GEOLOGY DEPARTMENT ASSESSMENT OF LEARNING OUTCOMES

Geology Program Assessment Plan for at least one Learning Outcome to be assessed SPRING 2007.

Goal No. 5—Provide a sufficiently broad and rigorous background with depth and currency in at least one area of specialization to allow qualified students to pursue graduate study and to enter professional careers in the earth sciences.

Outcome: Students can gain employment and/or admission to graduate studies in the earth sciences.

Department **Program**

Statement of Learner Outcome	Outcome link to Program Goal	Method of Assessing Outcome	Courses to be Assessed	Number of Students to be Assessed	Date of Assessment?	Who is Responsible for Assessment?	Results of Assessment	Dept. Action
5: Provide a sufficiently broad & rigorous background to allow students to enter professional careers or graduate school	Gain employment and/or admission to graduate school	Survey of HSU Geology grads	NA	~75	Sp 07	Lori Dengler	Exceeded AGI nationwide averages for acceptance into graduate school and earth science employment	Identify speicialization courses of greatest career importance and develop a plan to offer them

In spring semester 2007, the Geology Department sent a newsletter and a survey request to alumni. A copy of the survey form is attached. As of September 1, 81 responses have been received - 15 from people who graduated during the 1970s, 39 from the 1980s, 10 from the 1990s, 11 from 2000 through 2005 and two more recent. We also received responses from 4 students who were only enrolled in our Masters program.

Our primary measurement of our success at attaining this goal is the percentage of HSU geology undergraduates who have attained jobs in a geology field and/or attended graduate school. Of the 75 who received undergraduate degrees prior to 2005, 36 had attended some graduate school (46%) and 30 or 40% received at least a MA/MS degree. This compares very favorably with the most recent American Geological Institute (AGI) which found for 2000 that nationwide, 23% of students acquiring BA or BS degrees in earth sciences went on to graduate programs.

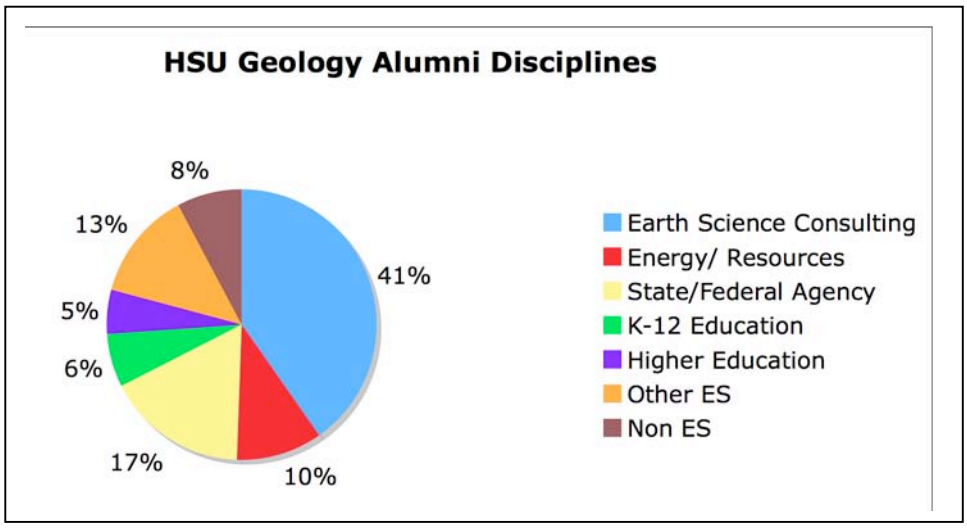
The tables on the next page summarize the professional and graduate school experiences of our alumni. Of our 75 alumni who received undergraduate degrees prior to 2005, 61 (89%) currently have jobs in earth-science related fields and 69 (92%) worked in an earth-science related job at some point in their careers. The nation-wide average in 2000 according to AGI was that 60% of US undergraduate earth science students attain jobs in an earth science-related field.

