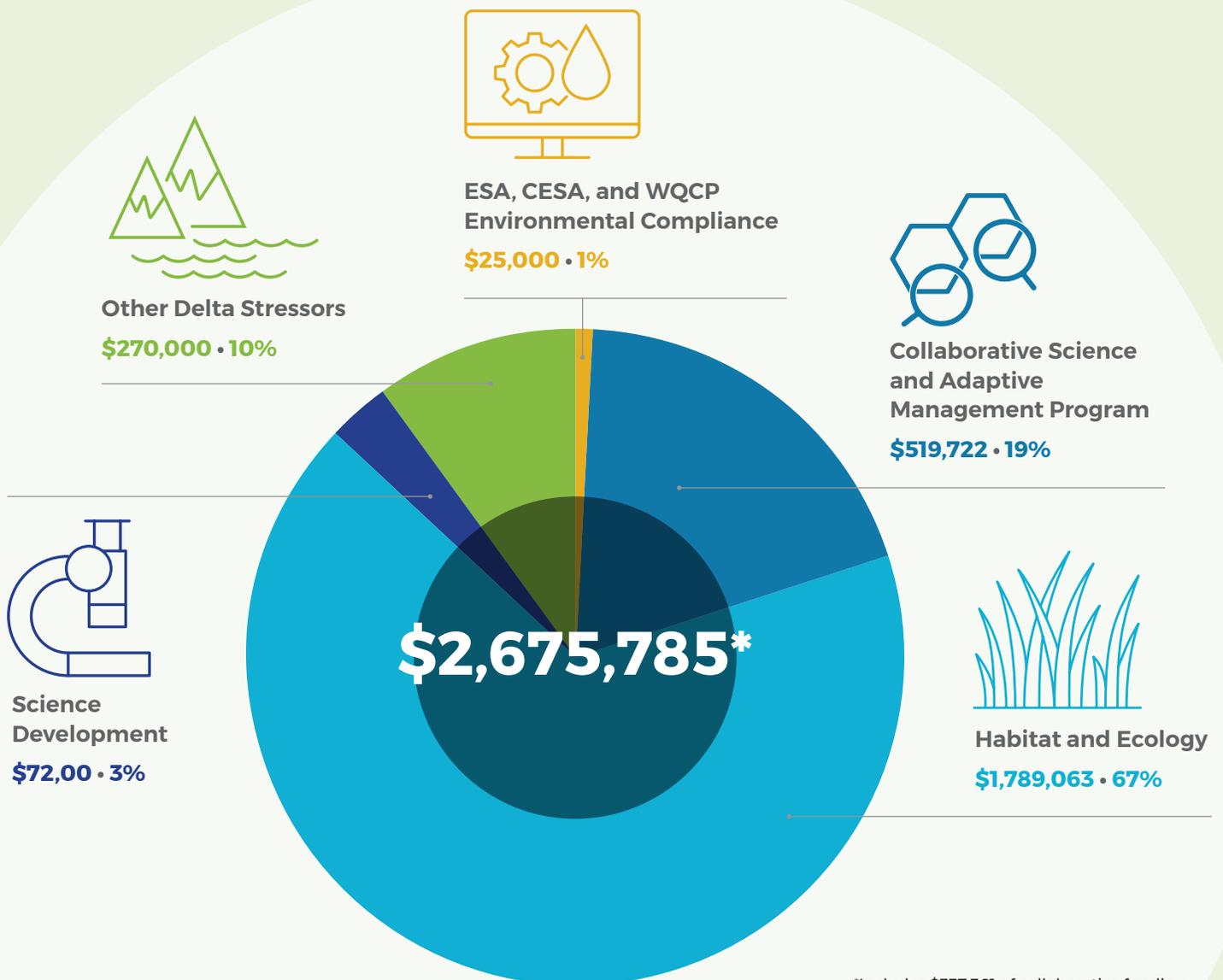


The State Water Contractors' (SWC) investment in science and scientific partnerships funds important research, giving insights to shape key water management decisions and informing the next era of policy. Collaboration is key, and the SWC are committed to working together with our partners in academia, government, non-profit and private sectors to invest in California's water future.

OUR INVESTMENTS

The SWC works with several partners to co-fund scientific research, sponsors several Prop 1 studies and has provided funding for joint solicitations. Our funding partners include Metropolitan Water District of Southern California, San Luis & Delta-Mendota Water Authority, Contra Costa Water District, the Delta Science Program and the US Bureau of Reclamation.



