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Working Towards Benefits and Economies of Scale in US Surveying/Geomatics Programs

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Abstract

The model for surveying education that was adopted, possibly by default, in the 1970s was built around each state having a surveying program. The rationale for this was that each state has its own specific way of dealing with land and property, and should therefore educate professionals with state-specific knowledge. While this model was modified in some cases, such as the New England states developing one common program and other states developing more than one program, the model has remained largely intact to this day.

This model contrasts starkly with that adopted in Europe and Canada. In these countries, programs were concentrated. While this involved students going to a specific university, most European countries are small enough and with sufficient public transport that this isn't a major issue.

The consequences of the US model are apparent today. The largest program in the US has fewer than 10 faculty, and most have 4 or fewer full-time faculty. The main programs in Canada have more than 10 faculty each, as do most of the European programs. The small numbers of faculty places all the US programs into the 'marginal' category for survival. Departure of one or two faculty, restructuring of a college, and the repeated budget cuts make it all too easy for a program to close, or get run down to the point where it struggles to continue.

Small programs do not have the luxury of the resources to put significant effort into recruitment, program expansion, new equipment, courses in new, leading edge fields, and the ability to allow faculty to take sabbaticals. Every change carries the risk of something going wrong and bringing more survival pressure on the program.

Adding to the problems is the fact that surveying and geomatics programs are expensive to set up and operate. Equipment changes rapidly, and it is not hard to have \$1 million in equipment for the program sitting in laboratories. As programs are often in engineering colleges, salaries can be at an engineering level, rather than at a humanities level, which can attract the attention of administrators looking to save money. Without the resources to tackle student recruitment, it becomes difficult to bring up student numbers and ensure long-term viability.

Within the ivory tower, faculty are called upon to take up increasing amounts administrative work, as administration continues to expand. Faculty on fixed salaries cannot get overtime, and so are

seen as an infinite resource that is available at a fixed cost. While effort is directed to administrivia, other more important functions get less attention. Teaching, research and non-university service get less time, as does actually running the program to be a long-term viable entity. Recruitment becomes more difficult and less productive as a result.

Another effect of the small faculty numbers are that programs have great difficulty offering courses that involve major specializations. A number of programs in the US have little to no photogrammetry or remote sensing, despite these fields being at the forefront of the technological revolution in the discipline. Very few programs offer any significant amount of hydrographic surveying. Many programs have only a handful of elective courses that they offer. Some programs have outsourced important parts of their program, such as GIS/LIS, to geography departments who may not understand errors and quality measures in any depth, and may have no real understanding of cadastral issues and LIS.

With few faculty, what can be offered is limited to the interests and skills of the current faculty. The departure of one faculty member can cause a major disruption if their courses cannot be covered by anyone else.

In summary, US surveying and geomatics programs are unable to take any advantage of the economies and benefits of scale, because the model works against these advantages. In order try to take advantage of these economies and benefits, we would need to try something different.

There were discussions some years ago about offering courses at more than one institution, but while a few were set up and run, these were not widespread. Various internal problems led to the experiment being largely ineffective in dealing with any of the problems listed above.

Coolgardie LLC was created to help solve some of these problems. It seeks to do this by creating and offering a range of services to surveying and geomatics programs. These services include the following.

Courses

- On-line courses that provide common material, but can still be customized to each program's curriculum.
- On-line courses that offer electives that may be beyond the resources of a program to deliver.
- On-line courses that are offered on a charging basis that allows a program to offer courses to any number of students, even one, without losing money.
- Support for faculty to transition from teaching to mentoring and supporting students taking these on-line courses.

Teaching Support Materials

- Support materials for instructors and students, including new textbooks.
- Labs designed to complement on-line materials.
- Support for labs for faculty with limited workplace experience.

Support Services

- Support for student recruitment, including recruitment plans and materials.
- Support for accreditation efforts.
- Support for prioritization efforts.
- Support for restructuring and program expansion.

It is hoped that these services will help support US programs and avoid more programs having existential crises.