

# Existing Program Review Report

**DEGREE PROGRAM:** ENVIRONMENTAL & RESOURCE SCIENCE

**PROGRAM REVIEW CHAIR & COMMITTEE:** LAURA ROSALES LAGARDE, EL HACHEMI BOUALI, & JENNIFER EDMONDS

## I. MISSION STATEMENT

### ***A. Institutional Mission Statement***

At Nevada State College, excellence fosters opportunity. Excellence in teaching leads to innovative, technology-rich learning opportunities that promote the acquisition of interdisciplinary knowledge and skills. Quality, affordable four-year degree programs open the door to career success and an enhanced quality of life for a diverse population of students. Our graduates, in turn, foster the greatest opportunity – the promise of a stronger community and a better future for all of Nevada.

### ***B. Degree Program Mission Statement***

#### MISSION

The Environmental and Resource Science program is designed for students motivated to become experts on how the environment functions through a hands-on approach focusing on specific case studies related to the interactions between human health and the earth's atmosphere, biosphere, hydrosphere and lithosphere.

#### EXCELLENCE

This program will prepare you for a meaningful career and lay the foundation for additional education at the graduate level. You will learn field and laboratory techniques, work with state-of-the-art software, explore authentic research projects, communicate science to a variety of audiences, and network with local and regional professionals.

#### VISION

As a graduate of the ERS program, you will understand the complexity of global environmental issues and be equipped with the skills to creatively solve real-world problems that are fundamental to our lives.

### ***C. Mission Statement Alignment***

The Environmental & Resource Science program is “central to the educational and research mission of Nevada State University.” This interdisciplinary degree focuses on the application of the scientific method in addressing current societal problems. It includes classes utilized by Biology majors and School of Education majors. The program also fulfills general education requirements for many non-science students to complete the Core Curriculum requirements, including ENV 101A/L, GEOL 101A/L, and GEOG 117 classes.

The classes in the ERS major contribute to NSU's current Strategic Plan (2020-25), to the Strategic Plan Addendum and to the NSU 2023 Master Plan Revision by: (1) providing experiential learning experiences that involve students from underrepresented groups in campus community outreach, serving the new majority; (2) providing Curriculum in Undergraduate Research (CURE) classes for high-quality research experiences inside the class curriculum; (3) enabling the presentation of class projects at our Undergraduate Research & Creative Works Conference as showcase experiences; (4) infusing the curriculum and the campus culture with activities that reinforce our commitment to inclusion, equity, diversity and sustainability; and (5) build partnerships through

collaboration with other programs at NSU, colleagues at other educational institutions, local organizations through internships. These outcomes specifically meet NSU’s Strategic Plan goals to:

- “Earn recognition for our instructors’ use of high-impact teaching practices to enable the success of students who are historically under-represented.”
- “Increase student participation in the Undergraduate Research and Creative Works Conference, as well as the number of students at all levels who collaborate with faculty on research projects.”
- “Demonstrating leadership in academic and student support, improving student success for a highly diverse, first-generation student population through innovative and evidence-based practices”
- “Innovate in curriculum and instruction by building socially relevant curricula that anticipate and are responsive to the regional workforce, are transformational in nature, and are committed to developing the whole student”
- “Increase access to classes, and thereby degree completion, by removing barriers to graduation”
- “Improve community engagement and economic development”

## II. INSTITUTIONAL RESEARCH DATA

### A. Student Profile and Success Metrics

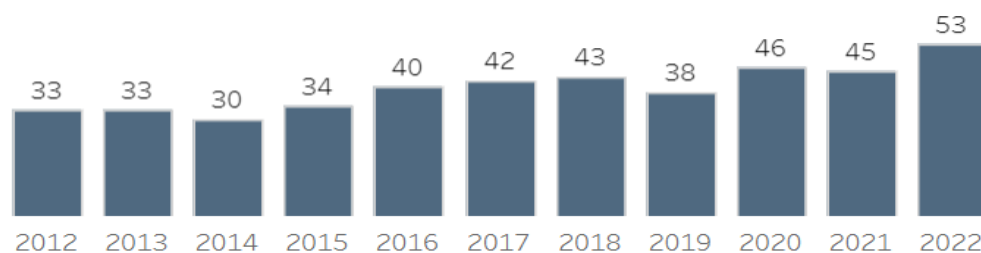
Data source used for this document:

[https://public.tableau.com/app/profile/nevada.state/viz/ProgramEvaluation\\_16766627256030/ProgramEvaluation](https://public.tableau.com/app/profile/nevada.state/viz/ProgramEvaluation_16766627256030/ProgramEvaluation)

The many figures in this section show breakdown and trends of students in the Environmental and Resource Science program based on many different metrics. Overall, trends over the past decade (2012-2022) look promising as the degree program grows in number of students (Figure 1), number of women (Figure 2), and diversity (Figures 3-5), among others.

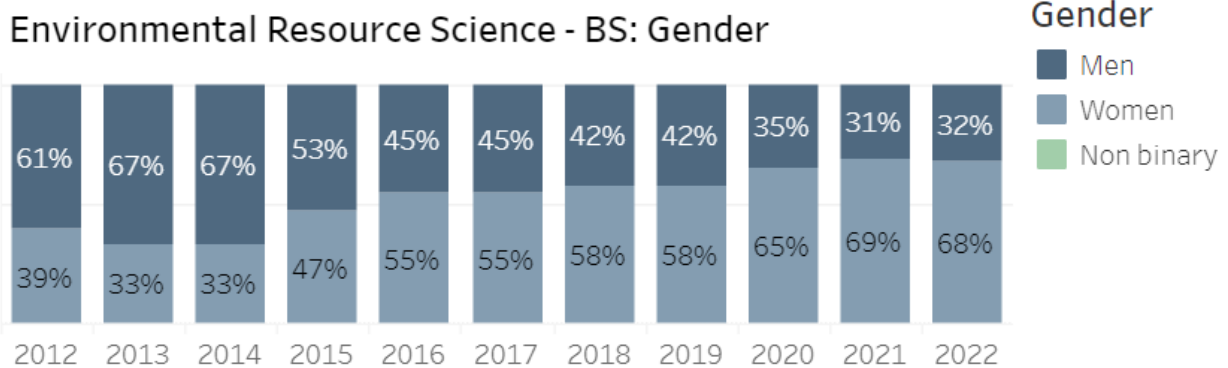
The Environmental and Resource Science program is trending in the right direction. The 2022-2023 academic year marks the first time since its inception in 2003 that the Environmental and Resource Science program will **not** be classified as a “low enrollment program” (one that graduates fewer than 20 students over a three-year period, per the Nevada System of Higher Education). A total of 25 students graduated over the past three years: five in 2020-2021, eight in 2021-2022, and twelve in 2022-2023. There is reason to believe the major will remain out of low enrollment status for years to come, with approximately twelve students projected to graduate in 2023-2024 and at least nine students to graduate in 2024-2025.

Environmental Resource Science - BS



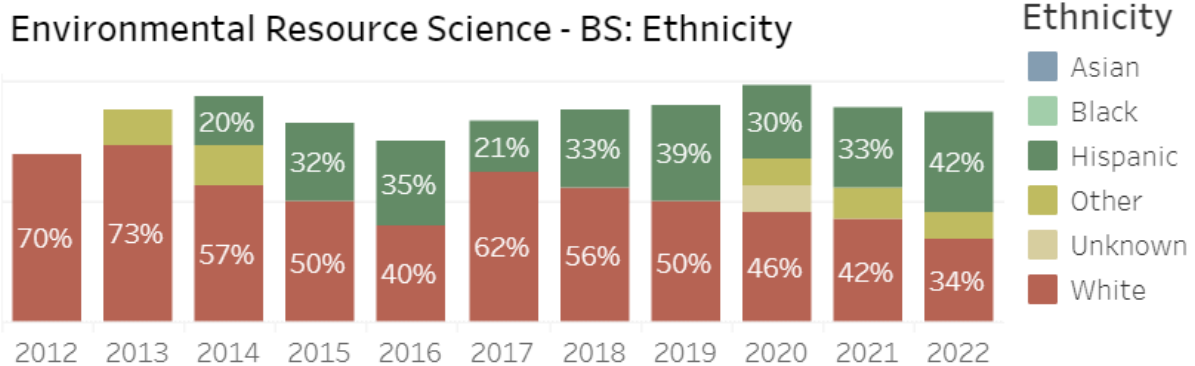
**Figure 1: Number of students declared as an Environmental & Resource Science major each year from 2012 through 2022.**

The program has displayed a consistent and gradual growth over the past ten years. Student cohort size increases approximately every four years: 30-34 majors in 2012-2015, 38-43 majors in 2016-2019, and 45-53 majors in 2020-2022. There were ~59 majors as of Spring 2023.



**Figure 2: Percentage breakdown of gender of students declared as an Environmental & Resource Science major each year from 2012 through 2022.**

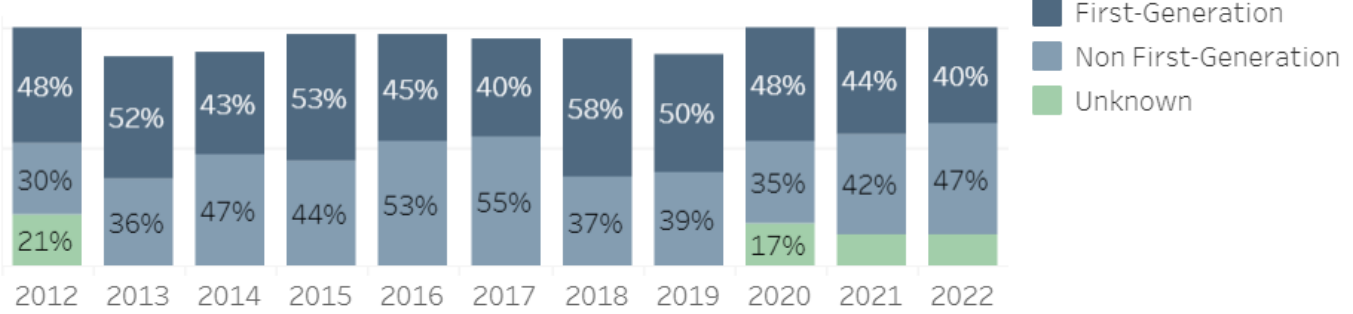
A majority of majors were men from 2012-2015 before a shift in the population to predominantly women from 2016-2022. An increase in the number and percentage of women in the Environmental & Resource Science major reflects the general population at Nevada State College: ~75%-78% of the 2012-2022 student population were women. Thus, women in the Environmental & Resource Science major have historically been unrepresented compared to the college student population. Recently (since 2020), women make up over 60% of the Environmental & Resource Science student population and, most likely, this increase will continue and we expect women to represent over 70% of the population by 2023-2024.



**Figure 3: Percentage breakdown of ethnicity of students declared as an Environmental & Resource Science major each year from 2012 through 2022.**

Diversity, with respect to ethnicity, has increased over the past decade and now more closely resembles the general student population at Nevada State College. For example, the ethnicity breakdown of all degree seeking students at Nevada State College in 2022 was as follows: 42% Hispanic, 26% White, 10% Asian, 9% Black, 8% Other, and 5% Unknown. Ethnicity breakdown of Environmental & Resource Science in 2022 was as follows: 42% Hispanic, 34% White, 11% Other, and no information for the remaining students.

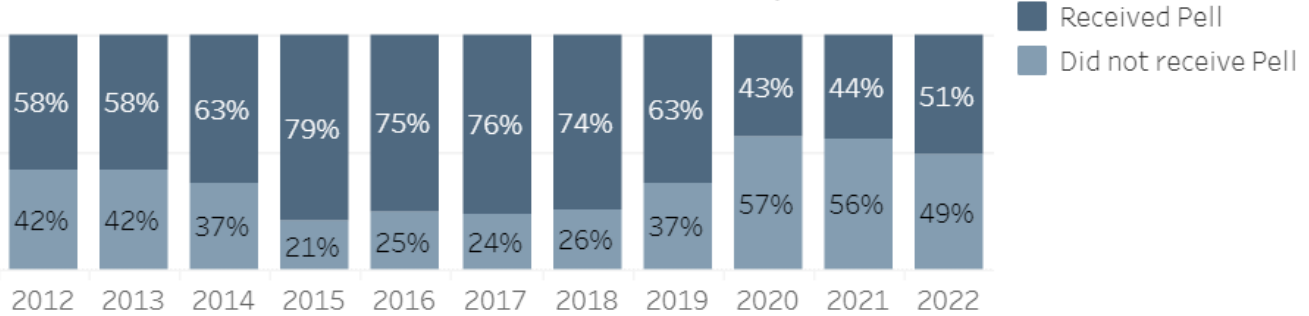
### Environmental Resource Science - BS: First Generation



**Figure 4: Percentage breakdown of first generation students declared as an Environmental & Resource Science major each year from 2012 through 2022.**

Percentage of first generation college students has been relatively consistent over the past decade, fluctuating from 40% to 58% of all Environmental & Resource Science majors. First generation college students made up 46%-51% of the total Nevada State College population, and this program has averaged that percentage between 2012-2022.

