

THE STUDENT CAREER EXPERIENCE PROGRAM

A Door to a Career with the National Weather Service

BY WARD R. SEGUIN AND STEPHAN B. SMITH



FIG. 1. Former Howard University student Shari Dixon and Florida State University student Bruce Veenhuis confer on MDL projects. Both have recently been hired by the NWS.

Concern has been expressed for sometime that there is a large and perhaps growing imbalance between the number of new atmospheric scientists graduating from universities in the United States and the number of employment opportunities available to them (Hanson 1993; Mass 1996; Knox 2008). Knox, in particular, sought to quantify trends using data from the U.S. Department of Education's National Center for Education Statistics (NCES; <http://nces.ed.gov/programs/digest/>) and the American Meteorological Society–University Corporation for Atmospheric Research (AMS–UCAR) online database (http://ametsoc.org/amsucar_curricula/index.cfm). Such a growing imbalance, if true, would, in theory, represent a favorable situation for both private and public sector employers of atmospheric scientists, in that there would be far more than enough skilled recent graduates available to fill their entry-level positions. However, because most students lack relevant work experience, ►

in practice it can be difficult for employers faced with large applicant pools to distinguish the potential top performers from those who are merely minimally qualified to do the work. In this paper, we will examine how the National Weather Service (NWS) of the National Oceanic and Atmospheric Administration (NOAA) avails itself of the federal Student Career Experience Program (SCEP) to mitigate the risks associated with entry-level hiring. Along with describing the basic aspects of the SCEP, we will take a look at how very functionally different organization units within the NWS have implemented the SCEP to best fit their needs. Last, we will present some basic agencywide statistics that show that the students participating in SCEP have a very high likelihood of being hired as full-time NWS employees after graduation.

The NWS employs personnel from a number of different physical science disciplines, such as meteorology, hydrology, and physics, as well as supporting disciplines including mathematics, statistics, computer science, and electrical engineering. Individuals with backgrounds and degrees in these disciplines perform an incredibly broad range of duties within the NWS: everything from issuing tornado warnings to establishing new service policies to developing decision support software and even operating and maintaining field-observing systems. The key to carrying out the NWS mission is its employees. The future of the organization depends on the ongoing development of the current workforce and recruiting the very best meteorologists, hydrologists, physical scientists, engineers, and support staff to replace those lost through attrition.

One of the very best ways the NWS identifies promising future employees is through the SCEP. The SCEP is a U.S. Office of Personnel Management program that “provides Federal employment opportunities to students who are enrolled or accepted

for enrollment as degree seeking students taking at least a half-time academic, technical, or vocational course load in an accredited high school, technical, vocational, 2 or 4 year college or university, graduate or professional school. The Student Educational Employment Program of which SCEP is part was established December 16, 1994” (additional details can be found at www.opm.gov/employ/students/intro.asp). The program is designed to provide real-world work experiences directly related to a student’s educational program and career goals. This program goes back many years under such names as the Student Trainee Program, the Cooperative Education Student Program, and now SCEP. Many senior NWS employees owe their start to these programs.

The SCEP allows students to demonstrate their potential for long-term employment through their work habits, enthusiasm, interpersonal skills, critical thinking, and dedication to the mission of the NWS. In addition, SCEP students are also able to exercise their understanding of basic core concepts and disciplines fundamental to NWS, that is, atmospheric and hydrologic science, computer science, and as the role of a government agency to serve the public. The SCEP greatly facilitates the new employee’s transition from the academic environment to the career work environment. It also allows students to refine their career choices, be it in operational services or in research and development.

Undergraduate and graduate students compete for SCEP positions, but they earn their eligibility for career conditional or career appointments upon graduation without further competition. Students must complete at least 640 hours (16 weeks) to be considered eligible for conversion to a position upon graduation. While in school, undergraduate students are eligible for general schedule (GS) grades (salary levels) 3–5, depending on the level of schooling completed. Similarly, graduate students are eligible for grades 7–9 while in school.

