WELCOME

20th ANNUAL MEETING OF THE

CALIFORNIA AQUATIC BIOASSESSMENT WORKGROUP

DAVIS, CALIFORNIA

OCTOBER 29 and 30, 2013

College of Bioassessment 2-Day Courses

Course 1 - Concepts of Bioassessment and Program Implementation

Course 2 - SWAMP Bioassessment Field Procedures

Course 3 - Aquatic Invertebrate Laboratory Procedures and Biological Metrics

Course 4 - Introductory Lab/Data Analysis

SWRCB Training Academy's College of Bioassessment

Course 1 – Concept of Bioassessment and Program Implementation

November 28 and 29, 2012	Sacramento
December 5 and 6, 2012	Sacramento
February 26 and 27, 2013	San Diego
March 13 and 14, 2013	Sacramento
May 13 and 14, 2013	Riverside
May 20 and 21, 2013	Sacramento
June 4 and 5, 2013	Costa Mesa
June 25 and 26, 2013	Arcata/Eureka

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Course 2 - SWAMP Bioassessment Field Procedures

March 19 and 20, 2013	San Diego
April 16 and 17, 2013	San Louis Obispo
May 1 and 2, 2013	Sacramento
May 23-24, 2013	Sacramento

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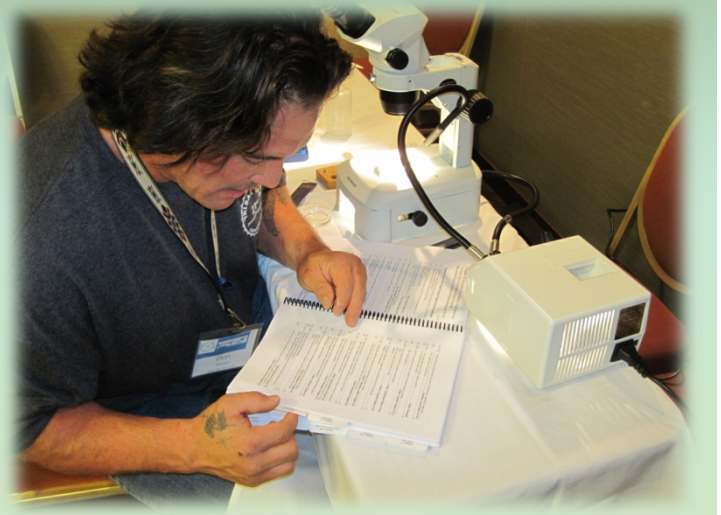
Course 3 - Aquatic Invertebrate Laboratory Procedures and Biological Metrics

September 16 and 17, 2013	Sacramento
October 1 and 2, 2013	Sacramento
November 6 and 7, 2013	San Diego



