**Annual Assessment Report for 2018-2019 AY**

Reports completed on assessment activities carried out during the 2018-2019 AY will be due September 30th 2019 and must be e-mailed to the Director of Assessment, Dr. Melissa Jordine (mjordine@mail.fresnostate.edu).

Provide detailed responses for each of the following questions within this word document. Please do NOT insert an index or add formatting. Furthermore, only report on two or three student learning outcomes even if your external accreditor requires you to evaluate four or more outcomes each year. Also be sure to explain or omit specialized or discipline-specific terms.

Department/Program: Geography and City & Regional Planning

Degree: BA Geography/BS City and Regional Planning

Assessment Coordinator: Dr. Mohan B. Dangi

1. **Please list the learning outcomes you assessed this year.**

Students will be able to read, interpret and construct maps.

1. **What assignment or survey did you use to assess the outcomes and what method (criteria or rubric) did you use to evaluate the assignment?** *Please describe the assignment and the criteria or rubric used to evaluate the assignment in detail and, if possible, include copies of the assignment and criteria/rubric at the end of this report.*

The students’ ability to read, interpret, and construct maps was assessed using a class project in GEOG 152 – Remote Sensing – in Spring 2019. The project was an extension of the class weekly lab activities and was assigned as the only class activity in the last three weeks of the semester, giving students enough time to complete it and ensure the techniques needed to process the data had been covered in lectures and lab exercises. Students were asked to process Landsat satellite TM5 data (Path 42, Rows 34 & 35) acquired on June 16, 2011 and used it to create normalized difference vegetation index (NDVI) maps and land cover classification maps of the study area, which covers a portion of Fresno County. A successful completion of the task requires students to perform some specific analyses, in a specific order. These include downloading the appropriate data from the United States Geological Survey (USGS) website, importing the raw data into a geospatial software and converting it into digital number (DN) values, performing atmospheric correction on the data, mosaicking the scenes, subsetting the study area and selecting the right combination of spectral bands for the classification and change detection mapping. Students are required to adopt unsupervised and supervised methods of image classification based on parallelepiped classifier and maximum likelihood classifier and using a minimum of six cover classes including road, water, soil, crops/pasture, residential area and forest. Students were asked to submit a report, describing the patterns on the maps, explaining the significance of the maps and the NDVI values associated with different cover classes.

**Benchmark**

The rubrics provided below was used for the assessment. We expected that **75% or more of the students** would achieve a **3 (proficient) or higher score** on the rubric. The assignment used is provided at the end of this report.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Geography 152  Project Rubric | Advanced  (Above Benchmark) | **Proficient**  **(Benchmark)** | Partially Proficient | Unsatisfactory |
|  | 4 | **3** | 2 | 1 |
| Ability to create maps | All maps are made, cover classes are adequately represented with overall accuracy more than 90%. | All classified maps are made, overall classification accuracy is between 75 and 85 %. | Some of the maps are made with significant classification error. | Failed to complete map creation procedures. |
| Ability to read and interpret output maps | All interpretations are presented and justified. | Correct and relevant discussions are made, but some important aspects were not presented. | Attempts to describe findings, but interpretations are irrelevant or incorrect. | Failed to interpret the findings. |

1. **What did you learn from your analysis of the data? Please include sample size (how many students were evaluated) and indicate how many students (number or percentage instead of a median or mean) were designated as proficient.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | % of students meeting the benchmark | 4  (Above) | 3 (Benchmark) | 2  (Below) | 1  (Unsatisfactory) |
| Create maps | **100%** | **75 (6)** | **25 (2)** | 0 (⎯) | 0 (⎯) |
| Read/Interpret maps | **100%** | **37.5 (3)** | **62.5(5)** | 0 (⎯) | 0 (⎯) |

GEOG 152 is a geography major course and because it can also be used to satisfy an elective for the Geographic Information System (GIS) certificate program, it is also taken by non-majors. For this reason, eight of the thirteen students enrolled in the class were geography majors, the others were non-majors. Though all the students in the class participated in the assessment, the results presented here applies only to the geography majors.

In creating maps, 100% or 8 students, met the benchmark with a clear majority (75%, n=6) that demonstrated an advanced knowledge.

In reading and interpreting maps, 100% or 8 students, met the benchmark with less than a majority (37.5%, n=3) that demonstrated advanced knowledge.

