San Diego Creek Watershed Characterization

SD Creek Casual Assessment Project

Workshop#1

December 17, 2014

Outline

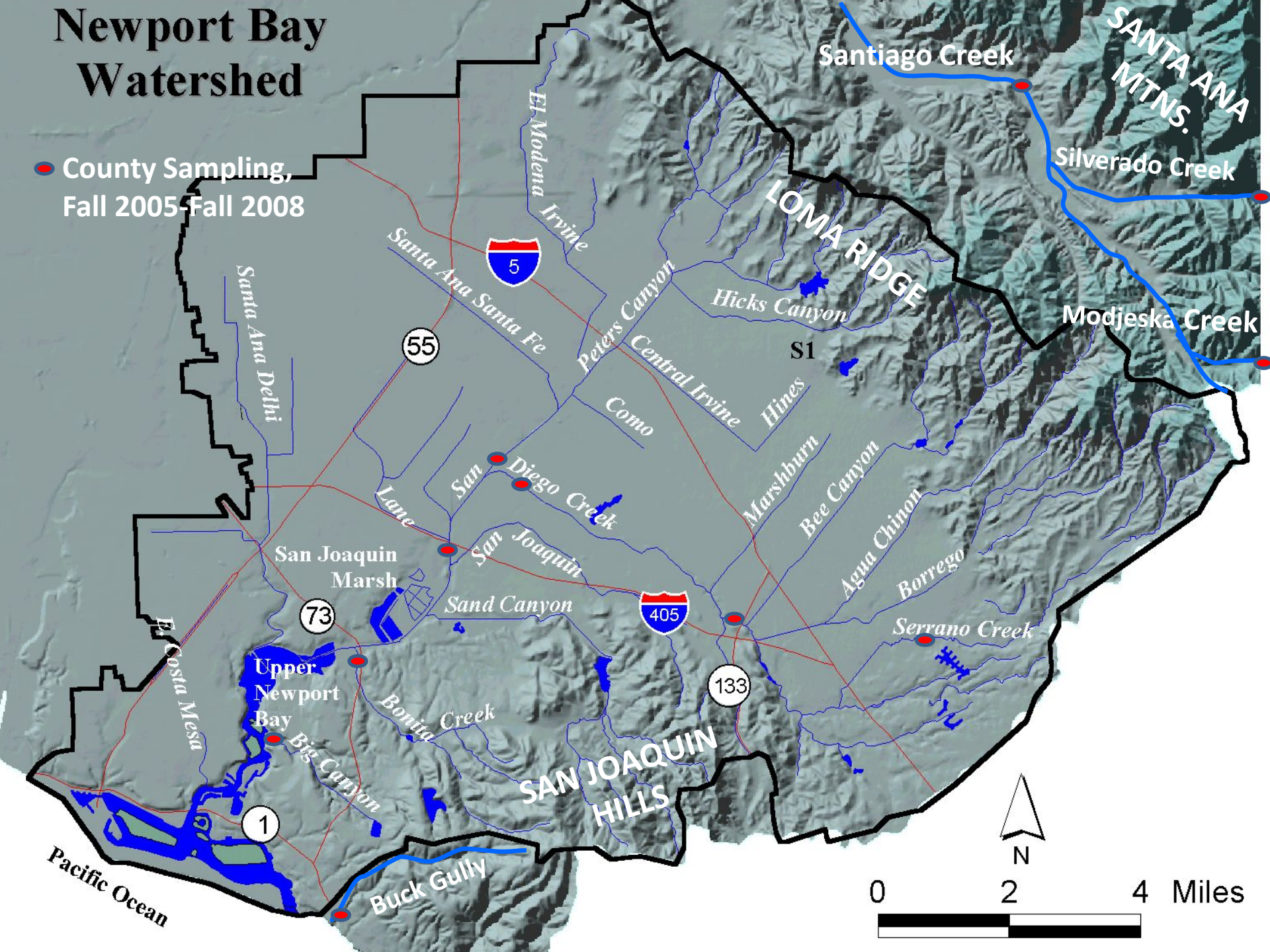
Physical Descriptions of Case Sites

- Elevation, land use, flow
- Test, Sites Comparator Sites
- County data set 2006-2008

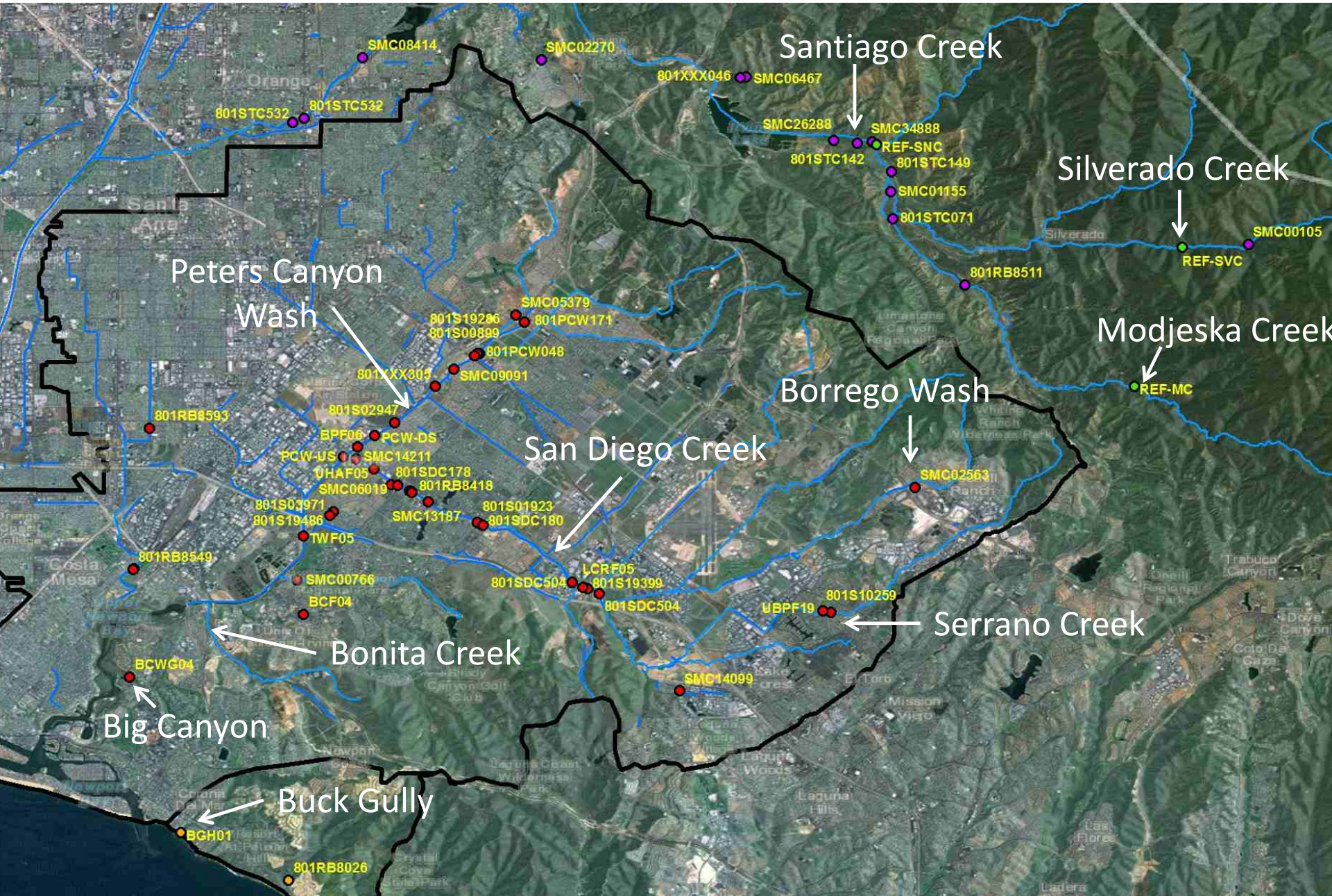
Water Chemistry

Biology

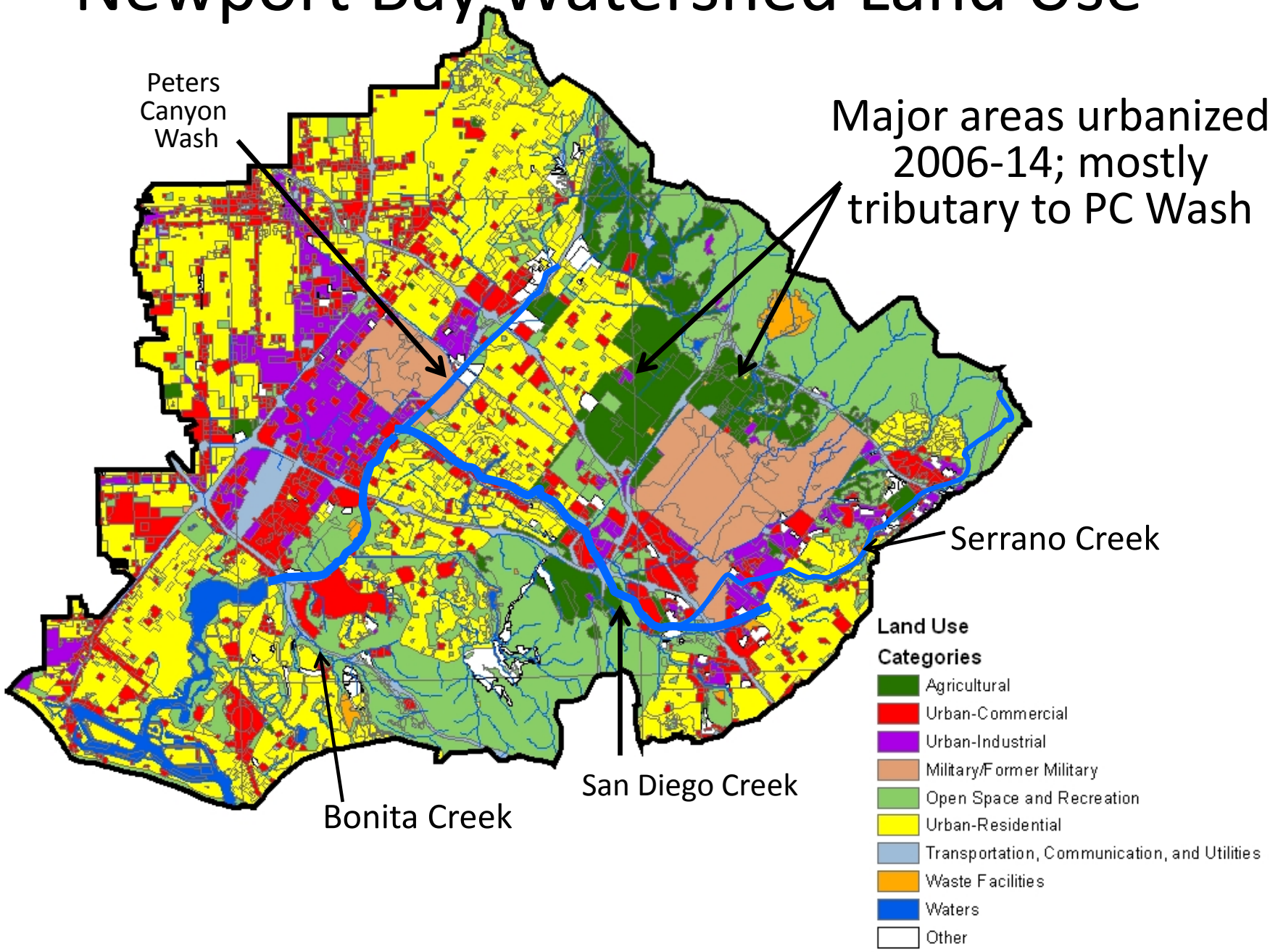
- Resident taxa
- IBI scores


Newport Bay Watershed
County Sampling, Fall 2005-Fall 2008
Santiago Creek
SANTA ANA MTNS.
Silverado Creek
Modjeska Creek
LOMA RIDGE
Hicks Canyon
S1
El Modena Irvine
Santa Ana Santa Fe
Peters Canyon
Central Irvine
Hines
Como
Santa Ana Delhi
San Diego Creek
Lane
San Joaquin
Marshburn
Bee Canyon
Agua Chinon
Borrego
Serrano Creek
San Joaquin Marsh
Sand Canyon
Upper Newport Bay
Bonita Creek
Big Canyon
El Costa Mesa
SAN JOAQUIN HILLS
Buck Gully
Pacific Ocean
5
55
73
405
133
1
N
0
2
4
Miles