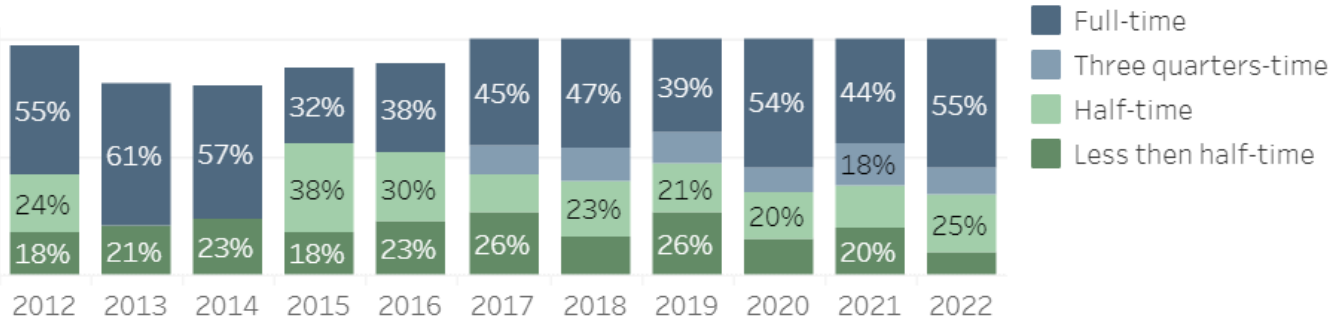
### Environmental Resource Science - BS: Pell Recipient



**Figure 5: Percentage breakdown of students declared as an Environmental & Resource Science major receiving a Federal Pell Grant each year from 2012 through 2022.**

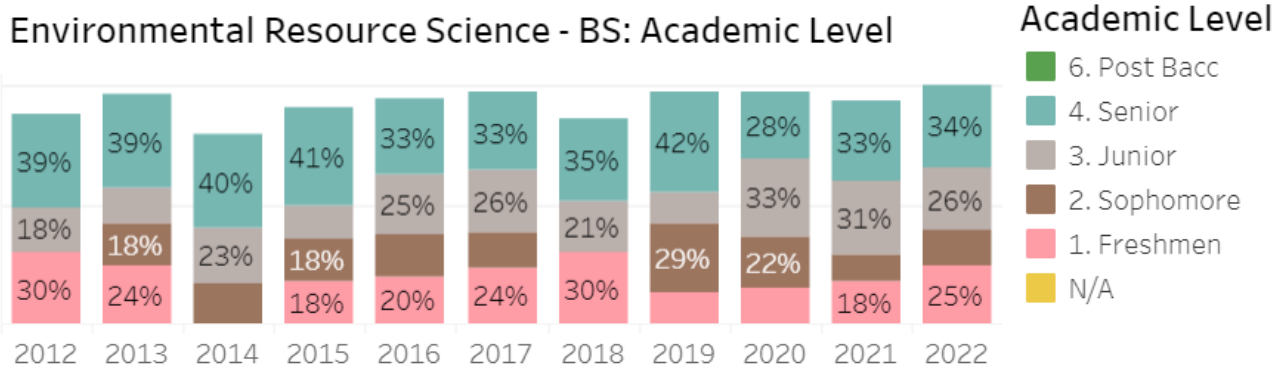
Percentage of Environmental & Resource Science majors receiving a Federal Pell Grant had fluctuated from a high in 2015 (79%) to a low in 2020 (43%). Pell grant recipients made up 47%-55% of the total Nevada State College population during the same time period.

### Environmental Resource Science - BS: Academic Load



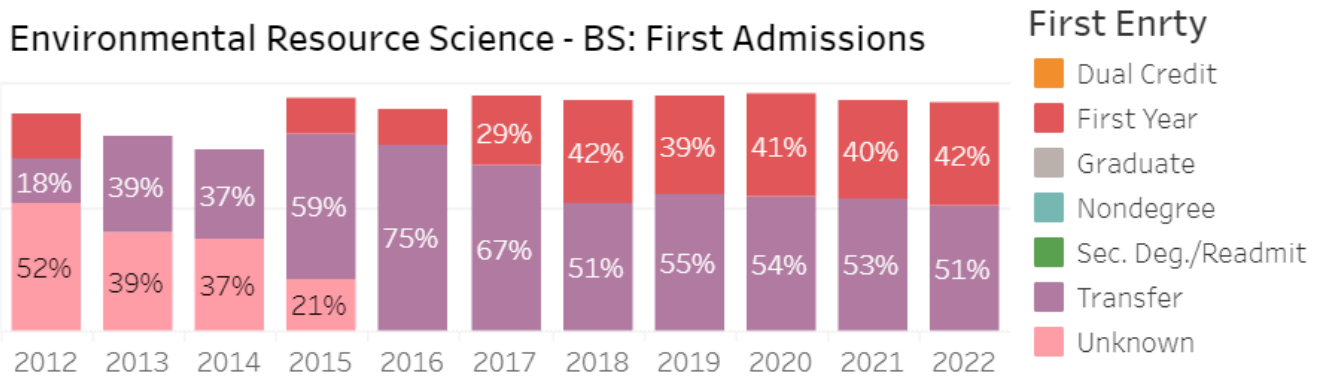
**Figure 6: Percentage breakdown of students declared as Environmental & Resource Science majors based on academic load (full time, three quarters time, half time, and less than half time) each year from 2012 through 2022.**

One parameter that Environmental & Resource Science majors differ greatly from the total Nevada State College population is academic load. Percentage of Environmental & Resource Science majors taking a full academic load has ranged from 39% to 61% between 2012 and 2022, while the percentage of total Nevada State College students taking a full academic load ranged from 29% to 37% during that same time.



**Figure 7: Percentage breakdown of students declared as Environmental & Resource Science majors based on academic level (freshmen, sophomore, junior, and senior) each year from 2012 through 2022.**

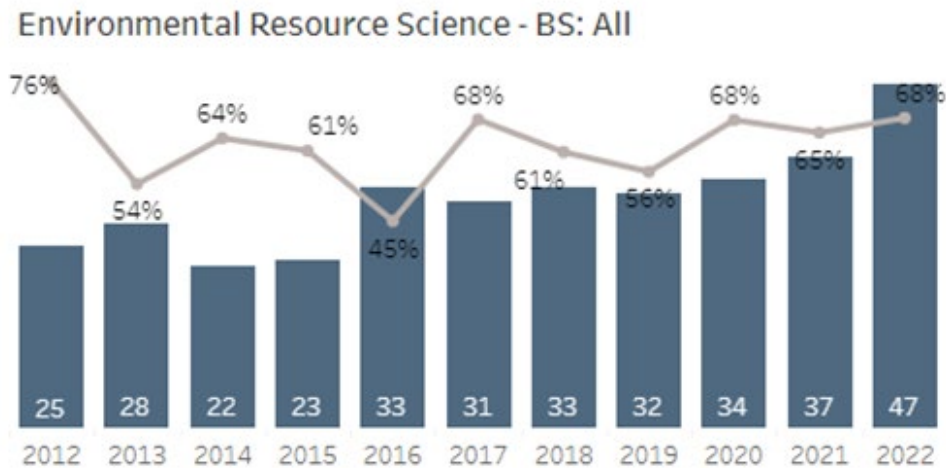
Most Environmental & Resource Science majors are seniors (students with over 90 completed credits) and juniors (students who have completed 60-89 credits) because most majors are transfer students from a community college (see figure below).



**Figure 8: Percentage breakdown of students declared as Environmental & Resource Science majors based on first admission status (first year, transfer, etc.) each year from 2012 through 2022.**

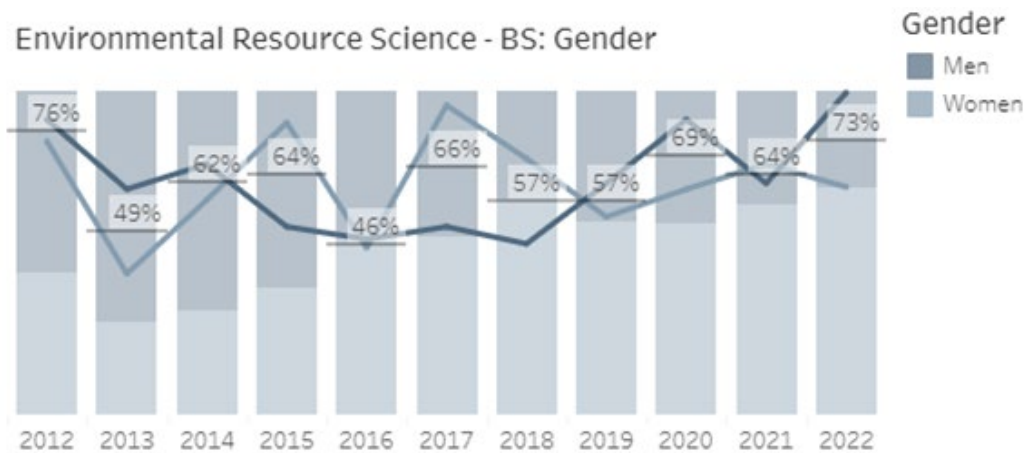
Most Environmental & Resource Science majors are transfer students who have completed coursework at a community college and enroll at Nevada State with at least 60 completed credits. The remaining students are admitted as first year students who have completed high school and are now enrolling at a college for the first time (or at least not bringing previous college-level credits from another institution).

**One-Year Retention Rates**



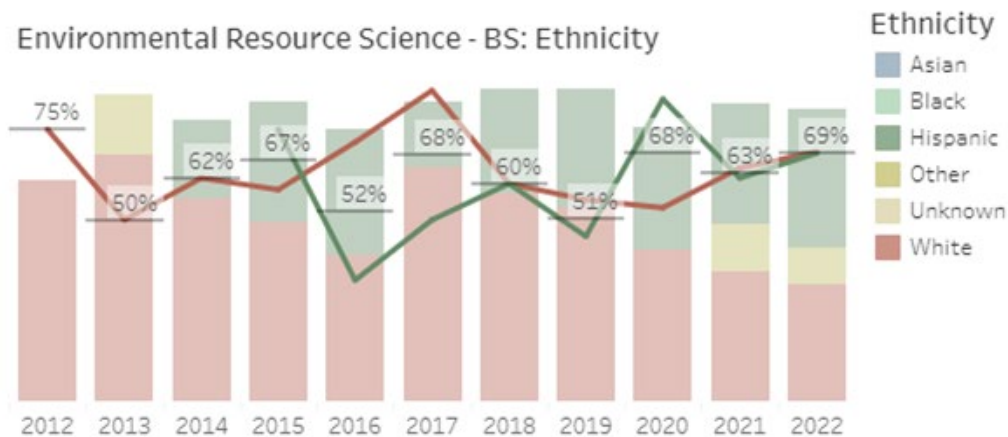
**Figure 9: One-year retention rates for all Environmental & Resource Science students from 2012 through 2022**

One-year retention rates of Environmental & Resource Science students ranged from 45% to 76% from 2012 through 2022. During this same period, one-year retention rates for all students at Nevada State College ranged from 45% to 57%. The only year Environmental & Resource Science retention rates dropped below Nevada State College retention rates was 2016 (45% for the major and 57% for the college).



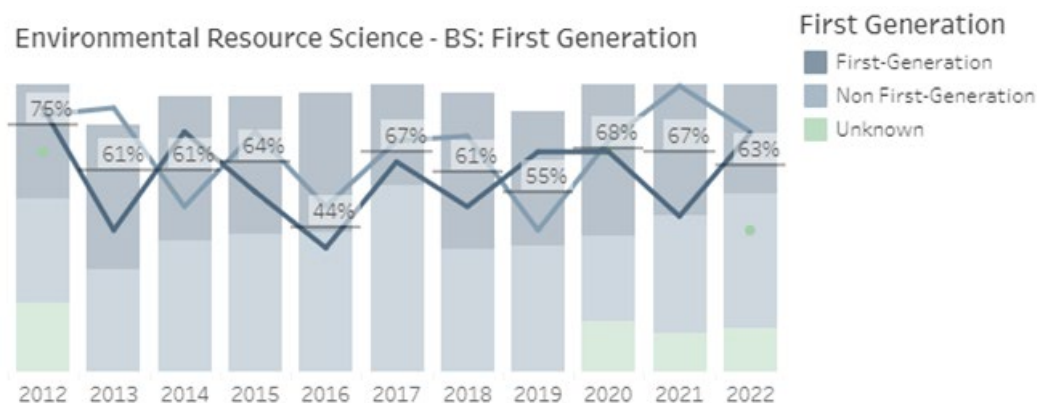
**Figure 10: One-year retention rates for men and women enrolled as Environmental & Resource Science majors from 2012 through 2022. Values show average one-year retention rates across both genders.**

One-year retention rates for women enrolled as an Environmental & Resource Science major ranged from 38% to 82% while for men ranged from 45% to 86%. In comparison, college-wide rates for women ranged from 47% to 57% and for men ranged from 39% to 55%. The wide range in retention rates for Environmental & Resource Science majors is probably due to the relatively low number of students enrolled in the program, among other possible confounding factors (e.g., high proportion of transfer students and part-time/non-traditional students).



**Figure 11: One-year retention rates based on ethnicity for students enrolled as Environmental & Resource Science majors from 2012 through 2022. Values show average one-year retention rates across all ethnicities.**

Average one-year retention rates across all ethnicities of students enrolled as Environmental & Resource Science majors ranged from 51% to 75%. In comparison, college-wide rates ranged from 44% to 57% across the same time period.



