Identifying Biomass Sources for Local Ethanol Production in Iowa

Topic: Agriculture, natural resources

Problem Statement: How can communities document local souces of biomass that can be used for energy production?

Level: Intermediate
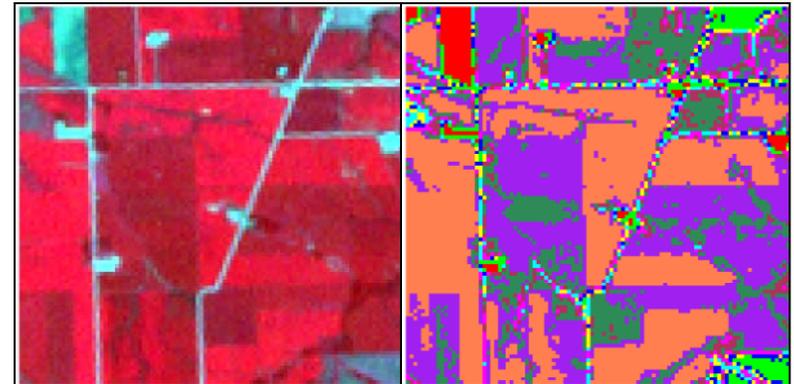
Software: ArcGIS, ENVI, PowerPoint

Description: The distribution of energy is inefficient when transportation of both raw materials and the retail product requires energy. It is more efficient to produce energy locally using readily available raw materials. Cellulosic ethanol production has the potential to provide energy from local biomass sources. It is a renewable energy source and in many cases it utilizes waste materials. Examples of cellulosic biomass include residue from the lumber industry, algae, corn stover residue, and switchgrass. Most regions of the U.S. have some type of cellulosic biomass that is available for energy production.

The goal of this Learning Unit is to develop a classified map that can be used to identify a local source of biomass for energy production. Students are guided through standard procedures for image processing, creation of a vegetative index, and classification to identify areas which have or would be suitable for recovery of biomass materials.

Key words: Biomass, ethanol, image processing, image enhancement, vegetation indices, unsupervised classification, GPS field validation, GIS integration

Natural Color

Infrared   Classification

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