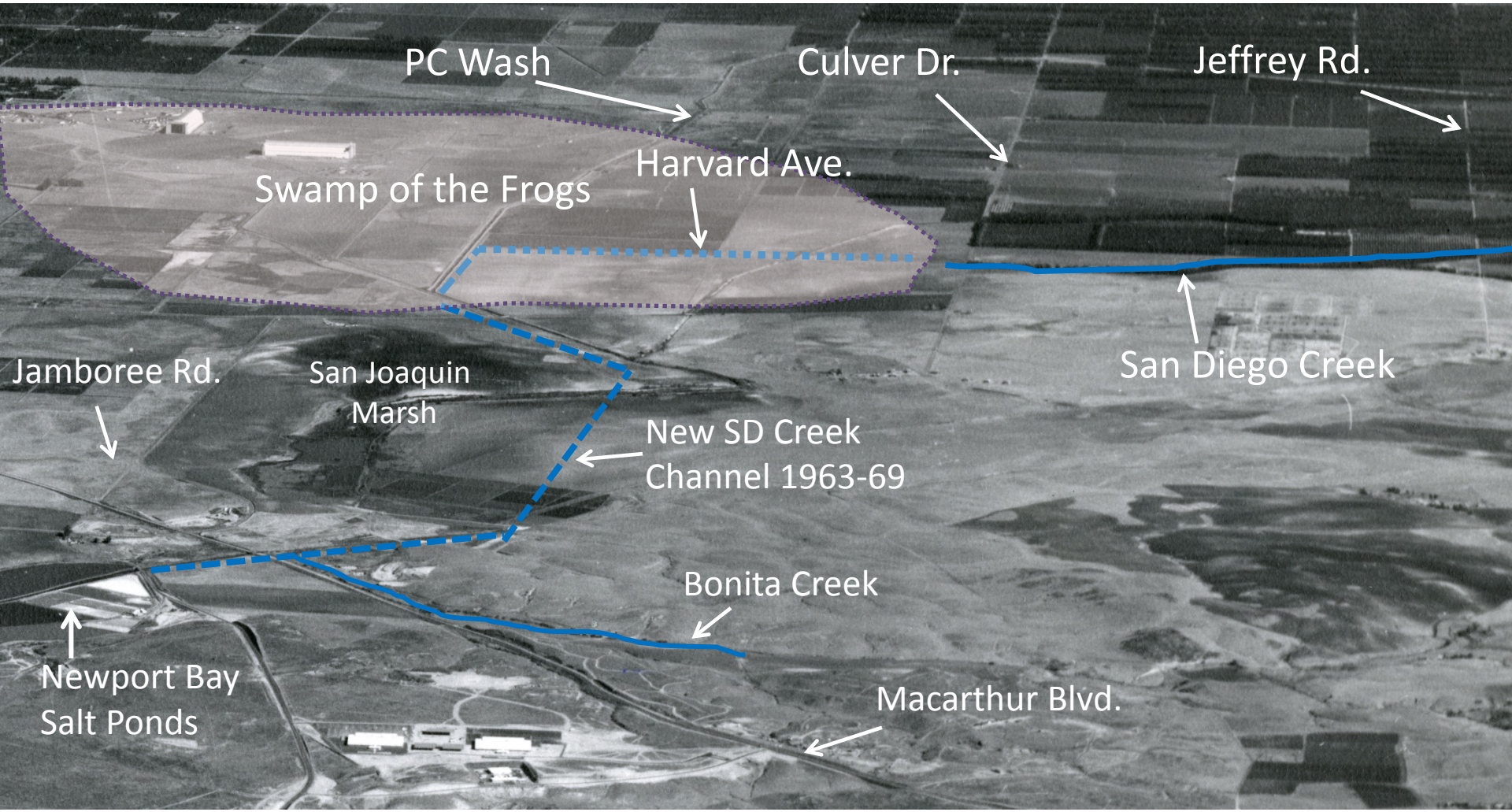
All Potential Case Sites



Newport Bay Watershed Land Use



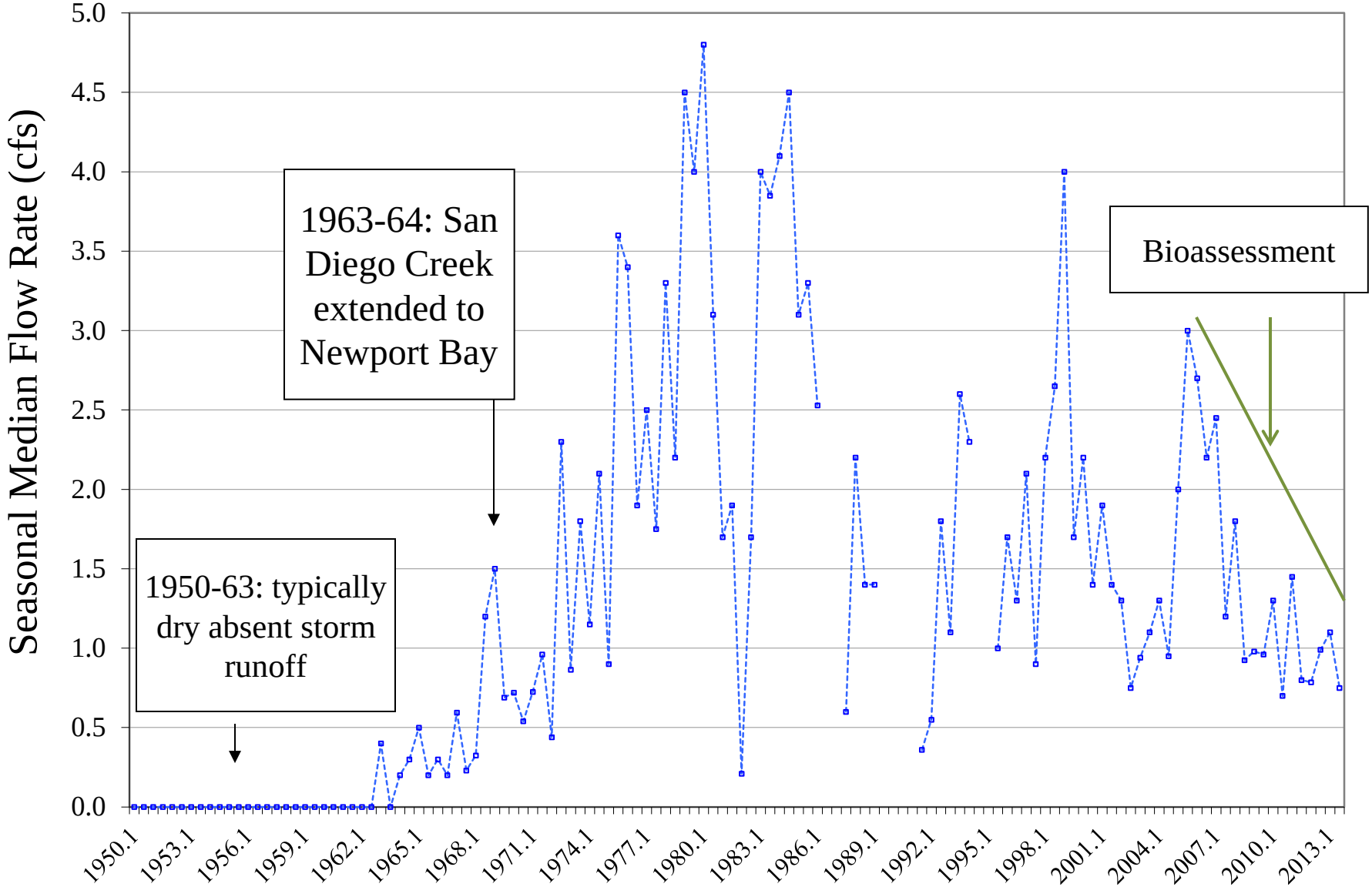
SD Creek & PC Wash - 1959



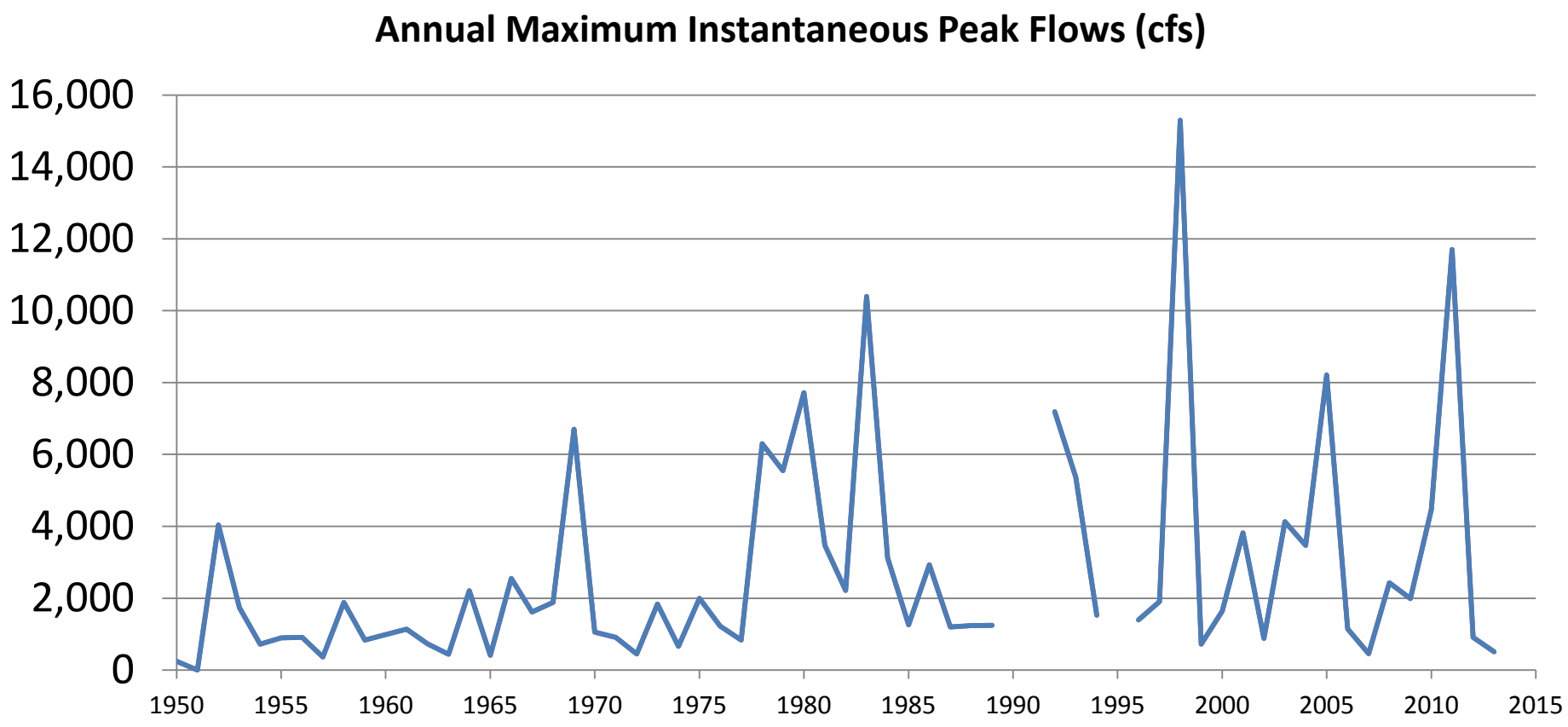
San Diego Creek

(between Valley Oak Dr. and Jeffrey Rd).

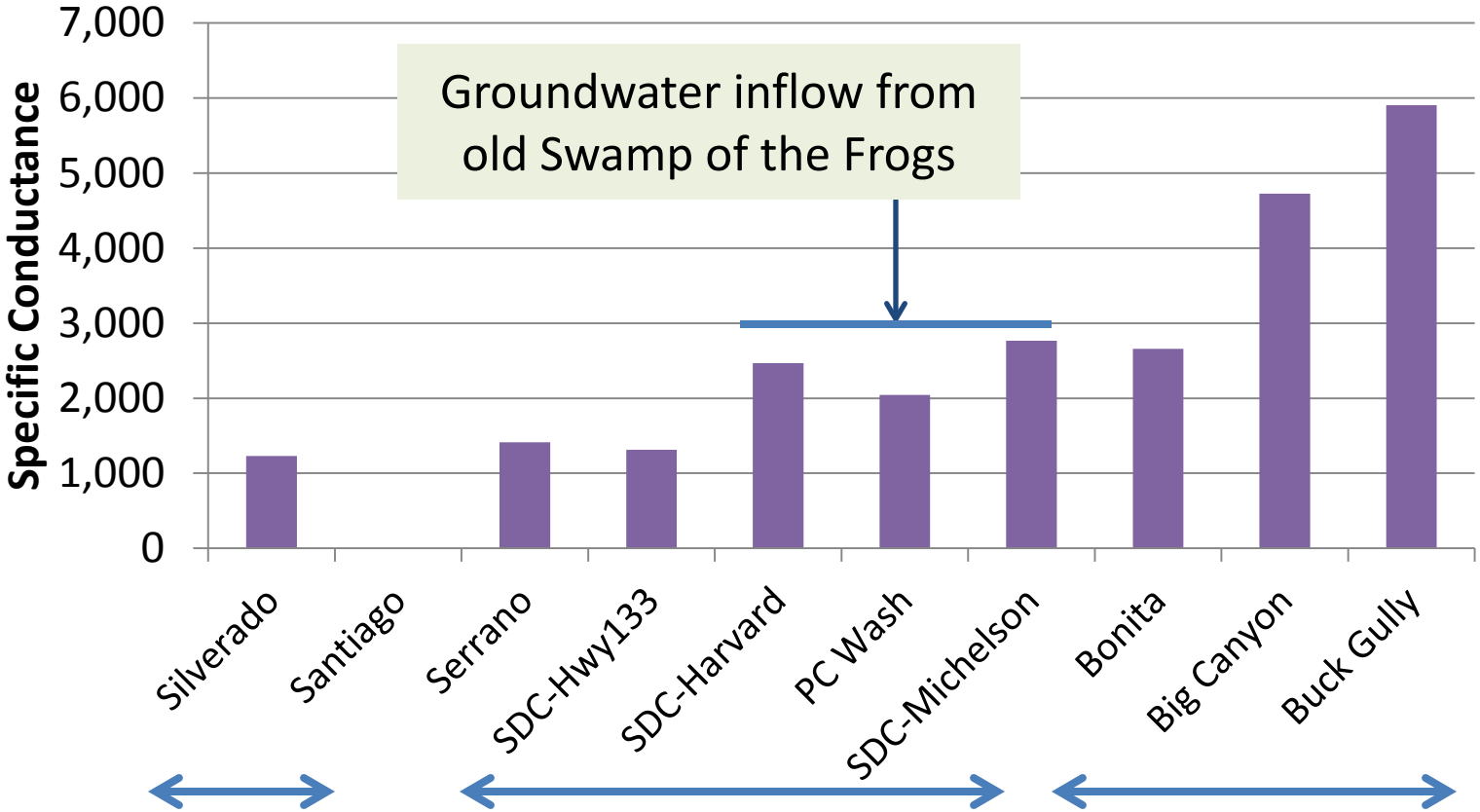
SD Creek – Dry Weather Flow @ Culver



San Diego Creek – Peak Flows
(Culver Drive)



Conductivity (County data set)

