

Central Valley Regional Water Quality Control Board
Pyrethroid TMDL and BPA Workshop

August 18, 2016

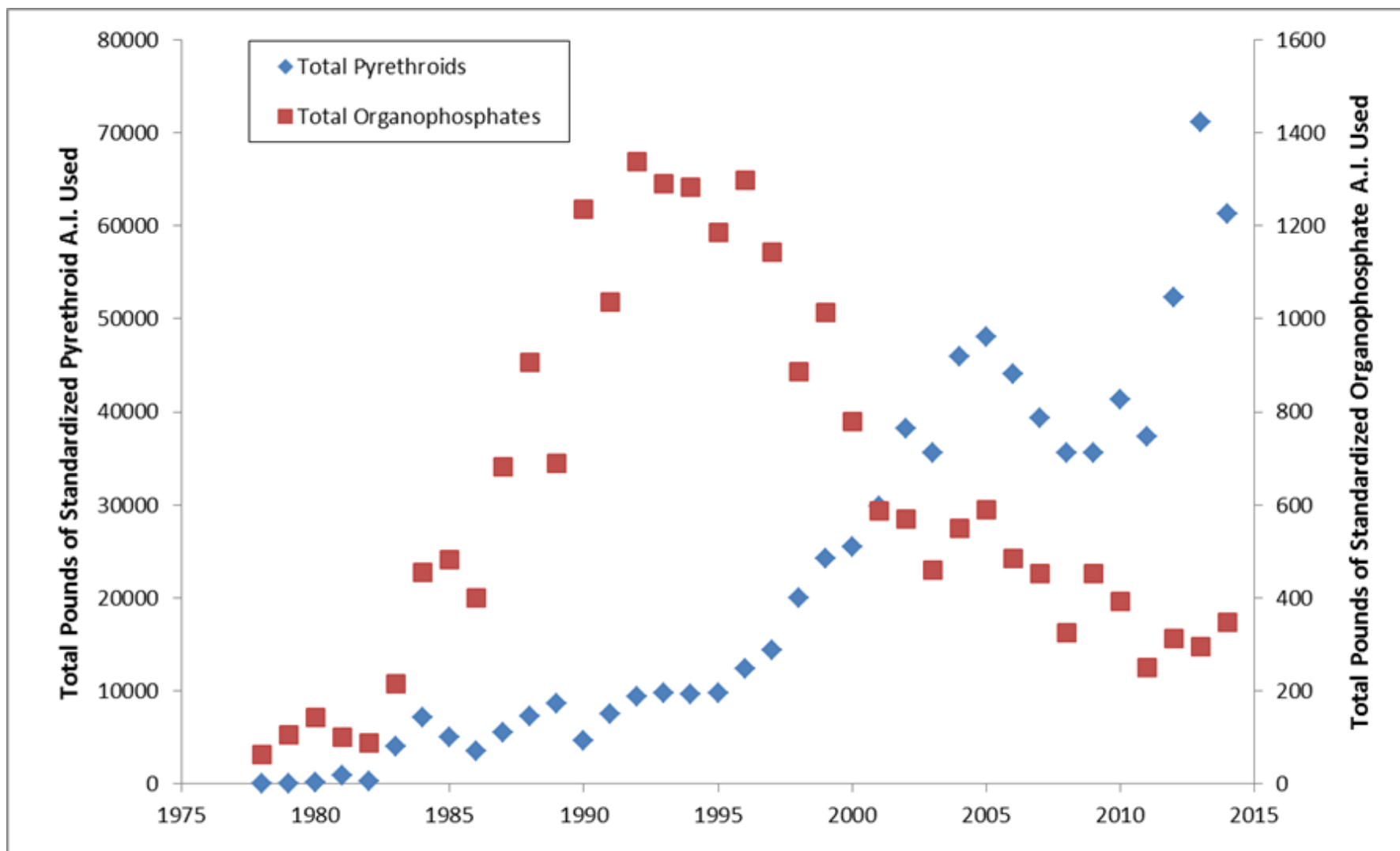
Public Comments

Stephen Louie