**Figure 12: One-year retention rates based on first-generation status for students enrolled as Environmental & Resource Science majors from 2012 through 2022. Values show average one-year retention rates across all groups.**

Average one-year retention rates across three groups—first-generation students, non first-generation students, and unknown—of students enrolled as Environmental & Resource Science majors ranged from 44% to 76%. In comparison, college-wide rates ranged from 48% to 56% across the same time period.

**Table 1: Average total number of credits earned by students at time of graduation. Note: Environmental & Resource Science degree requires 120 credits to graduate.**

Year	Environmental & Resource Science Graduates (Number of graduates)	Nevada State Graduates
2012	136 (<5)	156
2013	152 (<5)	162

2014	190 (6)	162
2015	189 (<5)	160
2016	153 (<5)	157
2017	154 (<5)	156
2018	169 (6)	151
2019	161 (<5)	145
2020	155 (<5)	142
2021	131 (5)	144
2022	154 (8)	141

Table 1 shows the average total number of credits earned by students at the time of graduation for each year between 2012 and 2022. Credits earned by Environmental & Resource Science students fluctuate greatly (minimum: 131, maximum: 190) due to the few students who have historically graduated with this degree.

**Table 2: Six-year graduation rate of students enrolled as Environmental & Resource Science majors by various metrics from 2010 through 2020. (Note: Years 2021 and 2022 are not included as six-year graduation rates seem to be calculated in such a way that they include *future* years and, therefore, the three most recent years are not included in these calculations.)**

Year	Overall	Gender		Ethnicity				
		Men	Women	Asian	Black	Hispanic	White	Other or Unknown
2010	58%	67%	*	*	*	*	67%	*
2011	56%	67%	43%	*	*	*	64%	*
2012	60%	57%	64%	*	*	*	69%	*
2013	57%	50%	75%	*	*	*	60%	*
2014	55%	67%	29%	*	*	*	69%	*
2015	43%	50%	33%	*	*	25%	58%	*
2016	42%	53%	33%	*	*	33%	71%	*
2017	58%	43%	71%	*	*	33%	76%	*
2018	61%	45%	68%	*	*	40%	75%	*
2019	50%	38%	58%	*	*	36%	56%	*



2020	53%	43%	60%	*	*	42%	67%	*
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*\*No data, probably because fewer than five students in this category graduated and, therefore, data are hidden in Tableau.*

Table 2 shows six-year graduation rates of students enrolled as Environmental & Resource Science majors by metrics including gender and ethnicity. Some important take-aways:

- Overall six-year graduation rates ranged from 42% to 61% between 2010 and 2020.
- There were only two years where both men and women had a six-year graduation rate at or above 50% (2012 and 2013). More recently (since 2017), women have a higher graduation rate than men.
- For ethnicity, White and then more recently (since 2015) Hispanic students graduated at a rate to display data in Tableau. Few, if any, Asian, Black, Native American, and Other groups graduated.

**Table 3: Average GPA earned by students at time of graduation.**

Year	Environmental & Resource Science Graduates (Number of graduates)	Nevada State College Graduates
2012	3.1 (<5)	3.5
2013	3.4 (<5)	3.5
2014	3.2 (6)	3.5
2015	3.5 (<5)	3.4
2016	3.3 (<5)	3.4
2017	3.2 (<5)	3.5
2018	3.2 (6)	3.5
2019	3.6 (<5)	3.5
2020	3.4 (<5)	3.5
2021	3.5 (5)	3.6
2022	3.5 (8)	3.6

Table 3 shows average GPA earned by graduates from 2012 through 2022. Generally there is an improvement of GPA over this period, with the four most recent years including GPAs between 3.4 and 3.6.

**B. Programmatic Comparisons**

- *Discuss the unique elements of the program. Discuss the special advantages and/or challenges this program experiences. Compare, if possible, with other programs in the institution or with other institutions.*

1) Need for the program.

The Environmental & Resource Science (ERS) Program is an interdisciplinary degree which focuses on the application of the scientific method in addressing current societal problems providing value to Nevada State University and to Nevada’s community as a whole. Some of the societal issues addressed in this program include climate change, air and

water quality, sustainable use of natural resources, and Urban Heat Island Effect. The program is hosted in the School of Liberal Arts, Sciences & Business, serving besides ERS majors, Biology majors, Human and Health Science majors, Interdisciplinary Studies majors and non-science majors. The ERS program also serves Secondary Education with emphasis in Physical Sciences concentration students in the School of Education.

## 2) Distinct elements of coursework/program. Comparison/relationship to other programs in NSHE

Some of the distinct elements of the ERS program include its scientific approach to address the interactions between the environment and human society, and the need to include diverse perspectives to provide equity, diversity and sustainability as detailed in the program learning outcomes. The curriculum supports a strong science background through biology and physical science courses to understand the surface processes occurring on our planet. Course offerings include a large variety of disciplines, including upper-division classes with Biology, Geology, Geography, and Natural Resources prefixes. Distinct coursework, which is not currently offered as part of other related NSHE programs in southern Nevada includes: Internships, Urban Agriculture, Limnology, Environmental Instrumentation, and Environmental Science Colloquium. The leadership of ERS Faculty in the Sustainability Council permeates into the program course offerings promoting the culture of sustainability between the ERS and other students at NSU.

There are four majors in southern Nevada that are closely related to the NSU Bachelor in Sciences in Environmental & Resource Science (BS ERS) program: a) CSN's Bachelor in Applied Sciences in Environmental Management (BAS ENVMGT) hosted by the School of Physical Sciences and Mathematics, b) CSN's Bachelor in Applied Sciences in Environmental Conservation (BAS ENVC) hosted by the School of Physical Sciences and Mathematics, c) UNLV's Bachelor in Sciences in Earth and Environmental Sciences (BS EAS) hosted by the Geosciences Department, and d) UNLV's Bachelor in Sciences in Urban Studies (BS US) hosted by the College of Urban Affairs. The existence of these four programs in the Las Vegas Valley highlights the perceived need of professionals with Environmental Science expertise. A comparison between these programs is included below.

### Special Advantages of the NSU Bachelor of Sciences in Environmental & Resource Science

The special advantages of the ERS program at NSU results from: a) the small size of the institution, b) the non-prescriptive nature of the major with more diverse class options, c) emphasis on implementing a culture of sustainability spearheaded by ERS faculty, d) the emphasis of its learning outcomes in inclusivity, diversity and equity.

The small size of NSU allows the interaction between students and faculty from different majors promoting a more integral approach to learning science skills. Some examples of these interactions include: collaborations between Biology, Data Sciences, English and Environmental & Resource Science faculty during research projects or the creation of linked-classes. The creation of the Environmental Health and Sustainability Minor also allows Human and Health Science students to take ERS classes.

The non-prescriptive nature of the major allows students who "like everything" to keep exploring different areas of knowledge, providing them with a strong science background. This approach may challenge students' job application skills and confidence if there is a lack of awareness of how to apply the acquired skills into particular fields. This confidence can be built through deeper knowledge in a specific field and reflection on the skills acquired and how they integrate throughout the major.

The faculty leadership to promote a Culture of Sustainability at NSU permeates into the classes taught at the ERS program. Thus, projects focusing on sustainability or awareness about the importance of climate change, equity, diversity and inclusion are included in classes offered to science and non-science majors like ENV 101, GEOL 101, GEOG 117. Urban Agriculture is the only upper-division class that builds on this topic. Including other classes that build on the practice of sustainability, energy, health, climate and food resources could strengthen the program and serve as potential recruitment tools. Faculty with these expertises would be required.

The importance of inclusivity, diversity and equity is reflected in the program learning outcomes and incorporated as Essential Learning Outcomes in some of the classes. An assessment of the alignment between the learning outcomes and the classes will help the faculty and students identify these values, how they are applied, and where they are applied to build awareness of students' learning throughout the ERS Program.

### *Special Challenges of the NSU Bachelor of Sciences in Environmental & Resource Science*

The special challenges that the ERS program experiences at NSU can be related to: a) recruitment and retention, b) accessibility to transportation for field experiences, c) number of physical science classes, d) limited number of faculty.

A continuous recruitment and retention of students in the major are key for the program success. Traditionally the largest pipeline of students result from CSN transfers (**Figure 8**). The BAS in Environmental Management and the BAS in Environmental Conservation at CSN started in 2019 may challenge this pipeline. Building a summer bridge program for high-school students and strengthening the ties to high-school teachers teaching AP classes related to our major could help student recruitment. Working closely with the recruiting office to visit high-schools, with the transfer office at CSN are imperative for the continuous success of the program. ERS faculty have closely followed and communicated with majors to improve students' retention while students are still taking the college requirements. Close-communication with the Advising department will also improve retention.

Transportation to provide students with field experiences is another challenge. Many of the freshmen students recently graduated from high school do not have transportation on their own and rely on the local bus system which can result in commutes of two-hours one way. The lack of accessible and reliable transportation challenges students' participation on in-class field trips, outside of class field trips and sometimes even everyday classes.

Another challenge is posed by the lack of enough of more frequent Physical Science classes that can allow students to pursue their interest in this field. This challenge has been ameliorated by the hiring of a Geoscience faculty who has allowed for more frequent offerings of required classes, thus, classes that were offered every two years are now offered annually. Yet, there is not enough faculty to provide sequential -100, -200, and -300 physical science classes. Students interested in this path may not be able to acquire a strong background to allow them to apply to jobs or pursue further studies in this field.

Currently only two faculty are hired full-time as part of the ERS program. Class offerings provided by Biology faculty strengthen and provide diversity to the teaching approaches to the program. However, big areas of opportunity in environmental sciences are missed due to the limited number of faculty.

### *Comparison between the NSU Bachelor in Sciences in Environmental & Resource Sciences and the CSN Bachelor in Applied Sciences in Environmental Management and CSN Bachelor in Applied Sciences in Environmental Conservation*

The CSN BAS in ENV MGT and the CSN BAS in ENVC are the most similar to the NSU BS in ERS. These CSN programs build on the Associate in Applied Sciences (AAS) in Environmental Management offered at CSN. This 60 credit associate differs only by 7 credits from the core ERS requirements and could offer the possibility to establish a transfer pipeline between CSN and NSU. Students completing the CSN AAS 2-year degree have the option to complete the BAS in Environmental Management or the BAS in Environmental Conservation. The BAS ENVMGT provides a prescriptive course path with a focus on geochemistry and geosciences capped with 6-credits of Undergraduate Research, Independent Study or Senior Thesis which can help students to specialize in a particular field. Additionally, the BAS ENVC provides a distinctive baccalaureate for students to further their environmental conservation technician skills. Similarly, the 6-credits of Undergraduate Research required by the BAS ENVC allows the students to potentially specialize into a particular topic related to conservation.

NSU BS in ERS includes classes in conservation and physical sciences that are included in the BAS at CSN. In contrast to the more prescriptive BAS ENVMGT and BAS ENVC, the upper-division classes in the BS ERS are not as prescriptive, allowing students with more upper-division class choices but requiring advice to define a path that leads to deeper-knowledge in a specific field. As a larger predominantly 2-year institution, CSN can potentially draw from a larger faculty-pool from their School of Physical Sciences and their School of Biological Sciences who may be able to participate in this program. Additionally, they keep field class-size small and have secured transportation to provide more access to these experiences for their students. CSN Associate of Science students have traditionally transferred to NSU. These two BAS at CSN may reduce the number of transfer students to our major.

### CSN Bachelor of Applied Science in Environmental Management

The CSN Bachelor of Applied Science in Environmental Management degree program provides students with a flexible, relevant and current curriculum that includes opportunities for students to demonstrate a depth and breadth of knowledge in environmental theory, technology with experiential knowledge necessary to function as an environmental technician [REF]. Admittance to this program requires to complete the CSN AAS in Environmental Management or program director approval.

This BAS builds on the Environmental Management Associate in Applied Sciences (AAS). This AAS is meant to meet the growing demand for environmental and resource technicians within the natural resource management areas. It emphasizes four areas: biology, chemistry, geology and environmental science.

**Table 4.** Comparison between the CSN AAS in Environmental Management degree and the NSU College Curriculum and ERS Core Courses. The underlined text depicts core classes that are included in both majors. *Text in italics and highlighted indicate courses that are different.* The order in which the courses are listed in the catalog has been changed to ease the comparison between both degrees. Classes in brackets are not stated but are implicit in the CSN catalog. \* Environmental Pollution at CSN AAS is part of the NSU BS ERS Area A Major Elective classes.

