



College of the Redwoods at Mendocino  
**Marine Science  
Technology Program  
Graduate Survey Report**

Spring 2010

This Report Provided By  
The Office of Institutional Research

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## Introduction

The Marine Science Technology Program Graduate Survey (MST Survey) was constructed to measure MST graduates' satisfaction with the MST program as well as how the knowledge gained in this program played a role in their education and career.

## Marine Science Technology Program Overview

The Marine Science Technology (MST) Program at CR Mendocino was established in order to fill the need for certified marine science technicians. The program is designed to train students for employment with a wide variety of fishery and wildlife agencies, marine and environmental consulting firms, marine aquariums, and marine laboratories.

Two options exist for program participants. An Associate of Science degree is awarded to students for satisfactory completion of the major requirements (24 units), 12 additional units of recommended elective courses, and successful completion of general education and graduation requirements. A Certificate of Achievement is awarded for satisfactory completion of the major requirements plus a minimum of six additional units of recommended elective courses.

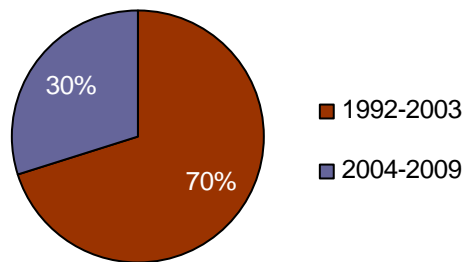
## Survey Administration

The MST Survey was administered to the graduates of the MST Program. Mendocino staff distributed surveys to graduates who were on record as having received either an Associate of Science or Certificate through the program. Graduates were initially contacted by an email which included an attached survey. Some graduates were contacted by postal mail when an email address was not available or outdated. The MST Survey resulted in 10 responses. Of the 40 graduates who were invited to participate in the survey, this represents 25% of the population.

## Findings




Survey respondents were asked to indicate the year in which they graduated from the MST Program. Seventy percent of respondents indicated graduating prior to 2003 while 30% indicated graduating after 2004 (see Table 1).

*Table 1: Graduation Year*



As shown in Table 2, half of the respondents (50%) indicated receiving both a Certificate of Achievement and an Associate of Science degree upon completing of the MST Program. Forty percent of respondents indicated solely receiving an Associate of Science degree while 10% of respondents indicated solely receiving a Certificate of Achievement.

*Table 2: Certificate/Degree Earning*

Certificate of Achievement	10%	
Associate of Science	40%	
Both	50%	

Respondents were asked if further education (in the marine technology or any other field) was pursued since graduating from the MST Program. While not every graduate responded, of those who did respond, eighty-eight percent had pursued further education while 13% had not pursued further education.

*Table 3: Pursued Further Education*





Yes	88%	
No	13%	

Of those respondents who indicated pursuing further education, sixty-three percent had pursued a Bachelor of Science degree. Other respondents indicated pursuing further education but did not indicate what type of educational goal was being pursued.

Respondents who had pursued further education were also asked to indicate whether an educational degree had been completed. Of those who responded, fifty-seven percent indicated that they had not completed the degree while 43% indicated they had completed the degree. Some respondents who indicated they had not received the degree explained that the degree was currently in progress.

Respondents were asked to indicate the jobs/positions they had held since graduating from the MST Program. Common responses indicated employment as a Scientific Aide, Fisheries Technician, or other type of Technician (see Table 4). A complete list of responses is included in the qualitative portion of this report which begins on page 7.

*Table 4: Jobs/Positions Held After Graduation*

Scientific Aide	30%	
Fisheries Technician	30%	
Other Technician	20%	
Other	20%	

When asked to detail their current roles and responsibilities, respondents listed many differing and some related responses including disease diagnosis, water monitoring, field research, and research communications. Additional responses included facility maintenance, data analysis, landscaping, and tour leader. A complete list of responses is included in the qualitative portion of this report which begins on page 7.