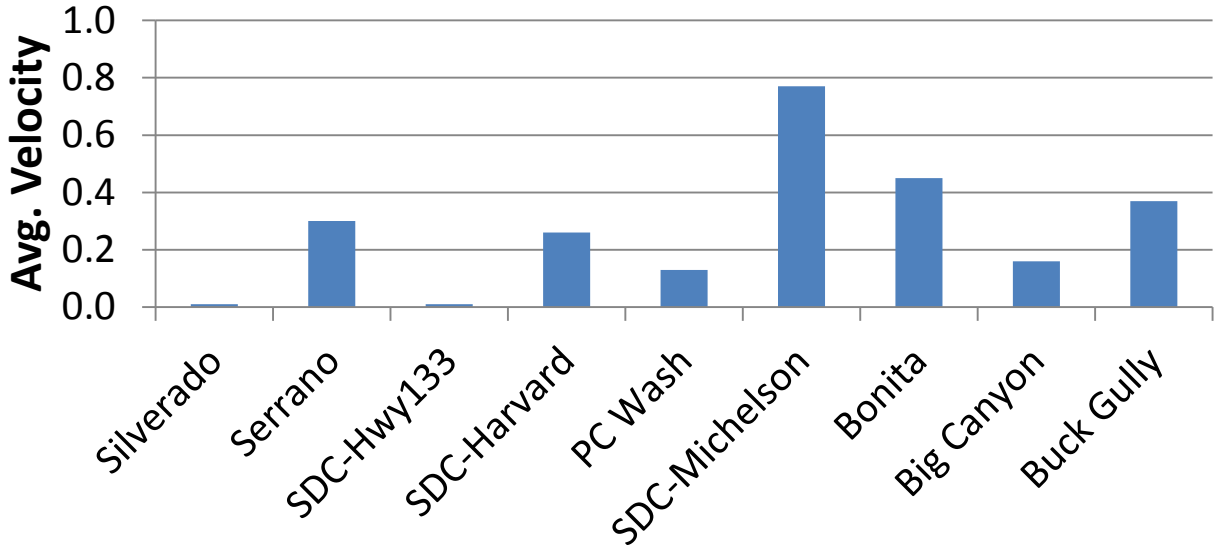


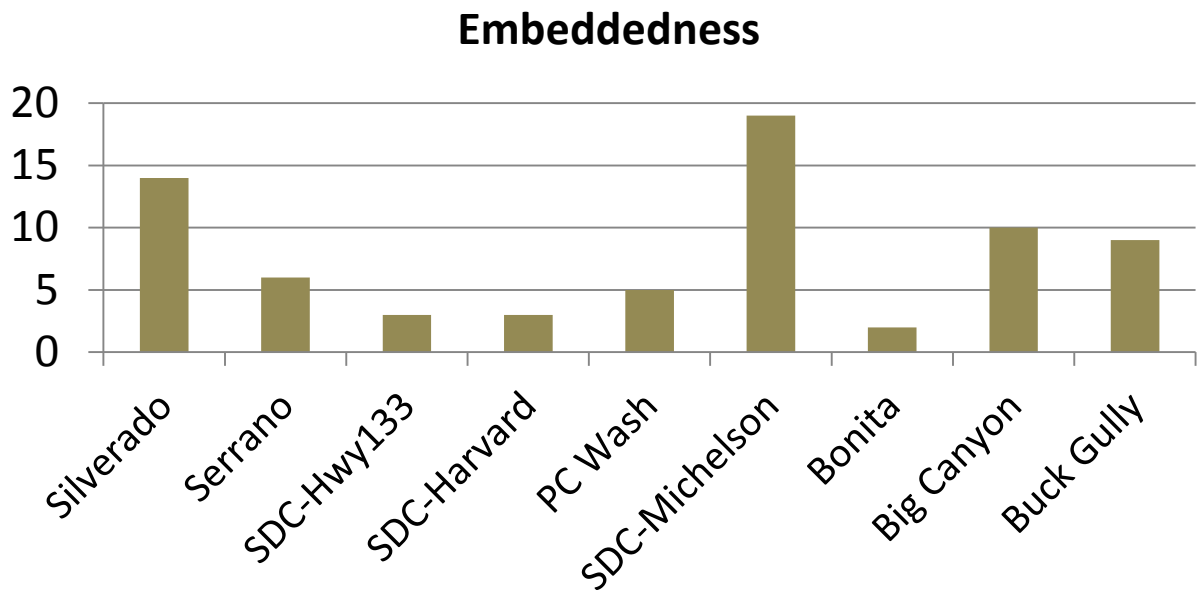
Santa Ana Foothills

Loma Ridge

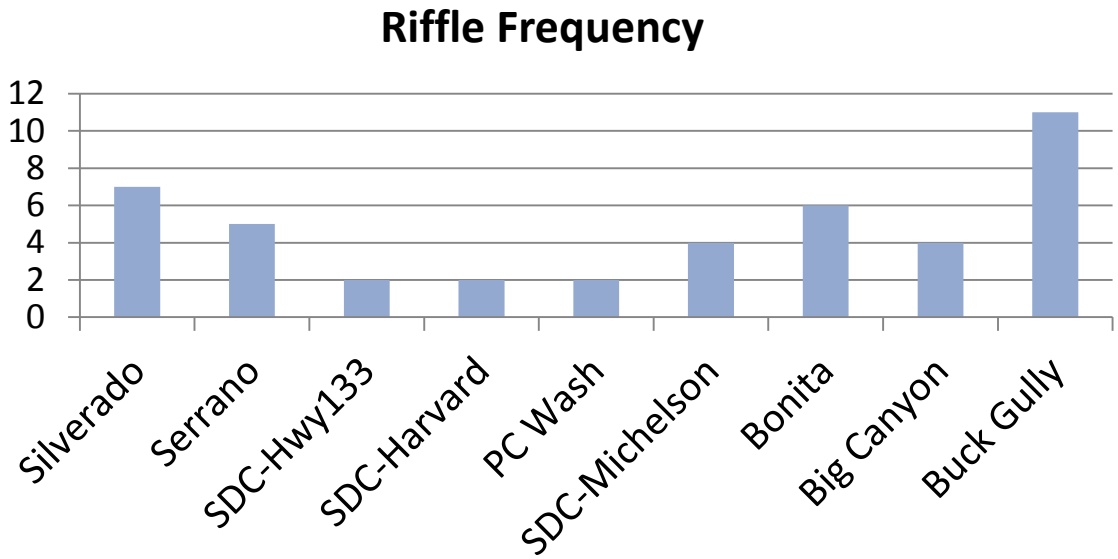
San Joaquin Hills

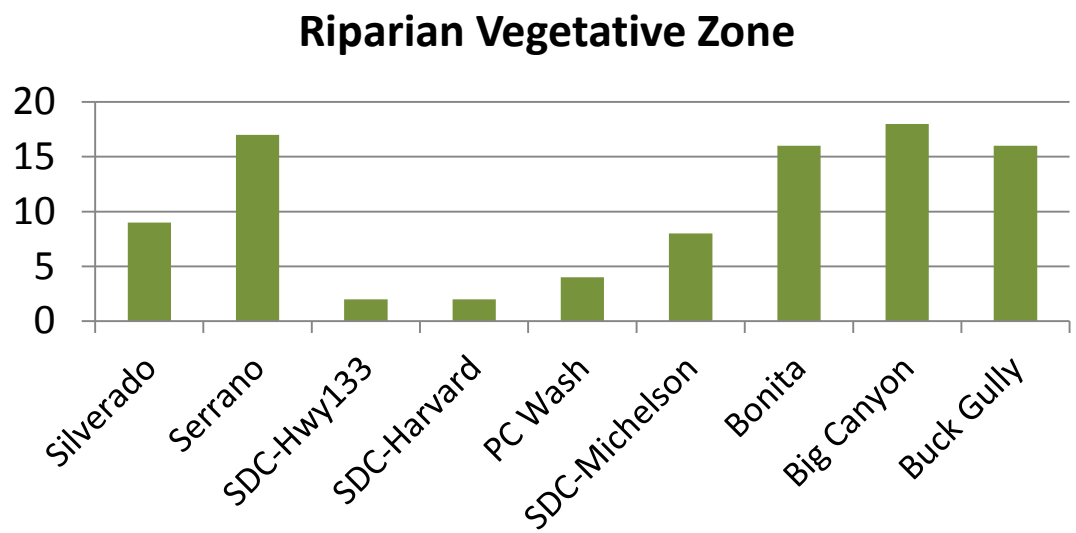
Physical Habitat Metrics – Fall 2008



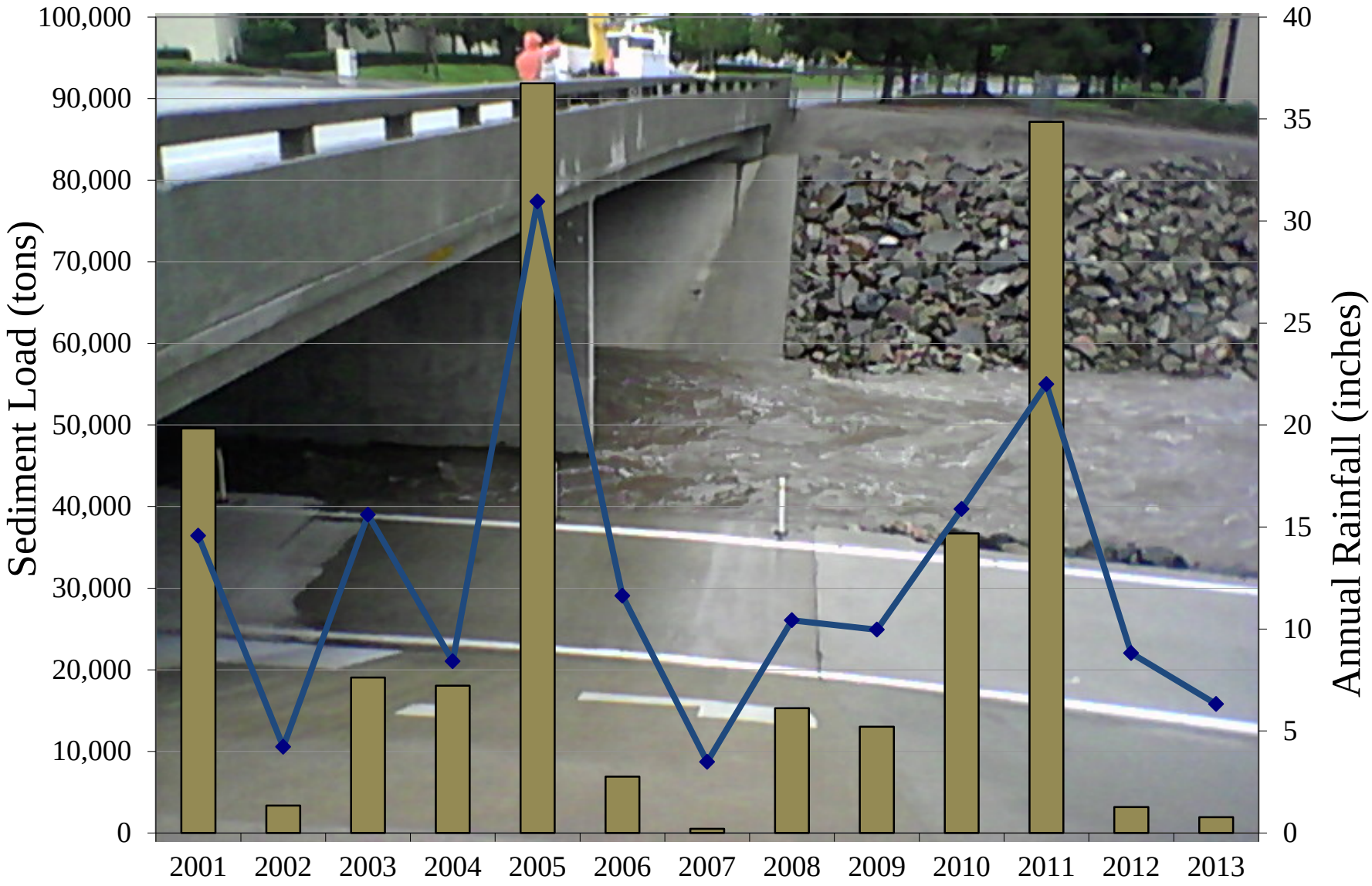


Physical Habitat Metrics – Fall 2008





SD Creek Sediment Loads @ Culver Drive



Taxa from County 2006-08 data (11 sites, Fall &Spring)

Order	Name	Total Count
Diptera	True flies	7,517
Ostracoda	Seed shrimp	7,037
Amphipoda *(Hyallela azteca)*	Lawn shrimp	6,333
Oligochaeta, Turbellaria, Nematoda, Hoplonomertea	Worms	4,000
Ephemeroptera	Mayflies	1,792
Basommatophora, Neotainglossia, Sorbeoconcha	Snails	1,458
Trichoptera	Caddisflies	1,149
Trombidiformes	Water mites	653
Odonata	Damsel/Dragonflies	509
Copepoda	Copepods	227
Veneroida	Clams	194
Hemiptera	True bugs	127
Coleoptera	Water beetles	97
Plecoptera	Stoneflies	21
Hydroida	Hydra	12
Arhynchobdellida, Rhynchobdellida,	Leeches	12
Cladocera	Water flea	12
Decapoda	Crayfish	9
Lepidoptera	Moths/butterflies	1

Biota Comparison with Local Reference 2006-09 (County Data-Fall&Spring)

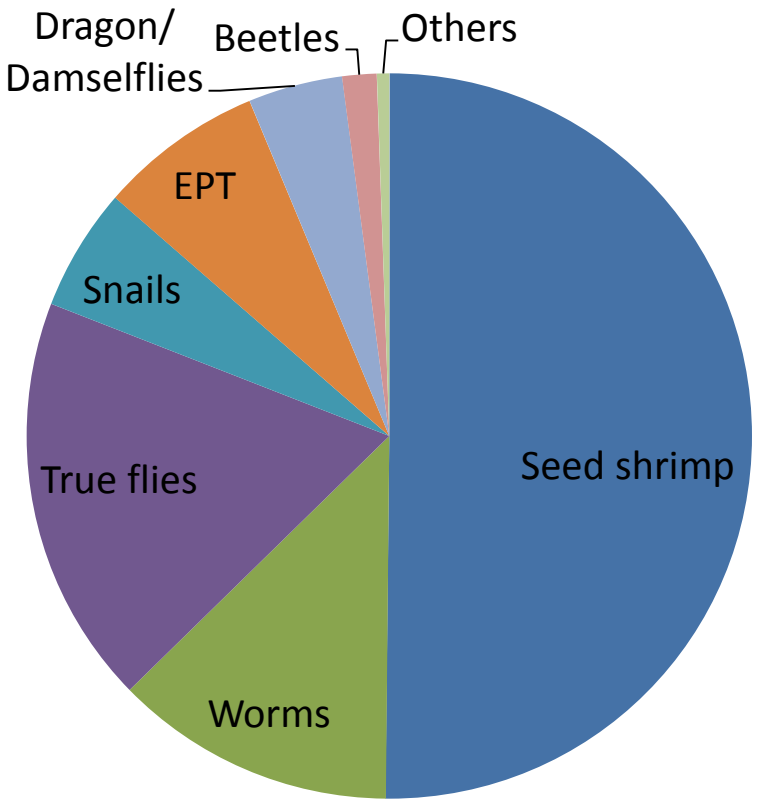
Taxa	Local Reference Sites	Test Sites in PC Wash & SD Creek	Other Local Sites
Hyallela azteca *(lawn shrimp)*	Absent	#1 or #2 most abundant taxon	Rare in Buck Gully & Serrano Creek
Plecoptera *(stoneflies)*	Present	Absent	Absent
Coleoptera *(beetles)*	Present	Rare	Rare
Trombidiformes *(mites)*	Present	Rare/Absent	Absent

Six Orders found everywhere:

