

# Hazardous Materials: A Course to Help Prepare Geologists for Employment in the Environmental Industry

Michele M. Hluchy, Alfred University  
Thomas J. Barnett, ABB Preheater, Inc.



why? what? to whom? how

# Why?

Jobs

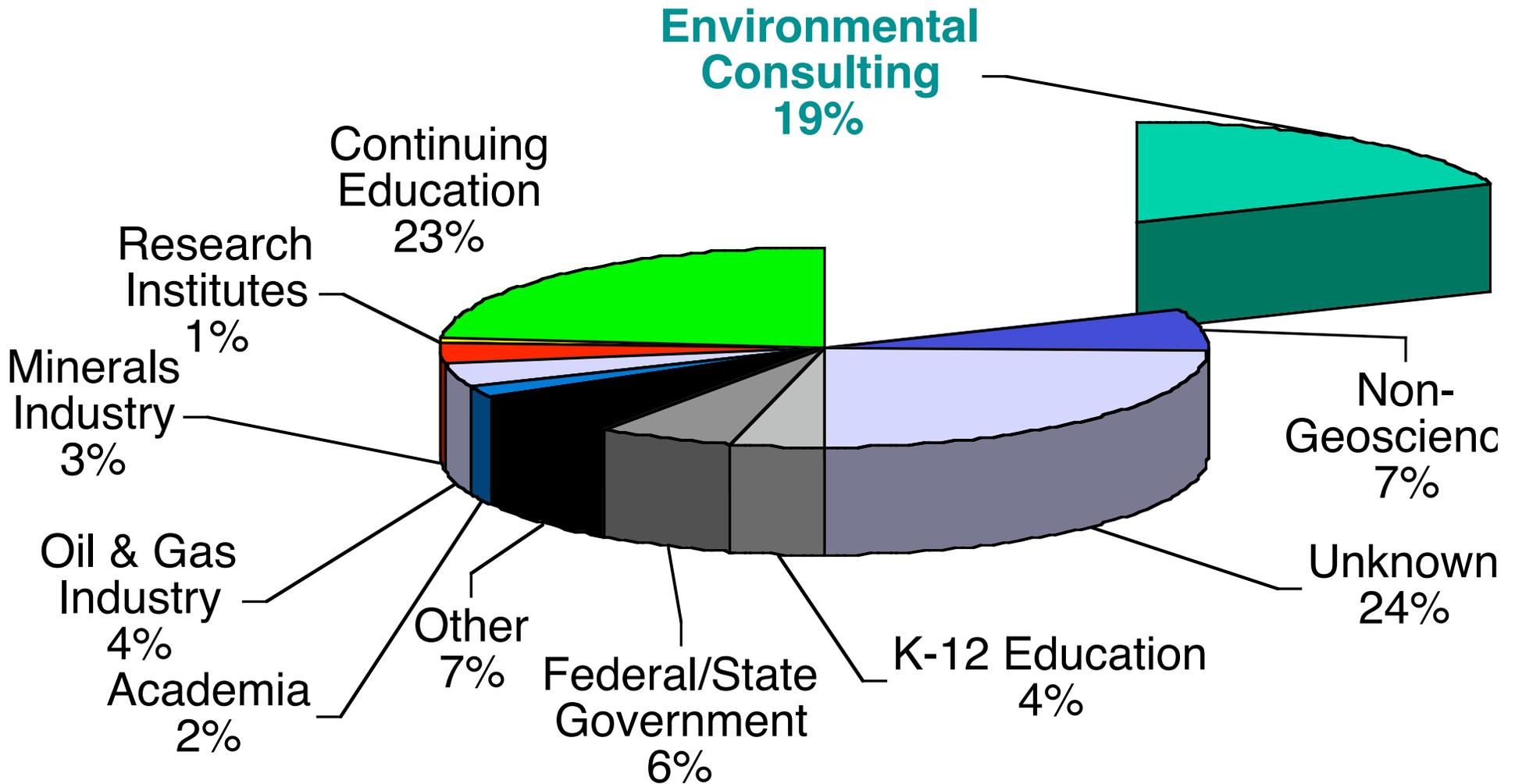
Internships

General Safety

Jobs.....