Respondents were asked to indicate the kinds of on-the-job training received after graduating the MST Program that assisted them in performing their currently assigned duties. Responses greatly varied amongst respondents with some focus being placed on the general categories of receiving training on various computer programs, data collection methods and safety measures. Specific responses included receiving training on fish measurement and tagging, meter reading, survey techniques, fish life history, microscope techniques, statistics, GIS and GPS, and supervisory skills. Specific trainings also received by respondents included ATV training, swift water rescue training and safety & navigation training. A complete list of responses is included in the qualitative portion of this report which begins on page 7.

Some respondents indicated having used or using various computer programs, netting techniques and types, and navigation equipment (i.e., GIS) to perform their job duties. Responses also included using measuring technology, various metering equipment, molecular techniques and data gathering methods to perform past or current job duties. Many job duties were indicated and are listed in the qualitative portion of this report which begins on page 7.

Respondents were asked to indicate the specific skill sets used on-the-job. Common responses included computer programs/software, microscope techniques, and various field work. Specific responses included data collection, water quality testing, surveying techniques, GPS/GIS, field observations, equipment maintenance, chemical handling, supervisory skills and writing/editing skills. A complete list of responses is included in the qualitative portion of this report which begins on page 7.

When asked to indicate the extent to which they felt their education received at College of the Redwoods at Mendocino is or was relevant to their subsequent educational or occupational endeavors, the majority of respondents (90%) indicated feelings of satisfaction with the one remaining respondent offering no response to indicate either satisfaction nor dissatisfaction. Respondents' comments indicated satisfaction with the MST Program's relevance in achieving career success, educational success, preparedness for transfer and networking.

Respondents were also asked to share any additional comments at the conclusion of the survey. These general comments as well as the detailed responses for the above items are listed in the following section labeled "Qualitative Comments."

## Qualitative Comments

### 1. What year did you graduate from the MST program?

- 1999
- I believe it was 2002
- 1999
- 2009
- 1998
- 2003
- 2004 (I think)
- 1992
- 1996
- 2007

### 2. Did you earn the Certificate of Achievement or the Associate of Science degree, or both?

- Certificate of Achievement
- Certificate of Achievement and Associate of Science. Although I never received an actual paper certificate; I would like one if possible.
- Associate of Science
- Associate of Science
- Certificate of Achievement and Associate of Science
- Certificate of Achievement and Associate of Science
- Certificate of Achievement and Associate of Science
- Associate of Science
- Certificate of Achievement and Associate of Science
- Associate of Science

### 3. Have you pursued further education (in this or any other field) since completing the degree? If so, what did you pursue (and where), and has this education goal been completed?

- I later went to Humboldt State University for two years (four semesters) and stopped after a death in the family (2002 and 2003).
- I am two semesters away from completing my BS at Humboldt State University. I was offered a position with Fish and Game and I stopped classes to take it. I do plan on completing study at Humboldt within two years.
- BS in Marine Biology from UC Santa Cruz, MS in Ecology from San Francisco State University, PhD in Ecology from UC Davis is still in progress
- No
- I am pursuing a Nutritional Consultant Certificate by distance learning. It should be completed by February 2011.
- I've taken a science class at CR with Teresa Scholars.

- BS in Biology with emphasis in fisheries and botany, minor in agriculture: CSU, Chico, 2004.
- Yes, I'm currently attending Humboldt State University in Arcata, CA majoring in Oceanography with a minor in Geology. I am also graduating this May with my BS in Oceanography and minor in Geology.

