

PROJECT facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Sequestration

03/2005



INSTRUMENTATION SYSTEMS FOR MONITORING AND VERIFYING CARBON SEQUESTRATION IN TERRESTRIAL SYSTEMS

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Background

There is a need to develop an accurate, low-cost, airborne, remote-sensing technology that will directly determine terrestrial biomass and the carbon stored in aboveground vegetation. Zimmerman Associates will test a new technology, which uses a down-looking, very high frequency (VHF) synthetic aperture radar (SAR) that will provide a faster, more accurate, and less expensive method to conduct biomass and carbon surveys.

The proposed airborne VHF SAR system will be flown at 3,000 meters with a downward looking antenna. Radar pulses returned from the area at 150,000 pulses per second will be used to estimate biomass and carbon contained within the footprint of the radar. Phase I will investigate the use of a single VHF frequency between 30 and 80 MHz. The selected frequency will be used for field experiments to determine power and sensitivity levels required for radar operations. A preliminary design for an operational prototype will also be developed.

Primary Project Goal

The primary goal of the project is to develop an airborne remote sensing system that will have the ability to conduct carbon surveys at a rate of 300 square miles per day at a cost of \$0.25 per acre with an accuracy of $\pm 10\%$.



CUSTOMER SERVICE

1-800-553-7681

WEBSITE

www.netl.doe.gov

PARTNERS

Zimmerman Associates, Inc.

COST

Total Project Value

\$99,836

DOE/Non-DOE Share

\$99,836/\$0

Objectives

The objective of the project is to develop an airborne VHF (30-80 MHz) SAR system that, when flown at 3,000 meters with a downward looking antenna, can conduct biomass and carbon surveys within the radar's footprint.

Benefits

The project will provide a fast, accurate, low-cost method to conduct surveys of biomass and carbon stored in aboveground terrestrial ecosystems. This technology could significantly improve our ability to verify terrestrial carbon sequestration and improve our ability to use this natural sink as a method for reducing CO₂ emissions.