

# **Strong Geoscience Departments in Research-Intensive Universities: How do You Know You Are One and How Much Planning is Needed to Stay One?**

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## **1. ABSTRACT**

During the 2003-2004 academic year, we surveyed 63 geoscience departments, drawn primarily from the research-intensive institutions in the American Association of Universities, on the challenges, threats and opportunities they felt they faced in the next 3-5 years, and the role that planning played, or could play, in addressing departmental needs. The survey was completed at over an 80% rate, and while confirming that not all geoscience departments are identical in their needs and issues, found a large number of issues common among many departments, even considering the very wide range of departments involved (over at least an order of magnitude in size and resources). For example:

- Many departments see opportunities in large, community-wide initiatives such as EarthScope, and in interdisciplinary science, in the next 3-5 years.
- Most departments felt that the biggest threat in the next 3-5 years was declining resources, and the associated problems (faculty retention, lab support, etc.).
- For departments facing faculty retention issues, many recognized the benefit of pre-emptive measures. Responding to outside offers, many found benefit in strong, prompt counter offers, and the growing need to address spousal/partner job issues.
- In terms of recruiting faculty, the strategy most commonly cited was substantial start-up packages.
- For both graduate and undergraduate students, recruitment was much more of an issue than retention. Recruitment strategies were quite variable, but involved lots of personal contact.
- The vast majority of departments felt it was important to integrate, or balance, research and education. The most commonly cited example was undergraduate research opportunities.
- Planning was seen as overwhelmingly valuable, but written comments carried an undertone of frustration with planning in a rapidly varying environment. Planning was found most useful for faculty hiring plans and for curriculum reform/revision.

## **2. INTRODUCTION**

How do you know your geoscience department is strong? What measures define 'strong' geoscience departments? What are the biggest opportunities for such departments in the next 3-5 years? What are the biggest threats facing departments in the next 3-5 years? Do most departments feel at risk of losing faculty? Can departments stay strong without conscious planning, relying instead primarily upon day-to-day decisions?

To begin to answer these questions, we initiated a survey of geoscience departments in institutions that are members of the American Association of Universities (AAU), a self-selected

group of just over 60 of the most research-intensive public and private institutions in North America. Not all AAU institutions have geoscience departments. We added about six geoscience departments that we felt were strong, but not from AAU institutions. We created an online survey for department heads from these 63 departments. Fifty-one departments responded, for a response rate of 81%.

### **3. A QUESTION-BY-QUESTION LOOK AT THE SURVEY RESULTS.**

#### **a. What are the largest opportunities for your department in the next 3-5 years?**

- Large, community-wide initiatives (e.g., EarthScope/ Plate Boundary Observatory, IODP, Project Neptune, etc.)
- Build on existing departmental disciplinary research strengths
- Interdisciplinary science (“new scientific progress at the interfaces between disciplines”), or the intersection of geosciences with other disciplines (e.g., ocean sciences, atmospheric sciences, biological sciences, physics, ...)
- Build partnerships on your campus, especially with environmental sciences, engineering
- Many disciplinary areas were mentioned, with clumping around environmental, climate change and paleoclimate, and biogeosciences. Others with multiple occurrences included ocean sciences, atmospheric sciences, earth-system science, solid-earth geophysics/geodynamics, hydrogeology, planetary science, mineral physics
- Using scheduled retirements to move departmental research emphasis
- Broadening UG and Grad experience to reflect “a society that is keenly interested in its impact on Earth and not so much why Earth is the way it is.”

#### **b. What are the largest threats for your department in the next 3-5 years?**

Biggest threat, by far, is declining resources, at all levels (federal, state, institutional, etc.), especially for state/public institutions, and corresponding impact on departmental activities. Some areas most impacted by resource loss include:

