CECs Early Warning Network: California Pilot Project

Meeting Summary – Regional Expansion of NOAA's Mussel Watch Program
San Francisco Estuary Institute | October 20 & 21, 2009

MEETING OBJECTIVE

Determine which CECs shall be added to Mussel Watch (MW) Program monitoring activities in coastal California Winter 2010

OPERATING PARAMETERS

1. Maintain connection to historical Mussel Watch at a subset of original sites
2. Existing funding resides on current Mussel Watch analytical contract, and includes standard list of legacy contaminants plus some CECs that have been measured regionally and nationally during special assessments (PBDEs, PFOS, *etc.*)
3. TDI Brooks, the analytical contract laboratory for MW, is able to sub-contract specialized analyzes as needed, but not to Federal laboratories.
4. Cost savings are realized when Project partners collect samples, allowing for additional analyzes and/or sites to be sampled

MATRICES

Mussels (native and caged) and passive samplers (POCIS and SPME) will be the focus of this pilot project, though mussels will be the primary matrix. Native mussels cut down on sampling costs and field time but transplants can be used in some areas to expand spatial coverage. Polar Organic Chemical Integrative Samplers (POCIS) will be used to assess contaminants that do not accumulate in bivalves. At selected sites Solid Phase Microextraction (SPME) samplers will also be deployed to help determine the comparability of these samplers with mussels (SCCWRP). Additionally, sediments, water, fish tissue, marine mammal tissue may be analyzed through further collaborations, but are not part of the year 1 design.

SPATIAL DISTRIBUTION

Up to 80 sites will be collected; of which 25 are to be selected from the core MW sites (*figures 1a-c*). It would be advantageous to make collections from ALL existing California MW sites (N=70; only 25 priority sites to be analyzed); however, that will be at the discretion of project partners. Additional sites will be selected from the following strata: POTWs, agricultural, urban, non-urban, stormwater discharges and protected areas such as Areas of Special Biological Significance (ASBS), National Marine Sanctuaries and National Estuarine Research Reserves.

SAMPLING FREQUENCY

One sampling event will occur for each of the 25 original Mussel Watch sites during the prescribed time frame of MW sampling in California, November 2009 – March 2010. The remaining 65 sites will be sampled according to partner availability, but preferably prior to summer, 2010.

CANDIDATE CONTAMINANTS/CLASSES

1. Flame retardants: PBDEs, TBBPA,TDCPP, HBCD, PBEB, TPP, DBDPE, BTBPE, Dechlorane Plus (DP)
2. Phenolics including: Bisphenol A, Alkylphenols, Triclosan
3. Perflourinated compounds: PFOS, PFOA
4. Current use pesticides: Phyrethroids, atrazine, organo-phosphates, Fipronil
5. Hormones: 17-alpha-ethynylestradiol, 17-beta-estradiol, musks
6. Pharmaceuticals : Carbamazepine, Erythromycin, Diazepam, Acetominophen
7. Nanoparticles: nano-silver, carbon-nanotubes

BROADSCAN

New broadscan analyses are not included in this plan, though broadscan using time-of-flight technology is being performed by SFEI and NIST in the Bay area. Results from this complementary effort will be leveraged to determine the presence of CECs not detected by the Pilot Project, and may influence the CEC list in project out years.

BUDGET

Sites	***Analyte***	***Cost***	***Total cost***
25	Standard MW analyte list (TDI, *table 1*)	$1,736	$43,400
80	PBDEs (TDI)	$450	$36,000
80	PFCs (TDI)	$500	$40,000
80	Pharm (research - AXYS)	$850	$68,000
20	New flame retardants (Cal EPA | DTSC)	$500	$10,000
80	Phenolics - (AXYS)	$550	$44,000
80	Tissue Pesticides - ~~POCIS~~ (USGS)	$500	$40,000
10	Nanoparticles (research) (TDI)	$2,500	$25,000
20	Pharm/phen/pest/horm - POCIS (USGS/EPA)	$2,600	$52,000
			$***358,400***