COLLEGE of BIOASSESSMENT 2013

Aquatic Invertebrate Laboratory Procedures and Biological Metrics

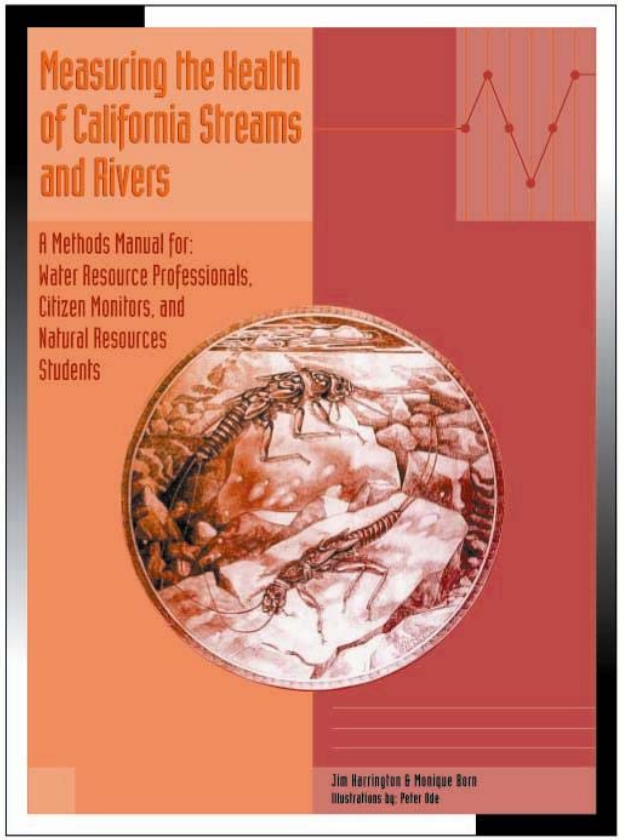
Course 3 Overview

Jim Harrington
California Depart of Fish and Wildlife

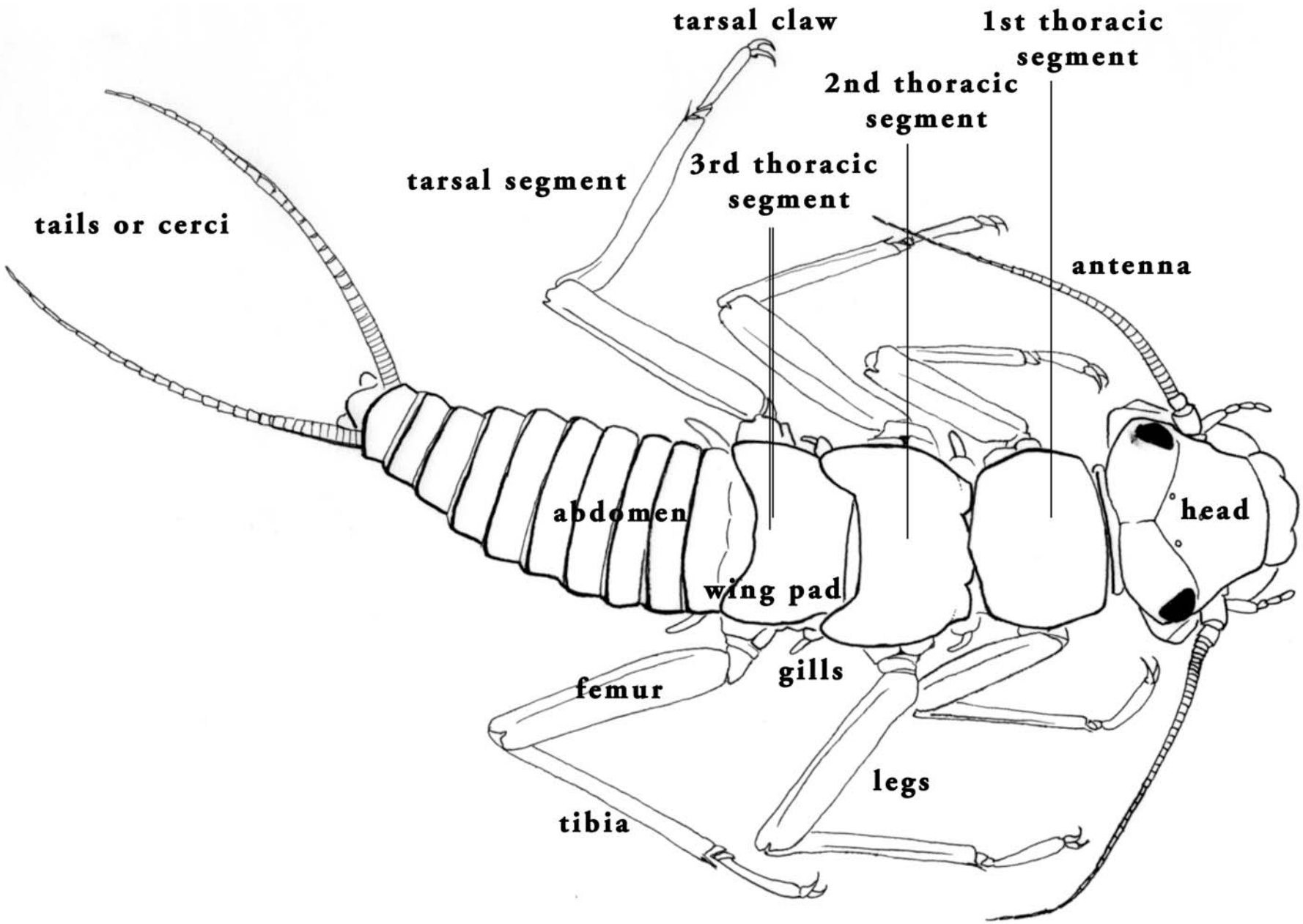
Measuring the Health of California Streams and Rivers

