A PRESENTATION of the Regional Monitoring Program for Water Quality in the San Francisco Estuary

EXPOSURE AND EFFECTS - 2011/2012

MEG SEDLAK, SAN FRANCISCO ESTUARY INSTITUTE

December 13th, 2011

EEWG Studies

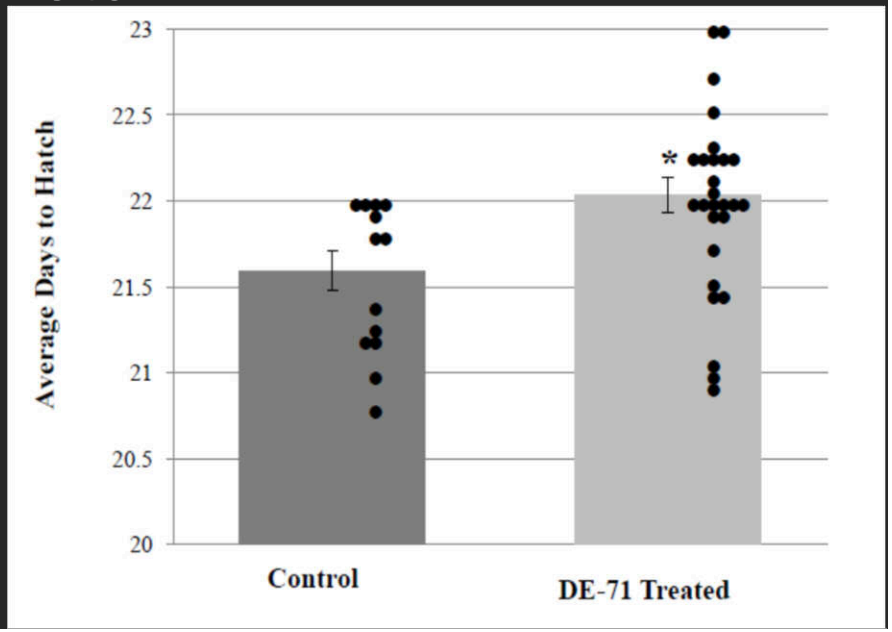
- Completed:
  - Causes of Sediment Toxicity, Molecular TIE, BDEs & terns
- Almost finished:
  - PAH and Juvenile flatfish (NOAA)
  - EEPS Summary report
- Underway:
  - Effects of Cu on salmonids (Baldwin)
  - Follow up on Hotspots (SFEI)

E&E Strategy

- Effects on Birds
  - Is there clear evidence of pollutant effects on survival, reproduction and growth of individual birds
  - Are pollutants in the Bay adversely affecting bird populations?
  - What are appropriate guidelines for protecting bird populations that are at risk?
  - Do spatial patterns in accumulation indicate particular regions of concern?

Evaluating Tern & BDEs

- High conc. observed in terns in South Bay (63 ug/g lipid dw basis)
- LOEL for Kestrels is 1.8 ug ww (~32 ug/g lipid dw)
- Evaluated BDE conc (0.2, 2, and 20 ug/g ww) on tern egg survival, hatch and growth
  - No significant effects