All the students achieved proficiency in reading, interpreting and creating image classification maps. This is significant in that image classification is an advanced topic in remote sensing and spatial data analysis, and because the same knowledge and skill required to complete the project were required for the final exam, all the students performed well in the final exam and received an A grade in the course.

1. **What changes, if any, do you recommend based on the assessment data?**

The ability to read, create and interpret maps is a skill geography majors must have, especially those with career interest in geospatial sciences and remote sensing, so we are pleased that all the students are proficient in this area. However, we see a need for improvement in interpreting maps, and for this reason, we recommend a revision of GEOG 152 content to strengthen this aspect of the course.

1. **If you recommended any changes in your response to Question 4 in last year’s assessment report, what progress have you made in implementing these changes? If you did not recommend making any changes in last year’s report please write N/A as your answer to this question.**

N/A.

1. **What assessment activities will you be conducting during the next academic year?**

The Department is planning to offer GEOG 30 – Spatial Statistics – in the spring semester of 2020 and we would like to assess Goal 3, Outcome 5: Students will be able to perform quantitative analysis and interpret the results.

1. **What progress have you made on items from your last program review action plan?**

Action #1: SOAP

We have greatly improved our SOAP each year since the last program review. In fact, at one point our SOAP was the most complete in the college. We have done an alumni survey every three years.

Action #2: Curriculum Review

The Review Team recommended to the Department to modify its curriculum by eliminating the “Major Areas of Concentration” and replacing them with a set of required Upper Division Core courses. We have created Upper Division Core courses for our new City & Regional Planning option. While we do not have an Upper Division Core for our Geography major, we have simplified the curriculum such that students now take one course from each area of concentration.

Action taken: Also, the Department revised its degree program so that there are six essential core courses that are taken by majors:

GEOG 2. Introduction to Cultural Geography

GEOG 4. World Geography

GEOG 5. Physical Geography: Global Concepts, Weather and Climate

GEOG 7. Physical Geography: The Earth's Surface

GEOG 30. Introduction to Spatial Statistics

GEOG 141. GIS I: Data Display and Manipulation

And, any 18 units of geography, or city & regional planning (CRP) courses; with the stipulation that at least twelve (12) units be upper-division. The number of units in the major was also reduced from 42 to 36.

The new degree program, BS in City & Regional Planning has been deployed; however, the program is currently being revised to better address the needs of local students, and potential employers. The current program includes major requirements of 42 units, additional requirements of 22 units, and electives of 18-21 units for a total of 82 to 85 units, plus GE requirements, university requirements, and other units required to satisfy the 120 units for a Bachelor’s degree. The revised program will be 36 units, in addition to GE requirements, university requirements, and other units required to satisfy the 120 units for a bachelor’s degree.

Action #3: Increase the number of majors

The Review Team recommended that the Department find creative ways for maintaining the FTES at the same time that it increases the number of majors. The Team also stated that “a structural shift away from spending high quality and scarce resources on G.E. courses than spending them on majors is needed to improve and grow the undergraduate program, and ultimately reinstate a Master’s program”. Increasing majors has still been a struggle; however, we hope our increased efforts in the area of planning will bring new interest to the Department.

In the meantime, we continue to:

• Participate in university outreach events as they become available.

Action taken: Many of the faculty have participated in ‘Preview Days’ and ‘Dog Days’ activities. Additionally, faculty have participated in University Outreach events with community college transfer counselors in order to facilitate the transfer of community college students into our existing programs.

• Renew contacts with the local community colleges.

Action taken: Jon McPhee, Geography Instructor and Department Chair of Social Sciences for Clovis Community College (CCC), is now a member of the Department’s advisory board, and is providing a connection between the Department and CCC. Sean Boyd, a former lecturer in the Department, is now a full-time Geography Instructor at Fresno City College (FCC) and can provide a connection between this Department and that campus.

• Organize our Geography Forum Lecture Series.

Action taken: None.

• Explore the possibility of making a recruitment video.

Action taken: None.

• Complete the ongoing modernization of the Department website.

Action taken: The revision has been done, and is currently ongoing.

• Organize community events for Geography Awareness Week.

Action taken: None.

• Enforce all University and Department mandatory advising schedules to keep students on track 4.

Action taken: Except for career advising, faculty are no longer directly advising majors with regard to their programs. All program advising is done in the COSS Advising Center.

