AECOM

From Pollution to Power: Restoring Florida's Waterways with Algae Harvesting and HTL

Supported by the FDEP Innovative Technologies Grant Program

Florida Department of Environmental Protection

City of Lakeland www.lakelandgov.net

bonnet springs PARK

Genifuel

Lakeland is leading the effort on clean water and energy - harvesting harmful algae blooms to produce sustainable, carbon-neutral fuel

Breaking the Cycle of Algae Growth with Nutrient Removal

Harmful algal blooms degrade water quality, threaten aquatic life, disrupt recreation, and pose risks to human health. These blooms are a direct consequence of nutrient pollution. Unlike methods that only treat the symptoms, AECOM's Hydronucleation Flotation Technology (HFT) with its Intelligent Process Automation System (IPAS) targets the root cause of algae blooms—by physically removing excess nutrients from waterbodies.

The patented HFT process uses microbubbles to gently separate and extract nutrient-rich algae and suspended solids from the water — returning clear, low-nutrient and oxygen-rich water back to the waterbody providing significant water quality improvements with a reduced risk of HABs.

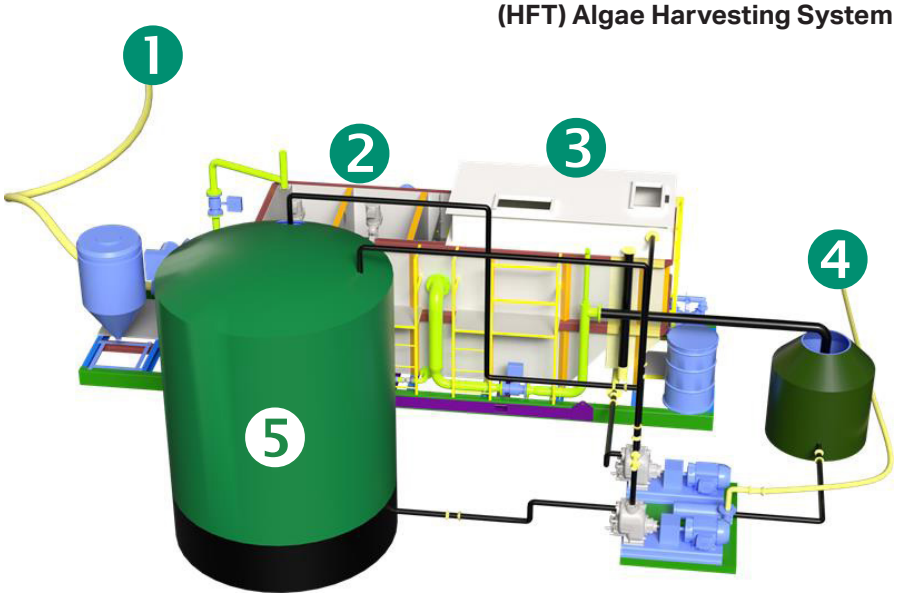
The harvested algae can be repurposed as a renewable source of nutrients and carbon for fertilizers, fuels, and other eco-friendly products—supporting a sustainable approach to water quality management.

- **Prevents Harmful Algal Blooms:** Physically removes nutrients that cause harmful algal blooms.
- **Improves Water Quality:** Produces clear, oxygen-rich water that supports aquatic health
- **Creates Renewable Value:** Harvested algae can be transformed into sustainable fuels, fertilizers, and other green products.