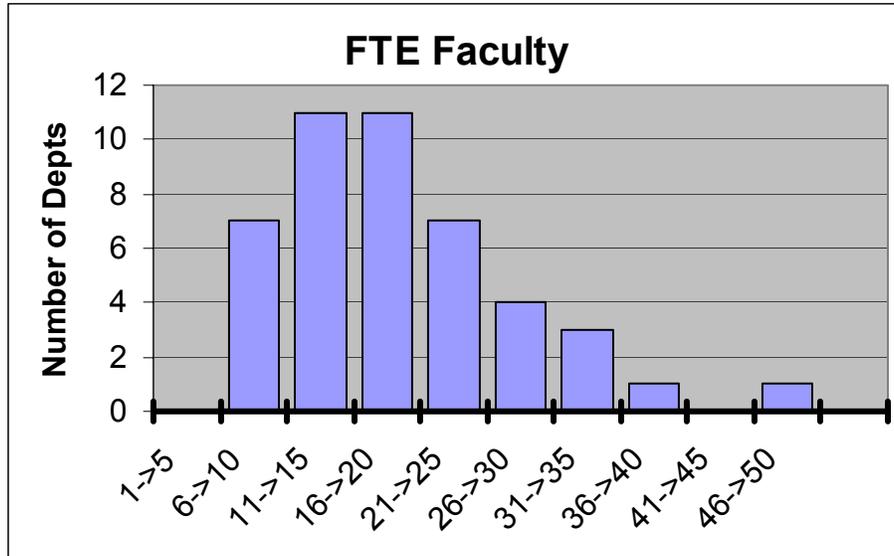
- Inability to fill faculty vacancies
- Inability to provide competitive salaries, start-up packages, and matching funds
- Inability to support research labs, both with personnel and facilities
- Loss of key faculty
- Loss of TA lines

Other threats included:

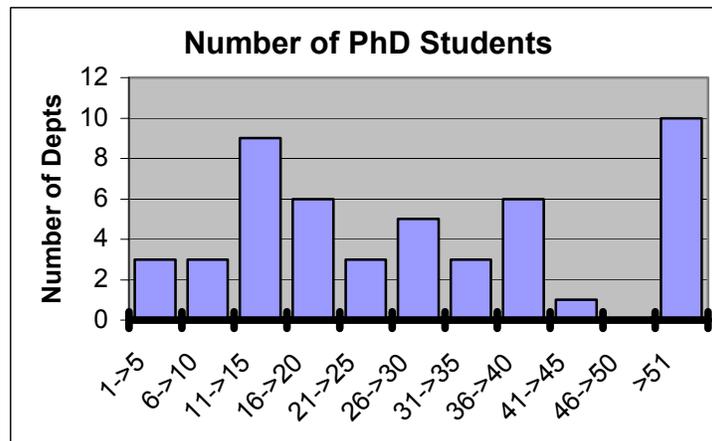
- Failure to work as a departmental team (if we fail to collaborate with other colleges on campus, “we will be dismissed as irrelevant for another decade”)
- “National decline in interest in physical sciences”
- Declining enrollments, especially at the undergraduate level.
- Inability to attract quality graduate students
- Poor (declining) preparation of students at all levels

- “De-emphasis on research; increased emphasis on undergraduate teaching”
- Increased faculty workload and associated loss of emphasis on research
- Lack of administrative support (e.g., “The view of the upper administration that ‘geology is the past,’ and that somehow environmental science activities are not related to the geology department.”)

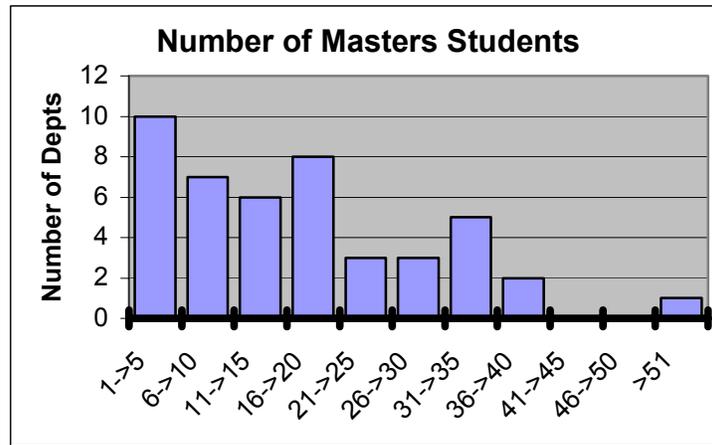
c. How many full-time equivalent (FTE) faculty are in your department?



