Response Summary:

U.S. Army Corps of Engineers (USACE) performs maintenance dredging (i.e., repetitive removal of naturally shoaled bottom sediment in the existing federal navigation channels) of the Newport Bay Harbor entrance channel and inner harbor to maintain a safe and navigable waterway. In 2021, an invasive species of green algae, *Caulerpa prolifera*, was found in Newport Bay Harbor. *C. prolifera* has the potential to significantly impact local flora and fauna as well as recreational opportunities. Efforts lead by the California Department of Fish and Game (CDFG) and NOAA to survey and local Water Board to remove the invasive species took place soon thereafter. Yet, numerous subsequent surveys of the infestation site have proved that the invasive algae is still present. Due to the presence of *C. prolifera* in Newport Bay Harbor, there are concerns of how dredging may spread or exasperate the current infestation. Currently, there are limited tools and approaches for surveying *C. prolifera* to better understand the spatial and temporal extent of the algae. Therefore, there is a need to identifying existing or emerging technologies that could be used to monitor or predict the presence of Caulerpa in nearshore environments.

Period of Performance:

June-September 2022

Benefits of the Response to the USACE Dredging/Navigation Program:

A technical report was provided which summarizes technologies that could be applicable to supporting early detection of *Caulerpa* sp. along the continuum of technology readiness from conceptual to full scaled application. The current survey approaches required near a disturbing activity (i.e., any work activity initiated which could fragment or disseminate *Caulerpa*) are defined in three survey levels based on the required intensity level which are primarily human-based and have proven to be effective in past years; however, the time, resources, and risks associated with human-based surveys likely increases as the spatial extent of the algal species increases. Therefore, adaptation of other survey approaches and predictive models can supplement and inform these current efforts as an effort to increase efficacy (detection) and efficiency (time and resources).

Deliverable:

White paper titled "Review of Technologies to Support Early Detection of the Invasive Algae *Caulerpa prolifera*"

POC: Andrew McQueen, PhD

Providing environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance navigation and dredging missions

Andrew McQueen, PhD
ERDC-EL ● andrew.d.mcqueen@usace.army.mil

DOTS ID: DOTS-22-R11