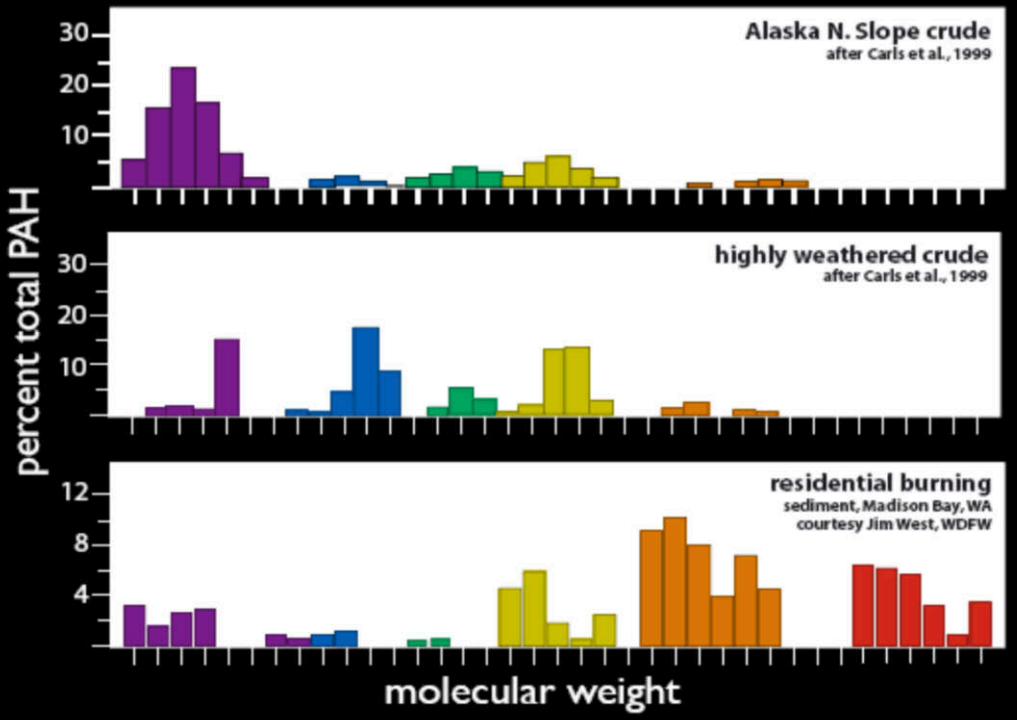


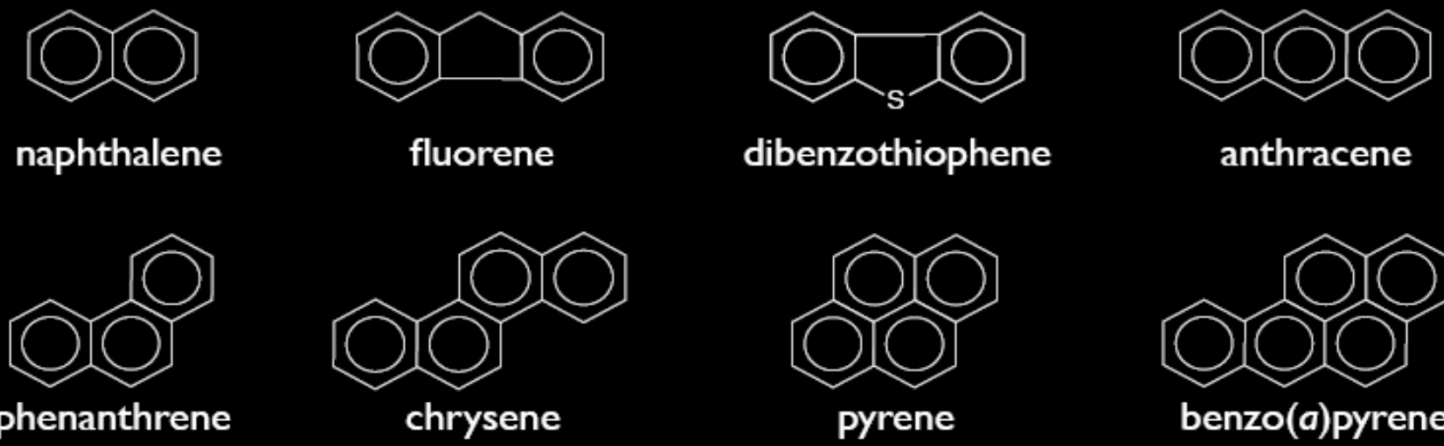
Effects of PAHs on early life stage development of flatfish