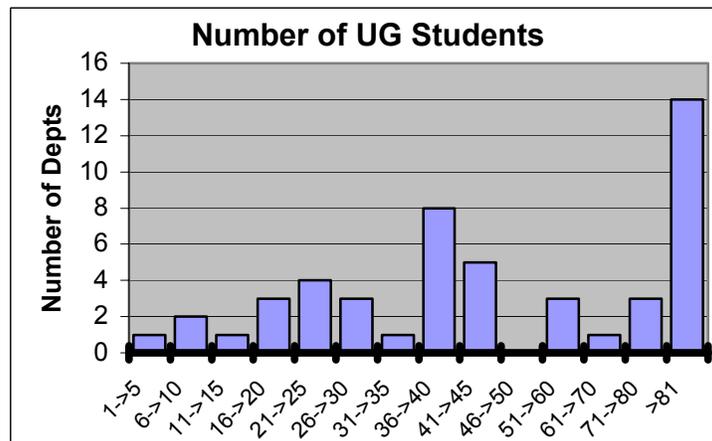
d. How many Ph.D. students are in your department?



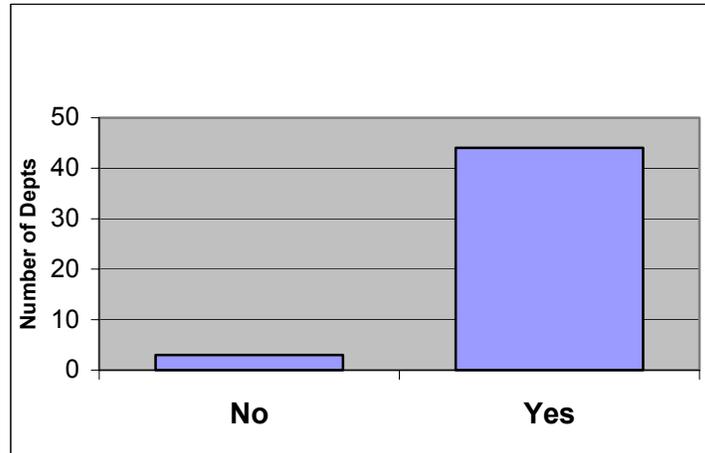
e. How many Masters students are in your department?



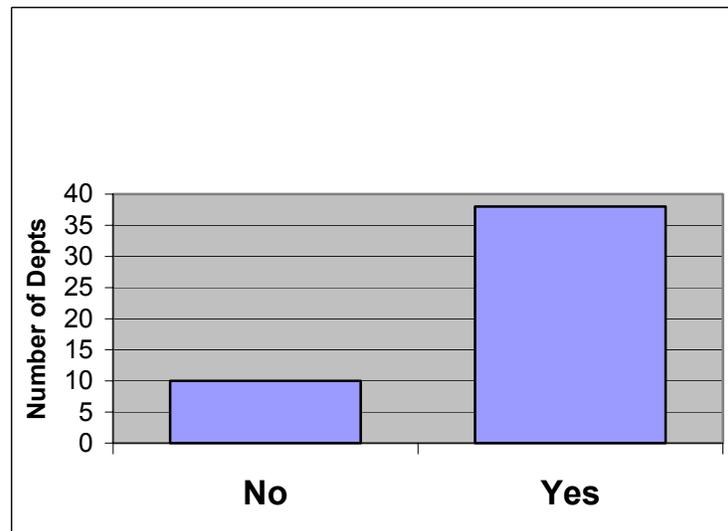
f. How many Undergraduates are in your department?



**g. "Are there expectations that your department will contribute significantly to teaching Non-Majors on your campus?"**



**h. "Do you feel that your department is at risk of losing faculty to other institutions?"**



If yes, what efforts have you used to address it?

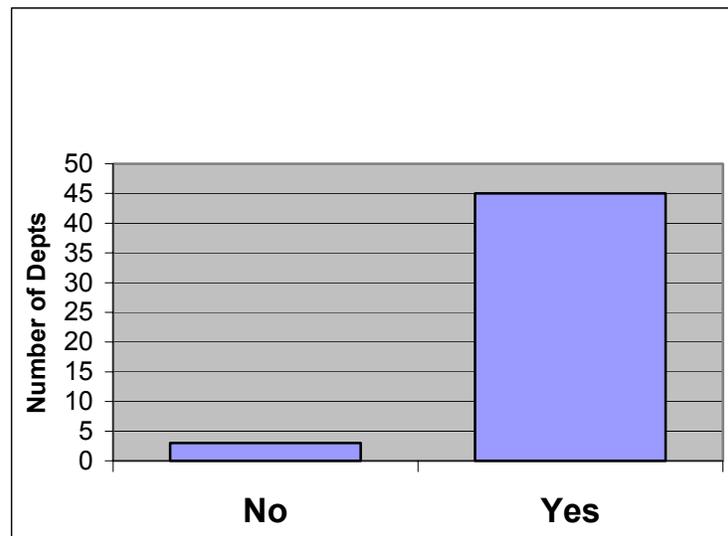
Many emphasized the need for pre-emptive measures, such as:

