

Shrimp Farm

Puerto Nuevo, Ecuador

Location: Puerto Nuevo, Ecuador

Farm Area: 20 acres

Installed: 2024

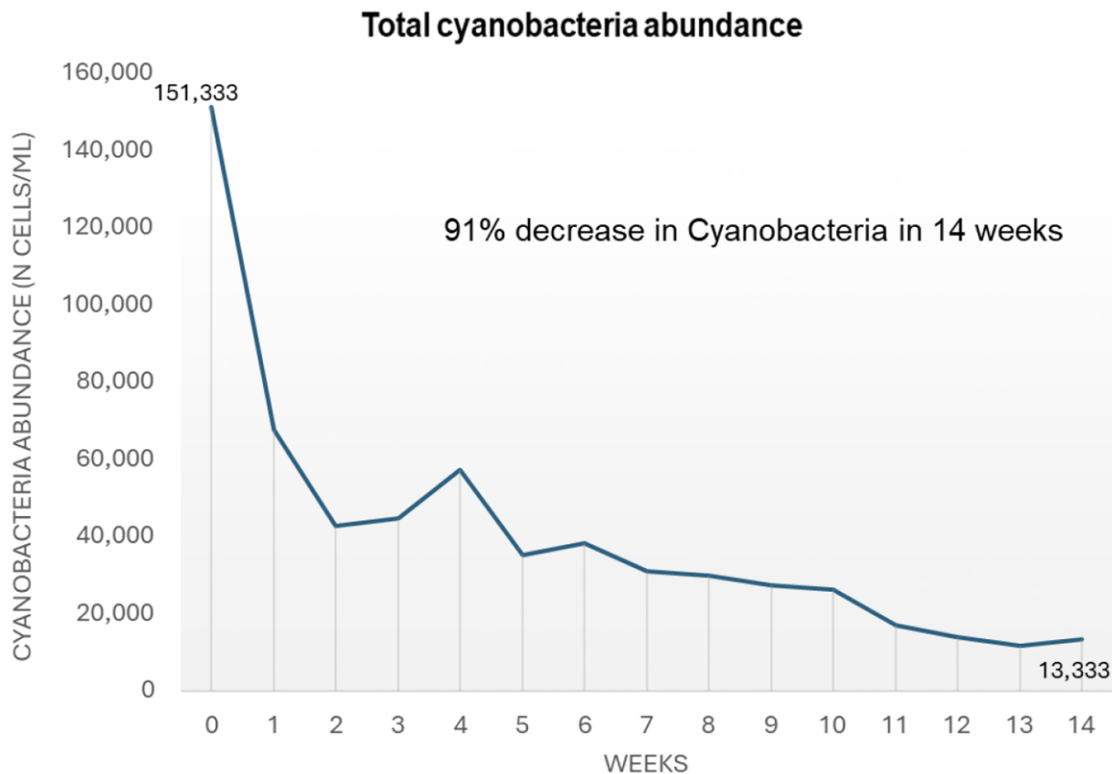


Overview

Ecuador is the world's leading shrimp producer, with over **233,000 hectares** devoted to aquaculture. One of its largest operators faced recurring algae blooms across its 5,400-hectare shrimp farms that reduced oxygen levels, slowed shrimp growth, and increased mortality risk. The company spent over **\$180,000 annually** on peroxide and sulfate treatments to control cyanobacteria. In collaboration with **SonicPure®** they installed **dual Pulsar 4400™ ultrasonic systems** to test ultrasound as a chemical-free, sustainable algae solution for shrimp production ponds

The Challenge

Cyanobacteria such as *Oscillatoria* and *Raphidiopsis* were responsible for low dissolved oxygen, toxic byproducts, and off-flavors in harvested shrimp. These harmful blooms required constant chemical dosing that risked shrimp health and increased operational costs. The client needed a **biologically safe, non-invasive solution** capable of reducing algae density without disrupting the ponds' microbial balance. The system would need to maintain oxygen above 5 mg/L, preserve shrimp health, and eliminate the toxic cyanobacteria that plagued production—while aligning with the company's environmental stewardship goals.



