P1.1 A DECADE OF EDUCATION AND OUTREACH PROGRAMS AT A NATIONAL WEATHER SERVICE FORECAST OFFICE

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1. INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) continues to be an important partner in educational efforts for the public, whether it is a senior citizen or philanthropic group, or the K-12 education community. Many NWS offices have some sort of outreach program with the communities in the County Warning Areas (CWAs) that they serve, especially since the NWS' Modernization and Associated Restructuring (MAR) was completed in the late 1990s. NWS Taunton has been at the forefront of educational outreach efforts, reaching thousands of citizens each year since moving from Boston's Logan International Airport to the Myles Standish Industrial Park in Taunton, Massachusetts (40 miles south of Boston) in 1993.

This paper will discuss the history of the NWS Taunton Outreach Program, including statistics showing the program's growth over the years. The results from several surveys, previously presented at AMS Education Symposia, will be summarized, including how the NWS Taunton Outreach Program has been accepted and utilized by the educational community. Other survey results will show how NWS offices across the country have conducted their outreach efforts, as well as innovative methods they have implemented to reach out to their communities (see section 3).

Changes in outreach philosophy within the NWS and NOAA, which have necessitated a redirection of NWS Outreach Services, will be discussed. This paper will close by describing how these changes have been incorporated into NWS Taunton's outreach efforts, as well as how we still remain in touch with the K-12 educational community.

2. HISTORY OF NWS TAUNTON OUTREACH PROGRAM

The NWS has had a long history of outreach and education programs for the public. Prior to the NWS Taunton's move from Logan Airport in Boston, the office staff conducted tours and visited locations across eastern Massachusetts to give weather related awareness and education presentations, including the K-12 schools. Three former Weather Service Offices (WSOs) and one former Weather Service Meteorological Observatory (WSMO) also conducted education and outreach programs for their areas of responsibility across the remainder of southern New England. These included:

- WSO Providence, RI, which covered all of Rhode Island
- WSO Hartford, CT was responsible for the entire state of Connecticut
- WSO Worcester, MA conducted outreach for central and western Massachusetts
- and the WSMO in Chatham responded to requests across Cape Cod

Before the MAR, outreach and education programs from the NWS were provided when time was available. However, these programs were limited due to the lack of a staff member to organize educational materials and schedule visits. This was a difficult task at the WSOs, with only five staff members covering shifts 24 hours a day, 7 days a week at their offices, while WSMO Chatham had up to five staff members covering two shifts a day. Only a few requests for school visits or tours were received, but it still took some creative scheduling. Tour requests were easier to fulfill. However, even tours could fall victim to Mother Nature. If there was inclement weather, a tour group either had to reschedule or only had an abbreviated tour of the facility. At the forecast office at Logan Airport, tours were the exception rather than the rule due to traffic constraints getting to the airport, except for some local schools in the greater Boston area. Additionally, there was little organization or planning for educational outreach. The programs that were available were limited in scope. There was little thought of how the information would be used, except for severe and winter weather preparedness. This was especially important for the K-12 education community, as the old programs may not have necessarily fit into science and math curricula being taught in the schools.

Another impediment for outreach was that, even at the old Boston office, few requests were received. No one really knew that the NWS had forecasters available that would go and present weather information for their groups. The requests that were received were mainly due to word of mouth or a friend knowing a friend that worked at the office, or a happenstance call from a school or organization.

After the NWS office's move to Taunton in 1993, the outreach program changed. A new office position was developed at each of the 123 Weather Forecast Offices (WFOs) nationwide, known as the Warning and Coordination Meteorologist (WCM). Part of the WCM's duties are specifically to organize and develop outreach and education programs for the public, along with acting as a liaison with the media and emergency management community, managing the SKYWARN spotter network for the County Warning Area (CWA), and much more. At the NWS Taunton office, the wide scope of WCM duties proved daunting. As a result, the position of Outreach Coordinator (or Outreach Program Leader) was developed at NWS Taunton.