The SCEP enables students to schedule school attendance around periods of career-related work. While in the program, students are eligible for promotions, awards, annual and sick leave, the federal retirement system, and health and life insurance. Students can avail themselves of flexible work schedules and assignments, and gain exposure to public service while advancing their educational goals.

NWS field offices, regional headquarters, national centers, and laboratories tailor the SCEP to their individual needs. Students can apply for positions in meteorology, hydrology, engineering, and information science/technology. Some forecast offices allow

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students to work part time while they continue to attend school, whereas some laboratories request their students to work full time and alternate work periods with school semesters. Meteorologists in Charge (MICs) of Weather Forecast Offices (WFOs) often look for undergraduate students who have completed their junior year of school because by that juncture they usually have completed several meteorology courses of sufficient difficulty to determine if they really want to complete a degree in meteorology. A college junior is usually able to “spin up” more quickly than most freshmen or sophomores, which is important for the WFO mentor, who is responsible for introducing the SCEP student to office operations. To increase their chances of being selected for the SCEP, some students do volunteer work at offices prior to completing their junior year of college. Some students are first hired under the Student Temporary Employment Program (STEP) and later converted to the SCEP. Unlike the SCEP, the STEP does not have the advantage of noncompetitive conversion to permanent employment upon completion.

When SCEP students graduate, they are given 120 days to find permanent employment with the NWS or another federal agency. SCEP students usually work with their SCEP coordinators to find a full-time position. In the regional headquarters, the SCEP coordinator has knowledge of existing and/or possible upcoming vacancies. In addition, graduates can review available agency openings and seek their current office’s assistance in contacting offices with vacancies. Offices with these openings welcome these overtures because they can count on SCEP students having highly relevant work experience in addition to the fact that their hiring process is greatly simplified because of the noncompetitive conversion. Some regional SCEP coordinators forward a list of students who have graduated to the MICs for their consideration in filling forecast office vacancies.

STUDENT DUTIES AND EXPERIENCES.

Tours and assignments vary depending on where the student participates in the SCEP. At WFOs, SCEP assignments are used as orientation and familiarization for meteorologist intern positions. Work tours usually occur during the summer vacations and are supplemented by holiday and spring breaks. However, some WFOs, particularly those collocated with university meteorology programs, allow students to work part time during the school year. Students can start out in a customer service position in which they learn to answer the telephone and e-mails for the purpose of providing the public with forecasts, data,

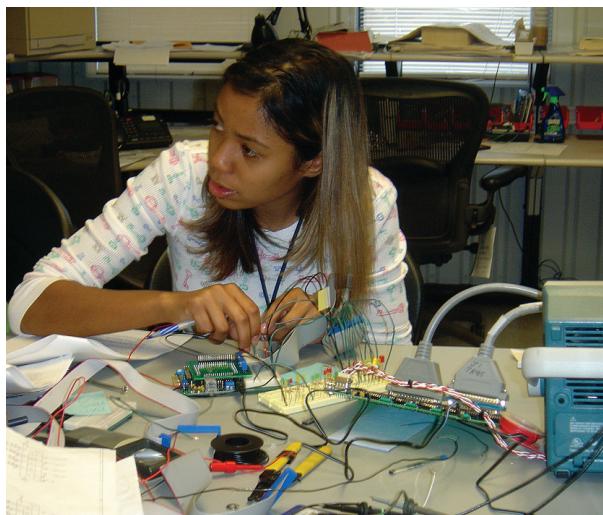


FIG. 2. Shawna Ong, ROC SCEP student, testing a transmitter simulator she designed and built. Ong is studying electrical engineering at the University of Oklahoma.

and information. Later, they are trained to receive and quality control data and to take surface observations for climatological records. Students can be asked to help write general weather summaries for NOAA Weather Radio and to monitor its broadcasts. Some students are introduced to grid-editing software used for analysis and forecasts. For those WFOs with an upper-air program, students may have an opportunity to be trained and certified to calibrate sondes, to release the balloons, and to acquire the data. Many students take on special projects that can involve climatological or case studies of severe weather events for the WFO. Depending on study outcomes, results may be used to improve local forecasts and may be published as technical bulletins and peer-reviewed articles. SCEP students have completed a number of beneficial projects, including the development of directories for volunteer storm spotters and emergency managers and a text messaging system and database for sending hazardous weather information to spotters, emergency managers, local government officials, school districts, and first responders. SCEPs have also participated in outreach activities, including talks to civics groups on storm safety.

