Partnering between a Community College & Non-Profits in Water Quality Monitoring: Problem Based Learning in Creating Sampling & Monitoring Project Plans and Analysis

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STEPS TO DEVELOPING A PROJECT PLAN*

Step 1: *Establish* a partnership. The CBO will serve as advisors and mentors to guide students through the process.

Step 2: *Determine* the goal and objectives of your project:

Why it is needed

Who will use the data:

Step 3: *Collect* background information to design your experiment. Look at historical data if available from various CBOs and government agencies.

Step 4: *Refine* goals.

Step 5: *Design* the Sampling, Analytical and Data requirements. The What, How, When, Where you will be monitoring.

- **What:** CBOs and CCSF EMSA program will determine the physical, chemical and microbiological parameters to monitor.
- **How:** Follow Standard Operating Procedures (SOP) from the EPA Approved Methods for sampling and analysis.
- **When:** CBO and EMSA students determine how often this should be done. Eg. wet/dry weather monitoring of surface water is usually once a week for 5 weeks. For SPAWN, monitoring will be done before, during, after restoration.

Step 6: *Begin* monitoring, collecting data.

Step 7: *Analyze* data and ***write*** a report

Step 8: *Present* report to CBO at a community meeting and to the class for a class project

*Steps are edited from the EPA's The Volunteer Monitor's Guide to Quality Assurance Project Plans (Sept 1996, EPA 841-B-96-003)

INTRODUCTION

- **A 4-year Grant from the Department of Labor provided funds for field and chemical analysis equipment and the initiation of a new Environmental Monitoring Sampling and Analysis (EMSA) Program.**
- **The aim of CCSF's EMSA Certificate Program is to provide a working understanding of environmental monitoring and its application to real-world settings.**
- **To this end, we have collaborations with the National Park Service as well as various community based organizations (CBOs) for water quality monitoring.**

CBOs Contribute:

1. **Projects with real-world objectives**
2. **Knowledge of their wetland Creek/River/Lake/Estuary**
3. **Networking Opportunities: Professional interaction with a community based organization (soft skills)**
4. **A forum for students to teach and present**
5. **Expertise in Project Plans: CBOs are made up of professionals with environmental and engineering background**

CCSF's EMSA Program Contributes:

1. **Technically trained student volunteers**
2. **Equipment and lab for analysis (YSI Pro Plus Quattro, IDEXX)**
3. **Necessary reagents for lab analysis**
4. **Expertise in sampling and analysis**
5. **Training for CBOs in field equipment**
6. **On-going monitoring capability**

EMSA student providing training to a monitoring group

EMSA students monitoring and recording data at Islais Creek, SF

OUR PARTNERS

Protecting SPAWNERS San Pablo Creek

CALIFORNIA ACADEMY OF SCIENCES

CCWF CONTRA COSTA WATERSHED FORUM

NATIONAL PARK SERVICE

TURTLE ISLAND RESTORATION NETWORK SPAWN

CCSF EQUIPMENT

Water Quality Monitoring Parameters:

- pH/ORP
- Temperature
- Conductivity
- Dissolved Oxygen
- *E.coli* & *Enterococci*
- Nitrite & Nitrate
- Phosphate
- Chlorine

YSI Proplus

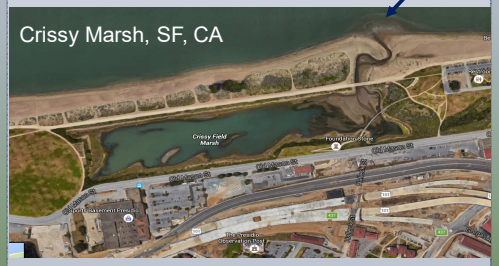
IDEXX Quantitray 2000

Chemical Analysis Capabilities

- Ion chromatography (inorganic anions & cations)
- GC-MS (organic compounds & volatiles)
- ICP-OES (for trace metals such as Hg, As)

A PROJECT with the NATIONAL PARK SERVICE

A fall semester project: collect *E.coli* and *Enterococci* data at the Crissy March Inlet when the tide goes out. Objective: to determine whether there is contamination from outlets going into this marsh.



CHALLENGES

- New Program, enrollment & recruitment
- New model of student learning
- Lack of dedicated facility for the program
- Staffing experience, shortages/turnover
- Funding (grant ends 9/2016)

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