The Outreach Coordinator is the main contact point for any type of outreach request. The Outreach Coordinator developed the office's Station Duty Manual for Outreach programs, which outlines the procedures for scheduling and conducting outreach visits, office tours and job shadow assignments for K-12 high school students and teachers. This document has evolved over the years with the demands of the rotating work schedule and changes in national policy (discussed in Section 4). An Outreach Team was formed and managed by the Outreach Coordinator at NWS Taunton. Several team members have greatly contributed in the development of outreach materials, including PowerPoint presentations and educational shows that are age appropriate and conform to K-12 State Science Standards. The Outreach Coordinator has also solicited other staff members that are interested in helping with the Outreach Program by fulfilling requests in their areas of expertise, such as the Service Hydrologist, Marine Program Leader or Aviation Program Leader.

Similar to before the MAR, requests from local schools for a meteorologist's visit or an office tour were minimal. Once

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word spread among science teachers and Girl and Boy Scout leaders that an educational program was offered by NWS meteorologists, the NWS Taunton's outreach program quickly grew. NWS Taunton also became involved with local educational efforts such as Project BEST (Building Educational Success Together), also located in Taunton, Boston Partners in Education, and the Volunteers in Cranston Schools in Rhode Island.

The WFO and co-located Northeast River Forecast Center (NERFC) held Open Houses every two years from 1994 to 2000, which attracted several thousand visitors to the WFO Taunton facility in each two-day event. Staff members from both the WFO and NERFC gave educational presentations in tents outside the facility. Other organizations involved with emergency preparedness and weather were invited to have booths in another tent, including the US Army Corps of Engineers, the Greater Boston Chapter of the American Meteorological Society (AMS), the Blue Hill Observatory Science Center, and the Plymouth Community Intermediate School Weather Club, to name a few. Unfortunately, due to security costs and concerns that have arisen since the tragic events of September 11, 2001, an Open House has not been held since 2000.

The yearly statistics that NWS Taunton has kept on the number of people reached by the program demonstrate the positive impact of our office's educational services (Fig. 1). Since the September 1995 to August 1996 time frame, the Outreach team has consistently reached a yearly average of over 6000 people. Fluctuations in the number of people impacted by the NWS Taunton Outreach Program have been due to conflicts in trying to schedule visits around a 24/7 WFO work rotation. To date, the program continues to flourish.

3. RETROSPECTIVE OF PREVIOUS OUTREACH RESEARCH

The NWS Taunton Outreach Program Leader conducted a series of surveys to assess the Outreach programs in other NWS offices, as well as the impact of the NWS Taunton's Outreach Program on the K-12 education community.

3.1 *1997 NWS Eastern Region Outreach Survey*

During the late spring of 1997, a survey was conducted of the NWS Eastern Region (ER) Offices about their outreach programs (Vallier-Talbot 1998). This survey evaluated the level of past, present and future outreach and education support throughout NWS ER. The survey covered the 26 WFOs in ER, as well as the River Forecast Centers (RFCs) and the Center Weather Service Units (CWSUs) at the Federal Aviation Administration (FAA) Air Route Traffic Control Centers (ARTCCs). With a high response rate (80%), meaningful correlations were made on the NWS ER Outreach services, including information about the types of outreach offered and the amount of time dedicated to outreach. Over 87 percent of the respondents felt the ER WFOs offered at least moderate support prior to 1997, but this was expected to drop to 75 percent in the future. At that time, it was felt that the decrease in support for outreach was due to the downsizing of NWS, which was a part of the MAR. As stated by one respondent, outreach was "(a) very important program but not a priority in the NWS and lacking appropriate resources." The AMS Project ATMOSPHERE programs, including the DataStreme Project (now known as DataStreme Atmosphere) for K-12 teachers, were well supported by the NWS ER offices and provided an efficient way of bringing weather into the classroom, as stated from survey respondents.

3.2 *1997 K-12 Educator Survey*

A second concurrent survey, with the NWS Eastern Region Outreach survey, targeted participants in the NWS Taunton Outreach Program from 1995 to 1997. A total of 130 K-12 educators were contacted. Only 47 percent responded to the survey, likely because the surveys were mailed out near the end of the school year. In spite of the low response rate, it is believed that previous thank you letters, e-mails and other positive correspondence received by the Outreach team allowed the results to be representative of how the program had been accepted by the K-12 education community throughout NWS Taunton's CWA. Around 80 percent of the respondents felt that there was high enrichment to their science curriculum (Fig. 2).