SCEP students can be given activities to gain experience for specific positions. Those interested in forecasting can work with forecasters to analyze data and assist in preparing the forecasts. If students are interested in Warning Coordination Meteorologist (WCM) duties, they can work with the WCM in interacting with emergency managers, compiling storm data reports, providing “weather” talks to

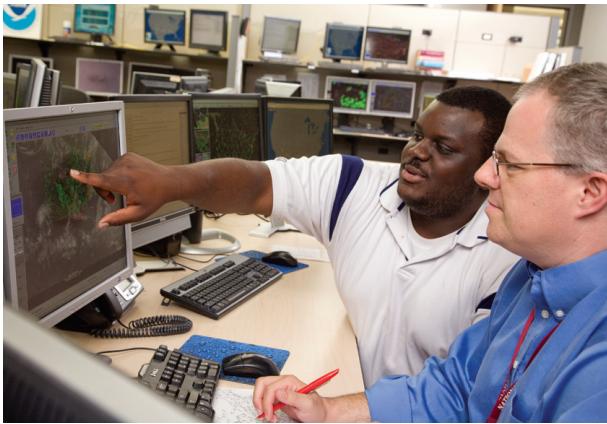


FIG. 3. Ashton Cook, a student at the University of Oklahoma, working with Jeff Peters, SPC Mesoscale/Outlook Forecaster.

schools and civic organizations, and hosting tours of the WFO. Students interested in Science Operations Officer (SOO) activities can assist in preparing training materials, developing mesoscale models, and transferring science from research to application at the WFO. Students are given opportunities in each of these areas so they can find their interests.

Assignments with River Forecast Centers (RFCs) can provide quite different experiences. These offices have broad missions ranging from river forecasting and drought support to water resource management and support for flooding associated with hurricanes, winter storms, coastal storms, and so on. RFCs seek students with a strong interest in hydrologic forecasting, particularly as it relates to water resource management and river forecasting. Students can be asked to become involved in research projects on water resources. They can work with senior hydrologists and meteorologists to quality control field data, prepare narratives for the hydrometeorological conditions within a river basin, coordinate with forecast offices, and perform software maintenance and development.

The centers of the National Centers for Environmental Prediction (NCEP), such as the Aviation Weather Center (AWC), National Hurricane Center (NHC), and the Storm Prediction Center (SPC), also host students. Because the SPC is collocated with the University of Oklahoma's meteorology program, SCEP participants can work concurrently on undergraduate or graduate degrees. Research projects initiated at SPC have served as the initial work toward graduate dissertation papers. As an example, one student performed extensive research on microbursts in the southeastern United States, which has provided SPC forecasters with a better database

of environments most likely to produce these historically difficult-to-forecast events.

The NHC has a long history with the SCEP and its predecessors. SCEP students at the NHC undertake a wide range of applied research and development activities aligned with operational needs. In 2009, the National Weather Association recognized one of the NHC's newest permanent employees for the research she did at the NHC as a SCEP student. One of the SCEP students' most helpful and rewarding contributions is derived from their participation in the NHC's "Hurricane Support Meteorologist" (HSM) program during the hurricane season. While assisting an HSM, they can assist forecast operations by analyzing tropical cyclone data, providing audio interviews to media, and responding to public inquiries. SCEP students also occasionally get involved in doing NHC's "poststorm" analysis and documentation, where they help develop the NHC's official report on storms. Students also have the opportunity to learn and assist in the operation of the NHC's Tropical Analysis and Forecast Branch.

