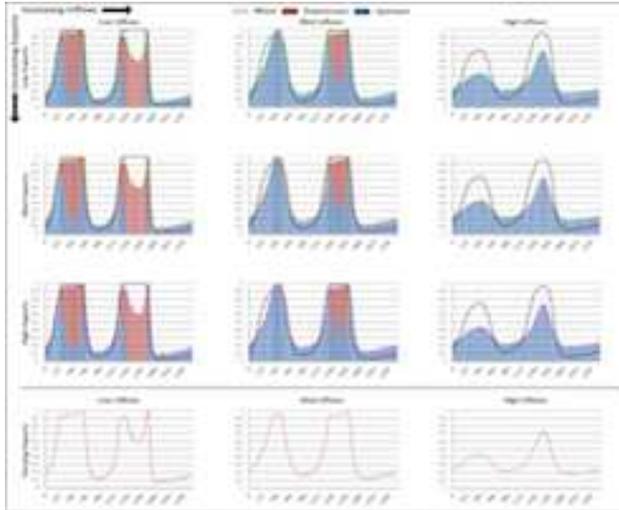




How Do Water Exports Influence Flows in the Delta?

The relative influence of tides, inflows, and exports on flow patterns in California's Sacramento-San Joaquin Delta continues to be a source of confusion and uncertainty for resource managers. The potential for impacts to sensitive fish species from export pumping remains highly contentious and has been the focus

of ESA protective measures. To shed light on the issue, CFS scientists have been investigating water movement in the Delta using a new approach that reveals flow patterns in Delta channels. We are using flows estimated at 15-minute intervals by the Delta Simulation Model-2 (DSM2 Hydro) to describe flow patterns in the interior Delta and at nine Delta junctions.



Our analysis shows that the magnitude of flow, direction of flow, and proportion of water which enters the interior Delta all change dramatically with the outgoing and incoming tides. These findings are directly relevant to salmon migration routing since recent acoustic telemetry studies indicate that fish choose routes in proportion to flow. CFS senior scientist Brad Cavallo recently gave a presentation that included some of our results and compared fish entrainment probability at Georgiana Slough with the proportion of flow routed into Georgiana Slough [[click the picture for a larger view](#)]. An updated version of his PowerPoint presentation is available as a PDF download: [A Juvenile Salmonid Perspective on Delta Hydrodynamics](#). For more information, contact Brad Cavallo at (530) 888-1443.

Predicting Gains from Passage Improvements

Are potential gains from passage improvements great enough to warrant the cost? CFS recently helped answer this question for Beaver Creek, Oregon. We expanded our previous work on habitat-based methods to estimate carrying capacity, and used the new model to predict potential gains in production of steelhead, Chinook, coho, and chum salmon from passage improvements and other restoration actions. The model can be used on any watershed, and requires only the input of habitat characteristics from a representative sampling. Application of the new model to Beaver Creek revealed the bottlenecks to production and distinguished which habitat features, at which locations and seasons, and for which life stages, are limiting adult production. A [project report](#) is available as a PDF download.

Can Floodplain Restoration Recover Habitat for Salmonids?

The Merced River Ranch Floodplain Restoration project is attempting to recover productive salmon and steelhead rearing habitat by restoring floodplain and coarse sediment processes. A summary of year 1 of the 5-year project was featured in our June 2011 CFS:Bulletin. Since then, additional floodplain has been restored, nearly 20,000 cubic yards of spawning gravel has been placed in the river, and excavation of the south side channel has continued. The project has been getting some local publicity too, with recent articles highlighting student involvement appearing online and in print. Visit the [project website](#) for the latest project information, a time-lapse video, photos, and links to news articles.