

**FE 257. GIS and Forest Engineering Applications**

Week 9

---

---

---


---

---

---

---

---



**Week 9**

- Last week:
  - Chapter 12: Synthesis of Techniques Applied to Advanced Topics
  - Chapter 10: Updating GIS Databases

---

---

---


---

---

---

---

---



**Week 9 Topics**

- Lab final
- Final project
  - Schedule and parts
- Contemporary GIS issues
  - Trends in GIS Technology
  - Licensing and Certification of GIS users
- Spatial tools that I use for UAS remote sensing

---

---

---

---

---

---

---

---

### Lab final

- During your lab time this week
- Will have most of lab period (1 hour, 50 minutes)
- Open book

---

---

---

---

---

---

---

---

### Final Project

- Written report due on the last day of classes by 5 PM
  - Drop off in Snell Hall 210A
- Result should include a spatial summary or comparison of some natural resource area

---

---

---

---

---

---

---

---

### Final Project Guidelines

- Cover page
  - Name(s) and title
- Three to five double-spaced, typed report pages
  - Grammar, punctuation, spelling
    - Make sure you proof read
- Minimum of two 8.5 x 11 inch maps (location & results)
  - Not included in the 3-5 pages

---

---

---

---

---

---

---

---

**Final Project Guidelines**

- Make sure your report has the following sections labelled
  - Introduction, Methods, Results, Conclusion
  - These are each graded separately
- What you intend to do and why it's important (Introduction)
  - Set the stage for your project
  - Why are you looking into this issue?
  - Why should others care about this topic?

---

---

---

---

---

---

---

---

**Final Project Guidelines**

- How you did it (Methods)
  - Describe your data
    - Scale, quality
  - Were your data a good fit for your project?
- What you found (Results)
- Relevance and implications (Conclusion)
  - Impact of your study
  - Problems and/or successes with methods
  - Recommendations
    - Regarding the issue you researched
    - For others that might do future research

---

---

---

---

---

---

---

---

**Next week**

- Quantum Spatial
- ArcGIS alternatives
- Final review

---

---

---

---

---

---

---

---

**Trends in GIS Technology**

- Open source programming and analysis software
  - Python
    - GEOG 462: PROGRAMMING FOR GEOSPATIAL ANALYSIS
  - R-studio
- Freely available spatial software
  - QGIS
  - \_\_\_\_\_
  - Fusion, LidR, CloudCompare
- Cloud based computing and storage
  - Data Basin
  - Google Earth Engine
    - GEOG 481: DIGITAL IMAGE PROCESSING
  - Oregon Imagery Explorer
  - Box

---

---

---

---

---

---

---

---

**Trends in GIS Technology**

- Raster data platforms and resolution
  - Increased coverage of satellite systems and return intervals
  - Unmanned aircraft remote sensing
- Increasing computing capabilities
  - Processors, RAM, graphic processing cards, SSDs
- GIS software scalability
  - Aps can be created with ArcGIS Pro
  - ArcMap app could be run on a phone
- User support
  - Discussion boards

---

---

---

---

---

---

---

---

**Precision Forestry**

- The term "precision forestry" officially appeared in 2001
  - The 2001 UW Precision Forestry Symposium
  - Precision agriculture has been around for ~ 40 years
- In contrast to precision agriculture applications, forestry landscapes have
  - Trees
  - Terrain
  - Higher rates of disturbance
  - Chaos

---

---

---

---

---

---

---

---

### GIS licensing and certification

- Disputes have arisen between the surveying, photogrammetry, and GIS professions
  - \_\_\_\_\_
  - Most states have legislation stating that only surveyors and/or engineers are qualified to record and report measurements of earth's features
  - Have initiated legal challenges in several states
    - Generally, these challenges have been successful: don't collect data unless you're licensed to do so
  - Who is trained to collect, process, and map spatial data?
    - In what capacity?

---

---

---

---

---

---

---

---

### GIS community

- Has never required certification or licensing
- Very loosely organized legislative presence
  - Can't compete with land surveying and engineering boards
- ASPRS was the first organization to offer a nationally recognized certification program
  - Few enrollees (n = 133 2020, n = 76 2015, n = 59 2009)
- URISA started a certification program (2003)
  - No exam necessary until July 2015
  - Become a "GISP" after portfolio and payment submitted (n = 9892 2020, n = 7528 2017, n = 7515 2015, n = 5501 2013, n = 4716 2010)
    - 675,000 Geospatial Employees in the U.S. (2020)

---

---

---

---

---

---

---

---

### NCEES

- The National Council of Examiners for Engineering and Surveying (NCEES) has a "Model Law" that identifies surveying activities:
  - Using GIS to:
    - Determine earth's features (terrain)
    - \_\_\_\_\_
    - Determining position, or using GIS to place or reset, survey control monuments or reference points
  - Survey license required!

---

---

---

---

---

---

---

---

**How do you become a professional land surveyor?**

1. Graduate from a four year ABET-accredited land surveying or engineering curriculum
2. Take and pass eight-hour Fundamentals of Land Surveying exam (50% average passing rate)
3. Accumulate four years of land surveying experience under the guidance of a professional land surveyor
4. Successfully pass a six-hour national exam (70% passing rate)
5. Successfully pass a four-hour state (in Oregon) essay exam (40% passing rate)

1. Most states require a two-hour exam

---

---

---

---

---

---

---

---

**Most professions have licensing**

- Defines standards necessary for competence
  - Education
  - Internship
  - Exams
- Protects public welfare and safety
  - What many proponents of licensing reference:
    - Fire hydrants
    - Emergency route mapping (police, fire, hospitals)
- Control and enforcement
  - Who makes sure that competency exists?

---

---

---

---

---

---

---

---

**Is licensing/certification necessary for the GIS community?**

- It depends but...
- Until a national certification program is recognized and respected, GIS users will find themselves struggling with state and federal regulatory groups, other professions, and with each other for control of GIS activities

---

---

---

---

---

---

---

---