

NWCET Best Practices

Title: MATE Center Staff Development

Challenge:

The Marine Advanced Technology Education (MATE) Center located at Monterey Peninsula College in Monterey, California is national in scope but works through regional partnerships to help create new curricula and collect information from employers related to Marine Technology education. The MATE Center has developed industry-driven skill and knowledge guidelines for such select marine related occupations as ship-board (research) technician, remotely-operated vehicle technician, hydrographic survey technician, oil spill response technician, and aquaculture technician. The Center is constantly looking for additional methods to interest educators in their staff development opportunities and to maintain high participation levels Marine Technology education in the future.

Solution:

Two of MATE's most successful faculty development institutes are the *Building Remotely Operated Vehicles (ROVs)* and the *GIS and Marine Science Project* conducted each summer. The goals of the institutes are to: 1) create an awareness of ocean activities related to marine research, exploration, and industry; 2) highlight career opportunities associated with these activities; 3) promote the teaching of higher-level technical, problem-solving, critical thinking, communication, and teamwork skills; and 4) provide opportunities for educators to interact with employers - and vice versa. Grant funds allow MATE to offer these institutes for no fee to pairs of participants representing twelve different sites. Hotel accommodations for those living more than 50 miles from Monterey, lunches, and some dinners are provided by the MATE Center. Some travel stipends are also available. In addition to the classroom and hands-on time, participants take a boat trip on Monterey Bay and a field trip to the Monterey Bay Aquarium.

The *Building Remotely Operated Vehicles (ROVs)* institute provided a forum for educators, especially those interested in participation in future MATE/Marine Technology Society's (MTS) ROV Committee Student ROV Competitions, to: 1) acquire the knowledge and skills needed to implement ROV design and building curriculum that is aligned with the country's work force needs; 2) gain exposure to and an understanding of the type of work that ROV technicians do and the technologies they use; and, 3) learn about the many career opportunities available in the submersible technology field.

The *GIS and Marine Science Project* focused on topics related to the marine environment, marine technology, and the applications of GIS. Currently the greatest advances in our understanding of marine and coastal ecosystems are being brought about by advances in technology, such as remote sensing – be it from satellite, from the sea surface using sound, or *in situ* using submersible technology. GIS has become the universal tool to pull together, manage, and visualize large volumes of geospatial data from multiple sources at a variety of scales. One of the most exciting developments that

has resulted from the ability to collect and analyze high-resolution data is the ability to create suitability models that can predict where a particular species or assemblage of fish, invertebrates, or algae might occur. These models are not only helpful in identifying areas (or habitats) that should be set aside for protection or further study, but are also critical to examining our level of understanding of the physical requirements of a species. If a model fails to adequately predict suitable habitat, it may be a problem with the model or, more importantly, it might indicate a need to examine our level of knowledge and understanding of a particular species or system. GIS has “thrown red flags” upon the understanding of a variety of species and has broken down old beliefs regarding their habitat requirements.

Outcomes and Benefits:

Participants in the ROV institute accomplished these objectives:

- Built a small-scale, fully functional ROV that can be replicated with students.
- Completed a set of pre-determined missions with the vehicle.
- Acquired the knowledge, skills, and resources to effectively mentor students in designing and building an ROV to participate in future MATE/ MTS ROV Committee competitions.
- Acquired marine-related resource materials for curriculum development.
- Identified marine-related, problem-based scenarios and activities that will enhance current curriculum.
- Visited and interacted with undersea engineers, ROV pilots, and marine technicians to understand the work they do and the technologies they use.

In addition, 14 educators interested in organizing future workshops or regional student ROV competitions to feed into the national event participated in an optional day at the end of the institute.

The accomplishments by the participants in the GIS institute were:

- Became comfortable using ArcGIS to work with raster data to build suitability models.
- Increased the knowledge and understanding of GIS applied to marine problems.
- Increased the understanding of technologies used to collect data in the marine environment.
- Experienced closer interactions between GIS faculty, marine science faculty, and resource agencies.
- Increase the diversity of faculty and students exposed to GIS, marine technology, and marine technical careers.

Participants enthusiastically reported such comments as "Excellent! Thank you for providing such a valuable and useful experience. Well-organized, well-run, and easily the best training experience I have ever participated in." and "I am excited about the possibilities in my classroom. Using GIS/Marine Science in projects is an excellent way for students to apply what they learn in a way that will require them to use higher thinking skills so often lacking in many courses."

Two other important aspects of the institutes are the sharing of the curriculum products developed by the participants via the posting on the MATE web site for each institute and the MATE Alumni section of the same web site. The Center has realized that disseminating its products to the widest available audience will increase interest in the center's programs and services. For example, numerous ROV competitions have been conducted nationwide and continue to grow. The alumni site is also an excellent way to maintain contact with participants and insure a long-term relationship with the participants in which the MATE Center has invested.

Next Steps:

Unfortunately, the greatest obstacle for the continuation of these fabulous workshops is funding. The ability to provide extensive accommodations and travel expenses has been a valuable component of the successful institutes. Grant money has been used to provide these services and there has not been an effort made to identify other funding alternatives.

Plans for the 2005 institutes will be announced in the spring of 2005. For additional information on the institutes, complete descriptions and products developed at each of the institutes during the past years, and the other services offered by MATE, visit the official web site at www.marinetech.org.

Key Issue:

The development and delivery of first-rate faculty development institutes requires substantial funds. The MATE Center has identified two areas of interest and produced a series of institutes that create an awareness of ocean activities and promote career training and opportunities in marine technology. Using their web site, the Center is able to distribute products developed by the institute participants and follow up with institute alumni. Identifying a self-sustaining funding source that does not solely rely on grant monies may, however, determine the future of these wonderful opportunities to explore marine science.

Partners:

Monterey Peninsula College
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