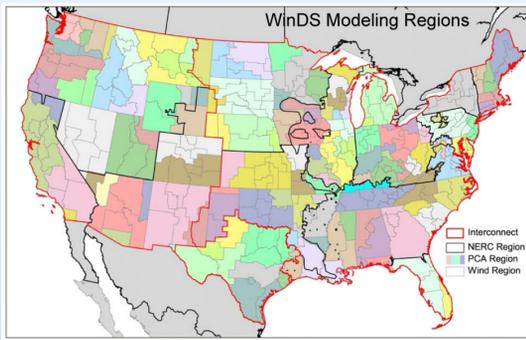


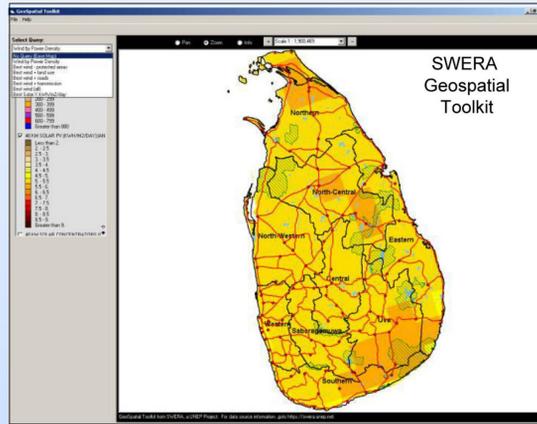
GIS Analysis Capabilities

Ray George, Pam Gray-Hann, Donna Heimiller, Anelia Milbrandt, and Liz Brady Sabeff

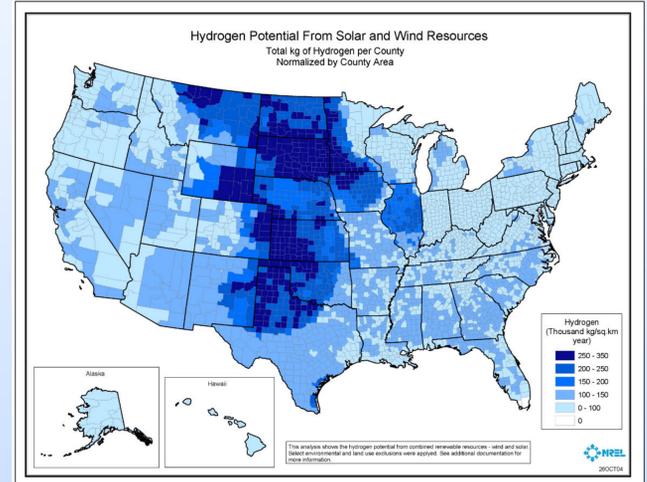
Analysis Support and Applications



GIS prepares data inputs to the WinDS model. 358 regions based on county boundaries were created. Wind resource, transmission capacity, generation capacity, planned retirements, and electricity demand are the inputs summarized by region. Additionally, a GIS optimization determines how much and at what relative cost wind can be used by existing transmission lines. Those results are summarized by region, wind class and cost for use in the model.

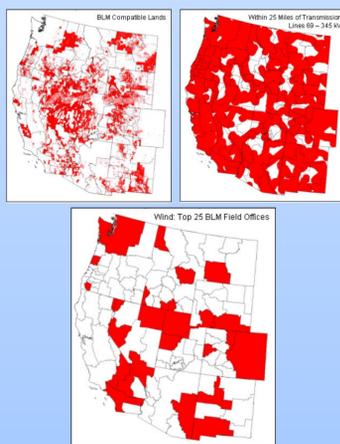
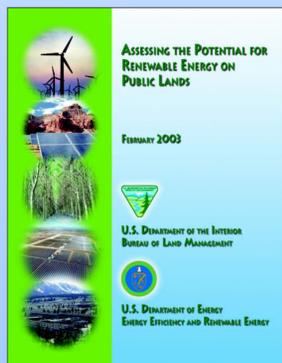


Stand-alone and easy to use geographic toolkit that allow non-GIS users to relate the resource (solar and wind) data to other geographic data (land use, protected areas, elevation, etc.).