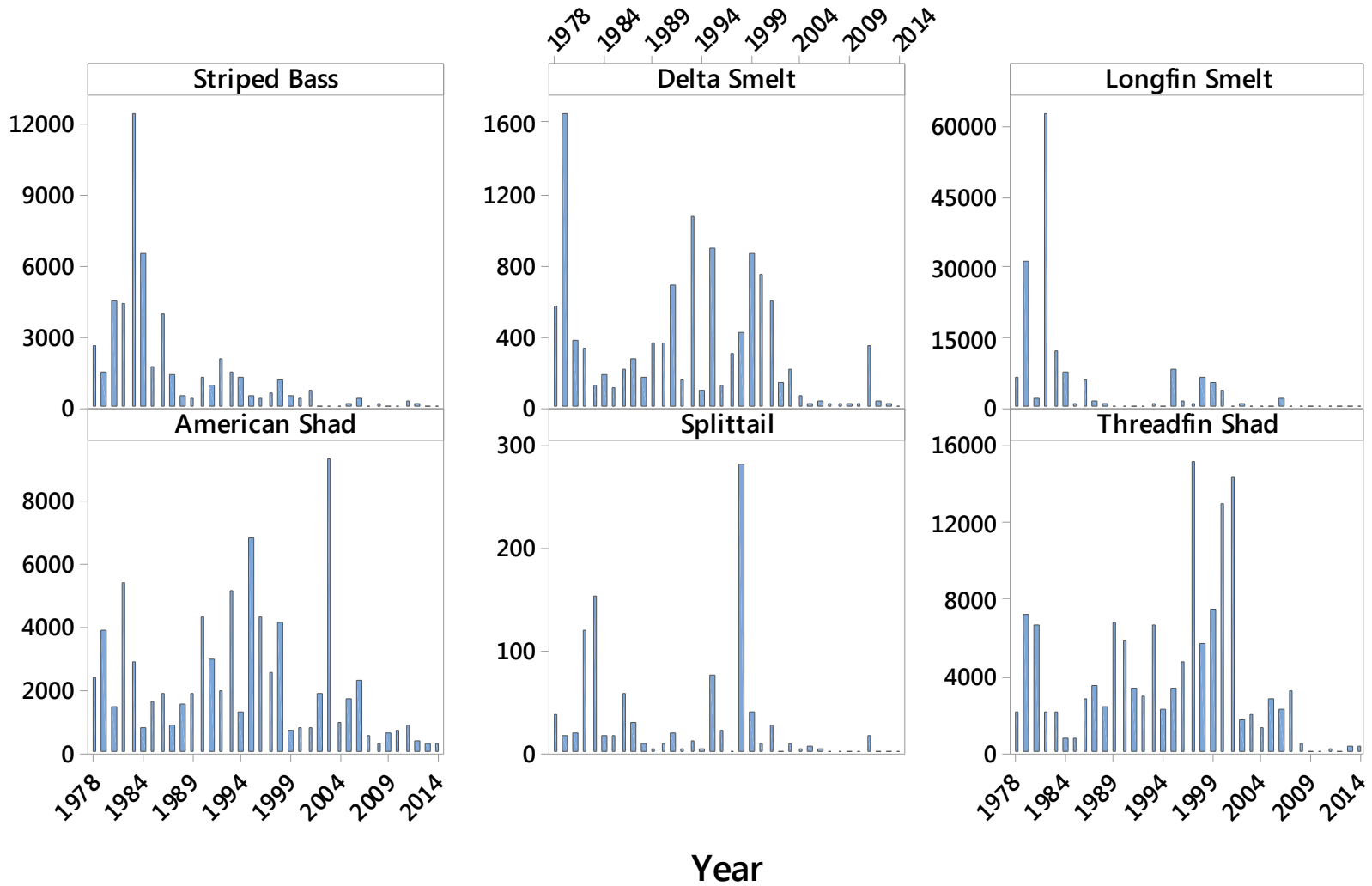
Senior Environmental Scientist

California Department of Fish and Wildlife



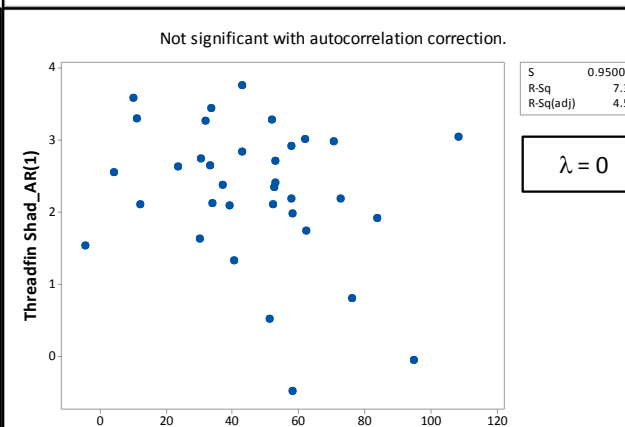
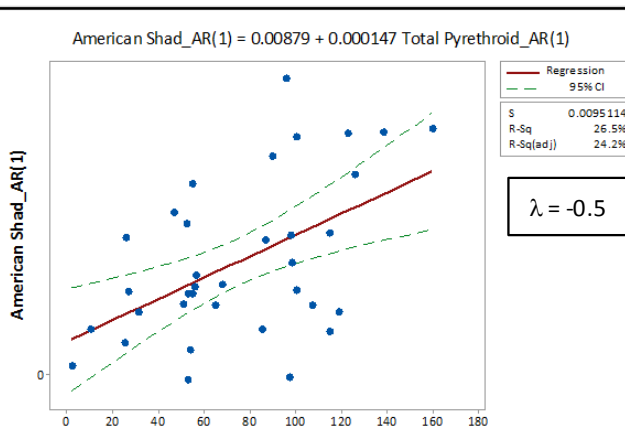
