

IEP Science Highlights

IEP Quarterly Directors Update

October 2010

IEP Science Highlights from the 2010 Bay-Delta Science Conference

The 3-day conference was attended by about 1000 people. It included a POD session with 20 talks and numerous posters as well as IEP contributions in many other sessions on diverse topics.

Some new fish findings:

- *Longfin smelt distribution and genetics:* Maturing fish shifted from the Delta to downstream bays and deeper water. SF Bay longfin smelt are genetically isolated from the Washington population.
- *Delta smelt distribution:* New otolith chemistry data shows great life-history diversity in delta smelt, with resident and migrating contingents throughout the Delta. Central Delta residents are more susceptible to entrainment than north Delta residents.
- *Delta smelt survival and growth:* Initial output from a new individual-based delta smelt model shows that delta smelt survival was particularly good in 1999 and bad in 2002 and that changes in food resources may have had a larger effect on growth than exports.
- *Predation on delta smelt:* A novel genetic technique detected silverside predation on larval delta smelt in the middle of the Sacramento Ship Channel, but not in shallow areas near the shore. Modeling suggests that striped bass-delta smelt encounter rates are low, while field results show that largemouth bass are now very abundant, but prey mostly on inshore species, not delta smelt.

Some new water quality and food web results:

- *Turbidity:* New studies show successive, downward step changes in turbidity in the Delta and SF Bay after the 1982-83 and 1997-98 El Nino events due to flushing. The turbidity decline in the early 1980s may have stimulated the proliferation of aquatic weeds. Aquatic weeds then further contributed significantly to additional declines in turbidity.
- *Phytoplankton:* Phytoplankton dynamics in 2010 were different from previous years: there were two spring diatom blooms in Suisun Bay during low-ammonium conditions and there was little evidence of a summer *Microcystis* bloom, perhaps due to low summer water temperatures.
- *Zooplankton:* Larger copepods are nearly always food limited in the San Francisco estuary, but smaller ("micro-") zooplankton are only rarely food limited. Microzooplankton are a food source for invasive clams and the small, invasive, copepod *Limnoithona*. New studies show that delta smelt larvae feed and grow on *Limnoithona*, but growth is better on larger copepods.

Other IEP Science Activities:

- Reviewed proposals for joint DOI/DOC Federal Biological Opinion Task Force
- Turbidity and fish migration PWT – first flush study review and planning
- IEP presentations to CA WQMC, Delta RMP, Delta Independent Science Board

What's next:

- Completion of 2010 IEP POD Synthesis Report/Work Plan in November – Regime Shift
- Completion of FWS Delta Smelt Fall Habitat Action Adaptive Management Program Implementation Plan in November
- IEP's Future Direction