CSN AAS in Environmental Management (60 credits)	NSU BS in ERS Core Curriculum & Core Courses
GENERAL EDUCATION REQUIREMENTS (28 credits) Mathematics (6 credits: MATH 126 - Precalculus & MATH 127 - Precalculus II) English composition (3-5 credits) Communications (6 credits) Human Relations (3 credits) Fine Arts/ Humanities/ Social Sciences (3 credits) U.S. and Nevada Constitutions (4-6 credits)  Natural Science (3 credits) <u>ENV 101 - Introduction to Environmental Sciences</u>  CORE REQUIREMENTS (30 credits) <u>CHEM 121 - General Chemistry I</u> <u>[CHEM 121 - General Chemistry I Lab]</u> <u>CHEM 122 - General Chemistry II</u> <u>[CHEM 122 - General Chemistry II Lab]</u> <u>ENV 206 - Introduction to Climate Change</u>  <u>BIOL 190 - Introduction to Cell and Molecular Biology</u> <u>[BIOL 190L - Introduction to Cell and Molecular Biology Lab]</u> <u>BIOL 191 - Introduction to Organismal Biology</u> <u>[BIOL 191L - Introduction to Organismal Biology Lab]</u> <u>GEOL 101 - Geology: Exploring Planet Earth</u> <u>[GEOL 101L - Geology: Exploring Planet Earth Lab]</u> <u>PHYS 151 - General Physics I + Lab</u> <i>Elective (2- 4 credits): CEE 121 - Elementary Surveying or GEOL 220 - Mineralogy or GIS 109 - Introduction to Geographic Information Systems</i> <i>Digital Literacy Elective (0-3 credits)</i> <u>NRES 210 - Environmental Pollution*</u>	COLLEGE CORE CURRICULUM (33- 44 credits) Mathematics (4 credits, up to <u>MATH 181 - Calculus</u> )  English (3-8 credits) Cultural Diversity (3 credits) Humanities (6 credits) Social Sciences (3 credits) Fine Arts (3 credits) Constitution (3-6 credits) Study & Technology Skills (0-3 credits)  Natural Sciences (8 credits) <u>ENV 101 - Introduction to Environmental Sciences</u>  <u>CHEM 121 - General Chemistry I</u> <u>CHEM 121L - General Chemistry Laboratory I</u> <u>CHEM 122 - General Chemistry II</u> <u>CHEM 122L - General Chemistry Laboratory II</u>  MAJOR REQUIREMENTS -ERS CORE COURSES (25 credits) <u>BIOL 190 - Introduction to Cell and Molecular Biology</u> <u>BIOL 190L - Introduction to Cell and Molecular Biology Lab</u> <u>BIOL 191 - Introduction to Organismal Biology</u> <u>BIOL 191L - Introduction to Organismal Biology Lab</u> <u>GEOL 101 - Geology: Exploring Planet Earth</u> <u>GEOL 101L - Geology: Exploring Planet Earth Lab</u> <u>PHYS 151 - General Physics I + Lab</u> <u>ENV 220/ BIOL 220- Introduction to Ecological principles</u> <u>ENV 480 - Geographic Information System for Environmental Management</u> <u>GEOG 117 - Meteorology/ Climatology</u>  <u>STAT 391 - Applied Statistics for Biological Sciences</u>

**Table 5.** Comparison of Upper Division Classes between the CSN BAS in Environmental Management and the NSU BS in Environmental & Resource Sciences. The underlined text depicts classes that are included in both majors. \*Hydrogeology is one of the topics covered in the Principles of Hydrology class at NSU.

CSN Bachelor in Applied Sciences in Environmental Management (BAS ENVMGT)	NSU Bachelor in Sciences in Environmental & Resource Sciences (BAS ERS)
<p>LOWER DIVISION CORE REQUIREMENTS (45 credits) Includes CSN AAS Core requirements (30 credits, <b>Table 4</b>) plus: BIOL 211 - Introduction to Field Biology + lab <b>CHEM 220 - Introductory Organic Chemistry + lab</b> ENV 201 - Environmental Toxicology and Risk Assessment ENV 260 - Environmental Measurement and Analysis + lab</p> <p>UPPER DIVISION REQUIREMENTS (39 credits) <u>BIOL 305 - Introduction to Conservation Biology</u> BIOL 341 - Principles of Ecology CHEM 310 - Environmental Chemistry CHEM 330 - Analytical Chemistry <u>ENV 345 - Environmental Regulations, History, Law, and Methods</u> ENV 360 - Environmental Assessment Methods GEOL 330 - Introduction to Geochemistry GEOL 334 - Environmental Geology GEOL 362 - Principles of Stratigraphy and Sedimentation GEOL 448 - Field Geology I <u>GEOL 474 - Hydrogeology*</u> <u>NRES 322 - Soils</u></p> <p>UPPER DIVISION ELECTIVES (6 credits) BIOL 492 - Undergraduate Research or ENV 492 - Undergraduate Research or GEOL 495 - Independent Study and Research or CHEM 495 - Senior Thesis in Chemistry I and CHEM 496 - Senior Thesis in Chemistry II</p>	<p>MAJOR ELECTIVES AREA A (9-11 credits) <u>ENV 345 Environmental Regulations: History, Law, and Methods</u> <u>NRES 210 Environmental Pollution</u> <u>NRES 304 Principles of Hydrology*</u> <u>NRES 322 Soils</u> BIOL 441 Field Ecology <b>BIOL 472 Limnology</b> <b>BIOL 472L Limnology Lab</b></p> <p>MAJOR ELECTIVES AREA B (12 credits) Any extra classes from Area A BIOL 300A Principles of Genetics BIOL 300L Principles of Genetics Lab <u>BIOL 305 Introduction to Conservation Biology</u> BIOL 319 Vertebrate Biology BIOL 321 Marine Biology BIOL 330 Plant Biology BIOL 330L Plant Biology Lab BIOL 340 Urban Agriculture BIOL 351A Microbiology Lecture BIOL 351L Microbiology Lab BIOL 408 Bioremediation BIOL 415 Evolution BIOL 416 Tropical Ecology BIOL 433 Ornithology BIOL 462 Microbial Ecology) <u>ENV 492 Undergraduate Research (1 - 3 credits)</u> ENV 493 Independent Study (1-3 credits) ENV 494/BIOL 494 Environmental Science Colloquium (1 credit) GEOL 333 Principles of Geomorphology (4 credits) GEOL 405 Geology of the National Parks (3 credits) NRES 360 Environmental Instrumentation (4 credits) NRES 416 Internship (1-3 credits) NRES 432 Advanced Environmental Toxicology (3 credits)</p>

CSN Bachelor of Applied Science in Environmental Conservation

This degree furthers the Association in Applied Sciences in Environmental Management by providing its students with technical expertise in environmental conservation focused on the resource management perspective, as expressed by its outcomes.

This major encompasses many of the biology offerings in the NSU BS ERS major, providing a two semester research focused to deepening specific skills in the area.

**Table 6.** Comparison of Upper Division Classes of the CSN BAS in Environmental Conservation and the NSU BS in Environmental & Resource Sciences. The underlined text depicts classes that are included in both majors. \*Field School in Biology at CSN is likely similar to the Field Ecology class at NSU.

CSN Bachelor in Applied Sciences in Environmental Conservation (BAS ENVC)	NSU Bachelor in Sciences in Environmental & Resource Sciences
<p>LOWER DIVISION CORE REQUIREMENTS (34 credits) Includes CSN AAS Core requirements (30 credits, <b>Table 4</b>) plus:</p>	<p>MAJOR ELECTIVES AREA A (9-11 credits) <u>ENV 345 Environmental Regulations: History, Law, and</u></p>

CHEM 220 - Introductory Organic Chemistry + lab  
 ENV 206 - Introduction to Climate Change  
NRES 210 - Environmental Pollution

UPPER DIVISION REQUIREMENTS (56 credits)  
BIOL 300 - Principles of Genetics  
BIOL 305 - Introduction to Conservation Biology  
BIOL 330 - Plant Biology  
 BIOL 331 - Plant Taxonomy  
 BIOL 341 - Principles of Ecology  
BIOL 400 - Field School in Biology\*  
BIOL 415 - Evolution  
 BIOL 421 - Conservation Biology  
 BIOL 432 - Herpetology  
BIOL 433 - Ornithology  
 BIOL 434 - Mammalogy  
BIOL 492 - Undergraduate Research (6 credits)  
ENV 345 - Environmental Regulations, History, Law, and Methods  
 NRES 310 - Wildlife Ecology and Management  
NRES 322 - Soils  
 NRES 410 - Compliance with the National Environmental Policy Act

Methods  
NRES 210 Environmental Pollution  
 NRES 304 Principles of Hydrology  
NRES 322 Soils  
BIOL 441 Field Ecology\*  
 BIOL 472 Limnology  
 BIOL 472L Limnology Lab

MAJOR ELECTIVES AREA B (12 credits)  
 Any extra classes from Area A  
BIOL 300A Principles of Genetics  
 BIOL 300L Principles of Genetics Lab  
BIOL 305 Introduction to Conservation Biology  
 BIOL 319 Vertebrate Biology  
 BIOL 321 Marine Biology  
BIOL 330 Plant Biology  
 BIOL 330L Plant Biology Lab  
 BIOL 340 Urban Agriculture  
 BIOL 351A Microbiology Lecture  
 BIOL 351L Microbiology Lab  
 BIOL 408 Bioremediation  
BIOL 415 Evolution  
 BIOL 416 Tropical Ecology  
BIOL 433 Ornithology  
 BIOL 462 Microbial Ecology)  
ENV 492 Undergraduate Research (1 - 3 credits)  
 ENV 493 Independent Study (1-3 credits)  
 ENV 494/BIOL 494 Environmental Science Colloquium (1 credit)  
 GEOL 333 Principles of Geomorphology (4 credits)  
 GEOL 405 Geology of the National Parks (3 credits)  
 NRES 360 Environmental Instrumentation (4 credits)  
 NRES 416 Internship (1-3 credits)  
 NRES 432 Advanced Environmental Toxicology (3 credits)

### UNLV Bachelor of Science degree in Earth and Environmental Science (EAS)

The UNLV BS EAS prepares students for careers in the broad fields of environmental and geological sciences, including science education. It allows students to lean on advisors to help them select from a wide range of sub-disciplines within the Earth Sciences including Geology, Geography, and other electives to meet their educational goals and the employment criteria for their chosen profession. This program is similar to the NSU BS ERS in the fact that upper-division courses are not as prescriptive. One lower-division and three upper-division geoscience or physical science classes are the same between both programs. In contrast, the BS ERS electives include a large variety of biological sciences which are not directly offered by the UNLV BS EAS. An increase in the physical science classes in the BS ERS program will strengthen the background and the possibility for our graduates to access geoscience-related jobs available in the Las Vegas Valley and in the state or to continue post-bachelor studies in this field.

The University of Nevada Las Vegas (UNLV)'s undergraduate Bachelor of Science in Earth and Environmental Science (EAS) is a science-based program designed to prepare students for a range of challenging careers in the broad fields of environmental and geological sciences, including science education. The degree program also provides a solid foundation for those looking to pursue advanced degrees in education, environmental studies, public policy, or law. Students in this degree track are accorded the flexibility to work with their advisors in selecting Geology, Geography, and other electives that will best prepare the student to meet their educational goals and the employment criteria for their chosen profession. This degree offers students the opportunity to explore a wide range of sub-disciplines within the Earth Sciences, including: geology, hydrology, soil science,

climate change, natural resource development, and sustainability. Additionally, students can choose to develop critical skills in field-based geologic techniques, remote sensing, and geographic information systems (GIS).

**Table 7.** Comparison between UNLV BS in Earth & Environmental Science and NSU BS in Earth & Environmental Resources. Classes that are included in both majors are underlined. \*Hydrogeology is one of the topics covered in the Principles of Hydrology class at NSU.

UNLV Earth & Environmental Sciences	NSU BS ERS Core Curriculum & Core Courses
<p>GENERAL EDUCATION REQUIREMENTS (33-36 credits)            English composition (6 credits)            Multicultural and International (6 credits)            Humanities and Fine Arts (9 credits)            Social science (9 credits)            Constitutions (4-6 credits)            Distribution requirements (18 credits)            First-year seminar (2-3 credits)            Second-year seminar (3 credits)</p> <p>MAJOR REQUIREMENTS (87-90 credits)            CHEM 121 - General Chemistry I            CHEM 121L - General Chemistry Laboratory I            PHYS 151 - General Physics I            PHYS 151L - General Physics I Lab</p> <p>Writing requirement (3 credits)</p> <p>Required department courses (25-26 credits)  <u>Any GEOL/GEOG 100 level course (4 credits)</u>            GEOL 102 - Earth and Life Through Time            GEOL 220 - Mineralogy            GEOG 335 - Earth Resources and the Environment  <u>GEOL 333 - Principles of Geomorphology</u>  <u>GEOL 474 - Hydrogeology*</u>  <u>GEOG 430 - Geographic Information Systems (GIS): Theory and Applications</u></p> <p>Related Required courses (12-14 credits)            MATH 128 - Precalculus and Trigonometry or MATH 126 - Precalculus I and MATH 127 - Precalculus II or MATH 181 - Calculus I</p> <p>Geology Electives at 200 level or above, with at least 21 credits of additional Geology and Geography 300 level or above - Total Credits: 24</p> <p>Additional Electives in Geology or other topics, at least 13 credits above 300 level -Total Credits: 23</p> <p>Life and Physical Sciences and Analytical Thinking</p>	<p>COLLEGE CORE CURRICULUM (33- 44 credits)            English (3-8 credits)            Cultural Diversity (3 credits)            Humanities (6 credits)            Social Sciences (3 credits)            Fine Arts (3 credits)            Constitution (3-6 credits)            Study &amp; Technology Skills (0-3 credits)</p> <p>Natural Sciences (8 credits)            CHEM 121 - General Chemistry I            CHEM 121L - General Chemistry Laboratory I            CHEM 122 - General Chemistry II            CHEM 122L - General Chemistry Laboratory II</p> <p>MAJOR REQUIREMENTS            -ERS CORE COURSES (25 credits)</p> <p>BIOL 190 - Introduction to Cell and Molecular Biology            BIOL 190L - Introduction to Cell and Molecular Biology Lab            BIOL 191 - Introduction to Organismal Biology            BIOL 191L - Introduction to Organismal Biology Lab            ENV 101 - Introduction to Environmental Sciences  <u>GEOL 101 - Geology: Exploring Planet Earth</u>  <u>GEOL 101L - Geology: Exploring Planet Earth Lab</u>            PHYS 151 - General Physics I + Lab            ENV 220/ BIOL 220- Introduction to Ecological principles  <u>ENV 480 - Geographic Information System for Environmental Management</u>            GEOG 117 - Meteorology/ Climatology</p> <p>Mathematics (4 credits, up to MATH 181 - Calculus)            STAT 391 - Applied Statistics for Biological Sciences</p> <p><u>GEOL 333 Principles of Geomorphology (4 credits)</u></p> <p><u>NRES 304 Principles of Hydrology*</u>  <u>NRES 322 Soils</u></p>

UNLV Bachelor of Sciences in Urban Studie

The UNLV BS US provides students with the conceptual knowledge and technical skills they need to understand and analyze the physical, social, political and economic environment of large and small urban communities. It is focused on the social sciences in comparison with the BS ERS at NSU. The BS ERS and the BS US have in common Geographic Information Systems and Environmental Law and Regulations. Our program can be strengthened by including the social component in its classes to reach the learning outcomes.