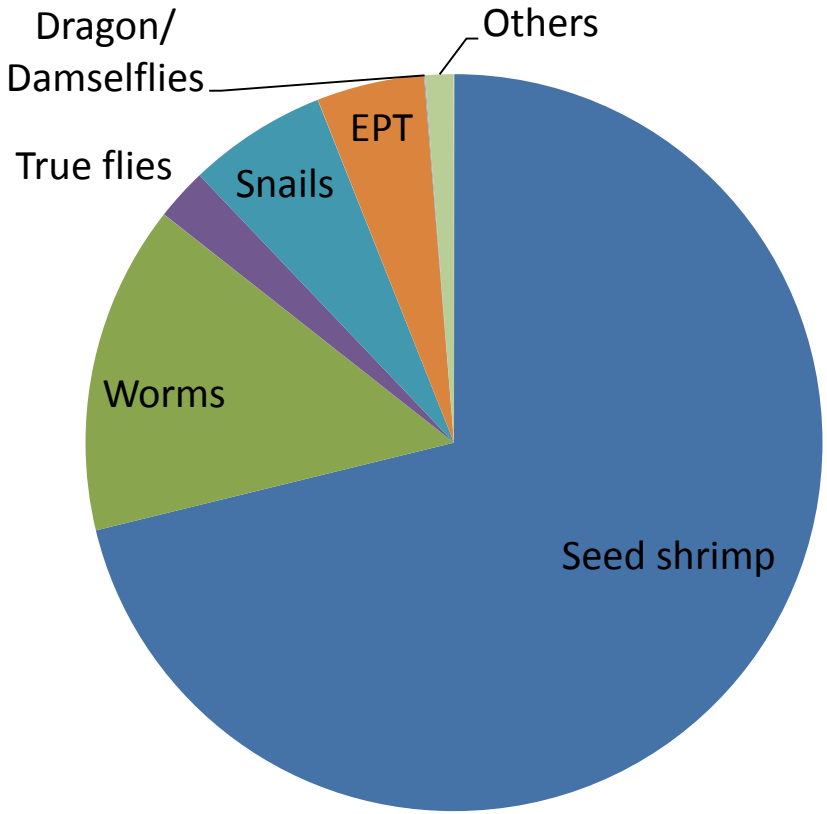
- Ostracoda *(seed shrimp)*
- Oligochatea *(worms)*
- Tricladida *(flatworms)*
- Diptera *(true flies)*
- Basommatophora *(pond snails)*
- Ephemeroptera *(mayflies)*

Average Taxa Counts by Order

County Data (Spring '06, '07, '08)



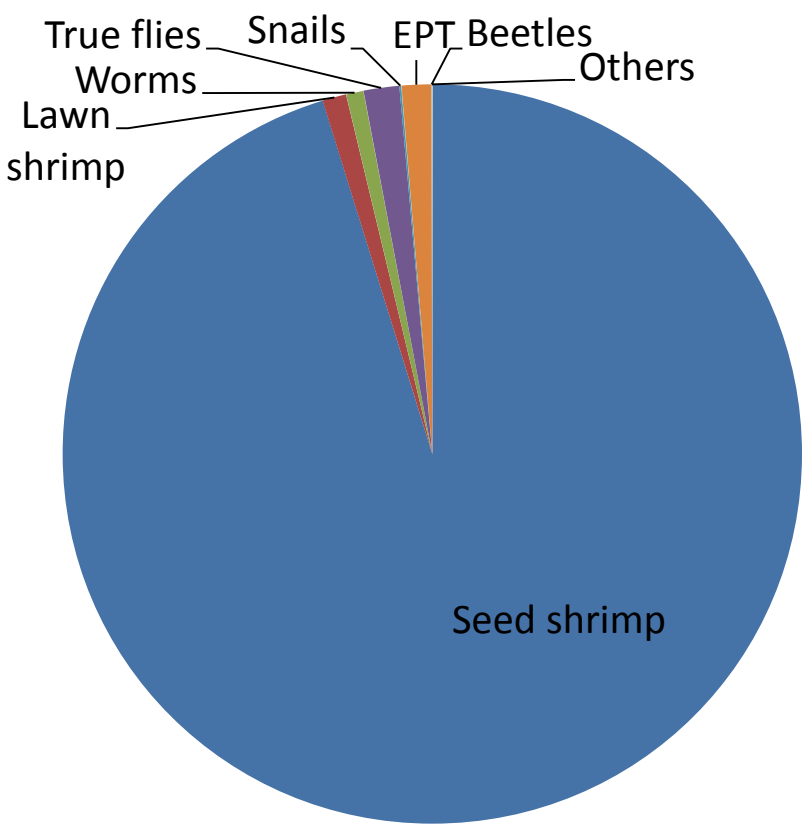
Modjeska Creek
Avg. IBI=35; Elev.=1,426 ft.



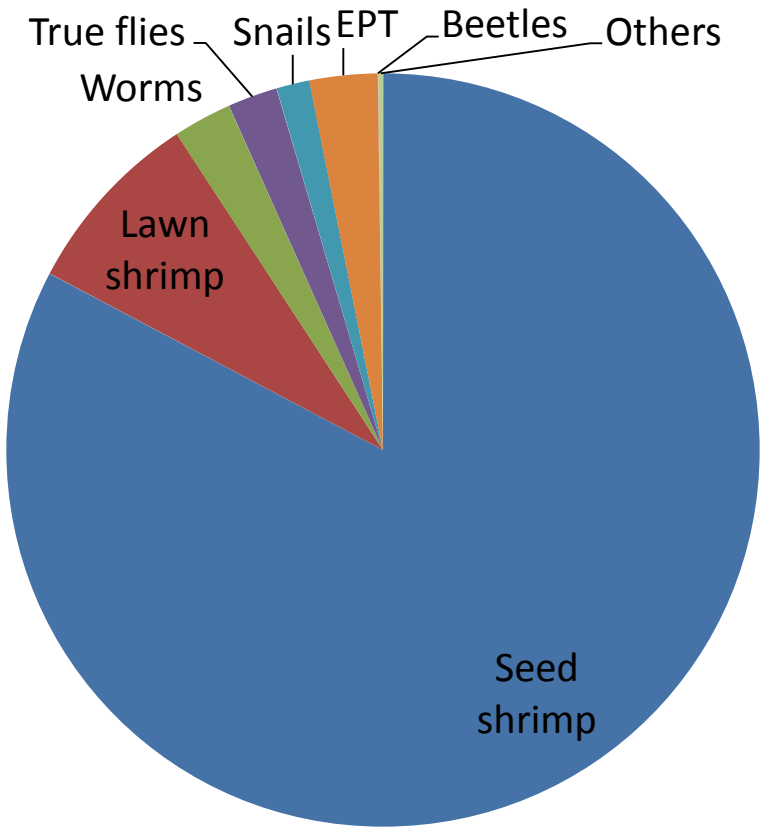
Serrano Creek
Avg. IBI=9; Elev.=404 ft.

Average Taxa Counts by Order

County Data (Spring '06, '07, '08)



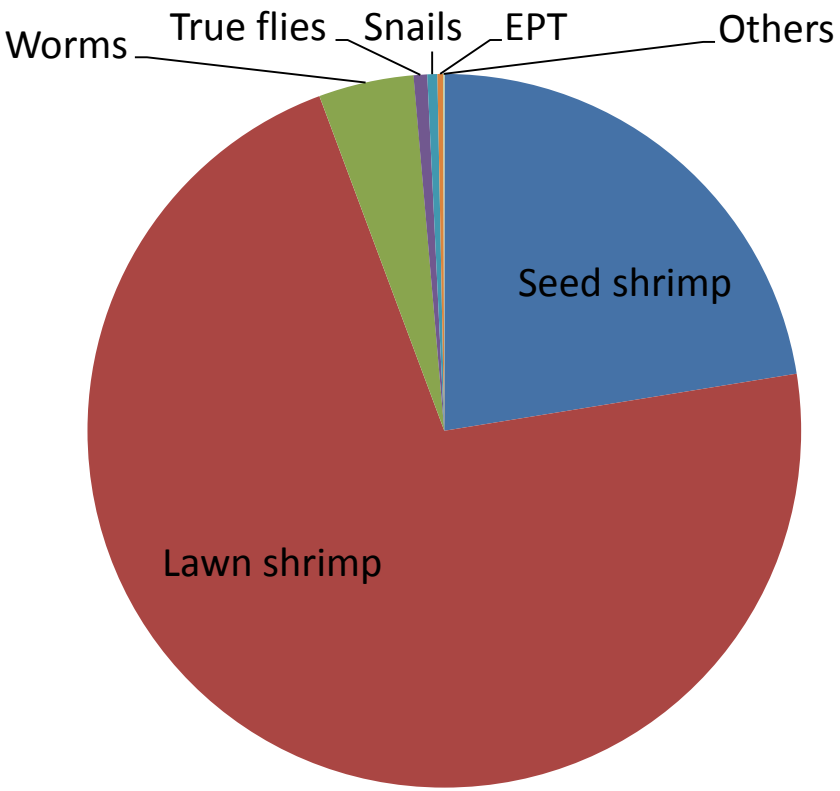
San Diego Creek- Hwy133
Avg. IBI=5; Elev.=160 ft.



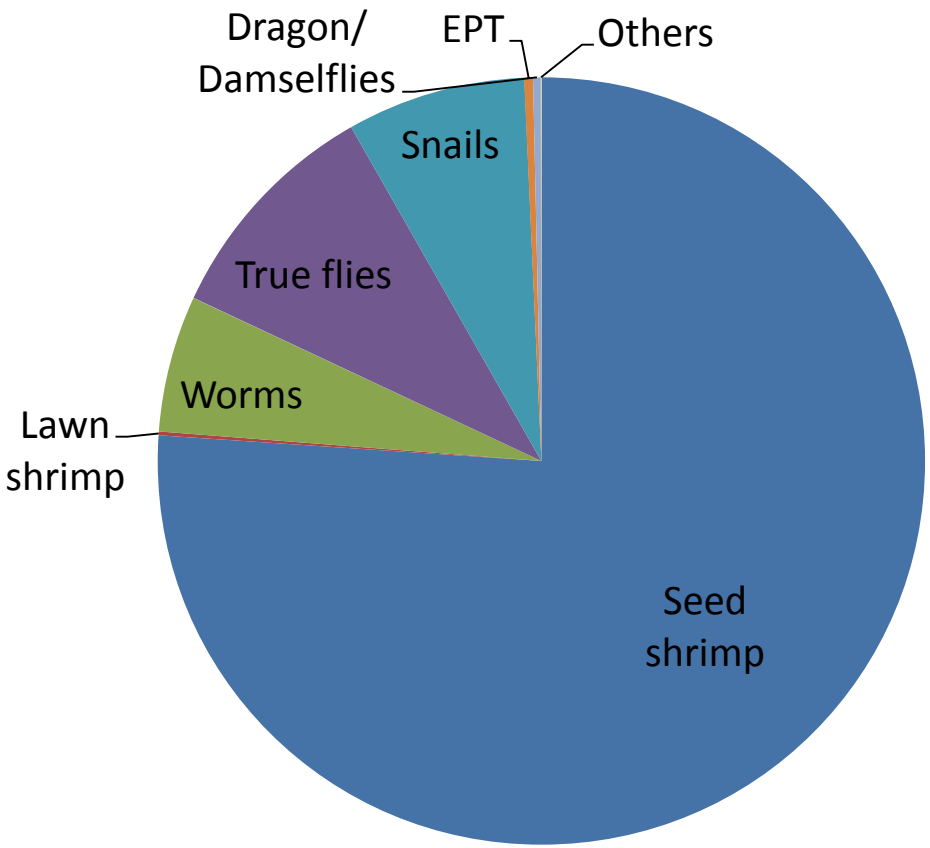
San Diego Creek-Harvard
Avg. IBI=5; Elev.=47 ft.

Average Taxa Counts by Order

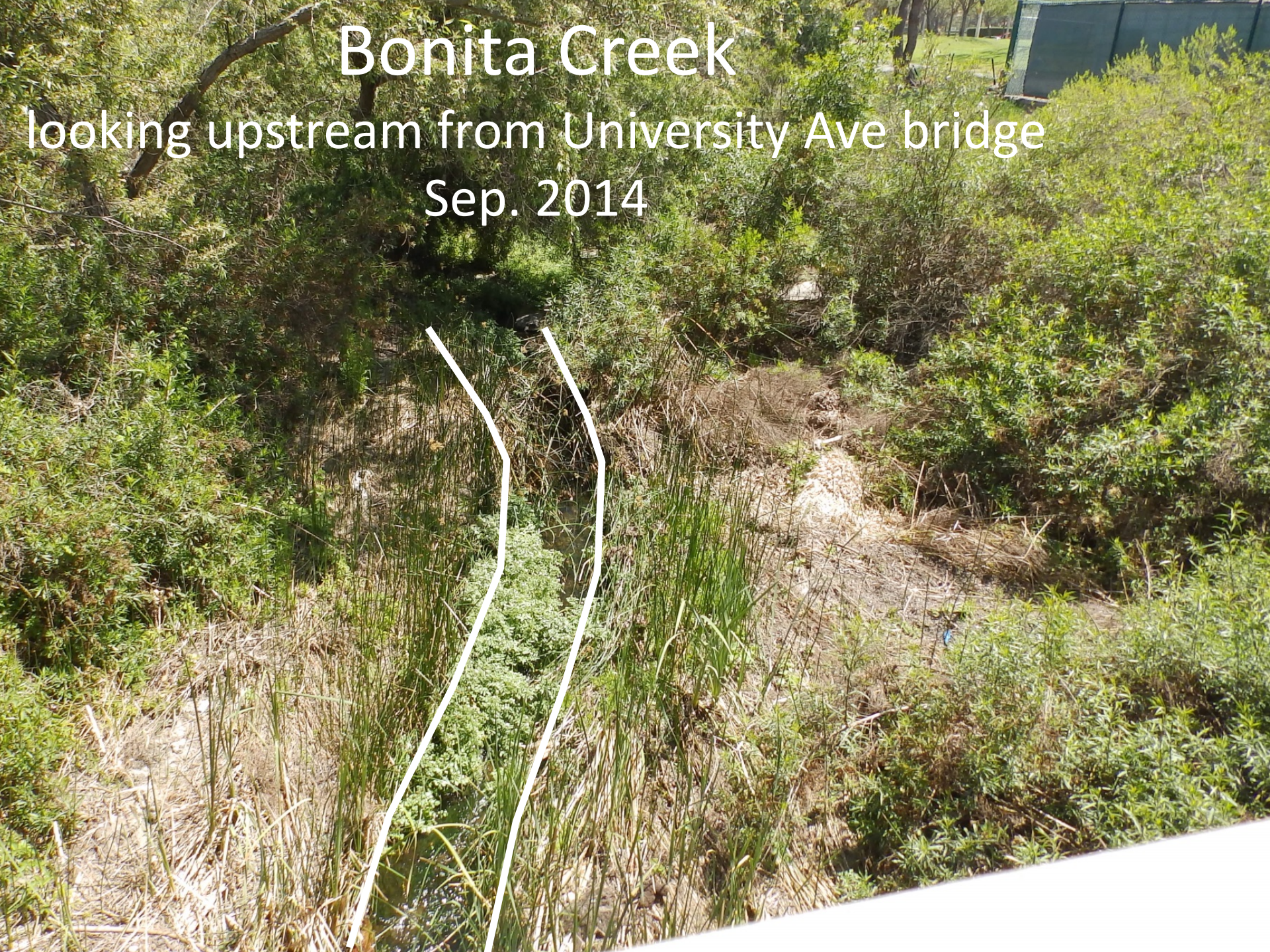
County Data (Spring '06, '07, '08)



Bonita Creek
Avg. IBI=4; Elev.=33 ft

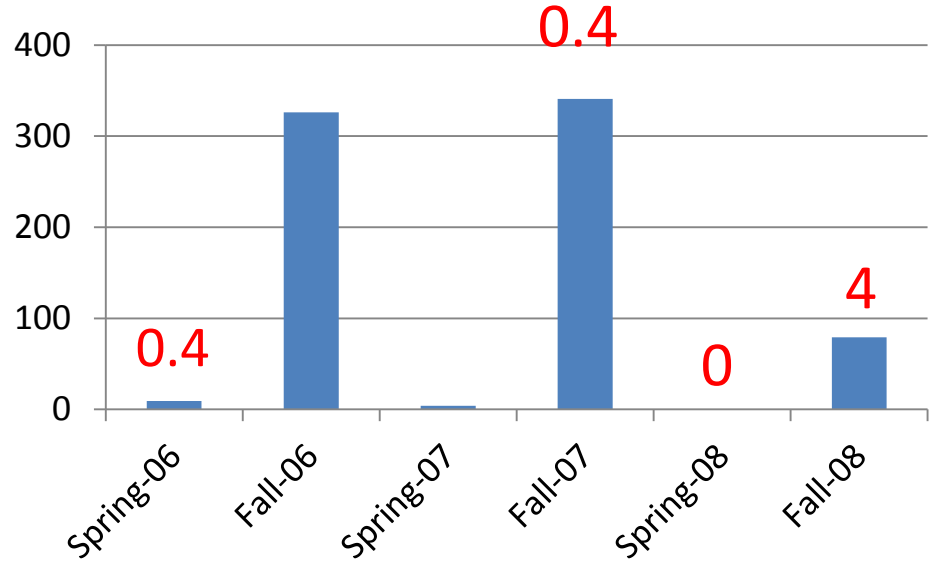


Buck Gully
Avg. IBI=5; Elev.=23 ft.

