Successful Career Planning in the Geosciences

GLG 310 Structural Geology

11/21/2013

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Agenda

- Brief introduction about me
- Research as an undergraduate student
- What classes should I take?
- What can I do with my undergraduate degree?
- What about grad school?
- Some useful resources
- Q & A session
About me

- B.Sc. Geological Sciences (2006), GIS Certification, Geography Minor
- Undergraduate internships (Tempe and Phoenix)
- Undergraduate thesis advisor: Ramón Arrowsmith
- GeoClub Vice President (2005)

Fault scarp from the Volcanic Tableland (CA)
About me

- Arizona Geological Survey (Arizona state government)

Pleistocene terrace of the Agua Fria River (AZ)
About me

- M.Sc. Geological Sciences (May 2010)
- Advisor: Ramón Arrowsmith

Precariously balanced rocks in the Granite Dells (AZ)

Paleoseismic trenching across the San Andreas fault (CA)
About me

- Ph.D. Geological Sciences (May 2014)
- Advisor: Ramón Arrowsmith
About me

• Internships with ConocoPhillips (Houston, TX)

From Crain’s Petrophysical Handbook (http://spec2000.net/01-index.htm)

From Circle Star Energy (http://www.circlestarenergy.com/)

From Virtual Seismic Atlas (http://see-atlas.leeds.ac.uk:8080/home.jsp)
Undergraduate research

• *Should I get involved in an undergraduate research project?*
  – Absolutely (if time and finances permit!)
  – Important addition to any grad school application
  – Brainstorm research topics with professor(s) and pick one
  – Stick to it!
  – Great opportunity to get a flavor of research:
    • Do I *really* want to go to grad school?
    • Can I see myself eating/drinking/sleeping/thinking/loving/hating my research project (for *1 year, 3 years, or 5 years*)?
    • What is it like to *write* and *defend* a thesis?
  – Earn undergraduate credits for it!
    • Visit the SESE website for more information:
    • [http://sese.asu.edu/content/guidelines-undergraduate-%E2%80%9Csenior%E2%80%9D-thesis#](http://sese.asu.edu/content/guidelines-undergraduate-%E2%80%9Csenior%E2%80%9D-thesis#)
What classes should I take?

- **SESE website has a lot of information about this**
  - http://sese.asu.edu/content/sese-courses

- **B.A.**
  - Take as many quantitative classes as you can!

- **B.A.E.**
  - Courses are predetermined for you

- **B.Sc.**
  - Structural Geology, Mineralogy, Sedimentology, Geophysics
  - Geochemistry, Hydrology, Hydrogeology, Field I & Field II
  - Geographic Information Science/Systems
  - Minors and GIS Certification

- **Geologist State registration**
  - Will need knowledge in **ALL** of the above subjects in order to pass the Arizona Board of Technical Registration exams (including other states)
  - http://www.btr.state.az.us/forms/geologists.asp
What classes should I take?

• Consider taking graduate-level courses (GLG 5xx and above) as an undergraduate student:
  – Credits will not be applied toward your undergraduate degree…
  – …BUT you can reserve them for a future graduate program
    • They are transferrable to other universities 😊
What can I do with my undergraduate degree?

• **B.Sc.**
  – Many options!
  – Mining, environmental, hydrology, hydrogeology
    • Internships!
  – Need to get certified/registered as a geologist with the state
    • [http://www.asbog.org/](http://www.asbog.org/)
  – Grad school (next slide)

• **B.A.**
  – Various non-technical (but sometimes technical?) opportunities
  – Provide geoscience insights into policy making, advocacy, etc.
  – Lack of quantitative training may be a limiting factor

• **B.A.E**
  – Teach!
  – Now is an *excellent* time to be a science teacher = job security 😊
  – Make sure you are *passionate* about teaching
Graduate school

• Should I go to grad school?
  – Depends on where you see yourself in 5+ years
  – More career options available in the long run if you have an advanced degree

• M.Sc. Or Ph.D.?
  – Depends on what you want to do after graduate school
  – If you want to be a:
    • Secondary Education teacher: B.A.E. & additional certifications
    • Community College instructor/lecturer: M.Sc. minimum
    • Government researcher: B.Sc., M.Sc., or Ph.D. acceptable
    • Mining geologist: B.Sc. sufficient but depends on economy
    • Petroleum geologist: M.Sc. minimum, Ph.D. acceptable
    • Professor: Ph.D. minimum, Post-Doc usually required
  – M.Sc. option (2 – 3 years): usually requires a thesis
  – Ph.D. option (5 - ?? years): requires preparing a proposal, passing a candidacy exam, and defending a dissertation
• **How should I pick an advisor?**
  – It’s *all* about the *fit*
  – Management style (hands-on vs. *laissez-faire*)
  – Expectations
  – Funding (research vs. teaching assistantships)
  – Research group size (i.e. how much time will he/she have for you)?
  – Is he/she OK with you doing internships (important!!!)
  – Obligations to your family and/or kids

• Professor Nathan Toké has an excellent guide on how to select a graduate school (also posted on Blackboard)
Some useful resources

- SESE undergraduate and graduate advisors

- Professional associations:
  - *Get involved!*
  - Arizona Hydrological Society
  - Arizona Geological Society
  - Association of Environmental and Engineering Geologists
  - American Association of Petroleum Geologists

- ASU Career Center (not relevant to geoscience students, but contains many resources on how to get an internship, build a professional network, etc).

- Professor Nathan Toké’s ASU course:
  - [http://activetectonics.asu.edu/teaching/GLG494-ICOG/index.htm](http://activetectonics.asu.edu/teaching/GLG494-ICOG/index.htm)
  - Excellent guide to selecting graduate schools (see Blackboard)

- Send me if an email you want to chat about any of this
  - david.e.haddad@asu.edu
Q & A session

• Let’s start off with the following:
  – What is it really like to be a geoscientist as a/in a:
    • Teacher
    • Graduate student
    • Post Doc
    • Professor
    • Government agency (e.g., USGS)
    • Small private consulting (environmental/hydro) firm
    • Large, publically traded company (petroleum or mining)