**4. What jobs/positions have you held since graduating from the MST program?**

- I worked as a "Scientific Aide" for the Ocean Salmon Project with the Department of Fish and Game (2000 and 2001).
- I have worked various technician level jobs with Campbell timberland management, Gualala Redwoods Inc., Sotoyome Resource Conservation District, Gualala River Watershed Council and the California Department of Fish and Game.
- Independent Contractor—Mbari, Research Technician—UC Santa Cruz, Graduate student researcher—Rhombert Tiburon Center, Graduate student researcher—UC Davis, Teaching assistant—UC Davis
- Fisheries Technician—Campbell Timberland Management, Save Our Shorebirds Director—Mendocino Coast Audubon
- I was employed at a wholesale jewelry company for six years, until they had to downsize because of competition from China in 2005. I was then employed at an inn until November 2008 when I was laid off.
- CDFG and NOAA, each only seasonal jobs.
- I worked as a field tech/scientific aide with DFG in Fort Bragg for six years. I harvested seaweed for three years. I currently own a landscaping business and grow and sell vegetables.
- Groundfish Fisheries Technician, (GS7), Pacific State Marine Fisheries Commission/California Dept. of Fish & Game, Ft. Bragg, CA. Public Outreach, Clean Boater Program, Butte County, CA. Park Aide II, Grizzly Creek Redwoods State Park, Carlotta, CA. Deckhand, F/V northern Light, Noyo Harbor, CA.
- Scientific Aide, Student Aide, Editorial Aide, Research Writer.
- Since graduating from College of the Redwoods, I have been a full-time student, and a part-time student assistant in the Admission's Office at Humboldt State University.

**5. What is your current role and responsibilities?**

- Ocean Salmon Project no longer exists and I no longer work for Fish and Game or any related agencies.
- Department of Fish and Game as Fish and Wildlife Technician at the Mad River Fish Hatchery. My duties are to care for eggs in incubators to hatching as fish, thru release as smolts. This includes feeding, disease diagnosis and treatment, weight counts weekly to determine proper feed amounts, pond cleaning, water quality testing, surveying for invasive species and hauling fish by truck to mountain lakes for release. The Mad



River Hatchery is unique in that it is the only state hatchery that re-conditions and recalculates its water. Proper nitrate and mineral balance is important to maintain. As technicians we are also responsible for facility maintenance. This includes things like pump repair, chainsaw, backhoe, forklift and riding mower use, roofing, painting, plumbing, welding, drilling, concrete work and various types of construction.

- Teaching Assistant—Introductory Biology lab course at UC Davis/Two lab classes with 24 undergraduates/Office hours/Exam proctoring. Graduate Student Researcher—Host symbiont interactions of isopods/field research lab experiments/genetic study of symbiont diversity and host population structure.
- Self-employed/Data Analyst
- I am currently unemployed.
- No longer at CDFG or NOAA. I am self-employed now.
- I have a landscaping business. I design, install, and maintain landscapes. I hire employees as needed. I also grow vegetables on about  $\frac{3}{4}$  acre with a partner.
- Instructional Support Specialist III, Science Lab Tech, College of the Redwoods, Mendocino Campus.
- I am a research writer for the California Department of Fish and Game. My responsibilities over the years have included: heading up the Marine Communication Team, producing, writing and editing fishery management plans, fish identification books, newsletters, fishing regulations booklets and posters, press releases, magazine and newsletter articles, DFG website content, marine protected area outreach publications, etc. I also act as backup DFG Marine Region Webmaster, answer e-mail questions from the public on a wide variety of DFG-related topics, and help to organize and participate in DFG outreach events.
- Currently, I'm a student assistant. I help to plan campus tours and admissions appointments, welcome visitors to the campus, answer phone calls and direct visitors, and I assist the Tour Coordinator and Admissions Counselors with various tasks.

**6. Since graduating from the MST program, what kind of on-the-job training did you receive to perform your assigned duties?**

- Mainly, I was shown how to take exact measurements and collect tags implanted in heads of some salmon. I also needed to give detailed descriptions to sports fishers on how to identify different species of salmon, and have knowledge of what other kinds of fish were being taken.
- Skills I learned in the field biology class were especially helpful. Data collection, use of dissolved oxygen meters, elementary surveying and

fish life history were skills I obtained that were instrumental in landing jobs.