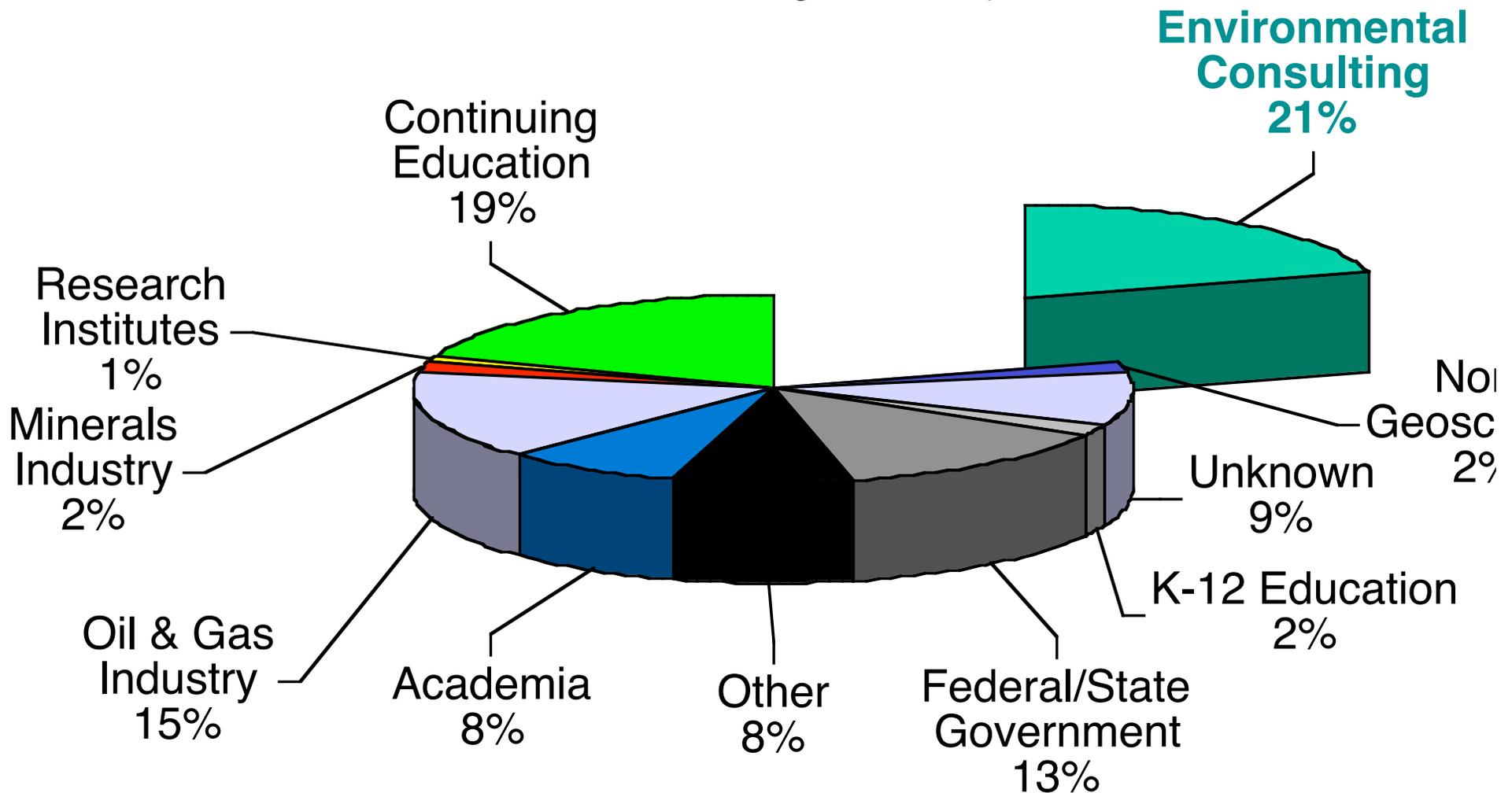
# Employment Trends of Recent Geoscience Undergraduate Degree Recipients

(from "1999 Report on the Status of Academic Geoscience Departments",  
The American Geological Institute)



# Employment Trends of Recent Geoscience Master's Degree Recipients

(from "1999 Report on the Status of Academic Geoscience Departments",  
The American Geological Institute)



## Staff Geologist : EMI 143 ....

### Skills Requirements:

Excellent communication and writing skills, computer literate and some overnight travel required. **40-hour OSHA trained**

### Education Requirements:

BS in geology or related field

## Associate Hydrogeologist/Geologist II : 9541 ...

### Experience Requirements:

Bachelors degree in geology or hydrogeology and three to seven years experience; or a Bachelor's degree and a Master of Science (MS) in Hydrogeology or Geology and one to eight years experience in the work described in the job responsibilities section. Good writing skills are a requirement. **40-hour OSHA 1910.120 Hazardous Waste Training Certification**, experience with groundwater computer modeling, and/or knowledge of GIS desired, but not required.

## ENVIRONMENTAL GEOLOGIST/SCIENTIST (Boston, MA)

Participate in site assessments, site investigations and regulatory compliance projects. Conduct soil and groundwater sampling. B.A. or M.S. degree in geoscience discipline, strong writing and verbal skills, **40-hour H&S Certification required** and one year field experience preferred.

### Entry-level Hydrogeologist/Geologist : 9441 :

#### Experience Requirements:

Bachelor's Degree in geology or hydrogeology, and zero to three years experience in the work described in the job responsibilities section. **40-hour OSHA 1910.120 Hazardous Waste Training Certification is desired** but not required. Experience with groundwater computer modeling, and/or knowledge of GIS desired but not required.