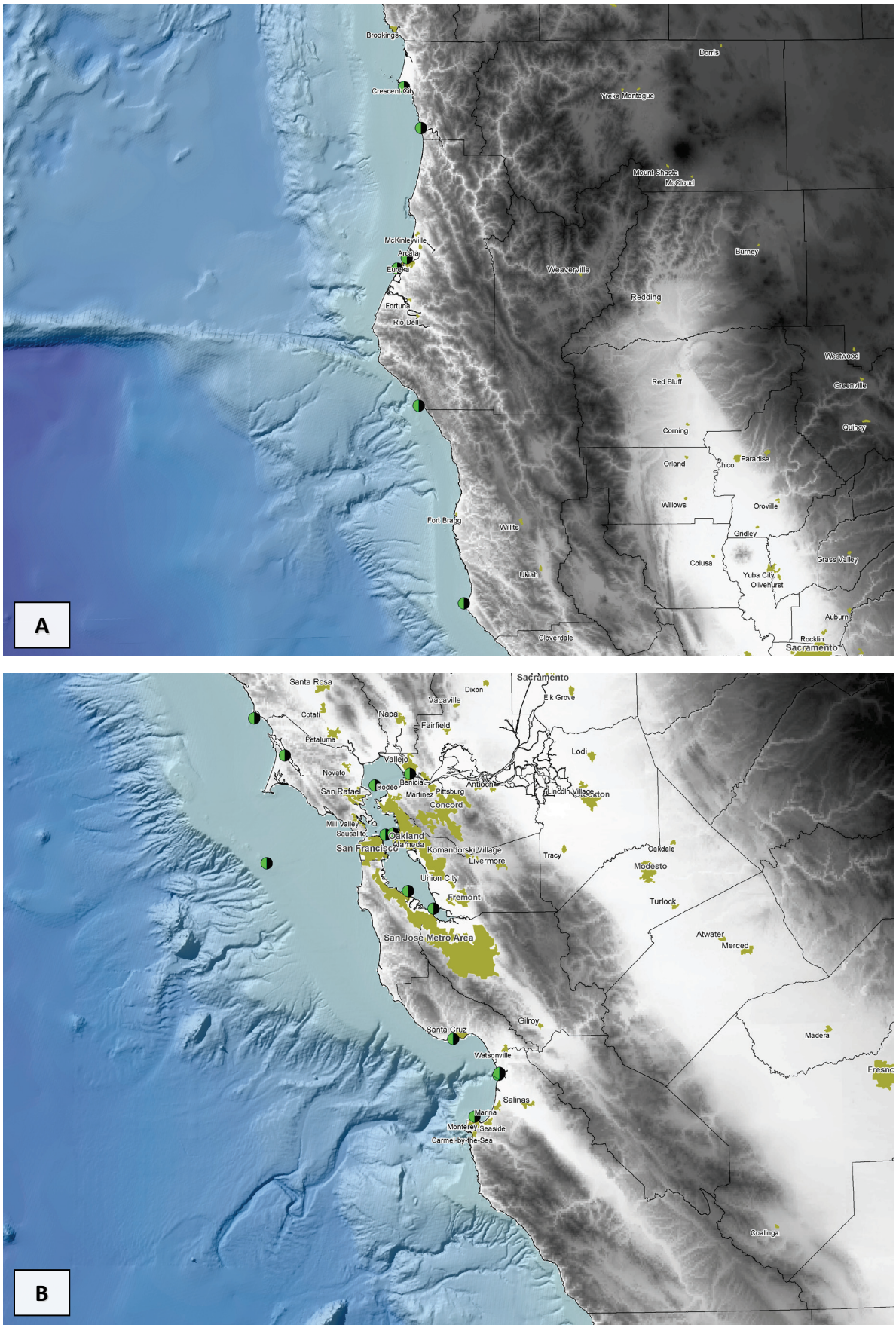

Figure 1A & B: Historical Mussel Watch sites in northern (A) and central (B) California.

