Certification for Oceanographic Professionals: A Needs Assessment Study

Executive Summary

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Certification is a way to recognize that an individual has demonstrated professional competence and integrity in an occupational field. The Marine Advanced Technology Education (MATE) Center undertook a study from September 2006 to September 2009 to assess whether there is a need for a voluntary certification program for oceanographic professionals (CPOP) in the U.S. We defined *oceanographic professionals* as workers whose primary occupational focus revolves around studying, measuring, managing, and/or forecasting the ocean, including its physics, geology, biology, and chemistry for scientific, commercial, defense, environmental protection or other purposes.

Funded by NOAA, the study was motivated in part by the rapid growth in recent years of operational oceanographic activities and ocean observing systems, and the increased public attention to ocean issues. The project explored the advantages and disadvantages of a certification program by examining certification programs in similar fields of expertise, and collecting and analyzing data on the opinions about the need for, and structure of, a CPOP. A CPOP has the potential to: improve ocean-related education, enhance professional development for oceanographic professionals, help meet national ocean-related workforce needs, and assist users of oceanographic products and services in making well-informed decisions. In this report we present an analysis of the data collected and make recommendations to the oceanographic community on whether and how to proceed with future certification efforts.

A number of professions similar to, and comparably diverse as, oceanography have one or more professional certification programs administered by professional societies or independent bodies. The number of certified individuals is small relative to the number of people in those professions. There are no existing certification programs in the U.S. specifically for oceanographers. A small fraction of what oceanographic professionals do is covered by existing U.S.-based certification programs in other fields (e.g. professional certifications in meteorology, fisheries, engineering, hydrography, and ecology). The Institute of Marine Engineering, Science and Technology (IMarEST) in the U.K. grants the credentials Chartered Marine Scientist and Chartered Marine Technologist, which are available to citizens of any country who meet the requisite qualifications, which generally include at least a master's degree or the equivalent. As far as we have been able to determine, the Chartered Marine Scientist and Technologist credentials, along with Registered Marine Scientist and Registered Marine Technologist, newer IMarEST credentials that provide recognition for individuals who have only a bachelor's degree but achieve the same competencies as for chartered status, are the only marine science/technology professional certifications anywhere in the world.

We sought to solicit input on the need for a CPOP in the U.S. from oceanographic professionals with differing levels of expertise covering the diversity of oceanographic disciplines and working in a wide variety of capacities, as well as users of oceanographic products and services. To accomplish this, we employed a variety of methods including meetings with appropriate professional societies, interviews, surveys, and workshops. To stimulate discussion and inform our target audience about professional certification, we drafted a multi-level, multi-track, multi-discipline/specialty certification framework, incorporating elements from existing certification programs in environmental professions.

During the course of this study, we interacted with over 600 people with an interest in the ocean science, technology, operations, and policy arenas. Up to half of them were previously unfamiliar with professional certification programs in the environmental professions. Among the 330 people we surveyed and interviewed, just over half were undecided or did not express an opinion for or against a CPOP. Among those that did express a definite opinion, more than twice as many supported the idea of a CPOP as rejected it. The most popular reasons cited in support of the creation of a CPOP are that it would help identify qualified individuals by documenting experience and proficiency in a way that other measures do not, and that it would promote career-long learning through continuing professional development requirements. The reasons most often cited in argument against a CPOP are the difficulty in defining a certification program for a field as diverse as ocean science/technology, and that voluntary certification could lead to mandatory licensure in the future.

Two-thirds of the 202 survey respondents felt that certification should be aimed at practitioners with a bachelor's as their highest degree, while only a third thought certification should be aimed at individuals with a doctorate in the field. Slightly less than half thought certification should be geared to those with a master's or associate's as their terminal degree. (Note that respondents could indicate more than one degree level at which they thought certification should be aimed.) Over half the survey respondents identified operational oceanographers/forecasters and technicians as occupational areas for which certification would be most useful. These are the same areas which were named most frequently in the interviews and in written comments.

The time and effort needed to start a new professional certification are substantial, and such an endeavor should not be undertaken lightly. There are undoubtedly some enthusiastic supporters of certification, but it is not clear that the broad support, or even a sufficiently large highly motivated group, has been identified to effectively carry out such an effort. Right now there is a high degree of ambivalence and misunderstanding within the oceanographic community as to what professional certification is, although we did not encounter widespread negative reaction to the idea of a CPOP. Without a requirement, or at least strong incentive, there may not be enough impetus for people to apply for professional certification. But an argument can be made that oceanographic professionals should have the opportunity to demonstrate their professional legitimacy, as do their peers in environmental and earth sciences that have professional certifications or, in the case of geologists and engineers, licensing.

As our following recommendations make clear, we do not think it would be productive to force a certification program from the top down. We believe the effort expended to educate and engage all parties (potential applicants for certification, employers, users of ocean products and services, educators etc.) upfront, and throughout the process, would be worthwhile in the long run.

Our recommendations concerning development of a CPOP are:

1. Follow a process similar to that used by IEEE to decide whether and how to proceed with a certification program. This lays out specific go/no-go decision points. Interested parties including employers, professional societies, practicing oceanographic professionals, and educators should have an opportunity to weigh in on these decisions.
2. Make sure there is a dedicated corps of people to set up and run a program before initiating it, since certification programs depend heavily on volunteers to run them.
3. Ensure there is a market among employers. While we have identified some employers who would welcome certification for oceanographic professionals, it is not clear that there is broad enthusiastic support at this point.
4. Identify and educate the target audience for certification, as well as users of oceanographic products and services.
5. Start with a carefully defined program for a subset of the ocean occupations. Operational oceanographers/forecasters and marine technicians are two occupations that have been identified as perhaps being ripest for such an effort. In this country, there are a limited number of large employers of operational oceanographers/forecasters, so any certification efforts in this area should be further pursued with them.
6. Learn from existing programs, several of which have offered their experience and expertise.
7. Consider partnering with other organizations already operating certification programs in related or overlapping fields.
8. Consider a governance structure independent of professional societies.
9. Investigate liability issues.
10. Require an exam and continuing professional development as part of a CPOP.
11. Seek national, or even international, accreditation from an organization such as the Council of Engineering and Scientific Specialty Boards, the American National Standards Institute, or the National Commission for Certifying Agencies.
12. Choose a name and logo, and start the trademark application process early, as this process apparently can take quite a long time.

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