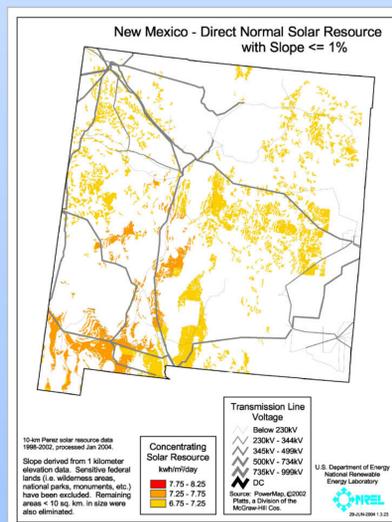


A GIS analysis was conducted for this study to estimate the hydrogen potential from solar and wind on those land areas not excluded due to land use or environmental considerations.

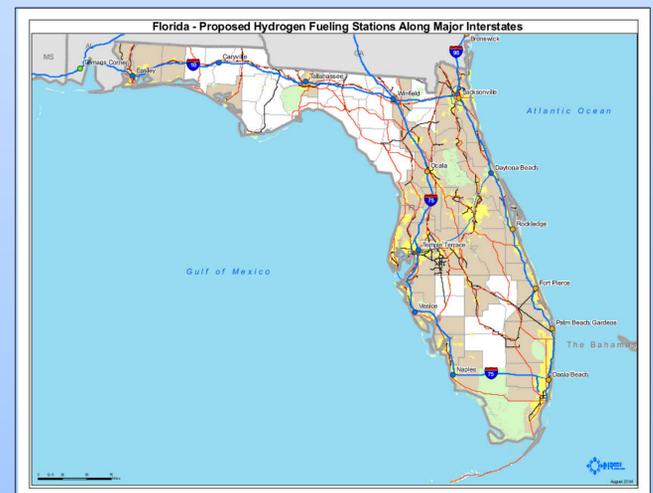
Siting



NREL assisted the Bureau of Land Management in identifying areas with development potential for wind, solar, geothermal and biomass. Input from technology and industry representatives was used to develop screening criteria for each technology and develop a prioritized list of field offices that should address renewable energy in their resource management plans.

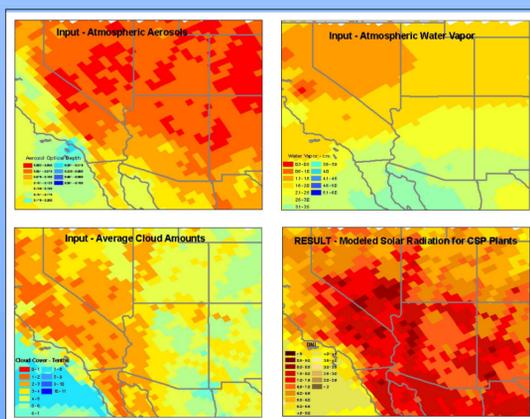


Direct normal solar resource is screened using GIS to identify areas with good development potential.

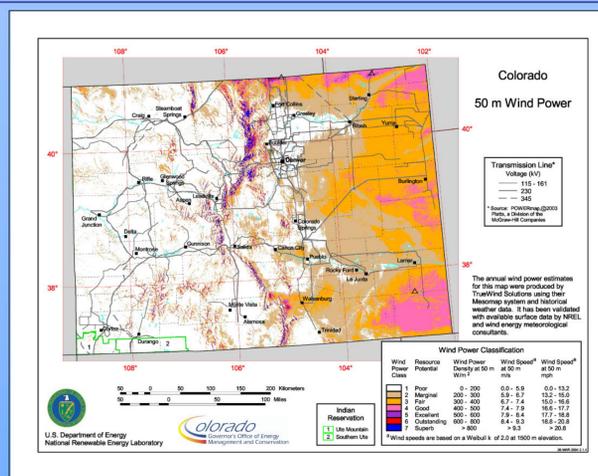


The objective of this study is to determine the location and number of hydrogen stations nationwide that would make hydrogen fueling available at regular intervals along the most commonly traveled interstate routes.