- Advanced microscope techniques, molecular genetics, statistics, GPS & GIS.
- On the job training with Fisheries, On the job training with Shorebirds.
- Supervising workers assembling jewelry, jewelry assembly, packing and shipping for a deadline, customer service, Computer: Quickbooks, UPS Worldship, Guest Tracker (reservation software).
- With DFG I attended ATV training and swift water rescue training classes. I was very well prepared for this job after graduating; I had been introduced to most of the duties required of me. I was also more learned than the owners of the seaweed harvesting business and was able to improve the harvesting methods and increase their awareness of the life histories of the various species harvested.
- Some computer instruction for various data entry programs, hands-on instruction in field methods specific to certain tasks/procedures, safety and navigation training on board commercial fishing vessel, lab prep, biological culturing, marine aquaria care, and preserved specimen techniques, safe use of chemicals including formulating compounds and disposal.
- While a Student Aide at CSU, Monterey Bay, I learned desktop publishing and web maintenance on the job. While a student, I learned journalism, science writing and to use computer graphics applications.
- Since I'm still a student, I have not had the opportunity to enter the Marine Science work force. However, once I do, I plan on utilizing all the hands-on experience I have gained from College of the Redwoods and Humboldt State University to better my performance as a worker in the Marine Science field.

**7. What kinds of equipment/technology have you used or are currently using to perform your duties?**

- I have used mainly measuring technology as in: how long is the salmon in millimeters?
- Use of nets and scales for fish weight counts in the hatchery troughs and raceways, dissolved oxygen meter, ph meter, turbidity meter, egg incubators, air spawning of steelhead, computer programs (excel, word, access).
- Molecular techniques (PCR, Gelelectrophoresis), analysis software, fluorescent microscopy.
- Hand held palm pilot, salmon id tagging, Excel.
- Computer, fax, copier, phone.
- E-fisher, Alaskan Weir Densimeter, level and stadia rod, wright buckets, GIS, various computer programs for inputting data, gill net, juvenile downstream traps.

- Various computer programs, sterile technique for biological culturing, use of various scientific data-gathering equipment, computer integration with navigation equipment (charts, ocean topography, commercial vessel navigation).
- Computer, camera.
- I have used Ponar Bottom Grab, Sechii Disk, CTD, Niskin Bottles, Ocean Instruments Box Corer, Bongo Nets, Plankton Nets, Rosette Assembly, multiple sieving procedures, Matlab, CTD programming, and ODV as well as other processes for titrations and filtering.

**8. What specific skill sets do you use on the job?**

- I no longer work in this field at all.
- How to properly collect data, water quality testing, surveying for invasive species.
- Advanced microscope techniques, molecular genetics, statistics, GPS & GIS, Molecular techniques (PCR, Gelelectrophoresis), analysis software, fluorescent microscopy, technical writing, public speaking.
- Knowledge of flora and fauna species and Microsoft Excel.
- I did use: Computer skills, math skills, worked well as part of a team.
- Planning—I have 20-25 accounts to manage customer interaction, talking to new customers, managing employees—occasionally I hire help, usually one person through the summer.
- Field observations for various experiments (scientific method), adapt equipment/methods for optimal student learning, use, care and maintenance of lab and field equipment, chemical handling.
- Writing and editing, knowledge of marine science, computer skills, artistic skills.
- Again, I don't have a job in the field yet. But I will soon!

**9. To what extent do you believe the education you received at CRMC is/was relevant to subsequent education or occupational endeavors?**

- CRMC helped prepare me for Humboldt State University.
- I believe that without the MST program I would not be working fisheries today. It allowed me to get my foot in the door and work my way up from there. It gave me the skills I need to effectively do my job today. It is such a well-rounded program, that it gives you options to go in almost any direction you want.
- Solid foundation and interest in marine biology and basics of oceanography plankton sampling and identification which helped in finding Mbari job and placement and success in undergraduate/graduate course in marine plankton—Honors thesis.
- Networking with local employers through Greg Grantham. Entry level/seasonal positions only.
- The science courses I completed in the MST Program are helpful in my study of nutrition. The math courses I took to get my degree have

helped with my bookkeeping duties and so many other tasks. While working at the inn, I shared my knowledge of birds and natural history with interested tourists.

