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Survey of Geoscience Departments Finds Shared Goals and Challenges

Results of an online survey of a broad variety of geoscience departments at Canadian and U.S. colleges and universities have indicated a striking degree of common perspective across institution types. In the survey, which was sent to 900 institutions and completed by 364 respondents (for a response rate of nearly 40%), respondents noted that three of the most important measures of a successful department were effective curricula; recruitment of students, staff, and faculty; and building partnerships within and outside of their institutions.

The threat to a department that was most commonly mentioned by respondents across all institution types—whether 2-year, 4-year, master's, or doctoral departments, and whether public or private—was pressure from declining resources, although the type of resource (whether state, federal, or private) varied. Respondents noted varied opportunities, but interdisciplinary and multidisciplinary research and teaching were common themes and are growing trends that need institutional support structures.

The survey, conducted by coauthor Randy Richardson, was distributed and completed in late 2005. Over the past year and a half, the Building Strong Geoscience Departments program—a U.S. National Science Foundation–sponsored project focusing on helping geoscience departments adapt and prosper in a changing and challenging environment—has sponsored three workshops focusing on issues related to the results of this survey. Workshop participants have represented more than 100 geoscience departments. Their discussions have echoed the comments from this survey, suggesting that these issues are ongoing and convincing us of the value of making the survey results more widely known.

Survey Results

While future surveys could well take advantage of evolving definitions of department or institution type, we relied on the Carnegie Basic Classification, which classifies institutions of higher education according to degrees awarded, program size, and other factors (http://www.carnegiefoundation.org/classifications/index.asp?key=791). In our survey, 2-year college and master's departments each constituted 16% of survey respondents, while 4-year and doctoral departments represented 36% and 31%, respectively, of respondents. Of the departments surveyed, 54% had 15 or fewer full-time equivalent faculty positions, and 37% had only one to five full-time equivalent faculty positions. In addition to asking for basic information on numbers of faculty, students, and degrees, the survey also included questions about indicators of departmental success, opportunities and threats, recruitment and retention of students and faculty, and departmental planning efforts. Analysis of the results indicates that commonalities outweigh differences between institutional types.

A significant majority of respondents indicated that effective curricula and student recruitment are two of the most important measures of successful departments. Respondents from 4-year and master's departments considered the following important for success: curricula; teamwork; recruitment of students, faculty, and staff; and partnerships. In Ph.D.-granting departments, recruitment was the most important measure of success, followed by curricula and partnerships. In 2-year college departments, curricula was the most important factor, followed by partnerships (see Figure 1).

Departments were asked to identify major opportunities and threats anticipated in the next 3–5 years. All types of institutions reported opportunities in multidisciplinary science and in building new partnerships on campus, with other institutions, and with industry. Many institutions saw opportunities to expand into environmental, climate, and natural disasters studies, and into geographic information systems (GIS) technology. Some Ph.D.-granting institutions also mentioned opportunities to expand with biogeochemistry, geobiology, geodynamics, and geophysics studies. The 4-year, master's, and Ph.D.-granting institutions reported opportunities to partner with industry, especially given the economic growth and projected increase in employment in the energy sector. Private fundraising and outreach to alumni were also reported as opportunities. There were numerous comments about opportunities for the geoscience community—including increasing enrollment and demonstrating the relevance of geoscience programs to institutional administrators—as a result of recent natural disasters and major scientific programs such as EarthScope (a data-intensive project, sponsored by the U.S. National Science Foundation, using geophysical arrays to study the structure and evolution of the North American continent).

By far, the major threats indicated by all types of institutions were declining resources and budget cuts at all levels. These declines included not being able to replace retiring faculty, low salaries, inadequate staff support, and insufficient space. For the 2-year, 4-year,

