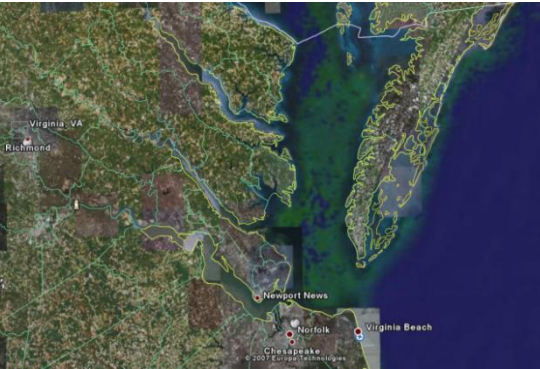


MicroAlgal Biodiesel for Virginia



Virginia and Algal Biodiesel: The Perfect Match

Virginia's vast coastline, natural waterways, warm temperatures and abundant sunshine are ideal for growing algae. VA also has the transportation and industrial infrastructure to service these facilities and a large population to make use of local fuel. In 5-10 years, algal biodiesel production could create 1,000 skilled jobs in VA and provide opportunities for local manufacturing and service industries.

Chesapeake Bay. The green color throughout the bay is microalgae as seen from space.

5% of US Agricultural Land Would Supply All Our Transportation Fuel!

Algal biodiesel yields per acre are much higher than for other biofuels. Therefore algal biodiesel does not compete with food crops for limited land.



Algae Clean Wastewater, Improving the Environment

Wastewater treatment plants spend vast sums of money to remove nutrients. VCERC has shown that algae can remove nutrients from wastewater, reducing pollution in the Bay and supplying a renewable fuel for VA. Preliminary VCERC cost estimates suggest Algal Nutrient Remediation would cost 1/3 the price of current wastewater remediation technologies.

Algae Trap CO₂, Reducing Global Warming

Climate warming, caused mainly by CO₂ from fossil fuels, is a major social concern. Algae can provide carbon neutral fuels and also trap CO₂ released by burning fossil fuels. VCERC is assessing the efficiency of CO₂ uptake in our algal facilities.





VCERC Biodiesel Research and Development



One Acre Algal Growth Facility

VCERC has a working algal “raceway” estimated to be capable of producing 3,000 gallons of biodiesel per year. The raceway is providing the data necessary for a full economic feasibility study of algae-to-biodiesel production within Virginia. These data are necessary to promote the building of the first commercial algae-to-biodiesel production facility in the world, right here in Virginia.



Choosing the “Best” Algae

Algal species have been selected for various qualities. Virginian *Scenedesmus/Desmodesmus* species have been chosen for fuel production, rapid and stable growth in raceways and for algal nutrient remediation. *Botryococcus braunii* and *Chlorella* show promise for fuel production in bioreactors.



Milking Algae?

A single algae cell leaking oil. Research is underway to harvest this oil directly from the water via a VCERC “algal milking technology”.



Harvesting

Various existing technologies are being assessed and novel techniques developed to harvest algae at the 1-acre facility, including DoE funded work with ACENT Laboratories LLC. Economic and energy efficient harvesting is a key step in the production of competitively priced algal biofuel for Virginia.

One-Step Fuel, As Easy as ABC

VCERC have patented a one-step algae-to-fuel conversion technology that we predict will give Virginia an edge in the production of algal fuels. Other work is developing oil extraction and oil-to-fuel conversion technologies that would replace or complement conventional two-step processes.

