

# SITE SUITABILITY ANALYSIS FOR ALGAE BIOFUEL-PRODUCING FARMS IN FLORIDA

Cartographer: Patrick Knight, Department of Urban and Environmental Policy and Planning, May 2009  
 Projection: GCS North American 1983 HARN  
 Source Agencies: Florida Geographic Data Library, National Renewable Energy Laboratory, Project Vulcan



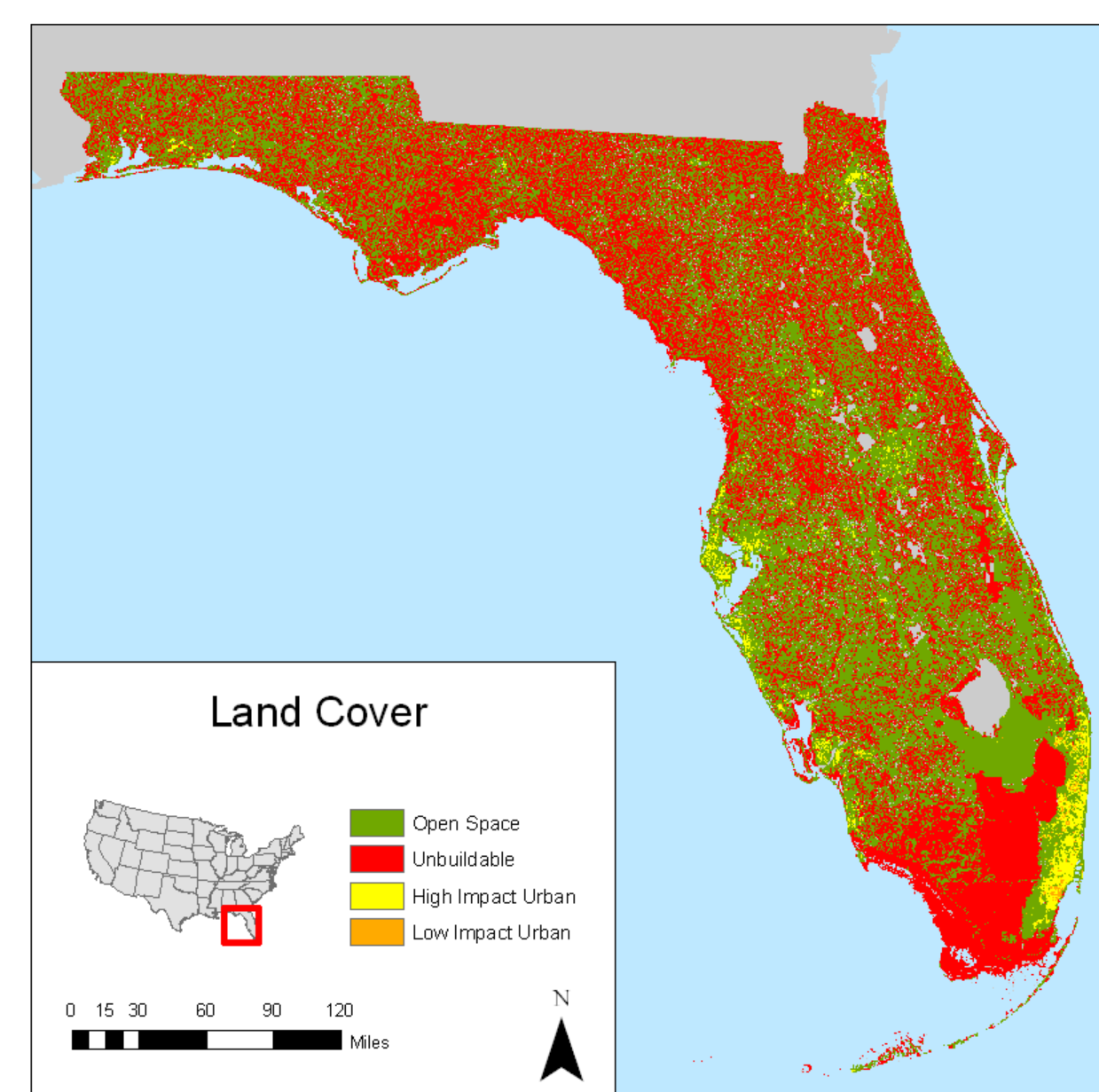
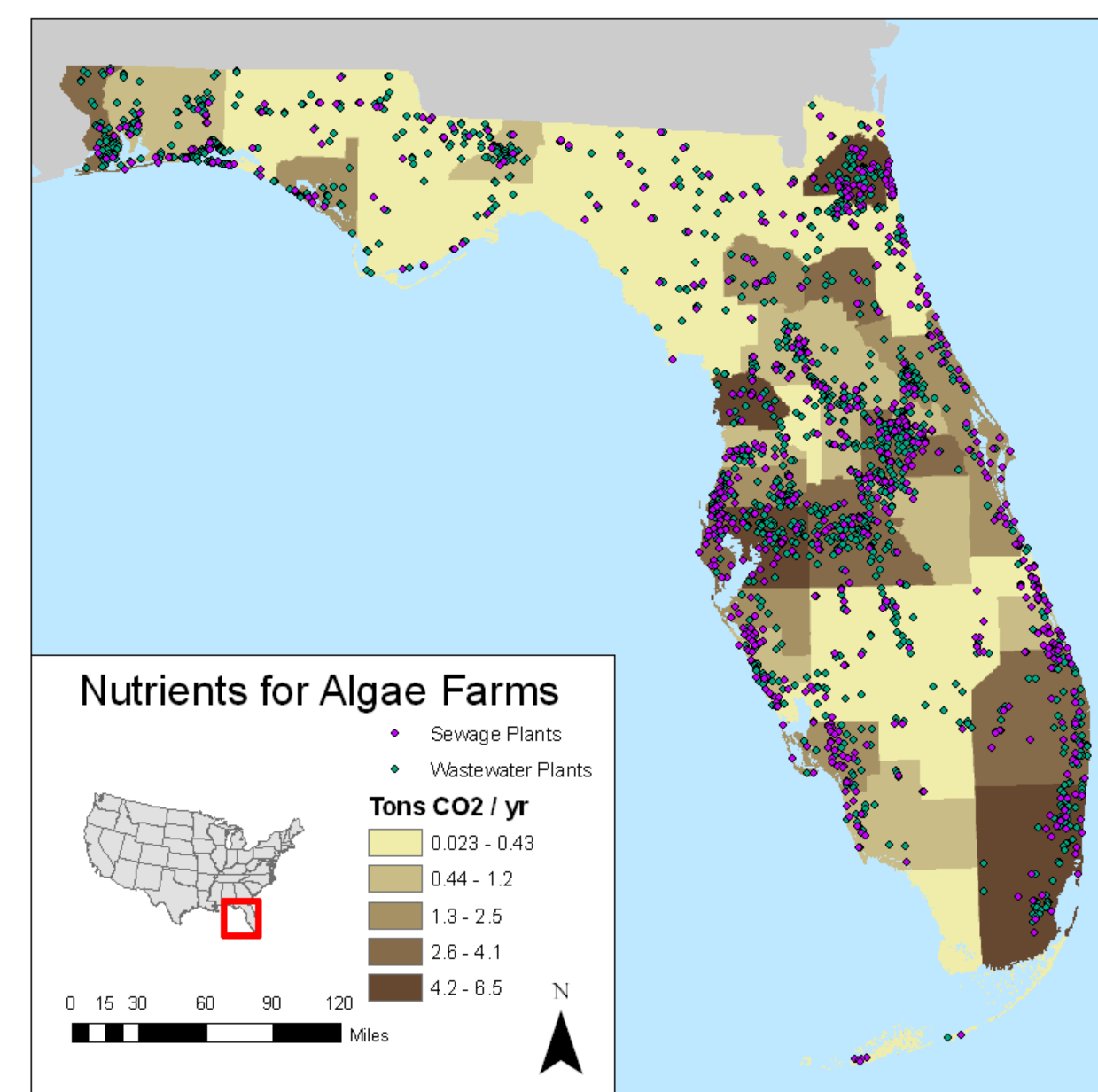
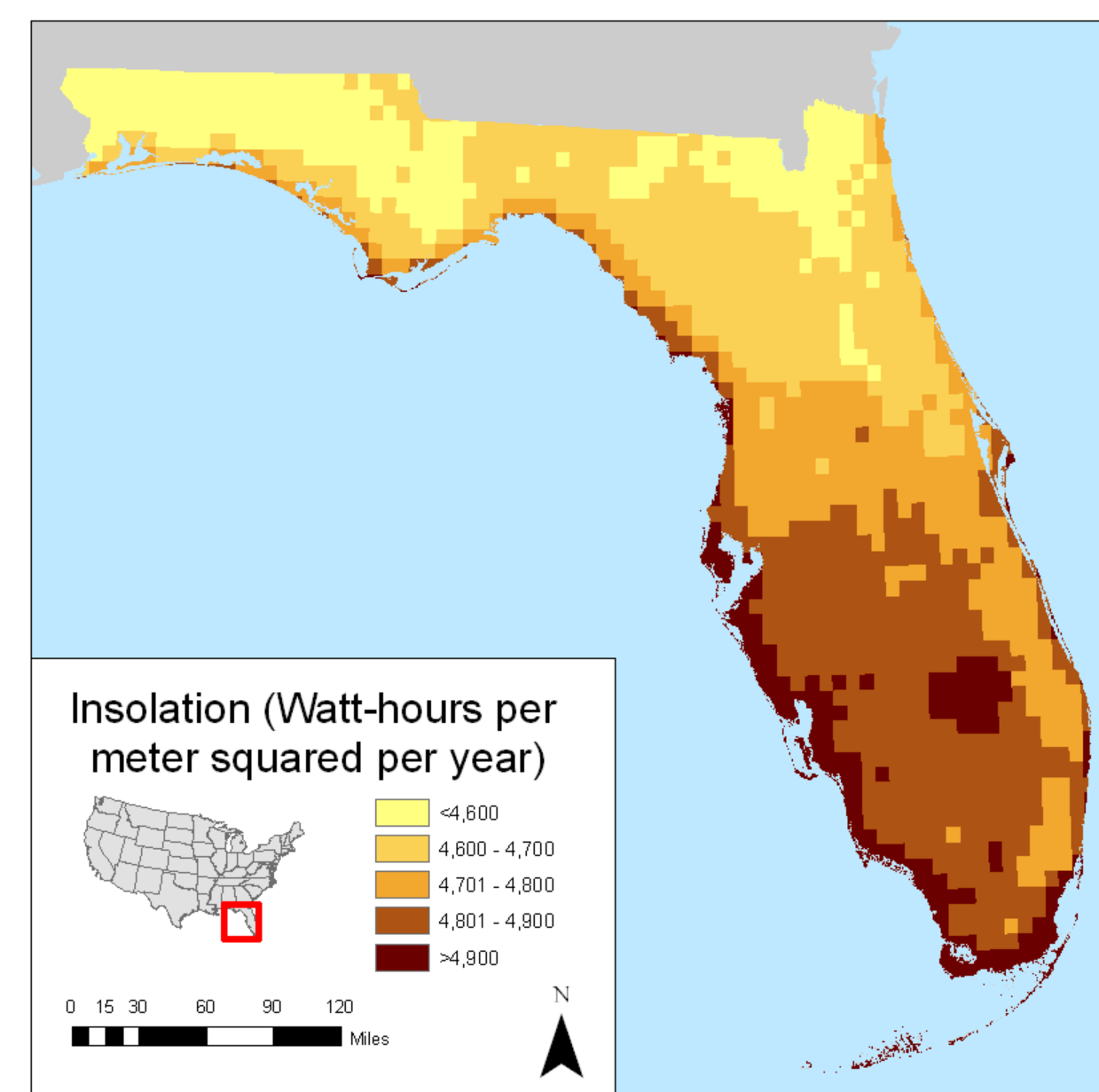
As petroleum supplies run out, replacement fuels must be found. Despite the growing popularity of biofuels from corn and other agricultural products, these crops are inferior to biofuel derived from algae in terms of cost, productivity, and sustainability. Recent advances in the technology use pre-existing infrastructure, such as wastewater and sewage treatment plants, and carbon dioxide emitters to provide nutrients for the growth of algae, encouraging the construction of algae farms nearby.

