

Division of Academic Affairs
Technology Fee – ITEP Project Proposal
2016

Proposal Deadline: Friday, January 22, 2016 @ 5:00 pm

Project Proposal Type

Instructional Technology Enhancement Project (ITEP)

Focused projects proposed by an individual or small team with the intention of exploring new applications of instructional technology. ITEPs will typically be led by a faculty “principal investigator.” ITEPs are time-limited projects (up to two years in length) and allocations of Technology Fee funds to these projects are non-recurring.

Project Title

The Acquisition of Shallow-water Multibeam Sonar for Instruction and Research in Maritime Survey Applications

Total Amount of Funding Requested

\$142,000

Primary Project Coordinator

Gregory D. Cook
Assistant Professor
Department of Anthropology

Division of Academic Affairs
Instructional Technology Enhancement Project (ITEP) Proposals Template
2016

ITEP proposals must provide the following information:

1. Project description.

This proposal is for the acquisition of a NORBIT wideband multibeam sonar system to enhance the instructional and research capabilities of the University of West Florida's maritime archaeology survey activities. This will be the first step in exploring the application of this technology for use in maritime archaeological survey, an evaluation process that will extend for two years after purchase of the sonar unit. The shallow-water multibeam sonar unit proposed for this project is relatively new technology, not found in any other university program involved in maritime archaeological research and instruction. As such, this is an excellent opportunity to gain access to cutting edge technology, enhance UWF's maritime survey program, and evaluate this technology using it in Pensacola's rich maritime context.

UWF's Division of Anthropology and Archaeology has a long tradition of excellence in archaeological instruction and research, both in terrestrial and maritime contexts. As only one of three universities in the United States with an active graduate maritime archaeology program, our students gain critical experience through hands-on access to state of the art survey equipment, and it is the *only* program that extends this access to undergraduate students. Our remote sensing survey capabilities have had a direct impact on student success in getting jobs and pursuing careers in maritime archaeology after graduating from our program. Along with the instructional aspect of these technologies, they also have resulted in the discovery and analysis of multiple historic wreck sites in the region, some of which have led to M.A. thesis research topics.

Our current suite of marine remote sensing instrumentation includes a Marine Magnetics magnetometer, a Marine Sonics side-scan sonar, and a Stratabox sub-bottom sonar. Briefly, the magnetometer detects the local magnetic field of an area, and anomalies in this field can indicate the presence of non-natural ferrous metals, which in shipwreck sites can include cannon, chain, fasteners, ballast stone, etc. The two single-beam sonar units we have (side-scan and sub-bottom) both use acoustic energy to provide images of the seafloor, indicating the presence of anomalies on the surface (in the case of side-scan sonar), or buried beneath the seafloor (in the case of sub-bottom sonar).

These methods are considered tried and true techniques for marine remote sensing, and are generally the first techniques required in any archaeological survey. The field is constantly advancing, however, and more advanced systems are increasingly utilized in marine survey applications. Support from the Instructional Technology Enhancement Project would allow the purchase of a NORBIT wideband multibeam sonar system that would significantly enhance the instructional and research capabilities of UWF's marine archaeology activities. This is the first shallow-water application multibeam sonar designed to work on small research platforms for in-shore waters, and is perfectly suited for the bays and offshore Gulf waters of this region. As new technology, it is particularly suited for a formal evaluation of the device and its potential for maritime archaeological survey. As a means of enhancing student education and involvement, the principal investigator will select

a graduate student with interests in this technology to use the evaluation period as material for their M.A. thesis on new techniques in marine archaeology survey.

2. Description of project alignment with UWF Strategic Plan.

This project aligns with several key priorities in UWF's Strategic Plan, including:

1.1 "Foster student learning and development to include the knowledge, skills and dispositions that optimize students' prospects for personal and professional success." This proposal would increase students' knowledge and skill relating to a remote sensing technology that is increasingly required in the competitive market for jobs after graduation.