A Methods Manual for:
Water Resource Professionals,
Citizen Monitors, and
Natural Resources Students

www.slsii.org



Jim Harrington & Monique Born
Illustrations by Peter Ode


tarsal claw
1st thoracic segment
2nd thoracic segment
3rd thoracic segment
tarsal segment
tails or cerci
antenna
abdomen
head
wing pad
gills
femur
legs
tibia

Chapter 13
Sorting into Major Groups

Taxonomic Keys to the Major Groups of Aquatic BMIs

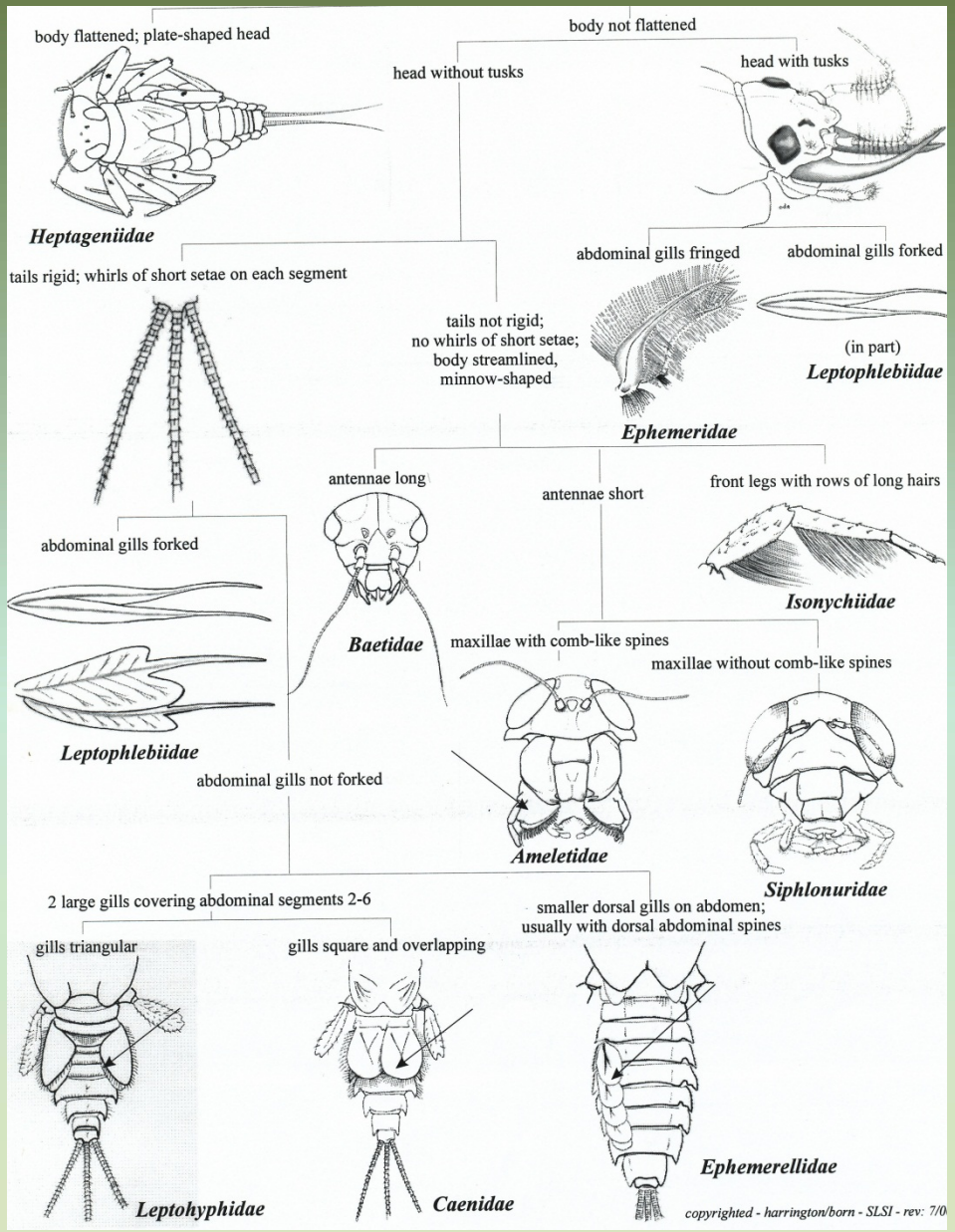
1a Organism very small (<3mm) and body encased by a transparent shell or organism of various sizes and body enclosed by hard shell.....2