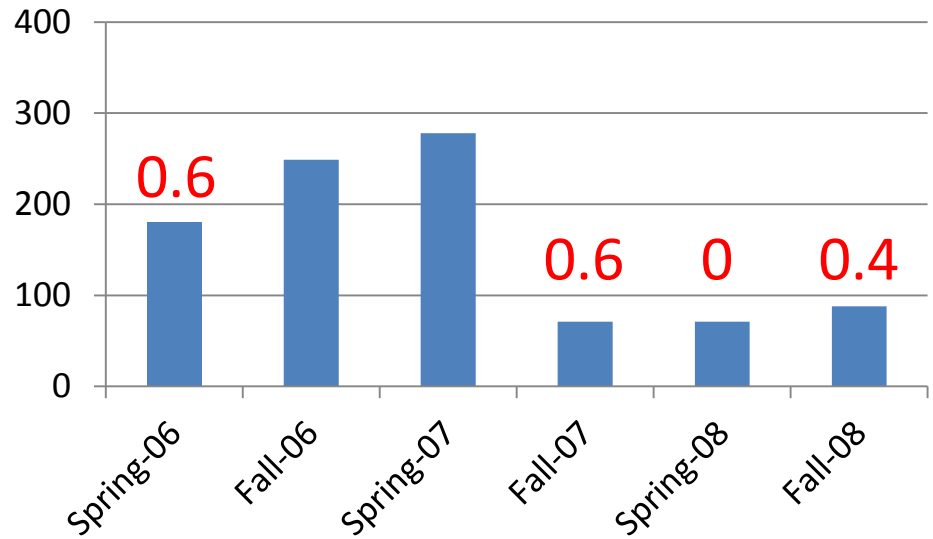

Bonita Creek
looking upstream from University Ave bridge
Sep. 2014

Seasonal Patterns in *Hyalella azteca (lawn shrimp)* Abundance

San Diego Creek-Hwy133 (LCRF05)



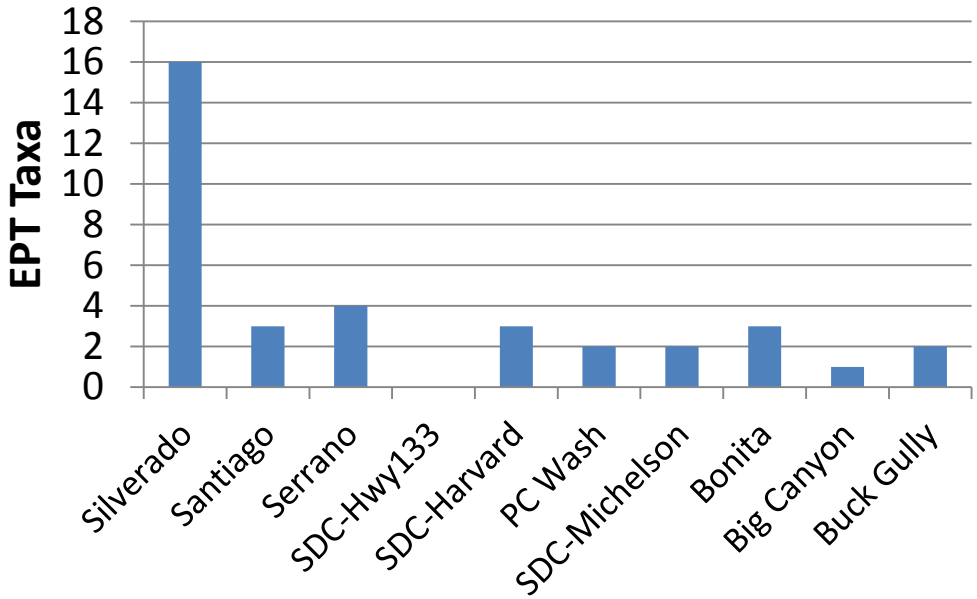
Peters Canyon Wash (BPF06)

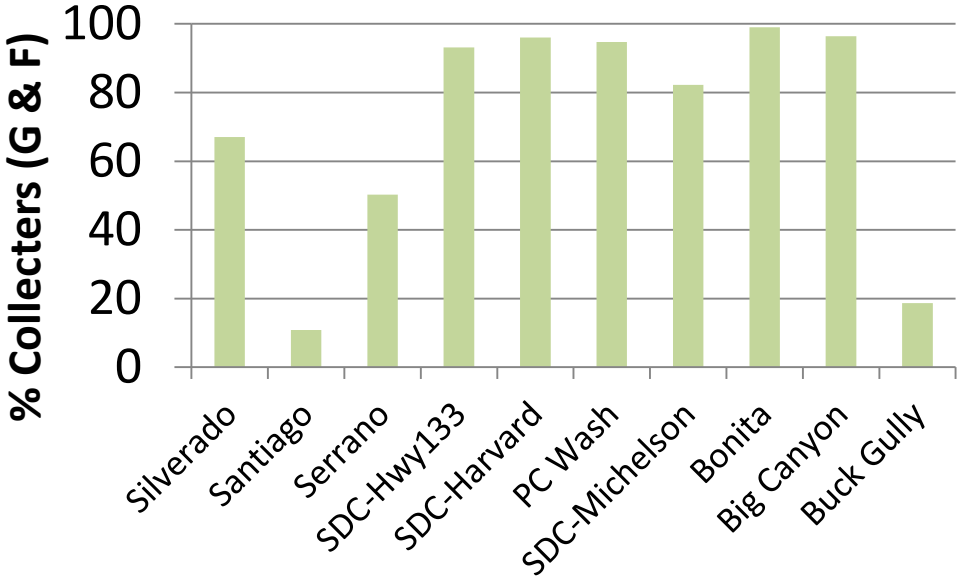


Red values are *Hyalella* toxicity results (TUa)

TUa= $100/LC_{50}$

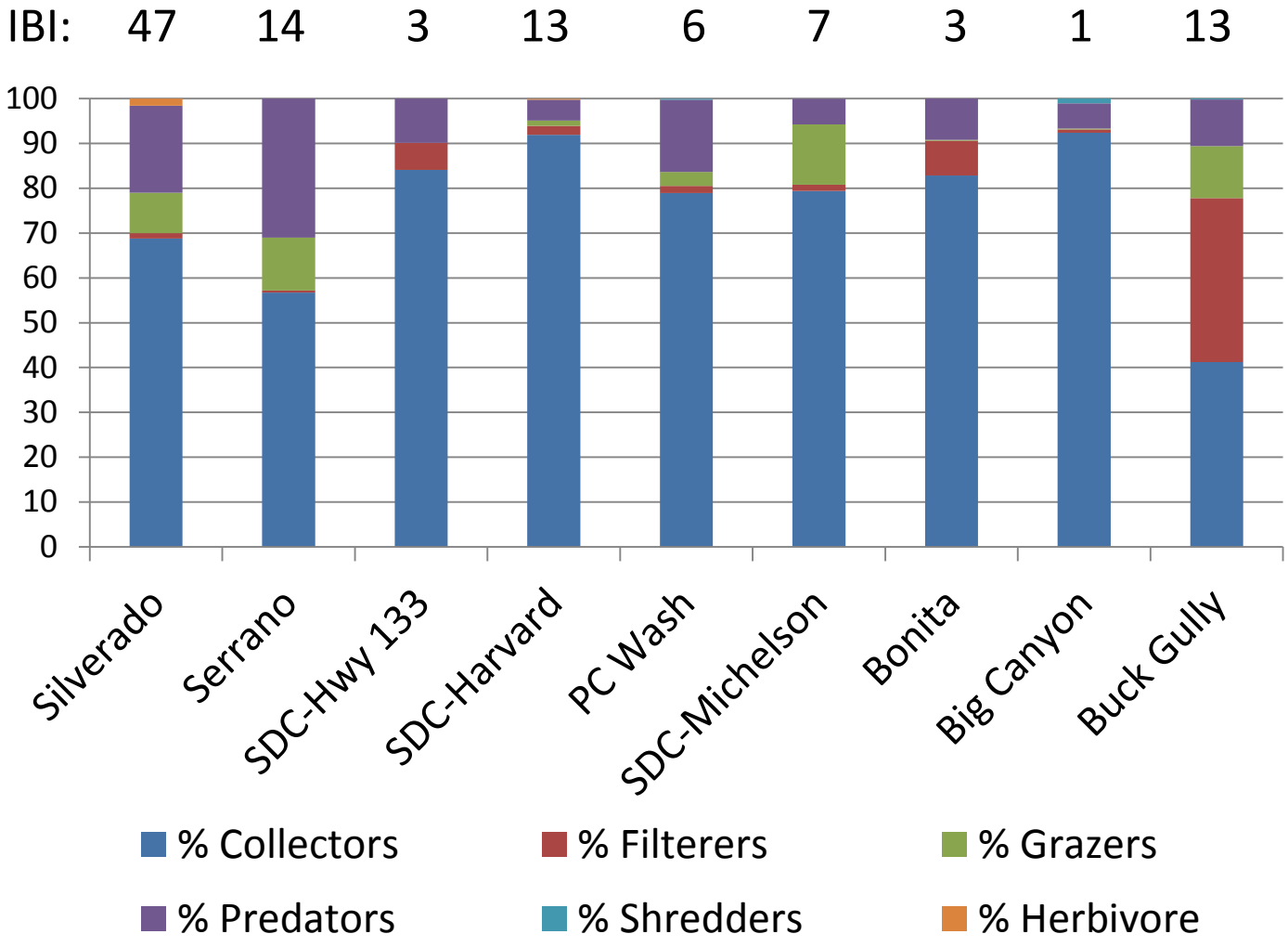
Fall 2006 IBI Metrics (County Data Set)





Site	IBI
Silverado	74
Santiago	36
Serrano	26
SDC-Hwy133	1
SDC-Harvard	4
PC Wash	3
SDC-Michelson	5
Bonita	4
Big Canyon	6
Buck Gully	17

