EARTH SC/ENVIR SC/GEOG 2GI3

Exercise 6: Overview

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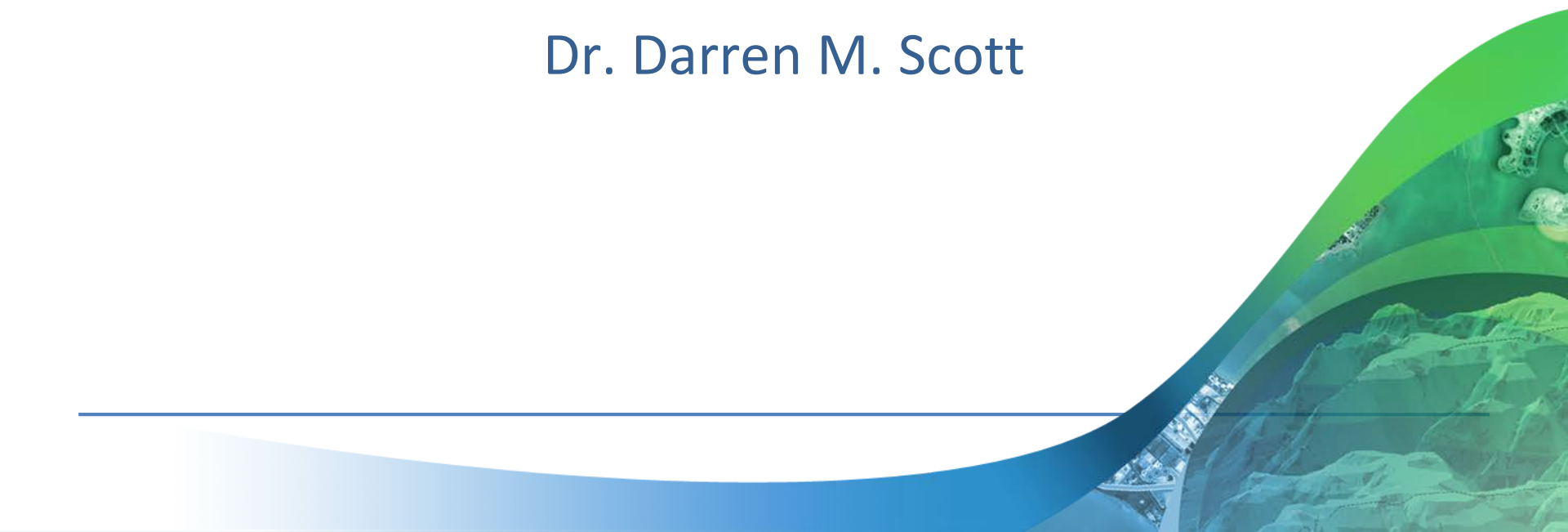

Learning Objectives

- Learn how to query datasets
- Apply some vector geoprocessing tools
- Apply some raster geoprocessing tools
- Construct binary models
- Create maps
- Understand that some analyses can be done in both vector and raster environments

Objectives

1. Identify potential Black Hills mountainsnail habitat
2. Calculate how much habitat would be lost if forested areas near roads were cut down

Habitat Criteria

- Snails thrive in areas with the following characteristics:
  - Limestone geology unit
  - Dense coniferous forest
  - Elevations between 1200 and 1600 m.a.s.l.

Data Pertaining to Criteria

- Shapefiles: Geology, Vegetation, Elevation
- Grid: DEM (digital elevation model)

Approach for Objective 1

- Develop vector and raster binary models to meet the first objective
  - Binary models use logical expressions to select areas from multiple layers that meet specified criteria
  - The layers are then overlaid
  - Output is in binary format: areas that meet **all** specified criteria and areas that do not.

Approach for Objective 2

- Buffer roads to a distance of 100 meters
- Intersect the buffer with potential snail habitat to identify snail habitat lost if cleared of trees
- Calculate area
  - Vector: use Calculate Geometry
  - Raster: must do so manually by multiplying cell count by resolution (cell size) squared
    - Remember: cell area = resolution × resolution

Deliverables

- Map of potential snail habitat that also includes layers pertaining to criteria (Part A, Q11)
- Map of potential snail habitat that also includes forested areas targeted for clearing and roads (Part B, Q16)
- Snail habitat lost if cleared of trees (Part A, Q11; Part B, Q15)
- Answers to all other questions

Reminders

- For each section of the exercise, **read all instructions first** before doing anything
- Always set your workspaces
- Keep track of the shapefiles and rasters you create (suggested names are provided)
- Grid names can be no longer than 13 characters
  - Do not use spaces nor non-alphanumeric characters to name grids
- Copy, move, and delete shapefiles and grids **only** through ArcCatalog or Catalog

Style and Format Guidelines (1)

- Answers must be typed using Microsoft Word or some other word-processing package; otherwise your grade = 0
- Style and format is worth 20% of your mark or 9 marks out of 45 for this exercise
- 1 mark is deducted for each unique mistake

Style and Format Guidelines (2)

- To avoid losing marks, ensure the following:
  - Title page contains the exercise number and name (Exercise 6: Vector and Raster Data Analysis), your name and lab section, submission date, and your TA's name
  - Staple your submission in the upper left-hand corner
  - Use 12 point font
  - Use 1.5 spacing between lines
  - Use 1 inch borders
  - Pages must be numbered in the bottom right-hand corner
  - Correct all spelling and grammatical mistakes
  - Do not use ink or pen on the submission