Contaminants subteam meeting January 30, 2015

DWR: Krista Hoffmann

UCD: Swee Teh, Linda Deanovic

CDFW: Dave Contreras, Rosemary Hartman, Alice Low, Stacy Sherman, Dave Zezulak

Shawn Acuna (phone)

Goal: Populate hypothesis and metrics tables for draft monitoring plan, check in with physical processes team for "state variable" input

Hypotheses:

- Few comments, but should re-visit H9.2.1, as pH modifies chelating properties

Core metrics

- Discussion about whether any contaminants metrics should be "core." Consensus was that sediment testing before and immediately after restoration is important, but need not be continued if problems not detected; make note in text about source of sediment (native or fill).
- For all, change "continuous" to "routine" or similar (discrete samples rather than continuous sampler)
- Cost for chemical analysis is variable, often have price breaks with greater number of samples
- Swee suggested talking with Tracy Collier (Delta Stewardship Council ISB) about increasing funding available for monitoring contaminants on a regular basis
- Should prioritize chemical analyses based on which chemicals likely to have most deleterious effects on fish and their food – PCB, PAH, copper for sure, Hg uncertain (some sublethal at high conc) but most likely to be required for compliance

Observation triggered metrics

- Testing only if see effects on fish or in environment: metals, ammonium, PBDEs, PPCPs and insecticides for fish deformities
- Organized by triggers, so column should move to far left of table
- Not likely to see things like gross fish deformities in field-caught specimens; score fish on condition, loss of fins, rattiness of fin or gill, parasites, etc. **Fish team should add score of health to fish metrics; Bad scores could trigger special study to look at intersex frequencies; Swee will send Dave C. a paper about scoring used in the Great Lakes. Should use multiple species, not just targets because sensitivity to chemicals different
- Cost savings if use land use or initial samples to test likely candidate contaminants rather than entire group
- decision tree could be helpful for method/species selection –e.g. wouldn't use h azteca if know insensitive to selenium

- Trigger: Low invert biomass with high phytop and quality; insecticides, metals and selenium most likely, tox testing with H.Azteca and c dubia together narrows source options. Additional TIEs narrow further. Need to asterisk this trigger, as stuff other than contaminants could cause low invert biomass. Think about groups of inverts (benthic vs. pelagic) to provide more evidence about potential cause. E.g. if benthic inverts okay, but zoop low, then side on default that there are no contaminants issues.
- Trigger of low phytop and invert biomass as same time redundant in table
- Food web group covering HAB toxicity

Situation –triggered based on site characteristics

- Like observation-triggered, organize by trigger
- Should also consider past land use – county farm advisors or ag commissioners used to record chemicals applied, could be source of data for legacy contaminants.
- Tox testing probably most economical way to test for contaminants
- Species choice needs some thought, for entire Delta, as salinity tolerance is an issue (Thalasiosira ASTM method??, Neomysis mercedis, but not EPA method)
- DPR requires reporting of pesticide use, but info release delayed
- Testing should occur after storms, hydrophobicity of chemicals will determine if washed out quickly; 3 or more grab samples ideal, but usually for toxicity it's one grab; Could also sample with set schedule, but analyze data with retrospective knowledge of storm timing
- Other industrial chemicals or relevant chemicals we should be thinking about: Hg anti-fungicide for paper; Benecia oil refinery chromium, vanadium, arsenic, selenium; lead near Navy yards; combine metal and relevant chemical rows
- add effects of plastics as special study
- Define "proximate" based on distance and hydrologic connectivity (ad hoc definition rather than strict buffer)
- Add ammonium and nitrate and metals to waste water treatment outfalls (and pathogens); method hard b/c know so little about pharma and personal care (Linda will look into this more) chemical analysis (not toxicity, so remove from metric) ; special study for looking for intersex fish linked to pharma

Special studies

- Everyone should think about and provide feedback via email
- Genotoxicity studies - hard to find controls, because genes so variable. We already know many of the effects of chemicals, so chemical analysis of water may be better; Maybe next step if can't determine what happening to fish (intersex or tumors) but can't tell why from other studies
- For studies on lesions on fish internal organs add "and concurrent tissue analysis for contaminants" –when fish people see issues send to Swee for necropsy process
- Effects of common contaminants on delta or longfin smelt fecundity or other endpoints

- LC50 change for invertebrates in general not just pelagic; research going more to predicting response based on mechanisms of action, so maybe more testing of those predictions
- Would be interesting to examine how to restore in way to limit contaminant effects.

“State” variables

Physical processes group characterizing area (regional context) via map. Other suggestions for map: industrial and mining, urban runoff; spread of waste water treatment sludge on fields - happened a lot in Cache slough area on pastures

Data sources: epa ecotox database (a lot of toxicity data) and ECHO (EPA something where apply to use stuff); DPR good source for what going on in urban environment; could give pesticide use data before provide publically (like 3 months after); Bay delta live trying to consolidate all state variable info but maybe not GIS; Integrated water resources information system DWR web based GIS to access water info