Table 1: HSU Geology Undergraduate Alumni Job Experiences

Decade	Number Surveys	ES job current	Non ES job current	Retired current	Unemployed current	Ever worked in Earth sciences
1970s	15	12	2	1		15
1980s	40	30	8	1	1	34
1990s	11	9	1			10
2000-05	10	10	1			10
TOTAL	76	61	12	1	1	69

Table 2: HSU Geology Undergraduate Alumni Earth Science Disciplines

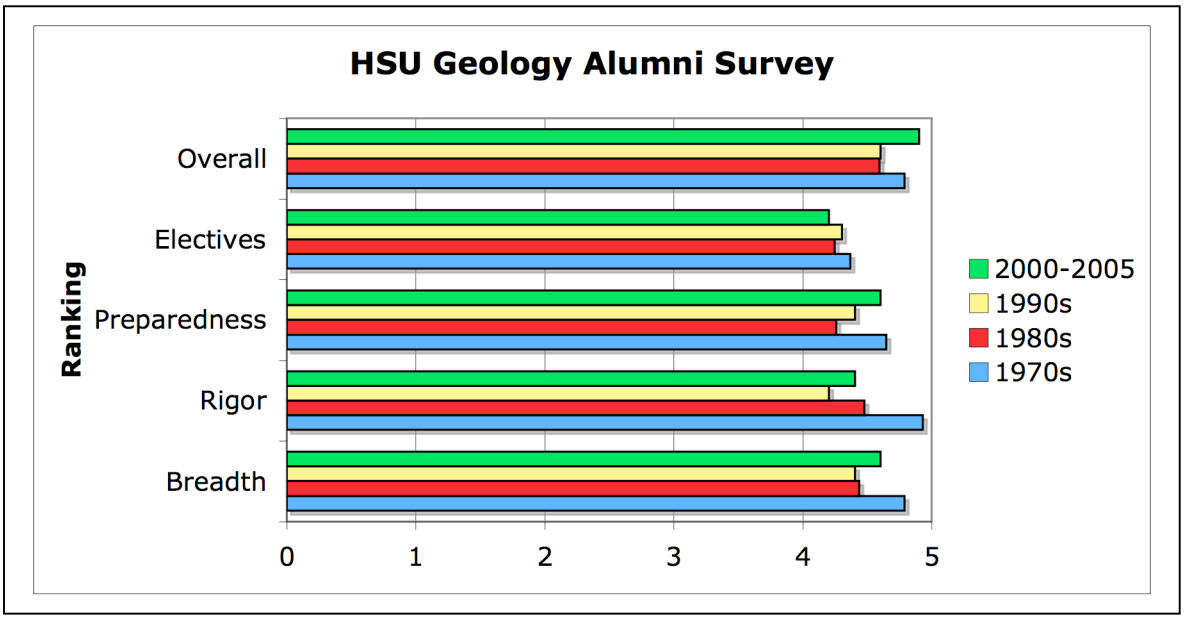
Decade	#	Earth Science Consulting	Energy/ Resources	State/Federal Agency	K-12 Education	Higher Education	Other ES
1970s	15	5	4	3	0	1	2
1980s	40	18	4	6	2	2	2
1990s	11	4	0	3	1	1	3
2000-05	10	4	0	1	2	0	3
TOTAL	76	31	8	13	5	4	10



The largest percentage (41%) of HSU geology graduates go into the Earth Science consulting field, identical to the nationwide average of 41%.

In addition to job and graduate school experience, the survey also polled alumni about the rigor, breadth and quality of the program. The graph below summarizes five areas (question 5) rated on a sliding scale from 1 to 5.

Responses from alumni were overwhelmingly positive and show little variation among the decades. The standard deviation among the response was small – ranging between 0.3 and 0.9. From this sample of HSU geology alumni, there is a high degree of satisfaction with the program. This is reinforced by the comments respondents included on their surveys (attached).



Several points emerge from the survey comments:

1) Strong enthusiasm for our program.
2) Strong endorsement for our core program, and particularly for field-based courses.
3) The importance of specialization courses in career success. Specialization courses mentioned at least 5 times by our alumni are:

Hydrogeology	GEOL 556
Quaternary Tectonics	GEOL 555
Soils	GEOL 558
Hillslope Processes	GEOL 551
Quaternary Stratigraphy	GEOL 553
Engineering Geology	GEOL 457
Geophysics	GEOL 460
Geochemistry	GEOL 445

Of these courses, only 553 and 555 are offered on a regular basis (every other year, required for the graduate program). Soils, Geophysics and Hydrogeology are offered every 2 to 4 years. Engineering Geology and Geochemistry have not been taught since 1999. We have no plans to teach either of these courses in the immediate future for two reasons. First, our faculty has shrunk to the point where their teaching loads are filled with required courses. A bigger problem is the decision at the College level to cancel any non-required with fewer than 12 students. The average enrollment in all of these courses has been between 6 to 10 students.