The Bachelor of Science in Urban Studies (BSUS) is the degree for individuals desiring to make a difference in their community. The BSUS at UNLV is an undergraduate degree that provides students with the conceptual knowledge and technical skills they need to understand and analyze the physical, social, political and economic environment of large and small urban communities.

Urban Studies at UNLV will equip students with the skills and understanding to address many of the most pressing issues facing society today, and most of them are urban in nature. The curriculum will offer a set of core classes building a dual foundation of urban data analysis and community engagement. Because of the school's belief in a multi-disciplinary approach to learning, Urban Studies students will develop a deeper grasp of specific aspects of the urban environment, including but not limited to economic development, sustainability, governance, or data analytics. Finally, and maybe most importantly, Urban Studies students will have the opportunity to apply skills to meeting community needs and solutions. Students, faculty, and graduates will work in public agencies and a wide range of community-based organizations in the Las Vegas metro region.

This program is available fully online as well as face-to-face.

**Table 8.** Comparison of UNLV Bachelor of Sciences in Urban Studies and NSU Bachelor of Sciences in Environmental & Resource Science. List is an excerpt to highlight classes included in both majors. These classes are underlined.

UNLV BS in Urban Studies	NSU BS in Environmental & Resource Sciences
<p>GENERAL EDUCATION REQUIREMENTS (33-37 Credits)            English composition (6 credits)            Multicultural and International (6 credits)</p> <p>Humanities and Fine Arts (9 credits)            Constitutions (4-6 credits)            First-year seminar (2-3 credits)</p> <p>Mathematics (3 credits, MATH 120- Fundamentals of College Mathematics)</p> <p>Life and Physical Sciences and Analytical Thinking (9-10 credits)            PHIL 102 - Critical Thinking and Reasoning  <u>and two courses from life and physical sciences category; at least one must be a lab.</u></p> <p>MAJOR DEGREE REQUIREMENTS (39 credits)            Second-year seminar (2-3 credits)            GSC 300 - Second-Year Seminar: Civic Engagement in Urban Communities            URST 241 - Governance in the United States: An Urban Focus            URST 301 - Theories of Urban Communities            URST 303 - Introduction to Urbanization &amp; Demography            URST 305 - Data Analysis for Urban Studies            URST 498 - Capstone in Urban Studies</p> <p>Additional courses in Urban Studies - Credits: 21            Select 21 credits from the following list, 12 credits of the 21 credits of Major Electives should be from Upper Division Classes            :  <u>ENV 206 - Introduction to Climate Change</u>  <u>URST 410 - Environmental Policy in Urban Settings</u></p>	<p>COLLEGE CORE CURRICULUM (33- 44 credits)            English (3-8 credits)            Cultural Diversity (3 credits)            Humanities (6 credits)            Social Sciences (3 credits)            Fine Arts (3 credits)            Constitution(3-6 credits)            Study &amp; Technology Skills (0-3 credits)</p> <p>Mathematics (4 credits, up to MATH 181 - Calculus)-</p> <p>Natural Sciences (8 credits)            CHEM 121 - General Chemistry I            CHEM 121L - General Chemistry Laboratory I            CHEM 122 - General Chemistry II            CHEM 122L - General Chemistry Laboratory II</p> <p>MAJOR REQUIREMENTS -ERS CORE COURSES (25 credits)</p> <p>BIOL 190 - Introduction to Cell and Molecular Biology            BIOL 190L - Introduction to Cell and Molecular Biology Lab            BIOL 191 - Introduction to Organismal Biology            BIOL 191L - Introduction to Organismal Biology Lab  <u>ENV 101 - Introduction to Environmental Sciences</u>            GEOL 101 - Geology: Exploring Planet Earth            GEOL 101L - Geology: Exploring Planet Earth Lab            PHYS 151 - General Physics I + Lab            ENV 220/ BIOL 220- Introduction to Ecological principles  <u>ENV 480 - Geographic Information System for Environmental Management</u>            GEOG 117 - Meteorology/ Climatology</p> <p>STAT 391 - Applied Statistics for Biological Sciences</p>



URST 480 - Geographic Information Systems for Socioeconomic Analysis & Environmental Management

General Electives (38-47 credits)

MAJOR ELECTIVES AREA A (9-11 credits)  
ENV 345 Environmental Regulations: History, Law, and Methods

MAJOR ELECTIVES AREA B (12 credits)- *see V. Curricular Information for a complete list of these electives*

### Overall Estimated Comparison

Credit Load	NSC	UNLV	UNR
12 credits	\$2,520	\$3,890	\$3,605
15 credits	\$3,112	\$4,726	\$4,418
30 credits	\$6,225	\$9,452	\$8,837
Estimated cost to complete 120 credits	\$24,900	\$37,808	\$35,348

### Articulation Agreements

The Nevada State Transfer Team oversees the update of our articulation agreements with the College of Southern Nevada every spring. The Transfer Team works in tandem with CSN's Assistant Director of Academic Articulation to maintain and update these agreements for all of the Bachelor of Arts and Bachelor of Science degrees that Nevada State offers. The finalized agreements are posted each summer on the dedicated CSN transfer page of the Nevada State website for ease of student and CSN Academic Advising access. The agreements are produced in the format of a four-year degree map to simplify understanding of the pathway from the student's first semester at CSN to their final semester at Nevada State. This process is carried out in coordination with David Singleton, NSHE Academic and Transfer Policy Analyst.

#### Transfer agreements-CSN- AS Physical Science 60 credits

There is only one transfer agreement established between College of Southern Nevada and Nevada State University. This agreement allows students finishing an Associate in Science in Physical Science to transfer to the Environmental & Resource Science program at NSU. This AS has been an important pipeline to recruit students to our program as shown in **Figure 8**.

There is the possibility to create new transfer agreements with CSN through the general Associate of Science and the AS in Biological Sciences.

## III. FACULTY INFORMATION

### A. Faculty Profiles

Courses with five different prefixes (BIOL, ENV, GEOG, GEOL, and NRES) are included in the Environmental and Resource Science degree. For simplicity, all courses with these five prefixes are included in this sections dataset, although to be clear not all courses with these five prefixes are required or an elective for the major (i.e., GEOG 106 Introduction to Cultural Geography is not required nor an elective). Here is a list of statistics for the faculty who taught courses starting with these five prefixes in Fall 2022:

- 26 different faculty taught classes: 16 were full-time (FT) and 10 were part-time (PT).
- FT faculty taught 73% of class selections while PT faculty taught 27% of class selections.
- Gender breakdown of FT faculty is as follows: 38% female, 62% male. Gender breakdown of PT faculty is as follows: 40% female, 40% male, 20% unknown.
- 69% of FT faculty and 70% of PT faculty were white, while the remaining percentages were too small to report in order to maintain anonymity.

Currently there are five FT faculty that primarily teach courses for the Environmental and Resource Science major. Their Curriculum Vitae are included in the link:

- Dr. Bryan Sigel - [Associate Professor of Biology](#)
- Dr. Jennifer Edmonds - [Associate Professor of Biology](#)
- Dr. Laura Rosales - [Associate Professor of Environmental Sciences](#)
- Dr. El Hachemi Bouali - [Assistant Professor of Geosciences](#)
- Erica Tietjen - [Lecturer of Environmental Sciences and Biology](#)

Part-time instructors teaching required classes in our major in 2023:

- Dr. Sarah VanderMeer- GEOL 101A and GEOL 101L- Exploring Planet Earth Lecture and Lab
- Sonya Wilson- ENV 480 - Geographic Information System for Environmental Management (there is not a full-time faculty teaching this class)

## ***B. Teaching Quality***

- 1) Representative examples of exceptional teaching (e.g., experiential opportunities, field experiences and production courses, high-impact practices)
  - STEM internship advisor (NRES 416/BIOL 399), securing 7 new employers in 2022-23 year, and advising 21 student interns in the last 12 months (Fall '22-Summer 23). Seven student interns have been secured for fall 2023. This mentorship has included extensive effort to help students with preparation of a cover letter and their resume.
  - Multiple class field experiences:
    - ENV 101 Introduction to Environmental Science, BIOL 472 Limnology, BIOL 441 Field Ecology- visit to Springs Preserve, Lake Mead, Clark County Wetlands Park, and Corn Creek Visitor Center in the Desert National Wildlife Refuge, Clark County Museum, etc.
    - GEOL 333 Geomorphology- visit to Harris Springs, Red Rocks, etc.
    - GEOL 101 Exploring Planet Earth - field trips to: Frenchman Mountain, Bootleg Canyon, Clark County Wetlands Park
    - GEOG 117 Meteorology/Climatology class - National Weather Service at Las Vegas- balloon launching
    - NRES 304 Hydrology - measuring stream flow rate at Clark County Wetlands park
  - Optional field experiences opened for all students to:
    - Atwood Preserve in Beatty, NV, to discuss the Oasis Valley ecosystem
    - Colorado River along Black Canyon, overnight canoe trip to map the geology
    - Corn Creek springs in collaboration with CSN faculty
    - Wounded Knee Cave- measuring air temperature and learning about how caves form
    - Sweeney Granite Mountain, University of California Research Station, discuss impacts of humans, biology and geology of the Mojave desert in collaboration with CSN faculty- three days trip
  - Interactions with experts in the field: ENV 494, NRES 304, ENV 101
  - Research projects completed where original data is collected: ENV 101, BIOL 340, BIOL 441, BIOL 472, GEOG 117, NRES 360
  - ENV 101 and GEOL 101 have been writing intensive classes in the past

- CURE experience every time taught, including a formal, journal-style write up: BIOL 340 Urban Agriculture, BIOL 441 Field Ecology
- ENV 494 Colloquium taught by Edmonds- involves discussion of career possibilities, resume development, and interview skills
- Discussion of careers in science where students explore job openings: BIOL 472 Limnology, NRES 416 Internship, NRES 304 Hydrology
- Evidence based discussion of pro and cons of conservation approaches in the BIOL 305 Conservation Biology
- Building and deploying their own open-source data loggers Environmental Instruments in ENV 360, Environmental Instrumentation class
  - a. Project-based classes

2) Selected teaching-focused awards, certificates, and other formal and substantive professional development awarded to the full-time faculty in the program

*Dr. El Hachemi Bouali*

- 2022 Accessibility Integration Summer Course, Center for Teaching & Learning Excellence, June-July 2022, Nevada State College, Henderson, Nevada.
- 2021 Certificate of Effective College Instruction, Association of College and University Educators, completion of 25-module course, September 2020-April 2021, Nevada State College, Henderson, Nevada.

*Dr. Jennifer Edmonds*

- 2019 Teaching Excellence in Physical and Life Sciences, Nevada State University - Dr. Jennifer Edmonds
- Teaching Native Waters, a community of educators and scientists working in service of Indigenous youth: "Deepening Our Knowledge of Soils" online live sessions 5/11/22 through 6/10/22
- AHSIE Alliance of Hispanic Serving Institutes Educators: "14th Annual Best Practices Conference", March 28-30, 2022
- 'Team Nevada' member for nationally produced mini-course created and implemented by ESCALA Educational Services, titled "Moving Towards Serving". Jan-April 2022
- NSC Anti-racist Pedagogy Collective, Summer 2020-May 2022

*Dr. Laura Rosales-Lagarde*

- Completion of the Foundations of Teaching Certificate- Center for Teaching and Learning Teaching Institute, Nevada State College, January 14 2021
- Teaching to Transgress Faculty Learning Community- NSU Center for Teaching and Learning Excellence, Spring 2021
- E-Portfolio workshop- AAC&U conference- Feb 2021
- Developing strategies for Inclusive Teaching Practices workshop and Teaching and learning about feedback loops workshop- Summer 2021- Earth Educators Rendezvous
- Active member of the National Association of Geoscience Teachers

*Dr. Bryan Sigel*

- Association of College and University Educators (ACUE) and American Council on Education (ACE) Certificate in Effective College Instruction (2021)
- Teaching Excellence Award, School of Liberal Arts and Sciences, Department of Physical and Life Sciences (2020)

*Erica Tietjen*

- NSC PEER Advance 2023-24 Scholarship of Teaching and Learning (SoTL) Fellows Program for “A Pathway to Sustainability Thinking: Linking Ecological Education and Literacy Classroom Experiences”; \$1000 stipend
- Completion of the Foundations of Teaching Certificate- Center for Teaching and Learning Teaching Institute, Nevada State College, December 2020

### ***C. Student Evaluations***

- 1) Below are overall student evaluation ratings for faculty teaching courses in BIOL, ENV, GEOL, and NRES. The averages differ for faculty teaching in these disciplines as follows: BIOL classes are averaging between 4.4 to 4.6 (out of 5.0); ENV classes are averaging between 4.2 to 4.6; GEOL classes are averaging 4.6; and NRES classes are averaging 4.3. In regard to quantitative student ratings, a 4.5 average has been Nevada State’s typical standard for excellence in teaching in the LASB Standards of Academe.

