We are implementing an NSF-funded program of inquiry-based biotechnology and bioinformatics education in marine science for middle and high school teachers and their students. THE PROBLEM: This program is in direct response to a need expressed by regional biology teachers that teach some biotechnology content. They wanted to clearly understand the connection between biotechnology and bioinformatics and gain comfort using the available bioinformatics resources. WHAT IS BEING DONE: We choose to take teachers through the process that scientists use to address a scientific question that requires the manipulation of DNA sequence information to answer. Taking a uniquely collaborative researcher-teacher-student approach this program uses existing MLML research projects and facilities to enhance the information technology education of 2,700 middle and high school students (65% are from underserved populations) over a three-year period. The project goals are as follows: (1) Expand teacher understanding of how biotechnology information is acquired and applied in an intensive 3-week summer workshop where teachers test their understanding in the context of an existing research project. (2) Collaborate with additional research projects at MLML where teachers use biotechnology techniques and information analysis to contribute to those projects. Include presentations by graduate students, post-doctoral and faculty researchers from those projects. (3) Develop a full curriculum packet for use in the classroom. Program staff (PIs and college students) go to area classrooms to assist in the implementation of the curriculum. Necessary equipment and reagents are available for travel to the classrooms as needed. The curriculum specifically targets State Standards in Investigation and Experimentation, Genetics, and Evolution and is purposely geared to fit within the context of established STEM curricula. (4) Develop a workshop curriculum and integrative website on biotechnology and its related information technology (bioinformatics) to support the teachers and their students. (5) Teachers are exposed to career and educational paths related to biotechnology and bioinformatics through interaction with researchers, college students, and industry professionals on field trips to local academic institutions and private biotechnology facilities. (6) In subsequent summers, teacher participants from prior years select students from their classes to work through biotechnology and bioinformatics projects at MLML under their guidance allowing teachers to teach what they have learned. (7) Program staff and participant teachers discuss developments and provide comments through online sharing and through follow-up meetings at MLML once per semester. Webcasts from the labs to the participant teacher classrooms are available once per semester. (8) All aspects of the project are evaluated during the course of the project and at set time points by an external evaluator. Results of the on-going evaluations are incorporated into the program as it progresses. Through this program teachers gain the important connections between biotechnology and bioinformatics that they need to incorporate these linkages into their curriculum. WHY THIS WORK IS IMPORTANT: By understanding the role of bioinformatics and using DNA sequence information that they themselves acquired, teacher are more open to working with bioinformatics software. By using bioinformatics in the program setting and with the help of program staff they are more likely to incorporate bioinformatics exercises into their classrooms.