narrative describing the practices/curriculum in place for your department/program. Please include both direct and indirect measures employed. Finally, what were your findings from this past year's graduates?
 - The Department of Geography believes that it is doing a good job of preparing our students for employment and graduate school opportunities. We'd like to be doing a great job though, and that is why we've undertaken the thorough departmental evaluation as detailed above. Word-of-mouth evidence suggests that our students are finding jobs and graduate appointments, but we have not been forthright in tracking students after graduation. We do survey our graduates (see below), and on our website, there is a place for graduates to check-in and update us on their doings, but they haven't been very informative. Additionally, we invite graduates back to campus to talk to our majors, but not in a systematic way. So, like in several areas listed earlier in this document, we endeavor to do better.
 - To reach that goal, one of our first tasks is to set up a Geography Advisory Board to help guide us toward preparing students for the marketplace. Staffed with leaders in business, industry, non-profits, and government, we hope that the board will steer us in a way that helps our graduates succeed. Likewise, I've joined a nationwide group of geography department chairs who are also working to improve their departments by sharing their successes, shortcomings, and experiences. I expect this to be a great resource as we move forward. We also plan to engage our adjuncts more formally as we retain and advise students, as well as help our graduates prepare for life after

graduation. And finally, I can say unequivocally, I have the department faculty's full support for strengthening our program. We've already had more department meetings this semester than we've had in the last several years. Their commitment to our students and our department is tremendously encouraging and presages a bright future our program.

2019-2020

1) First year student success is critical to WSU's retention and graduation efforts. We are interested in finding out how departments support their first-year students. Do you have mechanisms and processes in place to identify, meet with, and support first-year students? Please provide a brief narrative focusing on your program's support of new students:

- Any first-year students taking courses in your program(s).
 - The vast majority of first-year students that come through the geography department, do so as General Education students in our four Social and Physical Science Gen. Ed. classes (1000, 1300, 1500, 1520). The department spends a good deal of time helping students succeed in those classes, as well as encouraging them to take other geography classes and consider the discipline for a major or minor. We actively invite those students to presentations, film screenings, field opportunities, and especially to Geography club events.
- Students declared in your program(s), whether or not they are taking courses in your program(s)
 - New students to our program (majors, minors, BIS, and certificate seeking students) benefit from the full range of our attention as a department. Regular advisement, tutoring, field and travel opportunities, scholarship help, support for internships, career preparation, technical skills, and graduate school are widely encouraged. We often bring back successful alumni to interact with students, invite them to participate in undergraduate research, and strongly support their quest for financial assistance, conference presentation, and meaning field experiences. And, while we struggle at this, we actively try to follow our alumni after graduation.

2) A key component of sound assessment practice is the process of 'closing the loop' – that is, following up on changes implemented as a response to your assessment findings, to determine the impact of those changes/innovations. It is also an aspect of assessment on which we need to improve, as suggested in our NWCCU mid-cycle report. Please describe the processes your program has in place to 'close the loop'.

- Much of this, really, is detailed above. In response to our formal outside department review, yearly assessment, interviews with alumni, graduate exit surveys, interaction with other geography chairs nationwide, and our own faculty discussions, the department is continuously looking for ways to "close the loop."
- For example, we are (again) revising the core concepts for our Gen. Ed. classes and crafting better questions to measure those outcomes. After an exhaustive research and deliberation, we've changed our department name to Geography, Environment and Sustainability, and are completely revising our curriculum: emphases or tracks, course titles and descriptions, electives, and content. We've just begun a thorough look at "KSAs" or the Knowledge, Skills, and Aptitudes essential for any student to be a successful and meaningful geographer after they graduate. It is, to understate the obvious, a work in progress.

2021-2022

1) Review and comment on the trend of minority students enrolling in your classes (particularly lower-division, GEN Ed) and in your programs.

(Answer is in full report)

2) What support (from enrollment services, advising, first-year transition office, access & diversity, etc.) do you need to help you recruit and retain students?

At this point, I think marketing is more what we'll need. We've begun to work with the campus Marketing and Communications Office to "get the word out" about our new programs. This is a rather robust campaign with lots of components, and beyond the thrust of this question.

3) We have invited you to re-think your program assessment. What strategies are you considering? What support or help would you like?

As mentioned elsewhere, Geography has recently undergone a complete curricular overhaul. As our new classes, tracks, core requirements, minors, and majors are deployed, we're eager to see how things go. At that point, we'll just be assessing, not re-thinking how we'd like to assess. We've got departmental learning outcomes as well as learning expectations for each of the seven tracks or emphases that we offer. Once some students have journeyed through those tracks, we'll evaluate, assess, and undoubtedly, make some adjustments.

4) Finally, we are supporting our Concurrent Enrollment accreditation process. Does your program offer concurrent enrollment classes? If so, have you been able to submit the information requested from the Concurrent Enrollment office? Staff from OIE will reach out to you in the next few months to assist in finalizing that data submission as well as gather information for concurrent Gen Ed assessment. Geography, happily given all of the recent hand-wringing over CE, does not offer any Concurrent Enrollment courses.

Assessment of Graduating Students

The Geography Department conducts a Graduate Exit Survey of Majors with this questionnaire.

Geography Graduate Survey

Your participation in this survey helps us assess how well the Geography Department meets its mission. Please rank the following items based on your experiences from **only Geography Courses, Internships, or Field Experiences at Weber State University**.

1. Geography **courses** provided me with a firm understanding of the earth's natural environment and its relationship to human society and activities.

A. Strongly agree B. Agree C. Disagree D. Strongly disagree

2. Geography **courses** provided me with a firm understanding of the world's peoples, nations, cultural environments, and spatial organization.

A. Strongly agree B. Agree C. Disagree D. Strongly disagree

3. Geography **courses** provided me with an appreciation for the great variety of cultural forms and ways of thinking throughout the world, and to help me formulate a world view that uses this appreciation to become a responsible member of my local and global communities.

A. Strongly agree B. Agree C. Disagree D. Strongly disagree

4. Geography **courses** provided me with a firm understanding of human impacts on the environment and the holistic ideas and practices of sustainability.

- A. Strongly agree B. Agree C. Disagree D. Strongly disagree
E. I did not take courses that introduced sustainability.

5. Geography **courses** provided me with a grounding in the modern technical skills of the discipline (including geographic information systems, remote sensing, and cartography).

- A. Strongly agree B. Agree C. Disagree D. Strongly disagree
E. I did not take courses in GIS, remote sensing, nor cartography.

6. Geography **courses** provided me with a firm understanding of the planning industry and issues related to that field.

- A. Strongly agree B. Agree C. Disagree D. Strongly disagree
E. I did not take courses in land use planning.

7. Geography **Internship(s)** provided me with a practical experience in the modern applied skills of the discipline through work with a government agency, private business, or NGO.

- A. Strongly agree B. Agree C. Disagree D. Strongly disagree
E. I did not have an internship (cooperative work experience).

8. Geography **Field Experience(s)** provided me with a meaningful experience through a field trip, community service, study abroad, or by doing field work.

- A. Strongly agree B. Agree C. Disagree D. Strongly disagree
E. I did not have a field experience.

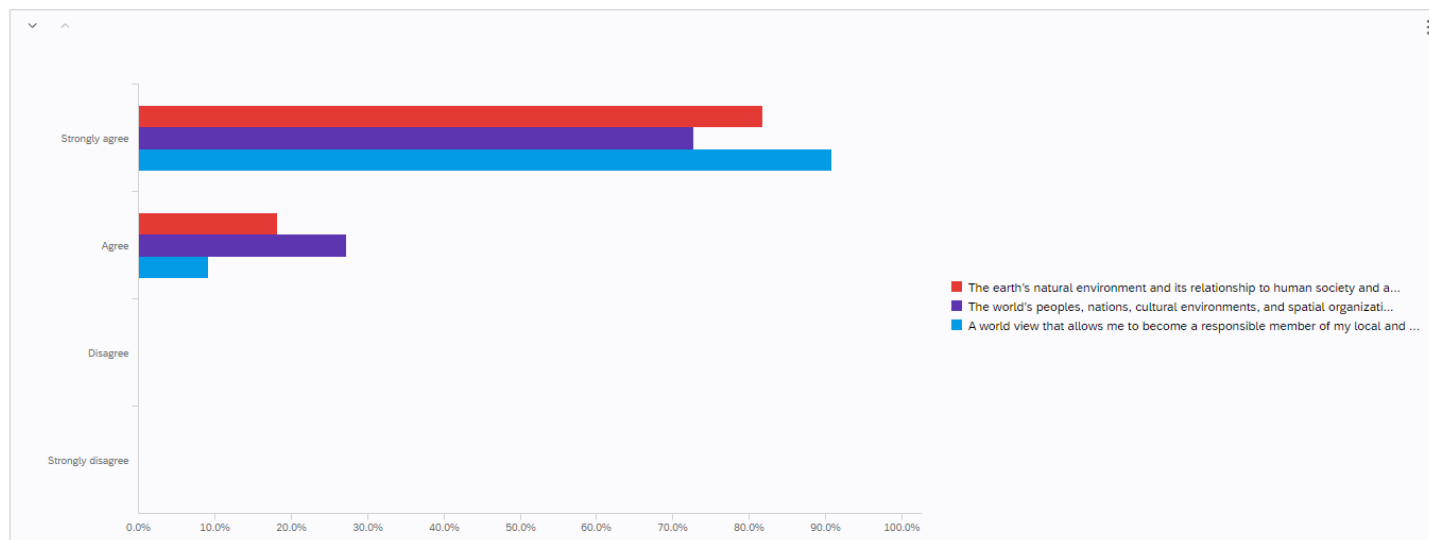
9. Briefly describe **your upcoming goals** (travel, employment, graduate school, other).
How has the Geography Dept. assisted you in meeting those goals?

10. If you have been accepted into a **graduate program or attained employment**, please provide us with the name of the institution or employer and your position.

11. How might the **Geography Department improve its courses, internship programs, and field experiences** to better meet the objectives spelled out in items 1-8? Please specify the survey item number in your response. Also, please feel free to comment on the Department's strengths and/or what you enjoyed most about being a geography major? Your honest responses will help us improve our entire program.

12. Thank you - we appreciate your feedback and hope you will keep in touch. Best of luck with your future endeavors. **We'd like to stay connected to you in the future.** Please share a reliable e-mail and phone number.

A sample response from our most recent Qualtrics Exit Survey for Graduating Majors:



A Sampling of Written Student Responses from the same Survey (apologies for the tiny type):

How might the Geography Department improve its courses, internship programs, and field experiences to better meet the objectives spelled out above? Also, please feel free to comment on the Department's strengths and/or what you enjoyed most about being a geography major? Your honest responses will help us improve our entire program.

How might the Geography Department improve its courses, internship programs...

More courses for global studies would be great. I loved all of my Geography classes so much but I was never able to take Geography of Europe or Russia to round out my Global Studies emphasis.

I enjoyed developing strong relationships with my professors which enabled them to share with me great opportunities. Since I was mostly involved in environmental sustainability, it would have been nice if I knew about it sooner. Find ways to get the word out about opportunities with Geography other than just GIS because this department is so much more than that. Perhaps update the website to highlight other things than just GIS and get more photos of involvement. Maybe connect with the WSU Sustainability Clubs (though most of the students are from the College of Science, the past two presidents were Geography majors).

More online and more classes and times/days/semesters.

More class diversity, and more professors teaching subjects to ease class scheduling stress on students.

Once you are in the geography program good luck getting out. It is a family between professors and students pushing you to strive and succeed. I met some amazing people while in the program and learned some great skills while I was at it.

I know it might not be possible because of the amount of students taking the courses, but it would be extremely helpful if some of the upper division courses were offered over the summer and both fall and spring semesters. There were classes I would have preferred to take over others, but forced to take classes because the others weren't offered the semester I needed to take them. Also, I could not take any classes over the summer, (which I like doing), because there weren't any I could take. As a full-time employee, it is nice to be able to spread the load into the summer so I am not over-whelmed during the fall and spring semesters. As for the department's strengths, the professors are the strength. You have been there cheering all of us on, encouraging us to push ourselves to achieve while helping us build confidence in our work. It is a comfortable and enjoyable conversation in the classroom. There is a respect for each other as students and a respect from the professors for the students. It feels almost safe. (The political environment in our country still has some of us fear sharing our beliefs, whatever they may be, and that cannot be helped.) I also thought the professors in the geography department were patient and willing to share their time for helping or talking about whatever. It made us students feel important. I cannot stress how crucial that is going into the workforce as a graduate. It is quite intimidating and daunting, but I gained confidence that I can successfully compete in that world by receiving the continual positive encouragement from the professors. I will always be thankful for that and think on the geography department with fondness. I also remember the first time one of the professors called us students in the class geographers. I pondered that and realized it was true. We are geographers learning about our world together. Pretty cool.

In relation to the Planning profession, I think an expansion on the general plan development process and long range planning would be nice. Something to help build a better understanding of the process as well as text amendments and alike. Perhaps this could be accomplished by having a semester long project where the student had to overall design a city and plan its future by adding to it through the semester; establishing a general plan, workin with zoning codes and requirements, etc. in the end the student has gained experience in the field with items most important in the profession although done through a hypothetical design. Perhaps input could be provided at certain checkpoints along the way from planners out in the real world that could play devils advocate here and there bringing their experiences and challenges they face or have faced in the field.

I like the diversity of classes offered here at Weber State. I think it would be awesome to incorporate a basic land surveying class that teaches students how to setup and use different GPS equipment like total stations. I also think it would be neat to offer some training in operating drones. I enjoyed my GIS classes and would think it would be neat to do some more practice problems for a variety of industries that employers are interested in.

Honestly, I loved this program. I do wish I had been able to participate in more field work and experiences outside of the classroom. The faculty are incredible. I loved being able to tutor this last year; teaching was fun and I learned so much from the students.

Sample Activities and Destinations for Geography Majors after Graduation:

Discipline	Year of Graduation	Employers	Job Title
Geography	2012	United States Airforce	Cartographer
Environmental Studies/Geography	2013	United States Airforce	Logistics Manager
Geography	2017	United States Airforce	United States Airforce A1C
Geography	2006	United States Airforce	Cyber Security Specialist
Discipline	Year of Graduation	Employers	Job Title
Geography	2020	Davis School District	English and Geography Teacher
Geography	2020	Davis School District	Geography Teacher
Geography	2006	Davis School District	Teacher
Geography	1992	Davis School District	Photography/Art Teacher
Discipline	Year of Graduation	Employers	Job Title
Geography (Emphasis in GIS)	2004	University of Utah	Sr Database Administrator
Geography	2008	University of Utah	Researcher Huntsman Cancer Research institute (Ph Candidate)
Geography	2011	University of Utah	Assistant Director (not sure what dept)

Discipline	Year of Graduation	Employers	Job Title
Geography	2020	Church of Jesus Christ of Latter-Day Saints	Seminary Admin
Geography	2012	Church of Jesus Christ of Latter-Day Saints	Sr Records Manager Church History Department
Geography	2008	Church of Jesus Christ of Latter-Day Saints	Manager, Historic Sites Operations at Church History Department
Discipline	Year of Graduation	Employers	Job Title
Geography	2011	Weber State University	Assistant director
Geography	2006	Weber State University	Disability Specialist
Geography	2012	Weber State University	Energy Manager
Geography	2022	Weber State University	System Analyst
Geography	2013	Weber State University	Student Sustainability Coordinator
Geography	2020	Weber State University	Sustainability Community Programs Coordinator
Geography	2016	Weber State University	Water Conservation and Stormwater Coordinator

Standard D - Academic Advising

Advising Strategy and Process

All new and continuing students (majors, minors, Certificates, BIS) are encouraged to come in person or to communicate through email to declare major/minor/Certificate/BIS and Track and to be advised by the Department Chair. The advising appointment entails a discussion of the required 18-credit hour Core and then selection of a Track (for the BS) which matches student's interests can be met with a specific set of courses. A tentative plan of courses and requirements and projected schedule of course work is agreed upon. We have constructed several graduation maps for Geography majors (see Appendix I). Informal advising is carried out by all faculty members (particularly in their areas of expertise) and by the department administrative specialist. The department Chair serves as the main advisor by maintaining advising records in CatTracks with notes to provide historical data, and completing sign-offs for graduation. Each faculty member maintains a "Starfish" advising relationship with their own students. General Education advising is done centrally in the college by three (now four) Gen. Ed. advisors.

Effectiveness of Advising

We evaluate the effectiveness of our advising by noting completion rates after 90+ credit hours (see earlier table), through our Graduation Exit Survey (discussed earlier), and by the success of our students in Internships, Employment, and Graduate School. We also strive to remain in contact with our graduate alumni. Relatively few remain in contact with us, but those that do, report great success, and often return to talk to our students as part of Geography Club Events or through our capstone Senior Seminar.

Past Changes and Future Recommendations

Our most successful single advising addition came in the form of a new 1-credit hour course that introduces prospective students to the major, its many options, and to possible careers.

GEOG 2790 - Pathways and Careers in Geography, Environment & Sustainability

GEOG 2790 - Pathways and Careers in Geography, Environment & Sustainability



Credits: (1)

Typically Taught Fall Semester: *2nd Block*

Typically Taught Spring Semester: *2nd Block*

Description: This course introduces new and prospective Geography, Environment & Sustainability majors and minors to career opportunities, department faculty, options for major tracks, and real-world applications of geographic perspectives and techniques. When you finish this course, you will be able to identify a pathway through a major or minor and into a productive career.

Standard E - Faculty

Programmatic/Departmental Teaching Standards

Teaching standards are determined by three sources: (1) The campus Peer Review policies and procedures (consisting of a rating system for Course Instruction (including classroom observations, student evaluations, quality and relevance of course materials, and evaluation of instructional activities and contributions to the teaching mission of the program/university), and a Teaching Evaluation (including maintenance of academic standards and professional activities, use of innovative teaching techniques, teaching contributions to the program, provision of enrichment opportunities beyond lectures, and maintenance of professional, ethical conduct) (2) The Faculty Annual Review for merit policies and procedures of the College of Social and Behavioral Sciences. Faculty annual review is submitted to the chair who evaluates faculty members' annual accomplishments and recommends merit considerations to the dean who makes the final decision. (3) The College and University Rank and Tenure policies and procedures. These standards are communicated to the faculty by the Program Coordinator, Department Chair, Dean, and other key academic administrators of the university, such as the Associate Provost and Provost. New faculty are also given orientations in the Fall Semester of their first two years as well as through campus workshops provided for all faculty and are given first- and second-year reviews by the Chair.

Faculty Qualifications

	Tenured	Tenure-Track	Other Contract	Adjunct
Number of faculty with Doctoral degrees	5	2		
Number of faculty with Master's degrees				8
Number of faculty with Bachelor's degrees				
Other Faculty				
Total	5	2		8

Faculty Scholarship

The Weber State University Department of Geography boasts a diverse and accomplished faculty dedicated to fostering an enriching educational environment. The department's faculty members hold advanced degrees in their respective fields, contributing to a rich tapestry of academic qualifications that underpin their teaching and research endeavors. Their scholarship is extensive, with many faculty members actively engaged in publishing research that contributes to the broader understanding of geographical sciences. This commitment to research is paralleled by a dedication to service, both within the university and the wider community, often integrating field trips and practical experiences into the curriculum to enhance student learning. The department prides itself on a personal approach to education, where students are encouraged to engage directly with their professors, benefiting from their expertise and mentorship. This dynamic combination of education, qualifications, scholarship, research, and service positions the Weber State Department of Geography as a leader in geographical education and research. Please see the Appendices and linked websites (as per the Office of Institutional Effectiveness) for Faculty Scholarship and CVs.

Faculty Service

Geography Faculty have selflessly and indefatigably donated their time and talents to department, college, university, community and professional service. An impressive list of this service can be found in Appendix K.

Mentoring Activities

In addition to mentoring students through classwork, field work, research, and internships, our faculty are quite involved in “mentoring” other faculty. Most obviously are Dr. Dan Bedford’s work as the Honors Director and Dr. Alice Mulder work as Head of SPARC. Here, for example, are samples of Dr. Mulder’s Mentoring of Interns and Independent Study:

Mulder – Independent Study/Internships Oversight 2017-2023

2023

- Internship, WSU’s Energy and Sustainability Office, Hunter Ricardelli, position of Zero Waste Coordinator (Spring 2023)
- Internship, WSU’s Sustainability Practices and Research Center, Camelia Becerril, position of Diversity Engagement Coordinator (Fall 2023)
- Internship, Bear Lake Marina Crew Summer, McKenna Laney, Fall 2023 credit

2019-20

- Internship, WSU Energy and Sustainability Office, Sadie Braddock as Environmental Ambassador lead, 2019-20

2019

- Internship, WSU Sustainability Practices and Research Center, Chase Wilson, as Sustainability Coordinator, Spring 2019

2017

Advisor/Committee member for BIS student. Her Capstone Project which combined, geography, nutrition, and human performance: “Sustainable Food Production and Diet: An Integrated Disciplinary Consideration.”

1-credit Independent Research Direction: The student further researched and refined information to present her BIS work as a poster for the Intermountain Sustainability Summit

Fall 2017 – Oversaw two student internships, one each working in the Energy and Sustainability Office and SPARC on campus. A comment on the evaluation from the SPARC intern was, “This was a great opportunity to earn class credit while providing a valuable service to the university and the community. I have learned many new skills and developed new relationships that will serve me throughout my career and my life.”

