

Geol 588

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GIS for Geoscientists II

Lecture I

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Today

- Syllabus (also on WebCT)
- What are your background & interests?
- Using the GIS lab's Delphi server
- WebCT
- Making screenshots with Printscreen
- Loading data into ArcGIS

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Syllabus

- Full syllabus on WebCT
- Format: Lecture + Lab (exercises)
- Lecture may include "follow along" activities
- Thu.: 1 hr lecture, pause, 1 hr lab
- Tue. 2 hr lab time (I may start with a lecture)
- No text book (I may give you pdfs)
- Start with getting familiar with ArcGIS 10

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- Homework assignments / exercises (40% of total grade)
 - practice the material covered in the lecture
 - quality of the solution counts
 - quality of documentation (detail of description, number of screen shoots, etc.) also counts
- I will help you with the exercise during lab hours (Tue 3-4, Thurs 2-4)
- you may need more time: see GIS lab schedule at door
- Science I Computer lab (Rm. 255, 2. floor) should have ArcGIS 10 installed soon

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- Midterm (20% of total grade)
 - open book exam
 - Multiple Choice part (15 min.)
 - Practical part (90 min. - should only need 60 min.)
- Class (final) project (30% of grade)
 - main work for the last 2-3 weeks
 - poster (only electronic form needed!)
 - 10 min. oral presentation (10 powerpoint slides)
 - Material up to you (your research?), start early!
- Participation (10 % of total grade)

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Topics covered

- getting up to speed with ArcGIS 10
- raster data concepts (general)
- types of rasters: ESRI Info grid, images, DEMs, satellite images,
- int vs. float vs. categories
- images: color-indexed vs RGB vs greyscale (luminance), statistics, histograms,
- raster analysis setup (temp./perm. rasters, mask, environment, raster information)
- raster symbolization (color-ramp, stretching, classified, histogram)
- raster import/export/conversion: vector data, TIN, raster file types (geotiff, grid, ASCII NoData)

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- map algebra/Raster Calculator (boolean overlay, mask, NoData)
- cell statistics (map stack math)
- neighborhood stats (moving kernels)
- zonal (summary) statistics
- distance analysis (straight line, least-cost-path)
- Interpolation (IDW, natural neighbors, Spline,
- (((Geostatistics, kriging)))
- Terrain (surface) analysis :slope, azimuth, contour, cut-fill, viewshed, hillshade
- hydrological analysis: flow direction, accumulation, watershed delineation

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- cell statistics (map stack math)
- neighborhood stats (moving kernels)
- zonal (summary) statistics
- Volume/thickness analysis
- distance analysis (straight line, least-cost-path)
Interpolation (IDW, natural neighbors, Spline)
- Terrain (surface) analysis:
slope, azimuth, contour, cut-fill, viewshed, observer points, hillshade

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- Suitability analysis
- Geo referencing Geo-referencing
- ArcScene/ArcGlobe for 3D visualization
- Volume/thickness analysis
- Data sources for rasters (Iowa DNR, USGS seamless, Lidar)
- We may not go over all these topics
- Let me know if you have other suggestions/interests

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Scheduling

- Please let me know if you will miss class or need more time for the assignments
- I will need to leave at 3:15 on:
- Tue. Jan 18, Feb. 8, Mar. 8, Apr. 5 and Apr. 19
- No class on Thursday - work on online course

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Your background & interests

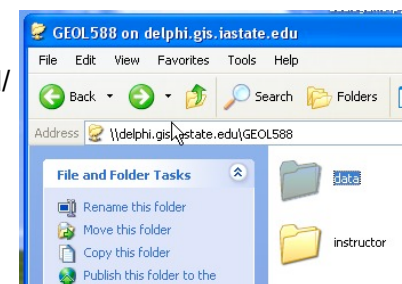
- Name ?
- Major ?
- Advisor ? Thesis project ?
- Prior GIS involvement ?
- Why are you taking this course ?

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Access to GIS server (delphi)

Map \\delphi\geol588 as network drive

- My Computer > Tools > Map Network Drive
- Drive: X
- Folder: \\delphi\geol588
- Login with ISU id and password
- Sometimes you need to use: \\delphi.gis.iastate.edu\geol588 and/or IASTATE\<netID>
- Alternative: File Manager Address: \\delphi\geol588
- Do this before starting Arc!



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- Gadwin printscreen demo (for making jpgs and pasting them into Word, use for homework!) Needs to be configured (within Properties)?
- Rest of lecture: Play around with ArcMap 10
- (you'll do a very extensive online module later)
- Let's play with it - load:
data/lidar for 588/Ames_lidar_data.mxd
- Fix red !
- Add an online map (world road map via search)

- What's new/different in Arc10? in ArcGIS10 Help - look at
 - What's new in ArcGIS10
 - Mapping and Visualization
 - Geoprocessing

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- Data for each module of the online course is already in geol588\data\LearnArcGIS10... (or download it at the start of each module)
- Let's look at the online module now
- Homework 0 (Get familiar with ArcMap10) - work through the online course
- 8 modules - has lots of details (good general ArcGIS refresher, if you need it ...)
- BUT you can skim/skip over stuff you find boring or too easy
- Deliverables: screenshots within Word of the end result of each module - no need to describe your process (
- Due: Jan 25 (will be on WebCT assignments later)

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