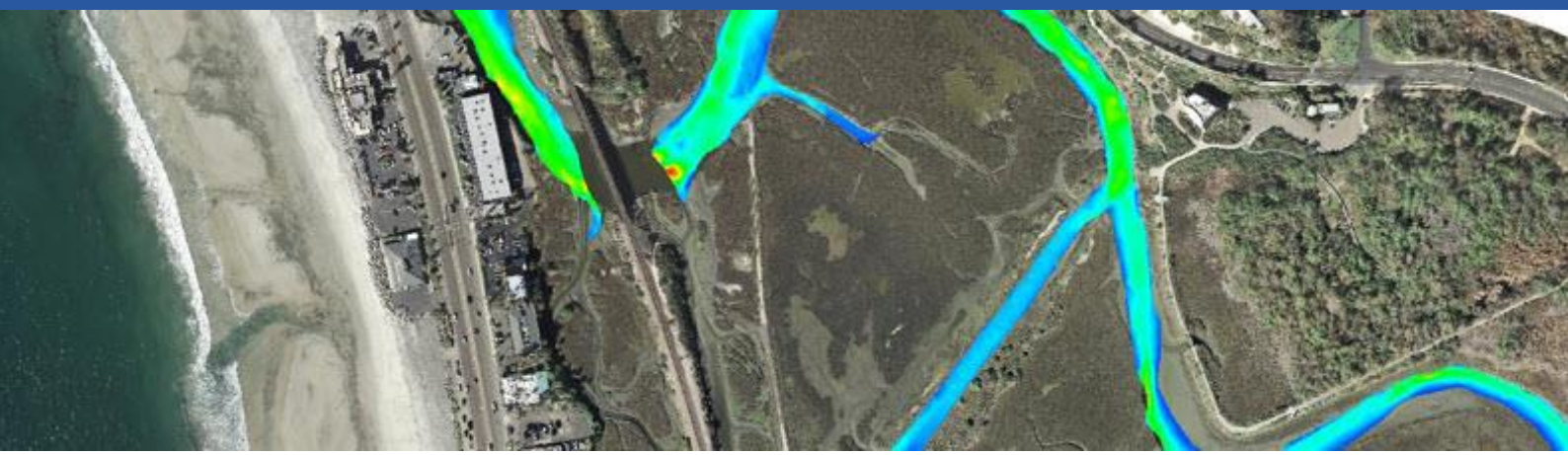
CEE HydroSystems™

CASE HISTORY



CEE ECHO™ Used for Very Shallow Surveys in San Elijo Lagoon Restoration

In one of the largest wetland restoration projects in California, coastal survey and engineering experts Coastal Frontiers used the CEE ECHO™ for very shallow lagoon and channel surveys as part of a multiple-year project. Establishing pre and post construction conditions, and providing ongoing monitoring required an echo sounder capable of operating when the boat was barely floating above the bottom. Extensive use of digital echograms in HYPACK represented a welcome departure from the "old ways" of the paper chart echo sounder!

Since 2017, Coastal Frontiers Corporation (Moorpark, CA USA) has provided lagoon and nearshore data collection services to San Diego's habitat restoration non-profit Nature Collective and project contractor Moffatt and Nichol as part of the San Elijo Lagoon Restoration Project (SELRP) in Cardiff-by-the-Sea, USA. SELRP is one of the most extensive wetland restoration projects in California, and the ecosystem features a number of very shallow channels and lagoons. As part of the project, the lagoon channels and adjacent uplands were dredged and graded to improve tidal flushing and water quality. In addition, 450,000 cubic yards of beach quality sediment was beneficially reused as beach nourishment in Cardiff and Solana Beach.

Beach nourishment (front), lagoon dredging (rear).

As part of the project, bathymetry surveys were required to establish the pre and post construction conditions in addition to progress surveys. Owing to the

extremely shallow water, echo sounder selection was a critical factor to enable a successful outcome with survey depths typically under 4ft (1.2m).

Considering this, Coastal Frontiers used the project to replace their previous echo sounder with the CEE ECHO™. Deployed on a small manned boat or the CEE-USV™ in combination with HYPACK software the CEE ECHO™ received RTK GNSS position data from a Hemisphere S320 rover.

Launching at the lagoon.

On the new equipment benefits, Chris Scott of Coastal Frontiers comments:

"The auto-gain and -sensitivity vastly improved the time required to both collect and process our single-beam data. In addition, the CEE ECHO's small form-factor allowed us to reduce deck space needed for our gear and eliminate about 20 lbs of batteries required for our old echosounder!"

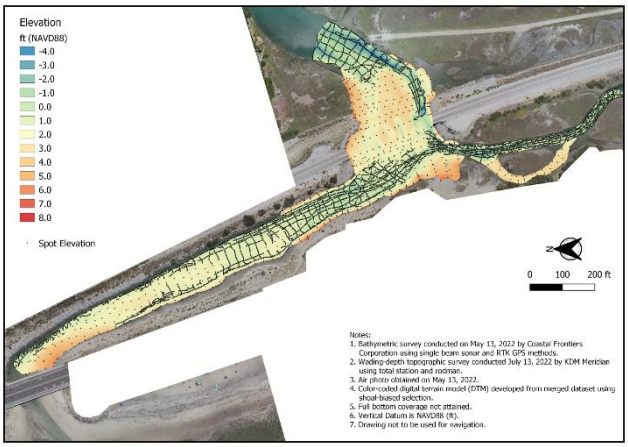
As specialists in this type of multiple technique nearshore survey project, Coastal Frontiers also monitored the beach nourishment program with UAV flights and bathymetry surveys at depths of 10-60ft using their CEE ECHO™.

With active dredging and sediment resuspension, survey conditions were tricky at times and advanced QA/QC supported by the CEE ECHO™ was useful:

"The digital echogram efficiently mapped both the top and bottom of the loosely-consolidated layer. We were die-hard paper chart users, but since using the CEE ECHO™ we would never consider surveying without a digital echogram."

Loosely consolidated lagoon sediment.

In combination with wading and land survey data, a complete topographic map of the entire lagoon system was generated for the project managers.



Wading and boat progress survey data from 2022.