- Sustainability Coordinator, WSU SPARC, Tyler Hole, Fall 2017
- Environmental Ambassador, WSU ESO, Kyia Hill, Fall 2017

Diversity of Faculty

The faculty at Weber State University’s Geography Department are actively engaged in a particularly wide variety of research and scholarship activities. Here are some highlights:

Version Date: April 2023

Climate Science and Environmental Change

Drs. Daniel Bedford and Maria Groves: Focus on climate science, particularly the impacts of climate change on various environments. Their research includes studying climate patterns and their effects on ecosystems and human societies, as well as adaptations and science communication.

Geospatial Technology

Dr. Ryan Frazier: Specializes in Geographic Information Systems (GIS) and remote sensing. His projects often involve urban planning, environmental management, and the application of geospatial technologies to solve real-world problems.

Sustainability

Dr. Alice Mulder: As the Director of the Sustainability Practices and Research Center (SPARC), she researches sustainable urban development and community resilience. Her work aims to promote sustainable practices within urban settings and enhance community adaptability to environmental changes.

Urban and Global Studies

Dr. Jeremy Bryson: Specializes in urban geography, East Asia, and planet-wide regional change. His research ranges from the nature of gentrification to helping communities protect dark night skies.

Urban and Regional Planning

Dr. Bryan Dorsey: Leads students through the complex practice of sustainable planning while treating topics such as housing, mass transit, and construction techniques.

Economic and Population Geography

Dr. Eric C. Ewert: Focuses on environmental, economic, and population geography, examining the spatial aspects of economic activities, demographic change, and their impacts on regional development and environmental degradation.

Our faculty members integrate their research findings into their teaching, providing students with current knowledge and practical experience. Their work not only advances academic understanding but also addresses real-world challenges, contributing to the field of geography and beyond.

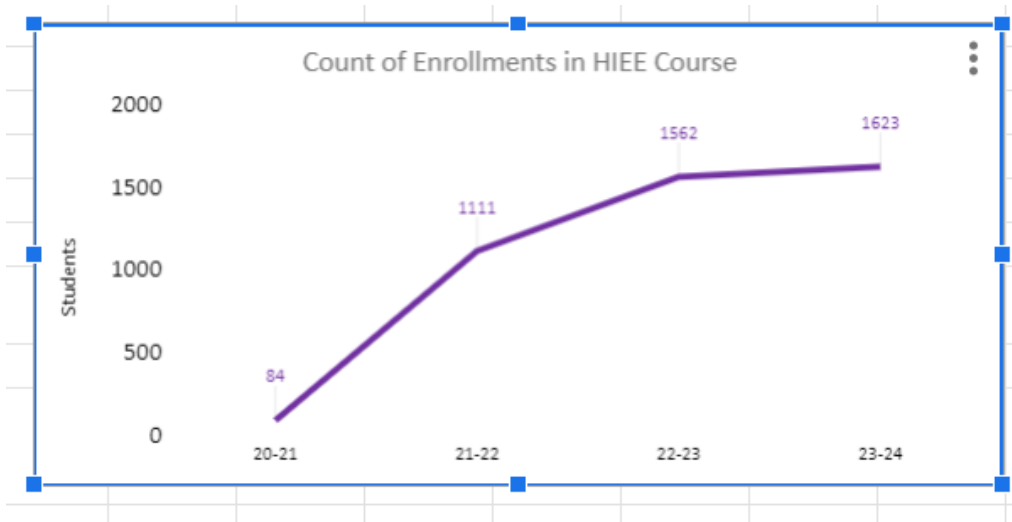
Ongoing Review and Professional Development

Faculty face ongoing review through student and class evaluation as well as through Annual Faculty Reports, Merit Pay, Rank and Tenure evaluations, and Post-Tenure Review. Additionally, and importantly, most department members participate in workshops, training sessions, software tutorials, and mini-courses to remain current in the Climate, Sustainability, GIS, and Planning fields.

Use and impact of high impact educational experiences

For the Fall 2020 to Fall 2023 time period, Geography's HIEE growth has been admirable. We've grown from 84 enrollments in the 2020-2021 academic year to 1623 this academic year. High Impact Educational Experiences are a priority for Weber State, and through field trips, service learning, volunteer work, internships, etc., the Geography Department delivers them.

Version Date: April 2023



The Department of Geography at Weber State University offers a dynamic and comprehensive program that integrates High Impact Educational Experiences (HIEEs) to enhance student learning and engagement. These HIEEs are designed to foster active and integrative student engagement through curricular and co-curricular activities, providing students with invaluable opportunities to reflect on their learning, engage in meaningful interactions with faculty, staff, and peers, and interact with diverse people and circumstances. The department's commitment to HIEEs is evident in its diverse offerings, which include community engaged learning, global learning experiences, internships, career development, leadership opportunities, peer mentoring, sustainability initiatives, and undergraduate research. These experiences are embedded in courses and activities outside the classroom, ensuring that students can find HIEE designations on a variety of courses and experiences.

The benefits of HIEEs are manifold, contributing to teaching and learning in ways that captivate the imaginations of students, faculty, and staff alike. They actively engage students in the learning process and set them up for success both inside and outside the classroom by developing competencies that help them succeed in their academic, career, and personal goals. For instance, the department has liaisons with various state, county, and local planning agencies that employ graduates, offer internships, and provide occasional instruction and guest appearances, which further enhances the practical application of HIEEs.

Additionally, the department offers certificates that make students hireable after only two semesters of coursework, utilizing high-tech equipment and lab space. This approach not only equips students with the necessary skills and knowledge but also provides them with a competitive edge in the sustainability job market, which is projected to grow significantly by 2030. The median geographer salary nationwide, as of 2020, stands as a testament to the lucrative opportunities available in this field. Weber State's Geography Department, therefore, represents a hub of academic excellence and practical experience, preparing students to tackle the planet's biggest challenges and uncover hidden wonders through a well-rounded and impactful educational journey.

A full list of sample HIEEs can be found in Appendix L.

Evidence of Effective Instruction

- i. Regular Faculty
- ii. Adjunct Faculty

Effective Instruction can be measured many ways: graduation rates, GPAs, successful employment of graduates, instruction inspired by scholarship and research, etc. Examples of departmental Teaching Innovation can be found in Appendix J.

Standard F – Program Support

Support Staff, Administration, Facilities, Equipment, and Library

Adequacy of Staff

The Geography Department includes one $\frac{3}{4}$ time Administrative Assistant, Sarah Rivkind. Ms. Rivkind has extensive institutional experience and ably serves as the face of the department as well as the key to navigating Weber's growing bureaucracy. That said, with ever more workload finding its way to the Chair's and Admin's desks, Geography would like to move Sarah Rivkind from $\frac{3}{4}$ time to full-time and an 11-month contract.

Evidence of ongoing Staff Development

Administrative Specialist Training (Sarah Rivkind).

8/8/2017 Information Security Training
9/22/2017 Discrimination, Harassment & Sexual Misconduct
8/17/2017 Ethics, Integrity, and Fairness: Legal Issues in Higher Education
8/24/2017 University Governance and Employee Rights
4/10/2020 FERPA Training
10/08/2020 Customer Service Virtual Conference
8/30/2021 Courserdog Class Schedule Training
8/30/2021 Argos Scheduling Reports
9/7/2021 Registration Restrictions and Overrides
5/31/2022 Annual Information Security Training
6/2/2022 Email and Phishing, Malware, and Information Security
8/30/2022 Campus Security Authority Training
1/18/2022 Banner Faculty Self Service Training
7/19/2022 Budget Bootcamp with Betty K.
10/26/2022 Registrar's Workshop
11/21/2022 OEO Title IX Training
2/14/2023 Information Security Training
7/27/2023 Registrar's Bootcamp
9/19/2023 Campus Security Authority Training
10/2/2023 Abusive Conduct Prevention Training
11/30/2023 Concur P-Card Training
12/5/2023 Concur Travel Training
12/13/2023 Concur Approver Training for Reconcilers and Supervisors
3/15/2024 WSU Data Training
6/13/2024 Information Security Training
7/8/2024 Abusive Conduct Prevention Training
Monthly meetings with CSBS Administrative Specialists
Monthly Meetings with Campus Admins

Adequacy of Administrative Support

Support in the College is good. With a Dean, Associate Dean, and four Advisors, the geography department enjoys adequate administrative backing.

Adequacy of Facilities and Equipment

In 2019, the program moved back to the newly refurbished Lindquist Hall. The new faculty offices are equipped with standardized new furniture and well-arranged spaces. There are also cubicles for adjunct faculty to prepare their lectures and meet with students. The department has its own conference room, a joint administrative space, joint mailroom and break room. Beyond these dedicated program spaces, geography classes are taught in classrooms across Lindquist Hall, all of which are equipped with a computer, wi-fi connection, and a projecting system. Most classrooms are also set up to synchronously broadcast courses. Each faculty member has a personal computer and office equipment (e.g., copy machine) shared by the department. Overall, facilities and equipment are adequate.

The department also maintains a decent collection of field trip camping gear, research equipment, and weather, climate, and soil sampling gadgets, as well as drones, paper maps, GPS units, etc.

Adequacy of Library Resources

The Stewart Library is used frequently by students and faculty for research and educational purposes. Library resources include extensive collections of geography books, journals, and digital collections. There is also an extensive streaming video collection (e.g., Kanopy and Academic Video Online) which includes many classic and modern geographical films and documentaries. The library also has an efficient Inter Library Loan service which can provide articles and books within a few days of a request. Finally, the dedicated Social Sciences and Music Librarian, Wade Kotter (who unfortunately has just retired), is an anthropologist and quite knowledgeable about geographic topics. The library resources are adequate for the program.

Standard G - Relationships with External Communities

For this section, See Appendix E, for specific examples of community partners we rely on for internships, advising, and employment of our graduates.

Description of Role in External Communities

The Geography program maintains strong ties to the broader Ogden community through a number of partnerships maintained by various faculty, and through engaged learning practices, including both service work and community research. Many of our alumni work in Ogden and other local communities as well as in local, county, state, and federal agencies with skills they acquired in through our programs. They work, for example, in law, healthcare, the military, data analysis,

planning and GIS departments in both Weber and Davis Counties, the schools (Weber and Davis Districts), as well as higher education, and in the private sector.

Most of our Faculty teach community engaged learning (CEL-designated) courses every semester. Drs. Mulder and Dorsey routinely include community-based research in their upper division courses. These various engaged learning practices have involved hundreds of students in community engagement with a wide number of agencies. The program also created a relationship with the new Farmington high school to offer GIS classes there.

Summary of External Advisory Committee Minutes

The Geography Department collaborates with the Earth and Environmental Sciences Department in maintaining a *Geospatial Advisory Board*. This Board originated with a successful NSF Grant proposal coauthored by Drs. Eric C. Ewert and Michael Hernandez. The Geospatial Program was made possible with generous support and guidance from the GeoTech Center at Jefferson Community and Technical College in Louisville, Kentucky, and from the National Science Foundation (NSF) in Washington D.C. It is part of an NSF Grant (DUE-1304888) held by professors Ewert and Hernandez at Weber State University. The program is also ably guided and counseled by a generous Advisory Board that represents government agencies, academics, and the private sector:

Wing Cheung, Associate Professor of Geography and GIS, Palomar College, California;
Bert Granberg, Director, Utah AGRC, Automated Geographic Reference Center;
Kasey Hansen, GIS Services Director, Gateway Mapping, Inc., Utah;
Josh Jones, Senior Project Coordinator GIS, Ogden City Corp, Utah;
Jim Quarles, Weber County Utah GIS Division Administrator, Weber County GIS;
Teresa Rhoades, Regional GIS Program Manager, USDA Forest Service, Intermountain Region, Utah;
Esther Worker, Education Manager, Intermountain West (Wyoming, Colorado, Utah, Arizona, New Mexico), ESRI - Broomfield, Colorado office;
John Ziakas, Sr. GIS Business Consultant, Questar Gas Company, Utah.
The program has also benefitted greatly in review and evaluation by Mary E. Seigrist, owner, IMSA Consulting in Denver, Colorado.

Minutes from the most recent Board meeting:

1. Final Program Plan – approved through Board of Trustees and Board of Regents (GST CP only)
2. Approved course curriculum
3. Benefits from project outcome
 - New joint appointment faculty line
 - Concurrent enrollment (Farmington HS)
 - New facilities: Geography Department and GIS Lab - Lindquist Hall (take a tour)
4. The Future of NUGeoTec – Discussion (how can the board help)
6. The board structure and policies (new members??)

Community and Graduate Success

Success can be measured a number of ways. For our programs it includes:

Where our students have attended graduate school recently:

- University of Utah
- Utah State University
- Brigham Young University
- University of Colorado-Boulder
- Arizona State University
- University of Washington
- Central Washington University
- University of California, Santa Barbara
- University of Alaska Southeast (Juneau)
- Rutgers University
- University of Nottingham, England.

Where they've found jobs:

- Sean Allen, Planner, Sandy City, UT
- David Bennett, Utah Transit Authority, SLC, UT
- Gregg Benson, Planning Director, Clearfield City, UT
- Trevan Blaisddell, Utah Transit Authority, Ogden, UT
- Scott Burningham, Utah Transit Authority, SLC, UT
- Shaunna Burbidge, Metro Analytics and Active Planning, Northern Utah
- Dennis L. Marker, Community Development Director, Santaquin City, UT
- Steven McRann, Planner, Evanston, WY
- Scott Mendoza, Planner, Weber County, UT
- Justin Morris, Planner, Weber County, UT
- Thomas Powell, Planner, Planner, Rock Springs, WY
- Teisha Richins, Surveyor, Weber County, UT
- Justin Ryan, Planner, Marion County, Ocala, FL
- Joseph Simpson, Planner, Ogden City, UT
- Brandon Toponce, Assistant Planner, Centerville City, UT
- Shaun Wilkinson, Planner, Weber County, UT
- Chad Wilkinson, Community Development Planner, Murray, UT

WSU Geography Alumni in Cartography/GIS Careers:

- Andrea Douglass, Ogden City GIS, UT
- Justin Hillier, National Intelligence Service NIS
- James McBride, Weber County GIS, UT

And with our Community Partners:

- Ogden City GIS and Planning Department
- Weber County Storm Water Management
- Student Conservation Association Fire Education Corps
- Davis County Public Works
- NAI Utah Commercial Real Estate
- Utah Division of Wildlife Resources
- Weber Pathways

- Coalition for Utah's Future, Envision Utah
- State and Local Planning Section, Governor's Office of Planning and Budget, Utah
- Weber County Planning Department
- Public Works Department, Washington Terrace
- Ogden City Council
- Box Elder County Recorder/Clerk/Surveyor's Office
- Ogden-Weber Chamber of Commerce
- Box Elder County Chief Recorder/GIS
- Weber Basin Water Conservancy District
- Community Development, Woods Cross City
- Forest Service
- U.S. Department of Interior: BLM
- State of Utah Educational Trust Lands Office
- Utah Transit Authority (UTA)

Standard H – Program Summary

Results of Previous Program Reviews

As detailed earlier, Geography’s previous program review is seven years old, and since that time, the majors, minors, certificates, core curriculum, course descriptions and titles, department objectives and mission statement have undergone a substantial overhaul. Thus, many of the problems and recommendations from 2016-2017 are no longer valid nor germane. We’ll address them as best we can, though.

Date of Program Review: 2016-17	Recommendation	Progress Description
Recommendation 1	Text of recommendation	
Better Advising	Carefully consider practices around advising, with special attention to the needs of students who are close to graduation.	With the use of Dashboards, Starfish, Grad. Maps, the new GEOG 2790 class, and more consistent communication with majors (and students in general with the College Advisors), we believe that we have improved considerably.
Recommendation 2	Text of recommendation	
Better Scheduling	Assure that courses are available for students to graduate in a timely manner.	Our new Core, Tracks, and Grad. Maps have led to better scheduling, although the many modes of delivery now (F2F, Virtual, Hybrid, Online) have challenged us to balance the needs of online and on-campus students. We strongly aim to offer most of our Core classes every year, and our regional, technical, and systematic classes in such a way that a students can meet requirements in a timely way.

Recommendation 3	Text of recommendation	
Better Planning	Attempt to develop a course rotation schedule that will aid students in planning their long-term schedules.	Grad. Maps, Scheduling, and Advising have helped here.
Recommendation 4	Text of recommendation	
Better Assessment	Include elective courses in your assessment processes.	As the wealth of assessment data in this document demonstrates, we've made a number of improvements. We still need to better assess Adjunct classes and some of our infrequently taught upper division classes.

APPENDICES

Appendix A: Student and Faculty Statistical Summary

Geography, Environment & Sustainability	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24*
Student Credit Hours Total 1	6,103	5,346	5,825	4,899	5,111	5,345
Student FTE Total 2	203.4	178.2	194.2	163.3	170.0	178.0
Student Majors 3	54	51	50	41	48	42
Program Graduates 4						
Certificate of Proficiency					3	1
Associate Degree						
Bachelor Degree	11	15	17	9	9	14
Student Demographic Profile 5						
Female	23	21	19	16	27	23
Male	31	30	31	25	21	19
Faculty FTE Total 6	9.17	10.85	10.86	9.56	N/A	N/A
Adjunct FTE	3.95	3.60	3.55	3.35	N/A	N/A
Contract FTE	5.22	7.25	7.31	6.21	N/A	N/A
Student/Faculty Ratio 7	22.2	16.4	17.9	17.1	N/A	N/A

Data pulled August 2023

Appendix B: Faculty

	Tenured	Tenure-Track	Other Contract	Adjunct
Number of faculty with Doctoral degrees	5	2		
Number of faculty with Master's degrees				8
Number of faculty with Bachelor's degrees				
Other Faculty				
Total	5	2		8

Most recent completed year; contract/Adjunct Faculty Profile

Name	Rank	Tenure Status	Highest Degree	Years of Teaching	Areas of Expertise
Eight Adjuncts	NA	NA	Masters	2-20	All Geography

Appendix C: Staff Profile

Name	Job Title	Years of Employment	Areas of Expertise
Sarah Rivkind	Admin. Assist.	10	All Dept. Matters

Appendix D: Financial Analysis Summary

Geography, Environment & Sustainability						
Funding	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Appropriated Fund	690,008	767,772	802,281	804,718	853,345	804,242
Other: IW Funding from CE	114,247	104,725	96,705	90,400	98,174	100,477
Special Legislative Appropriation						
Grants or Contracts						
Special Fees/Differential Tuition					2,347	2,911
Total	804,255	872,497	898,986	895,118	953,866	907,630
Student FTE Total	203.43	178.20	194.17	163.30	170.00	178.00
Cost per FTE	3953.47	4896.17	4629.89	5481.43	5610.98	5099.04
(Total cost/Student FTE) = cost per FTE						

Appendix E: External Community Involvement Names and Organizations

Name	Organization
	Ogden City GIS and Planning Department
	Weber County Storm Water Management
	Student Conservation Association Fire Education Corps
	Davis County Public Works
	NAI Utah Commercial Real Estate
	Utah Division of Wildlife Resources
	Weber Pathways
	Coalition for Utah's Future, Envision Utah
	State and Local Planning Section, Governor's Office of Planning and Budget, Utah
	Weber County Planning Department
	Public Works Department, Washington Terrace
	Ogden City Council
	Box Elder County Recorder/Clerk/Surveyor's Office
	Ogden-Weber Chamber of Commerce
	Box Elder County Chief Recorder/GIS
	Weber Basin Water Conservancy District

	Community Development, Woods Cross City
	Forest Service
	U.S. Department of Interior: BLM
	State of Utah Educational Trust Lands Office
	Utah Transit Authority (UTA)

Appendix F: Site Visit Team (both internal and external members)

Name	Position	Affiliation
Dr. Carrie Franz	Associate Professor	Department of Earth and Environmental Science, on-campus
Dr. Andrea Brunelle	Professor of Geography	University of Utah, off-campus

Appendix G: Evidence of Learning for Courses within the Major

Evidence of Learning: General Education, Social Science Courses

Course GEOG 1300 Spring 2020 (only time taught during 2019-20 and 2020-2021 period) 23 students

Outcome	Measurable Learning Outcome Students will demonstrate their mastery of the skill by:	Method of Measurement Direct and Indirect Measures*	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
Gen ED SS Outcome 1: “Interactions between individuals and society”. Students will describe how individuals and groups influence and are influenced by social contexts, institutions, physical environments and/or global process.	Four multiple choice exam questions over three exams (listed below table)	direct	75% students answering correctly	82.9%	Students are at or above target	NA
Gen ED SS Outcome 2: “Application of concepts, theories, and methods”. Students will apply	Four multiple choice exam questions over two	direct	75% students answering correctly	69.2%	Students are below target based on exam questions identified.	Evidence of learning for this LO may be better assessed from other

Outcome	Measurable Learning Outcome Students will demonstrate their mastery of the skill by:	Method of Measurement Direct and Indirect Measures*	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
basic social science concepts, theories, and/or methods to a particular issue and identify factors that influence change.	exams (listed below table)					assignments in the class. Consider ways to assess via better exam questions.
Gen ED SS Outcome 3: "Diverse Perspectives" Students will identify an argument about a social phenomenon and understand alternative explanations.	Two multiple choice exam questions over two exams (listed below table)	direct	75% students answering correctly	93.5	Students are well above target based on measure.	NA

1300 Questions used (Spring 2020):

LO 1:

- Ex1, Q13 - Which of the following are typical consequences of overurbanization?