One question was asked about the impact of a possible reduction or restructuring of the NWS Taunton Outreach Program in the late 1990s. The responding educators were *very* vocal about the NWS Taunton Outreach Program and its continuation into the future. Several commented on how the information presented was not only relevant in science classes, but in other sections of their curricula as well as career planning for the students. One math teacher commented about how probability and statistics are used in the real world, not just numbers in the classroom. A guidance counselor responded that having a female meteorologist as a presenter showed several female students that a career in science is more accessible to women. Many stated how important it was to bring a "real" scientist into the classroom so students could see science in the real world. Educators clearly wanted to see the NWS Taunton Outreach Program continue.

3.3 *2002 NWS wide WCM Survey*

One final survey was conducted during the summer of 2002, a few years after the MAR had been completed nationwide (Vallier-Talbot and Babcock 2003). The survey was sent to the WCMs across all six NWS regions, including Eastern, Central, Southern, Western, Alaska and Pacific Regions, to gauge their outreach activity. The focus was on the educational outreach from the offices, especially how outreach had been supported since the completion of the MAR. Additional questions were developed for the ER offices as a follow up to the 1997 ER survey. A total of 73 responses (60%) out of the 122 surveys sent out were completed and returned to the authors. The respondents were either the WCMs or their designated representatives, such as an Outreach Program Leader or others involved with outreach services.

The survey results provided positive feedback for NWS Outreach programs. At least 80 percent of the respondents indicated that their offices conducted school visits, office tours and career day presentations, participated in science fairs (including judging and mentoring students), offered volunteer internships to high school and college students, and provided educational information on their Internet websites. Over half of the offices held at least one Open House, assisted with the AMS educational initiatives, and mailed informational packets to teachers. Most respondents stated that they reached an average of 1000 to 5000 people yearly. However, 10 percent of the respondents stated they reached over 10,000 people annually.

The important question asked of the non-ER NWS offices was their past and estimated future support of education and outreach programs on a low, moderate and high level. A total of 85 percent of the respondents felt they offered at least a moderate level of support in the past. The respondents' estimate of future outreach program actually rose to a whopping 91 percent, though most felt it would remain at a moderate level. For the ER respondents, a full 50 percent of those felt that their outreach participation actually increased from the 1997 survey, with 29 percent remaining the same.

This was surprising to the authors, especially in light of reduced staffing and increased workloads in the WFOs. However, when it came to the past versus future support question, the percentage of "high" support responses dropped from 50 percent in 1997 to only 34 percent in 2002.

Once again, the overriding theme in the 2002 survey was the strong support that education and outreach programs have in all NWS offices. Also, many indicated that their involvement in the K-12 education arena had increased from 2000 to 2002. As stated by one Central Region respondent, "Our office's management team all agree that *all* outreach is important, and we try to reach as many as possible."

To that end, many WFOs continued to keep in touch with the K-12 education community despite changes in national policy (discussed in Section 4). The most used method to reach out was through the Internet. Some of the outreach efforts include:

- WFO Memphis, Tennessee, produced several education presentations and posted them on their website for download. This best practice has been followed by many other WFOs, including WFO Taunton.
- WFO Riverton, Colorado has developed several educational lessons and presentations, which has been made available to teachers in their CWA by way of a CD-ROM.
- WFO Key West, Florida has included NOAA environmental displays and hands on educational displays in the design of their new headquarters, which was dedicated in March 2006.
- WFO Spokane, Washington developed a weather hazards video, targeted toward schools, emergency managers and many other groups.
- WFO Taunton has participated in the Massachusetts Middle School Science Olympiad (www.soinc.org) since 2005, developing the Meteorology event for the Olympiad. The Science Olympiad has up to 25 different science related events for 7th and 8th grade students. The students of the winning school represent Massachusetts at the National Science Olympiad each May.
- Another fun and educational effort was run at the WFOs in Wilmington, Ohio and Grand Junction, Colorado. They sponsored poster contests for students. At WFO Wilmington, a statewide contest is run for Grades 1 to 6, while the Grand Junction contest concentrates on Grade 5. This is a focus for severe weather awareness weeks at both offices, when the winners are announced.
- WFO Honolulu, Hawaii was working with the Hawaii Department of Education to try and incorporate natural hazards preparedness into the Hawaii K-12 curriculum.

