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 priority areas for attenuating floods and mitigate flood damages. With your knowledge of landscape modeling and GIS data sources, you are asked to develop site suitability models that help public officials (elected, appointed, and staff) make decisions about landscape changes and land management practices that attenuate floods and mitigate flood damages. Examples include the following:
A. Watershed management practices
B. Floodplain evacuation (buyouts? resettlement?)
C. Restoration of native vegetation (wetlands, woodlands, grasslands)
D. Land uses compatible with flooding
E. Retrofitting ecological approaches to stormwater management

Develop suitability models that help answer the following spatial questions:
1. Where should the landscape be changed to minimize future damages due to flooding?
2. What landscape changes or management practices should occur in these locations to minimize flood damages?

Procedure
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. Develop a list of flooding issues (current/recent news sources, Web)
4. Meet with your team members and make a list of potential spatial questions
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 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 8 / Monday, October 11

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)