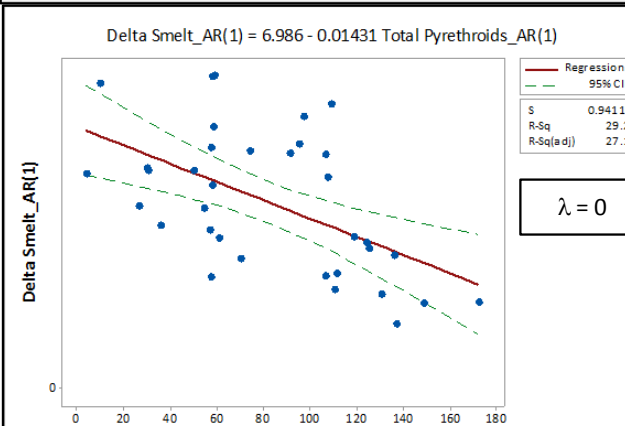
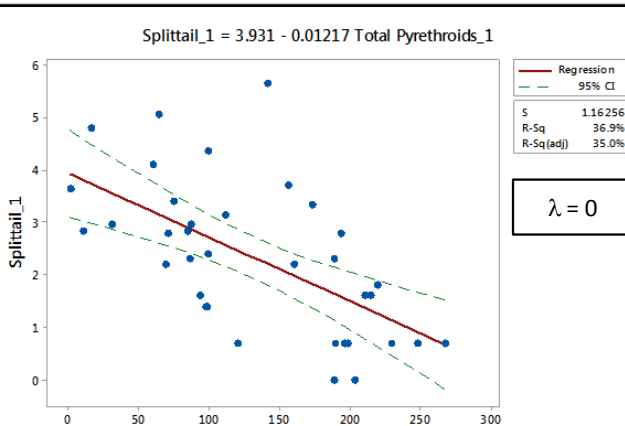
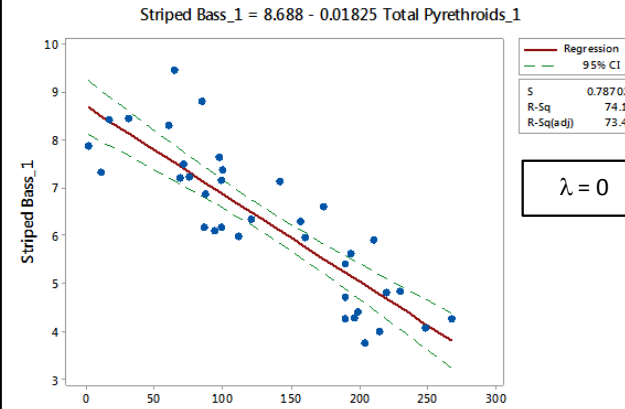
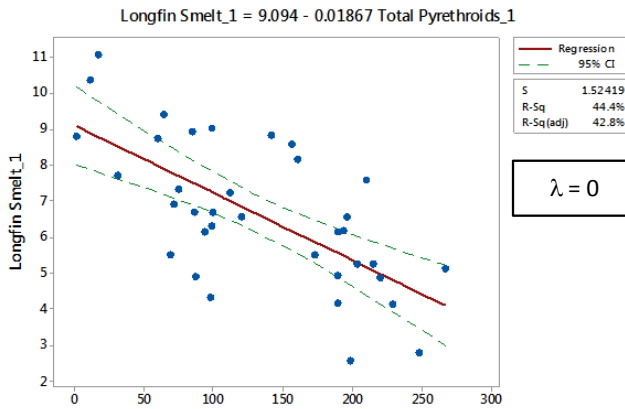