## Faculty Ratings

		Spring 2018	Summer 2018	Fall 2018	Spring 2019	Summer 2019	Fall 2019	Spring 2020	Summer 2020	Fall 2020	Spring 2021	Summer 2021	Fall 2021	Spring 2022	Summer 2022	Fall 2022
BIOL	Students	888	295	790	846	251	875	875	149	624	737	322	696	781	255	748
	DFW or I grades	17%	8%	17%	15%	8%	17%	9%	9%	16%	13%	22%	27%	22%	19%	22%
	Instructors	16	9	16	16	8	17	19	6	17	21	13	22	22	12	21
	Instructors (FT)	9	3	6	8	5	11	11	3	11	13	5	11	13	7	14
	Instructors (PT)	7	6	10	8	3	6	8	3	6	8	8	11	9	5	7
	Rating (All)	4.6	4.5	4.6	4.5	4.7	4.5	4.5	4.6	4.4	4.4	4.5	4.4	4.5	4.6	4.5
	Rating (FT) - LD	4.4	4.6	4.4	4.4	4.8	4.5	4.4	4.6	4.2	4.3	4.4	4.4	4.5	4.6	4.4
	Rating (FT) - UD	4.7		4.6	4.6		4.6	4.7	4.8	4.6	4.4	4.8	4.3	4.4	4.8	4.5
	Rating (PT) - LD	4.4	4.6	4.4	4.4	4.8	4.5	4.4	4.6	4.2	4.3	4.4	4.4	4.5	4.6	4.4
	Rating (PT) - UD		4.6	4.6		4.4										
	Rating (In-person)	4.6	4.5	4.5	4.5	4.7	4.5	4.5		4.4	4.4	4.5	4.5	4.5	4.6	4.5
	Rating (Hybrid)					4.8			4.6							
	Rating (Web based)															
	Rating (Online Live)											4.3				
	Rating (Remote Live)											4.5	4.4			
	Rating (Remote Hybrid)															
Rating (Remote Asynch)								4.8	4.4	4.4	4.4	4.5				
ENV	Students	54		78	56		69	45		49	80		124	47		143
	DFW or I grades	6%		13%	21%		14%	24%	0%	24%	11%		8%	4%		6%
	Instructors	2		2	4		4	3	0	4	3		3	2		4
	Instructors (FT)	1		1	2		3	3	0	3	3		2	2		3
	Instructors (PT)	1		1	2		1	0	0	1	0		1	0		1
	Rating (All)	4.4		4.5	3.7		4.5	4.4		4.2	4.6		4.4	4.8		4.2
	Rating (FT) - LD				4.7											
	Rating (FT) - UD				4.9		4.5	4.2		4.5	4.8		4.2	4.9		4.8
	Rating (PT) - LD				4.7											
	Rating (PT) - UD				3.1											
	Rating (In-person)	4.4		4.5	3.7		4.5	4.4								4.0
	Rating (Hybrid)															
	Rating (Web based)															
	Rating (Online Live)															
	Rating (Remote Live)												4.4			
	Rating (Remote Hybrid)									4.2						
Rating (Remote Asynch)																

GEOL	Students	25		34	44			28		31	58		66	35		70
	DFW or I grades	24%		26%	36%			36%		29%	19%		23%	14%		16%
	Instructors	1		1	1			1		1	3		3	3		2
	Instructors (FT)	1		1	1			1		1	2		2	3		2
	Instructors (PT)	0		0	0			0		0	1		1	0		0
	Rating (All)										4.6		4.6	4.6		4.5
	Rating (FT) - LD										4.6		4.7			
	Rating (FT) - UD												4.9	4.9		
	Rating (PT) - LD															
	Rating (PT) - UD															
	Rating (In-person)												4.6	4.6		4.5
	Rating (Hybrid)															
	Rating (Web based)															
	Rating (Online Live)															
	Rating (Remote Live)															
	Rating (Remote Hybrid)															
	Rating (Remote Asynch)											4.7		4.6		
NRES	Students			18	5		17	7		22			20	10		15
	DFW or I grades	0%	0%	11%	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	13%
	Instructors	0	0	1	0	0	2	0	0	1	0	0	1	1	0	2
	Instructors (FT)	0	0	1	0	0	1	0	0	1	0	0	1	1	0	2
	Instructors (PT)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Rating (All)						4.2									4.3
	Rating (FT) - LD															
	Rating (FT) - UD															4.3
	Rating (PT) - LD															
	Rating (PT) - UD															
	Rating (In-person)						4.2									4.3
	Rating (Hybrid)															
	Rating (Web based)															
	Rating (Online Live)															
	Rating (Remote Live)															
	Rating (Remote Hybrid)															
	Rating (Remote Asynch)															

## IV. STUDENT INFORMATION AND ASSESSMENT

### A. Post-Graduate Success

- Provide information about program graduates' success, appropriate to the discipline. This evidence might include, where possible, the number of graduates employed in areas related to the program or pursuing advanced degrees.

This particular program had low response rates for First Destination surveys from graduating students. In the future, we'll need to work on improving response rates from these students or increasing the distribution of these surveys to graduates.

## ***B. Student Learning Outcomes***

- Characterize the abiotic and biotic components and processes of a system at different spatiotemporal scales
  - 1) Identify and describe the quantitative and qualitative properties of key system components (e.g. atmospheric conditions, minerals, landscape elements, flora, and fauna)
  - 2) Define the processes that shape a system
  - 3) Apply an appropriate temporal and spatial scale to the system (e.g. maps, timelines)
  - 4) Relate the components and processes of a system in space and time (e.g., conceptual models)
  - 5) Predict how a disturbance (e.g., climate change) will affect a system
- Qualify and quantify the interactions between human social systems and the environment
  - 1) Identify and analyze how laws, regulations, decision-making, and customs influence the environment
  - 2) Examine how environmental risks unequally impact humans based on racial, social, and economic lines.
  - 3) Describe and evaluate how human activities can contribute to a sustainable system
  - 4) Utilize data to demonstrate the disproportionate health impacts communities of color or low socioeconomic status experience due to environmental factors such as pollution, calling attention to the need for environmental justice
- Design a well-reasoned study to address current issues in environmental science
  - 1) Identify an appropriate research question based on careful field observations and scientific literature
  - 2) Generate multiple hypotheses explaining an observation, citing published literature
  - 3) Design a sampling protocol that generates data, or select an existing data set that can adequately test a hypothesis
  - 4) Use scientific equipment effectively by calibrating for accuracy and recording instrument precision
  - 5) Analyze and interpret data to draw a conclusion and relate findings to a broader context
- Engage in the conversation about environmental issues
  - 1) Identify and critically evaluate evidence, reasoning, common misconceptions, and conclusions about environmental issues (identify limitations and implicit biases)
  - 2) Formulate an informed decision based on information derived from different sources (e.g., coursework, media, peer-reviewed literature)
  - 3) Develop science-based solutions for environmental problems
- Effectively communicate scientific ideas to a diverse audience
  - 1) Recognize, evaluate, and practice different communication modalities
  - 2) Select appropriate style and content and tailor to the audience
  - 3) Provide evidence to support assertions
  - 4) Deliver clear and organized content with a logical flow
  - 5) Distill, synthesize, and communicate complex ideas
- Transform knowledge and skills into personal and career growth
  - 1) Recognize and develop transferable skills and confidence as a scientist
  - 2) Develop practical experience in environmental science
  - 3) Realize a personal connection or role in environmental issues
  - 4) Build the skills and motivation to continue learning
  - 5) Foster a culture of inclusive excellence, promote diversity, and actively demonstrate that everyone belongs in the environmental science community regardless of race, gender, and socioeconomic background.

## ***C. Outcomes Assessment***

- The process of Outcomes Assessment occurs on a bi-annual basis for all degree programs. In October the Dean of the College of Liberal Arts and Sciences, in consultation with area Department Chairs, selects assessment chairs for each program under review, who in turn select a three-person committee of faculty

reviewers. This committee typically consists of three individuals with expertise in the discipline under examination, but often will include a strategically-selected faculty member from outside of the discipline. In broad terms, the committee targets a single learning outcome, randomly selects student “artifacts” (i.e., major assignments) that presumably reflect outcome performance, and then devises a rubric to evaluate the artifacts. The resulting scores and qualitative observations are incorporated into a formal report that describes the strengths and weaknesses of the program and renders suggested revisions. The revisions are implemented and the process begins anew as faculty gauge the extent to which the program has improved.

- Several essential methodological elements enhance the quality and consistency of this process:
  - 1) Outcome alignment: Faculty strive to develop clear, concise learning outcomes that reflect meaningful achievements in the area of study. At the outset of each assessment cycle, faculty also are asked to carefully align these learning outcomes with institutional and school-wide missions and consensus goals of the field. In this fashion, we consistently ensure that each program contributes to larger strategic objectives and maximizes each student’s potential for success in his or her respective field.
  - 2) Clear rubric: Assessment is most effective if the evaluation of student performance is guided by a rubric that minimizes ambiguity by relying on clear, widely understood definitions and rating scales. A rubric is “a predefined scoring scheme to guide the analysis of student performance or artifacts” (Nicholas & Nichols, 2005, p. 110). It is applied as a set of rules for evaluating student performance, and it establishes a criterion by which the student will be deemed successful (e.g., at least a 3 on a 4-point scale). To this end, rubrics “set a common understanding among multiple judges about what represents success in student learning” (Nichols & Nichols, 2005, p. 110). The rubric answers fundamental questions about how student performance will be measured, it discriminates between high and low quality student work, and it helps ensure that our judgments are valid and reliable. In general terms, it does this by clearly identifying several criteria by which a student’s performance can be judged (e.g., relied on empirical data, provided a clear thesis statement, etc.) and then by delineating performance levels for each criterion (e.g., unsatisfactory, satisfactory, proficient, & excellent).
  - 3) Random Sampling: A random and robust sample of student work (referred to as “artifacts”) in this circumstance is our best chance of taking a representative snapshot of NSC student performance, and thereby is most likely to guide improvements that assist a broad proportion of our student population. Moreover, the artifacts selected for analysis are “key assessments” – culminating assignments that are designed to showcase important student knowledge and skills.
  - 4) Value added: For each outcome we assess a sample of student artifacts from lower division classes and a separate sample from upper division courses. In this fashion we can estimate how much progress students have made over time as a result of the quality of the instruction and curriculum in our law enforcement program.
  - 5) Iterative philosophy: Importantly, the act of assessment does not exist in isolation; rather, it is a process that yields recommendations, the implementation of those recommendations, and a follow-up assessment to determine the effectiveness of the changes. At the close of this basic three-stage cycle, the process begins anew, which in many ways is the only response to a constantly evolving discipline and the ever-changing needs of businesses, organizations, and the community.

#### **D. Student Satisfaction**

*Provide evidence of student satisfaction with the program. (May include surveys of current and alumni students, NSSE data, or customized surveys.)*

Data from NSSE student surveys aggregated across the past five (5) years is presented below. Student respondents from the ERS program are compared to Nevada State student respondents from all other programs. ERS students reported experiencing slightly higher levels of effective teaching practices, learning strategy usage, quantitative reasoning, and student-faculty interaction.



Effective Teaching Practices - Amount instructors emphasized student comprehension and learning with clear explanations and organization, use of illustrative examples, and providing formative and effective feedback.	Other	N	1,774
		Score	42.7
		% Diff. from Avg.	0%
	ESBS	N	20
		Score	43.4
		% Diff. from Avg.	0%
Learning Strategies - How often students enacted basic strategies for academic success, such as identifying key information in readings, reviewing notes after class, and summarizing course material.	Other	N	1,702
		Score	41.7
		% Diff. from Avg.	0%
	ESBS	N	20
		Score	47.0
		% Diff. from Avg.	0%
Quantitative Reasoning - How often students engaged with numerical and statistical information across the curriculum, and used this information to reach conclusions, examine real-world problems, and evaluate what others have concluded.	Other	N	1,723
		Score	29.4
		% Diff. from Avg.	0%
	ESBS	N	20
		Score	39.7
		% Diff. from Avg.	0%
Student-Faculty Interaction - How often students had meaningful, substantive interactions with faculty members and advisors, such as talking about career plans, working on committees or student groups, discussing course material outside of class, or discussing their academic performance.	Other	N	1,831
		Score	22.5
		% Diff. from Avg.	0%
	ESBS	N	20
		Score	29.4
		% Diff. from Avg.	0%

***E. Demand for Graduates & Barriers to Success***

*Evaluate the demand for program graduates. Identify barriers to success for graduates if the barriers relate to course offerings, scheduling, and/or staffing at Nevada State.*

### *Demand for Graduates*

The ERS program “meets a demonstrated workforce need,” including “projected future needs of the state or region.” The availability of jobs in the environmental science field has increased and is projected to grow 5% from 2021 to 2031, about as fast as the average for all occupations. Approximately 7,800 openings for environmental scientists and specialists are projected each year to replace workers who transfer to different occupations or exit the labor force, and as demand increases for resources related to environmental hazards and population growth. In the 2022 Las Vegas Global Economic Alliance (LVGEA) Workforce Blueprint, Environmental Scientists and Specialists, including Health, is listed as number 7 among the Top 50 occupations for two-year and four-year programs in Southern Nevada, increasing in ranking from number 42 in 2019. The existence of four majors related to Environmental Science in the Las Vegas Valley highlights the demand for graduates in this field.