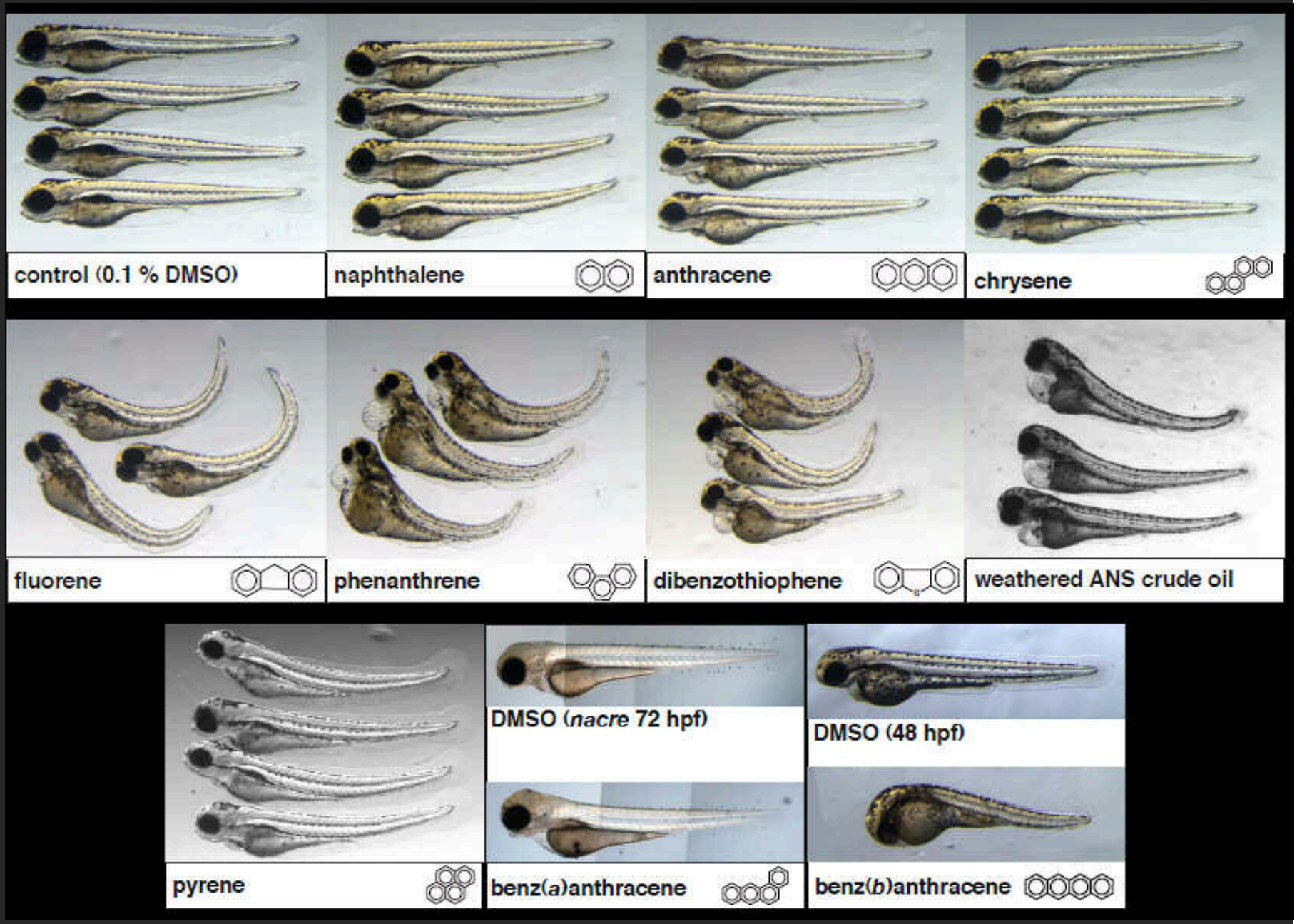
- Objective 1: Analysis of effects of individual PAHs and mixtures on a model fish
- Objective 2: Determine the threshold for effects of PAHs in sediment-exposed larvae of resident SF Bay flatfish (California halibut)