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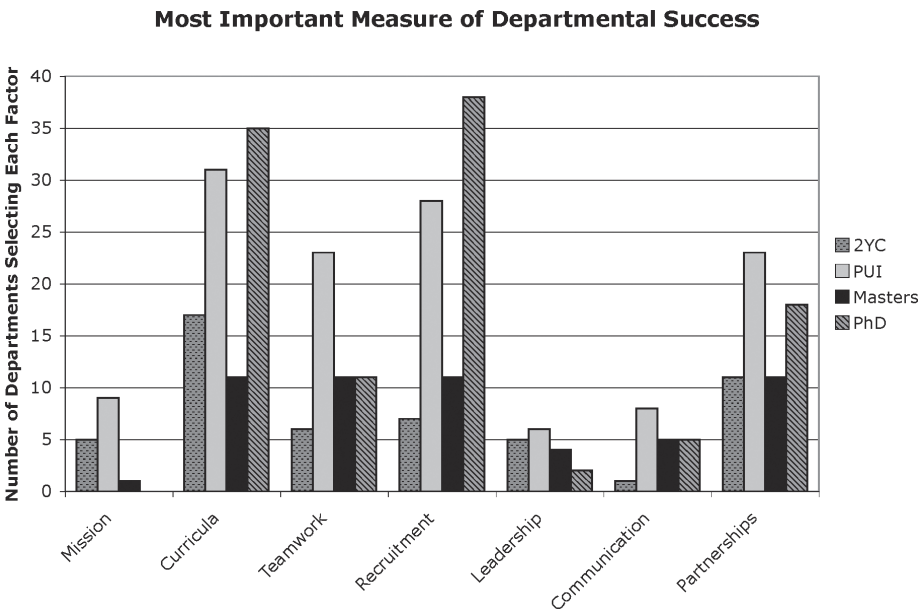

Fig. 1. Departments were asked to choose the most important measure of departmental success. Possible choices included defining the mission of the department to align with the institution vision; taking a proactive stance in building modern and dynamic geoscience curricula and, as appropriate, research agendas; working effectively as a department team; acknowledging that recruitment, development, and retention of students, faculty, and staff are key elements of departmental success, and working effectively in these areas; developing strong departmental leaders now and for the future; communicating success, using effective metrics, to colleagues, senior administrators, students, donors, and friends; and forging strategic partnerships within the university (e.g., with biosciences, engineering, environmental studies, or geography departments) and outside the university (e.g., employers or alumni). Curricula, recruitment, and partnerships were among the top three measures of success at all types of institutions, while teamwork was also seen as important at undergraduate and master's institutions.

and master's-granting institutions, low enrollment was a common concern. The Ph.D.-granting institutions cited the decline in federal research dollars as a major threat that is often beyond the control of the department or faculty. Other concerns included low faculty salaries and the high cost of housing relative to salaries. Also, concerns about the elimination of departments and reduced support, due to the perception by some university and college administrators that the geosciences are an outdated science, was expressed by numerous survey respondents.

Across institution type, student recruitment, much more than retention, was an issue. Many common recruiting strategies emerged, most focusing on what faculty can do in their courses and on building institutional support for the department and its programs. Faculty efforts include revising curricula to increase societal relevance, incorporating active recruitment efforts into introductory courses, maintaining a high level of contact with students, and emphasizing early opportunities for field experiences. At the institutional level, departments are working with their institutional recruitment offices, building relationships with institutions that provide potential new students—whether K-12 or community college, as appropriate—informing academic advisors about the geosciences, providing support for student geology clubs, raising scholarship money for undergraduates, providing space for students to study and congregate, and keeping departmental Web sites and publications dynamic.

Survey responses indicated some variation between institution types in their focus on recruitment efforts. Two-year institutions tended to emphasize employment opportunities, 4-year institutions tended to better coordinate efforts with institutional recruitment offices, master's institutions commonly cited the importance of relationships with K-12 schools and community colleges, and doctoral institutions tended to more often hire staff to help with recruitment.

Summary

While the survey found significant variations between institution types, the degree of common perspective across institution types was striking. This suggests that we can all benefit from sharing best practices, resources, and success stories.

The Building Strong Geoscience Departments project Web site, http://serc.carleton.edu/departments/index.html, has been designed to share successes and provide resources that address many of the issues raised in the survey, and includes pages on successful curricula, student recruitment strategies, and interdisciplinary research and teaching. Project principle investigators are Cathy Manduca, Carleton College, Northfield, Minn.; Heather Macdonald and Geoff Feiss, College of William and Mary, Williamsburg, Va.; and article coauthor Richardson. Workshop participants have shared their successful strategies, and these and other resources can be found at http://serc.carleton.edu/departments/workshops/index.html.

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