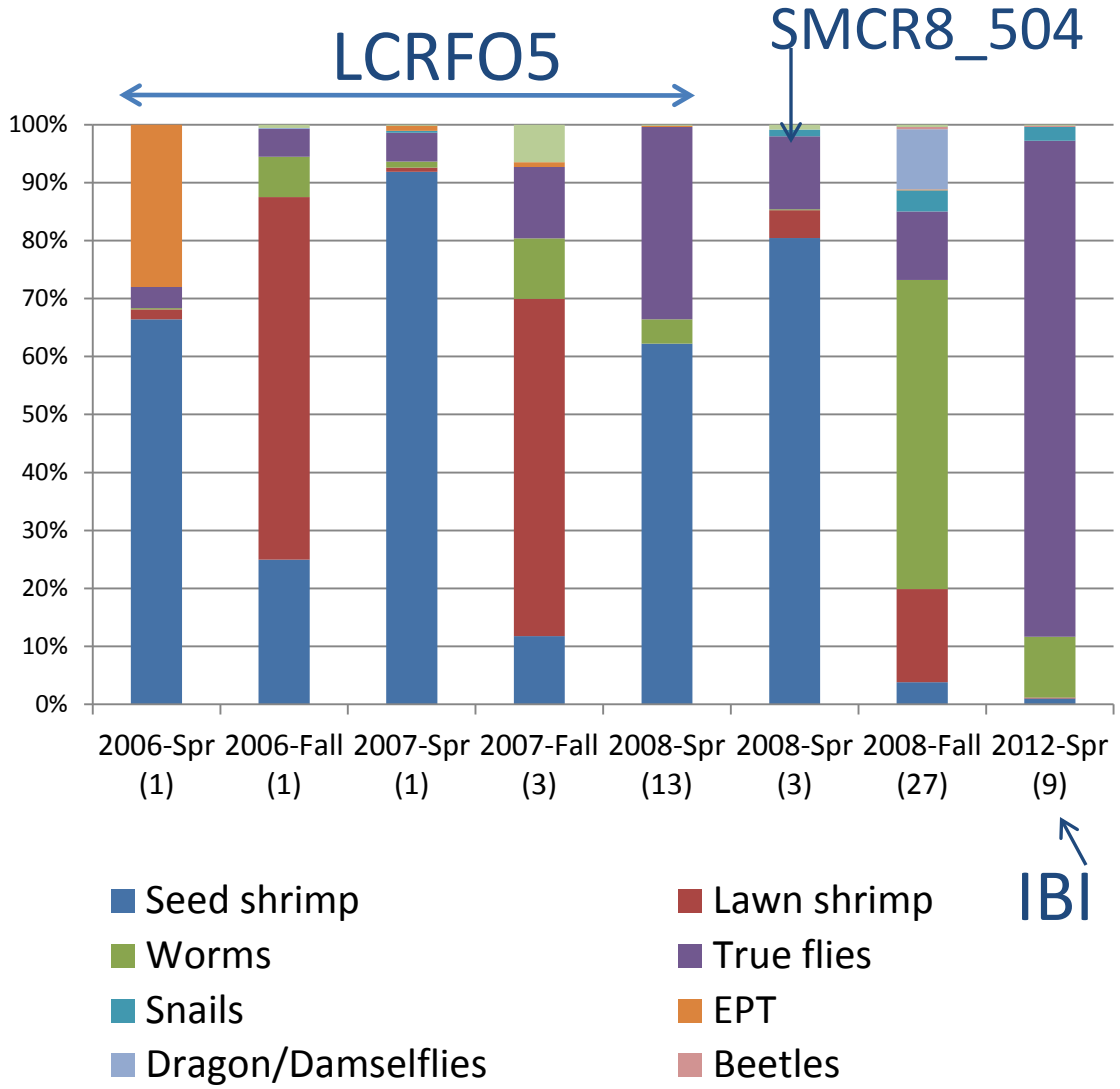
Functional Feeding Groups – Fall 2007



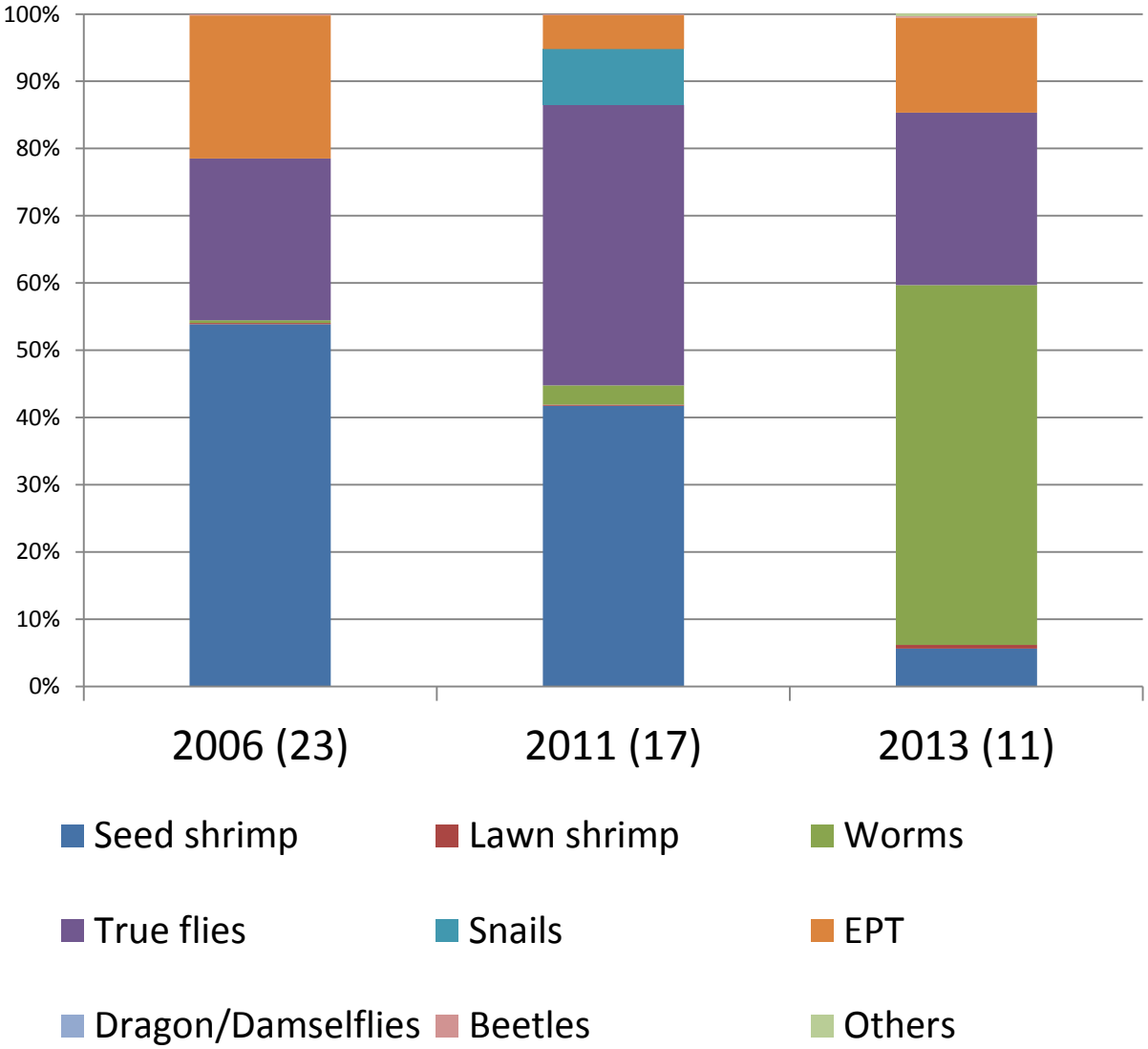
San Diego Creek Site Summary

Sub Reach	Length (ft)	Elev (ft)	Channel	Years Sampled								IBI	
				'06	'07	'08	'09	'10	'11	'12	'13	Range	Avg.
Laguna Fwy.-Jeffrey	11,000	155-170	wide	x	x	x				x	x	1 - 13	5
Jeffrey-Culver	8,250	62-114	wide, lowest gradient	x			x		x		x	1 - 23	12
Culver-Confluence	5,700	36-54	narrow, riprap groundwater inflow	x	x	x		x			x	0 - 26	11

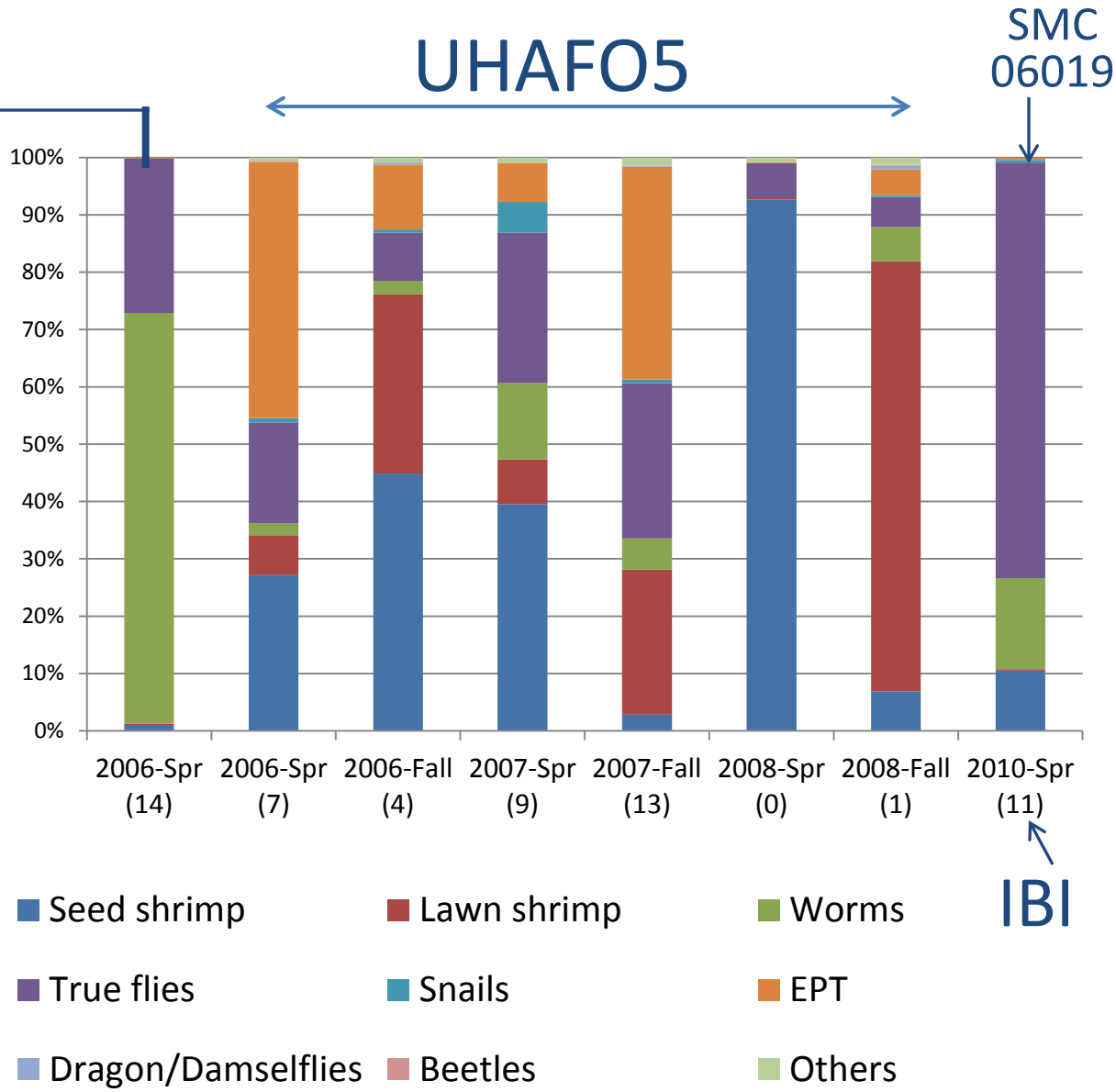
SD Creek – Hwy 133 to Jeffrey Rd.



SD Creek – Jeffrey Rd. to Culver Dr.