- It was extremely relevant. It really seemed like the MST Program was specifically designed for the work I did with DFG. I was completely prepared for that job.
- Extremely important. The field methods learned in the MST classes are far superior to most other field classes I have taken, even at a 4-year institution. I have used many of these techniques at work and with upper division classes. Courses are tough, but fair, and have given me an edge not only for upper division classes, but also for employment as field biologists. Many of the sampling techniques learned in MST classes are not even taught in 4-year classes, and are something most biologists will learn for the first time as OJT when employed.
- To a great extent. The MST program is the foundation of my education in marine science, which was at least as academically rigorous as my experience CSU, Monterey Bay. Completing the MST Program prepared me mentally to undertake the final two years of my baccalaureate degree program. My occupation as a marine science communicator relies heavily on the education and experience I received at CR and CSU, Monterey Bay in marine science. Without my marine science background, I would not be able to help the biologists, scientists, etc. who work for the Department to communicate their work to the public, to legislators, and so on. I “speak” both languages: science and journalism, and can act as a kind of translator. Science has often been called a language of its own, and translating it for various audiences in accurate and understandable language is a skill I put to use for the Department. I gained a great deal of knowledge of science in the MST program.
- The education that I received from College of the Redwoods prepared me significantly for what I was about to experience at Humboldt State University. I was already well versed in field techniques upon entering the Oceanography program at Humboldt which put me well ahead of many of my fellow peers.

**10. Do you have any additional comment you would like to share?**

- My experience was that Mr. Grantham was an excellent teacher of elementary science with very poor interpersonal communication skills.
- I believe that Greg Grantham and the MST program are a great asset to College of the Redwoods. It was a great experience.
- Suggest improved computer training and course in GIS/GPS. Introductory biology course should be in a format that is transferable to the UC system.
- Providing more job placement/employment opportunities is needed. Such as a job/share, online job/resume posting via CR. Upgrading technology and research procedures through local agencies.

- The MST Program really enriched my life. I became very interested in birds while in the program. I am a ceramic artist and use the images of birds, marine mammals and other animals in my work. I would be interested if it were possible to do independent study of birds through CRMC.
- If it wasn't for the MST Program I would never have earned my A.S. at CRMC. I believe Greg Grantham's MST Program is a tremendous asset for CRMC.
- When I started the MST Program I had a young family and was in need of a change in occupational direction. Greg Grantham kept me interested and taught much. Besides learning the subject matter, his classes brought me into contact with people that are still a part of my business and personal life. Without a doubt I would not be where I am today without this program.
- After attending 4 other universities before entering the MST program and one after, I can truly say this program teaches more field biology sampling techniques and methods than a four-year institution. Any graduate from the MST program has a definite edge not only when continuing their education, but also out in the job market. This type of program is one of the few of its kind in the U.S., and its location on the Mendocino Coast only improves the content of instruction and techniques presented that are invaluable for one entering this career path. The program is enhanced by its coordinator and instructor, Greg Grantham. His knowledge, enthusiasm and humor plus a teaching style that mixes the use of visuals, equipment demonstrations and experiments, has earned my respect as a student and a colleague.
- Your current instructor, who was my instructor, is exceptional at what he does. Yet, the framework of the MST Program is such that the success of the program need not be reliant on one exceptional instructor. It is likely a bit much to hope that future instructors will be as good as Greg, but I can see where this program can continue to give students a fine education that will lead to successful entry-level marine science jobs or four-year programs as long as a dedicated instructor is guiding it.
- Yes, I would just like to say that Greg Grantham is a wonderful professor and such a wealth of knowledge. I truly enjoyed the opportunity that I had to learn from him. His program really helped me to realize the love and passion that I have for Oceanography. Without his guidance, I'm not sure if I would be at this point in my educational career. I would just like to thank him for creating this program and being such an amazing professor.

## Survey Instrument

College of the Redwoods

### Questionnaire for Marine Science Technology Program Graduate

Name: \_\_\_\_\_

Date: \_\_\_\_\_

If your name is different than when you graduated from CR, please indicate:

\_\_\_\_\_

1. What year did you graduate from the MST program?
2. Did you earn the Certificate of Achievement or the Associate of Science degree, or both?
3. Have you pursued further education (in this or any other field) since completing the degree? If so, what did you pursue (and where), and has this educational goal been completed?
4. What jobs/positions have you held since graduating from the MST program?
5. What is your current role and responsibilities?