PAHs: ubiquitous contaminants associated with fossil fuels

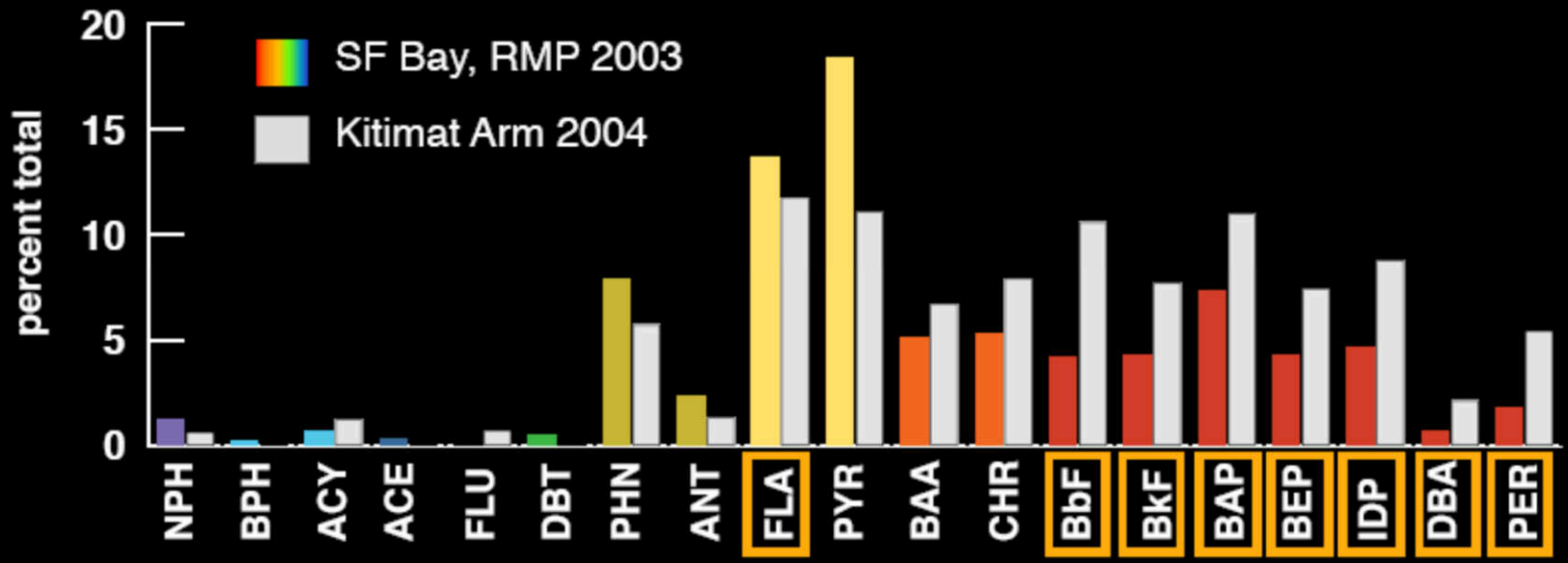
# rings/series	
2	NPHs
3	FLUs
3	DBTs
3	PHNs/ANT
4	FLA/PYR/CHR
5	BzPYRs/BzFLAs






control (0.1 % DMSO)
naphthalene
anthracene
chrysene
fluorene
phenanthrene
dibenzothiophene
weathered ANS crude oil
pyrene
DMSO (*nacre* 72 hpf)
DMSO (48 hpf)
benz(*a*)anthracene
benz(*b*)anthracene

