Nutrient Reduction through Innovative Technology in Removing Biomass and Accumulated Nutrients

Prepared For: FWC/South Florida Prepared By: AguaCulture

SHORT PROJECT DESCRIPTION

FWC, The Army Corps of Engineers and South Florida Water Management District are interested in testing the innovative technology that AguaCulture has patented which consists of mechanically harvesting aquatic vegetation such as algae, water hyacinths and hydrilla. This harvesting technology focuses on nutrient reduction by economically and efficiently harvesting the aquatic vegetation that has absorbed nutrients from the water column. The vegetation is reduced to a slurry, applied to upland areas and harvested as part of a process that removes nutrients from the watershed. The result is improved water quality and a reduced potential for algae blooms. FWC will designate an area which will be the focus of this project to showcase the efficacy, feasibility and standardization of this system as a solution for aquatic weed management and nutrient control for Florida waterways. The project objectives are outlined as below:

1. Demonstrate the pounds of phosphorus removed via AguaCulture's innovative technology.
2. Demonstrate that harvesting aquatic vegetation and unconsolidated sludge is economically feasible.
3. Demonstrate that the waste product can be applied to Agricultural land.

PROJECT BENEFITS

There is an array of major environmental benefits that this project will accomplish. First and foremost, this project will improve the water quality by removing nutrients, beyond just phosphorus, from the water which will mitigate against future algae blooms and improve water clarity, improve dissolved oxygen levels for other aquatic species as well as improving fish habitat. A reduction of chemical use may also lead to a reduction of unconsolidated sludge as the weeds are sprayed, die, sink to the bottom, rot and release the nutrients that the plant absorbed into the water perpetuating the problem. One drawback to traditional harvesting is the disposal of harvested material. An additional benefit of this system is repurposing the waste into a useful product that eliminates point source pollution and improves soil conditions for higher yields and healthier crops. The system can work year-round, resulting in continual nutrient removal. Lastly, the removal of aquatic invasive plants will benefit native habitat and the fish and wildlife dependent on these.

CONTACT INFORMATION (Government Agency):

Matt Phillips, Section Leader
Florida Fish and Wildlife Conservation Commission
620 S. Meridian Street
Tallahassee, FL 32399

Project Funding Type: New Project

ANTICIPATED GRANT FUNDS NEEDED: $500,000
MATCH: $50,000 (will be updated during development of Scope of Work)
TOTAL PROJECT COST: $550,000

COST EFFECTIVENESS
Current methods of aquatic vegetation harvesting are high cost and low yield due to disposal issues. When harvesting aquatic vegetation, the harvesters extract the material and shuttle the vegetation to shore. The material is typically sent to a landfill or deposited to dry and then transported away which adds a significant cost to the agencies or the material is left at the side of the bank resulting in point source pollution as nutrient wash back into the waterbody, further exacerbating the problem. Again, both factors result in an ineffective, inefficient and unsustainable temporary solution to nutrient reduction through removal of aquatic vegetation. AguaCulture's system processes the weeds instantly eliminating the need to shuttle the weeds back to shore. Additionally, the end-product has been tested through 3rd party laboratory testing and a value to the material being harvested has been established creating an agricultural market for the product and providing placements for future harvesting. This created market will offset the cost overtime and the days of high landfill and hauling costs associated with current disposal methods will be non-existent with AguaCulture's innovative technology.
Lastly, this harvesting system is versatile in that it can harvest a variety of aquatic plants such as water hyacinths, hydrilla along with unconsolidated sludge and algae. The versatility of this project results in an affordable, efficient and effective solution for the State of Florida as mitigation against future algae blooms through nutrient reduction.

COMMITMENT TO OPERATE AND MAINTAIN PROJECT
FWC, ACOE and SFWMD will be providing matching funds and in-kind services. AguaCulture plans to expand operations and pursue government contracts to continue to reduce nutrients through the removal of aquatic vegetation such as water hyacinths/hydrilla/unconsolidated sludge/algae and continue to work with the Agencies to improve water quality and utilize this technology as mitigation against future algae blooms for the State of Florida.

PROPOSED START DATE: December 2020

THE MANAGEMENT TEAM INFORMATION:
FOUNDER, NICHOLAS SZABO has been in Agriculture for over 30 years. He grew up on a large hog farm in Southwest Ontario where his passion for Agriculture began. Mr. Szabo recognized at a very young age the inefficiencies within his own family farm. At the age of 19, he started a manure hauling company which led to the birth of his loading system which enabled his family business to haul manure 300% more efficiently than anyone in the industry. In 2008, Mr. Szabo ventured across the border to the USA for an opportunity to capitalize on a larger Agricultural Industry. Working on some of North America's largest farms such as Cargill, Premium Standard Farms, Smithfield Foods, Murphy Family Ventures and an egg farm in the midwest, utilizing his expertise in logistics made viable the converting of what many in the industry considered a waste and began marketing/selling/hauling/applying this as a viable product to local crop farmers selling over 1 million dollars worth. To date, each journey that he

has taken in his life continues to expand his Knowledge, Perspective and Understanding, each fundamental to the attainment of his mission.

LOGISTICS MANAGER, TED MCINTYRE is the founder and CEO of MTT. His vision and dedication to ingenuity has resulted in MTT completing more diverse custom turbine engine packaged solutions than any other company in the world. These projects involve in-house engineering, production, test and aftermarket services. One of Mr. McIntyre's greatest accomplishments was draining the City of New Orleans by utilizing his turbine technology and drained the City in 3 days after the electric pumps had failed.

OPERATIONS MANAGER, JOEL ANDERSON has over 40 years of experience working and consulting with multi-million-dollar corporations such as Disney, USDOT, Duke Energy, Florida Power and Light, Hensel-Phelps to name a few. Mr. Anderson has been recognized as a jack of all trades with his expertise ranging from Welding/Fabrication to Marine Propulsion Systems and specializes in Detroit Diesel and Caterpillar Generators.

NAVAL ARCHITECT, CHRIS GUNTER has over 40 years-experience practicing as a Naval Architect designing and building specialized watercraft for commercial, military, leisure among others. Mr. Gunter is a member of the Royal Institution of Naval Architects since 1990 due to his many multi- discipline naval accomplishments building vessels ranging from 20ft to 200ft in length.

ADVISOR, RON SKINNER is part of the Xylem Corporation which specializes in project pumping systems for liquid. One of the company's accomplishments was draining Houston, TX after a Hurricane devastated the city with extreme flooding.

ADVISOR, DR. DAN CANFIELD is a professor of Limnology and he specializes in applied research that directly relates to the management of aquatic ecosystems. Mr. Canfield is the founder of Florida LAKEWATCH, a statewide citizen volunteer water quality monitoring program now being emulated across the United States and Internationally.