- Salary increases
- Early promotion and nomination for awards
- Technician and other Lab support
- Working to "remain a collegial and fairly administered department"

Responses to other offers included all of the above, as well as:

- Prompt, strong counter offers
- Spousal/partner job offers (“the two-body problem”)
- Renegotiate research/teaching/service loads
- Subsidized housing

**i. “Is it important in your department to Integrate, or balance, research and education?”**



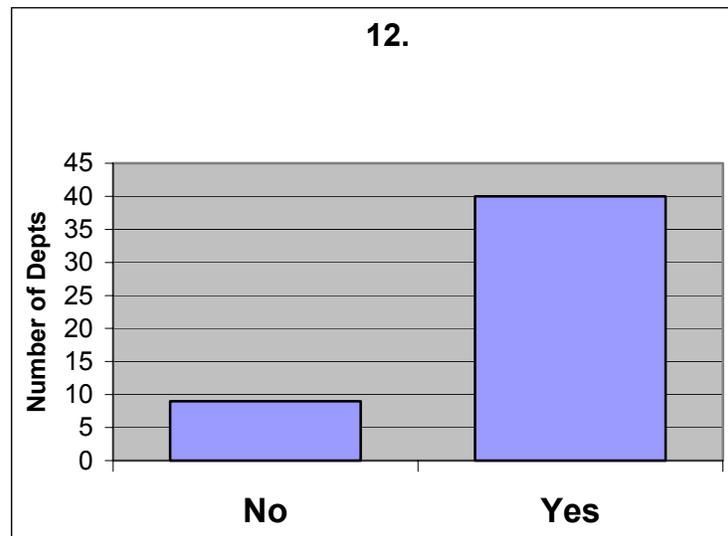
- Some expressed annoyance that there is even a question about this; it is a given
- By far the most common effort is to provide a research experience for undergraduates
- Several indicated that teaching is very important in annual reviews and promotion cases (e.g., “people don’t get tenure unless they take both very seriously”)
- Flexible teaching/research loads that don’t go to zero in either area
- Faculty mentoring of junior faculty by senior faculty known for their effective integration of research and education
- Hiring faculty in geoscience education positions

**j. “What departmental or institutional strategies have been most effective in recruiting faculty?”**

- Substantial start-up packages (e.g., “gobs of start-up money”)
- Demonstration of long term commitment (i.e., “excellence promotes excellence,” future hires)
- Recruitment is a “team effort” at all stages, involving lots of personal contact, especially during decision-making period
- “Target high-potential candidates just as they are finishing their doctorates”, taking a risk on candidate before other institutions are ready to commit
- Joint appointment with other departments on campus

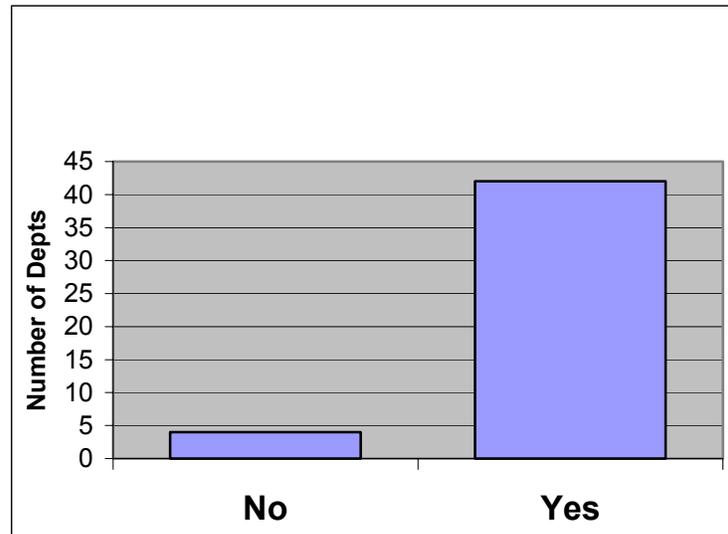
- Institutional or federal initiatives to increase diversity
- Spousal/partner accommodation
- “Opportunities for faculty to take part in designing curricular programs (rather than merely filling existing teaching requirements)”