Additionally, it is important to recognize other factors when considering the best siting of algae farms. Algae farms require large areas of open space and should be sited near water. Furthermore, taking into account the proximity of nearby highways and electrical transmission lines when siting farms would decrease costs associated with transmitting energy.

With these constraints in mind, this project aims to serve as a demonstration of site suitability determination using raster data and ArcMap's Spatial Analyst tool.



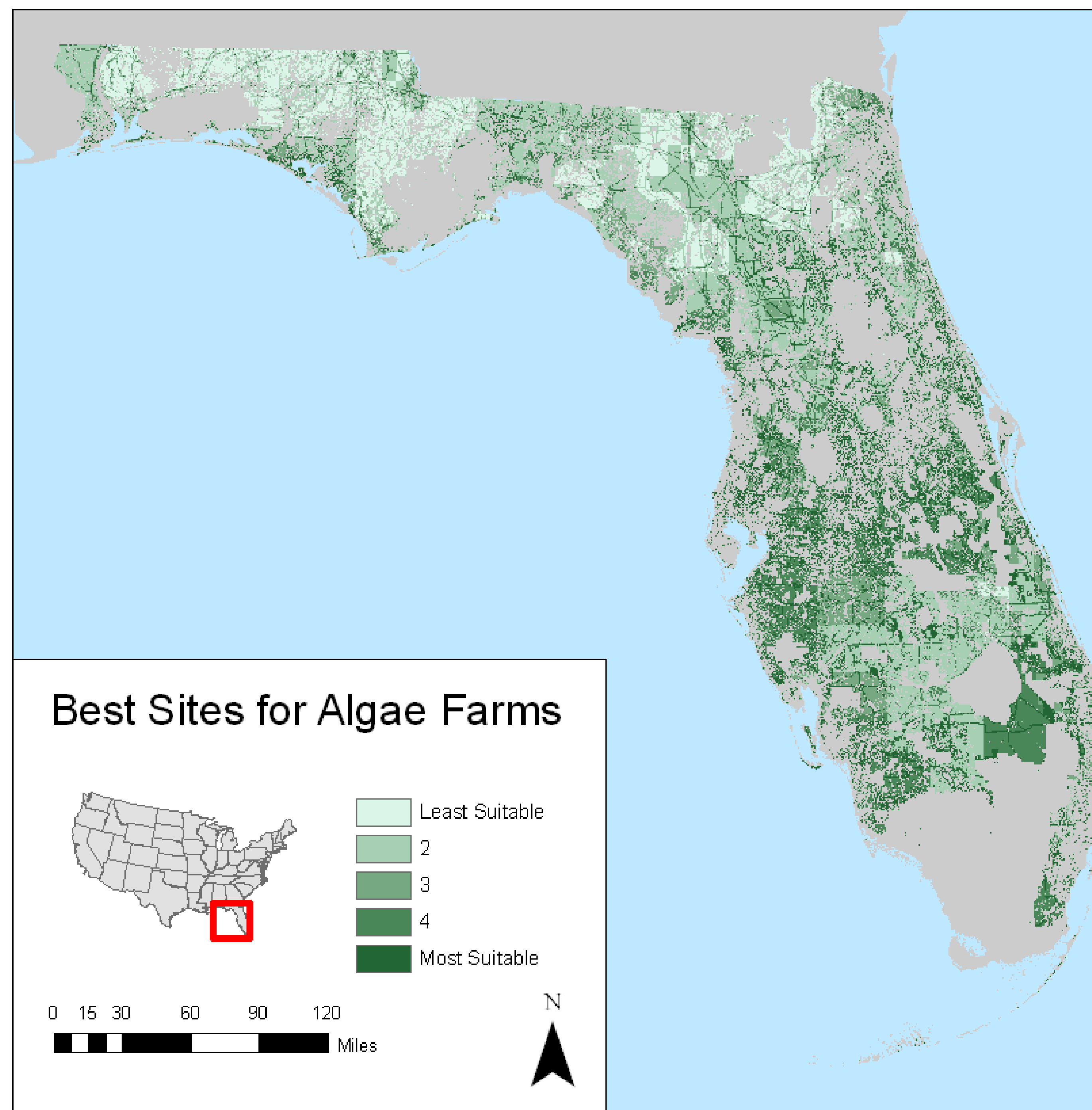
## INPUT MAPS



## METHODS

1. Gathered datasets for sewage treatment and wastewater plant locations, carbon dioxide emitters, major highways, electrical transmission lines, public lands, hydrography, land cover, and insolation.
2. Converted all polygon, arc, and point data to raster data.
3. Assigned desirability rankings based on proximity of an object or a land's ability to be built upon.
4. Used the Raster Calculator tool to determine best site suitability based on these rankings.

Rank	0	1	2	3	4	5
Sewage Treatment (m)	—	>401	301-400	201-300	101-200	<100
Wastewater Treatment (m)	—	>401	301-400	201-300	101-200	<100
Water (m)	—	>401	301-400	201-300	101-200	<100
Transmission Lines (m)	—	>401	301-400	201-300	101-200	<100
Highways (m)	—	>401	301-400	201-300	101-200	<100
CO <sub>2</sub> output (tons/yr)	—	<0.10	0.11 - 0.30	0.31 - 0.57	0.58 - 2.05	>2.05
Insolation	—	<4605	4606-4671	4672-4782	4783-4856	>4857
Public Land	On	—	—	—	—	—
Land cover	Unbuildable, High Impact Urban	—	Low Impact Urban	Open Space	—	—



## CONCLUSIONS

The results above provide a preliminary example of regions to best site algae farms in the state of Florida. The methodology supplied can also be employed in other site suitability studies.

## AREAS OF INTEREST