Version Date: April 2023

- Ex1, Q15 - The concept of sustainable development
- Ex 2, Q20 - In the region of Southwest Asia and North Africa, population is clustered in certain key locations. What best explains the population distribution we find in this region?
- Ex4,Q32. The caste system in India has left a legacy of discrimination, even though such discrimination is now, officially, illegal.

LO2

- Ex1, Q8 In which stage of the demographic transition would you be most likely to find the wealthiest countries in the world?
- Ex1,Q33 All of the following are possible activities in Latin America's informal sector EXCEPT
- Ex4, Q40. Which of the following is NOT an example of characteristics typically found as part of a colonial legacy?
- Ex4, Q52.Tibet was traditionally (until the Chinese takeover) run as a theocracy. Iran currently is a theocracy. What does this mean?

LO3

- Ex2, Q9 - Which of the following factors helps explain the typical life expectancy found in many Sub-Saharan African countries?
- Ex4, Q30. Two inhabitants of China may not be able to understand each other's speech, but they can likely read each other's letters.

Evidence of Learning: General Education, Social Science Courses
 Course___GEOG 1520__Fall 2020-Spring 2021 (virtual classes – total of 22 students)

Outcome	Measurable Learning Outcome Students will demonstrate their mastery of the skill by:	Method of Measurement Direct and Indirect Measures*	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
Gen ED SS Outcome 1: “Interactions between individuals and society”. Students will describe how individuals and groups influence and are influenced by social contexts, institutions, physical environments and/or global process.	Two multiple choice exam questions over two exams (listed below table)	direct	75% students answering correctly	65.3%	Students are below target based on questions identified. However the overall averages for the exams these questions were drawn from were 73% (F20) and 81% (S21)	Consider whether identified questions are appropriate measure. Check on other assignments which address this LO.
Gen ED SS Outcome 2: “Application of concepts, theories, and methods”. Students will apply basic social science concepts, theories, and/or methods to a particular issue and identify	Three multiple choice exam questions over three exams (listed below table)	direct	75% students answering correctly	70.8%	Students are somewhat below target based on exam questions identified. As noted above, overall exam average was close to/above target.	Evidence of learning for this LO may be better assessed from other assignments/questions in the class. Consider ways to assess via better exam questions.

Outcome	Measurable Learning Outcome Students will demonstrate their mastery of the skill by:	Method of Measurement Direct and Indirect Measures*	Target Performance	Actual Performance	Interpretation of findings	Action Plan/Closing the Loop
factors that influence change.						
Gen ED SS Outcome 3: “Diverse Perspectives” Students will identify an argument about a social phenomenon and understand alternative explanations.	One multiple choice exam questions on first exam (listed below table)	direct	75% students answering correctly	79.8%	Students are above target based on measure.	NA

1520 Questions used (F2020, Sp2021):

LO 1:

- Ex1, Q43. Which of the following was an advantage that helped the United States develop a strong, industrialized national economy during the 20th century?
 - o A. A well-educated, growing population
 - o B. A culture that was traditional and discouraged novel thinking
 - o C. A large land base and abundant natural resources
 - o D. Both A and B

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- E. ** Both A and C
- Ex1, Q44 As documented by Dr. Robert Reich in the *Inequality for All* film, over the last few decades the middle class in America has _____, while inequality has _____ across the population.
A. grown / increased B. grown / decreased C. stayed the same D. ** shrunk / increased E. shrunk / decreased

LO2

- Ex1, Q22 Which of the following best summarizes Zelinsky's theory of first effective settlement?
 - A. That the first people to successfully arrive in an area gain an advantage over subsequent groups.
 - B. **That groups who are the first to successfully settle a place have the longest impacts on its cultural landscape.
 - C. That the first treaty to be agreed upon is not always the most effective.
 - D. That the first group to attempt to settle an area will be successful if they adapt to their new environment.
 - E. It refers to those settlements that lasted the longest.
- Ex2, Q27. Which has been the greatest shaper of U.S. urban morphology and growth over time?
 - A. **changing transportation (modes and infrastructure) B. government rules and regulations
 - C. an aging population D. diversity of immigration E. the lack of land use zoning
- Ex3, Q49. Inequality in the US is exemplified in which of the following?
 - A. Superzips versus "normal" zips B. Park Avenue Manhattan and Park Avenue in the Bronx
 - C. Poverty in the Mississippi Delta and the historic plantation mansions of the South D. **All of the above.

LO3

- Ex1, Q21. Which of the following is correct regarding Native American/First Nation settlements? (Multiple choice)
 - A. They lived only in small temporary settlements.
 - B. They lived only in permanent settlements, villages and cities.
 - C. ** Some groups lived in migratory groups and others in villages and cities.
 - D. Generally groups lived in large cities comparable in size to the largest European cities.
 - E. There was little diversity in the types or size of settlement.

General Education Social Science Core Course: [GEOG 1300, Places and People of the World](#) (see explanation and methodology outlined after the table).

Outcome	Measurable Learning Outcome Students will demonstrate their mastery of the skill by:	Method of Measurement Direct and Indirect Measures*	Threshold	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Gen ED SS Outcome 1: “Interactions between individuals and society” Students will describe how individuals and groups influence and are influenced by social contexts, institutions, physical environments and/or global process.	Students will strongly understand the connections between societal institutions, their natural environments, and their actions as individuals and members of larger groups.	Measured through responses to exam questions in Chi Tester.	Students need to score better than 70% on average on the sample questions over the three semesters surveyed.	71.8% of the students chose the correct multiple choice answer from a possible 5 responses. These data represents 4 sections over three semesters (84 of 117 students answered correctly).	Students successfully demonstrated understanding of the connection between humans and their environment objective.	No curricular or pedagogical changes needed at this time.
Gen ED SS Outcome 2: “Application of	Faculty will expose students	Measured through	Students need to score better	73.5% of the students chose	Students successfully	No curricular or pedagogical

concepts, theories, and methods". Students will apply basic social science concepts, theories, and/or methods to a particular issue and identify factors that influence change.	to the most common Social Science concepts and methods through case studies or examples.	responses to exam questions in Chi Tester.	than 70% on average on the sample questions over the three semesters surveyed.	the correct multiple choice answer from a possible 7 responses. These data represents 4 sections over three semesters (86 of 117 students answered correctly).	demonstrated understanding of the theory and methods objective.	changes needed at this time.
Gen ED SS Outcome 3: "Diverse Perspectives" Students will identify an argument about a social phenomenon and understand alternative explanations.	Students will experience "diverse perspectives" through immigration, politics, cultural variety, and change.	Measured through responses to exam questions in Chi Tester.	Students need to score better than 70% on average on the sample questions over the three semesters surveyed.	81.2% of the students chose the correct multiple choice answer from a possible 4 responses. These data represents 4 sections over three semesters (95 of 117 students answered correctly).	Students somewhat successfully demonstrated understanding of the diversity objective.	No curricular or pedagogical changes needed at this time.

General Education Physical Science Core Course: [GEOG 1000, Natural Environments of the Earth.](#) (see explanation and methodology outlined within the table).

Natural and Physical Science Gen. Ed. Learning Outcomes	Geography Learning Outcomes	Essential Topics	Sustainability Objectives	Assessment Topic	Percent of students that answered the question correctly fall 2021 out of 49 students.								
<p>1. Nature of Science</p> <p>Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific.</p>	<p>Understanding the Scientific Method: hypotheses, research, data collection, analysis, peer review, and publication</p>	<p>The Scientific Method and Science based Research</p>	<p>Knowledge of the peer-reviewed process in scientific communication as opposed to popular science communication that may lead to misinformation and mistrust of science</p>	<p>Analyze scientific information online, compose a critique of the post including biases present or not in the information</p>	<p>Question 1.Geographers use the scientific method to establish conclusions after data has been analyzed. A _____ process looks at the methods used, the reproducibility of the research and if the study follows scientific and mathematical laws. Correct answer: The peer review process</p> <table border="1" data-bbox="1514 993 1890 1281"> <thead> <tr> <th>Semester/Year</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Fall/2021</td> <td>82</td> </tr> <tr> <td>Spring/2021</td> <td>87</td> </tr> <tr> <td>Fall/2020</td> <td>91</td> </tr> </tbody> </table>	Semester/Year	Percent Correct	Fall/2021	82	Spring/2021	87	Fall/2020	91
Semester/Year	Percent Correct												
Fall/2021	82												
Spring/2021	87												
Fall/2020	91												

					<table border="1"> <tr> <td>Spring/2020</td> <td>Question not used</td> </tr> </table> <p>2021 82% of students answered by filling in the peer review process.</p> <p>Question 2. Maps use projections to convey a round earth on a flat map. All maps are distorted. For example, the mercator projection distorts the _____ of countries as the latitude increases from the Equator to the poles. 91% of students answered correctly by filling in size.</p>	Spring/2020	Question not used
Spring/2020	Question not used						
<p>2. Integration of Science All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be</p>	<p>Integration of the Earth's Spheres: Atmosphere, Lithosphere, Hydrosphere, and Biosphere</p>	<p>Concepts of Interconnection and Sustainability</p>	<p>Knowledge of the anthropogenic effects on the atmosphere, hydrosphere, lithosphere, and biosphere due to economic development.</p> <p>Understand changes to ocean circulation, atmospheric cells, jet streams, ecological</p>	<p>After watching films such as Chasing Ice and Chasing Coral, write an essay on how human activity has impacted natural systems.</p> <p>After watching weather reports of the polar vortex, discuss how global warming has</p>	<p>Question 1 Tiny solids or liquids suspended in the atmosphere— including dust and pollutants— are called ____ and can ____ temperatures by obscuring the sun's incoming solar radiation. 82% of students answered correctly by filling in aerosols and lowers.</p>		

cohesive and integrated.			systems, and the cryosphere, due to global warming.	affected the polar jet stream	<table border="1"> <thead> <tr> <th><u>Semester/Year</u></th> <th><u>Percent Correct</u></th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>100</td> </tr> <tr> <td>Spring 2021</td> <td>98</td> </tr> <tr> <td>Fall 2019</td> <td>94</td> </tr> </tbody> </table>	<u>Semester/Year</u>	<u>Percent Correct</u>	Fall 2021	100	Spring 2021	98	Fall 2019	94
					<u>Semester/Year</u>	<u>Percent Correct</u>							
					Fall 2021	100							
					Spring 2021	98							
					Fall 2019	94							
<p>Question 2 The Hadley atmospheric cells disperse the sun's heat from the tropics to the poles. The high pressure area as the air descends around 30 degrees N and S as the Hadley cells meet the Ferrel atmospheric cells create an area of ____ pressure associated with the world's ____.</p> <p>76% of students answered correctly by filling in <u>high</u> and <u>deserts</u>.</p>													
<table border="1"> <thead> <tr> <th><u>Semester/year</u></th> <th><u>Percent Correct</u></th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>78</td> </tr> <tr> <td>Spring 2020</td> <td>72</td> </tr> </tbody> </table>					<u>Semester/year</u>	<u>Percent Correct</u>	Fall 2021	78	Spring 2020	72			
<u>Semester/year</u>	<u>Percent Correct</u>												
Fall 2021	78												
Spring 2020	72												

					<table border="1"> <tr> <td>Fall 2019</td> <td>81</td> </tr> </table> <p><u>Question 3</u> Students are given a map with countries and air pressures then asked: In which general direction is the wind blowing over England due to the pressure gradient force in this image? Helpful hint: Look at where the high pressure is compared to the low pressure. Choose only one direction</p> <table border="1"> <thead> <tr> <th>Semester/year</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>78</td> </tr> <tr> <td>Spring 2020</td> <td>76</td> </tr> <tr> <td>Fall 2019</td> <td>72</td> </tr> </tbody> </table> <p><u>Question 4</u> A jet stream is narrow band of fast flowing air produced as result of _____ differences between air masses. (Temperature)</p>	Fall 2019	81	Semester/year	Percent Correct	Fall 2021	78	Spring 2020	76	Fall 2019	72
Fall 2019	81														
Semester/year	Percent Correct														
Fall 2021	78														
Spring 2020	76														
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Semester/year	Percent Correct												
Fall 2021	96												
Spring 2021	94												
Fall 2020	98												
<p>3. Science and Society The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment.</p>	<p>Environment and Society: Natural Resource Limits, Human Impacts, Change, and Sustainability.</p>	<p>The use of GIS and Remote Sensing</p>	<p>Processes including the link between human activity conducive to global warming and climate change specifically the anthropogenic greenhouse effect.</p>	<p>Question 1 Use climate mapper (a climate mapping tool with input of variables such as greenhouse gas emissions under various carbon pathways) to look at ways climate is projected to change by 2100</p> <p>Question2 Use remote sensing images to identify ENSO events</p>	<p>Question 1 Students that completed the activity were able to correctly identify changes in climate under various scenarios by 2100:</p> <table border="1"> <tr> <th>Semester/year</th> <th>percent correct</th> </tr> <tr> <td>Fall 2021</td> <td>100</td> </tr> <tr> <td>Spring 2021</td> <td>100</td> </tr> <tr> <td>Spring 2020</td> <td>100</td> </tr> </table> <p>Question 2 Milankovich cycles have changed the Earth's climate from glacial times to interglacial times. How is current climate change different than changes during</p>	Semester/year	percent correct	Fall 2021	100	Spring 2021	100	Spring 2020	100
Semester/year	percent correct												
Fall 2021	100												
Spring 2021	100												
Spring 2020	100												

					<p>this the various Milankovitch conditions? Discuss time periodicity, forcers, and feedback loops.</p> <table border="1"> <thead> <tr> <th>Semester/year</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>91</td> </tr> <tr> <td>Spring 2021</td> <td>94</td> </tr> <tr> <td>Fall 2019</td> <td>98</td> </tr> </tbody> </table>	Semester/year	Percent Correct	Fall 2021	91	Spring 2021	94	Fall 2019	98
Semester/year	Percent Correct												
Fall 2021	91												
Spring 2021	94												
Fall 2019	98												
<p>4. Problem Solving & Data Analysis</p> <p>Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner.</p>	<p>Geographic Approaches and Spatial Perspectives: Tools and Techniques.</p>	<p>Maps, GIS, Remote Sensing, and Spatial Analysis</p>	<p>Map projections and their biases</p> <p>Analysis of environmental data from MODIS and other satellites to decipher the impact of economic development and climate change</p>	<p>Question 1 Analyze data from NASA's Earth Observatory website to learn about the satellites used, their sensors, and the Earth's features measured, then discuss how scientists monitor the health of the planet.</p> <p>Question 2 How have humans changed the Earth's features measured</p>	<p>Question 1 Go to earthobservatory.nasa.gov</p> <p>Look at the Landsat 8 images of Kjer glacier, then and now. Read about Kjer glacier on this page. How much has Kjer's ice flow increased since the collapse of its floating ice sheet? (4 fold increase 1,200 m/yr to ~4,200 m/yr)</p> <table border="1"> <thead> <tr> <th>Semester/Year</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>100</td> </tr> <tr> <td>Not published</td> <td></td> </tr> </tbody> </table>	Semester/Year	Percent	Fall 2021	100	Not published			
Semester/Year	Percent												
Fall 2021	100												
Not published													

				through remote sensing?	<p>Question 2</p> <p>Look at the chart in lesson B3 Ozone Depletion. From 1979 to 1987, the Ozone Hole increased from ____ to _____</p> <p>92% of students answered correctly.</p> <p>0.0 - 16.5 million Km2</p>								
<p>5. Organization of systems</p> <p>The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws.</p>	<p>Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>The Hydrologic and Carbon Cycles</p>	<p>Knowledge of the Earth's energy budget and how industrialization has caused a surplus of energy in the system</p> <p>Impact of industrialization and urbanization on water quality and water availability. Topics include water management and ethical discussions on water rights.</p>	<p>Question 1</p> <p>Learn the atmospheric cells and ocean currents that govern climate at various latitudes. Research how humans have modified the ecosystem to survive under climatic conditions (dams, fog nets, terracing, irrigation, digging, desalination, slash and burn etc.)</p>	<p>Question 1</p> <p>As temperatures increase, evaporation rates will _____(increase)</p> <table border="1"> <thead> <tr> <th>Semester/year</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>92</td> </tr> <tr> <td>Spring 2020</td> <td>88</td> </tr> <tr> <td>Fall 2019</td> <td>97</td> </tr> </tbody> </table> <p>Question 2</p> <p>Fog nets have been used in areas of the Atacama desert based on the principle that air will cool and _____ on a material.</p>	Semester/year	Percent	Fall 2021	92	Spring 2020	88	Fall 2019	97
Semester/year	Percent												
Fall 2021	92												
Spring 2020	88												
Fall 2019	97												

					<p>98% of students answered correctly by filling in <u>condense</u>. Fall 2021</p> <p>Question 3 More ice would lead to a ____ in Earth's energy budget 96% of students answered correctly by filling in <u>deficit</u></p> <table border="1"> <thead> <tr> <th><u>Semester/Year</u></th> <th><u>Percent</u></th> </tr> </thead> <tbody> <tr> <td>Fall 2020</td> <td>73</td> </tr> <tr> <td>Spring 2019</td> <td>81</td> </tr> <tr> <td>Fall 2018</td> <td>84</td> </tr> </tbody> </table>	<u>Semester/Year</u>	<u>Percent</u>	Fall 2020	73	Spring 2019	81	Fall 2018	84
<u>Semester/Year</u>	<u>Percent</u>												
Fall 2020	73												
Spring 2019	81												
Fall 2018	84												
<p>6. Matter</p> <p>Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales.</p>	<p>Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>Rocks and Minerals, including the Rock Cycle</p>	<p>Knowledge of the Earth's fossil fuel and mineral industry and impact on the environment of the process of extracting, refining, and exporting resources.</p>	<p>Learn how to identify minerals and rocks, choose at least 5 of each and discuss how they are used for economic purposes. Discuss the environmental impacts of their extraction and use.</p>	<p>Question 1 Sedimentary rocks are formed when minerals are cemented together in</p> <p>Students answered correctly by selecting a <u>water environment</u></p> <table border="1"> <thead> <tr> <th><u>Semester/yr</u></th> <th><u>Percent</u></th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>85</td> </tr> <tr> <td>Spring 2021</td> <td>82</td> </tr> </tbody> </table>	<u>Semester/yr</u>	<u>Percent</u>	Fall 2021	85	Spring 2021	82		
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Spring 2019	76												
Fall 2018	71												
<p>7. Energy</p> <p>Interactions within the universe can be described in terms of energy exchange and conservation.</p>	<p>Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>Weather, Climate, and Biogeography</p>	<p>Human relationship in the biosphere as humans develop economic areas encroaching on animal habitat, and or inflicting changes in the climate, water quality, or air quality that prevent sustainability of a population. Students will also explore methods by various cultures to manage wildlife populations in a sustainable manner.</p>	<p>Question 1 Compose a food web paying special attention to where humans fit in. Discuss how trophic levels change as predators are removed or added to the web.</p> <p>Read articles on the reintroduction of wolves to yellowstone, how did the re-introduction impact the ecosystem and what arguments did people have for or against their introduction, what was the outcome?</p>	<p>Percent of students that succeeded in making correct connections among species.</p> <p>_____ are essential to the exchange of energy among animals and producers in an ecosystem. This group is most important in preventing a trophic cascade by keeping herbivores and omnivore numbers in balance. students answered correctly by filling in <u>predators</u>.</p> <table border="1"> <thead> <tr> <th>Semester/year</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>Spring 2021</td> <td>71</td> </tr> <tr> <td>Fall 2020</td> <td>74</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Semester/year	Percent	Spring 2021	71	Fall 2020	74		
Semester/year	Percent												
Spring 2021	71												
Fall 2020	74												
<p>8. Forces</p>	<p>Earth's Natural Systems: The</p>		<p>Knowledge of hazards such as earthquakes, landslides, and</p>	<p>After watching Utah's DNR</p>	<p>Pick all of the supporting evidence that Wegener did</p>								

<p>Equilibrium and change are determined by forces acting at all organizational levels.</p>	<p>Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>Plate Tectonics and Geomorphology</p>	<p>avalanches, and their economic toll on societies who develop near naturally active areas</p>	<p>video, "Wasatch Fault Fly" discuss the risks and benefits of building near the Wasatch fault and on areas of liquifaction.</p>	<p>have for his Theory of Plate Tectonics</p> <p>Question 1 Fit of continents, (Correct answer) Fossil correlation, (Correct answer) Rock distribution, (Correct answer) Paleoclimate Data, (Correct answer)</p> <table border="1" data-bbox="1514 651 1892 906"> <thead> <tr> <th>Semester/yr</th> <th>percent correct</th> </tr> </thead> <tbody> <tr> <td>Falll 2021</td> <td>100</td> </tr> <tr> <td>Spring 2021</td> <td>77</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p>Question 2 The Wasatch Fault is a _____ caused by the _____ of the Great Basin (Normal, Extension)</p> <table border="1" data-bbox="1514 1146 1892 1338"> <thead> <tr> <th>Semester yr</th> <th>percent</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>79</td> </tr> <tr> <td>Spring 2021</td> <td>71</td> </tr> </tbody> </table>	Semester/yr	percent correct	Falll 2021	100	Spring 2021	77			Semester yr	percent	Fall 2021	79	Spring 2021	71
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General Education Physical Science Core Course: GEOG 1500. Global Warming. (see explanation and methodology outlined within the table).