1b Organism not enclosed within a shell; most body parts visible 5

4a (2b) Body enclosed in a single shell; usually with spiraling coils; snails and limpets…..**Class: Gastropoda (Figures 13-3, 13-4 and 13-5)**

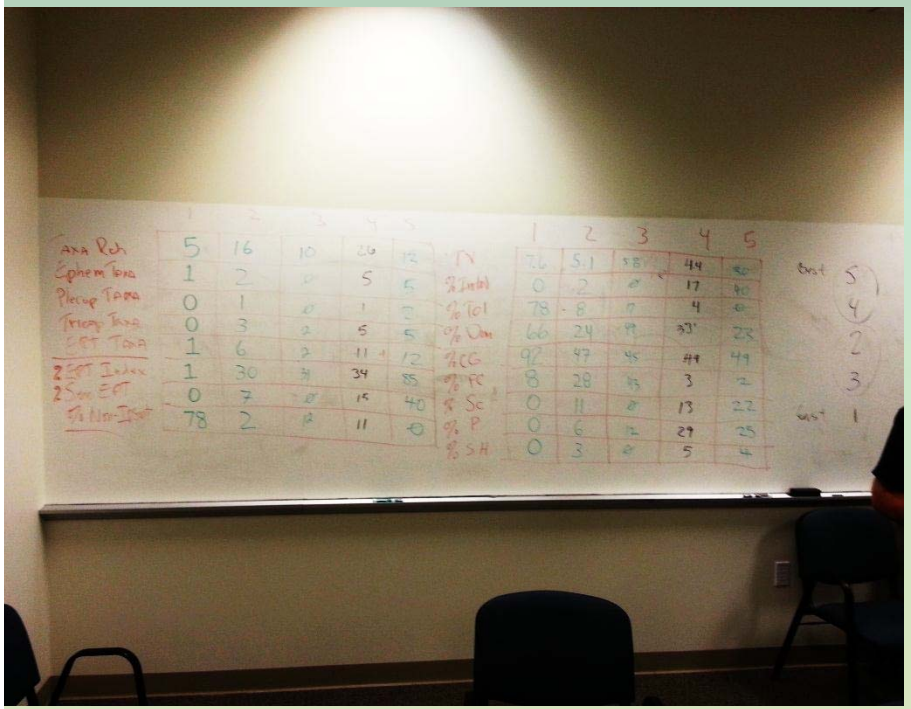
89 Distinct Taxa Possible

Chapter 14 - Mayflies



Perlidae

Courtesy of
SFS Collection



Chapter 19. Data Development

There seems to always be a few types of tolerant BMIs that can thrive on any given pollutant substance.