Even with the concerns voiced in the surveys about changes in policy with regard to K-12 education (discussed in Section 4), as well as security concerns brought to light by the tragic events of September 11, 2001, it appeared that the WFOs continue to dedicate at least some time to K-12 education. As stated by one of the WFO respondents from Southern Region, "I think that outreach activities focused on our youth are vital to the future success of the National Weather Service. If they grow up with the National Weather Service, they will stick with us in the future."

4. "ADAPTING TO CHANGE"

As many of the NWS WFOs were setting up outreach and education programs, change was in the air on a national scale. As early as October 1997, concerns were voiced within NOAA and the NWS about educational efforts being conducted by each agency. A report entitled "Towards a Strategic Plan for Education and Human Resources Development" stated that NOAA's educational efforts lacked coordination and commitment and needed to be strengthened (NOAA 2000). This report also stated that an education office should be established at the NOAA level.

Widely publicized media reports indicate declines in math and science skills being demonstrated in standardized testing by students, as shown by the science and math educational community. These declines in the K-12 schools today would have major ramifications as these students grow and try to work in an increasingly technological society in the future. They would not be able to compete and succeed in the workplace, nationally and globally. This was another impetus for NOAA and NWS to incorporate and streamline outreach and educational efforts.

The NOAA Education Committee was formed in 2000 to develop a direction of the agency's education and outreach efforts. The Education Committee stated that, "Education fosters the continuation of NOAA's contributions by creating a scientifically literate workforce and a scientifically and environmentally informed citizenry capable of furthering the agency's mission." (NOAA 2000). This committee reported several findings, including that education was not mandated at every line office within NOAA, including the NWS, as well as no formal budget available to develop education and outreach activities. More importantly, very few full time employees (FTEs) were given duties to accomplish these activities. One good aspect from these findings was that there was a strong commitment to education by NOAA employees at both headquarters and at field offices. Even with this commitment, as well as the breadth of the educational activities supported by NOAA and NWS, there was a lack of focus and organization. Additionally, there was a false impression that few educational activities or materials were available through NOAA. A report by the U.S. General Accounting Office (GAO) for the U.S. House of Representatives Committee on Science backed this impression. "(U.S. Department of) Education's search of the Eisenhower (National) Clearinghouse and the results of our survey showed that most agencies did not submit all their materials to the clearinghouse as required by law." (U.S. GAO 2000). Further, the NOAA Education Committee noted that there was no mechanism in place to track *any* outreach and education efforts.

The NOAA Education Committee presented nine recommendations in their White Paper to make a commitment throughout NOAA toward education and outreach for the entire citizenry, not just in K-12 education venues. In its commitment, funding would become a line item in each line, staff and program office throughout NOAA, which would give substantive backing to the other recommendations.

The final report from the Program Review Team (PRT) was presented to Vice Admiral Conrad Lautenbacher (Retired), Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator, in May 2002. Two major recommendations in the PRT were directed toward education and outreach throughout NOAA. The first was renaming the NOAA Office of Sustainable Development and Intergovernmental Affairs to the NOAA Office of Education and Sustainable Development (NOAA OESD). The OESD, which was renamed in 2003, would ensure that a coordinated effort in education and outreach would be spread throughout NOAA, and report directly to the NOAA Administrator. The second recommendation requires that a fixed percentage of funds be dedicated to develop effective education and outreach strategies (NOAA 2002). Vice Admiral, retired, Lautenbacher fully concurred with the PRT recommendations with regard to education and outreach. These recommendations, among the other 66 in the NOAA Program Review, were tracked to their implementation.

The PRT also presented several tools that could enhance education and outreach, to truly incorporate NOAA in line offices' Strategic Plans while improving intra-agency collaboration and cooperation. As stated in the PRT Review, "The proposal to develop geographically-based regional coordination nodes could serve to refine education and outreach messages for local audiences. Partnerships with other Federal agencies and academia also provide an opportunity to ensure that NOAA's contributions are well documented." (NOAA 2002). Another feature was to include an education element in the performance objectives for mid level managers and higher-level staff members. This meant that managers and staff throughout the agency would have the responsibility to oversee the implementation of education and outreach efforts in their offices.

