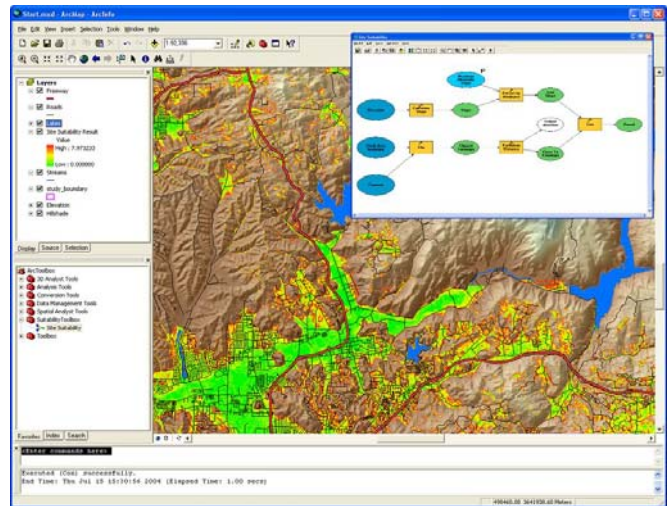


# GIS Landscape Suitability Modeling

Project 2 -- Team Project

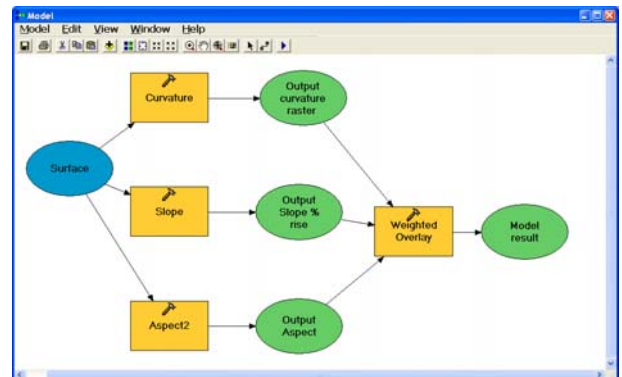
## Learning outcomes

1. Develop suitability models that increase your understanding of landscape features and patterns—their potential opportunities and limitations for use
2. Explore advanced GIS modeling procedures involving landscape data about points, networks, surfaces, grids, and images
3. Make use of analysis functions in Spatial Analyst and other extensions
4. Convert feature themes to appropriate grid themes (continuous or discrete)
5. Apply the Weighted Overlay and Raster Calculator functions to integrate derived data developed with Spatial Analyst
6. Evaluate appropriate uses and limitations of ModelBuilder
7. Make effective modeling decisions and contributions in a team project situation
8. Document analysis procedures and results using MS PowerPoint
9. Practice presentation skills by sharing your results with the entire class



## Expectations

1. We want your modeling work to be valuable to *our class*, by—
  - A. Including both descriptive (inventory) and predictive (suitability) modeling
  - B. Creating model scenarios that incorporate a variety of data concepts and analysis measures
  - C. Comparing alternative models using a variety of weights and rankings
  - D. Giving us some insight into your modeling interests
  - E. Explaining your modeling work to our class in a clear, concise way
2. We want your modeling work to be valuable to *you*, even if it—
  - A. Does not include all possible variables that could be included
  - B. Does not use the most recent data available
  - C. Does not include as much detail as you would like
3. We want you to use data management strategies that make your database efficient to use
4. We expect each team to have about an equal number of people
5. We expect you to
  - A. Contribute data to your team’s project database
  - B. Complete your fair share of modeling
6. We expect you to make appropriate use of ArcGIS 9, Spatial Analyst and ModelBuilder functions



## Project

Suppose you work for a public agency charged with locating and regulating priority areas for wind energy generation (wind farms). With your knowledge of landscape modeling and GIS data sources, you are asked to develop suitability and location models that help public officials (elected, appointed, and staff) make decisions about spatial implications and issues related to wind energy generation. Develop site suitability models and site location models that help answer the following spatial questions:

1. Where are suitable locations for wind farms?
2. What landscape changes or management practices should occur in these locations to minimize potential negative impacts of wind energy generation?

## Procedure

1. Read "Landscape Suitability Analysis" (pages 79-82 of Chapter 3 "Procedural Theory" in Michael D. Murphy, 2005, *Landscape Architecture Theory: An Evolving Body of Thought*, Waveland Press, Long Grove, Illinois) in PDF format linked to our class Web page
2. Read "Logic and Extent Elevate Suitability Models to New Levels" (by Joe Berry, in *GeoWorld*, October 2004, pages 20-21) in PDF format linked to our class Web page
3. Meet with your team members and make a list of potential spatial questions
4. Develop a list of wind energy location issues (current/recent news sources, Web)
5. Identify potential data sources for your database
6. Meet with me to refine your list of issues and data and to develop priorities
7. Select your study area
8. Complete the ESRI Virtual Campus course for Spatial Analyst (required)
9. Locate and acquire appropriate data; organize it in folders and databases
10. Import, convert, edit, or modify your data to meet your modeling needs
11. Develop alternative models by consulting sources: literature, interviews, Web
12. Define your modeling procedures for using Spatial Analyst and ModelBuilder
13. Apply your modeling procedures to data in your database
14. Document your modeling procedures and results using PowerPoint
15. Present your modeling procedures and results to the class using PowerPoint

## Requirements

1. Develop and compare at least three alternative suitability models (scenarios)
2. Complete the ESRI Virtual Campus course for Spatial Analyst (required)
3. Complete all required readings (listed above) and read additional relevant literature
4. Use the "Notes Page" feature of PowerPoint to document details about each slide
5. Give us a copy of your PowerPoint file
6. Design your presentation for a 8-10 minute period, followed by 5-6 minutes of questions and discussion
7. Include in your presentation a thoughtful critique of Spatial Analyst and ModelBuilder
8. Incorporate concepts for both raster and vector data
9. Contribute data to your team database that meets team specifications:
  - A. Cell size, coordinates and projection, clipped or masked to study area
  - B. Discrete grid theme with appropriate classes
  - C. Continuous grid themes (ex: distance, slope steepness)
  - D. Feature themes for orientation (ex: roads, streams, towns) and context (location)

## **Schedule**

- Week 1: Form teams; gather background info; list data needs, acquire and examine data
- Week 2: Convert to grid; Spatial Analyst and ModelBuilder functions, develop models
- Week 3: Evaluate results; revise models, prepare presentation  
Present to class on Friday, October 9

## **Grading criteria**

- 25% Application of site suitability concepts to modeling
- 20% Contribution to team effort
- 5% Completion of Spatial Analyst on-line course
- 10% Critique of ModelBuilder, Spatial Analyst, and other extensions
- 20% PowerPoint presentation (organization, illustrations, notes pages)
- 20% Oral presentation (organization, introduction, conclusions)