At the AWC, students have the opportunity to understand how various international and domestic aviation forecasts are developed and issued. Students are exposed to the "phraseology" of area forecasts and the use of global models and satellite data, as well as interactive software used to analyze and prepare the products. They are also given the opportunity to perform ancillary duties, such as organizing and recording interagency meetings, verifying forecast products such as the operational aviation icing forecasts, and helping to develop and maintain AWC Web pages.

The Meteorological Development Laboratory (MDL)¹ of the Office of Science and Technology has hosted more than 170 students over the last 30 years. During the height of the NWS modernization in the 1990s, MDL hosted almost 20 students per year. Today, MDL typically has 3–5 students on board in any given year. Because MDL is a development organization, most students devote much of their time to developing and programming statistical forecast and verification techniques for Model Output Statistics (MOS) and applications for the agency's Advanced Weather Interactive Processing System (AWIPS). They are exposed to all facets of development, including analysis, design, coding, testing, and documentation. Students are afforded the opportunity to work with senior-level meteo-

¹ Previously named the Techniques Development Laboratory of the Office of Systems Development.

rologists or computer scientists on development and implementation of statistical prediction techniques. The students develop and assess the performance of those techniques. In certain instances, the students create or modify software tools used to develop or implement those techniques.

The Radar Operations Center (ROC) hosts electrical engineering SCEP students. The ROC assigns a senior engineer to mentor its SCEP students, who are given a mix of high- and low-level assignments requiring a variety of engineering and other technical skills. In the past, students have been asked to design and build test devices to simulate the capability of expensive and difficult-to-obtain hardware, or to make modifications to existing equipment that affects the entire Weather Surveillance Radar-1988 Doppler (WSR-88D) radar network. One student modified a radar pedestal simulator to simulate the response of a radar antenna pedestal. Another student worked with his mentor to develop a transmitter trigger amplifier modification that tripled the reliability of the WSR-88D transmitters. The student developed a test capability, tested 420 new diodes, and grouped the diodes in matched sets. As a result, the student was included in a group Department of Commerce Bronze Medal award. The ROC has also assigned student engineers to assist in reviewing major hardware and software modification documentation and engineering drawings for accuracy and completeness as part of the formal acceptance process.

PLACEMENT OF SCEP STUDENTS IN THE WORKFORCE. Over the last 5 years (2005–09), the NWS hired an average of approximately 275 new people every year across the agency, including support staff. Of the 275 people hired, approximately 120 were in entry-level positions (i.e., positions that can be filled by graduated SCEP students), such as meteorologists, hydrologists, and engineers. During this same 5-yr period, approximately 35 SCEP students per year started their student career experience program, and approximately 30 SCEP students graduated per year from the program and were converted to career conditional appointments. In other words, during this period, 85% of all SCEP students became full-time permanent NWS employees. Clearly, acceptance into the NWS SCEP, while not a guarantee of a full-time position in the NWS, provides students with a very solid opportunity to start their careers with the agency. In addition, with SCEP students filling approximately one-third of all available entry-level positions, it is evident that the SCEP is helping NWS meet a significant percentage of its current need for

new employees. The number of SCEP opportunities has increased recently with the NWS's decision, in 2008, to centrally fund a number of SCEP positions. As a result in 2009, 64 SCEP students started the program.

From a demographic standpoint, SCEP students are more diverse than the NWS's current workforce, particularly with regard to gender. During the period 2007–09, 59% of the incoming SCEP students were males and 41% were female. During the same period for the NWS as a whole, the workforce was 81% male and 19% female; 14% of SCEP students were minorities compared to 12% for the entire NWS workforce.

The average number of students on board varies. Most students work in NWS operational field offices, with one field office located in each of the six regions (refer to www.nws.noaa.gov/organization.php). For example, over the last five years, the average number of students on board per year in the southern region offices has been approximately 22, of which an average of 7 students per year converted to permanent positions within the region. The central region has had an average of six students per year on board and has placed an average of five of its students per year within the region. For the period of 2004–09, the eastern region has had 26 students on board and has been able to convert 18 to permanent positions upon graduation. These numbers, however, can be quite variable from year to year. For example, the southern region was able to place 11 students in permanent positions in 2005 and only 4 students in 2007.