Screening high molecular weight PAHs



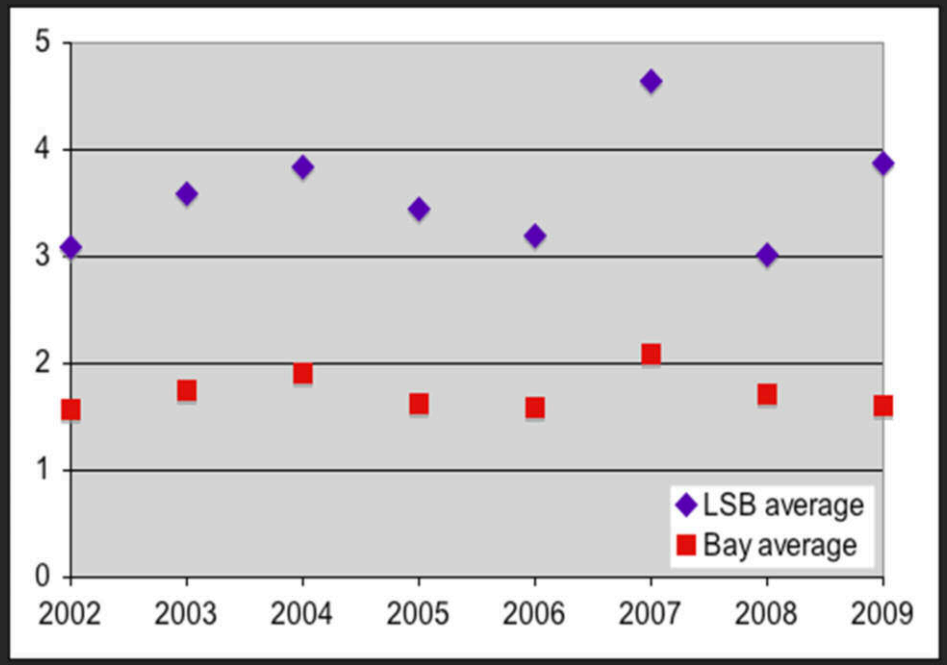
EEPS Summary Report
Example: Recommendations for birds

	Influence on Management Decisions	Relevance to RMP Management Questions	Protecting Species of Public Concern	Likelihood of Finding Ecologically Significant Effects	Potential for Linkage of Laboratory and Field Studies	Availability of Literature on the Indicator to Aid Interpretation	Temporal and Spatial Integration	Benefit Per Unit Cost	Linkage to Specific Pollutants	General Indicator of Ecosystem Health	High Signal to Noise Ratio	Successful Trial in the Pilot Study	Clear Reference Condition	Contributing to a Balanced Mix of Indicators for the Bay
Terns														
Cormorants														
Diving Ducks														

- Recommended incorporating exposure monitoring of tern and cormorants into S&T starting in 2009
- Discontinue monitoring diving ducks
- No additional studies proposed for Birds

2012: Effects of Cu on Fish

- Cu used in pesticides, industry, and brake pads
- Cu SSO for Bay
- Dramatic decline in recent salmon runs

