

Interim List of 16 High Impact Topics

High-Impact Topic		Example research topics
1	Drought-related projects	Lessons learned from the implementation of the Drought Operations Plan 2014: effects on fish migration, survival, entrainment, water quality effects on salmonids and green sturgeon; as well as other potential effects of drought on the Delta ecosystem.
2	Understand the interaction between Delta levees and ecosystem function	Identify the best available science on the integration of Delta levees and ecosystem function to support developing criteria for designing and implementing setback levees in the Delta. Synthesis could include state of knowledge on methods for determining appropriateness of setback levee incorporation as they relate to habitat enhancement and flood control benefits.
3	Effects of seismicity on levee integrity	Identify the best available science to use in risk assessment to offer management with alternative options, improving technology to assess levee integrity and seismic risk.
4	Salmon/Steelhead/Sturgeon Assessment of Indicators by Life Stages (SAIL)	Support of the IEP effort in integrating the vast number of analyses for anadromous fish conducted in the Delta; age, growth, fin ray microchemistry, recruitment limitations of sturgeon, hydrological process effects on fish behavior, incorporation of life-history information.
5	Climate change research	Effects of climate change on regional down-scaled climate predictions; impact of changes in sea level rise, temperature, freshwater flow on Bay-Delta dynamics with focus on native and non-native species; altered hydrology effects on levee system integrity and impacts on flood risk standards.
6	Fate and transport of water quality contaminants in the Delta	<i>Drinking water quality:</i> Delta system response to contaminant and pathogen dynamics with focus on wastewater. <i>Environmental water quality:</i> Microcystis interactions with flow and habitat change, development and use of bioanalytical assays to examine toxicant effects on fish migration and mortality, toxicant effects on primary production, develop and implement nutrient study plan for Suisun Bay and Delta, effects of salinity on invasive species ecology.
7	Mercury	Studies to develop and evaluate best management practices to control methylmercury consistent with Mercury Control Program in Delta, chemical treatment to remove methylmercury from wetland systems.
8	Flow	Assess the effects of flow on fish: outflow and fish abundance particularly Longfin and Delta smelt, X2 variability and protection of fish and wildlife, testing indices for reverse flows and compliance to biological opinion requirements, effects of flow modifications to fish survival and entrainment. Obtain better understanding of determining in-stream flow needs to protect and benefit native wildlife, plants, and fish.
9	Better understand habitat needs of native estuarine species	Fish habitat use: population distribution, timing of migration and spawning, effects of temperature operations on population stability and productivity with focus on Sacramento, San Joaquin, and Stanislaus Rivers; establishment and habitat use by native species.
10	Understand food web dynamics and productivity and how they can be improved for native species	Effects of invasive clams, mollusks, and <i>Egeria</i> on food web: importance of distribution, nutrients and clam success, grazing, factors affecting colonization; methods to control invasive clams and mollusks; characterize conditions that support phytoplankton and zooplankton communities in Suisun and Grizzly Bay. Ammonium/nutrients: better understand ammonium inhibition; develop models that evaluate importance of this inhibition on primary production at ecosystem scale.
11	Predator-prey interactions	Predator distributions: influence of submerged aquatic vegetation and flow patterns with focus on Franks Tract and South Delta; in-river juvenile/tag fish survival and mortality studies, comparison of predation rates between hatchery and natural origin fish; BACI-design predator removal experiments.
12	Effects of Invasive Aquatic Vegetation (IAV) of Delta ecology	Effects of IAV on native plants and wildlife and other ecological factors, IAV I from both chemical and biological control methods and IAV ability to recover, effects of IAV removal on Microcystis blooms.
13	Understand the importance of entrainment to fish populations	Relationship between flows/Delta intakes and entrainment with focus on Old and Middle Rivers, factors affecting adult Delta smelt entrainment, efficacy of fish screens, SWFSC winter-run salmonid life cycle model.
14	Implement urban and agricultural water use efficiency research	Understand how to manage water through tributary corridors, the Central Valley, estuary, and bay sustainably; identify methods and costs for increasing water-use efficiency, recycling, and potable re-use; regionalization of water supplies in Delta to reduce dependence on CVP/SWP; evaluate opportunities for capturing and recharging storm water/excess water.
15	Delta As A Place	Identify the Delta's agricultural regions, analyze their competitive advantage, threats, and opportunities to environment and economy; better understand recreational use of Delta through surveys to inform marketing and planning.
16	Subsidence effects on Delta ecology/economy	Assessment of opportunities to control or reverse subsidence such as carbon sequestration from growing native marsh plants, develop and implement carbon sequestration protocol for California wetlands.