## FIELD SCIENTIST

Marin Environmental, Inc. seeks a field scientist to perform ground water and soil sampling duties and complete environmental field investigation. Individual will also assist in the installation, monitoring and troubleshooting of ground water and soil remediation systems. A.S. or B.S. degree in environmental or related sciences, or the equivalent of 2 years work related experience. Strong written and verbal communication skills, strong mechanical skills and basic knowledge of construction field desired. **40-hour OSHA certification is a plus.**

# Internships

- “...the internship is the most bankable credential you can put on a resume” - America’s Top Internships, Mark Oldman and Sammer Hamadeh
- According to a 2000 survey of employers by the National Association of Colleges and Employers (NACE), the most frequently used source of entry level hires is a company’s internship or co-op program.

# What?

## ENS 301: Hazardous Materials (3 cr.hrs)

- Course Description:

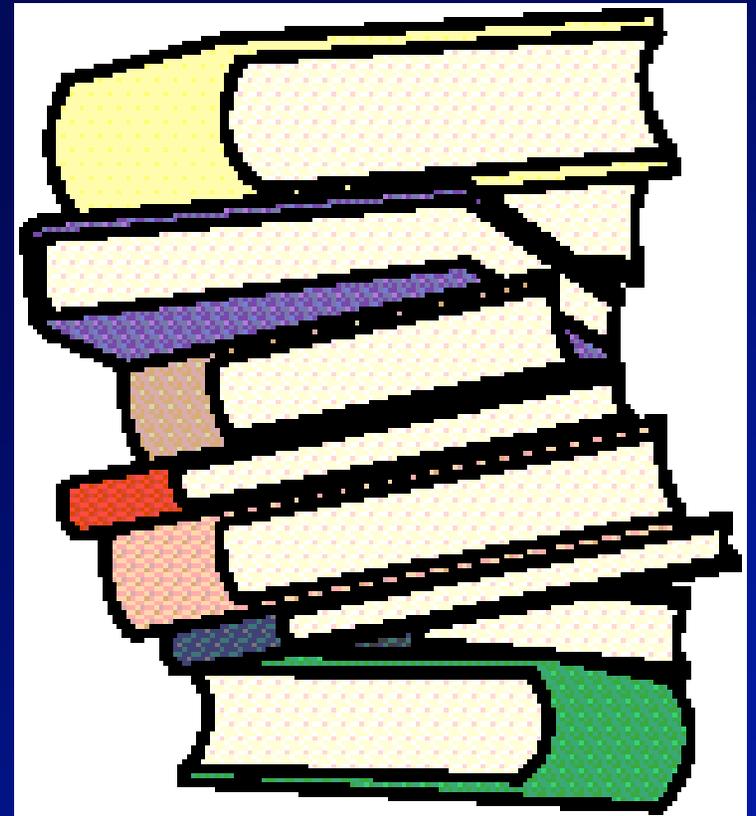
“Concerns, procedures, and tools for safely handling hazardous materials in emergencies and remediation projects. Successful completion of this course earns certification for the OSHA 40-hour HAZWOPER training, which is required for many environmental internships and jobs.”

# ENS 301: Hazardous Materials

- Course Objectives:
  - Compliance with 29CFR 1910.120(3)(3)
  - Appendix C(2)
  - Appendix E
- Provide sufficient hands-on exercise to instill confidence
- Certification for successful completion of course

# Major topics discussed: Legal and Regulatory Aspects

- OSHA
- RCRA
- CERCLA
- SARA
- who mandates what



# Major topics discussed: Material handling, communication equipment, and personal protective equipment

- Level A, B, C, D
- “moon suits”
- respirators



# Major topics discussed:

## Hazardous materials chemistry

- properties of chemicals
- hazards
  - reactivity
  - toxicity
  - ignitability
  - corrosivity
- Material Safety Data Sheets



# Major topics discussed:

## Industrial hygiene; basic toxicology

- routes of exposure
- categories of exposure
  - acute, sub-acute, chronic
- effects of exposure
- regulations and standards
  - LD50s and LC50s
  - permissible exposure limits (PEL)
  - threshold limit values (TLV)



# Major topics discussed: Safe work practices

- laboratory safety
- proper disposal
- clothing
- lab emergency situations
- exposure control measures



# Major topics discussed:

## Air sampling, respiratory equipment

- air-purifying respirators
- supplied air respirators
- self-contained breathing apparatus
- respirator fit testing
- protection factors
- detectors



# Major topics discussed:

## Decontamination

- site control
- work zones
- decontamination procedures
- monitoring



Major topics discussed:

Emergency response; resource books; spill control



# Final Exercise: mitigate a (staged) emergency



Underlying principle stressed  
throughout the course:

**SAFETY**

# Who takes this course?

- Geology majors
- Env. Science majors
- Biology majors
- Chemistry majors
- Engineering majors
- Faculty & Staff



# Who teaches this course?

- Tom Barnett:
  - certified health and safety professional
  - health/ safety officer for a local industry
  - member of county HAZMAT team
- in the past, others on the faculty have taught parts of the course, too
  - geologist
  - biologist
  - chemist



# Follow-up

- 8-hour refresher course needed each year to maintain certification
- can be on a specific topic or a general review

# Summary

- Hazardous materials course can serve a variety of majors
- Certification can help students get internships and/or permanent jobs in environmental industry
- Basic laboratory safety is a good thing to know!