

**Sept. 29, 2008**

**Frequently Asked Questions**

**The Report to Congress: The Shortage in the Number of Individuals with Post-Baccalaureate Degrees in Subjects Related to Fishery Science**

**What is the extent of the shortage projected in the report and how will this affect the operation of NOAA's Fisheries Service?**

The Report to Congress projects a shortage of between 20 and 180, with a likely shortage of between 100 and 180 stock assessment scientists for the nation in the next decade. As the largest employer of stock assessment scientists, NOAA will be significantly affected by this serious shortage. It will hamper the nation's ability to conserve, manage and rebuild depleted stocks. It will also slow NOAA's ability to do ecosystem-based management, an approach to rebuilding and sustaining populations, species, biological communities and marine ecosystems at high levels of productivity and biological diversity. A shortage would force NOAA's current stock assessment scientists to take on increasing workloads, making it harder for scientists to spend time on new research and the development of improved monitoring, both of which are crucial to advancing fisheries management and the conservation of marine mammals and other protected species. Overloaded scientists will be unable to publish as many peer-reviewed articles that help advance fisheries science for the national and international community and improve the management of depleted species globally.

**Why is there a shortage of fisheries stock assessment scientists?**

The number of stock assessment scientists coming out of academic institutions is not keeping pace with the growing demand for fisheries stock assessment scientists. Legislation, including the Magnuson-Stevens Fishery Conservation and Management Act, the Endangered Species Act and the Marine Mammal Protection Act, has given stock assessment scientists a greater role in fisheries management. The Magnuson-Stevens Act now requires that annual catch limits be set by 2010 for an estimated 40 fish stocks that are considered overfished and for the approximately 500 other stocks by 2011. At the same time that there is greater need for stock assessment scientists at NOAA's Fisheries Service and other agencies, the proportion of population dynamics faculty on university campuses is declining. The problem is exacerbated by insufficient funding to support graduate students.

**What does a fisheries stock assessment scientist do?**

Stock assessment scientists conduct high quality scientific research to determine the current status and future trends in abundance and productivity of marine species. They provide key advice to policymakers who set fishing quotas designed to allow for sustainable fishing over the long-term. A quantitative stock assessment requires monitoring of fish catch and abundance, and an understanding of how biological characteristics affect marine species. These scientists take into consideration information about habitat, migration, population structure and behavior when designing models. Scientists feed several data sources into mathematical models that help forecast how various management measures will likely affect the long-term catch, abundance and sustainability of a stock.

### **What are the skills needed for success in the field?**

Stock assessment scientists must have an understanding of ecology, biology, math, statistics, and computer science. In order to gain the coursework and research experience needed, a stock assessment scientist is required to have at least a master's degree, and in most cases must complete a doctorate.

### **Where do fisheries stock assessment scientists work?**

The largest employer in the U.S. is NOAA's Fisheries Service. NOAA employs approximately 90 stock assessment scientists. Stock assessment scientists are also employed by other federal, international, state, and tribal fisheries management agencies. Commercial and recreational fishing groups, non-governmental organizations and environmental consulting firms also employ stock assessment scientists to represent and advise them.

### **Why are fewer people teaching in this field when the demand is growing?**

Universities, faculty and students may not understand the current and projected need for more fisheries stock assessment scientists, and with it, the increases in funding that are likely. That is why this Report to Congress is so important. Historically, stock assessment science has not received the headlines and has not drawn as many students as other aspects of marine biology. Children don't grow up saying they want to be stock assessment scientists. Funding has also been a deterrent in the past. Key criteria used to decide among disciplines when hiring new faculty is the amount of research funding available in each discipline. Currently, in the biological sciences, the disciplines of bioinformatics, genetics, ecotoxicology, and molecular biology have the greatest potential to bring in research funding from the National Institutes of Health and the National Science Foundation. In comparison, the discipline of fisheries stock assessment with funding from NOAA's Fisheries Service has had much smaller potential.

### **What is attractive about the profession?**

Stock assessment scientists play a major role in our nation's efforts to rebuild the depleted stocks of fish, marine mammals and other marine species. They are the unsung heroes in several recent environmental success stories for fish species, including the rebuilding of swordfish, scallops and other fish stocks. Stock assessment scientists are able to get outside and work in the field. They collaborate with biologists, policymakers, fishermen, and others on a routine basis. They're job is similar to a detective who must solve a natural resource problem. Travel is an important part of their job enabling them to work with professionals from across the region, country, and world. They continually work on a variety of projects, which keeps their work new, exciting and challenging. Stock assessment scientists receive great satisfaction from outlining and testing the best methods to bring about the recovery of our nation's marine resources.

**Does this profession attract more men than women or vice versa?**

Historically, the vast majority of stock assessment biologists were male. However, this is changing. The ratio of females to males accepted into NOAA's Fisheries Population Dynamics Recruiting Program has been 2:1 female to male, and higher, in recent years. This trend is not unique to stock assessment science, as an increasing number of young women pursue higher education in the biological sciences.

**What can be done to eliminate the projected shortage of fisheries stock assessment scientists?**

NOAA's Fisheries Service has established a number of fellowships, internship and recruiting programs aimed at increasing the number of stock assessment scientists. NOAA has increased the number of population dynamics faculty at universities by encouraging its stock assessment scientists to work as adjunct professors and by stationing stock assessment scientists on select college and university campuses with strong fisheries programs. NOAA's Fisheries Service provides funding to universities to conduct fisheries research. This in turn provides financial support to graduate students and postdoctoral associates. In addition, the Fisheries Service works with the Sea Grant College Program to offer fellowships to doctoral students. The Fisheries Service, through its parent agency NOAA, offers scholarships and internships to undergraduates to help identify, support and recruit students interested in fisheries science careers. One particular program, the Population Dynamics Recruiting Program, identifies, trains and mentors promising undergraduates in this discipline.

While effective, the current fellowship, internship and recruiting programs are not sufficient to eliminate the shortage. They must be expanded. In addition, NOAA must encourage institutions of higher education to place a higher priority on quantitative training of undergraduates and to increase faculty numbers and course offerings in this important discipline.