Natural and Physical Science Gen. Ed. Learning Outcomes	Geography Learning Outcomes	Essential Topics	Standard Questions (or very similar type of question targeting the Geography Learning Outcomes)												
<p>1. Nature of Science</p> <p>Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific.</p>	<p>Understanding the Scientific Method: hypotheses, research, data collection, analysis, peer review, and publication, scientific consensus.</p>	<p>The Scientific Method and Science based Research The scientific consensus on climate change.</p>	<p>1.A peer reviewed study is one that is reviewed by a panel of experts and is ____ with the method and data given. (reproducible)</p> <table border="1" data-bbox="1283 712 1713 842"> <thead> <tr> <th>Semester/year</th> <th>percent correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>89%</td> </tr> </tbody> </table> <p>2. In a survey of 3,146 Earth Scientists with expertise in climate science (writing most of their peer reviewed research papers on climate change) more than ____ agreed that "human activity is a significant contributing factor in changing mean global temperatures. (97%)</p> <table border="1" data-bbox="1283 1117 1892 1370"> <thead> <tr> <th>Semester/year</th> <th>percent correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>93</td> </tr> <tr> <td>Spring 2021</td> <td>88</td> </tr> <tr> <td>Fall 2019</td> <td>90</td> </tr> </tbody> </table>	Semester/year	percent correct	Fall 2021	89%	Semester/year	percent correct	Fall 2021	93	Spring 2021	88	Fall 2019	90
Semester/year	percent correct														
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Fall 2019	90														

<p>2. Integration of Science All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated.</p>	<p>Integration of the Earth's Spheres: Atmosphere, Lithosphere, Hydrosphere, and Biosphere</p>	<p>Concepts of Interconnection and Sustainability</p>	<p>1. The IPCC reports confirm that many changes in the climate system become larger in direct relation to increasing global warming. Which of the following is intensified by human induced warming of the climate? Select all correct answers (frequency and intensity of heat extremes, marine heatwaves, heavy precipitation, agriculture and ecological drought, the proportion of intense tropical cyclones, reduction of ice in the cryosphere)</p> <table border="1" data-bbox="1283 651 1892 971"> <thead> <tr> <th>Semester/yr</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>98</td> </tr> <tr> <td>Spring 2021</td> <td>96</td> </tr> <tr> <td>Spring 2020</td> <td>99</td> </tr> <tr> <td>Fall 2019</td> <td>90</td> </tr> </tbody> </table> <p>2. Volcanic activity is related to a ____ in temperatures due to the emission of aerosols which ____ the amount of incoming solar radiation. (decrease, limit)</p> <table border="1" data-bbox="1283 1179 1892 1365"> <thead> <tr> <th>Semester/yr</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Spring 2021</td> <td>87</td> </tr> <tr> <td>Fall 2020</td> <td>78</td> </tr> </tbody> </table>	Semester/yr	Percent Correct	Fall 2021	98	Spring 2021	96	Spring 2020	99	Fall 2019	90	Semester/yr	Percent Correct	Spring 2021	87	Fall 2020	78
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<p>3. Science and Society</p> <p>The study of science provides explanations that have significant impact on society, including technological advancements, improvement</p>	<p>Environment and Society: Natural Resource Limits, Human Impacts, Change, and Sustainability.</p>	<p>Human-Induced Climate Change Scientific findings as threats to status quo, and the response of threatened elements</p>	<p>1. A person who only surrounds themselves with people very much like them who share the same opinions or who only get information from a few limited sources is likely subject to _____. (Confirmation bias)</p>																		

<p>of human life, and better understanding of human and other influences on the earth's environment.</p>		<p>within society (e.g. misinformation); Challenges in communicating the science of climate change.</p>	<table border="1"> <thead> <tr> <th>Semester</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>100</td> </tr> <tr> <td>Spring 2021</td> <td>100</td> </tr> </tbody> </table> <p>2. Developing nations were pledged 100 Billion in aid from developed nations in the Paris Agreement that produce most of the excess GHG's. Which regions are at high risk for sea level rise (South east asia, Pacific Islands)</p> <table border="1"> <thead> <tr> <th>Semester</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Spring 2021</td> <td>100</td> </tr> <tr> <td>Fall 2020</td> <td>100</td> </tr> <tr> <td>Spring 2020</td> <td>97</td> </tr> </tbody> </table>	Semester	Percent Correct	Fall 2021	100	Spring 2021	100	Semester	Percent Correct	Spring 2021	100	Fall 2020	100	Spring 2020	97
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<p>4. Problem Solving & Data Analysis</p> <p>Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner.</p>	<p>Geographic Approaches and Spatial Perspectives: Tools and Techniques.</p>	<p>Maps, GIS, Remote Sensing, and Spatial Analysis</p>	<p>1.Using the Yale Climate Opinion Map making tool students were able to construct a map and analyze regional patterns concerning populations and their attitudes towards climate, energy, and politics.</p> <table border="1"> <thead> <tr> <th>Semester/yr</th> <th>Average grade</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>87%</td> </tr> <tr> <td>Spring 2021</td> <td>92%</td> </tr> <tr> <td>Fall 2020</td> <td>91%</td> </tr> </tbody> </table>	Semester/yr	Average grade	Fall 2021	87%	Spring 2021	92%	Fall 2020	91%						
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			<p>2. Using Climate Toolbox by UC Merced students are able to create maps showing climate modeling for precipitation and temperature under various RCP scenarios and analyze regional impacts.</p> <table border="1" data-bbox="1283 412 1896 667"> <thead> <tr> <th>Semester/Year</th> <th>Average grade</th> </tr> </thead> <tbody> <tr> <td>Fall 2021</td> <td>85</td> </tr> <tr> <td>Spring 2021</td> <td>88</td> </tr> <tr> <td>Fall 2020</td> <td>92</td> </tr> </tbody> </table>	Semester/Year	Average grade	Fall 2021	85	Spring 2021	88	Fall 2020	92
Semester/Year	Average grade										
Fall 2021	85										
Spring 2021	88										
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<p>5. Organization of systems</p> <p>The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws.</p>	<p>Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>The Hydrologic and Carbon Cycles; the climate system.</p>	<p>Although tropical forests in the Amazon have been CO2 sinks over the past 50 years, increasing land use change, drought, fires, and tree deaths in recent years may have tipped the balance, making this region a periodic net carbon _____(source) [Yang et al., 2018].</p> <table border="1" data-bbox="1283 911 1896 1101"> <thead> <tr> <th>Semester/Year</th> <th>Percent Correct</th> </tr> </thead> <tbody> <tr> <td>Fall 2020</td> <td>74</td> </tr> <tr> <td>Spring 2020</td> <td>87</td> </tr> </tbody> </table> <p>Evidence of climate change can be inferred from the oxygen isotope data in ice cores. Oxygen 16 is _____ than Oxygen18 and is more easily evaporated. A higher ratio of O16 in an ice core would indicate a _____ climate. (colder)</p>	Semester/Year	Percent Correct	Fall 2020	74	Spring 2020	87		
Semester/Year	Percent Correct										
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Fall 2021	82										
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<p>6. Matter</p> <p>Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales.</p>	<p>Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>Conservation of mass; Stocks and flows; Molecular structures of greenhouse gases and fossil fuels.</p>	<p>ESSAY: Fossil fuels are natural non-renewable resources formed by a natural process of the decomposition of plants and other organisms, buried beneath layers of sediment and rock, and have taken millions of years to become carbon-rich deposits (Nunez, 2019). Major examples of fossil fuels are coal, crude oil, and natural gas, How does the consumption of fossil fuels add to global warming?</p> <table border="1"> <thead> <tr> <th>Semester/yr</th> <th>Average grade</th> </tr> </thead> <tbody> <tr> <td>Spring 2021</td> <td>88</td> </tr> <tr> <td>Fall 2020</td> <td>86</td> </tr> <tr> <td>Spring 2020</td> <td>85</td> </tr> </tbody> </table>	Semester/yr	Average grade	Spring 2021	88	Fall 2020	86	Spring 2020	85
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<p>7. Energy</p> <p>Interactions within the universe can be described in terms of energy exchange and conservation.</p>	<p>Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.</p>	<p>The greenhouse effect; Earth-atmosphere energy balance</p>	<p>ESSAY: Compare and contrast the Greenhouse Effect to the Human Induced Greenhouse Effect</p> <table border="1"> <thead> <tr> <th>Semester/yr</th> <th>Average Grade</th> </tr> </thead> <tbody> </tbody> </table>	Semester/yr	Average Grade						
Semester/yr	Average Grade										

			Spring 2021	
			Fall 2020	
			Fall 2019	
8. Forces Equilibrium and change are determined by forces acting at all organizational levels.	Earth's Natural Systems: The Flow of Matter and Energy, and the Forces that Guide them through the Earth's Complex Systems.	Plate Tectonics Forcings on the climate system.	ESSAY: Explain to someone how recent climate change is different from climate change as seen from paleoenvironmental reconstructions. Be sure to mention the external forcings of climate.	
			Semester/yr	Average Grade
			Spring 2021	94
			Spring 2020	
			Fall 2020	

Course Number:	GEOG 1000	Course Title:	Natural Environments of the Earth		
Semester:	Fall	Year:	2019		
Evidence of Learning: Honors Program/Physical Science General Education Courses					
Measurable Learning Outcomes	Method of Measurement	Threshold for Evidence of Student Learning	Findings Linked to Learning Outcomes	Interpretation of Findings	Action Plan/Use of Results
Students will...	What did you have the students do?	Example: Everyone will obtain a C	What % achieved threshold	What do the results mean?	Call to Action, Plan

Learning Outcome 1:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	None. This learning outcome seems to have been addressed effectively in this class.
PS: Nature of science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific	A total of 10 multiple choice exam questions, 7 on the first exam, 3 on the final.	70% of the students will answer the questions correctly.	Across the 10 questions, an 89% correct answer rate was achieved.	Students exceeded the threshold.	
Learning Outcome 1:	Measure 2:	Measure 2:	Measure 2:	Measure 2:	

<p>PS: Nature of science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific</p>	<p>A homework assignment examining a debate over the world's oldest microfossil. Students read a New York Times article about this issue, and answer several questions. The homework examines the difference between peer reviewed publications and press releases, and the iterative nature of science, i.e. scientific claims are continuously tested and refined, even after appearing in a peer reviewed journal.</p>	<p>70% of students will score 70% or more.</p>	<p>78% of students scored 70% or better.</p>	<p>Students exceeded the threshold.</p>	
<p>Learning Outcome 2:</p>	<p>Measure 1:</p>	<p>Measure 1:</p>	<p>Measure 1:</p>	<p>Measure 1:</p>	<p>None. This learning outcome seems to</p>

PS: Integration of science. All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated	A total of 12 multiple choice exam questions, 1 on the second, 11 on the final.	70% of the students will answer the questions correctly.	Across the 10 questions, a 76% correct answer rate was achieved.	Students exceeded the threshold.	have been addressed effectively in this class.
Learning Outcome 3:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	None. This learning outcome seems to
PS: Science and society. The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment	A total of 10 multiple choice exam questions, all on the final.	70% of the students will answer the questions correctly.	Across the 10 questions, a 73% correct answer rate was achieved.	Students exceeded the threshold.	have been addressed effectively in this class.
Learning Outcome 4:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	None. This learning outcome seems to

PS: Problem solving and data analysis. Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner	A total of 10 multiple choice exam questions, all on the final.	70% of the students will answer the questions correctly.	Across the 10 questions, a 70% correct answer rate was achieved.	Students met the threshold.	have been addressed effectively in this class.
Learning Outcome 4:	Measure 2:	Measure 2:	Measure 2:	Measure 2:	
PS: Problem solving and data analysis. Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner	A homework assignment, in which students analyze river discharge data.	70% of students will score 70% or more.	88% of students scored 70% or better.	Students exceeded the threshold.	
Learning Outcome 5:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	
PS: Organization of systems: The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws	A total of 4 multiple choice exam questions, 2 on the first exam, 2 on the final.	70% of the students will answer the questions correctly.	Across the 4 questions, an 82% correct answer rate was achieved.	Students exceeded the threshold.	None. This learning outcome seems to have been addressed effectively in this class.

Learning Outcome 6:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	
PS: Matter: Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales	A total of 18 multiple choice exam questions, 8 on the first exam, 10 on the final.	70% of the students will answer the questions correctly.	Across the 10 questions, a 75% correct answer rate was achieved.	Students exceeded the threshold.	None. This learning outcome seems to have been addressed effectively in this class.
Learning Outcome 7:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	
PS: Energy: Interactions within the universe can be described in terms of energy exchange and conservation	A total of 37 multiple choice exam questions, 3 on the first exam, 1 on the second exam, 33 on the final.	70% of the students will answer the questions correctly.	Across the 37 questions, a 74% correct answer rate was achieved.	Students exceeded the threshold.	None. This learning outcome seems to have been addressed effectively in this class.
Learning Outcome 8:	Measure 1:	Measure 1:	Measure 1:	Measure 1:	
PS: Forces: Equilibrium and change are determined by forces acting at all organizational levels	A total of 11 multiple choice exam questions, 5 on the first exam, 6 on the final.	70% of the students will answer the questions correctly.	Across the 37 questions, a 72% correct answer rate was achieved.	Students exceeded the threshold.	

Appendix H: Sample Signature Assignments

Big Questions and Signature Assignments

Dr. Dan Bedford

GEOG 1000 End-of-semester Signature Assignment

All General Education classes at Weber State University are required to include a signature assignment. For this class, this homework will serve as our signature assignment. Please be aware of the [policy on late assignments](#) as you work towards completing this homework. **Please be aware that this assignment has a specific required structure, which you will find a little further down on this page. Your response needs to follow this structure in order to earn a good score.**

Objective: The purpose of this assignment is to give you an opportunity to reflect on multiple aspects of the class, and pull them together to consider the class's Big Question: **What will it take to bring your own community into the 'safe space' of planetary boundaries?**

What does this mean? The planetary boundaries concept is simpler than it looks. It suggests that there are 9 specific aspects of the Earth system that have been identified as being essential to the maintenance of life on Earth. These aspects are listed below, and shown in the accompanying diagram. We have addressed, or will address, most, if not all of these over the course of the semester.

- **Novel entities:** Pollution from materials that are "novel" in a geologic sense, meaning they didn't exist in nature before humans came along. Plastics are one obvious example (think of the Great Pacific Garbage Patch); radioactive waste is another; genetically-modified organisms are another.
- **Stratospheric ozone depletion:** The ozone layer in the stratosphere is essential to life, as it shields all of us from harmful ultraviolet radiation from the Sun. A family of chemicals called chlorofluorocarbons (CFCs), with a wide range of industrial applications (air conditioning, refrigeration, electronics manufacture, styrofoam manufacture, etc. etc.), were made by the chemicals industry starting in 1928. Their release into the atmosphere was later found to be destroying stratospheric ozone, potentially endangering all life on Earth. Manufacture of CFCs was rapidly phased out by a series of international agreements, most famously the Montreal Protocol of 1989. Nobody makes CFCs today.
- **Atmospheric aerosol loading:** Small solid particles in the air, from industry, home heating, and vehicle tailpipes. Basically the smog we get during inversions in winter.

- **Ocean acidification:** As the amount of carbon dioxide in the atmosphere increases, some of it dissolves in ocean water. When that happens, the ocean gets less alkaline and more acidic. This can have serious impacts on ocean life, especially ocean life that builds shells or other structures out of calcium carbonate (coral reefs, most shellfish).
- **Biogeochemical flows:** Human manipulation of chemicals for fertilizer-- notably nitrogen (N) and phosphorus (P)-- is having impacts on the biosphere, e.g. the ocean dead zones covered earlier in the semester.
- **Freshwater use:** Humans divert a lot of the Earth's freshwater for direct consumption, and for irrigating agriculture. This can have serious downstream consequences (look no further than our own Great Salt Lake).
- **Land-system change:** Humans are changing natural landscapes, mainly to make way for agriculture. Tropical deforestation is one clear example.
- **Biosphere integrity:** In other words, mass extinction of species. Large numbers of species appear to be going extinct due to human action, either indirectly through alteration of their habitats (such as deforestation, replacing forest with agriculture, as noted under Land-system change, above; or by introduction of novel entities such as plastic pollution or complex pesticides; or ...etc.), or directly through hunting (this is not to say all hunting leads to extinction-- in some instances hunting can be an important element of management-- but there are plenty of instances, in Africa, for example, of animals being pushed to the brink of extinction by hunting). This is threatening the integrity of the biosphere.
- **Climate change:** As humans pour huge amounts of carbon dioxide into the atmosphere, we are warming up the planet. This warming is causing climates all around the world to change. Some places are becoming wetter, others are becoming drier, and more extreme weather events are becoming more common.

The diagram below shows the current thinking on where humanity as a whole is within an estimated *safe operating space*, and where we are stressing the Earth system. The safe operating space is shown by the dashed circular line and green area in the middle. Where we are overshooting the estimated planetary boundaries, the wedges are shown in yellow, and orange to purple if we're really pushing things. Don't worry too much about the technical details of the diagram (they are pretty complicated, but if you're curious you can read the latest planetary boundaries paper [here](#)). The main point is that, according to estimates by a large number of scientists, published in top-level peer-reviewed scientific journals, we are overstressing the Earth system in six areas: biogeochemical flows (nitrogen and phosphorus), freshwater change, land system change, biosphere integrity, climate change, and novel entities (i.e. chemical pollution).

Assignment: Please write a 2-3 page essay (typed, double spaced, not counting any graphics you decide to use), in which you consider the Big Question for the class, as shown above: **What will it take to bring your own community into the 'safe space' of planetary boundaries?**

- **What does "community" mean, in this assignment?** You may think of "community" in several different ways: your household, your extended family, your community of friends, Weber State University, or the city where you live (Ogden, Layton, Farmington, wherever). While "community" can be fluid, and your sense of community can change, and can operate at multiple different levels, in this assignment you are required to pick one specific, tangible form of community, one where you can say you personally know more than one real, live, actual person. Pick one level of community, and focus your thinking and your writing on that.
- **What does "what will it take" mean, in this assignment?** Think about the six areas where we are going beyond the safe space, and consider what your community could do to walk things back, even if it's only by a little bit. For example, "novel entities" includes plastic pollution. What could your community do to reduce consumption of plastic (therefore reducing the amount that has to be thrown away, possibly to end up in the Great Pacific Garbage Patch)? As another example, climate change is caused by humans burning fossil fuels. What could your community do to scale back your dependence on fossil fuels? For ideas, see the Resources section at the end of this assignment.
- **Please think about specific actions you might take as an individual, as well as actions the community as a whole could take.**

Please do not use subheadings in your essay, and please write in the first person (I, me, mine). Don't put responsibility onto others by using passive language. Don't say "we must", or "you could"; say "I must", or "I will". **Your essay must take the following structure, and you must address all 6 of the elements listed below.**

1. Introductory paragraph. Give a general answer to the question, What will it take to bring your own community into the 'safe space' of planetary boundaries. Will it take drastic action? A few small, but easily achieved steps? Can action at the level of your community make a meaningful difference?
2. What are you considering as your community? How many people does it consist of? Why is this particular community important to you? Why did you choose this particular community as your level of analysis? **Please be specific here.** For example, don't just say "a neighborhood", make it your neighborhood.
3. What specific actions could you and/or your community take? Which specific planetary boundaries would those actions affect? Please avoid generalizations here. If you're concerned about climate change, don't just say "My community will cut emissions." You need to say what specific actions you will take in order to bring this about. Will you drive less/take public transit more/carpool more? If you're concerned about plastic pollution, say specifically what you

will do to cut down on the amount of plastic you throw away. Will you recycle more? Buy less stuff with plastic packaging? Say no to plastic straws in restaurants? Not use the disposable plastic knives and forks provided with takeout food (or tell the restaurant not to include them at all)? Again, the Resources section at the end of this assignment has some ideas to help here, but the key is ***you must be specific about the actions you will take***. What will you, personally, do-- yes, you-- to implement the actions you've described?

4. How difficult would these steps be to undertake? How difficult would it be to make them permanent?
5. Reflect on your responsibility to undertake the actions you've suggested. You can consider "responsibility" quite broadly. Responsibility to whom? Yourself? Friends and family? People on the other side of the world? People who haven't been born yet? To animals or even plants?
6. Concluding paragraph: Sum up what you've suggested as actions, which planetary boundaries they apply to, and whether you might actually undertake them or not.

Audience: Please write for the notorious "intelligent lay person", i.e. me. This is the style of a well written, well argued op-ed piece in the high-end press, such as the [New York Times](#) or the [Economist](#). It's OK to use contractions (aren't, won't, can't, it's), but avoid slang-- and make sure your essay is grammatically accurate, typo free, and uses correct spelling. You must [avoid plagiarism](#), and give some indication of where information or ideas come from if they're not yours. The WSU [Writing Center](#) can help run another set of eyes over your work before you submit it.

Please upload your essay as a PDF file.

Resources:

- [12 Ways to Live More Sustainably](#), from the Center for Biological Diversity.
- Some possible actions individuals can take to address climate change can be found at [Count Us In](#).
- What is the [Anthropocene](#)?