The NOAA Education Council was formed in January 2003 as a direct result of the NOAA Program Review, as well as NOAA's Science Advisory Board's Subcommittee on Education. As recommended, the Council would serve as a forum of ideas and proposals for NOAA-wide education and outreach activities, as well as make recommendations on all aspects of educational efforts throughout NOAA to management. The NOAA Education Council would work in concert with the OESD, which would then coordinate and implement educational efforts across NOAA. In 2004, the OESD and NOAA Education Council developed the NOAA Education Plan (NOAA 2004). This plan was "based on a multi-level approach and serves our many constituents and partners at national, regional and local levels." The Education Plan outlines several ways to increase environmental literacy and bring NOAA sciences to a variety of venues, including schools, science centers, museums and aquaria. Three goals were outlined in the Plan as well as several strategies to accomplish these goals, including the development of educational materials, offering professional development programs to educators, and promoting participation in NOAA-related sciences and careers. The latest NOAA Strategic Plan states, "We seek to educate and inform present and future generations about the changing Earth and its processes, to inspire youth to pursue scientific and technical careers, and to improve the public's awareness, understanding, and use of NOAA products and services." (US Dept. Commerce 2005).

One educational program that began in 2004 is entitled "NOAA and the Preserve America Initiative (PAI)." (NOAA 2004). Inspired by a Presidential Executive Order signed by President George W. Bush in 2003 (Federal Register 2003), this program was brought together to show how the history of the United States and NOAA are intertwined. The Executive Order authorized funding in the form of grants, to be appropriated in the federal budget. Beginning in 2005, NOAA's Preserve America Initiative Grant (PAIG) Program has funded grants to inspire NOAA employees to preserve NOAA's heritage by developing historical and educational information and projects nationwide. These grants help promote historical preservation, work with a variety of governmental and private agencies to encourage private-public partnerships, and support preservation and economic development through heritage tourism. "Through dynamic education and outreach programs, exhibits, visitor centers, and the media, NOAA spreads the message that our heritage resources belong to everyone, and that we all have a role to play in preserving them for future generations." (NOAA 2004). Ten grants were awarded in 2006, including one entitled, "Wet Weather: Using Oral Histories to Preserve the Heritage of NOAA's Marine Weather Forecasting." A nationwide traveling exhibit, developed by NOAA and the PAI, is entitled "Treasures of NOAA's Ark." This exhibit shows citizens the history and contribution of NOAA to the United States. A virtual tour of NOAA's Ark is available online (www.preserveamerica.noaa.gov/hw06_photo1.html). A yearly celebration is also conducted by NOAA each February, called NOAA Heritage Week.

Many of NOAA's education and outreach goals and strategies have been incorporated by the NWS. The NWS Strategic Plan stated as a cross-cutting priority, "We will focus on an expanded customer education and outreach effort to better meet the needs of a more diverse population." (NOAA 2003). The Strategic Plan goes further to note several performance measures for the NWS, including an increase of education and outreach materials and services, improving community and public awareness of the NWS' goals and achievements, encouraging higher numbers and a greater diversity of students pursuing environmental science careers, and increasing agency staffing to judge science fairs. The NWS will partner with the American Meteorological Society, National Weather Association, NOAA OESD, the media, private sector, universities, other Federal agencies, and other science and community based organizations to help fulfill these efforts.