Action Plan

The department unanimously agrees that the field-based curriculum Humboldt has become known for must be maintained. Cutting back on field camp or the field exposure in other core courses is not an option. The department must lobby our administrators to offer the specialization courses most sought by employers, even though the enrollment in these classes is likely to be small and to support the infrastructure for a field-based program. The Department has already changed the course mode in two upper division GE classes – Geology of California and Natural Disasters – to increase the student-faculty ratio and continues to fill two sections of Geology 106 every semester.

Geology Alumni Survey Comments:
What would you tell someone about HSU geology?

1970s

The best field oriented general geology education on the west coast.

Encourage them to consider HSU. Professors very qualified/excellent relationships w/ students.

It's a great place to learn geology & grow as a person.

HSU has an excellent geology curriculum and faculty, students have a lot of close interaction with faculty. The physical location of the university is ideal for field work in a variety of settings, and the department is well equipped for hands-on lab work. The University supports the department. Arcata is a great place to live and learn, especially if the student likes outdoor activity. There is also a fine Oceanography Department that provides a solid minor.

Go there.

I have no idea about its current status.

Issue more basic: If you want to make $, don't go into Geol. If that is it, I highly recommend HSU.

Since it has been over 30 years since I graduated from HSU, I don't think I can say much about the current staff. But if the teaching is at least at the same level as previous staff and utilizes the geologic settings available locally, it should still be a good college.

Drop everything and go there!

Best place in CA for geology.

Good place.

First rate program where students learn from professors, not just research or teaching assistants

Great profs - one on one small classes - great locale. Great core and senior thesis and 6 week field camp is important! AA and x-ray available to undergrads if qualified.

Excellent fundamental BS Degree in Geol "family style" learning environment.

1980s

One of the greatest experiences of my life.

The department is excellent. Highly motivated professors, rigorous classes, excellent field classes.

Great small school where undergrads are taught by professors, not TAs.

Excellent staff; diverse geol in close proximity to campus.

I have always recommended HSU highly, as an undergraduate program and the master's program.

Great faculty, great location, caring enviroment

Luckiest SOB to have attended HSU Geol when I did; the wonderful faculty helped instill theoretical and practical academics that prepared for my career.

Enroll!

Good program.

Humboldt prepares geologists to be scientists, not just geologists. HSU grads focus on a career rather than just a job.

Absolutely - small school feel; faculty breadth of knowledge-good environment for learning.

Excellent program. Great field Exp. Great staff & accessibility

Great place to study with dedicated professors

They prepared me exceptionally well for my employment with Woodward-Clyde Consultants (1983-1988) and then GeoEngineers 1988-current. As the current CEO of GeoEngineers (300 people, 14 offices), I use the basic skills I learned from my Humboldt Geology experience on a daily basis. It is one of the cherished periods of my life, my years in HSU geology.

The best!

It was a great school.

I would highly recommend the program, especially now that I have learned that the faculty from the early 80's are still there.

A great environment for learning virtually every aspect of geology. Outstanding faculty and wonderful campus.

Great school, great professors; classes directed toward undergrads.

Warm, friendly, approachable faculty & staff.
Strong faculty; great faculty-student communication; taught by professors, not TA's.
Great field oriented program.
Students: GO, Colleagues: Hire the HSU Grad.
Small program with energetic, competent, motivated instruction. High quality program focusing on field application.
Great department, great staff, in a great location! Great support from other departments.
Great undergraduate program, a great place to learn.
A very accessible faculty, a faculty strongly interested in the success of its students, a very knowledgeable faculty. These are the things I would comment on and that would cause me to recommend the HSU program.
Accessibility of the faculty; one-on-one attention by faculty
It's a great program, fun but rigorous, with great students & a top-notch faculty. I still share w/students. Sue, Bud, Carver & Ken…man, I miss you guys.
Excellent teachers. Great field program in the best area possible.
Fantastic education! Experienced and knowledgeable professors with a very low student/instructor ratio. Considerable time spent in field gaining "hands-on" exp.
HSU offers a rigorous field-based geology program. The unique geologic location, fantastic teachers and small classes are unequaled in California.
Great instructors who are accessible, friendly, and knowledgeable
Talk to the teachers & students. Ask about Field Camp and work experience. I liked it . Excellent teachers & T.A.'s. A wide variety of geology courses whei I was a student.
Great Dept, great people & challenging course work.
I had a great experience and would recommend the program. Valued close relationships with faculty & other geol students in a supportive environ.