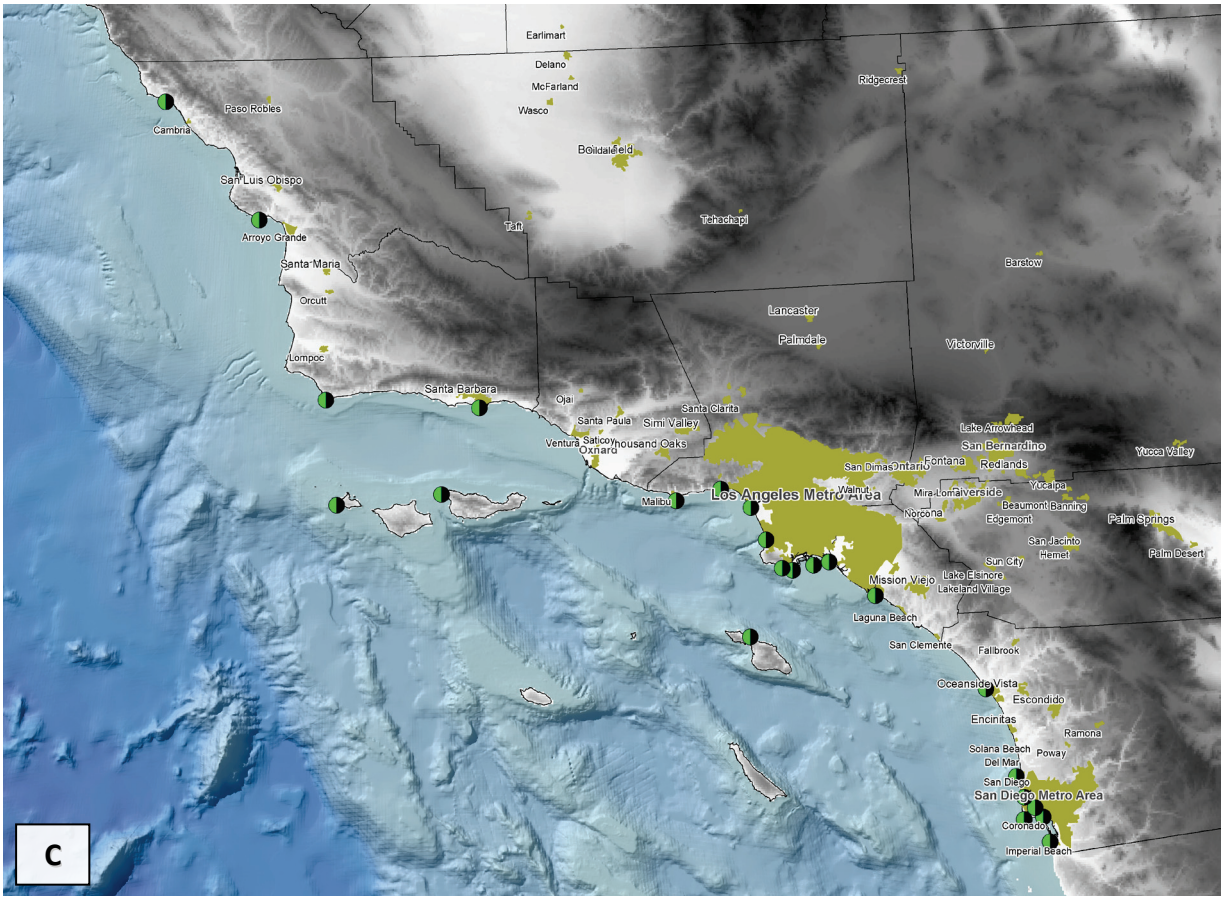

Figure 1C: Historical Mussel Watch sites in southern California

Table 1: "Standard" Mussel Watch contaminant list – organics only.