5. APPLYING CHANGES AND NEW POLICIES TO NWS TAUNTON'S OUTREACH PROGRAM

In order to incorporate the many changes and new policies put into place by NOAA and the NWS, there had to be changes to the NWS Taunton's Outreach Program. Staff members were to reach a wider audience in the office's education and outreach efforts, including a wide variety of community organizations, e.g., marine and aviation interests. However, there was only so much time that could be committed to these efforts. Unfortunately, this has meant a redirection of outreach efforts away from the schools. This redirection was stated in the 2002 NWS Taunton Operating Plan, "Redirect outreach more toward emergency managers and targeted customer entities and less to education. Partner with local non-profit weather education organization to help accommodate and refocus educational outreach demand." The changes in the way outreach was conducted were voiced during the 2002 NWS wide WCM survey. When asked about diversification of outreach, one Eastern Region office responded, "I have been told that I must cut back the total number of hours devoted to my outreach program for the next fiscal year." (Vallier-Talbot and Babcock 2003). Although the number of students visited by the NWS Outreach Program has only fallen slightly over the years, the number of actual outreach visits to schools has dropped when compared to visits to other organizations, especially since the 2003-04 school year (see Figure 3). When scheduling outreach visits to the schools, greater effort has been made to get more "bang for the buck," meeting with larger groups of students during each visit. Also, a concerted effort is being made to incorporate a more directed message which meets the new national goals during each visit, as well as presenting information about NOAA and the NWS to the students. One initiative is to develop new weather presentations geared toward specific hazard preparedness awareness weeks, such as National Lightning Safety Awareness Week each April, or Hurricane Awareness Week each May. Not only do students learn how different weather phenomena form, but they also learn ways to protect themselves if confronted by them. For example, in one presentation that NWS Taunton gives for Kindergarten to Grade 2, the students learn about clouds, rainbows, halos and thunderstorms, as well as a lightning safety message. This show meets teachers' curricula, yet brings a safety message to the youngest students.

The NWS Taunton Outreach team has previously worked with other NOAA line offices, including the Stellwagen Bank National Marine Sanctuary (NMS), a part of NOAA's National Ocean Service. Stellwagen Bank NMS held a series of educational programs about the Sanctuary on Cape Cod,

including one about the types of winter weather than can affect the region. The NWS Taunton office prepared a presentation about nor'easters that can affect Stellwagen Bank, as well as how these storms have caused shipwrecks over the years. One famous shipwreck was the Steamship Portland, which lies within the borders of Stellwagen Bank in Massachusetts Bay. The ship sank during a storm known as the "Portland Gale of 1898." The site of the sinking is listed on the National Register of Historic Places. The management team at NWS Taunton also held a regional meeting of all NOAA line offices across southern and central New England to outline plans for the development and incorporation of cross-cutting efforts on many levels, including education and outreach. Other meetings have been scheduled, to gather at the other NOAA offices across the region.

6. CURRENT OUTREACH PROGRAM AT NWS TAUNTON

The NWS Taunton's Outreach Program has seen many changes since 1993, including a redirection of outreach services to meet the increasing demands for outreach to the office's entire customer base. This redirection has allowed the team the opportunity to revise and refocus its approach toward the K-12 education community, while expanding to other targeted customers.

NWS Taunton continues to hosts several high school students for job shadow opportunities, showing them about career opportunities in meteorology in general, and the NWS in particular. Career day workshops and presentations remain high on the list of outreach events, including career information and resources that are provided by our office. The NWS Taunton office also hosts two or three volunteer college interns to work at NWS Taunton each summer. These students, majoring in either meteorology or related sciences, not only have the opportunity to work with the NWS forecasters and hydrometeorological technicians in the operations area, but they work with one staff member on a special research project. For example, during the spring of 2006, a senior from the University of Massachusetts at Lowell worked with the Marine Program Leader on a long-term study of high wind events across the CWA.

Providing weather education materials and presentations to educators, as well as continuing to work with the AMS education initiatives, remains one excellent way to stay in touch with the K-12 education community. The NWS Taunton Outreach Team continues to assist with the AMS DataStreme Atmosphere program at Bridgewater State College. A presentation about the NWS is given to the educators during DataStreme Local Implementation Team meetings. The Outreach Team also fulfilled another new teacher initiative. In November 2005, the Blue Hill Observatory Science Center and WBZ CBS4 held a Teacher Workshop at the Museum of Science in Boston. The Outreach Program Leader developed a presentation for the teachers about the NWS and other hands-on weather activities, as well as providing educational materials to each teacher. Teacher informational packets continue to be mailed to educators and Girl and Boy Scout leaders upon request.

Another way to provide weather education materials continues through the Internet. The NWS Southern Region has developed an online weather class called Jetstream (www.srh.noaa.gov/srh/jetstream/). This is an excellent online course, providing information about the atmosphere and weather, as well as how the NWS provides forecasts, watches and warnings for their CWAs. Education websites are available from both NOAA (www.education.noaa.gov) and the NWS (www.weather.gov/os/edures.shtml) to bring information about weather to everyone. As mentioned earlier, each safety awareness day or week also has information provided on the Internet, including printed materials, posters, public service announcement text, video and audio files for use by media and educators.