<u>1990s</u>

Best field geol school; great location; best instructors.
Excellent program & excellent Department; excellent faculty.
Highly encourage them to go.
I enjoyed my time at HSU and couldn't have asked for a more hands on involved education.
This is one of the best UG programs in the nation and is recognized as such by educators and professional geologists every where I have been.
Excellent program with great access to faculty. Good value for education $. Established and well organized field program.
Best geology program in the CSU, It's field based - better employment chances, good foundation degree for grad school.
Great department and program. Faculty is superb and students receive attention required. Field oriented.
Great Program, affordable area, go for it!
An Excellent program with a strong emphasis on teaching, but also with good exposure to research. The field component to almost all classes is extremely important , and is a rare commodity these days. The HSU geology department inspired me to become a geologist.
It is an excellent program, with great teachers and you can get an excellent education

<u>2000s</u>

The HSU Geology Program is a great place to get a geol ed. The location of the school is an added bonus(triple junction area. The staff/Fac is one-of-a-kind! Biggest Hearts and scientific minds anywhere. State of the art education. Keeps up with newest info/techniques & offers hundreds of field trips throughout education.
I would definitely recommend the program to someone! I'm a hands on learner and really appreciated how many field trips and labs there were. The professors were so willing to help me and do whatever

it took t make sure I understood the info. Class sizes were small and personable. I felt like I was learning with a group of people and everyone helped each other out.
Excellent Field School, good professors that are not just focused on their own research.
Great complete overall program. Great personal attention with opportunities to get to know your professors. One of the only few schools in the Cal State system that offers Geology Field Camp.
How great the field work is. How the HSU program allows one to be exposed to many geological modalities, as the Univ. is close to many great geologic sites. Field based program allows students to "do" rather than just talk about it.
Close-knit dept, all classes fascinating and educational. Great to have a diverse staff with sooo (sic) much knowledge and extracurricular interests. I definitely recommend the department, and although I am not working in my field, many of the people I graduated with are.
This is a great field to be in. With a geology degree your door is open to a variety of environmental fields. Finding a job after graduation will be easy.
The field based department prepared me for working in earth science fields by helping me develop basic(yet essential) field observation, data collection and analysis skills. These skills are frequently illuminated to me while I work as part of a scientific team. Most others are hardly as prepared as I am. A big thanks.
Excellent program, great fundamentals for starting a career in geology
I believe I received a top quality education from some of the best teachers in the world!
I would have nothing but positive things to say about the department. I was impressed by the faculty and their level of commitment, not only to teaching students in the classtoom, but outside as well. I felt every professor was available for consultation outside of class.
Great field experience; broad range of topics
Great school if committed to finishing up.
Excellent program
Strong program that exposes students to broad range of fields; dynamic faculty with strong focus on fieldwork.

What areas should we develop further?

<u>1970s</u>

Groundwater course
Keep requirements for other disciplines ie computer technology, chemistry, physics
It has been so long since I left, I am not familiar with the current courses.
Mining, soils, environmental clean ups.
No idea.
Stronger focus on energy, including oil and gas
Keep geophysics class current. If no ground-water classes, add basic hydrogeology, numerical modeling - forces students to compile all geologic, hydraulic and chemical data to come up with a conceptual site model. Ecncourages interpretation and creativity.
Global climate change, paleoclimatology, mg/ca in forams for surface, climate.
Environmental Geology and Geochemistry.
Work hard to keep field-related courses. Integrate GIS with geology program.
Geophysics.

<u>1980s</u>

hydrology & sedimentary deposits
At the time I was in the department (1978-1980) I don't recall a hydrogeology class. I think that is a class that really helps entry-level technical staff in the environmental consulting industry.
It has been a few years since I graduated but petroleum geology could have more development
Hydrogeology-prepare students for environ geol consulting
Keep a strong geopmorphology/neotectonics focus, but also maintain a balanced department (hard-rock, soft-rock, quat. Geol, etc.)