FIG. 4. Nick Hampshire, a recent SCEP graduate, prepares to release a rawinsonde at WFO Fort Worth. Hampshire was certified in the upper-air program while a SCEP student.

The Meteorological Development Laboratory has had an average of four students per year and has placed an average of two in permanent positions within the NWS. The ROC has had three students, two of which have graduated from the program. The first student accepted an ROC position on graduation and later took a position with the Federal Aviation Agency. The second student took a civilian position with the U.S. Air Force following graduation.

Students who are not selected for positions in the regions, NCEP centers, or laboratories in which they were initially hired, can apply for positions in the other regions or with other components of NOAA, such as the National Environmental Satellite, Data, and Information Service (NESDIS) and the Office of Oceanic and Atmospheric Research, or with other federal agencies, such as the U.S. Geological Survey, the National Aeronautics and Space Administration, and the Federal Aviation Administration. Over the years, MDL has been successful in placing its SCEP students who majored in meteorology at NCEP, NESDIS, and in field positions at WFOs. Many of the computer science majors leave the agency to accept higher-paying positions in the private sector. Sometimes these external positions are with private firms that support the NWS.

APPLYING FOR A SCEP POSITION. Each year, the NWS begins a 1-month SCEP national recruitment period in mid-January. More than 200 colleges and universities are notified. Applications are due in mid-February. The applications are reviewed centrally and an attempt is made to match the top candidates with the positions that exist throughout the agency. Questions about the national recruitment and application process can be addressed to nws.scep-reply@noaa.gov. The national recruitment program is highly competitive. The 2010 announcement yielded 247 applicants of which 54 were selected to begin the SCEP (22% acceptance rate). In addition, some organizations in NWS, such as MDL, carry out SCEP recruitment year round. Students are encouraged to contact WFOs and other organizations in the NWS directly (www.weather.gov) to inquire about SCEP or volunteer opportunities. Volunteering at an NWS office may increase the chances of a student being accepted into the SCEP at a later date.

SUMMARY. A position with the NWS has long been a goal of many students graduating with bachelor's, master's, and doctoral degrees in meteorology and hydrology. This goal has been and

is increasingly difficult to realize, particularly for meteorology graduates, because the average number of entry-level physical scientists the NWS hired over the last five years has averaged about 120 per year, including SCEP students converted to career conditional positions, while universities are generating between 600 and 1,000 new bachelor's degree recipients each year (Knox 2008). Having a large pool to draw on for filling the few vacancies that exist would normally be considered a good situation. However, for entry-level positions, where most applicants are coming straight out of university programs and possess little relevant job experience, distinguishing between the qualified candidates who will merely be able to do the work and those who will excel as NWS employees is challenging. The SCEP greatly mitigates this challenge.

The SCEP is an excellent way for the NWS to bring in fresh ideas, experience, and knowledge through the student and to reach the faculties of universities and to tap into their research and development. It allows the NWS manager to recruit exceptional individuals into targeted positions for workforce and succession planning, and to evaluate them in real work situations. It allows the agency to noncompetitively convert the students to permanent positions upon completion of degree programs.

For the students, the program is an opportunity to “get their foot in the door” and to refine their career paths. All of these opportunities expose students to working on special projects and conducting research and development, which can lead to published reports and conference presentations. Students learn about the NWS organization, its mission, and how the mission is carried out. Some students discover the work they are exposed to as a SCEP student is not what they want to do as a career. Others who had planned to attend graduate school decide they would like to enter the NWS operational world rather than immediately pursue graduate degrees or to work in a research and development position. Regardless of experiences, these students are acquiring position and life skills that will serve them well on jobs taken immediately after graduation and in future more senior positions. As one former SCEP student stated: “When I have interviewed and hired programmers, I have found that the candidates that had co-operative education experience always transitioned into an office environment easily . . .” Another former SCEP student stated: “The SCEP was an invaluable experience to guide me onto my career path, and to provide me with the skills needed to help me succeed . . .”

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