Delta Science Fellows 2015 Priority Research Topics

1. Assessing the effects of drought on the Delta

i. Investigate effects of drought-induced changes in flow and other physical parameters of the Delta, including impacts on species habitat, food web dynamics, survival, and migration patterns and follow these responses through time (e.g., wetter conditions).

ii. Using physical and biological data, advance both conceptual and computational models that assess and integrate effects of changes in flow, fish entrainment at water export facilities, water quality, food web dynamics, contaminants, and habitat on juvenile fish as a function of the drought.

iii. Investigations of the physiological effects of drought on fish.

2. Effectiveness and implications of habitat restoration actions

i. Understand the effectiveness of wetland habitat restoration of subsided Delta islands on subsidence reversal, carbon sequestration, and water quality.

ii. Assess the effectiveness of wetland habitat restoration on foodweb dynamics and fish condition and survival.

iii. Synthesize information from existing decision support tools (e.g. EcoAtlas, My Water Quality Portals, etc.) to provide an overview of current approaches to habitat restoration at a regional scale and identify remaining information gaps.

3. Develop decision support tools for management of estuarine and migratory species

i. Develop innovative approaches for describing, determining, and predicting abundance, survival, temporal and spatial distribution of fish and fish habitat. These new tools may include real-time tracking devices, airborne and satellite remote sensing, adjustments to monitoring, survey technologies and design. Examples of existing tools that serve various purposes include Bay Delta Live, California Estuary Portal, CARI, and CRAM.

ii. Improve existing tools (dashboards such as California Estuaries Portal, real-time data networks such as Bay Delta Live and EcoAtlas) by developing capabilities for predictive modeling of alternative regulatory and operational actions to support Delta water management.

iii. Investigate how monitoring results can be utilized for tactical forecasting and predictions of impacts of water management on fish.

4. Science supporting the enhancement and protection of the cultural, recreational, natural resource, and agricultural values of the Delta

i. Assessment of invasive aquatic vegetation effects on boating, recreation, water operations, habitat, economic and natural resources, and management (social, economic, and ecological studies).

ii. Identify the infrastructure sectors where improvements would most efficiently advance a sustainable, resilient Delta economy (other than levees and boating).

iii. Investigate the effects of changing climate patterns and understudied faults east of the coastal ranges and their potential effect on seismic activity and flood risk in the Delta including perception and preparedness within the Delta.

iv. Assess the economic and environmental sustainability and viability of consolidated islands (polders), expanded waterways, and setback levees.