Env. & Eng. Geology; man's use of resources and land planning; dam safety-seismic; soil; mechanics; sustainable groundwater basins withdrawal & recharge processes
Exploration geophysics, geotechnical, Hydrology, GIS, modelling, quantitative methods, data analysis
Hydrogeology as a UG core requirement
engineering Geol & environmental Geol
Mining (basic)
More emphasis on the business aspects of applied earth science. I'd be glad to offer suggestions and help in this regard
Groundwater contamination, landslides, faulting
Engineering geology
Environmental and hydrology classes
Keep up the strong field work. The preactical experience of HSU Grads is heads and shoulders above other schools
fluvial processes
Keep doing what you do
My experience did not teach me much about what to expect when entering the business world and applying my education. This was not a problem; I don't think that my employers extected me to know much about this as an entry level geologist. However, if I had known some of this, I might have had an edge during my early years after graduation.
Offer courses in practical & applied geol. Bring in practicing professionals to help develop courses in engineering geol & hydrology; use of GIS in data collection & analysis
Sedimentology & groundwater as pertains to environment.
More frequent field electives. Maybe add a drilling methods overview. Caltrans and local driller could let us observe maybe and prepare students for core logging, observations - 1 unit limited class time.
Mining Engineering; Economic Minerals in CA; Types of deposits, mining methods, terminology.
Drill Rigs & logging ;soil/sed deposits. Would have been helpful & practical.
GIS training

<u>1990s</u>

Environment al geol/hydrology, petroleum geol, project Mgmt for geol studies
Environmental geology
I wish I'd been turned on to historical geology more.
Encourage poster-type presentations w students sharing with professionals such as at FOG
Scientific report writing class
Groundwater studies, environmental problems, clean-ups
Climate change, both paleoclimate & modern, Quantitative skills in ES(data analysis, modeling etc), Geochronology, isotope geology
Some link with the Soils Department, maybe some more exposure to drilling and well-logging

<u>2000s</u>

Hydrology is so important in Humboldt County. Perhaps highlight these classes a little more.
Job preparation ie hydrology, contaminant transport, environmental geology
No weaknesses that funding couldn't cure
Would have like the BS to be part of the degree program.
Thanks over and over again for the most excellent opportunity to prepare myself for a lifetime of research and education in the earth sciences.
Engineering Geology, technical writing, consulting oriented course would assist students in the private sector.
I am a firm believer in field work, field work, field work. I feel I learned the most in the field applying what I learned in the classroom. Adding a gadgets course(if you haven't already would be good). Brunton, total station & drawing in the field. Also, having more required papers, research style with rigorous grading & multiple drafts. Overall I feel I got a really good education. I received great advise and encouragement from all dept members. Val is also such an important part of that dept that

she needs lots of love and attention! Many of the professors offer & encourage different opportunities, employment and otherwise.

All Quaternary topics continue to be useful in my work; effects of land mgmt activities (eg timber harvesting) on hillslope & channel morphology.

More emphasis on: regulatory practice of geol; principles & practices of engineering geol

Do you have any further comments?

1970s

Do we have a library a person could donate books to?

Encourage students to examine careers in the energy industries ie petroleum, new sources of energy

Involve geology alumni in department activities!

I've been gone for 30 years

In the 33 years since I graduated from HSU I have interracted with hundreds of geologists from top schools around the country, and the depth and breadth of my undergraduate education has been a great advantage. My education was second to none. I have observed that the department has continually updated its curriculum to stay current.

Encourage water resources studies

Hit the elem. Schools

No longer in Geol field

When you invite someone for a picnic for May 5, see to it that the invitation is received before May 14

After she graduated, HSU alum Alexis Levine volunteered in my office and did an excellent job. Articles by Kelsey & Bockheim (1994) and Aalto & Miller (?) were very helpful as I mapped southwestern Curry County.

Do you have a mineral museum yet? A rock and mineral display?

1980s

Soil testing for construction sites

I have been in the environmental consulting industry for over 20 years. The three things that can make a student stand out in an interview are: 1) Bring an example of a well-written report or thesis and have a technical writing class. 2. Some exposure to the fundamentals of groundwater hydrology or hydrogeology 3. Practical knowledge of soils classification using the unified soils classification system. I believe HSU geology students are well versed in rock and mineral classification but are weak in soils classification. A high percentage of invironmental investigations encounter only soils in surface exposures and boreholes/wells, thus it is very important that field geologists log soils.