On the next page is a list of some common biological metrics that have proven useful in measuring human disturbance to the BMI community of streams and rivers. As part of your Family Level Taxonomic exercise you will be calculating these metrics.

Calculating Biological Metrics for Family Level Taxonomic Effort

Before starting the following steps, gather your paperwork (Family Level Taxonomic Effort Benchsheets) for the laboratory exercise. You should have the:

Subsampling Benchsheet

Sorting Benchsheet

Ephemeroptera (mayfly) Final Benchsheet

Plecoptera (stonefly) Final Benchsheet

Trichoptera (caddisfly) Final Benchsheet

Other Groups Final Benchsheet

Family Level Biological Metrics Worksheet

The Biological Metrics Worksheet is a two-sided document. All of the information on final taxonomic benchsheets will be recorded on the back side and values of the biological metrics will be recorded on the front. Remember benchsheets are your laboratory notes and an official document, but should be your actual notes, with alcohol stains and all. The Laboratory Worksheet is meant to be neat and clean. It is an official document you will keep, but it is used to copy and pass out to interested parties (this will be explained further in a later section).

For our training, the people in the original six groups that subsampled together get back together to calculate the biological metric values using the following instructions:

Step 1 Copy the total number of organisms for each taxa from your four final benchsheets onto the back side of the Biological Metrics Worksheet. Do not duplicate the tally marks;

Step 2 Count the number of all the organisms you listed on the back side of the Biological Metrics Worksheet and record it in the column Total Number of Organisms. (Note: although you thought you subsampled 100 organisms, rarely will you end up with that number);

Step 3 Determine the **Taxa Richness** by counting the total number of taxa (distinct groups) listed on the back side of the Biological Metrics Worksheet. Record that number on the front side of the Biological Metrics Worksheet;

Step 4 Determine the **Ephemeroptera Taxa** (mayflies), **Plecoptera Taxa** (stoneflies) and **Trichoptera Taxa** (caddisflies) by counting the total number of families listed for each of these orders. Record the number for each order on the front side of the Biological Metrics Worksheet;

Step 5 Determine the **EPT Taxa** by counting the number of taxa in all three orders - Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) - together. Record that value on the front side of the Biological Metrics Worksheet;