Dr. Jeremy Bryson

GEOG 1520 Big Question: "How does regional diversity matter for me?"

Signature Assignment: Regional Diversity Reflection:

The Big Question for this course has been "**How does regional diversity matter for me?**" I've spent quite a bit of time lecturing about regional differences in the United States and Canada and you've spent some time reading and thinking and

writing about regional differences. Now is the time for you to answer the question for yourself: How do regional differences matter to you? I'd like you to consider an answer to this question on at least 3 different scales:

- **How does regional diversity impact your career or life plans?** Think about where you will work or live and how your work or live will be impacted by regional differences.
- **How does regional diversity impact your personal and family relationships?** Think about the friends and relatives you have and how where they live impacts those relationships.
- **How does regional diversity impact my life as a resident of the US or Canada?** Think about your knowledge and experience with diversity impacts your decisions about the jobs vs environment debate, the way that you interact with people that do not live the same way that you do, or how you vote in local, state, and national elections.

Spend some time thoughtfully responding to each of these questions. Your final essay should be 1 full page long. The page should be single spaced, size 12 Times New Roman font. Do NOT include any headings or titles on your page. A half page or three quarter pages is not a full page, so you should develop your ideas until you have a full page. I want a full page of your reflections on regional diversity.

Big Question: “How does globalization shape my world?”

Signature Assignment: Map My Clothes

For this discussion, you are going to create a map of your clothes, post your map, and participate in an online discussion about your findings. To complete this discussion, please complete the following steps:

1. **Read [Planet Money Makes a T-Shirt](#).** In this interactive document, the Planet Money team at National Public Radio explore the geography of a simple t-shirt. There are a lot of figures, history, and statistics--but don't get bogged down in those details. Be sure to watch the videos embedded at the beginning of each of the five pages. Watch/Read and think about how the world is interconnected through clothes.
2. **Make a world map that shows the global footprint of your clothing.** Follow the steps outlined below.
 - Search through your closet/dresser, check the labels, and tally up how many of your clothes come from which countries. Be sure that you find the countries for at least **40 items of clothing** (you can look at friends' or relatives' clothing if you need to--*with their permission, of course!*).

- Make a map of your results from part A. Use the **world map** at mapchart.net to make your map. Your map should **use at least 3 different shades of the same color to represent different intensities** (for example, light purple could represent countries with 1-2 items while another darker shade of purple might represent countries with 3-4 items and then the darkest shade of purple might be for countries with 5-8 items, *as seen in the example below*). **Label the shades on your map legend** as explained in the [instruction video](#).
- **Convert your map to an image**, as explained in the explanatory video. (If you have any questions, you should first consult the [instruction video](#))

3. Post your map *and* a short response to your map onto the Canvas discussion board.

- To post your map, you will need to upload the image to Canvas (Account, Files, Upload) and then post it using the Embed Image button in the discussion reply feature. (If you have any questions, you should first consult the [instruction video](#).)
- Your response should be at least 200 words and should address the following prompt: **Where do most of clothes come from? Which country? Which region of the world? Why do you think your clothes come from these places? IMPORTANT:** Be sure to use some of the ideas or evidence from the *Planet Money Makes a T-Shirt* article to support your response (*that's why we all read it!*).

4. Once you've posted your map and response, then you should look through your classmates' posts and comment on one of them. Your comment should be at least 50 words. In your comment, you could notice similarities or differences between other maps. You could notice patterns that they hadn't noticed. You could agree or disagree with their analysis of their own map. Whatever you do, just give them some useful commentary about their map and response.

If you are finished with this discussion, you should check and make sure that you have completed all of the steps. Have you: 1) Posted your map; 2) Posted your 200 word response; 3) Posted a comment about a classmate's project? If so, then you're done!

Dr. Bryan Dorsey

GEOG 1000 Planet Earth Signature Assignment

Self-guided field trip: Since much of the lecture material from class has application, i.e., can be seen or experienced in our surrounding environment, you are asked to write a brief and concise paper (2 page minimum, 3 page maximum; **must be typed**) describing observations of the local physical geography. Begin by choosing one of the trails from the Ogden Trails

Network **or** another natural area for your outing. (Please note that there are places to enjoy that are wheelchair accessible.) During your hike take photos (include in your written report making reference to your photos), and take as many notes as possible on the following:

- 1.) Weather conditions (note temperature, precipitation, cloud type, etc.)
- 2.) Climate, climate change, vegetation and soils (describe plant & tree types, observations of soils, rock formations, etc.) Are there visible signs of climate change?
- 3.) Topography/landforms (describe landscape features, e.g., Wasatch fault, both along the trail and views from the trail)
- 4.) Other relevant observations (wildlife, human impacts on the environment, etc.)

Look for useful information from trail signs, guidebooks and other sources. Write down as many questions as possible that came up from looking closely at the physical geography during your outing. The WSU Discovery Trail is a great option for a short 1 1/2 to 2 mile loop hike. Park at the trailhead on Skyline drive just east of the WSU football stadium, follow the trail up to the Bonneville Shoreline Trail, head north into Strong's Canyon, follow the trail downhill along the creek, then loop back south to the trail head. For extra credit, answer questions and summarize info. noted in the 6 or 8 Discovery Loop signs all along the trail.

Toward the end of the semester, write your paper, trying to answer questions using class notes and the text. Use the 4 topics listed above as **section headings** in your paper. You may wish to do some research to supplement your paper in an effort to answer all your questions (note that some questions may not have concise answers). Feel free to include a few concluding comments about the self guided field trip, e.g., what did you enjoy most about the experience?

IMPORTANT! Please highlight, italicize or underline all vocabulary words from lecture notes and the text that you use in your paper.

Finally, be certain to **proof read** your paper to avoid any spelling or grammatical errors. As with any paper submitted at the university level, you will lose credit for a poorly written paper.

Dr. Maria Groves
Maria Groves Big Questions

GEOG 1500 (Climate Change, Science Society, and Solutions) - *What are the effects of global warming, and what solutions are society implementing or considering?*

GEOG 1000 (Planet Earth, Air, Water, Land, and Life - *What are the features of planet Earth's atmosphere, hydrosphere, biosphere, and lithosphere and how are they part of an entire system?*)

GEO 1130 (Introduction to Meteorology) - *How do the features of planet Earth interact to form weather events?*

Dr. Alice Mulder

Big Question Signature Assignment for Geography 1300

Please turn in your essay by Monday April 20 and upload it into Canvas.

We are living through the Coronavirus and you have researched and written on it.

Now it is time to think about something else!

Here's our "Big Question" -- What makes a country/city a "happy place?"

Purpose -- With the backdrop of your learning about a variety of regions, places, and peoples in this class, including their physical, cultural, social, political and economic characteristics, this assignment is to identify key elements in making "the happiest places" in varied geographic and societal/cultural contexts as well as to consider these ideas in the context of your home place.

Consider this an exploration of and reflection on the kinds of factors in shaping a place that may or may not be important when thinking of human/societal happiness.

Tasks --

A) First read the questions (below) you are asked to address in your essay,

B) Carefully read and take notes on "[The World's Happiest Places](#)" [Links to an external site.](#) published in the *National Geographic Magazine* in 2017 (you may need to register with Nat. Geo - but it is free - please let me know if you have trouble accessing the article). NOTE - it looks like Nat Geo is now charging to register (bummer). I am going to see if I can get a color scanned copy of the article with the photos -- but here is a pdf of the text of the article: [THE WORLDS HAPPIEST PLACES Wha.pdf](#)

Actions

AND then

C) Imagine you are writing a paper for presentation to students and faculty at Weber State to share your analysis and thinking on this topic. Write a double-spaced, typed essay (2-4 pages) with the following three sections labeled, addressing the questions posed in each section.

Version Date: April 2023

Section 1 - Identifying what makes "happy places" (from the article)

1. Based on the reading, what are the factors that seem to contribute to making a "happy place"?
2. Are there characteristics (such as physical setting, climate, population/settlement/diversity, economic, development, political characteristics, way of life) held in common across these places?

Section 2 - Thinking of my local place

1. Think about Utah/your home place. Would you consider it a happy place? Why or why not?
2. Do you think it shares any of the factors identified in the article? If so, which ones?

Section 3 - Synthesis and Conclusion

Drawing on this reading, what you've learned in this class, and your reflection on *you and your* home place, how much do you think happy places are determined by:

- Their physical geography/environment?
- By government policy/leadership/history?
- By economics/development levels
- By individuals (such as their outlook, contributions/work)?

Please explain and support your answers.

Geography 1520, Spring 2023, Mulder

Project 2: A "Big Question Assignment" - Determining Where to Live in the U.S.

The Purpose of this assignment is to have you think about your own priorities about place *and* to engage in some spatial analysis, i.e., to think like a geographer, exploring and then looking critically at the spatial patterns of various attributes of place (those of interest to you) and in what ways they intersect, **including the consideration of climate change impacts on areas of the U.S.**

The Context: Imagine that you must move away from Utah and that you are trying to decide where to settle for the long term in the U.S. You are aware of climate change and that there are current and coming impacts, as a consequence of a warming planet. So, you want to take that into account. You must also choose another 5 characteristics of place to take into consideration as you make your decision. Deciding on those five will be a matter of thinking about what matters most to you, your family, career intentions, etc. It will also require some geographic analysis to see how the criteria you choose play out across the U.S. (e.g., housing affordability, or teachers' salaries, prevalence of mountains, low or high population, etc.). What are those spatial patterns? Are they what you expected or thought they would be? **Your goal is to find the place that best matches all, or nearly all of your desired criteria.**

Your Audience: In order to convince your family, friends and sponsor (who is funding your move) about the location you think is best for you, you need to make a short presentation and write an essay describing what you found and how you came to your decision about where you want to live.

To complete this assignment, you should follow these steps:

1. Review the current and coming impacts of climate change on different parts of the U.S. -- What are some places you would like to be that seem like they will be livable in a warming world?

- The [National Climate Assessment](#) [Links to an external site.](#) describes current regional impacts (see the "Chapters" dropdown menu - executive summaries in each region give you the run down).
- For predicted impacts by 2040 and beyond (just 16 years from now), consult the the maps developed by a ProPublica/New York Times Magazine project <https://projects.propublica.org/climate-migration/>. [Links to an external site.](#) (You should scroll through the full piece to see what's included.)

2. Choose Five Migration Factors in addition to the impacts of climate change (so you will have SIX total): Think about the factors that will most influence your decision about where you are going to live (i.e., think about what's important to you - kinds of climates/weather, environmental amenities, economic opportunities, politics, cost of living, education, income, lifestyle, etc.). Select five factors that will most influence your migratory decision. For example, your five migration factors might be that you want to live in a place that has 1) a lot of job opportunities, 2) cold weather, 3) evergreen trees, 4) a highly-educated population, and 5) a low chance of tornadoes, or maybe you want to live in an urban place, a diverse place (lots of non-English speakers say) or a rural one, etc.

3. Create six maps - one of Climate Impacts + one for each of your chosen Migration Factors (5 of those): Use the list of resources available below, and/or other resources of your choosing, to **create maps** that will help you identify where you should be living. For example:

- If you really like the look of cornfields and you want to be surrounded by cornfields, then you would make a map of the highest corn producing counties in the United States.
- If living in a place where housing costs were very low, you would make a map of counties or states with the lowest housing values.
- If you really are passionate about conservative politics, you might make a map of counties that had a high percentage of voters for Republican Party candidates.

You should clip these maps from your screen and paste them into a PowerPoint presentation to use when you are preparing your presentation later (be sure to include the website address as a source and be sure that what the map shows is clear - or you will need to add some explanation).

4. Identify and Notate Regions on each Map: Each of these maps will likely have some regional patterns (places where these factors exist and don't). **Identify the areas** that have your preferred characteristic (e.g., most affordable rents) and **note them** on the map by overlaying a circle or circles over those areas.

5. Make a Presentation: Prepare a title slide with your name, one PowerPoint slide for the climate impacts AND each of the five factors that are important to you. Each slide should have a map and 1-3 circles identifying regions that exhibit the factor you were interested in. Be sure to include the map subject and source if it isn't in the map picture itself. Then prepare a final slide that identifies the place where you are going to live. Determining that place (or places if you end up with more than one) requires you to compare and analyze where the most or, ideally all, of your migration factors intersect or overlap. This is a process of spatial analyses and is the work of a geographer! You should have 8 slides total.

6. Write an Essay: Prepare a 2-3 page double-spaced formal essay in which you:

1) Reflect on the regions you found for each one of the six factors (including climate change impacts). Address these prompts:

- What patterns did you see?
- Why do you think they are the way they are?
- Was this what you expected to find or different? Why?

AND

2) Discuss the place where you are choosing to live and why. Address these questions:

-
-
- Are you compromising on your desired traits?
- What climate change impacts will you be facing in your new location?
- Did you end up where you thought you would or somewhere different?

7. Submission: Turn in (upload) **both** your PowerPoint slide file and your essay online via Canvas.

Resources: Some examples of mapping resources for you to use are below, some of them are a little dated, but *you are very welcome and encouraged to find others as well or instead of these, just be sure to cite the source*). Don't be shy to find other maps of topics of interest to you and/or more recent versions of these topics, where possible:

- [Data USA Links to an external site.](#) (over 110 different themed maps)
- [Measure of America Links to an external site.](#) (An amazing site with all kinds of measures, including well being, sustainability measures, opportunities - such as employment, etc, by census district, city, county or state). Take a look at their [2013-14 report Links to an external site.](#) as well as their [mapping engine Links to an external site.](#)

- [US Census Demographic Data Map Viewer Links to an external site.](#)(allows you to create maps based on age, education, income, and housing characteristics at the state, county or even census tract level from the 2020 Census data)
- [Baseball Fan MapLinks to an external site.](#)
- [Basketball Fan MapLinks to an external site.](#)
- [Commuting pattern mapLinks to an external site.](#)
- [Dreariness IndexLinks to an external site.](#)
- [Temperature Range mapLinks to an external site.](#)
- [Low Density Living mapLinks to an external site.](#)
- [2016 Presidential election maps \(with an interesting examination of how best to represent voting and population\)Links to an external site.](#)
- [2020 Presidential election map Links to an external site.](#)(by state or county)
- [Agricultural Production mapLinks to an external site.](#)(by county)
- [Economic outlook mapLinks to an external site.](#)
- [Real Value of \\$100 across the U.S. Links to an external site.](#)(2020 - this is likely different now, but maybe relative differences would hold up)
- [Income and EducationLinks to an external site.](#) (be sure to read about the measure of the “super zips”)
- [Median home price mapLinks to an external site.](#)
- [Household income - for rental affordability mapLinks to an external site.](#)
- [Internal Migration Flows trackerLinks to an external site.](#)(allows you to see who is moving into and out of individual counties)
- [U.S. Diversity MapsLinks to an external site.](#)
- [Racial and Ethnic Diversity Index mapLinks to an external site.](#)
- [Dialect mapsLinks to an external site.](#)
- [Weather and Climate Disasters 2021Links to an external site.](#)
- [IncomeLinks to an external site.](#)
- [Greatest Upward MobilityLinks to an external site.](#)
- [Yale - U.S. Climate Opinion Maps \(2021\)Links to an external site.](#)

Appendix I: Geography BS – Graduation Map

Geography BS - Graduation MAP

This is a suggested plan. **Meet with an academic advisor to create a specific plan that meets your academic needs.** Taking 15 credit hours per semester facilitates timely graduation. Take 18 Core & 18 Track credit hours to = 36 total.



NAME: _____

Catalog Year: 2022-2022

Revised: 1/2021

<input checked="" type="checkbox"/>	Course	Credit Hour	Semester Offered	Milestones & Notes
Freshman (Semester 1)				
	GEOG 1300 or GEOG 1520	3	F, Sp, Su	<ul style="list-style-type: none"> Some students must take Developmental Math or Developmental English before taking regular Math or English that counts towards GE credit.
	ENGL 1010	3	F, Sp, Su	
	GE Quantitative Literacy: MATH 1040 recommended	3	F, Sp, Su	
	GE Humanities	3	F, Sp, Su	
	GEOG 1790	3	F	
	Total Semester Credits	15		
Freshman (Semester 2)				
	GEOG 1000 or GEOG 1500	3	F, Sp, Su	Students may count only one Geography General Education class toward their University General Education requirements.
	GE Life Science	3	F, Sp, Su	
	GE Creative Arts	3	F, Sp, Su	
	1st GEOG Elective course: see tracks	3	F, Sp, Su	
	ENGL 2010	3	F, Sp, Su	
	Total Semester Credits	15		
Freshman (Optional)				
				<ul style="list-style-type: none"> Students must earn a C or better in each GEOG course, a 2.0 GPA overall, and a 2.5

				GPA in Geography.
	Total Semester Credits			
Sophomore (Semester 3)				
	GEOG 2790	1	F, Sp	<ul style="list-style-type: none"> Students should visit with an advisor from the department by the end of 3rd semester to select one of seven tracks to study in Geography. GEOG 2790 will help guide that choice.
	2nd GEOG Elective course: see tracks	3	F, Sp	
	GE Humanities or Creative Arts	3	F, Sp, Su	
	GE American Institutions: HIST or POLS	3	F, Sp, Su	
	GE Social Science (not from GEOG)	3	F, Sp, Su	
	LIBS 1704	1	F, Sp, Su	
	Total Semester Credits	14		
Sophomore (Semester 4)				
	GEOG 1002, 1005, 2950, or 4950	1-3	F, Sp	<ul style="list-style-type: none"> General Education Courses may be taken in any order. Be sure to include GE courses that meet both Breadth and Diversity requirements.
	3rd GEOG Elective course: see tracks	3	F, Sp	
	Elective	3	F, Sp	
	GE Physical Science (not from GEOG)	3	F, Sp, Su	
	Elective	3	F, Sp, Su	
	Total Semester Credits	15		
Sophomore (Optional)				
	GEOG 1002, 1005, 2950, or 4950	1-3	F, Sp	<ul style="list-style-type: none"> Each of the 7 Geography Tracks requires 18 credit hours or 6 courses. Most of these will be Upper Division. Some may have prerequisites.
	Total Semester Credits	1		

<input checked="" type="checkbox"/>	Course	Credit Hours	Semester Offered	Milestones & Notes
Junior (Semester 5)				
	4th GEOG Elective course: see tracks	3	F, Sp	<ul style="list-style-type: none"> Students may declare a

	Any SS 3600 course if no MATH 1040	3	F, Sp	Geography major at any time. • Choose one of 7 Geography Tracks. • Be sure to meet with a Geography Advisor.
	Elective	3	F, Sp	
	GE Physical or Life Science	3	F, Sp, Su	
	Elective	3	F, Sp, Su	
	Total Semester Credits	15		
Junior (Semester 6)				
	GEOG 3790	3	Sp	• GEOG 3790 has a prerequisite, is only offered in the spring, and must be taken before GEOG 4990.
	5th GEOG Elective course: see tracks	3	F, Sp	
	Elective	3	F, Sp	
	Elective	3	F, Sp	
	Elective	3	F, Sp, Su	
	Total Semester Credits	15		
Junior (Optional)				
				• Be sure to complete at least 40 Upper Division credit hours. The Geography BS requires 36 credit hours in the major.
	Total Semester Credits			
Senior (Semester 7)				
	GEOG 4990	3	F	• Doing an Internship (GEOG 4890) or a Directed Research (GEOG 4800) is recommended. • Be sure to meet with a Geography Advisor. • GEOG 4890 is only offered in Fall.
	6th GEOG Elective course: see tracks	3	F, Sp	
	Elective	3	F, Sp	
	Elective	3	F, Sp	
	Elective	3	F, Sp, Su	
	Total Semester Credits	15		
Senior (Semester 8)				
	Elective	3	F, Sp	• Apply online for graduation through the student portal early in the last semester • Students must earn a C or better in each GEOG course, a 2.0 GPA overall,
	Elective	3	F, Sp	
	Elective	3	F, Sp	
	Elective	3	F, Sp, Su	
	Elective	3	F, Sp, Su	

	Total Semester Credits	15		and a 2.5 GPA in Geography.
Senior (Optional)				
				<ul style="list-style-type: none"> You don't want to arrive here and find that you're missing a class. Contact an advisor early in your college career.
	Total Semester Credits			
	Total Bachelor Credits	120		

Gen Ed Breadth Requirements (do not duplicate departments)

<input type="checkbox"/> HU	<input type="checkbox"/> CA	<input type="checkbox"/> HU or CA
<input type="checkbox"/> SS	<input type="checkbox"/> SS	
<input type="checkbox"/> PS	<input type="checkbox"/> LS	<input type="checkbox"/> PS or LS
<input type="checkbox"/> DV (Double dip with breadth course)		

Avoid misadvisement! Consult your academic advisor (weber.edu/advisors), the WSU Catalog (weber.edu/catalog), and your CatTracks degree evaluation (log into your eWeber Student Portal).

Notes:

*Only GEOG 1000, 1002, 1300, and 1520 are offered during summer. Typically, few, if any upper division (3000 or above) are offered during summer. Most GE classes are also offered online. All degrees—including GEOG-- require 3 credits of Diversity (DV).

Appendix J: Department Teaching Innovation:

Dr. Dan Bedford

Since 2019 I have undertaken the following updates and innovations in my classes:

Pandemic response: GEOG 1000, GEOG 3050, GEOG 3090 all pivoted to online delivery modes in Fall 2020 and Spring 2021. Some of the material developed, and insights gained, have been retained in the post-pandemic period, see below.