**k. "Is Graduate Student Recruitment/ Retention an issue for your Department?"**



- Recruitment was mentioned much more than retention, which formerly was only really a problem for international students, but may be growing for all students
- Graduate Forums/Booths (apparently more successful at GSA than AGU)
- Summer stipends, and fundraising to increase stipends in general
- “Flying students in for well-orchestrated visits” that involve faculty and existing students
- Lots of personal contact
- Effective web pages
- “Decouple first year grad support from research grants” to allow students to explore department
- Early decisions on admission
- Networking with colleagues at other institutions

**I. "Are departmental planning efforts important, or valuable, for your department?"**



Written responses, unlike the numbers, were mixed, with more favorable than not. Those finding it not useful cited rapidly changing environments making plan out of date, rapidly changing administrative directives, etc. ("Is it heresy to say that planning isn't useful? Most of our plans have short half-lives, as unpredicted changes in circumstances have forced us to abandon them," and "under the present budgetary climate, most planning has been limited to short term coping")

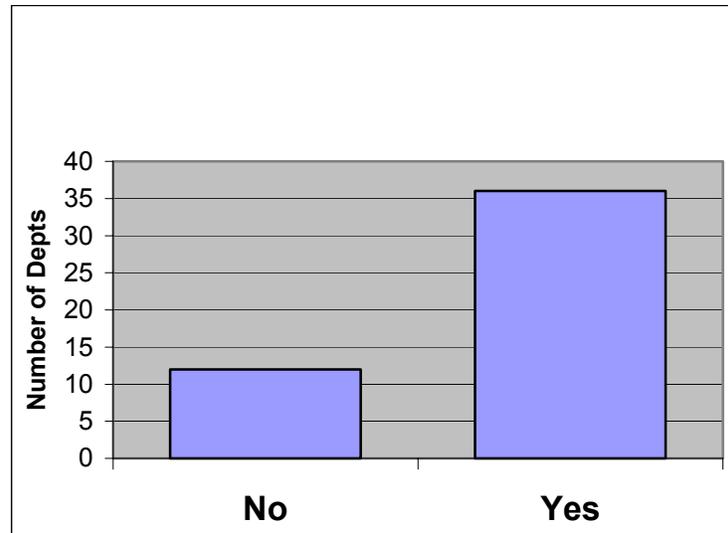
Those finding planning efforts useful concentrated the benefit in several areas, including:

- Hiring strategies
- Curriculum reform/revision
- Benefit of the process (e.g., "the process of planning was extremely useful," and "surprisingly, an effort several years ago to formulate a long-range hiring plan was extremely useful")
- Convincing administrations to devote resources ("planning and proposals to university administration has allowed us to receive new faculty positions")

Strategies used in planning include:

- Departmental retreats (annual, semi-annual, all day, etc.), sometimes with outside facilitators
- Outside review (Academic Program Reviews, Advisory Boards, etc.)

**m. "Is Undergraduate Student Recruitment / Retention an issue for your Department?"**



- Retention rarely mentioned in survey responses
- Revised curriculum and degree options to appeal to broader range of students (e.g., environmental, policy, biogeosciences, etc.); “Improving the pedagogical logic (as opposed to the disciplinary content)”
- Recruit from general education courses, using best, senior faculty to teach them, then good advising (“promote profession in large intro service classes,” “proactive recruiting from our general education courses”)
- Increasing field-trip opportunities for potential majors
- Hiring a full-time departmental recruiter for undergraduates
- Work with institutional admissions office and high schools

**4. NEXT STEPS**

- Disseminate results of survey to participating department heads.
- Incorporate summary results of survey into a web site, most likely within the [serc.carleton.edu](http://serc.carleton.edu) domain.
- Develop a workshop for department heads to address issues identified as a result of this survey and through other means.