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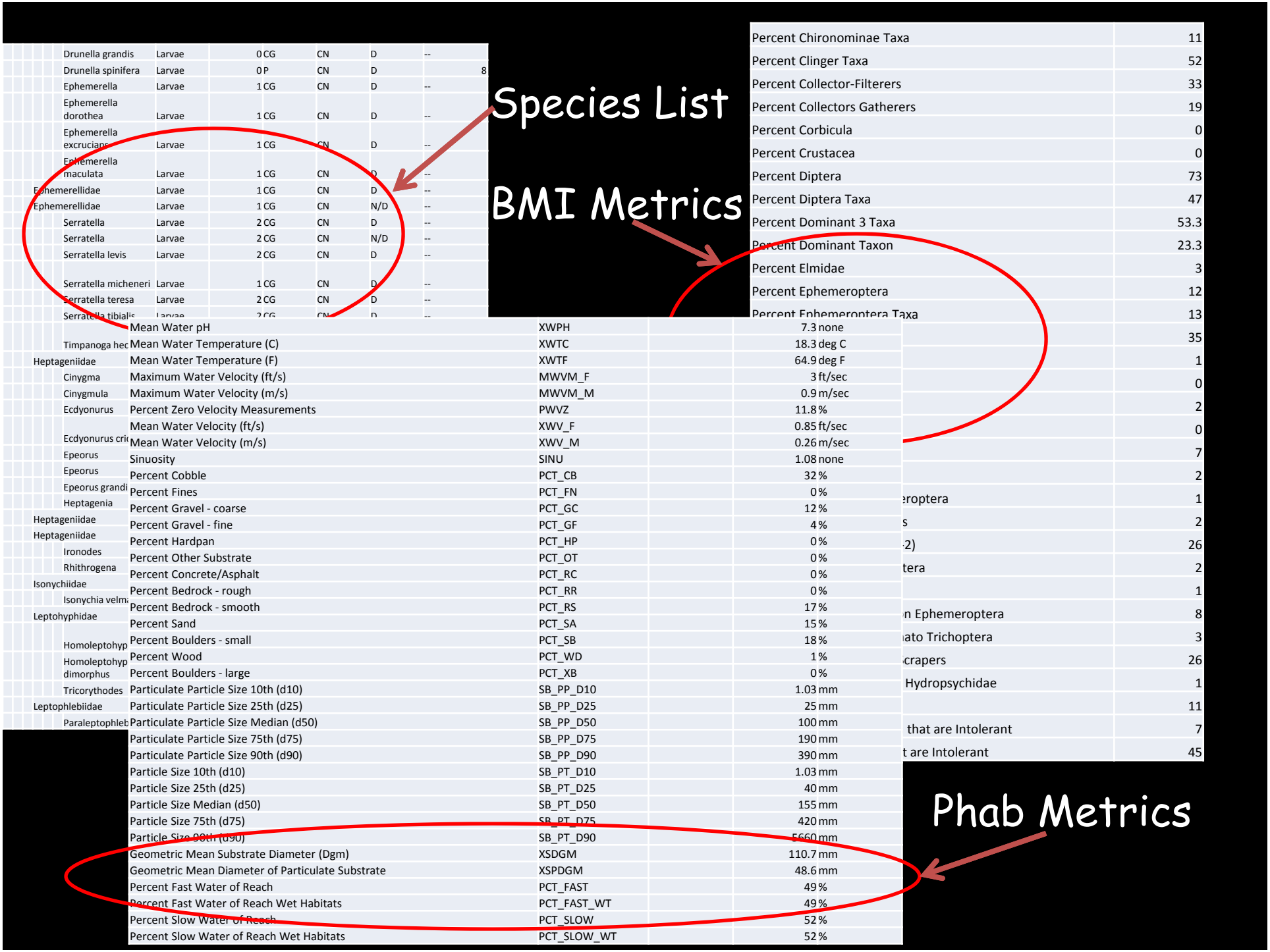
Course 4 - Bioassessment Data Analysis and Interpretation