2.1 "Respond to the changing needs of the region, state, and nation by investing strategically to support innovative instruction and high-quality, relevant and distinctive academic and research programs." This proposal would lead to the acquisition of a new, state of the art multibeam sonar device that would greatly expand our suite of marine survey tools, both for educational purposes as well as for new research projects.

4.1 "Support and sustain the high-quality services and infrastructure needed to achieve identified UWF priorities." This proposal would introduce a new remote sensing device that would update and sustain infrastructure critical to students' learning of new skills and concepts.

3. Description of benefits provided:

a) Ways in which student access to technology will be enhanced.

As stated above, the acquisition of this device would significantly enhance our ability to teach both graduate and undergraduate students how to use these remote sensing tools, as well as analyze the data generated through surveys in the region. This would directly increase their chances of being hired by geophysical, cultural resource management and archaeology firms upon graduation, and will provide them with a foundational understanding of remote sensing technology that would benefit them should they continue on to further studies in the archaeological, environmental or biological fields.

b) How the student experience will be enhanced.

The access to new technology will lead directly to the enhancement of the student experience by giving them hands-on capabilities and understanding of relatively sophisticated remote sensing equipment that is rare in the academic domain. As the principal investigator currently teaches an archaeological survey course during the spring semester, and an archaeological field methods course during the summer (both for graduate and undergraduate students), this equipment would greatly enhance the learning experience for students from multiple departments and from varying levels of their educational tenures.

c) How assessment will be conducted.

As this technology would be used in courses, assessment would involve in-class instruction and workshop activities that would include direct observation by the principle investigator to see if the students are understanding the interpretation and analysis of the data, and could include standard quizzes/tests on the principals of sonar remote sensing and multibeam applications specifically.

d) Which and how many students will be impacted.

Both graduate and undergraduate students will be impacted by this proposal, including students taking the archaeological survey class (this course includes up to 20 students per session, and often involves students from a variety of majors, including anthropology, maritime studies, environmental sciences, etc). Graduate students focusing on maritime archaeology would also would directly benefit. UWF has an excellent reputation in the quality of our graduate students entering the maritime archaeology field. We generally have 8-10 students focusing on maritime archaeology enter the program every year, and there are approximately 50 students active in the program working on their thesis research.

e) How students with special needs or disabilities would be helped.

During our field methods course, underwater archaeology is a key component, which requires the ability to SCUBA dive. We do have students at times who either cannot dive, or have some disability to prevent them from diving. Maintaining an active maritime survey component provides non-diving students with a highly relevant alternative to diving on wreck sites, and allows them to participate and make a significant contribution without actually physically visiting wrecksites.

f) How training of students and faculty in the use of technology would be enhanced.

As mentioned above, training students is a key component of our program here at UWF. The reality is that many of the potential jobs related to maritime archaeology involve survey more than diving, and enhancing our instructional capabilities with remote sensing technologies is a priority in getting students hired. I am not aware of any other program specializing in maritime archaeology that has access to these sophisticated multibeam sonar technologies, so this would significantly enhance student and faculty training and research at UWF.

4. Description of how the initiative has a potential scope within and beyond that of the proposing unit.

I have been in contact with Dr. Schwartz, Chair at the Department of Earth and Environmental Sciences at UWF, and he expressed interest in the utilization of this specific system in some of their ongoing projects and instruction. In the past, the Division of Anthropology and Archaeology has assisted the Department of Biology on marine-related thesis research with our remote sensing capabilities, and this collaboration would continue as our resources expand with the purchase of this unit. Also, UWF marine archaeologist faculty and graduate students have provided *pro-bono* assistance to Law Enforcement and Search and Recovery agencies in the search for missing persons and drowning victims using our remote sensing resources. Our most recent involvement

was after the crash of the National Guard UH-60 Blackhawk helicopter off of Navarre Beach in March of 2015. Assisting in this manner requires the use of advanced remote sensing devices, and the acquisition of the multibeam sonar would aid in this regard.