GEOG 1000: Post pandemic, I have tried to merge the best elements of online instruction with the positive aspects of in-person instruction. GEOG 1000 has undergone a radical transformation since fall 2022, with a particular emphasis on Just in Time Teaching (Novak et al., 1999), as follows:

- Textbook eliminated (cost to students was too high; updates were not timely enough to be effective).
- Extensive use now made of free online resources (videos and websites from reputable organizations such as NASA, NOAA, USGS, American Geophysical Union, etc.).
- Students are assigned short readings/viewings ahead of almost all class periods, with a quiz (or two or three) due a few hours before class. Quizzes are intentionally designed to prompt thinking and reflection, not only to prompt regurgitation of information.
- Written reflection books (green exam books) used starting fall 2024, to prompt handwritten responses to questions posed in class. This serves the dual purpose of encouraging attendance and reflection regarding class material.
- Classes always involve multiple class discussions, hands-on activities, or other forms of active learning. The ubiquity of student access to technology in the classroom is harnessed to aid learning (e.g use of Google Earth to investigate drainage basins and drainage patterns; use of PheT simulators on radiometric dating and on glacier dynamics).
- An intentional effort to build community in the classroom, via class discussions but also via a class playlist. Students are encouraged to suggest songs that connect somehow with course material, which I then play as students are coming into the classroom.

GEOG 3050: This class has always had a strong undergraduate research element. This was sidelined during the pandemic, and I began reviving it in fall 2024. Specifically:

- Students took measurements of ground surface temperatures throughout the month of September using infrared thermometers. Surfaces measured were grass, parking lot, and a new, extensive rock surface surrounding the Noorda building (new engineering building). This was conducted in collaboration with WSU Facilities and Grounds staff, who were interested in knowing how the rocks heat and cool in the sun. This work helped convey concepts of energy balance, as well as basic data analytic techniques (graphing data, calculating Pearson's R).
- Each week, one student signs up to be the "class weather photographer". The student serving in this role must keep an eye on the weather, catch a photo of something especially striking, and post it to a discussion in Canvas. We all then comment on what we can see in the photo, and how it relates to class material.
- In fall 2024, students gave group presentations on a weather/climate topic of interest to them.

GEOG 3090: During the pandemic, I developed very extensive online materials, attempting to follow best practices for length of recorded lecture segments, high-frequency, low-stakes testing, and other innovative ideas for promoting engagement. After teaching this class one other time as an online class (spring 2022), I have now added a field component. In spring 2024, the class is being run as a hybrid: part online, part in the field. Most of the work is via online modules; 4-5 times during the semester, we meet in person for a field trip. Field trips thus far have included:

- A snowshoe hike to a SNOTEL site (Ben Lomond Trail); air temperature measurements were taken en route, students analyzed the data afterwards.
- Snowpack analysis: snow pits dug and examined using tools purchased from Colorado-based company Snowmetrics. An example of a student report from the field trip is appended at the end of this summary of teaching innovations (the report is used with permission of the student).
- Drive to GK Gilbert Geologic View Park and Bell Canyon Trailhead, at the mouth of Little Cottonwood Canyon, to view features of glacial geomorphology (U-shaped valley, lateral moraines, glacial erratics).

GEOG 3590: Students are given some measure of control over course content. Each week, a student volunteers to select an episode of a podcast (The Europeans) for us all to listen to and comment on, both in a Canvas discussion and in person. Students are also choosing which European countries to focus on later in the semester, via anonymous voting using a Google Form.

Kaylee Anderson

Field trip 2 – Snowpack Properties

1. On Monday February 26th, our class took a large mini-van up to Snowbasin! When we arrived, we hiked up a trail just a bit to find an area to dig into the snow. My group of four worked together to dig all the way to the ground and analyze the layers of snowpack. We came up with snow composition, depth, ice-melt ratio, and temperature. Once our hole was completed, we took a look at everyone else's to compare data. We then filled in our hole and rode back to WSU.

2. Overall, the snow was 117 cm deep. We took our density measurement at 55 cm (marked in red on the photo). The density was calculated as 0.392 g/mL. (98 g / 250 mL). As labeled in the photo, we conducted a hand hardness test with the snowpack. From 0- 29 cm, the hardness was 4 fingers. From 29-47 cm, the hardness was knife hardness. From 47-75 cm the hardness was pencil. Finally, everything beneath 75 cm was one finger. The bottom layer was very faceted and airy. As you can see in the photo, it was very soft and fell from the rest of the snowpack. We also took the temperature in 2 areas on the snow, as marked on the photo. In both places (73 cm and 30 cm) the temperature was 0 degrees C.

4. When looking at the different types of snow (the bottom faceted layer compared to the harder layers) I didn't see much of a difference. This was slightly disappointing because I expected to see more melt in the granules on the harder layers. Additionally, it is worth mentioning that the faceted layer on the bottom of all the snowpack can be a potential avalanche hazard.

Sophie Trafelet

GEOG 3090 Field Trip 2 Report: Snowpack Properties

On February 26th, we took our second field trip up to Maples Trailhead in Snowbasin.

Once there, we split into groups and chose a spot to dig snow pits to examine the snowpack

layers. Our group chose a spot beneath an opening in the trees, because we thought there would be more variable snowpack properties there. We dug our pit to about 116 cm deep, which created a pretty deep pit. Once dug, we took note of the distinct layers found in the snow and the depths at which they occurred. Samples of each layer were measured in grams to compare densities, and ice crystals from each layer were viewed under a magnifying glass.

Sophie Trafelet

Figure 3 is a photo of the 116 cm deep snowpit we dug, before samples were taken.

Distinct layers can be seen here, as some are light and airy while others are hard and dense.

Figure 1 is a photo showing each sample taken from the snowpit layers. The samples were taken somewhat at random, which is something I would do differently if I were to take samples again, because I would rather the samples be taken intuitively and labeled 1 through 11 vertically, beginning at the top. Figure 4 shows the depth at which each sample was taken, which helps Figure 1 make a little more sense. Figure 4 also shows the densities in grams of each sample, which was collected by extracting a wedge of snow using a 200 cc wedge sampler, which was then placed in a bag and weighed with a hanging spring scale. Figure 2 is a photo of the 9th sample taken, about 13-15 inches from the bottom of the pit, which was an interesting sample because you can see large ice crystals and air pockets. Temperatures were taken in three locations of the snowpit, essentially splitting it into thirds. These measurements can be seen in Figure 4, but because the thermometer used was not calibrated, it was unable to take accurate temperature readings. Snow from a few samples was viewed under a magnifying glass, but we were unable to see snowflakes and only saw ice crystals, because the snow was hard and icy from continuous melting and refreezing.

Overall, it was interesting to see the differences in the layers within our snow pit, as we

were able to see numerous distinct layers. Some layers were thicker than others, and some were more dense than others, which helps us determine the conditions of the snow when it fell and how much fell, as well as how recently it fell. Most of our layers were fairly icy and hard with large crystals, and we did not see a lot of that light and airy powder that makes for good skiing. It was interesting to see the different kinds of snow that can fall here in Utah, where we have the greatest snow on earth.

Dr. Jeremy Bryson

Fall 2018-Spring 2023. I aim to continually develop my teaching skills and course preparation with each class that I teach. Sometimes this looks like finding new and interesting readings. Sometimes it is finding a new example to discuss in a class. Sometimes it is different way to engage with online students through zoom book group discussions. Sometimes it is creating a new project or presentation for students to complete. Basically, I am always trying to find new ways for students to engage with the class and with course materials. I have included some examples of developments below:

Dr. Ryan Frazier

- Microlearning. 14 day course to increase interest. Deployed in GEO 3710 and a few other GEO courses.
- Teaching all online since 2020.
- Frequently updating courses as software changes and student interest shifts.

Dr. Groves, Maria

Innovation/Development	Dates	Courses
Field Excursions	Fall 2021 - Present	GEOG 3080/GEOG 3780/GEOG 4800

<p>Importance</p>		<p>It is important for students of geography (who study changes in the environment and in human populations over time) to see the issues first-hand. Geography 3080 is called Arid Lands and is designed to teach students about the causes of desert climates, desertification, the geomorphic features, and the people, plants and animals that inhabit these landscapes. I established a relationship with Harmony Ranch in Ogden Valley, a regenerative farming community that strives to use sustainable development and practices in the arid lands of Utah. At first I would take the students on visits and hear about the regenerative practice from the rancher/farmer. Then, as the relationship between the geography department and Harmony Ranch solidified, students were able to conduct soil analysis projects, sustainable planning projects, and sustainable design for structures.</p>
<p>Innovation/Development</p>	<p>Dates</p>	<p>Courses</p>
<p>Research Posters based on Geographic Analysis</p>	<p>2021 - present</p>	<p>GEOG 3780</p>

<p>Importance</p>	<p>Having students use skills that they learned in other courses such as GIS in another course solidifies and links the importance of mastering skills from one class to another and then onto their professional careers. Many students approach college as a set of hoops (classes) that they need to take to graduate with a degree. They do not realize that they are building knowledge that they need to refine for future careers. I ask the students to use the GIS skills they have learned and apply it to creating research posters which they can then enter into the sustainability fair. This gives students a way to scaffold and review their skills as well as practice creating research posters and presenting them to an audience. At the end of the project which they complete in small increments with much feedback from peers and myself, students have a very nice research piece that they are often very proud of.</p>	
<p>Innovation/Development</p>	<p>Dates</p>	<p>Courses</p>
<p>Use of Packback for group discussions</p>	<p>2021 - present</p>	<p>GEOG 1500 and GEOG 1000</p>

Importance	<p>The use of Packback which is an AI that gives feedback for discussions has elevated the quality and effort of student discussions. Packback is an AI that can be incorporated to Canvas. It asks questions to post a question after I have assigned a topic that goes with the week's lectures. Students pose a question they are curious about but must do a little research themselves on the subject. They must then respond to another student, but in their response, they must add more information for the topic their classmate chose. They must also provide references, examples, graphs, or links to videos concerning the topic their peers chose. The AI will give them a score for grammar, pertinence to the topic, and effort in providing content. I pull these up every few lectures and we discuss some of the posts.</p>	
Using short, recorded lectures	Fall 2021 - present	GEOG 1000/1500/3080 GEO 1130
Importance	<p>Although I began recording lectures due to the need to pivot to online learning during the COVID 19 pandemic, I continue to do this for all of my classes. Not only do students prefer to digest smaller portions of information due to attention span and time constraints, but this also allows me to lecture more in depth during class and or add hands-on assignments but if I do not get to a topic I can easily add a lecture topic to Canvas. This prevents the course from getting off the schedule. It also allows me to give students who have missed class due to medical reasons lectures to catch up with.</p>	
Innovative/Developments	Dates	Courses

Using Exam Books for daily writing prompts	Fall 2020-present	GEOG 1000/1500/1300/380
Importance	The students use small exam books daily to jot down notes during short interactive assignments during lecture. I usually teach a T/TH schedule of 75-minute lectures. This is too long of a time span for most people's attention. I like to break up the time with meaningful groupwork where students research or discuss a topic just covered in lecture. Every day they put the date and take some time to engage in the lecture. Not only does this give everyone a chance to digest the terms, skills, or concepts in the lecture, but it gives me a chance to see how much they understand and at what level they can express themselves. I use the exam books for participation points as well.	
Innovation/Development	Dates	Courses
Using Mid-Semester Feedback/Check-in Questions	Fall 2022 – Fall 2023	GEOG 1000, GEOG 1500, GEOG 3780
Importance	I adopted Dr. Frazier's idea for asking students 4 main questions concerning the course up to the mid-term. I adopted the practice of having students divide a piece of paper into 4 sections for the answer to 4 questions: 1) what is something you liked about the course so far? 2) what is something you would change about the course? 3) what are four things you have learned in the course so far? And 4) what are you most interested in the remainder of the course? This allows for adjustments before the course is over.	
Innovation/Development	Dates	Courses

Creating an Instagram Account @geographygroves	Spring 2021	Applies to all courses
Importance	The creation of an Instagram course was inspired by readings from the Chronicles of Higher Education. The article supported the idea of having a method that students are familiar with for them to communicate or find smaller chunks of information. I post quizzes about images like “what formed this interesting cloud? For examples or short multiple-choice questions. I do not follow any students, but I do follow sustainable businesses, earth science institutions, etc. that students can also follow for more information on class topics.	

Dr. Alice Mulder

Teaching Innovations 2017-2023

Note that most of my teaching innovations are of the CEL/HIEE variety and so are mentioned in that document.

GEOG 2920/4920 – Innovative course/lecture series – Open to students/campus/community

During the past years as a SPARC and Geography collaboration I also created an innovative, multi-disciplinary course/lunch and learn for the WSU community (first offered fall 2015).

- 2015-2018 The course, Shades of Green: Perspectives on Sustainability for People, Environment and Economic Prosperity (GEOG 2920, 1 -credit), was offered for four years and had faculty members from a wide variety of disciplines presenting on sustainability from their perspective. All WSU faculty, staff, and students were welcome to drop in to any presentation.
- Fall 2019 - the format somewhat and had the sustainability series focused on climate change (Geog 4920, 2-credits) and invited mostly outside speakers, in addition to a few faculty. This series [“Climate Change and Utah’s Future”](#) (also Geog 4920) had the best attendance by far and a wonderful mix of faculty, students and many community members. There were regularly 25-30 people in attendance with some sessions numbering over 70.

- Fall 2020 - [Climate Change and Culture Shift](#) was the series for Fall 2020, with many non WSU speakers. Held virtually and very successful with average attendance of 33, a mix of faculty, students, staff and community members. This provided
- Fall 2021 – “Sustainability Snapshots” featured WSU faculty from all seven colleges sharing about their sustainability teaching, projects and/or research.

These courses provided students good exposure to the range of ways disciplines connect with sustainability, including Geography, and the greater understanding/application to solutions that they provide. Students did additional readings for the two climate focused courses, and, for all of these, completed weekly reflections tied to the week’s presentation.

Geography 3060 – HIEE/CEL work

- These are listed in the HIEE/CEL document in more detail, but one main focus of recent years has been a section of the class focused on the Ogden River. Students research in pairs about some aspect of the river (geography, water quality, historic and contemporary use/perceptions, recreation, land development, etc.) and present their findings. We also engage as a class in a river clean-up for four hours, collecting trash from around the Ogden River Parkway corridor. This ties in with both experience of the river and discussions and class material on material waste management, consumption (disposable packaging and disposables), and individual/structural roles in municipal waste management.
- As noted in the CEL document, this class has for several years included some sort of Community Engaged Learning project/service hour requirement.

Geography 1520 – Affordable course materials

In 2022-23 I changed from using a textbook for my Geog 1520 class to not using a text at all and using web-based materials that were freely available. This eliminated any cost for course materials and pushed me to explore more types of resources. It has worked pretty well for the class.

Use of in-class teaching tools/exercises

Other tools that I learned of from WSU’s Center for Excellence in Teaching and Learning’s (formerly the Teaching and Learning Forum) Tuesday Tips series are Google Jamboard for collaborative and multi-topic whiteboard type activities and Menti.com, an online site for creating interactive “quizzes,” polls, word clouds and the like. I use Menti several times a

semester typically (and have done, both on Zoom and in-person) for class activities, such as creating a word cloud of students' perceptions of a region or associations with the term "sustainability" or a particular topic, such as "food/agriculture."

Recognizing the value of collaborative knowledge generation, students in both my Geog 3060 Environmental Issues courses and Geog 1520 (United States and Canada) have contributed to group-built power point slides on a particular topic (such as dams around the world or a sub-region of the U.S.).

A focus on local/regional solutions

I teach often about the variety, complexity, extent and intersectionality of the environmental/sustainability challenges we face, whether that is in the classes that are explicitly focused on these topics or in my regional geography courses where they inevitably come up. Water and air pollution, ocean degradation, environmental and social injustices, biodiversity loss, deforestation, plastics pollution, climate change impacts -- this is just a sampling of the challenges which can easily lead to despair and a sense of overwhelm for students (or anyone for that matter). Consequently, I have worked over the last few years to have more time and materials in my classes that relate to solutions in the hopes of also fostering a sense of empowerment and possibility in my students. The most notable example of this is in my upper division World Environmental Issues course where, since 2018, I have had students read about and consider the local/regional application of solutions identified by [Project Drawdown](#), an international effort, co-founded by Paul Hawken, of scientists and researchers who have identified the top 100 solutions to reducing greenhouse gas emissions, with existing technology and know-how. Students do this through a solutions-focused poster project.

Increasing Attention to Social Justice

Another teaching effort of mine since 2020 stems from my desire to do more than I have in the past to foreground differing experiences and perspectives and justice issues in my courses. This comes in response to the events of 2020, following a series of police-related deaths of black Americans. I have been more intentional to include and foreground issues of social justice and inequity in the context of the geography of the United States and Canada and through the concept of environmental justice (and injustices). A discussion assignment in my Environmental Issues class, in which students watched a couple of videos on environmental justice and racism in the environmental movement, is an example of this. Students' responses to this were very positive in my mind in that they were largely being exposed to and thinking about something they seemed to know little about. .

Other examples include:

- A film and discussion assignment in my Geography of the United States and Canada class on contemporary Native American tribal life, both in the city and on the reservation.
- A class Canvas discussion on race, justice and equity, in the context of studying the American South (Geog 1520).
- Two class sessions in the Climate Change and Culture Shift class (Geog 4920), one on social justice and community organizing and the other on environmental exposures and building equitable cities. The latter of these presentations by Dr. Daniel Mendoza, a researcher at the University of Utah, highlighted disparities in exposure across neighborhoods in Salt Lake City.

Appendix K: Geography Faculty Service:

Records of Service 2017-present

Dr. Daniel Bedford

University service

- Director, WSU Honors Program, fall 2016 to Spring 2022.
- Organizer, Climate Teach-In, fall 2019, in support of the Youth Climate Strike.
- Outside member on Ranking, Tenure, and Evaluation Committee for College of Science (2018-19), College of Arts & Humanities (2022-23), and Department of Economics (2022-23). In a sense, this is college-level service, but it's also University-level service in that it involves work across colleges. I'm listing it as University-level service, but it could easily go under College-level service.
- University Assessment Committee, fall 2023 to present.

College service

- College Ranking, Tenure and Evaluation Committee 2017-18 (member) and 2023-24 (chair).

Department service

- Participant in department overhaul; developed requirements for Climate Science Track.
- Regular presenter in GEOG 2790 Pathways and Careers in Geography, Environment & Sustainability.
- Taught GEOG 2790 Fall 2023.

Service to the Community

- American Association of Geographers, carbon reduction task force, member 2019-20.
- Review team member and co-author of review report, program review for Utah Valley University Honors Program, spring 2022.
- Ogden City Sustainability Committee, member since summer 2022, chair since summer 2023.
- Ogden City General Plan Advisory Committee, member since May 2024.
- GreenWood Charter School Board member since June 2023.
- Frequent presentations to the community about climate change and related issues, throughout the last seven years.

Dr. Jeremy Bryson

Manuscript Review

- 2024. *International Journal of Urban and Regional Research*
- 2023. National Science Foundation grant proposal; *Sociological Spectrum*
- 2021. *Environmental Justice*
- 2020. *Journal of the American Planning Association*; *Environmental Justice*
- 2019. *Urban Geography*; *Journal of Urban History*; *Landscape and Urban Planning*; *Environmental Justice* (2 manuscripts)
- 2018. *Planning Perspectives*; *Environmental Justice* (2 manuscripts); *Cogent Humanities*
- 2017. *Geoforum*; *Journal of Historical Geography*

Other Service to Discipline

- 2016-2018. Founding member of the Consortium for Dark Sky Studies, a multidisciplinary, multi-university institution housed at the University of Utah.

Professional Service to the Community

- 2024. Presentation: "Contested Borders." Social Science Education Center. Weber State University
- 2022. Presentation: "Urbanisms." Social Science Education Center. Weber State University
- 2021. Presentation: Dark Skies: Humanities in the Wild Series. Utah Humanities, May 2021

- 2019. Presentation: “Political and Economic Geography in Asia.” Professional Development training for Utah Council for the Social Studies, July 2019
- 2019. Presentation: Orion Junior High Career Day speaker, March 2019
- 2019. Presentation: WSU Prep Career Awareness speaker, July 2019. Presentation to 7-9 grade students enrolled in summer college preparation program.
- 2018. Presentation: WSU Prep Career Awareness speaker, July 2018. Presentation to 7-9 grade students enrolled in summer college preparation program.
- 2017-19. National Geographic Utah Advisory Committee, Member

Service to the University

Committee Service

- 2023. Acting Chair, Department of Geography, Environment & Sustainability, Fall 2023
- 2023. Chair, department peer review committee for Maria Groves, Fall 2023
- 2020-2023. University Curriculum Committee, Member
- 2020. Acting Chair, Department of Geography, Environment & Sustainability, Spring 2020
- 2020. Endowed Professor Screening Committee, Member
- 2020. Presidential Awards in Community Engagement Committee, Member
- 2019-2021. Hall Endowment Committee, Member
- 2019. Geography Department Instructor Hiring Committee, Member
- 2017-2022. Geography Club Faculty Adviser
- 2015-2019. Social and Behavioral Sciences College Curriculum Committee, Member

Other Service to the University

- 2024. Book Group leader for *Walkable City* in conjunction with Intermountain Sustainability Summit. March
- 2023. Panelist. Presidential Leadership Fellows of Weber State University. December
- 2020. College of Social and Behavioral Sciences Faculty Online Coach
- 2019. Aletheia Book Club leader, Honors Program. *A Hope More Powerful Than the Sea: One Refugee’s Incredible Story of Love, Loss, and Survival*, October 2019.
- 2019. Alternative Spring Break Advisor: Dominican Republic, March 2019
- 2018. Aletheia Book Club leader, Honors Program. *Nothing to Envy: Ordinary Lives in North Korea*, January 2018

- 2018. Alternative Spring Break Advisor: Catalina Island, March 2018
- 2017. Alternative Spring Break Advisor: New York City, March 2017

Service Awards

- 2019. Presidential Award for Community-Engaged Faculty Member. WSU Center for Community Engaged Learning.