How It Works

1. Pond water containing nutrient-rich algae is pumped to the system
2. The pond water is treated to clump the algae
3. Clumped algae are floated to the surface with microbubbles and skimmed to a holding tank
4. Clarified, low nutrient and oxygenated water is returned to the pond
5. Recovered algae with nutrients and carbon are collected for use to create sustainable green products

Hydronucleation Flotation Technology (HFT) Algae Harvesting System



Innovative Technology that Transforms Algae into Clean Sustainable Energy

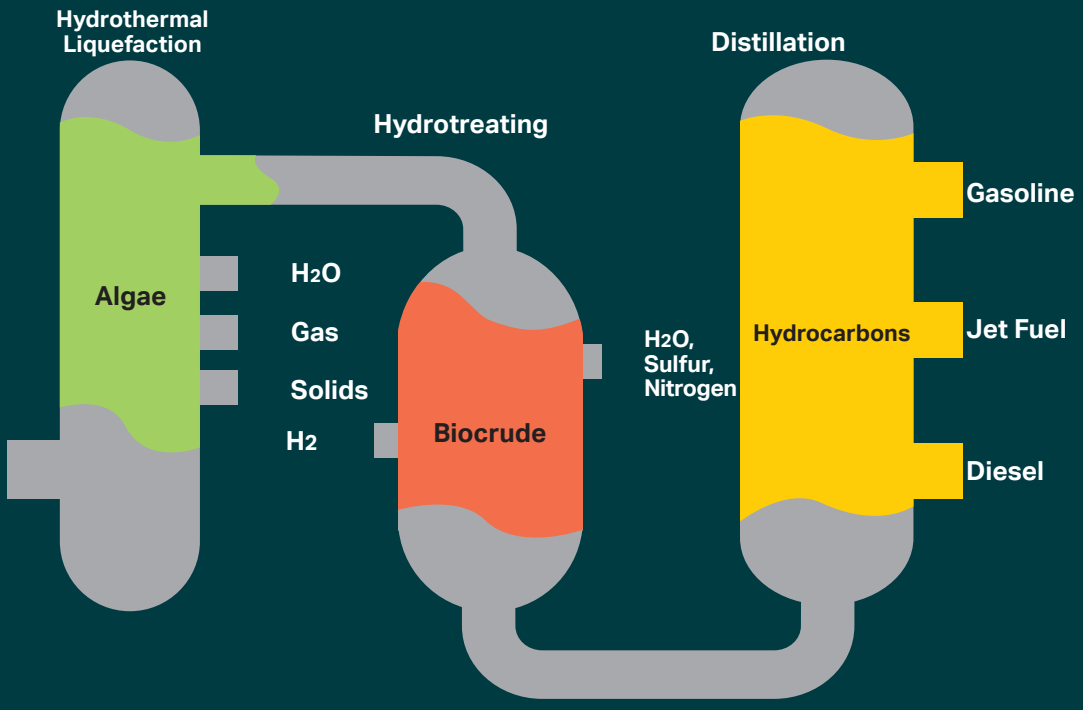
AECOM has expanded its research and development of innovative technologies and now through a strategic partnership with Genifuel created a sustainable closed loop system that transforms algae and other wet waste (biosolids, food, manure, etc.) into sustainable biofuel and biogas.

- Estimated fuel production from a typical 10 MGD algae harvesting plant has the potential to produce 12,000 barrels of biocrude per year (500,000 gallons per year).
- HTL offers a promising pathway for PFAS destruction—studies show it can degrade over 99% of certain PFAS compounds (like PFOA), with further reductions achievable through downstream refining or combustion, making it a valuable tool in addressing the nation's PFAS contamination crisis.

How It Works

HTL mimics the natural formation of fossil fuels—on fast-forward—by applying high heat and pressure to wet organic waste like biosolids or algae, HTL rapidly converts it into renewable biocrude oil, offering a sustainable, low-emissions alternative to traditional waste disposal and energy production.

The sustainable biofuel and biogas that is generated is nearly identical to natural fossil equivalents, except they release no new net carbon dioxide.



Demonstrating Innovation

This project is funded by the FDEP Innovative Technologies Grant awarded to the City of Lakeland, with additional support provided by Bonnet Springs Park.

Clean Water

Clear, oxygenated, low-nutrient water produced by algae harvest

Clean Energy

Biocrude made from algae

MORE INFORMATION

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Bringing innovative technologies to life to create a sustainable future