*Includes \$337,361 of collaborative funding and \$454,410 from a joint solicitation.

The Delta is a unique ecosystem that is home to hundreds of species and is at the heart of much of California's water supply. While regulatory agencies apply criteria to the water operations of the State Water Project (SWP), there are several other stressors on the system impacting water quality and species. The SWC invests funding in a category of projects focused on "non-operational stressors" (e.g., contaminants, nutrients, harmful algal blooms) to better understand how these stressors play a role in the ecosystem and to improve conditions for listed species.

BIG PICTURE | STUDIES OF NON-OPERATIONAL STRESSORS



SPRING OUTFLOW TOXICITY

Outflow actions in the Delta are based on the hypothesis that increased Delta outflow benefits native species. SWC funded a study to evaluate the interaction of spring outflow and the distribution and ultimate impact of toxins on Delta Smelt. Analyses from this study found that contaminants by themselves were unlikely to cause negative effects, either lethal or sublethal, on Delta Smelt health and condition, but did find that concentrations were likely at levels of concern for Delta Smelt food (phytoplankton and zooplankton). These findings can help managers understand the overall effects of outflow actions.

QUANTIFYING GROUPS OF CONTAMINANTS & ENVIRONMENTAL RISK IN THE DELTA

A risk assessment tool that analyzes the relative risks that contaminants of concern pose to Chinook salmon, Delta Smelt and aquatic invertebrates is nearly complete. This tool will be broadly available to agencies to help managers assess contaminant risks associated with various management scenarios, such as flow actions intended to benefit Delta Smelt.



The complexity of the Delta combined with the difficulty in detecting fish requires creative ways to monitor fish presence and risk assessment. SWC-funded research has developed a toolkit that includes advanced species detection methods to enhance monitoring efforts and models, and decision-making frameworks to better inform management decisions on water exports.

INSIGHTS THAT IMPACT | MANAGEMENT TOOLS AND MODELING



ENVIRONMENTAL DNA AND MODELING

A suite of studies developed a scientifically robust monitoring tool for observing and documenting Delta Smelt distribution, using the collection and statistical evaluation of environmental DNA (eDNA). The studies also refined a model (Artemis) that provides the statistical foundation for contextualizing eDNA detections in the environment. Using water samples, researchers can apply this method to determine the presence of Delta Smelt without needing to 'take' any actual individuals. Artemis, coupled with well-designed monitoring eDNA surveys, could provide agencies with a powerful set of tools for the detection of rare aquatic species.



SALMON ENTRAINMENT RISK PREDICTION TOOL

This research evaluated water management data to develop a predictive tool for determining real-time risk of salmonid entrainment at the state and federal south Delta export facilities. The model has been published and the tool is currently being used to assess risk of salvage. Better estimates of risk could lead to more flexibility in water management and better protection of salmon by increasing certainty of the risk of entrainment under real-time conditions.

The SWC science program coordinates with agencies and other programs to participate in and fund forums that emphasize the best available science and incorporate stakeholder perspectives. To further leverage its science program budget, the SWC co-funds studies with multiple entities and has participated in co-funding science solicitations. The collaborative nature of the SWC science program allows it to expand its reach and impact.

A COLLABORATIVE APPROACH



COLLABORATIVE SCIENCE AND ADAPTIVE MANAGEMENT PROGRAM (CSAMP)

A collaborative, three-phased structured decision-making process has examined actions intended to achieve Delta Smelt population growth, along with the associated trade-offs and uncertainties. Phase 2 has identified over 20 candidate management actions with potential to improve Delta Smelt population growth. The next phase will use four models to evaluate these actions relative to objectives for Delta Smelt, water supply, salmon, Longfin Smelt and management costs.



SALMON RECOVERY

Working with environmental conservation groups, the SWC invested in a collaborative effort to develop a scientific definition of recovery that can be used by all entities and agencies engaged in all runs of salmon management across the Central Valley. This definition will create a common starting point from which to evaluate and compare a diverse range of management options that work toward the salmon recovery goal. The SWC provided funding for the initial phase of workshops designed to assess values and gain input from tribal representatives. The Delta Science Program is funding the next phase of work, which will result in an agreed-upon list of actions for salmon recovery that can be used in a broad range of efforts, including nature-based solutions, permit criteria, conservation actions and the voluntary agreements.

