



"Green Ship Initiative" In the Great Lakes

NOAA Operates Three, 100 Percent Biobased Ships



photo credit: National Oceanic and Atmospheric Administration

As is often the case with people who start using biobased products, biodiesel gave Marine Superintendent Dennis Donahue his first experience with the products at the Great Lakes Environmental Research Laboratory (GLERL) in Muskegon, Michigan. Donahue's uses have come a long way since that first trial in 1999. For the last two years, three of GLERL'S diesel ships run completely on biobased (rather than petroleum-based) products. Those made from soybean oil are ISO 32 & 68 hydraulic oil, 90W gear lube, lithium grease, general purpose cleaners, soy 2-cycle oil, diesel crank case oil and biodiesel.

Being part of the National Oceanic and Atmospheric Administration's (NOAA) research division, Donahue says that it's not only the responsibility of his organization and his facility, but also his personal duty to do his utmost to protect the environment. And, it's a big environment. The GLERL vessels ply all of the five Great Lakes, the world's largest fresh water resource. He calls his overall effort the "Green Ship Initiative."

As part of that effort, Donahue uses, experiments with and demonstrates the environmental benefits of these new products. He is especially interested in finding biobased products for uses where there is the greatest risk for water contamination. Therefore, he gives preference to products with the highest biobased content for shaft seal oils and deck hydraulics where there is a risk of overboard discharge. These products, says Donahue, have been tested under the rigors of the marine environment in both warm and cold climates and have been found to be equivalent to petroleum-based products' performance.

What about costs? "We don't look at just the price of the product but calculate the life-cycle costs including such factors as equipment longevity and operational efficiency and found that use of biobased products pays off in the long run. And we've found some creative solutions, too," says Donahue.

For example, GLERL addressed the high cost of refueling small boats at remote sites by using 275-gallon "tote" containers as temporary storage and shuttle to dockside. This provides the economy of tanker truck shipments with fueling flexibility not available through commercial marinas, and the cost of the totes was recouped within two years based on the delivery cost savings.



Marine Superintendent Dennis Donahue of Great Lakes Environmental Research Laboratory has tested biobased products under the rigors of the marine environment in both warm and cold climates. He reports their performance is equivalent to petroleum-based products.

One concern raised about biobased oils is shelf stability. Through the use of inventory controls, GLERL keeps minimal amounts of material on hand to avoid the problem. "We have not encountered any operational problems with material age or stability," he reports.

To demonstrate the use of biobased products and the Green Ship Initiative, GLERL has participated in a number of public events, including the Michigan Energy Fair. The presence of their ships at these events is always a significant public attraction and highlights the federal government's efforts in advancing green products. Donahue has worked with the National Park Service's Chris Case from Pictured Rocks National Lakeshore (Lake Superior), at various events and outreach opportunities. (For more on Case's activities see www.soybiobased.org for the profile on Pictured Rocks.)

PRODUCTS USED AT GLERL INCLUDE:

- BPL – Bio-Penetrating Lubricant
- Bio-TC-W 2-Cycle Engine oil
- Bio-Syn ATF
- Bio-Ultimax 1000 ISO 68 Hydraulic oil
- Bio-Synthetic SAE 15W40 HD
- Bio-Air Compressor Fluid AC30
- Bio-180 High Temperature MultiPurpose Lithium Grease NLIG #2

These products are made by Renewable Lubricants
www.renewablelube.com.

GLERL also uses Hydro Safe ISO VG 68, which is made by Hydro Safe of Dewitt, Michigan.



photo credit: National Oceanic and Atmospheric Administration

For the last two years, three of Great Lakes Environmental Research Laboratory's diesel ships run completely on biobased (rather than petroleum-based) products. Their efforts have garnered honors from the U.S. Department of Energy Federal Energy Management Program.

ABOUT NOAA GREAT LAKES ENVIRONMENTAL RESEARCH LAB

The NOAA Great Lakes Environmental Research Laboratory is one of seven Federal research laboratories within the Oceanic and Atmospheric Research line office of NOAA. GLERL was formed in 1974 to provide a focus for NOAA's environmental and ecosystem research in the Great Lakes. Presently, GLERL's research resides under NOAA's Ecosystem Goal Team specifically in the Ecosystem Research Program. During its history, GLERL has made many important scientific contributions to the understanding and management of the Great Lakes and other coastal ecosystems. GLERL scientists thus play a critical role in academic, state, federal, and international partnerships, and GLERL research provides information and services to support decisions that affect the environment, recreation, public health and safety, and the economy of the Great Lakes and coastal marine environments.

GLERL'S MAIN SCIENCE ISSUE AREAS

- Physical Environment
- Water Quantity
- Water Quality
- Human Health
- Fish Recruitment and Productivity
- Invasive Species

FACT FILE

For more information on the use of biobased products at Great Lakes Environmental Research Laboratory, contact Dennis Donahue at dennis.donahue@noaa.gov or at 231-755-5173.

America's farms are just beginning to tap their potential as a source for natural, renewable biobased products that offer benefits to worker health, the environment, America's economy and energy security. To learn more about the many biobased products made from soybeans, such as those used at NOAA facilities, go to www.soybiobased.org.

Because of the potential for biobased products to create new markets for soybeans, U.S. soybean farmers have invested millions of dollars to research, test and promote biobased products. Much of this work was done through the United Soybean Board (USB), which is composed of 64 U.S. soybean farmers appointed by the U.S. Secretary of Agriculture to invest soybean checkoff funds. As stipulated in the Soybean Promotion, Research and Consumer Information Act, USDA's Agricultural Marketing Service has oversight responsibilities for the soybean checkoff.

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