Should not have done senior thesis..took an extra year & did not add value

Keep up the good work

Lori: Thanks for the update. It's good to hear about everyone who made a difference with me. Keep up the good work!

Keep it up-current students receiving same quality education I did. Best wished to Bud, thanks Lori and Sue for continued dedication to the program.

Find a way to provide the variety from a quarter format to a semester format

Great school. Best time of my life. Will always value what HSU provided

I like to hire HSU Grads because I know they have strong geology knowledge & skills (field work)

Keep a very strong emphasis on field work and writing. Expose students to exploration tools and make sure they get time logging test pits, trenches and exploratory borings

An excellent program, great professors

Thanks for keeping in touch and keeping me informed

e-mail directory of alumni

Target the state licensing requirements

The high quality of HSU grads continues to amaze me - it's the ultimate testament to the good work of the faculty

My lack of work in earth sciences is no reflection on my education at HSU.

As with many of the programs at Humboldt State University, what makes the geology program on the a kind is that yoou learn in a part of the country that is your lab.

If you see some value to having someone who used their education as a stepping stone to some success in the consulting/management field come in as a guest speaker, I could do that in the fall.

Use of GIS in engineering Geol; his co. is developing capabilities to perform geologic mapping & discontinuity mapping utilizing PC's & GIS.

Environmental consulting pertaining to public health & environment. Suggest a viable direction for classes as future is growing & employment looks promising.

Geomorphology should have more prerequisites. I was not prepared when I first started at HSU after transferring.

Internships, student work experience programs are essential for getting hired

1990s

Continue to focus on strong field geologists

Faculty, staff and students were on a first name basis and all were there to help each other learn.

Don't drink & womanize so much(you know who you are)

Field based classes are critical to producing employable graduates

I am proud to be an HSU Geology Dept alumni.

I miss the faculty

2000s

The emphasis on field trips at HSU is wonderful. Keep it up!

HSU Geology Dept. is awesome!

Had a freat and wonderful experience.Thank You!

My time in Arcata, at HSU were probably 2 1/2 of the best years of my life to this point. The learning and the friendahips formed will stay with me my entire life.

Thank all the teachers for their encouragment and faith in me. Having so much support in many areas has enriched my life.All my instructors went above and beyond the classroom education and I am so grateful.

HSU Geology Department is the best. In talking with other geologists and their experiences in college…they are always jealous about how much fun my school was.

This is the first "newsletter" I've gotten-didn't know you guys did that-is it new? Great idea.

Go Bud!!!

ALUMNI SURVEY

HSU Geology Alumni:

1. When did you graduate from HSU?_____ Degree (circle) BA BS

2. Have you attended Graduate School since graduating from HSU? YES NO
If Yes: Name of school _____ Degree _____ Year_____

3. How would you describe your current position? (check)

_____ Student:
- _____ Graduate student in earth science-related field
- _____ Student in a non earth-science field

_____ Employed in an earth science-related field:
- _____ Earth-science consulting
- _____ Mining/oil/resource industry
- _____ State or Federal Agency
- _____ K-12 Education
- _____ Community College
- _____ 4-year College/University
- _____ Other (please describe)_____

_____ Employed in non earth-science job

_____ Currently unemployed

If you are <u>not</u> currently working or studying in an earth science area, have you done so at any time since graduating? YES NO

4. Please rank the HSU Geology undergraduate program in the following areas (5 is the highest, 1 is the lowest):

	excellent				poor
Breadth of Program	5	4	3	2	1
Rigor of Program	5	4	3	2	1
Preparation for graduate school/employment	5	4	3	2	1
Availability of specialization classes (ie Geophysics, Geochemistry, Engineering geology etc.)	5	4	3	2	1
Overall Program	5	4	3	2	1

5. If you are working or are pursuing graduate studies in an earth science field, what specialization classes (non-geology core requirements) were most important to your current work?

6. If a colleague or potential student were to ask you about the HSU geology department, what would you tell them?

7. What area(s) if any should the geology program add, or further develop?

8. Do you have any further comments or suggestions?

Thank you very much for your feedback.
The HSU Geology Department