EQUIPMENT NEEDS ASSESSMENT APPLICATION
Fall 2017

Name of Person Submitting Request:	**Todd Heibel**
Program or Service Area:	**Environmental Science, Geography-GIS, and Geology-Oceanography**
Division:	**Science**
Date of Last Program Efficacy:	**SP 15 for GEOG-GIS, SP 16 for ENV SCI-GEOL-OCEAN, and SP for GIS (2-year)**
What rating was given?	**Continuation for all**
Equipment Requested	**Augmented Reality Sandbox – Virtual, Interactive Topography and Geomorphology**
Amount Requested:	**$8,000**
Strategic Initiatives Addressed: Strategic Directions + Goals	Student Access, Student Success, and Facilities

NOTE: To facilitate ranking by the committee, submit separate requests for each item; however, multiple items can be submitted as one request if it is required that the equipment is packaged together.

Replacement ☐ Additional ▣

Are there alternative funding sources? (for example, Department, Budget, Perkins, Grants, etc.)

Yes ☐ NO ▣

If yes, what are they? Although there are baseline budgets established for Geography, Geology-Oceanography, and GIS, there are no equipment funds available. There is no institutionally-supported budget for Environmental Sciences.

1. Provide a rationale for your request. (Explain, in detail, the need for this position.)

Currently, there is no budget to support any equipment expenditures, including the augmented reality sandbox. The augmented reality sandbox is an interactive tool that provides a hands-on approach to understanding abstract, esoteric fundamentals of topography. Essentially, students create topographic relief (e.g. hills and valleys) using sand as a medium. A camera, computer, and projection unit project superimposed contour lines onto the sand surface. Virtual bodies of water can also be created within valleys, and base levels can also be manipulated (e.g. water levels raised or lowered).

Because topography is a fundamental concept within a variety of physical sciences, the departments will "leverage" (share) this resource with other departments (e.g. Biology, Environmental Science, Geography, Geology-Oceanography, GIS, Physics, and others). This equipment could also play a starring role in outreach activities.

2. Indicate how the content of the department/program's latest Efficacy Report and/or current EMP supports this request and how the request is tied to program planning. *(Directly reference the relevant information from your latest Efficacy Report and/or current EMP in your discussion.)*

The augmented reality sandbox has the potential to positively impact the efficient operation of lecture, laboratory, and field activities. Therefore, overall enrollment, success, retention, recruitment, and efficiency could be positively impacted. A full-time faculty member was hired in the fall 2016 semester, there is now an AS-T degree option for GEOL students, and OCEAN courses are being offered on a regular basis following a multi-semester hiatus. Within the EMP document, the need for an increased equipment budget is clearly identified within Goals, Challenges and Opportunities, and Action Plan sections. In addition, the SP 2016 GEOL-OCEAN Efficacy document explicitly identifies the need for equipment on page 12.

There is also a transfer degree option available for Geography students, and the Environmental Science program will soon have this option available for students. In addition, the GIS program has recently updated its course- and certificate-level curriculum.

3. Indicate any additional information you want the committee to consider *(for example, regulatory information, compliance, updated efficiency, student success data, planning, etc.).*

Students require hands-on demonstration in order to reinforce concepts and knowledge that are typically difficult to acquire. In addition, students who wish to transfer to four-year institutions will be expected to understand the basics of topography, structure, and geomorphology within upper-division geology, oceanography, environmental, geography, and Earth science courses. Students who wish to enter the job market will also be expected to know how to utilize these important pedagogical tools. Please refer to the labor market information below. These career opportunities will be foreclosed to students who are not properly prepared:

Occupation:	**Mean Hourly Wage:**	**Annual Average Openings:**
Geological and Petroleum Technicians	$39.23	80
Geoscientists	$46.63	260

Source: State of California Employment Development Department (2013).

4. Indicate any related costs (including any ongoing maintenance or updates) and department/program's plans to support those costs.

Although $8,000 is a significant amount of money, this is a one-time need. In addition, this resource will be shared among several departments and utilized during STEM-related outreach events. Furthermore, this funding is needed, as demand for Earth, Spatial, and Environmental Science courses is anticipated to increase with the recent hire of full-time faculty and approval of transfer degrees, as well as improved job market prospects (especially within the energy, geospatial, and environmental sectors). To date, the departments have relied upon other departments and one-time sources of funding to sustain equipment. However, this piecemeal approach is unsustainable and not pedagogically sound. While grant funding could be pursued, there are no guarantees that funding would be procured, especially within the current grant funding climate. In addition, grant writing and administration requires significant time and energy that existing faculty, staff, and administrative resources may not be able to provide.

5. What are the consequences of not funding this equipment?

Without an augmented reality sandbox, students will continue to struggle with fundamental concepts of topography and geomorphology. In addition, student recruitment, retention, and

success may diminish. Other community colleges and universities use this equipment to great effect and their students are much more competitive in future academic and career pursuits.