COMPOUND CLASS	ORGANIC COMPOUND
PCB* (Sum of 38 PCBs) Polychlorinated biphenyls	PCB8/5, PCB18, PCB28, PCB29, PCB31, PCB44, PCB45, PCB49, PCB52, PCB56/60, PCB66, PCB70, PCB74/61, PCB87/115, PCB95, PCB99, PCB101/90, PCB105, PCB110/77, PCB118, PCB128, PCB138/160, PCB146, PCB149/123, PCB151, PCB153/132/168, PCB156/171/202, PCB158, PCB170/190, PCB174, PCB180, PCB183, PCB187, PCB194, PCB195/208, PCB199, PCB206, PCB209
PAH** Polycyclic aromatic hydrocarbons (Sum of 19 parent PAH compounds plus 19 groups of alkylated PAHs)	**Sum of 7 parent low molecular weight PAHs (with 2 or 3 rings):** naphthalene, biphenyl, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene **plus the sum of 12 parent high molecular weight PAHs (4 or more rings):** fluoranthene, pyrene, benz[*a*]anthracene, chrysene, benzo[*b*]fluoranthene, benzo[*k*]fluoranthene, benzo[*e*]pyrene, benzo[*a*]pyrene, perylene, dibenz[*a,h*]anthracene, indeno[*1,2,3-cd*]pyrene, benzo[*ghi*]perylene **plus the sum of 19 groups of alkylated PAHs:** C1-Chrysenes, C1-Dibenzothiophenes, C1-Fluoranthenes/Pyrenes, C1-Fluorenes, C1-Naphthalenes, C1-Phenanthrenes/Anthracenes, C2-Chrysenes, C2-Dibenzothiophenes, C2-Fluorenes, C2-Naphthalenes, C2-Phenanthrenes/Anthracenes, C3-Chrysenes, C3-Dibenzothiophenes, C3-Fluorenes, C3-Naphthalenes, C3-Phenanthrenes/Anthracenes, C4-Chrysenes, C4-Naphthalenes, C4-Phenanthrenes/Anthracenes
DDT (Sum of 6 compounds)	2,4'-DDD; 2,4'-DDE; 2,4'-DDT; 4,4'-DDD; 4,4'-DDE; 4,4'-DDT
Butyltin (Sum of 3 compounds)	Monobutyltin, Dibutyltin, Tributyltin
Chlordane (Sum of 4 compounds)	Alpha-Chlordane, Heptachlor, Heptachlor-Epoxide, Trans-Nonachlor
Dieldrin (Sum of 2 compounds)	Aldrin, Dieldrin

PARTICIPANTS

Jay Davis	SFEI	jay@sfei.org
Susan Klosterhaus	SFEI	susan@sfei.org
Meg Sedlak	SFEI	meg@sfei.org
Keith Maruya	SCCWRP	keithm@sccwrp.org
Steve bay	SCCWRP	steveb@sccwrp.org
Steve Weisberg	SCCWRP	stevew@sccwrp.org
Chris Beegan	Cal. State Waterboard	cbeegan@waterboards.ca.gov
Dominic Gergorio	Cal. State Waterboard	dgregorio@waterboards.ca.gov
Treda Grayson	USEPA	grayson.treda@epa.gov
Lisa Huff	USEPA	Huff.Lisa@epamail.epa.gov
Dave Alvarez	USGS	dalvarez@usgs.gov
John Kucklick	NIST	John.Kucklick@noaa.gov
Tracy Collier	NOAA | NMFS	Tracy.K.Collier@noaa.gov
Luke Nachbar	NOAA | NOS	Luke.Nachbar@noaa.gov
Gunnar Lauenstein	NOAA | NOS	Gunnar.Lauenstein@noaa.gov
Kimani Kimbrough	NOAA | NOS	Kimani.Kimbrough@noaa.gov
John Christensen	NOAA | NOS	John.Christensen@noaa.gov