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The Grand Isle Project – The Strength of Lower Division Student Research

Over the past few years my research agenda has been challenged by the hurdles facing most faculty in non-tenure track appointments; high teaching loads involving mostly lower division non-major students, lack of access to research equipment, job instability and appointment in departments that devalue teaching and those who teach general education populations by favoring research-oriented upper division faculty with policies that restrict permission to submit grant proposals to tenure track faculty. Without access to funding, graduate students or majors, my areas of research have been limited to low cost activities in geoscience education or field research that can serve a dual teaching and research role. The students I have served in both 4 and 2-year colleges mimic the geoscience student population in 2 year colleges in that they were lower division students not on the path to a geoscience major or graduate program and who most likely would not be available to the project after a relatively short period. I designed research projects suitable for freshman/sophomores with limited geoscience background that build data sets through teamwork and cumulative effort over time. Such projects build student expertise quickly allowing "experts" with 1-2 years experience to mentor and support initiates to the project. To be successful for students, the research must lend itself to individual students' completing the research process of developing a question, taking part in experiments to test the question, collection, analysis and presentation of data on at least a part of the larger question in the time in which they will be involved with the project. To be meaningful to faculty, the research gains made by individual students over 1-2 year time frames need to support a larger effort that contributes to a meaningful research question, leading to long term financial support and professional development via publication for the faculty member.

In my case working out of Tulane University on a fixed term contract, a beach-monitoring project on Grand Isle Louisiana was such a project. Grand Isle is a rapidly subsiding and eroding barrier island accessible by road about 2.5 hours from campus. Erosion on Grand Isle is rapid enough that significant changes in the beach can be seen and measured on the time scale of semesters, with fundamental changes occurring from year to year. Further, the fate of the island holds significance as a popular and valued resource for the tourism and fishing industries and the island's residents. More importantly, the island provides critical support to the nation's oil industry and vital storm surge protection to metropolitan New Orleans. Grand Isle matters! Monitoring the beach sufficiently to make recommendations to local officials requires a research effort richer in eager hands and minds than in expensive equipment. Using seed funding from a service learning course grant, approximately 60 general education students each semester traveled to Grand Isle in teams to collect beach profile data. Students were able to measure the shape and depth of the beach from the dune line out to knee depth on a monthly basis during the academic year, allowing for the rapid movement of sand along the Grand Isle shore to be documented in near real time. New groups of students each semester lead by a dedicated crew of motivated student researchers from prior terms were able to see how their data could measure the shape of the beach and contributed to capturing the seasonal cycle, effects of hurricanes, response to beach nourishment projects by the Army Corps of Engineers and eventually the effects of the BP oil spill and its clean up when integrated over time. The student researchers involved over multiple semesters were able to produce results worthy of presentation at the national GSA meeting. Of greater importance, the students' field data was actually used by Grand Isle State Park officials, BP contractors and the National Guard to guide aspects of the clean up in real time. The model has been so successful that other park units in Louisiana have inquired how they might become involved with geoscience service learning courses!

It should be noted that the research conducted by the lower division students did NOT replace larger scale and more precise beach profile measurements conducted by well-funded research teams of graduate students and run by post docs from other universities. What the Grand Isle students had to offer was longer-term data with high spatial and temporal density in a critical location and the day-to-day experience knowing how the beach behaved, compared to very precise but widely spaced and rarely sampled transects by the outside researchers. The error bars on the lower division student data are certainly higher than that of the R1 researchers, but they were able to correctly identify the direction of the long shore current, the likely location of boom failure during oil clean up due to chronic localized erosion and the role of BP wind fencing and traffic in inhibiting growth of the dunes by aeolian forces. The better-funded researchers were not sufficiently present on site to recognize these issues and thus had little credibility to the stakeholders on the ground needing to make important decisions in real time. This identifies a key niche for 2-year college student research. Freshmen and sophomores working with equipment purchased with a $5000 service learning grant and $10,000 REU grant, guided by a faculty member with a 4:4 course load cannot compete in terms of expertise, equipment and field support with a team from a research I university operating on a $500,000 grant. They will not quantify the transport of sediment across the entire Louisiana Gulf Coast. But they were there to inform decisions that saved a salt water marsh, restored steam cleaned sand to a segment of a spit from whence it would not be immediately eroded and gave park officials the data needed to guide placement of future breakwater rocks and a donation of BP wind fencing to capture and expand the park dunes, allowing return of endangered piping plovers to nesting sites covered by thick tar mats only months earlier. The R1 researchers produced fine data for their archives but nothing of immediate value to Grand Isle.

Research of this local importance can be done effectively by 2 year college students, but only if the faculty member is given adequate security and support to sustain the project over multiple years. Faculty in adjunct or contingent appointments forced to cobble together an income teaching at multiple institutions are seriously undermined by this unethical model for staffing academic institutions, particularly as they are ineligible to get even minimal grants for their work because their institutions will not sponsor a proposal from a faculty member that they are unwilling to commit to for the duration of the grant. With courage this problem can be circumvented. As Chair of the Geoscience Education Division of GSA, I have brought forward a proposal that would have a scientific society such as GSA serve as the institution of record for faculty to use to submit and administrate grants. In such a system, the society would be the institutional home for the researcher and project regardless of the vagaries of contingent employment…allowing for long-term sustainable projects to be supported even if the students ultimately come from multiple institutions. GSA is studying the proposal at present. If this approach is successful, faculty and lower division students from 2 and 4 year colleges across the nation will have greater access to the support needed to make projects like that on Grand Isle possible.

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