### *Barriers to Success*

Despite the need for these professionals, there is not general or public knowledge about the possibility and opportunities provided by an environmental science profession. This is particularly notable in underrepresented population as shown by the lack of diversity in environmental scientists and geoscientists in 2019: 20% underrepresented minorities, less than 40% women, less than 10% black and african americans, and less than 15% hispanics (American Geosciences Institute, 2020) . Due to the broad career paths that our graduates can follow, it is essential to provide them with examples of the possible career paths, as well as to strengthen our graduates' confidence in their own knowledge and skills, including job searching and life-long learning skills for them to be successful. ERS Faculty has built partnerships with local organizations to establish Internships, especially paid opportunities, which can be key for the success of our graduates. Providing more sequential courses in physical sciences will strengthen the preparation of our graduates in this field to be successful applicants to geoscience opportunities in the government, consulting or postgraduate studies.

The table below provides Nevada Department of Employment, Training & Rehabilitation (DETR) data on projected openings, through 2028, for those with an environmental science degree:

Major/Minor	Occupation Code & Title	Base Year Employment	Period		Total Annual Openings
			NV 2018-2028 Long-Term Projections		
			Numeric Change	Projected Employment	% Change
Environmental	192041 - Environmental Scientists and Specialists, Includin	689	127	816	18%
Resource Scie..	251053 - Environmental Science Teachers, Postsecondary	75	13	88	17%

## **V. CURRICULUM INFORMATION**

### ***A. Curricular Strengths & Weaknesses***

- *Provide evidence of curricular strength or weakness. This may include, but is not limited to, pass rates on certification or licensure exams, accreditation or other external review reports, results of exit exams, awards and honors (earned by faculty or students), explanations of course rotations and sequencing, and/or results of satisfaction surveys.*

#### **Curricular Strengths:**

- Strong science background
- Curriculum focuses on surface processes, including the interactions between biological and physical factors
- Broad degree with flexibility of class selection for students
- Hands-on experiences and skills-based that leads to employability
- Internships
- Advising and one-on-one relationship with students

- Collaborations between faculty teaching in other programs, including Biology, Data Science, and Health Sciences

Curricular Weaknesses:

- Competition between classes contained in Major Electives- List B tend to reduce the number of students per class, thus the low-enrollment may prevent the class to be offered and decrease the reliability of the offering of upper-division electives. This can result in barriers for students' graduation
- The lack of concentrations or curricular guidance challenges dipping deeper into a specific subject which may weaken students resume and prevent building their confidence in a specific field, despite the broad background knowledge provided by the major [Students have a 200-level knowledge of everything and a 400-level knowledge of nothing]
- Course offerings - historically limited due to the number of faculty. Hiring of a Geoscience professor in August 2019 improved course offerings. However, there is not enough faculty to reliably teach sequential -200, -300, and -400 level physical science classes. More faculty will allow the program to include sequential physical science classes that will open more job opportunities for our graduates.
- Limitation of the number of students who can complete either capstone courses, undergraduate research, or independent studies which can help to integrate student's knowledge

Classes required for the program (as of the 2022-2023 academic year):

- College Core Curriculum (33-44 credits)
- Major Requirements
  - Environmental and Resource Science Core Courses (25 credits)
    - BIOL 190A Introduction to Cell and Molecular Biology Lecture (3 credits)
    - BIOL 190L Introduction to Cell and Molecular Biology Lab (1 credit)
    - BIOL 191A Introduction to Organismal Biology Lecture (3 credits)
    - BIOL 191L Introduction to Organismal Biology Lab (1 credit)
    - ENV 101 Introduction to Environmental Science (3 credits)
    - ENV 220/BIOL 220 Introduction to Ecological Principles (3 credits)
    - ENV 480 Geographic Information System for Environmental Management (4 credits)
    - GEOG 117 Meteorology/Climatology (3 credits)
    - GEOL 101A Exploring Planet Earth Lecture (3 credits)
    - GEOL 101L Exploring Planet Earth Lab (1 credit)
  - Related Math/Science Core Requirements (7 credits)
    - PHYS 151A General Physics I Lecture (3 credits)
    - PHYS 151L General Physics I Lab (1 credit)
    - STAT 391 Applied Statistics for Biological Sciences (3 credits)
  - Major Electives List A (9-11 credits)
    - ENV 345 Environmental Regulations: History, Law, and Methods (3 credits)
    - NRES 210 Environmental Pollution (3 credits)
    - NRES 304 Principles of Hydrology (3 credits)
    - NRES 322 Soils (3 credits)
    - BIOL 441 Field Ecology (4 credits)
    - BIOL 472 Limnology (3 credits)
    - BIOL 472L Limnology Lab (1 credit)
  - Major Electives List B (12 credits)
    - Any extra classes from Area A
    - BIOL 300A Principles of Genetics (3 credits)
    - BIOL 300L Principles of Genetics Lab (1 credit)
    - BIOL 305 Introduction to Conservation Biology (3 credits)
    - BIOL 319 Vertebrate Biology (4 credits)
    - BIOL 321 Marine Biology (3 credits)

- BIOL 330 Plant Biology (3 credits)
- BIOL 330L Plant Biology Lab (1 credit)
- BIOL 340 Urban Agriculture (4 credits)
- BIOL 351A Microbiology Lecture (3 credits)
- BIOL 351L Microbiology Lab (1 credit)
- BIOL 408 Bioremediation (3 credits)
- BIOL 415 Evolution (3 credits)
- BIOL 416 Tropical Ecology (3 credits)
- BIOL 433 Ornithology (3 credits)
- BIOL 462 Microbial Ecology (3 credits)
- ENV 492 Undergraduate Research (1-3 credits)
- ENV 493 Independent Study (1-3 credits)
- ENV 494/BIOL 494 Environmental Science Colloquium (1 credit)
- GEOL 333 Principles of Geomorphology (4 credits)
- GEOL 405 Geology of the National Parks (3 credits)
- NRES 360 Environmental Instrumentation (4 credits)
- NRES 416 Internship (1-3 credits)
- NRES 432 Advanced Environmental Toxicology (3 credits)
- NRES 467 Regional and Global Issues in Environmental Sciences (3 credits)
- NRES 480 Independent Study (1-3 credits)
- NRES 485 Special Topics in Environmental Science (1-4 credits)
- NRES 485L Special Topics in Environmental Science Lab (1 credit)
- Upper Division Electives (16-18 credits)

## ***B. Program Improvement***

### **Program Assessment**

The College is exploring an overhaul to our assessment system, but currently we incorporate two primary modes of assessment, with one emphasizing a deeper analysis of student learning (the Nichols method; Nichols & Nichols, 2005) and the other complementing this approach with a broader look at program elements. The former method is referred to as "Outcomes Assessment," (section IV.C. of this report) and the latter is identified as "Program Assessment." In the years between the biannual Outcomes Assessment, faculty examine programs at a broader level. This type of assessment includes a comprehensive report from Institutional Research of the program's "vital signs" (e.g., enrollment, retention, and graduation trends) as well as another method that is tailored to the unique needs of the program. To this end, faculty have implemented program assessments that include audits of assignment quality, student surveys of the program, alumni surveys, and reviews of syllabi across the curriculum.

As a result of the assessments the program learning outcomes were revised in 2019 to assure they allow us to assess student's learning in both biology and physical science classes. The 2019 learning outcomes were successfully used for the first time in 2022 to assess student's progress between lower- and upper-division classes. Direct inclusion of the learning outcomes on the program required classes will provide a map to know which and where the learning outcomes are met or build on.

## VI. EVALUATION OF RESOURCES

### A. Library Resources

- The Marydean Martin Library is an 8,000 ft<sup>2</sup> facility in the Rogers Student Center that provides 16 desktop computers (with additional laptops for loan), seating for 174 students, 14 collaborative work spaces, and in-person assistance with research and technology questions. The Library's collections model emphasizes easy discovery and retrieval of materials in a wide variety of formats. The Library provides access to approximately 100,000 journals and serials, 1.5 million e-books, and 10,000 streaming video and audio materials. The predominately digital collection allows for easy remote access to the majority of the library collection. Within Canvas (the campus LMS), instructors can easily link to appropriate library resources.
- Library staff regularly monitor statistics on the use of online information resources, including cost effectiveness and patterns of use. Periodically, subscriptions are canceled or added in order to adjust to the addition or growth of programs and to the research and teaching needs of new faculty. Interlibrary Loan data are regularly examined to determine the items that are most frequently requested and to make purchasing decisions accordingly.
- Academic journals are among the most important resources for our students and faculty, and the NSC library provides access to key databases in the field. These include all the databases provided on this link: <https://nsc.libguides.com/environment>.

### B. Computer Resources

- The Office of Information & Technology Services (ITS) maintains and supports computer labs, general-use workstations, and kiosks. NSC provides approximately 470 student workstations that offer access to the internet, printing, Microsoft Office, and specialized software such as SPSS and Adobe Creative Suite. Additional equipment is available for checkout at the library, including laptops, Chromebooks, iPads, Kindle readers, and video cameras. A student technology fee is allocated annually to support a 5-year replacement plan for all classroom, lab, and general-use student workstations. This replacement plan ensures that student workstations are never more than 5 years old. The technology fee also supports upgrades to classroom audio/visual systems, software, and infrastructure.
- Each full-time employee is provided with at least one desktop workstation or laptop and resources such as the internet, network file storage, printing, Microsoft Office, and, as needed, specialized software such as Camtasia, SPSS, or the Adobe Creative Suite. Laptops, tablets, and projectors are available for checkout. All campus workstations, including those in open computer labs and spaces, are available for use by NSC faculty and staff. Funds are allocated annually to support a 5-year replacement plan for all faculty and staff workstations.
- ITS maintains a wide area network in all buildings across the main campus. The internal core network runs at 10 Gb/s with 1 Gb/s connectivity to end devices. Both a guest and secured wireless connection is available at all facilities to provide connectivity for mobile devices. Internet connectivity for the campus is provided by the NSHE's statewide network, NevadaNet, providing speeds of up to 10 Gb/s.
- NSC's data center infrastructure consists of a Nutanix virtual server environment. This infrastructure supports over 70 virtual machines running on 4 physical hosts with approximately 50 terabytes of disk storage. Server infrastructure equipment is configured with multiple layers of redundancy and is housed between two campus data centers. Data center, core network, and telecommunication infrastructure is refreshed on a 10-year replacement cycle.
- NSC takes a cloud-first approach for enterprise applications in order to reduce staffing needs and eliminate the costs for acquiring, maintaining, and upgrading hardware and software. Through a single sign-on online campus portal, NSC's enterprise applications are accessible 24/7 from anywhere in the world. This provides faculty, staff, and students with access to electronic resources to support management and operational functions, academic programs, and support services, wherever offered and however delivered.