The NWS Taunton office provides yearly outreach at the Southern New England Weather Conference (www.sneweatherconf.org/index.shtml). This conference started out as a workshop to bring the latest weather techniques and information to the media. The workshop then expanded to include many other participants, such as educators, weather enthusiasts, and students. In 2000, the first Southern New England Weather Conference was held in Needham, Massachusetts, with a variety of topics presented. Since that time, the Conference has grown in attendees and scope. In 2005, the focus of the Conference was on climate information. Presenters included the head of the Climate Services Division in the NWS Office of Climate, Water, and Weather Services and the Deputy Director of NOAA's National Weather Service, among others. Several local weather associations also sponsor the Conference, including the Blue Hill Observatory Science Center, the Greater Boston Chapter of the AMS, the University of Massachusetts-Lowell Student Chapter of the AMS, and the Southern New England Chapter of the National Weather Association. Additionally, educators can also earn Professional Development Points by attending the Conference.

A special opportunity arose in October 2004, as the United States Postal Service (USPS) issued a series of stamps called "Cloudscapes," fifteen cloud stamps arranged by altitude. The collaboration of the NWS, the AMS and The Weather Channel used the stamps as an educational tool to promote atmospheric sciences. Meteorologists from local television stations around the country also used the stamps to educate the public about weather. The First Day of Issue ceremony was held at the Blue Hill Observatory in Milton, Massachusetts, which is the longest continuously operational weather observing station in North America. Over 200 fourth-grade students and teachers from across central and eastern Massachusetts, whom participated in a coloring contest sponsored by the USPS, AMS and other organizations, also participated in educational demonstrations during the day of the First Day of Issue ceremony. Booths were set up around the summit of Blue Hill. The students and teachers learned about weather instruments and the Mount Washington Observatory in New Hampshire, among other booths. Since the stamps were released during National Stamp Collecting Month, the theme for the month was "Reach for the Sky and Collect Stamps!"

7. CONCLUSION

The Outreach Program at NWS Taunton, which began primarily as an education program for the schools, has grown and evolved over time. Major changes in local and national policies through NOAA and the NWS have necessitated changes in the NWS Taunton Outreach Program. However, even with the changes, the Outreach Team remains committed to reach as many people that want to learn about weather and the atmosphere as possible. This is especially the case with the K-12 education community, whom are the next generation of scientists and meteorologists. With a new direction and focus, the Outreach Team remains involved in the schools. Keeping in touch with educators, providing a wide variety of information on the Internet, holding educational workshops and conferences, and continuing to offer job shadow opportunities for high school students are ways to continue to reach out to the K-12 education community.

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FIGURES

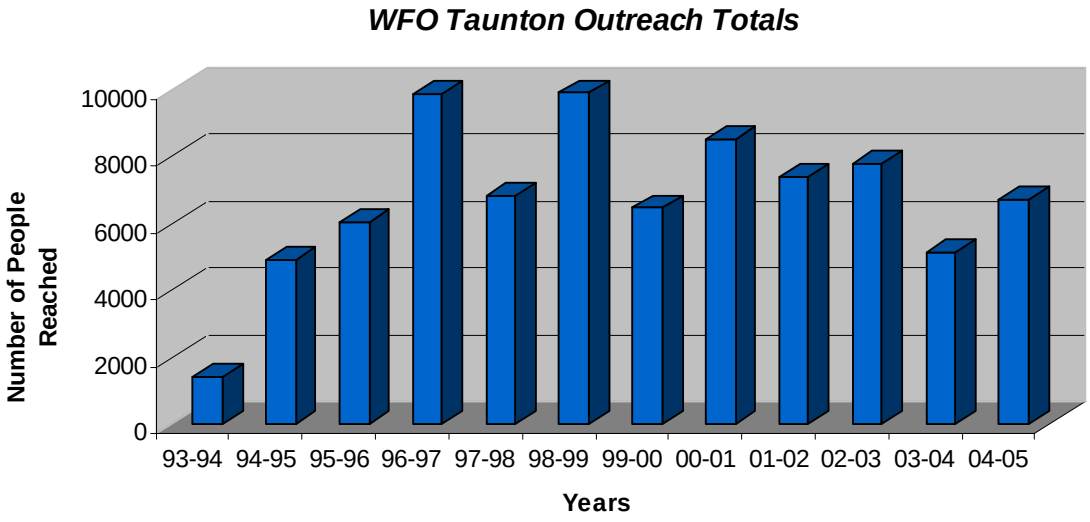

Figure 1. Number of people reached by NWS Taunton Outreach Program since move from Logan Airport