• Serve as the home base for the National Geographic Bee.

Action taken: The Department continues to be the ‘home base’ for the California State Geographic Bee.

The cancellation of major courses with enrollments that exceed ten (10) students places an unnecessary burden upon our majors. Such cancellations make it exceedingly difficult to grow a program due to a lack of student confidence in being able to graduate in a timely manner. To address this problem, the Department has been forced to convert even more major courses into GE courses so that they would have a sufficiently high enrollment that would prevent them from being cancelled.

In recent years, the Department has hired a human geographer to strengthen our human geography course offerings. Additionally, to address the retirement of one of our senior faculty members, a tenure-track search for a physical geographer has been initiated to replace him. The Department faculty hope that the successful candidate would also be able to teach two of the Department’s GIS courses, and allow existing planning faculty to focus on the deployment of planning course for the BS in City & Regional Planning program. It is hoped that growth in these fields of study will be attractive to prospective majors.

Action #4: Strengthen Research

The Department faculty continues to be very active in many research areas including air quality, recreational planning, environmental remediation, waste management, water quality, environmental policy analysis, health and diseases, and international business. Much of the research addresses concerns in Fresno, as well as other cities in the San Joaquin Valley. The faculty plans to continue to engage in research that will benefit the community in many ways.

Action #5: Expand Program by adding more Minors

In addition to our minor in Geography, and a minor in Meteorology, the previously existing minor in Urban Studies has been converted into a minor in City & Regional Planning.

Action taken: Although the Department has been informed that we may not create any minors until further notice, we have created a Certificate of Special Study in Broadcast Meteorology (in cooperation with the Department of Media, Communications and Journalism), and a Certificate of Special Study in Environmental Planning.

Action #6: Master’s in City & Regional Planning

Although our past efforts to develop a Master’s degree in City & Regional Planning did not come to fruition, we have now deployed a B.S. in City & Regional Planning.

**Geography 152 - Remote Sensing of Environment**

**Department of Geography and City & Regional Planning**

**Spring 2019 Class Project**

**Project Due Date: May 2, 2019**

**Introduction**

This project is an extension of the lab exercises that allows you to demonstrate the knowledge of remote sensing and image processing you acquired in the class. You are required to produce classification maps of Landsat scenes of an area covering a portion of Fresno County and submit a report describing your findings. The project carries 15% of the course grade

**Requirements:**

1. *Obtaining the Data*

You will be using Landsat 5 TM data for the study. Archived Landsat data are now offered by the United States Geological Survey (USGS) free of charge. The data is available on a searchable website (<https://earthexplorer.usgs.gov/>) and can be downloaded to a computer via the internet. For this class project download the Landsat data with the parameters given in the following table

|  |  |  |  |
| --- | --- | --- | --- |
| Landsat 5 TM C1-Level 1 | 42 | 34 | 2011-06-16 |
| Landsat 5 TM C1-Level 1 | 42 | 35 | 2011-06-16 |

1. *Import and convert the data to DN values*

To use the raw TIFF data they need to be converted to a TerrSet format. Convert the data using the appropriate TerrSet module and save them in the appropriate folder in your working directory.

1. *Atmospheric Correction : Convert at-sensor radiance to reflectance*

Convert at-sensor radiance to reflectance to remove the effect of the atmosphere on light traveling from the sun to the image scene. Use the appropriate TerrSet module with the relevant information that is available in the image metadata file.

1. *Mosaicking*

Mosaic the images, i.e. join two adjacent Landsat scenes.

1. *Subset the study area*

Subset the mosaiced images to obtain the study site bounded by the coordinates:

Min. X : 233205.0; Max. X : 281595.0

Min. Y : 4039935.0; Max. Y : 4087935.0.

1. *Classify the image*

Classify the image using

* 1. unsupervised method (use six as the maximum number of clusters)
  2. supervised method using
     1. parallelepiped classifier
     2. maximum likelihood classifier

As a guide use the following cover classes

1. Roads
2. Soil
3. Water
4. Crops/Pasture
5. Residential area
6. Forest

You have option to choose classes you think are better representative of the site

1. *What to submit*

Submit a report that include:

1. The classified maps (three maps, two for supervised method, one for unsupervised method)
2. Comparison of the two methods in term of their overall accuracy and patterns observed on the maps
3. Comments on the significance of the maps