IEP FMWT Species Annual Total Abundance Indices



Spring: Mar, April, May		Summer: June, July, Aug		Autumn: Sept, Oct, Nov		Winter: Dec, Jan, Feb		Life stages	
<i>Delta smelt</i>		<i>Delta smelt</i>		<i>Delta smelt</i>		<i>Delta smelt</i>		Adult	
<i>Longfin smelt</i>		<i>Longfin smelt</i>		<i>Longfin smelt</i>		<i>Longfin smelt</i>		Egg	
<i>Striped bass</i>		<i>Striped bass</i>		<i>Striped bass</i>		<i>Striped bass</i>		Larvae or fry	
	<i>Threadfin shad</i>		<i>Threadfin shad</i>		<i>Threadfin shad</i>		<i>Threadfin shad</i>	0-age Bass	
								Toxic Effects	
								A	Acute toxicity to larvae and juveniles
								F	Direct or indirect food limitation
								E	Maternal transfer of toxins to eggs
								I	Impaired behavior, disease susceptibility
								H	Harmful algal blooms
								M	Migratory release of toxins from fat reserves
								T	Temperature effects on toxic threshold
San Francisco Bay & Pacific Coast, <u>marine</u>	Suisun Bay, and other brackish, low salinity zones	Sacramento-San Joaquin Delta, <u>freshwater</u>	San Francisco Bay & Pacific Coast, <u>marine</u>	Suisun Bay, and other brackish, low salinity zones	Sacramento-San Joaquin Delta, <u>freshwater</u>	San Francisco Bay & Pacific Coast, <u>marine</u>	Suisun Bay, and other brackish, low salinity zones	Sacramento-San Joaquin Delta, <u>freshwater</u>	

Lambda Transformed IEP FMWT Species Indices



Lambda Transformed ($\lambda = 0.5$) Total Pyrethroid Use (pounds A.I.)

Predictor variables and summary statistics for multiple linear regression models explaining IEP FMWT species abundance variability from 1978-2014.

Species	R ² -adj.	Predictor Variables	Partial Coefficients	95% CI	p-value
Longfin smelt	0.79	Pyrethroid use	-1.097	(-1.422, -0.771)	<0.001
		Delta Inflow	-1.228	(-1.533, -0.902)	
Striped bass	0.77	Pyrethroid use	-1.235	(-1.494, -0.977)	<0.001
		Delta Inflow	-0.336	(-0.622, -0.050)	
		Delta Exports	-0.322	(-0.602, -0.042)	
Delta smelt	0.37	Pyrethroid use	-1.01	(-1.567, -0.452)	<0.001
		Delta Exports	0.422	(0.107, 0.737)	
American shad	0.41	Pyrethroid use	0.00973	(0.00472, 0.01473)	<0.001
		Delta Exports	-0.00464	(-0.00778, -0.00150)	
Splittail	0.54	Pyrethroid use	-0.744	(-1.089, -0.400)	<0.001
		Delta Inflow	-0.651	(-0.995, -0.307)	