December 4 and 5, 2013	Sacramento
December 16 and 17, 2013	San Diego



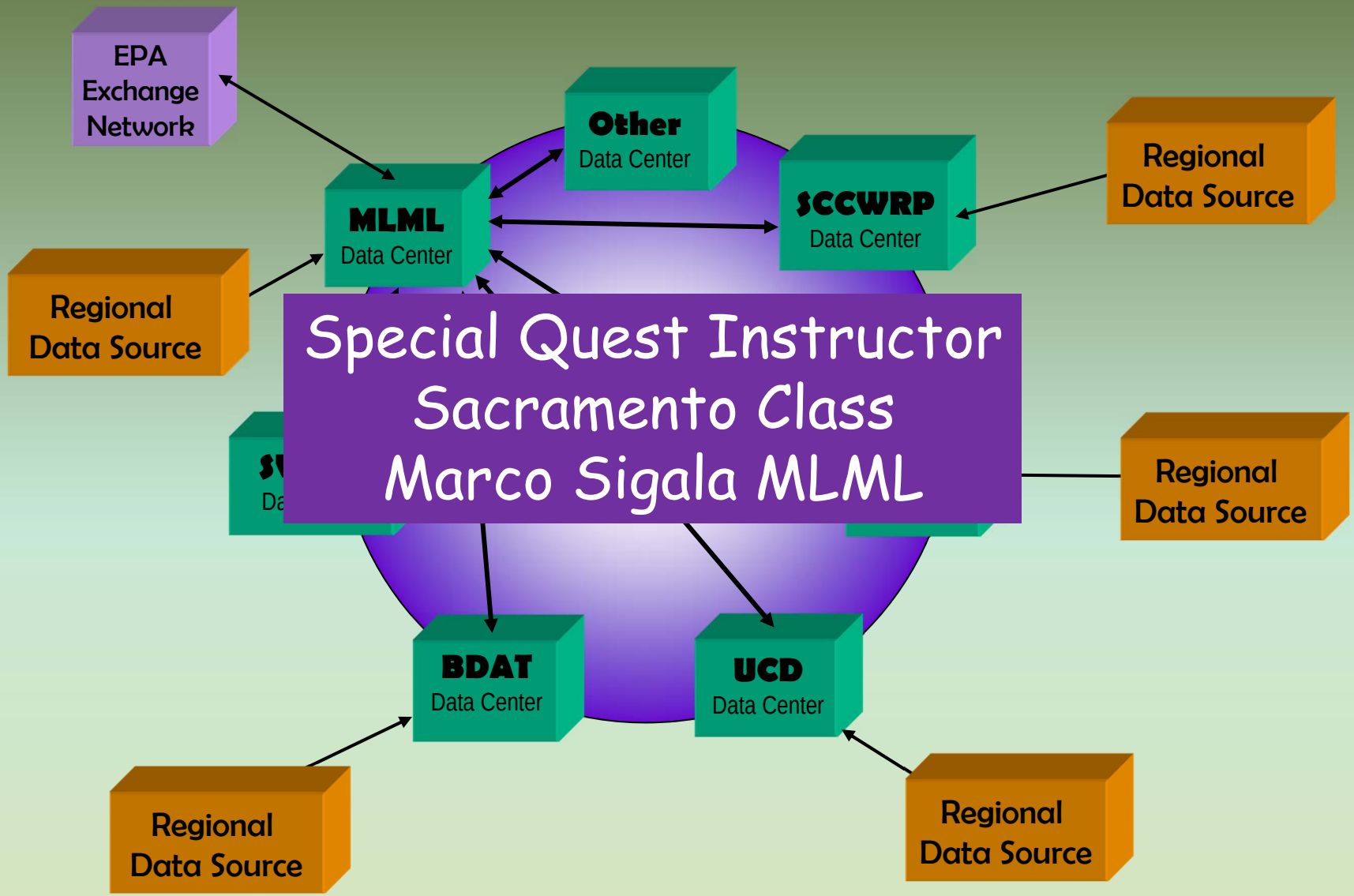
	Drunella grandis	Larvae	0	CG	CN	D	--
	Drunella spinifera	Larvae	0	P	CN	D	8
	Ephemerella	Larvae	1	CG	CN	D	--
	Ephemerella dorothea	Larvae	1	CG	CN	D	--
	Ephemerella excrucians	Larvae	1	CG	CN	D	--
	Ephemerella maculata	Larvae	1	CG	CN	D	--
Ephemerellidae		Larvae	1	CG	CN	D	--
Ephemerellidae		Larvae	1	CG	CN	N/D	--
	Serratella	Larvae	2	CG	CN	D	--
	Serratella	Larvae	2	CG	CN	N/D	--
	Serratella levis	Larvae	2	CG	CN	D	--
	Serratella micheneri	Larvae	1	CG	CN	D	--
	Serratella teresa	Larvae	2	CG	CN	D	--
	Serratella tibialis	Larvae	2	CG	CN	D	--
	Timpanoga hec						
Heptageniidae							
	Cinygma						
	Cinygmula						
	Ecdyonurus						
	Ecdyonurus cri						
	Epeorus						
	Epeorus						
	Epeorus grandi						
	Heptagenia						
Heptageniidae							
Heptageniidae							
	Ironodes						
	Rhithrogena						
Isonychiidae							
	Isonychia velm						
Leptohyphidae							
	Homoleptohyp						
	Homoleptohyp dimorphus						
	Tricorythodes						
Leptophlebiidae							
	Paraleptophleb						