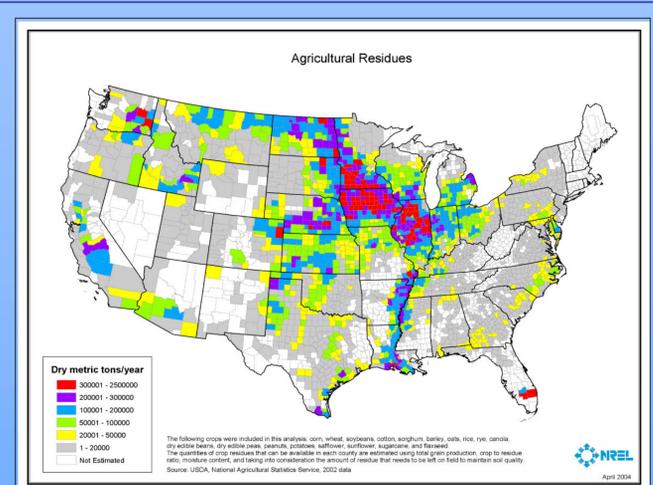
Resource Assessment



GIS software are used to create gridded spatial coverages of many different atmospheric input variables, using surface, balloon, and satellite data. The GIS can then export these coverages into a solar radiation model, and map the resulting solar parameters.



Sophisticated terrain processing is used in wind resource assessment models. Relative elevation reveals exposed features; directional terrain processing reveals features that block the wind. GIS is also used in validation, to compare point measurement data to the modeled wind resource.



Statistical based estimate of the following biomass feedstock categories: Agricultural residues (as shown), livestock manure, landfill gas, forest and mill residues, and energy crops.

Outreach

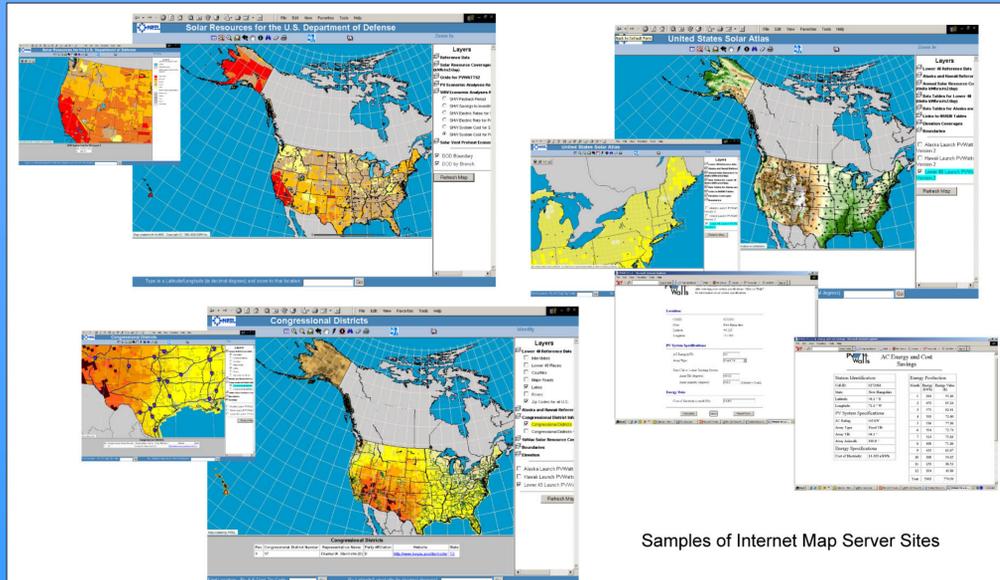


The GIS Team maintains a web site (http://www.nrel.gov/gis/index_of_maps.html) where a user can view a variety of interactive maps. Examples of available web sites include:

- Renewable Energy Atlas of the West
- Solar Maps which includes the United States Solar Atlas with access to the PVWatts V2 tool
- Wind Maps
- Solar Resources for the U.S. Department of Defense

We also maintain an FTP site (http://www.nrel.gov/gis/index_of_gis.html) where a user can download various data sets. Since 2001 when this site first became available, over 3,000 users have downloaded data. Examples of available data sets include:

- National Wind Resource High Resolution Wind Data
- National Solar Photovoltaics (PV)
- National Concentrating Solar Power (CSP)



Samples of Internet Map Server Sites