### **C. Facilities & Instructional Equipment**

- While NSC has expanded its physical facilities significantly in recent years, securing sufficient space continues to be a challenge, given the College's rapid growth. Current facilities are adequate to meet current demands for instructional space, employee offices, and other uses. Program growth will require additional space for classrooms, science labs, research facilities (including equipment and materials storage), employee offices, and open spaces for studying and student activity.
- Every classroom at NSC is configured as a smart classroom with instructor workstations, projection systems, wireless connectivity, document cameras, and interactive touch devices that permit instructors to write digitally on a board or computer monitor. Over 40% of classrooms have lecture capture systems that allow instructors to record lectures, demonstrations, and clinical simulations. Video conferencing is available through online conferencing tools such as BlueJeans, Microsoft Teams, and Zoom. The campus has adopted Canvas as the learning management system.
- The Office of Instructional Technology has invested in in-person and online training opportunities and online technology workshops and real-time instructional resources. This ensures that faculty can receive the type of training that best fits their preferences, needs, and skills. Web-accessible resources ensure that course design and development assistance is available wherever faculty need it. Instructional Technology and Center for Teaching and Learning Excellence (CTLE) staff provide one-on-one consultations on course development, instructional design strategies, assessment methods, course communication, online course management, and the use of media and live lecture materials.
- NSC provides laboratory equipment that makes learning relevant to current industrial standards as well as future trends. The Environmental & Resource Science program shares laboratory space with the Biology, Human and Health Science and Chemistry programs. A classroom was retrofitted as a lab with a sink and a sediment trap in spring 2023 to serve as teaching space for Biology and Environmental & Resource Science classes. Biology lab spaces are outfitted with equipment such as table-top refrigerated centrifuges, heated incubators, a deionized water station, and multiple classroom sets of high-end Motic digital microscopes with the capability to function with cameras. The College has two fluorescent microscopes, including one compound and one inverted microscope. Chemistry labs have eight dual-sided fume hoods with workstations that allow 32 students at a time to work safely. For lab preparation, two autoclaves, a large industrial dishwasher, two -80-degree Celsius freezers, three -20-degree Celsius freezers, and three 4-degree Celsius refrigerators are available. The College has four Beckman Coulter PA800 capillary electrophoresis machines, an Amnis imaging flow cytometer that performs high-throughput cellular microscopy and standard flow cytometric spectral analysis of cells, and a high-capacity Sorval Legend XTR centrifuge capable of spinning flow cytometry tubes. Molecular research uses both a Nanodrop spectrophotometer and a Qubit system for nucleic acid quantification, as well as multiple centrifuges, gel-rigs, and transilluminators for nucleic acid extraction, amplification, and visualization, including a LiCor imaging system. A Bio-Rad CFX96 Real-time System is available for quantitative PCR reactions, while a COY anaerobic chamber is used for culturing and measurements taken under anoxic conditions. Similar investments have been made for chemistry; NSC owns powerful high-performance liquid chromatography (HPLC) and gas chromatography (GC) instrumentation, a mass-spectrometer, ultraviolet-visible (UV-Vis) spectrophotometers, a HORiba FluoroMax 4 scanning fluorometer, an infrared (IR) spectrophotometer, and a PicoSpin Nuclear Magnetic Resonance (NMR). The College maintains two biological biosafety hoods and has a designated BSL2 laboratory. Environmental & Resource Science has available a Raspberry Shake Seismometer, a Davis Weather Station, and a Virtual Sandbox.
- Field instrumentation includes a YSI sonde, YSI Pro ODO meter, HACH HQ11D conductivity/pH probes, HACH DR1900 field spectrophotometer, and a Marsh McBirney Flo-Mate 2000. Field collection methods include 2 Malaise traps, a field-spotting scope, 30 pairs of binoculars, a soil auger, a soil hydrometer, a portable weather station, soil temperature probes, carbon dioxide, relative humidity and temperature monitors, and handheld GPS devices. Two portable heat sensors and bat-call detection devices are used with phone apps for data collection. Faculty also have access through collaboration with the Desert Research Institute to a FieldSpec 3 Spectroradiometer for field measurements of object spectra. Two GETAC tablets with hard casings to facilitate digital field mapping

#### ***D. Non-academic Services***

- **Academic Advising**

Since 2013, the Academic Advising Center has nearly quadrupled its number of professional Advisors from three to eleven, restructured the center to establish a Director of Advising, and created two additional leadership positions within the office, the Associate Director of Academic Advising and Student Success Initiatives, and the Advising and Completion Manager. Equipped with these resources, the AAC has been integral to the implementation of several NSHE projects (e.g., 15-to-Finish; continuous enrollment in gateway math and English) and has enforced semester-by-semester mandatory advising for all degree seeking students with fewer than 90 credits.

This substantive investment in a comprehensive model of advising reflects both our commitment to student success and our belief that close guidance and mentorship can help our students achieve their highest potential. Owing to this expansion in capacity, the AAC assumed a number of key responsibilities, including oversight of our 15-to-Finish campaign, and continuous enrollment in college math and English. Moreover, to increase the probability of student success, mandatory advising is applied to specific populations and enforced through registration holds. The presence of a hold and the need to meet with an advisor are communicated to students via email and through a notification in PeopleSoft.

The AAC has established a team model where advisors serve on one of three advising teams: Liberal Arts, STEM (including Pre-Nursing), and Education/Pre-Education/Pre-Speech Pathology. The team model allows students to receive timely advising appointments. Each advisor is responsible for advising students on matters related to their academic success, including academic standing, Satisfactory Academic Progress for financial aid recipients, and adherence to NSHE policies related to remedial math (see NSHE Handbook 4.16.1). Advisors at all levels understand that a high proportion of our students come from nontraditional, first-generation backgrounds, and they remain vigilant in directing students to resources and experiences that may be unfamiliar to our students (e.g., supplemental instruction; the importance of research experience for those planning to apply to graduate school).

- **Academic Success Center**

The Academic Success Center (ASC) provides academic guidance and enhanced learning skills through peer-to-peer support and evidence-based initiatives, while leading students toward independent learning. The ASC provides free in-person and online tutoring services to all enrolled students. Online tutoring services are available 24 hours a day, 7 days a week, and through a concerted marketing effort, usage of these services has increased substantially. The ASC works with faculty to ensure tutors have access to key course materials (syllabi, lecture slides, etc.) that assist tutors in designing tutoring sessions and ensure consistency in the information students receive. The ASC also provides embedded peer-led Supplemental Instruction and conducts metacognition and learning strategy workshops for College Success courses.

- **Disabilities Resource Center**

The Disabilities Resource Center (DRC) provides eligible students with accommodations and services. The DRC recently implemented an online case management program that allows for more efficient and easier tracking of all DRC notifications and documentation. The DRC Director has also increased students' access to assistive technologies such as Read & Write, which is available to all NSC students for free. DRC staff train DRC students on how to use these assistive technologies, which can greatly enhance their academic success.

- **Student CARE Team and Counseling Services**

The Student Concern, Assessment, Referral, and Education (CARE) Team promotes students' wellbeing and success. The CARE Team consists of a full-time case manager, faculty representatives from each school, and staff members from key units (e.g., Financial Aid, the Academic Advising Center). Faculty and

staff may refer any student who is in distress or otherwise poses a concern, and students may also self-refer. The CARE Team connects students with resources such as advising and tutoring; it also manages a food pantry and donated funds that can be used to cover emergency costs, psychological or disability assessments, or other needs. The College contracts with a private mental health provider and also employs one full-time staff member to offer free on-campus mental health services. Students receive several free sessions, and if longer-term therapy or other services are required, the case manager works with the student and recommendations from the therapists to connect the student with providers in the community who are covered by their insurance or accept sliding-scale fees.

- **Career Services Center**

The Career Services Center (CSC) organizes career fairs, mock and real interviews, resumé reviews, and other workshops that help students prepare for the job market. The CSC also offers students the opportunity to search for jobs through Handshake.

- **Financial Aid**

Financial aid programs at Nevada State College are directly aligned with our mission. Information about available financial aid programs is published on the NSC website and is discussed extensively at New Student Orientation. In addition to face-to-face and phone counseling, the Office of Financial Aid engages in extensive outreach to campus promoting financial aid and scholarship opportunities, and periodically conducts workshops on financial management and minimizing indebtedness. NSC provides each student with a membership to Financial Awareness Basics, an online, interactive financial literacy program maintained by the Educational Credit Management Corporation (ECMC). A library of topical videos and a chatbot also are available through Financial Aid TV (FATV) on the NSC website.

Generally, the number of aid packages has kept pace with our enrollment growth. Additional insight comes from an examination of the aid granted to IPEDs students, which can be compared to the data for our peer institutions. These data show that, starting in 2012–13, a greater proportion of NSC’s first-year full-time students have received grants than those students at our comparison institutions (Figure 4B-7), with over 80% of our incoming IPEDs cohort receiving grant aid in every year of this accreditation cycle.

While DACA/undocumented students are not eligible for federal financial aid, they do qualify for some state and institutional scholarships if they graduated from a high school or community college in Nevada. NSC also partners with TheDream.US to provide scholarships to undocumented students.

## VII. INFORMATION PROVIDED BY THE DEAN

### *A. Discipline-Specific Accreditation Status*

N/A

### *B. Resource Analysis*

Necessary resources specific to the ERS program have been noted at various places in the self-review above and in the final summary below. The following resources appear to be a priority:

- Many requested or suggested resources center on field experience for students in the ERS degree. For example, facilitating the accessibility of vans or transportation to make field trips accessible for everyone is noted. Securing additional field equipment such as camping gear would also benefit our students. Finally, improving the availability of storage space for field equipment would also be necessary.
- Designate a space for an environmental monitoring station where students can learn how to monitor changes in the environment using their recently acquired skills
- Share the cost of maintenance of the NSU Living Garden.



- Improve the accessibility of equipment to teach digital mapping skills, data collection, management and analysis. This will allow for an integral understanding of a particular environment, including its biological, physical and social characteristics.

While NS has expanded its physical facilities significantly in recent years, securing sufficient space continues to be a challenge, given the University's rapid growth. Current facilities are adequate to meet current demands for instructional space, but space is very limited for faculty and staff offices. Program growth will require additional space for classrooms, science labs, research facilities (including equipment and materials storage), employee offices, and open spaces for studying and student activity.

### **C. Student Success Data**

Summaries of student success data are thoroughly detailed in the sections above. General trends over the past ten years look promising as the degree program grows in number of students, number of women, and diversity. The 2022-2023 academic year marks the first time since its inception in 2003 that the ERS program will not be classified as a "low enrollment program." A total of 25 students graduated over the past three years: five in 2020-2021, eight in 2021-2022, and twelve in 2022-2023. There is reason to believe the major will remain out of low enrollment status for years to come, with approximately twelve students projected to graduate in 2023-2024 and at least nine students to graduate in 2024-2025. The program has experienced consistent growth over the past decade, reaching 53 students in 2022. Most ERS majors are transfer students, which is also a reason that total credit counts for graduating students fluctuate and tend to be higher than the average of other degrees. Over the past review cycle, one-year retention rates of ERS students ranged from 45% to 76%, and overall six-year graduation rates ranged from 42% to 61% between 2010 and 2020. Lastly, there has been gradual improvement of GPA scores in graduating ERS students, plateauing around 3.5-3.6 over the past few years.

## **VIII. IMPROVEMENTS SINCE LAST REVIEW**

### **A. Improvements**

*Discussion of evidence-based improvements made during this review cycle driven by accreditation recommendations, student learning outcomes assessment findings, program improvement evaluations, etc.*

- Revision of the program curriculum in 2016 to provide students with more flexibility of class offerings to avoid limited class offerings as a barrier to student's graduation.
- Development of the ERS brand materials to improve recruiting. These included the development of a program identifier and revision of the program description and associated materials in 2019.
- Establishment of program social media presence, Facebook and Instagram, presence for advertising jobs and internships.
- Worked with the advising and transfer office to promote recruitment of the program.
- Held joint field trips and collaborations with CSN supported by NSF Grants.
- Creation of an explicit articulation with CSN associate degree.
- Creation of give-away items to promote program visibility.
- Introduction of the Environmental Science Colloquium class series in 2017 to provide career path examples for our students to consider and the opportunity of a one-on-one interaction with professionals as a way for students to build their job skills.
- Hired a Geoscience faculty in 2020 to allow for more frequent offerings of required physical science classes. Since this hire, most upper-division classes are offered every year instead of every two-years as previously.
- Provided incentives for a staff member to recruit, advise, and maintain internships for ERS majors.
- Revision of the learning outcomes in 2019 to better reflect and assess students' progress throughout the program.

- Creation of the Environmental Health & Sustainability Minor in collaboration with the Human Health Sciences program.
- Teaching of Introduction to Environmental Science class as a high-school AP class.

## IX. FINAL SUMMARY & IMPROVEMENT PLAN

*Below are key recommendations and actions **that are suggested by the program faculty and chair:***

- Strengthen the recruitment pipeline and retention
  - 1) Create a high-school bridge program as an outreach opportunity about environmental sciences and as a recruiting tool.
  - 2) Improve program website to use as a tool for continuous recruitment of high school and transfer students.
  - 3) Strengthen the communication with faculty teaching ENV 101 in high-schools and the participation of their students in program activities.
  - 4) Explore the possibility of creating a transfer pipeline with CSN AAS in Environmental Management.
  - 5) Continue the close communication with ERS students to support their progress throughout the degree.
- Revise curriculum offerings
  - 1) Revision of ERS curriculum to improve the physical science class offerings and variety, this may require hiring another geoscience lecturer though.
  - 2) Consider degree concentrations as a possible way to improve the knowledge depth in a particular environmental science field, for example: biological sciences, physical sciences, health sciences, sustainability. However, the dean cautions against creating concentrations in programs that do not have high enrollment—it creates the potential for splitting of student cohorts across the degree, which can lead to low enrolled courses across *all* concentrations.
  - 3) Identification of the learning outcomes covered in each particular class to assure they are met and in which classes to build students confidence on their learning as they build awareness of the knowledge and skills acquired.
- Improve Human, fiscal and physical resources
  - 1) Hiring an assistant professor of geoscience or a geoscience lecturer to further improve the offerings frequency and sequencing of upper-division physical science classes. That said, a hire specific in geosciences was made in 2020.
  - 2) Pursue or facilitate the accessibility of vans or transportation to make field trips accessible for everyone.
  - 3) Designate a space for an environmental monitoring station where students can learn how to monitor changes in the environment using their recently acquired skills
  - 4) Share the cost of maintenance of the NSU Living Garden
  - 5) Improve the availability of storage space for field equipment
  - 6) Acquire field equipment, including camping equipment, to allow for students without access to these resources to participate in these activities
  - 7) Improve the accessibility of equipment to teach digital mapping skills, data collection, management and analysis. This will allow for an integral understanding of a particular environment, including its biological, physical and social characteristics.