Dr. Bryan Dorsey

Weber State University committees

- University Rank and Tenure Review Committee (2021-22)
- Community Engaged Learning Curriculum Committee (2018 to present)
- Environmental Initiatives Committee (1997-2009); chair (2006-2009).
- University Curriculum Committee (2000-2004).
- University Parking Committee (2001 to 2011). Ongoing involvement.
- Social and Behavioral Science College Dean’s Search Committees (2009, 2020)
- General Education Assessment Committee
- Scholarship Committee

Departmental level

- Department Chair (2011 to 2017)
- Rank and Tenure Review committees for Geography faculty
- New Faculty Search Committees
- Library Representative
- Geography Club advisor

Other committee/community professional service activities

- Ogden City’s Development Code Update (Zone Ogden) Advisory Committee (beginning late fall, 2023 through spring 2025).
- Ogden City Transportation Advisory Committee, WSU representative, Ogden City (2015-2019).

- Weber Pathways, board member, Weber County, UT: donate a significant amount of time to this non-profit trail and open space preservation advocacy group. Plan and construct pathways in Weber County (2006 to 2012). Continue to serve as ad hoc board member.
- Gombe School for the Environment and Society (GOSESO) board of directors, elected (2/14) as board member to advise on development of a K-12 private school in western Tanzania.
- 2014 Intermountain Sustainability Summit, moderated two sessions on hydroelectric power and solar power. Weber State University, February, 2014.
- National Science Foundation, funding proposal review: review funding proposals submitted to NSF for various studies, most focusing on rural development in Sub-Saharan Africa.
- Service-Learning Grant/Project: continue to work with other Weber State University faculty to promote service-learning partnerships with community organizations.
- Service to Marriott-Slaterville City, UT: prepared and presented a draft general plan, with assistance from Advanced Planning course participants, for the Marriott-Slaterville Planning Commission and City Council (the plan was adopted for use by the City in the Fall of 1999). Extended in Spring, 2000 to develop an Open Space Preservation Plan.
- Service to Morgan and Weber Counties, UT: made recommendations for open space preservation in rural areas. Participated in a conference entitled “Farmland's Future- A Weber County Perspective.”
- Service to City of Kaysville, UT. Developed and presented, with assistance from Advanced Planning course participants, the Kaysville Bicycle and Pedestrian Plan.
- Service to City of Ogden, UT: met with Ogden City Mayor and other officials to establish community service-learning partnerships with Weber State University. Provided assistance with Ogden City's general plan, and made recommendations for the city's recycling program. Continue to assist with the regional planning effort, Envision Utah.
- Service to Washington Terrace City, UT: prepared and presented a draft general plan, with assistance from Advanced Planning course participants.

Dr. Eric Ewert

Service

- **12 College Committees** (most recently *College Curriculum, Dean Evaluation, Scholarship, MA Peace and Sustainable Development, Distinguished Lecture, Advising, etc.*); **6 University Committees** (most recently the *University Chair's Council, Climate Justice Teach-In, Tree Campus, etc.*);

- **1 Professional Group** (*American Association of Geographers (AAG), Department Chairs' Discussion Forum*);
- **Several Community Organizations**, the most important of which is the *Northern Utah GIS User's Group*.
- **I have also volunteered widely through various NGOs**, including Community Rebuilds in Moab, Southern Utah Wilderness Alliance, Idaho Conservation League, and Trails Foundation of Northern Utah to name a few.

Dr. Ryan Frazier

Department

- GES Hiring Committee (Groves)
- EES Hiring Committee (Perez-Conseguera)
- Green Team (EES and GES)

• **College**

- COS Hiring Committee (Melodrum)
- Land Cession Mapping/Consulting
- CSBS Professional Grants Group

University

- Course Fees Committee

Public

- Walker Forum Talk - Sustainable Growth on the Wasatch Front
- Redistricting Talk - AAG

Frequent Reviewer for

- Remote Sensing of Environment
- Canadian Journal of Remote Sensing
- International Journal of Remote Sensing
- Remote Sensing

- Canadian Journal of Forest Research
- Forests
- ISPRS Journal of Photogrammetry and Remote Sensing
- ISPRS International Journal of Geo-Information
- Forest Ecology and Management

Dr. Mariangelica Groves

Service to the Discipline

- Manuscript Review

2023 Reviewer for Box & Box *The Science of Our Changing Climate* a Cambridge University Press the publishing and assessment department of the University of Cambridge. The corporate title of the University is The Chancellor, Masters, and Scholars of the University of Cambridge, Shaftesbury Road, Cambridge, CB2 8EA, United Kingdom.

Professional Service to the Community and University

Presentations

- 2023 “Extreme Weather and Climate Justice”
- 2022 “Climate impacts and regenerative farming”
- 2021 “Teaching Climate Change Solutions”
- 2020 “Exploring Disease on a Spatial and Temporal Scale, Looking at the history of medical geography and the public geographic information of the COVID19 pandemic”

Climate teach-in at the WSU Grand ballroom/Zoom enabled for faculty, students, and extended communities.

Climate teach-in at the WSU Grand ballroom and Zoom enabled for faculty, students, and extended communities.

The Sustainability Practices and Research Center’s Sustainability Snapshot series 2021 for faculty and students.

Member of volunteer group that compiled expertise in various subjects to present a WSU and community course (SOC 2090).

Service to the University

Committee Service

- 2024 – 2025 Learning Community GEOG (PS/SUS) 1500 Climate Change (3 cr) and Matt's ECON (SS/SUS) 1100 Environmental Issues & Economic Policy (3 cr).
- 2023 – 2024 University Curriculum Committee (CCC)
- 2022 - 2024 Member of the Teaching and Learning Committee (TLC)
- 2022 – 2023 Member of the Diversity Conference Planning Committee
- 2022 – 2023 Faculty advisor for the Hispanic, Latino, LatinX Center
- 2022 – 2023 Member of the sustainability COP
- 2021 – 2023 Member of the CRE community of practice
- 2020 - 2023 Member of the planning committee for the Climate Teach-in
- Liaison between Weber State and Harmony Ranch Development. held multiple meetings community Weber institutions to foster awareness and collaboration

Service to the College

Committee Work

- 2024 – 2025 Rank and Tenure Revisions Committee
- 2023 – 2024 College EDI Task Force

Service to the Department and Students

GEOG 4800 (3 credit hours)	Christy Cottrell	Senior Research – Soil analysis of Harmony Ranch (Geochemistry and Microbiology)	Summer and Fall 2023
GEOG 4800 (3 credit hours)	Auston Johnson	Directed Reading (Meteorology)	Fall 2023
GEOG 4800 (3 credit hours)	Olivia Vasquez	Directed Reading (Meteorology)	Fall 2021
GEOG 4800 (3 credit hours)	Logan Reichow	Senior thesis project (collected soil samples at Harmony Ranch and conducted geochemical analysis at the University of Utah)	Summer 2021

GEOG 4800 (3 credit hours)	Hafid Bahena	Student research mentor. Loss on ignition (LOI) analysis of organic material in Utah Valley Lake. Analysis completed at the University of Utah	Summer 2021
Letter of Recommendation	Derek Child	University of Utah, Football Program	Fall 2023
Letter of Recommendation	Madison Wilcox	USU Ambassador Program	Fall 2023
Letter of Recommendation	Hafid Bahena	Graduate School Recommendation Letter to Utah State University	June 6 2023
Letter of Recommendation	Tara Tankersley	NOAA University of Washington Internship Program for Oceanographic Studies	Jan 19 2022

Geography Club Advisor In this position, I recruit members, approve spending and advise on activities which promote student growth and collaboration as well as provide a community for those with geographical interests. 2022-Present

Dr. Alice Mulder

**Service Summary 2017-2023
University**

- 2015-**present**, Director of Sustainability Practices and Research Center (SPARC – please see more on this below)
- Fall 2017-**present**, Engagement Committee (focused on Student Success and High Impact Educational Experiences), led by Vice Provost Brenda Kowalewski, Member
- Fall 2017-**present**, Co-Chair Faculty Senate Environmental Initiatives Committee
- Chair of the SUS Attribute Review Committee (sub-committee of EIC)
- Fall 2018- **present**, Co-facilitator of Sustainability Across the Curriculum Faculty Community of Practice
- 2019-**present**, WSU Representative in the Conveners group of the Utah Climate Action Network
- 2017-**present**, Environmental Studies Minor advisor
- 2017-**present**, Advisor for Environmental Studies focus for Bachelor of Integrated Studies students
- 2012-2022, Engaged Learning Series Planning Committee, member

- 2021, Equity, Diversity and Inclusion Committee, member 2021 (group brought together by Assoc. Provost Brenda Kowalewski and Adrienne Andrews)
- 2020-21 – Member of a committee of faculty, led by Assoc. Provost Kowalewski, working on strategies and resource needs to meet the proposed Anchor Mission #5 for the revision of the University Strategic Plan.
- Spring 2020 – Spring 2021, WSU Climate Action Plan Update Committee, Member

College

- 2021-2023, Member of the group lead by Stephanie Wolfe to create a MA in Peace and Sustainable Development
- 2017-2022, member of CSBS Equity Task Force
- Fall 2017 – Spring 2019, Member of CSBS Caucus

Department

- 2017-**present**, Departmental Honors advisor
- 2017-**present**, Department Green Team, Member (both SPARC and Geography)
- 2023. Geography Department Peer Review Committee for Maria Groves, Member
- 2019. Geography Department Instructor Hiring Committee, Member
- April 2018, attended a half day “Chairs’ Symposium I: Encroachment or Opportunity? Defining Geography in a World of Environmental Studies, Global and International Studies, GIScience, Environmental Science and Sustainability Studies” at the American Association of Geographers Annual Meeting to help inform our departmental discussions of renaming and restructuring.
- Fall 2017, Geography Department Rank and Tenure Peer Review Committee for Jeremy Bryson, Member

Other

- 2024, Ogden Plan Advisory Committee Member, Ogden City
- 2018, Reviewer of submissions for Association for the Advancement of Sustainability in Higher Education’s Annual Conference (reviewed 24 submissions in categories of curriculum, campus engagement, and community engagement)

Elaboration on Service to the University through SPARC Director role

I spend much of my time in service to the university and wider community in my half-time role **as director of the Sustainability Practices and Research Center (SPARC)**. The main areas of my work fall into these categories (details on projects in individual years are listed further below):

- Increasing sustainability education, awareness, and high-impact experiences (curricular and co-curricular) across campus;
- Development and implementation of a Sustainability (SUS) Attribute (to designate courses that include/focus on sustainability);
- Oversight of the planning and hosting of the annual Intermountain Sustainability Summit held each March, attracting 350-400+ participants;
- Creation and implementation (oversight role) of “sustainability-in-practice” community programs of various types (especially oriented around energy efficiency);
- WSU yearly participation (since 2020) in the international Solve Climate by 2030 Initiative out of Bard College, including Utah Climate Solutions webinars, campus climate teach-ins and other events; and
- Gathering and reporting on sustainability in academics for WSU’s reporting (every three years) to the Sustainability Tracking, Assessment and Rating System (STARS) through the Association for the Advancement of Sustainability in Higher Education (AASHE).

My work with **SPARC in 2023** also included:

- Managing the Sustainability Leadership Scholarship application review and selection for 2023-24 (and hosting a donor meeting with the student recipients)
- Leading the effort for WSU to participate in the 2023 Worldwide Climate and Justice Teach-In (March 2023)
- Co-organizing a one-day sustainability “retreat” May 2023
- Serving as organizer and co-facilitator (Fall 2023-Spring 2024) for a faculty Sustainability Community of Practice working with six faculty participants on sustainability teaching
- Working with colleagues to explore and work towards obtaining grant funding, to expand the capacity of SPARC to create a community-facing sustainable demonstration home/one-stop shop for climate emissions reduction strategies and climate resilience, from the federal Inflation Reduction Act, via the Environmental Protection Agency or U.S. Dept. of Energy.

My work with **SPARC in 2022** included:

- Managing the first Sustainability Leadership Scholarship application review and selection for 2022-23
- Leading the effort to participate in the 2022 Worldwide Climate and Justice Teach-In (March 2022)
- Organizing a 2-day off-campus sustainability retreat and EIC orientation in May 2022
- Coordinating two WSU river clean-up service events, spring and fall, (with the CCEL Student Community Engagement team, Geog 3060, and the Geography Club). Each clean up involved 50-60 students in total.
- Presentation August 2022 to English Department Retreat on WSU Sustainability and SUS attribute
- Serving as organizer and co-facilitator (Fall 2022-Spring 2023) for a faculty Sustainability Community of Practice working with eight faculty participants on sustainability teaching
- Collaborating/participating with the Utah Climate Action Network, including SPARC's hosting of a Utah Climate Week events in early October 2022
- Working on a Self-Study Report for the SPARC Program Review 2022-23
- Working with colleagues on a proposal for the Provost to highlight sustainability in the curriculum at WSU, including a possible Sustainability Certificate, with an applied focus

My work with **SPARC in 2021** included:

- Working with the wider WSU sustainability team to create a 2020-2025 Sustainability Strategic Plan with goals and specific objectives identified for all areas of campus from operations, academics, planning and administration, and campus and community engagement. This plan aligns with the University Strategic Plan.
- Working with the American Association for the Advancement of Science to create, in partnership with the Walker Institute, a "Local Science Engagement Network" in Utah with WSU serving as the anchor institution. The aim of this is to build a network and resource of science-based briefs on climate related issues pertinent to Utah for policy decision makers. (The MOU for the first stage of this was just finally approved in February 2022)
- Helping to compile WSU's report to the Sustainability Tracking, Assessment & Rating System (STARS), specifically gathering information related to academics through a survey to all faculty.
- Serving as organizer and co-facilitator (Fall 2021-Spring 2022) for a faculty Sustainability Community of Practice working with six faculty participants on sustainability teaching.
- Coordinating a community river clean up service event linked to the Engaged Learning Series titled "Reconnect with the River" held in October 2021
- Collaborating/participating with the Utah Climate Action Network, including SPARC's hosting of a Utah Climate Week events in early October 2021

- Organizing an on-campus half day sustainability retreat and EIC orientation in August 2021
- Presentation 1/29/2021 to GSBE Teaching Brown Bag on SUS attribute

My work with **SPARC in 2019** included:

- Obtaining approval of the university's Sustainability (SUS) Course Attribute (January 2019) and initiating implementation of its roll-out and administration, including presenting to several College start-of-year meetings, hosting workshops and getting the necessary website and links prepared for the first applications, which were then reviewed, in October
- Working on the planning for the 2019 electric mower and trimmer exchange community program in partnership with WSU's Energy and Sustainability Office, the Davis and Weber-Morgan Health Departments, and the UT Division of Air Quality (DAQ);
- Presenting on WSU Sustainability to the Ogden Salon group which asked me to speak, February 2019;
- Organizing and participating in a TLF Faculty Symposium panel with other CoP participants on including sustainability in a course and the new SUS attribute criteria and process;
- Organizing the annual WSU Sustainability Retreat May 2019 (about 22 in attendance)
- Serving as a co-facilitator (Spring and Fall 2019)) for a faculty Sustainability Community of Practice where we have been piloted and developed (2018-2019) a faculty fellows program to build sustainability in the curriculum. These groups have had 12 and 8 faculty, respectively;
- Coordinating a panel event for the Engaged Learning Series titled "In Our Shoes: Understanding Food Insecurity and Solutions" held in September 16, 2019;
- Hosting two faculty help workshops on applying for the new SUS attribute;
- Collaborating/participating with the Utah Climate Action Network, including SPARC's hosting of a couple of Utah Climate Week events in October
- Preparing the WSU Sustainability Literacy and Culture survey.

My work with **SPARC in 2018** included:

- Completing a Proposal for a university-level, Sustainability Course Attribute (SUS)
- Coordinating a panel event for the Engaged Learning Series titled "Matter of Fact: The Public Lands" held in September 2018

- Working on the planning for the 2019 electric mower and trimmer exchange community program in partnership with WSU's Energy and Sustainability Office, the Davis and Weber-Morgan Health Departments, and the UT Division of Air Quality (DAQ)
- Organizing the annual WSU Sustainability Retreat May 2018 (about 20 in attendance)
- Serving as facilitator (Spring 2018) and co-facilitator (Fall 2018) for a faculty Sustainability Community of Practice where we have been piloting and developing a faculty fellows program to build sustainability in the curriculum.
- Representing WSU in meetings with other higher ed. institutions and the UT DAQ regarding their Air Quality Research Roadmap (AIR²) and guiding goals and priorities for research on air quality (Fall 2018)
- Collaborating/participating with the Utah Climate Action Network
- Overseeing data collection for the academic and engagement reporting areas in the national Sustainability Tracking and Rating System
- Organizing a campus presentation, class visits, and faculty workshop by author Gary Ferguson and cultural psychologist Dr. Mary Clare to campus, Feb. 22- 23.
- Organizing a TLF Faculty Symposium panel on sustainability and Big Questions and Signature Assignments

My work with **SPARC in 2017** included:

- coordinating, with the Center for Science and Math Education, to offer a workshop for teachers on climate science (held in Sept 2017);
- teaching Davinci High School students about sustainability at the Ogden Nature Center, for Adrian Maxon Day of Service, Sept. 20, 2017;
- conducting a small scale light-bulb exchange effort in conjunction with Habitat for Humanity in Ogden; and
- planning for the 2018 electric mower exchange community program in partnership with WSU's Energy and Sustainability Office, and the Davis and Weber-Morgan Health Departments.

Appendix L: High Impact Educational Experiences:

High Impact Educational Experiences

Dr. Dan Bedford

Weber State University defines High Impact Educational Experiences (HIEEs) as:

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- Community Engaged Learning
- Global Learning Experiences
- Internship & Career Development
- Leadership
- Peer Mentor/Tutor
- Sustainability
- Undergraduate Research

(See <https://www.weber.edu/hiee/default.html>)

Although not explicitly recognized as such by WSU's designation system, field-based classes are implicitly recognized by WSU as HIEEs ("Weber State University offers HIEEs by embedding these experiences in courses and in activities outside of the classroom.")

A partial list of my HIEE work is as follows:

- Undergraduate research has been a key element in GEOG 3050 Weather & Climate for many years. Within the last seven years, students in this class have conducted research on temperature properties of different landscaping surfaces on campus, presented it on campus at the Undergraduate Research Symposium and Intermountain Sustainability Summit, and at the annual meeting of the American Association of Geographers. Students have won awards for this research at the Intermountain Sustainability Summit.
- Field work is now a central element in GEOG 3090 Arctic and Alpine Environments, beginning spring 2024. Students took and analyzed measurements of air temperature, dug snow pits and measured and analyzed snowpack properties.
- Sustainability-designated classes are considered HIEE classes at Weber State. All classes taught in recent years have been designated as SUS (Sustainability) classes, with the exception of GEOG 3590 Geography of Europe, taught in spring 2024.
- The two-course senior research sequence of Research Methods and Senior Seminar is explicitly focused on undergraduate research, and I have taught this sequence on multiple occasions in the last seven years.

Dr. Jeremy Bryson

Employment of engaged learning strategies such as service-learning, community-based research, undergraduate research, etc.

Engaged learning strategies, such as service-learning and undergraduate research, are important to my teaching efforts. Listed below are some pieces of evidence of my efforts toward engaged learning strategies:

Service-Learning: Community Engaged Faculty Award 2019. I was nominated for and won this award primarily for my work with Alternative Spring Break trips each year from 2015 through 2019.

- 2019. Alternative Spring Break Advisor: Dominican Republic, March 2019
- 2018. Alternative Spring Break Advisor: Catalina Island, March 2018
- 2017. Alternative Spring Break Advisor: New York City, March 2017

Undergraduate Research: Each of the peer-reviewed publications listed below represents the culmination of a mentored undergraduate research project. I have used a similar strategy for each of these projects.

1) **Begin preliminary research on my own** to test out ideas and research plans. This stage of the research typically results in a presentation for an AAG conference.

2) **Invite a student** from one of my classes to participate in a research and writing opportunity.

3) **Divide the research and writing work** between me and student coauthor. Typically, I prepare and write any theoretical context and conclusions and the student coauthor would work more closely with the case-study research and writing. I have found that students coauthors are often able to manage the specific work of case studies more readily than the context writing that I am more prepared to complete.

4) **Meet with the student coauthor regularly** to discuss progress on our work and explore additional ideas and strategies.