Mean Water pH	XWPH	7.3	none
Mean Water Temperature (C)	XWTC	18.3	deg C
Mean Water Temperature (F)	XWTF	64.9	deg F
Maximum Water Velocity (ft/s)	MWVM_F	3	ft/sec
Maximum Water Velocity (m/s)	MWVM_M	0.9	m/sec
Percent Zero Velocity Measurements	PWVZ	11.8	%
Mean Water Velocity (ft/s)	XWV_F	0.85	ft/sec
Mean Water Velocity (m/s)	XWV_M	0.26	m/sec
Sinuosity	SINU	1.08	none
Percent Cobble	PCT_CB	32	%
Percent Fines	PCT_FN	0	%
Percent Gravel - coarse	PCT_GC	12	%
Percent Gravel - fine	PCT_GF	4	%
Percent Hardpan	PCT_HP	0	%
Percent Other Substrate	PCT_OT	0	%
Percent Concrete/Asphalt	PCT_RC	0	%
Percent Bedrock - rough	PCT_RR	0	%
Percent Bedrock - smooth	PCT_RS	17	%
Percent Sand	PCT_SA	15	%
Percent Boulders - small	PCT_SB	18	%
Percent Wood	PCT_WD	1	%
Percent Boulders - large	PCT_XB	0	%
Particulate Particle Size 10th (d10)	SB_PP_D10	1.03	mm
Particulate Particle Size 25th (d25)	SB_PP_D25	25	mm
Particulate Particle Size Median (d50)	SB_PP_D50	100	mm
Particulate Particle Size 75th (d75)	SB_PP_D75	190	mm
Particulate Particle Size 90th (d90)	SB_PP_D90	390	mm
Particle Size 10th (d10)	SB_PT_D10	1.03	mm
Particle Size 25th (d25)	SB_PT_D25	40	mm
Particle Size Median (d50)	SB_PT_D50	155	mm
Particle Size 75th (d75)	SB_PT_D75	420	mm
Particle Size 90th (d90)	SB_PT_D90	5660	mm
Geometric Mean Substrate Diameter (Dgm)	XSDGM	110.7	mm
Geometric Mean Diameter of Particulate Substrate	XSPDGM	48.6	mm
Percent Fast Water of Reach	PCT_FAST	49	%
Percent Fast Water of Reach Wet Habitats	PCT_FAST_WT	49	%
Percent Slow Water of Reach	PCT_SLOW	52	%
Percent Slow Water of Reach Wet Habitats	PCT_SLOW_WT	52	%

Percent Chironominae Taxa	11
Percent Clinger Taxa	52
Percent Collector-Filterers	33
Percent Collectors Gatherers	19
Percent Corbicula	0
Percent Crustacea	0
Percent Diptera	73
Percent Diptera Taxa	47
Percent Dominant 3 Taxa	53.3
Percent Dominant Taxon	23.3
Percent Elmidae	3
Percent Ephemeroptera	12
Percent Ephemeroptera Taxa	13
	35
	1
	0
	2
	0
	7
	2
eroptera	1
s	2
2)	26
tera	2
	1
n Ephemeroptera	8
ato Trichoptera	3
crapers	26
Hydropsychidae	1
	11
that are Intolerant	7
t are Intolerant	45

CEDEN Network

California Environmental Data Exchange Network



College of Bioassessment Certification (Starting 2014)

Certification for Individual Courses

Certification for Bioassessment Administrator

Certification for Bioassessment Practitioner – requires annual renewal

Will Really Help with your SCP