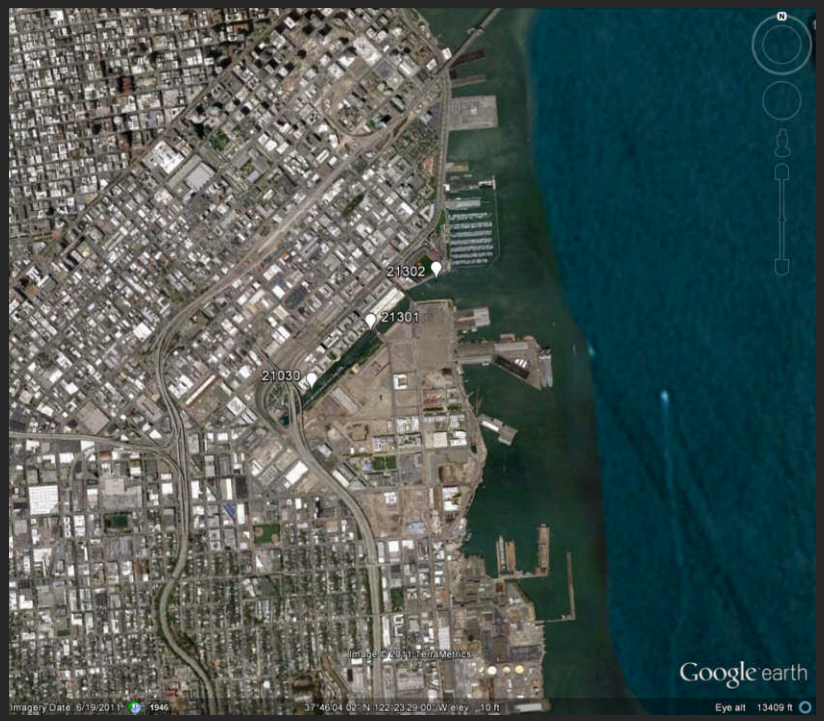


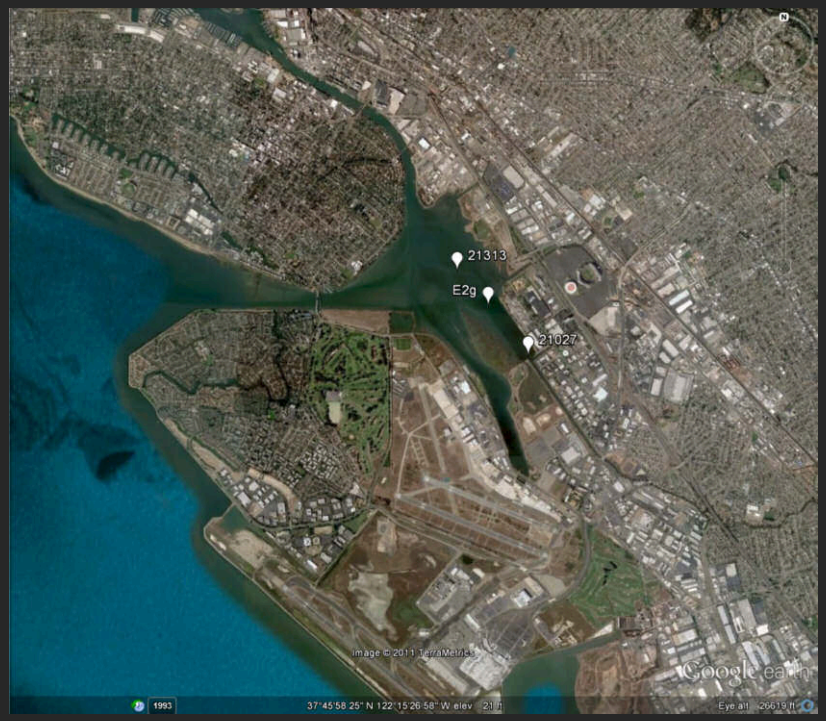
Goals of Project

- Goal: Assess impact of copper on seawater-phase juvenile salmon (Chinook)
- Currently evaluating salinity (not RMP-funded)
- Organism smolt June/ July, will do Cu/DOC in Aug/ Sept
- Vary DOC (2 to 6 mg/L)

2011/2012: Follow up on Hotspots

- Goal: Using SQOs to evaluate areas of persistent toxicity in the Bay
- Mission Creek
- San Leandro





2012: Mesohaline Index and Moderate Toxicity

- Scopes of work to be developed
- Will coordinate with SCCWRP on:
  - Development of Mesohaline index (and review of Benthic Index report)
  - Moderate Toxicity workshop
  - Will work with NCCA report will address SQO (SCCWRP to conduct evaluation)
    - Will supercede 2008-2009 SQO report

S&T Triennial Sport fish

- Likely defer to 2014

Questions?