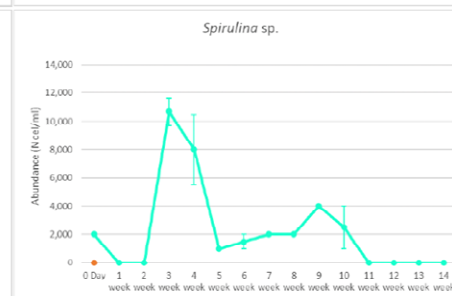
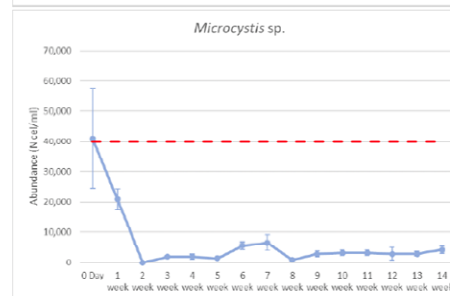
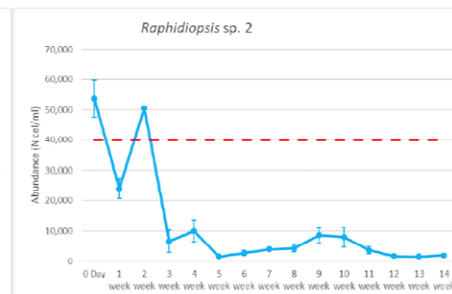
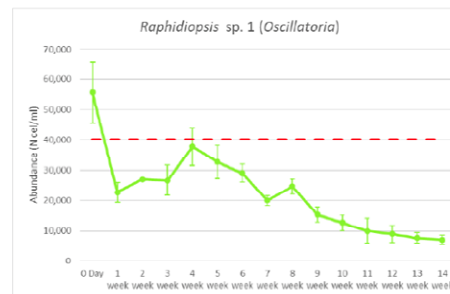
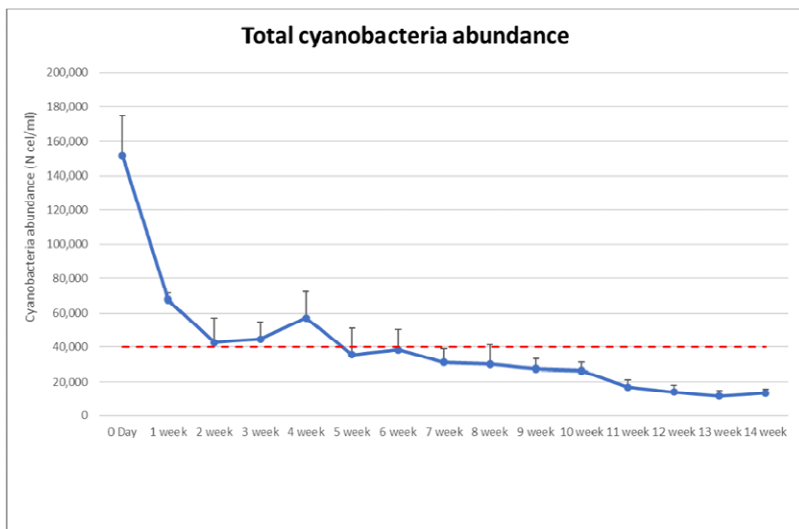
Results & Solution

Two **Pulsar 4400™ ultrasonic systems** were installed at **Pond #256**, a 1.5 m deep semi-intensive shrimp pond seeded with 80,000 shrimp (20/m²). Over **14 weeks**, phytoplankton samples were collected weekly to monitor algae populations. Initial water composition was 82% cyanobacteria and 18% diatoms.

By the **third week**, ultrasound reduced cyanobacteria below the threshold set by the client. By week 14, total cyanobacteria had dropped by **91%**, effectively controlling harmful species such as *Raphidiopsis* and *Oscillatoria*. Dissolved oxygen remained stable at an average of **3.6 mg/L (a.m.)** and **13.6 mg/L (p.m.)**, ensuring a healthy aquatic environment throughout the trial. Shrimp performance remained excellent — **82% survival**, average weight of **2.24 g**, and no

observed tissue abnormalities. Histological analysis confirmed **no cellular damage** to key organs including gonads, hepatopancreas, stomach, or gills. Water quality stayed within optimal ranges for shrimp growth.

Ultrasound replaced costly peroxide and sulfate treatments, saving the company over **\$180,000 annually** while improving biological balance. The stable DO levels eliminated the need for emergency water circulation and reduced paddlewheel aerator usage, further cutting energy costs.



----- Limit of maximum number of cyanobacteria established by the Cargill Health Department

Summary

The **Pulsar 4400™ trial** proved ultrasound's value as a sustainable, non-chemical solution for algae control in aquaculture. Cyanobacteria were reduced by **over 90%**, water clarity improved, and shrimp health and yield were maintained with no side effects.

The technology's continuous, frequency-modulated ultrasound selectively disrupted harmful algae cell structures while preserving beneficial microorganisms. The client achieved **major cost savings**, improved shrimp growth consistency, and aligned operations with international sustainability standards demanded by global seafood markets.

Dr. Viviana Almanza's independent research concluded:

"Ultrasound exposure eliminated 91% of cyanobacteria without affecting shrimp survival, growth, or tissue morphology."

This case confirms that **SonicPure's Pulsar 4400™** provides an environmentally responsible and economically superior approach for large-scale aquaculture—offering producers a path to cleaner water, healthier shrimp, and lower long-term operational costs.

Previously peroxide and sulfate were applied to control algae; peroxide cost \$150,000 dollars a year and sulfate cost \$31,000 a year.