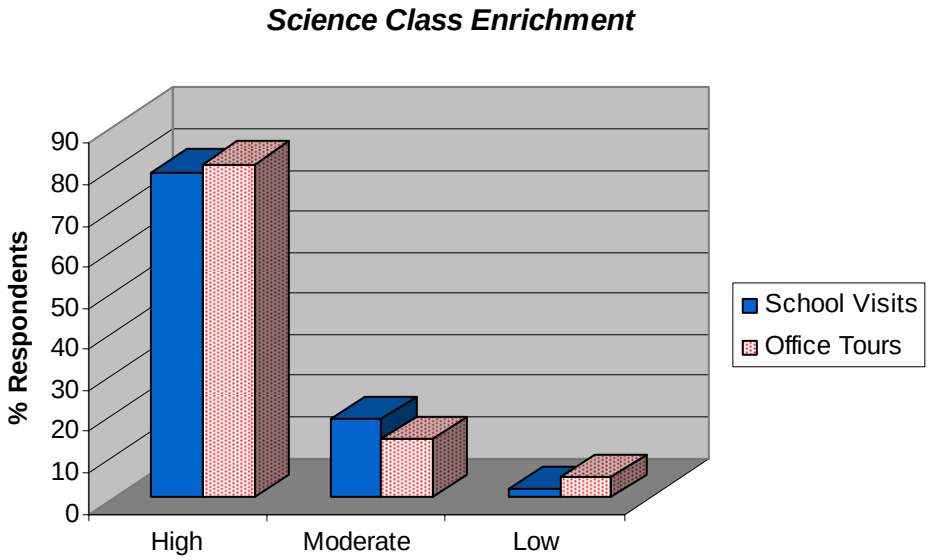

Figure 2. Enrichment received by science classes from NWS Taunton Outreach Program (Vallier-Talbot 1998)

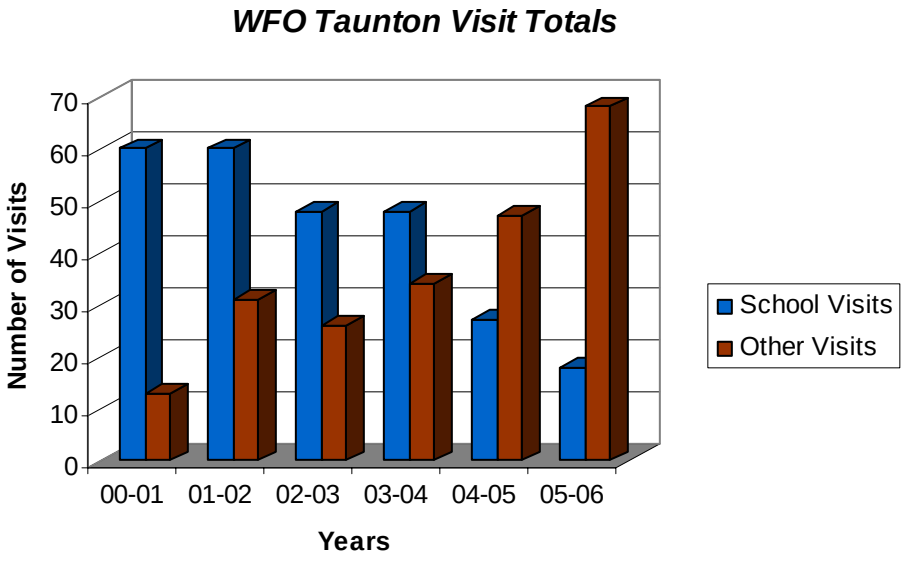

Figure 3. Number of Outreach Visits conducted by NWS Taunton since 2000