5. How will success be measured? Provide metrics.

The initial evaluation project to explore the application of this technology to maritime archaeological survey will last for two years after purchase of the technology. Since this technology will be utilized through classes, success will be measured through evaluating students' understanding of sonar principles, basic archaeological survey principles, and the ability to set up, survey and analyze the data generated from this remote sensing device. Upon being graded on the results, these activities will be judged a success if 80% or more of the students achieve a passing grade on assignments utilizing this technology. In addition, the principal investigator will select a graduate student interested in the application of multibeam remote sensing technology to maritime archaeology for their thesis research, and this student will be doing a more extensive evaluation of the technology for a co-authored paper with the principal investigator after this period.

6. Description of resources for the project and projected ongoing resource needs (total cost of ownership for the life of the project) including:

- a) Any hardware requirements (which should comply with standards established by the ITPAC (Information Technology Planning and Advisory Committee).

Access to research vessels appropriate for regional surveys is already guaranteed through UWF's Marine Services Center, which is part of the Division. UWF's MSC also includes the staff and equipment required for any custom design and manufacture of equipment for mounting the instrument onto our research vessels.

- b) Any software requirements (which should comply with standards established by the ITPAC (Information Technology Planning and Advisory Committee).

Navigational and analysis software required for gathering and post-processing survey data is already owned by the Division of Anthropology and Archaeology.

- c) Any personnel costs – only OPS and other time-limited appointments, non-recurring.

None.

7. Provide the proposed timeline for the project with major milestones and project end dates.

The initial period of exploring the applications of this technology will be for two years after the purchase of the equipment. During this time its use in coursework as well as fieldwork settings will be evaluated, and upon the completion of this time the principal investigator will present a research paper at the Society for Historical Archaeology on the application of shallow-water multibeam sonar in marine archaeological survey. The research paper will be

co-authored with a graduate student focusing on an application of this technology for their thesis project.

8. Include a plan for sustainability of the project beyond the initial project period if applicable.

Because the Division of Anthropology and Archaeology already has a tradition in marine remote sensing, this new technology will align seamlessly with our existing survey program. We already have the support in terms of research vessels, funds, hardware and software to sustain this equipment for the duration of its working life. Our current side-scan sonar, for example, is close to ten years old, so the impact of these remote sensing devices extends to generations of undergraduate and graduate students.

9. Provide any resource matching which might be provided by organizations with appropriate commitment authority documentation.

The Division of Anthropology and Archaeology will provide any resources required (in the form of vessels, hardware and software) for the continued use of the sonar system by faculty and students, making the additional purchases or match in resources from outside the Division unnecessary. We will continue to work with departments and colleges outside of CASSH who have a need or interest in utilizing this technology.

10. Indicate which individual or group will implement the project (to help determine any additional costs and resource restraints).

UWF's Division of Anthropology and Archaeology.

11. Indicate a lead person ("Principal Investigator") for the project for all communications and overall responsibility for reporting and fund utilization.

Gregory D. Cook
Assistant Professor
Department of Anthropology
gcook1@uwf.edu
850-474-2186

12. Project proposals should be succinct and submitted to the Technology Fee Committee by the deadline with a notice of submission to the chair and the dean or appropriately designated leadership in the unit (Center Director, etc.).

07 ITEP Gregory Cook

ITS Review Comments

GENERAL COMMENTS:

None.

COMPLIANCE WITH STANDARDS:

No comments.

INFRASTRUCTURE ISSUES:

No comments.

PRICING/COST ISSUES:

No comments.

OTHER SUPPORT ISSUES:

No comments.

SUGGESTIONS TO PROPOSER:

No comments.

For questions regarding ITS comments, please contact:

Melanie Haveard, Executive Director and CTO

ext. 2540

mhaveard@uwf.edu