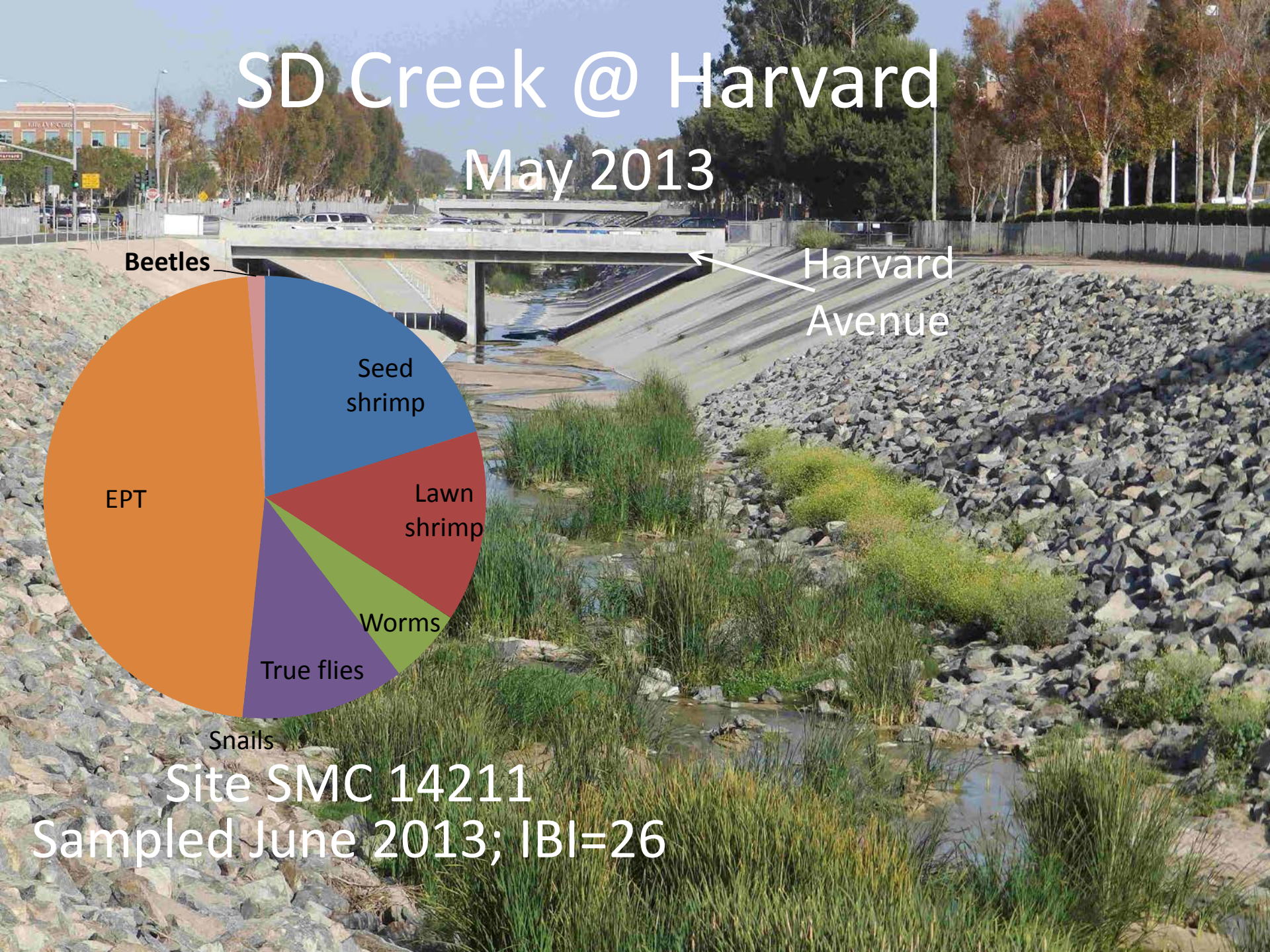
SD Creek – Culver Dr. to Confluence



SMC06019 lies between above two sites

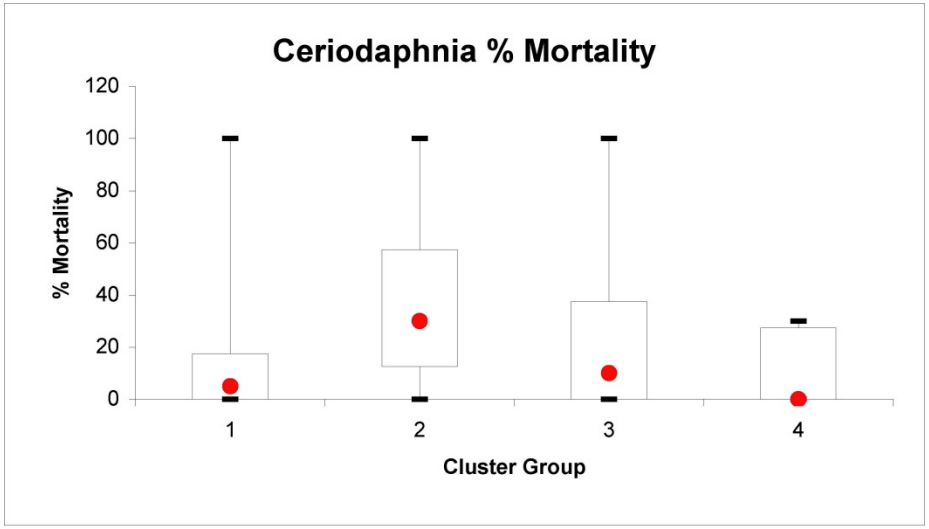
SD Creek @ Harvard

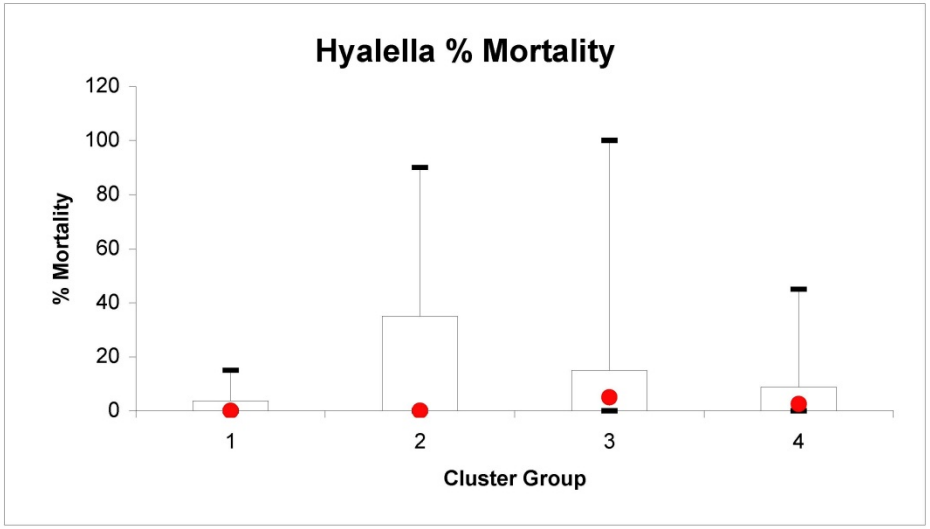
May 2013

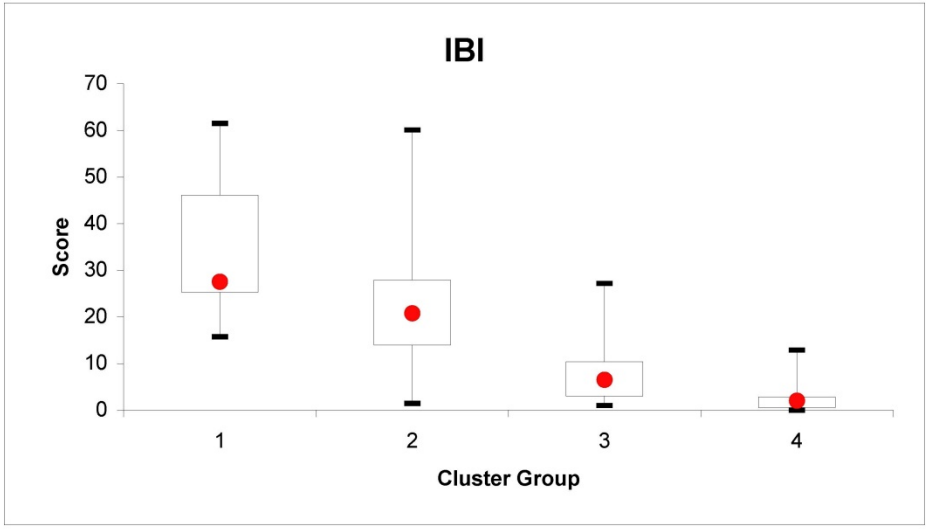


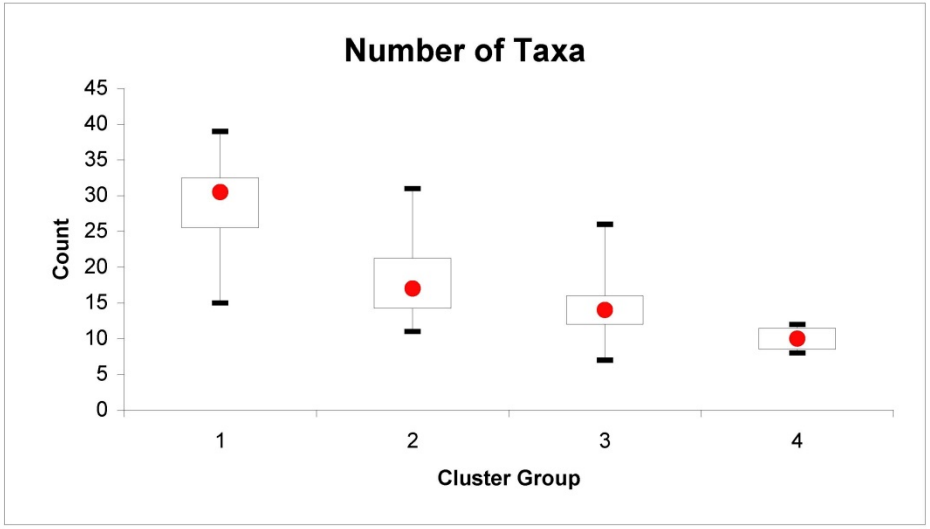
Site SMC 14211
Sampled June 2013; IBI=26

Cluster Analysis & Box Plots of Potential Causes (County of Orange, Fall 2008) 1/5