5) **Work student coauthor to prepare presentation** for the Utah Academy of Sciences, Arts and Letters conference. I presented the paper each time.

6) **Work with student coauthor to finalize manuscript** and submit to the journal.

7) **Work with student coauthor to respond to reviewer suggestions** and finalize the paper resubmission.

- Bryson, J. and J. Montague. 2022. "[Smoke Season: Exploring the Geographies of Transient Wildfire Smoke on the Wasatch Front.](#)" *Journal of the Utah Academy of Sciences, Arts, and Letters*, In Press. (mentored undergraduate research project) (*Outstanding Paper in Social Sciences Award*).

- Bryson, J. and M. Jensen. 2021. "[Silicon Placemaking: Examining the Rhetorics of Place and the Technology Economy along the Wasatch Front.](#)" *Journal of the Utah Academy of Sciences, Arts, and Letters*, 327-334. (mentored undergraduate research project) (*Outstanding Paper in Social Sciences Award*)
- Bryson, J. and A. Cooley. 2018. "[Dark Sky Compliance: Measuring the Effectiveness of Outdoor Lighting Ordinances in the Ogden Valley.](#)" *Journal of the Utah Academy of Sciences, Arts, and Letters*, 271-279. (mentored undergraduate research project)

Dr. Bryan Dorsey

High Impact Educational Experiences

Land Use Planning courses: As coordinator of the WSU Urban and Regional Planning Program, I teach Land Use Planning courses (GEOG 4410 and 4420), provide career counseling, and arrange internships. These planning courses provide a community service as students work with community agencies on projects relevant to theory and principles of planning. During Advanced Planning courses, I have involved students in the preparation and presentation of draft general plans and land preservation plans for surrounding municipalities and counties. These courses expose students to extensive field work methodology, such as the development, administration, and interpretation of survey questionnaires, gathering of data for land use classification, and/or the compilation and analysis of data for environmental impact analysis.

Field courses and research seminars: I have been teaching Advanced Field Studies courses for more than 20 years at WSU. In the past 6 years since my last sabbatical leave, I have led a field course every fall and spring semester, except during Covid closures. Typically, students are engaged in field studies that are increasingly focused on sustainability. Over the past 5-10 years, many field courses in the Moab area have featured community service work with a non-profit affordable housing program, Community Rebuilds. We have been visiting the Latigo Wind Farm in Monticello as part of the sustainable energy studies portion of those outings. Other trips include visits to a geothermal plant near the City of Rocks Natural Reserve in Idaho, and the Idaho National Laboratories to learn more about nuclear power. During all field excursions I provide students with extensive reading materials (descriptive, theoretical, and methodological), maps, and field research experiences. Field course work has drawn upon Utah's unique physical Geography (geomorphology, ecology, etc.), as well as challenges in land use and resource management. The latter has involved study with representatives from the U.S. Forest Service and Bureau of Land Management.

Dr. Eric Ewert

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During the last five years, **I've guided 39 credit hours of Directed Research, mentored 139 credit hours of Internships, and co-led 8 Field Trips**

Dr. Ryan Frazier

LOTS of student internship placements. Just 3-4 every term. Private industry, city, county government. Just good work that has lead to jobs.

If not this, then capstone research projects. One on new housing construction along the front being at higher elevation (not a strong result but some evidence ot support this from the results). Another on Wind River glacial loss. Another on historic trolley lines vs current UTA bus stops and population coverage.

Also have brought students to Maps on the Hill, three years now with good success.

Dr. Mariangelica Groves

Groves, Mariangelica High Impact Teaching

Innovation/Development	Dates	Courses
Field Excursions	Fall 2021 - Present	GEOG 3080/GEOG 3780/GEOG 4800 GEOG/4950

<p>Importance</p>		<p>It is important for students of geography (who study changes in the environment and in human populations over time) to see the issues first-hand. Geography 3080 is called Arid Lands and is designed to teach students about the causes of desert climates, desertification, the geomorphic features, and the people, plants and animals that inhabit these landscapes. I established a relationship with Harmony Ranch in Ogden Valley, a regenerative farming community that strives to use sustainable development and practices in the arid lands of Utah. At first I would take the students on visits and hear about the regenerative practice from the rancher/farmer. Then, as the relationship between the geography department and Harmony Ranch solidified, students were able to conduct soil analysis projects, sustainable planning projects, and sustainable design for structures.</p> <p>GEOG 4950 is a field course that takes students to the Rio Mesa Field Station to participate in daily hikes involving detailed lectures by the field station host as well as the presentations by students.</p>
<p>Innovation/Development</p>	<p>Dates</p>	<p>Courses</p>
<p>Research Posters based on Geographic Analysis</p>	<p>2021 - present</p>	<p>GEOG 3780</p>

<p>Importance</p>	<p>Having students use skills that they learned in other courses such as GIS in another course solidifies and links the importance of mastering skills from one class to another and then onto their professional careers. Many students approach college as a set of hoops (classes) that they need to take to graduate with a degree. They do not realize that they are building knowledge that they need to refine for future careers. I ask the students to use the GIS skills they have learned and apply it to creating research posters which they can then enter into the sustainability fair. This gives students a way to scaffold and review their skills as well as practice creating research posters and presenting them to an audience. At the end of the project which they complete in small increments with much feedback from peers and myself, students have a very nice research piece that they are often very proud of.</p>	
<p>Innovation/Development</p>	<p>Dates</p>	<p>Courses</p>
<p>Use of Packback for group discussions</p>	<p>2021 - present</p>	<p>GEOG 1500 and GEOG 1000</p>

Importance	<p>The use of Packback which is an AI that gives feedback for discussions has elevated the quality and effort of student discussions. Packback is an AI that can be incorporated to Canvas. It asks questions to post a question after I have assigned a topic that goes with the week's lectures. Students pose a question they are curious about but must do a little research themselves on the subject. They must then respond to another student, but in their response, they must add more information for the topic their classmate chose. They must also provide references, examples, graphs, or links to videos concerning the topic their peers chose. The AI will give them a score for grammar, pertinence to the topic, and effort in providing content. I pull these up every few lectures and we discuss some of the posts.</p>	
Using short, recorded lectures	Fall 2021 - present	GEOG 1000/1500/3080 GEO 1130
Importance	<p>Although I began recording lectures due to the need to pivot to online learning during the COVID 19 pandemic, I continue to do this for all of my classes. Not only do students prefer to digest smaller portions of information due to attention span and time constraints, but this also allows me to lecture more in depth during class and or add hands-on assignments but if I do not get to a topic I can easily add a lecture topic to Canvas. This prevents the course from getting off the schedule. It also allows me to give students who have missed class due to medical reasons lectures to catch up with.</p>	
Innovative/Developments	Dates	Courses

Using Exam Books for daily writing prompts	Fall 2020-present	GEOG 1000/1500/1300/380
Importance	The students use small exam books daily to jot down notes during short interactive assignments during lecture. I usually teach a T/TH schedule of 75-minute lectures. This is too long of a time span for most people's attention. I like to break up the time with meaningful groupwork where students research or discuss a topic just covered in lecture. Every day they put the date and take some time to engage in the lecture. Not only does this give everyone a chance to digest the terms, skills, or concepts in the lecture, but it gives me a chance to see how much they understand and at what level they can express themselves. I use the exam books for participation points as well.	
Innovation/Development	Dates	Courses
Using Mid-Semester Feedback/Check-in Questions	Fall 2022 – Fall 2023	GEOG 1000, GEOG 1500, GEOG 3780
Importance	I adopted Dr. Frazier's idea for asking students 4 main questions concerning the course up to the mid-term. I adopted the practice of having students divide a piece of paper into 4 sections for the answer to 4 questions: 1) what is something you liked about the course so far? 2) what is something you would change about the course? 3) what are four things you have learned in the course so far? And 4) what are you most interested in the remainder of the course? This allows for adjustments before the course is over.	
Innovation/Development	Dates	Courses

Creating an Instagram Account @geographygroves	Spring 2021	Applies to all courses
Importance	The creation of an Instagram course was inspired by readings from the Chronicles of Higher Education. The article supported the idea of having a method that students are familiar with for them to communicate or find smaller chunks of information. I post quizzes about images like “what formed this interesting cloud? For examples or short multiple-choice questions. I do not follow any students, but I do follow sustainable businesses, earth science institutions, etc. that students can also follow for more information on class topics.	

Engaged Learning Strategy	Course	Date
Service Learning	GEOG 1500	Fall 2023
Description	Students studied the benefits and criticisms of a sharing economy defined as a peer-to-peer(P2P) based activity of acquiring, providing, or sharing access to goods and services. Students volunteered to share what they had by providing goods to Upward Veterans, an organization that provides necessities to homeless veterans.	
Engaged Learning Strategy	Course	Date

Community Based Research	GEOG 3080, GEOG 4800	2020 - 2023
Description	<p>Students in GEOG 3080 (Arid Lands), a SUS, designated courses, learned Geographic Information System (GIS) skills to create a geographic analysis of a community issue such as water availability for farming, invasive species, resource depletion etc. The final project culminated in a student poster which was entered into the Sustainability Fair held at Weber State University in the Spring.</p> <p>Students in GEOG 4800 conducted research on the soil quality of the future site of Harmony Ranch Regenerative Farm a local farm in the Ogden Valley. The hopes is to publish the findings within the year</p>	
Engaged Learning Strategy	Course	Date
Undergraduate Research	GEOG 4800	Summer 2021 Fall 2023
Description	<p>A GEOG 4800 student conducted research on the soil quality of the future site of Harmony Ranch Regenerative Farm. The hope is to publish the findings within the year</p> <p>A GEOG 4800 student conducted research at the Records of Environmental Disturbance lab at the University of Utah to determine Loss on Ignition in Utah Lake Sediments (a measure of organic productivity).</p>	

Think Pair Share	GEOG 1000, GEOG 1500, GEOG 1300, GEOG 3780, GEO 1130	Date
Description	Almost every class period, students are asked to think of an example that applies to a lecture topic. They are then asked to write it down and then pair up with another student and share what they have learned. This turns a very quiet classroom into a room full of chatter. Students are then asked to volunteer any interesting examples their partner may have mentioned.	2020-2023
Engaged Learning Strategy	Course	
The use of name table tents	GEOG 1000, GEOG 1500, GEOG 1300, GEOG 3780, GEO 1130	

<p>Description</p>	<p>Every semester students use a piece of cardstock paper to create a name table tent. On the name card students put names on the front. This allows me and other students to address students by their names forming a sense of belonging and community. Students seem more comfortable around each other, and I often hear them say “Alisha’s example” instead of not knowing that person’s name. Students are also encouraged to add their pronouns. On the inside of the name card students write their experience with the subject (i.e. classes already taken including AP in high school, jobs, etc.) I also ask them to list the number of hours that they work or have commitments outside of class. Everyday I hand out the table tents and mark a dot on the inside of the tents whose students are not in class. This gives me an idea of who is continuously missing class and that way I can check in on them.</p>	<p>Annually since Fall 2015</p>
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Engaged Learning Strategy	Course	
Small Group Work-Days	GEOG 1000, GEOG 1500, GEOG 1300, GEOG 3780, GEO 1130	Date

Description	<p>I often have hands on kinesthetic activities for students to work together. For example, in GEOG 1000 students pick a member of a trophic level and then they are asked to move around and find members of their ecological community and then construct a food web. In Meteorology, students work in small groups to go outside and explain meteorological observations for the day. For example – Do the clouds today indicate the arrival of a cold front or warm front? How do you know? Students in the Science of climate chain work in groups to present changes to environments caused by climate change such as increase of rain in storm systems.</p>	<p>Annually, since Fall 2015</p>
Engaged Learning Strategy	Course	

Use of interactive quizzes in the classroom	GEOG 1000, GEOG 1500, GEOG 1300, GEOG 3780, GEO 1130	Date
Description	I have always enjoyed immediate feedback. Students are asked to use their phones to participate interactive quizzes without using their real names. I have used kahoot and quizziz. Quizizz is a simple but very effective multiple choice question system. Students log in with a code and answer questions. If a question has many incorrect answers, I use this time to ask the students why some may have picked the choices that were not correct. This often reveals a common misunderstanding, and I can then fix that right away and avoid any further confusion as we move on and build on the topic.	Annually since 2015
Engaged Learning Strategy	Course	

Field Trips	GEOG 3080, GEOG 4950, GEOG 3780	Date
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Description	<p>I take students to local areas that exemplify the use of methods or provide examples of topics covered in class. For example, for GEOG 3080 (Arid Lands), I have taken students to the Weber Basin River Conservancy District to learn about sustainable plants and water conservation in an arid land environment, I also take them to Harmony Ranch in Ogden Valley to learn about regenerative farming. In GEOG 3070 (Geography of National Parks) students visit Golden Spike National Monument to talk to rangers about park management and learn about employment with the department of the Interior. GEOG 4950 (Field Excursion to Rio Mesa Research Center) students spend 3-4 nights at a University of Utah Research Center to present topics in situ concerning the American South West. They also participate in research, are given lectures, do a community service project, and hike around to appreciate the landscape.</p>	<p>Annually, since Fall 2015</p>
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Engaged Learning Strategy	Course	
Inclusive Teaching Strategies	GEOG 1000, GEOG 1500, GEOG 1300, GEOG 3780, GEO 1130	Date

Description	<p>This strategy ensures students see themselves reflected in course readings, activities and lesson plans. I bring in diverse guest speakers to give a lecture on a niche topic. For example, last semester Dr. Zhao spoke to the climate change class about the psychology of accepting or not accepting scientifically robust data. I also try to make sure that a certain percentage of their required readings are authored by scholars from under-represented populations. I often research examples of women in science, and speak about some of the struggles I had understanding a topic when I was an undergrad.</p>	<p>Annually since 2021</p>
Engaged Learning Strategy	Course	

Use of Current Events to start a course	GEOG 1000, GEOG 1500, GEOG 1300, GEOG 3780, GEO 1130	Date
Description	Every class period, I start off with a current event that pertains to the topic we are covering in class. This reenforces the value of what they are learning and that it is applicable to the real world. In Meteorology, we look at weather reports from local and international stations. This gives the students a sense that the world is a community that often has the same day in and day out concerns and that science is international. They can also see people of different cultures in successful careers.	Annually since 2018

Dr. Alice Mulder

Department of Geography, Environment and Sustainability
Community Engaged Learning in Teaching & Campus/Community Engagement
COMMUNITY-ENGAGED LEARNING (CEL) COURSES TAUGHT

Geography 3060 CEL Environmental Issues: Local to Global Impacts and Solutions. This class first carried CEL attribute in Sp. 2015 (engaged learning component dates to 2007). Students learn about environmental and sustainability challenges as well as solutions and the course has included various CEL elements over the years, including:

- Service hour requirements relevant to sustainability, including a class-based Ogden River research and “Re-Connect to the River” clean-up service project, working with the student leadership in CCEL and Ogden City (F 2021, F & Sp 2022, and upcoming Sp 2024)
- Research and creation of educational posters for the campus community focused on local/regional climate issue and specific solution options (F 2020)
- Service work in the "Empower Ogden" energy efficiency, LED light-bulb exchange program focused on Ogden's East Central neighborhood or an independent, waste-reduction focused applied learning project (F 2019)
- Research and recommendations on campus sustainability initiatives, including air quality, waste reduction/management, composting (working with Sodexo the campus food service provider), and highest impact projects for the Environmental Ambassadors’ use of student sustainability funding (F 2017)
- Collaborative project with a graphic arts class to create a public educational exhibition for the first Engaged Learning Series “Waterworks” (exhibit was in the Union Bridge art space and focused on water issues) (F 2012)
- Collaborative research for creation of a WSU “Green Living Guide” (F 2011)
- Waste audits and recycling education campaign at the Davis campus (F 2007)

Honors 1520 SS CEL, Sustainability: What It Is and How to Do It. Co-taught with Jenn Bodine, WSU Sustainability Manager, and Hal Crimmel, English. Student projects focused on sustainable practices and creating education pieces for the campus connected to the Engaged Learning Series “On Air.” (F 2013, 2016)

Geography 2920 CEL, Sustainability in Thought and Practice. Co-taught with Jenn Bodine. Students researched and created an educational presentation titled “Towards Sustainability: Creating Change Through Choice,” shared at a public event at DaVinci Academy in Ogden. (F 2014)

OTHER CEL STUDENT EXPERIENCES (Not CEL Attributed)

Student Workers in the Sustainability Practices and Research Center. Nineteen students have worked over 8,800 hours since AY 2016 in our office in positions of “sustainability coordinator,” “sustainability communications coordinator,” “engagement coordinator,” and “admin. assistant.” Students plan programs, events, promotions, engage in professional development, and gather data for the university’s Sustainability Tracking, Assessment and Rating System (STARS) reporting. Note, these students’ immediate supervisor and main mentor in the office is Bonnie Christiansen, but I also have worked with these students on various focused projects/events/reporting tasks. (2015-present)

Geography 4990 CRE Senior Seminar. Mentored 17 students through the final research and writing of their primary research projects, each with a focus on understanding place-based issues, e.g., Ogden green spaces and urban heat, non-traditional housing needs, recycling messaging, ground covers and temperature, bike-ability of Salt Lake City. (F 2023)

Geography Field Experience: International Academic Conference on the SDGs - "Why it Matters." Accompanied 19 students to this United Nations Conference held at Utah Valley University and focused on the Sustainable Development Goals. (F 2022)

Geography 4950, Capitol Reef Field Course: Sustainability & Public Lands. Led a class of eight students to explore the park and its past and present inhabitants. Students met with area practitioners in ranching, state park management, and real estate, practiced sustainable living at the Capitol Reef Field Station, shared research presentations in the field, wrote observations and reflections and completed a final research project related to their experience. (Summer 2022)

Geography 4950, United Nations 68th Civil Society Conference Field Experience. Took students for two days from a variety of majors to this UN Conference focused on “Building Inclusive and Sustainable Cities and Communities” held in Salt Lake City, with attendees from around the world. Students attended sessions, wrote reflections on their learning and met for a de-brief after the event. (F 2019)

INVOLVEMENT WITH THE CENTER FOR COMMUNITY ENGAGED LEARNING

Engaged Learning Series Planning Committee Member (2012-2022)

Organized inaugural speaker event featuring Sandra Steingraber focused on water, environment and human health, for what became the Engaged Learning Series “Waterworks.” In subsequent years, led the planning of a sustainability-tied educational event to the yearly theme.

CEL Faculty Fellow, one of a cohort of faculty to learn about community engaged learning pedagogy and practice. (2012)

CAMPUS/COMMUNITY ENGAGEMENT

Solve Climate by 2030/Worldwide Climate/Justice Teach-Ins (2020-2024)

Founder and lead organizer for WSU's engagement with this international initiative from Bard College toward campus and community climate education and engagement in solutions:

- April 2024 (upcoming): Worldwide Climate and Justice Education Week, will feature four Teach-In sessions with 12 faculty presenters on local challenges/local solutions, an eco-poetry jam and climate theater session, student-led educational "Jeopardy" event, and Community Garden hands-on service work
- March 2023: Climate/Justice Teach-In, 140 students, faculty, staff attended four Teach-In sessions (15 faculty presentations from 12 departments), each with a climate presentation and faculty flash talks
- March 2022: Climate/Justice Teach-In, 138 students, faculty, staff and community attended five Climate/Justice Teach-In Sessions with the same format as in 2023
- March 2021: Solve Climate Utah Webinar, 130 attendees
- March 2020: Solve Climate Utah Webinar focused on Utah climate solutions, 178 attendees

Development of SUS (Sustainability) Course Attribute and Yearly Sustainability Across the Curriculum Faculty

Community of Practice (CoP)

- Worked with faculty to successfully propose the creation of the SUS attribute (2019), indicating the inclusion of sustainability-related learning outcomes in courses.
- Engage faculty as lead co-facilitator of SUS CoP each year. Focus is on teaching sustainability, including connecting to local place, diverse perspectives, experiential learning, and use of the SUS attribute for courses (2019-present)

Intermountain Sustainability Summit (oversee the planning and hosting of this event, 2016 to present) The management and organization is by SPARC staff – a total team effort.

- Engages students, faculty, sustainability professionals across the region
- Usually 350-400 participants, 30-50 speakers, keynotes
- Opportunities for student engagement with vendors, organizations and sessions – and our SPARC student workers in the planning and implementation of the event

WSU Sustainability Survey. Research on student, faculty and staff knowledge, attitudes, behaviors and awareness and engagement with WSU Sustainability initiatives and programs (2020 and 2024)

Sustainability Community Programs Offered Through SPARC. *Oversee* these in collaboration with WSU's Energy & Sustainability Office, Utah Clean Energy and others, include residential-solar, electric vehicles, and home energy efficiency through LED light bulbs and smart thermostats (2015-2023)

Weekly Campus/Community Sustainability Series (2015-2021)

Available for-credit (Geography 2920 or 4920) for students, or as a drop-in series for anyone from the campus and community. Variable attendance from a dozen to nearly 70, for some topics.

- Sustainability Snapshots – faculty/staff presentations highlighting sustainability in teaching, application and research (F 2021)
- Climate Change & Culture Shift – speakers, including out-of-state (via Zoom) included practitioners and faculty (F 2020)
- Climate Change & Utah's Future – faculty, students, and practitioners presented (F 2019)
- Shades of Green: Perspectives on Sustainability – faculty presentations from departments across campus (F 2015-F 2018)