

Groundbreaking findings on global biodiversity, alternative energy

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Innovative University of Maryland research went to print last week in two leading scientific publications. Faculty members and a Ph.D. student from the Department of Geographical Sciences (Behavioral and Social Sciences) highlighted their significant findings on the use of marginal lands for alternative fuel production and global biodiversity research.

An ideal fuel source for alternative energy

Adjunct Professor César Izaurrealde and Ph.D. candidate Ritvik Sahajpal have published a groundbreaking study, titled "Sustainable bioenergy production from marginal lands in the US Midwest," in the current issue of *Nature*, that outlines how

marginal lands - those deemed unsuitable for [food crops](#) - can be used to generate alternative energy fuels by the growth of grasses and non-woody plants ("biomass") that thrive naturally.

While finding efficient uses for marginal lands is not new, this is the first study of its kind to offer an estimate for the [greenhouse gas](#) benefits as well as a concrete assessment on the full-scale potential for marginal lands to produce significant amounts of biomass.

This is also the first study to show that grasses and other non-[woody plants](#) that grow naturally on unmanaged lands are sufficiently productive to make [ethanol production](#) worthwhile. Researchers are hopeful that alternative [fuel production](#) could also be increased by the deliberate selection of the mix of plant species grown on marginal lands.

"With conservation in mind, these marginal lands can be made productive for bioenergy production and, in so doing, contribute to avoid the conflict between food and fuel production," says Izaurrealde, a soil scientist with the Pacific Northwest National Laboratory (PNNL).

Dr. Izaurrealde also is a laboratory fellow at the Joint Global Change Research Institute, a collaboration of the PNNL and UMD. Research for the marginal lands project was primarily funded by the Department of Energy's Great Lakes [Bioenergy Research](#) Center, the National Science Foundation (NSF) and Michigan State University, along with the support of UMD and the PNNL. The researchers focused on 10 Midwestern states, drawing from 20 years of data from MSU's Long-term Ecological Research Site (LTER). A primary goal was to compare and characterize the productivity and greenhouse gas impacts of different crops, such as corn, alfalfa and old-field vegetation.

Beyond generating alternative energy fuels, the benefits for using marginal lands include new revenue for farmers and other landowners. There would also be no inherent carbon debt from land conversion if existing vegetation is used, or if new crops are planted alongside existing vegetation.

The study - published in the January 16 issue of *Nature*, is called "Sustainable bioenergy production from marginal lands in the US Midwest" and can be read [here](#).

Promoting global biodiversity research

Professor George Hurtt and his co-authors published "Essential [Biodiversity](#) Variables" in the newest issue of Science magazine.

The article finds that while reducing the rate of biodiversity loss and averting dangerous biodiversity change are clearly international goals, the lack of a global observation and information/data delivery system on biodiversity change has proven to be an obstacle to progress.

"Reducing [global biodiversity](#) loss, and the loss of habitat on which it depends, is a goal with broad support around the world," says Professor Hurtt. "Coordinated international monitoring of a common set of essential biodiversity variables should greatly improve the scientific information basis on which the best management decisions can be made."

The study - published in the January 18 issue of *Science*, is called "Essential Biodiversity Variables" and can be read [here](#).

Provided by University of Maryland

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