

Understanding Freshwater Invertebrates and the Health of Streams and Rivers in California

About the Course

The status of freshwater invertebrate communities reflects the health of streams and rivers. Measuring aquatic communities is called bioassessment and is commonly accepted by water quality managers as the lead indicator of the biotic and physical/habitat condition of aquatic ecosystems. Development of standardized bioassessment techniques began in the early 1990s based on guidelines proposed by the U.S. EPA. Over the years, there have been considerable advancements in bioassessment techniques and tools for developing biotic indicators. This work, led by the California Department of Fish and Wildlife (CDFW) in cooperation with the State and Regional Water Board's Surface Water Ambient Monitoring Program (SWAMP), will be extensively explored in these courses.

In this 3-day classroom/laboratory course, students will learn about the SWAMP bioassessment protocol for collecting freshwater invertebrate and algae samples and measuring the physical habitat of wadeable streams. The California Rapid Bioassessment Protocol (CRBP) will also be presented as a lower effort alternative for Citizen Scientists or as biotic screening tool.



In a laboratory setting, students will identify invertebrates from various SWAMP monitoring sites and produce the data for examining site condition. Students will be introduced to the Family Level Index as part of the CRBP. The last day of this course covers sampling design and data analysis of both ambient and point-source assessments. Excel spreadsheets of taxa

lists, biotic metrics and physical habitat elements will be examined by the students to answer a series of questions on data interpretation, quality and variability at actual SWAMP sites.

Who Should Take this Course?

This course was designed to provide students the necessary training to become competent with administering, conducting and interpreting data from a bioassessment project. There are no pre-requests for the course; just an interest in streams and rivers and how to measure their health. Typically, students work at water resource agencies, citizen monitoring groups and consulting firms working in the field of aquatic resource management.

About the Instructor

The Instructor is Jim Harrington, a Senior Environmental Scientist with the California Department of Fish and Wildlife (CDFW) for more than 30 years, who is now retired. Jim has been working in the field of freshwater bioassessment since 1980 and developed the field and laboratory curriculum used in this course.

The instructor is considered an expert in the field of bioassessment and environmental education in California and has received outstanding achievement awards from the National Water Quality Monitoring Council and the Society for Freshwater Science (SFS). He is currently a fellow for SFS.



Course Agenda

Day 1

Conference Room and Laboratory

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| 9:00 – 9:30 | Introductions, training objectives and description of course manual |
| 9:30 – 11:00 | Presentations on the principles of bioassessment and the SWAMP field protocol |
| 11:00 – 12:30 | Presentation on freshwater invertebrate ecology and sample processing |
| 12:30 – 1:30 | Lunch |
| 1:30 – 3:00 | Form teams and sub-sampling BMIs from samples |
| 3:00 – 5:00 | Perform invertebrate taxonomy to order Level |

Day 2

Laboratory and Conference Room

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| 9:00 – 9:30 | Review and questions from Day 1 |
| 9:30 – 12:30 | Perform invertebrate taxonomy to family level |
| 12:30 – 1:30 | Lunch |
| 1:30 – 2:40 | Complete taxonomy, generate biological metrics and calculate Family Level Index (FLI) scores |
| 2:40 – 3:00 | Break |

3:00 – 5:00	Discuss significance of biological metrics and FLI scores
Day 3	Conference Room
9:00 – 9:30	Introductions and Training Objectives
9:30 – 10:40	Presentation on Study Design
10:40 – 11:00	Break
11:00 – 12:30	Description of Team Assignment and Practice Data Analysis and Interpretation
12:30 – 1:30	Lunch
1:30 – 2:40	Practice Data Analysis and Interpretation
2:40 – 3:00	Break
3:00 – 5:00	Wrap-up and Data Entry

2019 Course Schedule and Locations

May 22, 23 and 24
June 3, 4 and 5

Rancho Cordova
Rancho Cordova

How to Register

Courses will be held at the following location in Rancho Cordova:

**Central Valley Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-3291**

This course is the only bioassessment training available for 2019. If you are interested in attending, then send registration requests to Jim Harrington at his personal e-mail bocasjim@yahoo.com and call 916-456-5696 if you have questions that cannot be addressed in an e-mail. Those who successfully register for a course will be informed within 10 days and receive course instructions and materials one week before the course begins.

There may be a fee for this course, but it has not been determined yet. Those interested in attending the course will be informed as soon as possible about costs.