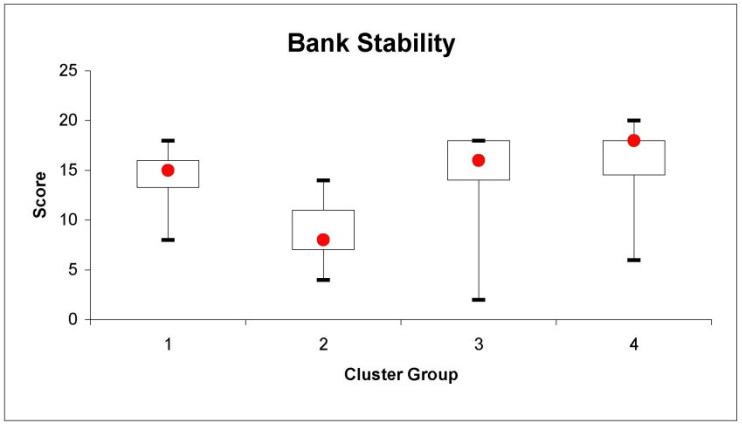


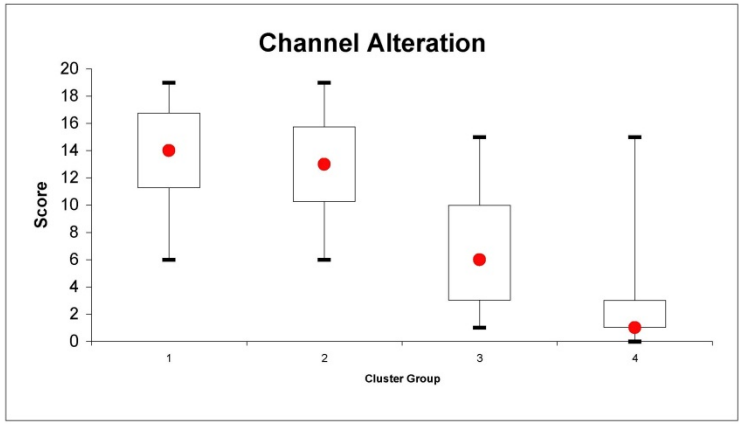


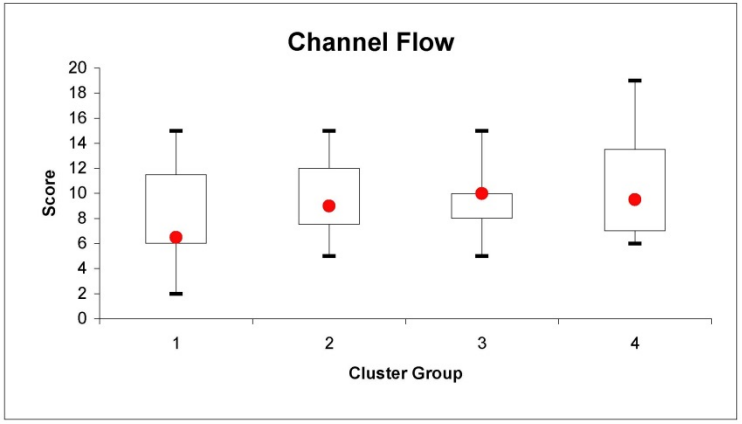


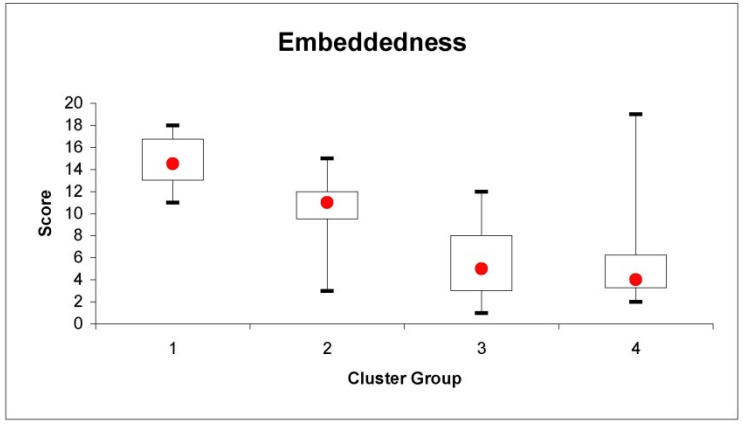


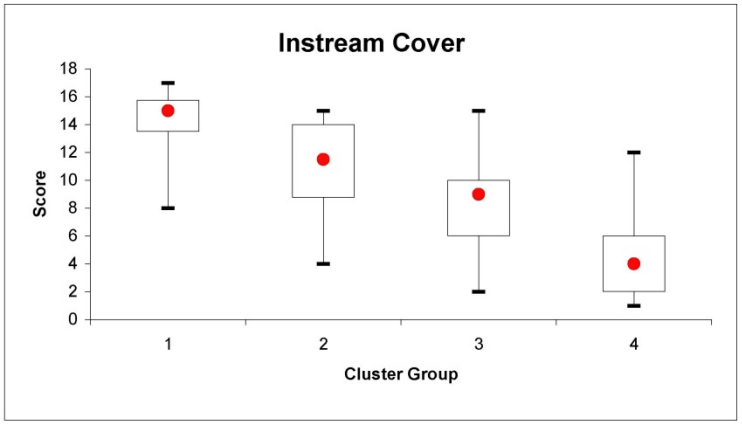
Candidate Causes – 2/5

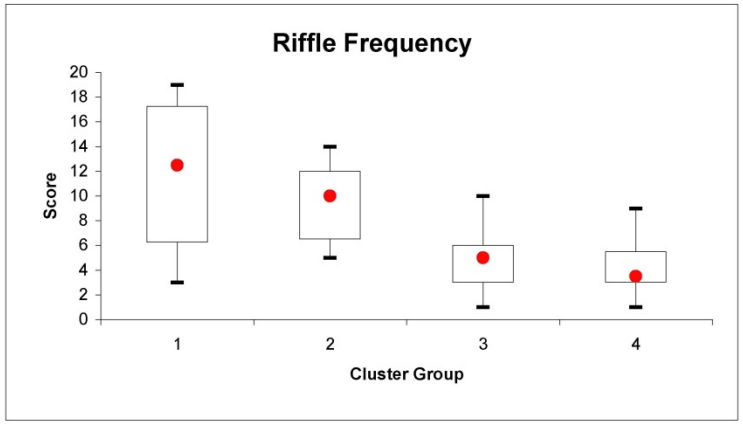




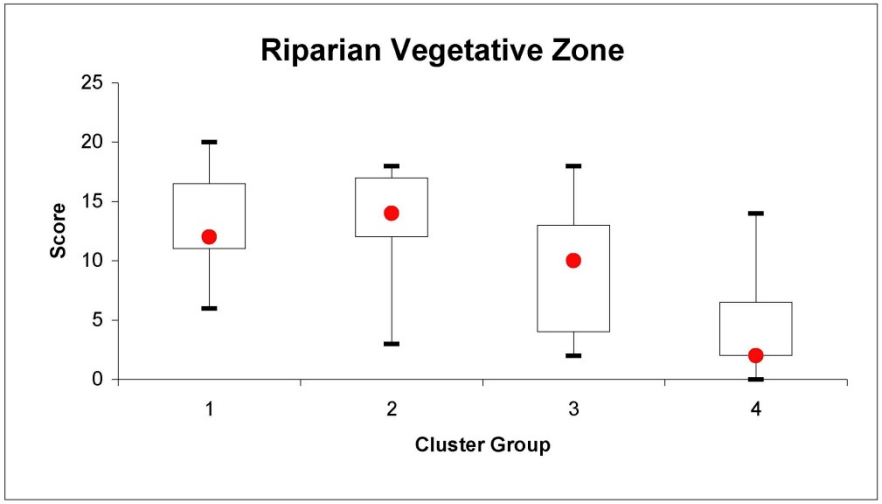


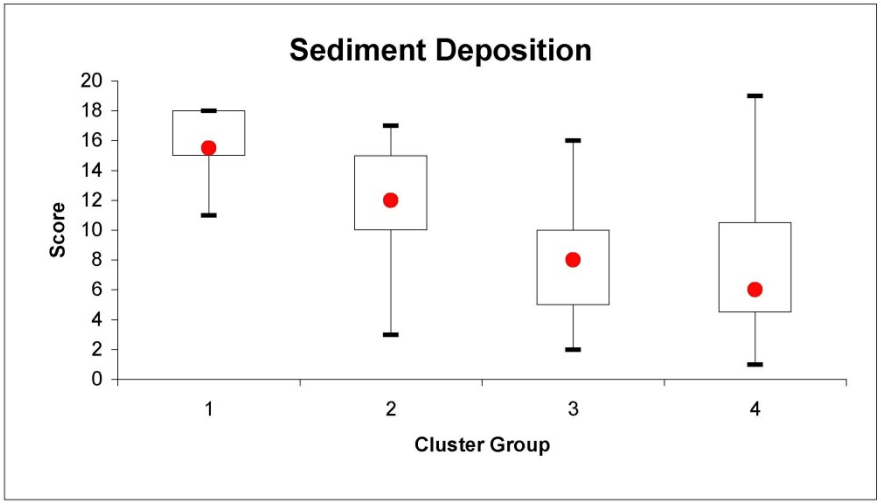


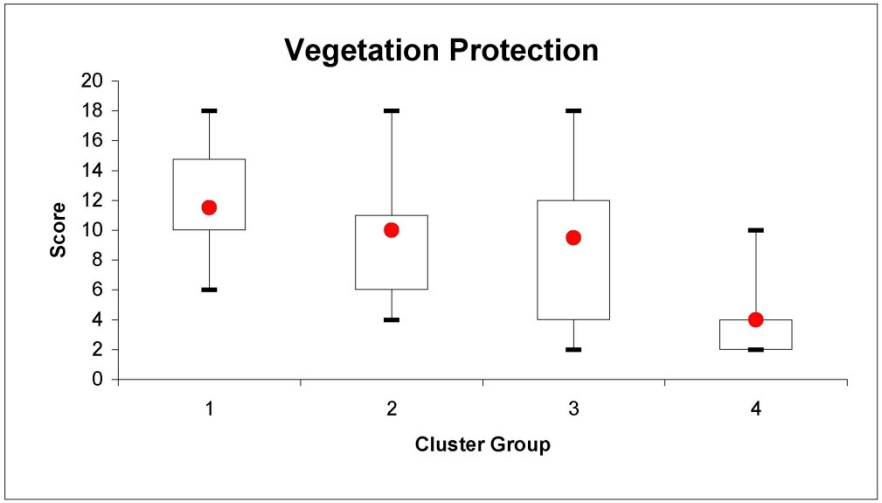


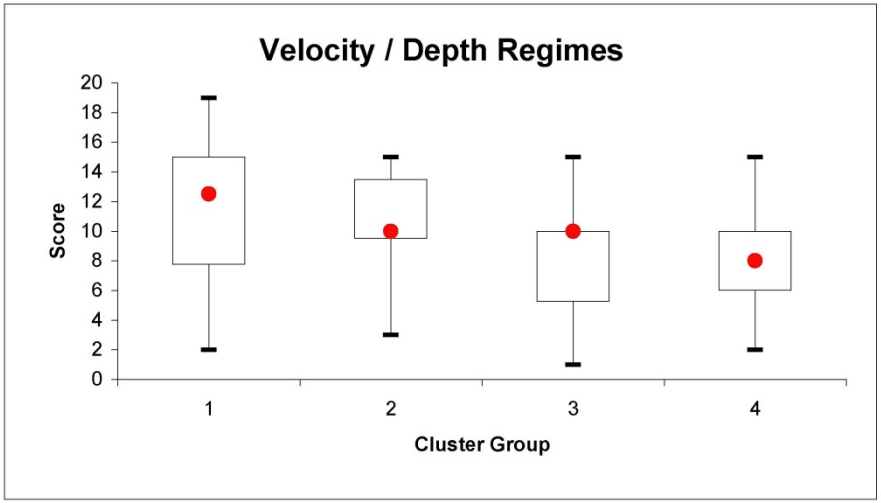


Candidate Causes – 3/5

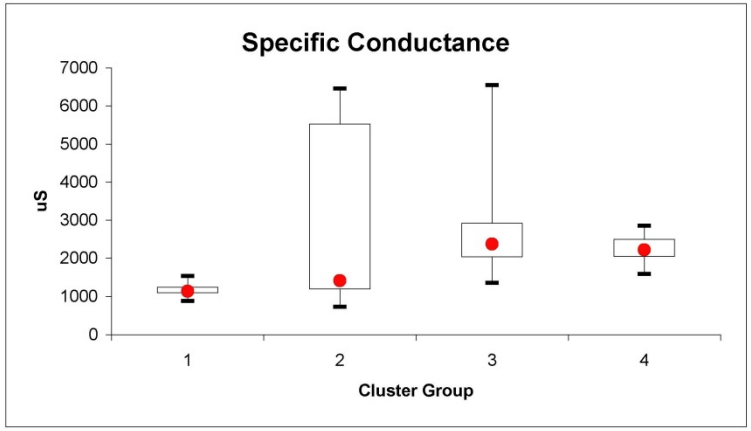


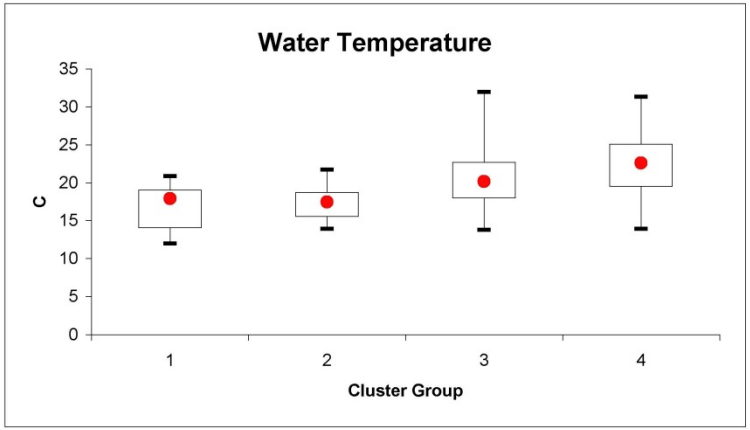


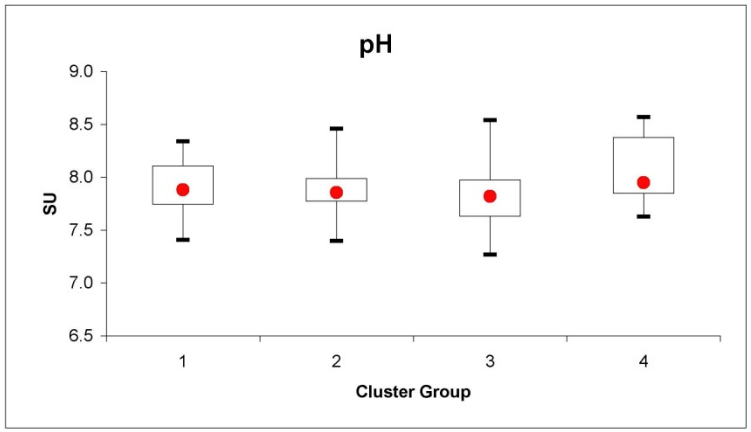


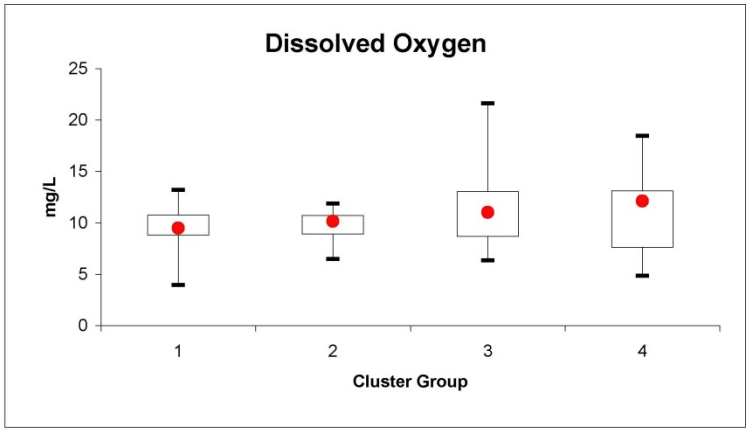


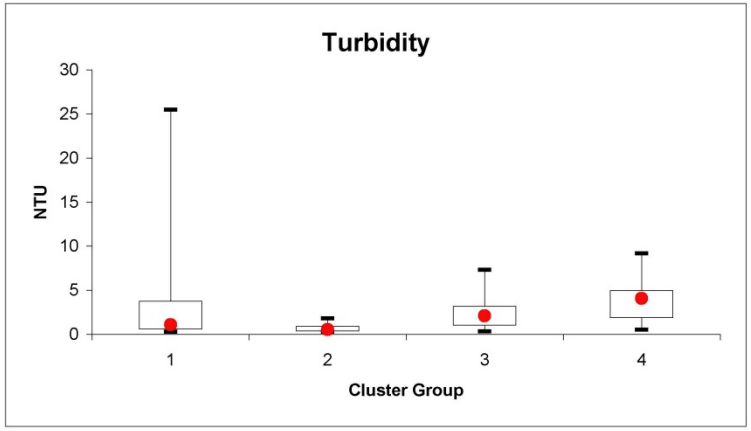
Candidate Causes – 4/5

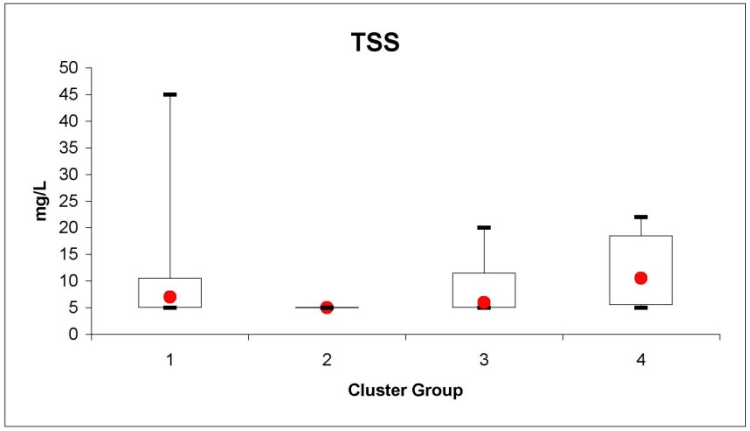
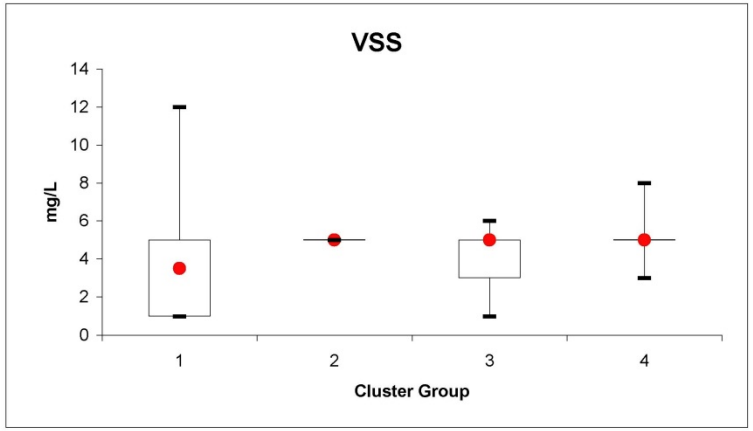
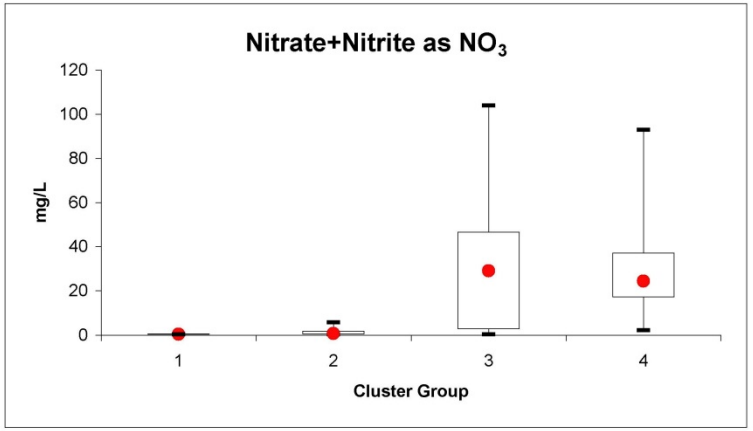
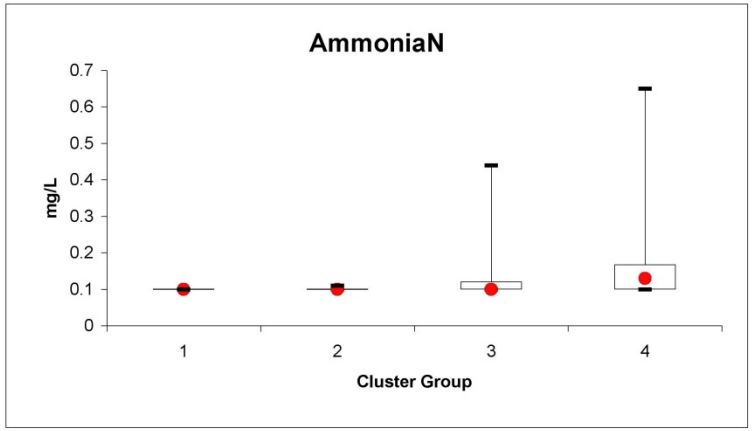
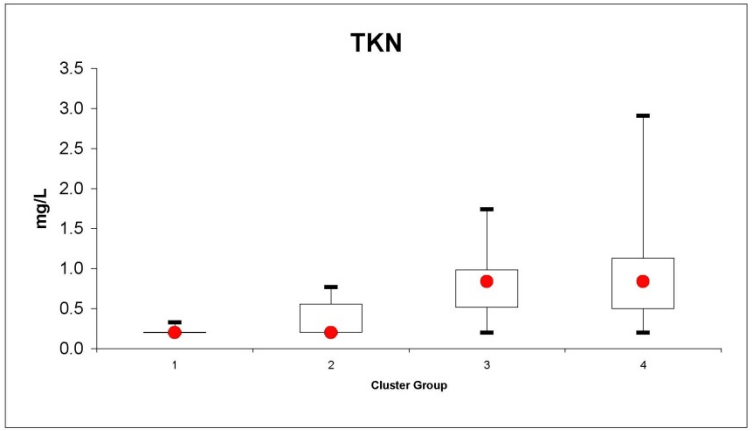
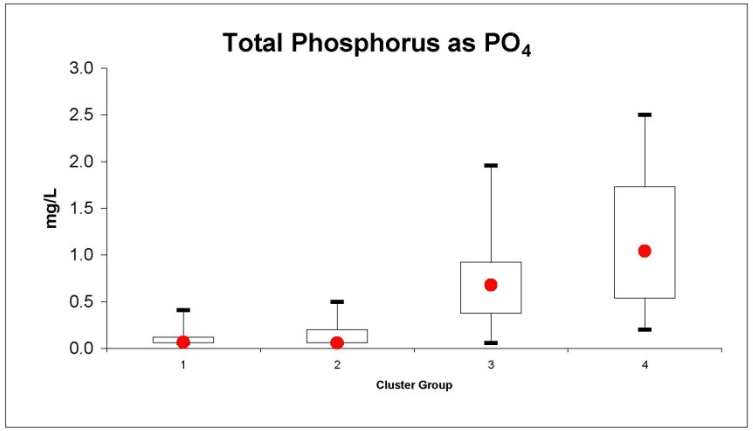
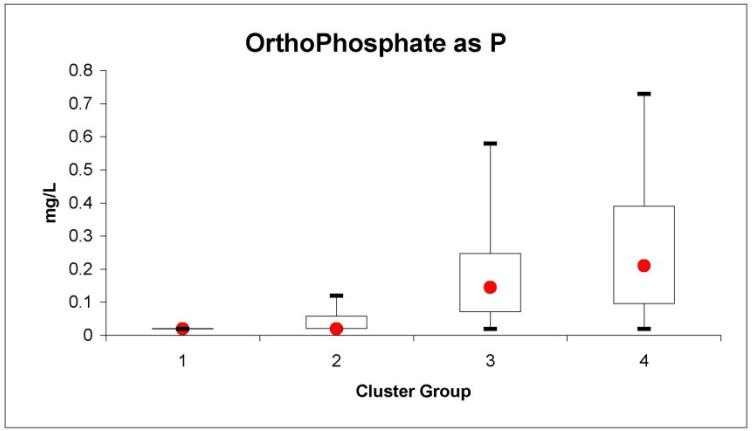












Candidate Causes – 5/5