Peak Performance Newsletter

Winter 2016-2017

Performance & Evaluation Branch
Operations Division
NWS Office of Chief Operating Officer
Silver Spring, Maryland

This Issue

NWS FY2016 Q4 Customer Satisfaction Survey Update

Sal Romano, NWS Headquarters

Here's the latest update on our ongoing customer satisfaction surveys. This article is about the FY2016 Q4 (summer), continuous, pop-up survey on NWS websites (e.g., weather.gov, forecast.gov, WFOs' web pages) that was "live" from early April 2016 to early July 2016 and the Internet Panel survey that was completed in April 2016.

At a glance, the number of respondents were as follows:

> **Pop-Up Survey (3-month period) – 6,665 respondents**
>
> **Customer Satisfaction Score = 82 (TREND ⇒ steady)**
>
> **Internet Panel Survey – 486 respondents**
>
> **Customer Satisfaction Score = 76 (TREND ⇒ rising)**

The pop-up survey respondents had an Overall Customer Satisfaction Index score of 82. This is the same score as the previous quarter (i.e., the spring quarter).

Each of these quarterly surveys contains approximately 25 questions. The customer satisfaction index questions to

Continued on next page...

NWS FY2016 Q4 Customer Satisfaction Survey Update – Continued from Page 1

determine the satisfaction score, desired outcomes questions, and demographics questions make up about 15 questions. These questions are never changed. In addition, there are about 10 seasonal/topical questions. These questions are changed from quarter-to-quarter as follows (current article focusing on the Summer 2016):

- Fall 2016 (Q1 FY17), this version of the survey went "live" in early October 2016 and contains questions on winter weather, including extreme cold/wind chill questions.
- **Summer 2016 (Q4 FY16), extreme heat and weather threats to rangeland fires.**
- Spring 2016(Q3 FY16), severe thunderstorms and tornado questions
- Winter 2016 (Q2 FY16), winter weather and flash flooding questions
- Fall 2015 (Q1 FY16), extreme heat-related and weather threats to rangeland fire-related questions
- Summer 2015 (Q4 FY15), severe thunderstorms and flash flooding questions
- Spring 2015 (Q3 FY15), winter weather and Weather Ready Nation questions

In addition to the pop-up surveys, CFI selects a panel of individuals each quarter and compensates them to take a very similar survey on the Internet. These Internet panelists/respondents more closely represent the demographics of the United States according to the 2010 U.S. Census. The Internet panelists took the summer survey, containing extreme heat and weather threats to rangeland fires, in July 2016. The July 2016 Internet Panel Overall Satisfaction score of **76** is an increase of four points from the last quarter.

PERCEPTIONS OF EXTREME HEAT UNDERSTANDING AND FOERECAST ACCURACY

Results of the surveys revealed that the Pop-up and Internet Panel respondents in FY2016Q4 showed significantly more knowledge of extreme heat events than those surveyed in FY2016Q1. Also, Pop-up and Internet Panel survey respondents in FY2016Q4 had significantly higher scores than in FY2016Q1 for how well NWS contributes to their understanding of the dangers of *extreme heat events and* the *accuracy of* extreme heat events *information*. Perceptions of *accuracy* improved by nine points since FY2016Q1 for both Pop-up and Internet Panel respondents.

PERCEPTION OF WILDLAND FIRE ACCURACY

Pop-up and Internet Panel survey respondents in FY2016Q4 rated the NWS's accuracy of wildland fire weather information very favorably and even improved their rating by five percent from FY2016Q1.

FEEDBACK ON CLIMATE SERVICES

Respondents from both the Pop-up and Internet Panel surveys rated their familiarity with NWS Climate Services on the low side. An interesting and partially-related comment received from a respondent was: *"Better access to historical weather records, better coverage/reporting on local significant weather events, like to see satellite photos available in time lapse like radar images, would like to see online weather discussion forum moderator by NWS experts…"*

Here's another interesting comment: "*More weather history should be made available and also emphasized to the general public. It should be easier to find on your site…"*

HOW TO ACCESS CUSTOMER SATISFACTION SURVEY RESULTS

The NWS Pop-Up and Internet Panel survey results are available through a Web portal provided by CFI. You may access the survey results' Web

Continued on next page…

NWS FY2016 Q4 Customer Satisfaction Survey Update – Continued from Page 2

portal at:
https://portal.cfigroup.com/Portal

The generic username and password are:

Username: NWSwm@noaa.gov
Password: NWSportal1

Once you have gained access to the portal you will see the survey menu selections **(Figure 1)** or in some cases you will need to first go to the upper right side of the screen and click "Exit to Portal List."

If you select any of the "NWS Pop-up" options, for example "NWS Pop-up Q4 FY2016," you can then go to the far left side of the page and click on "Questions" in **(Figure 2)**.

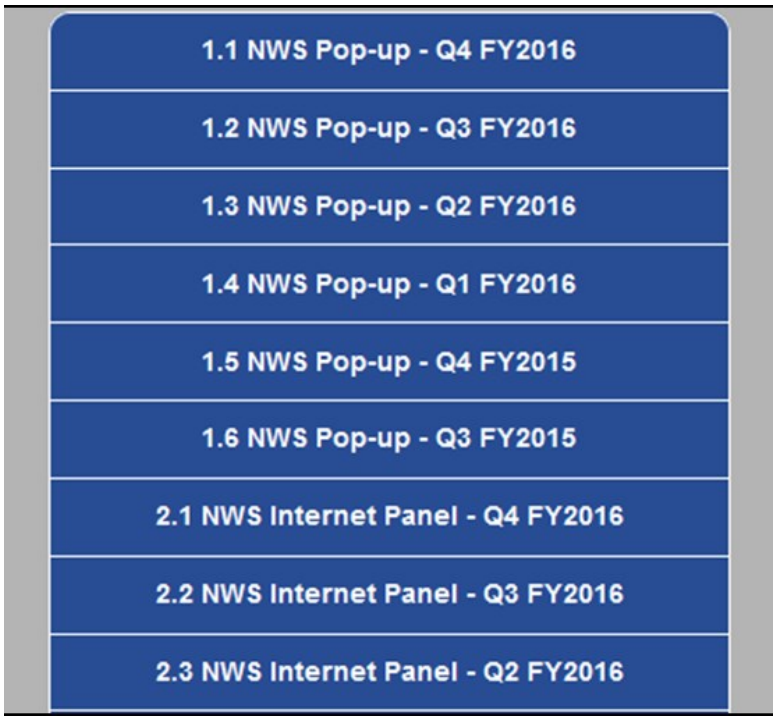


Figure 1. Survey menu selections.

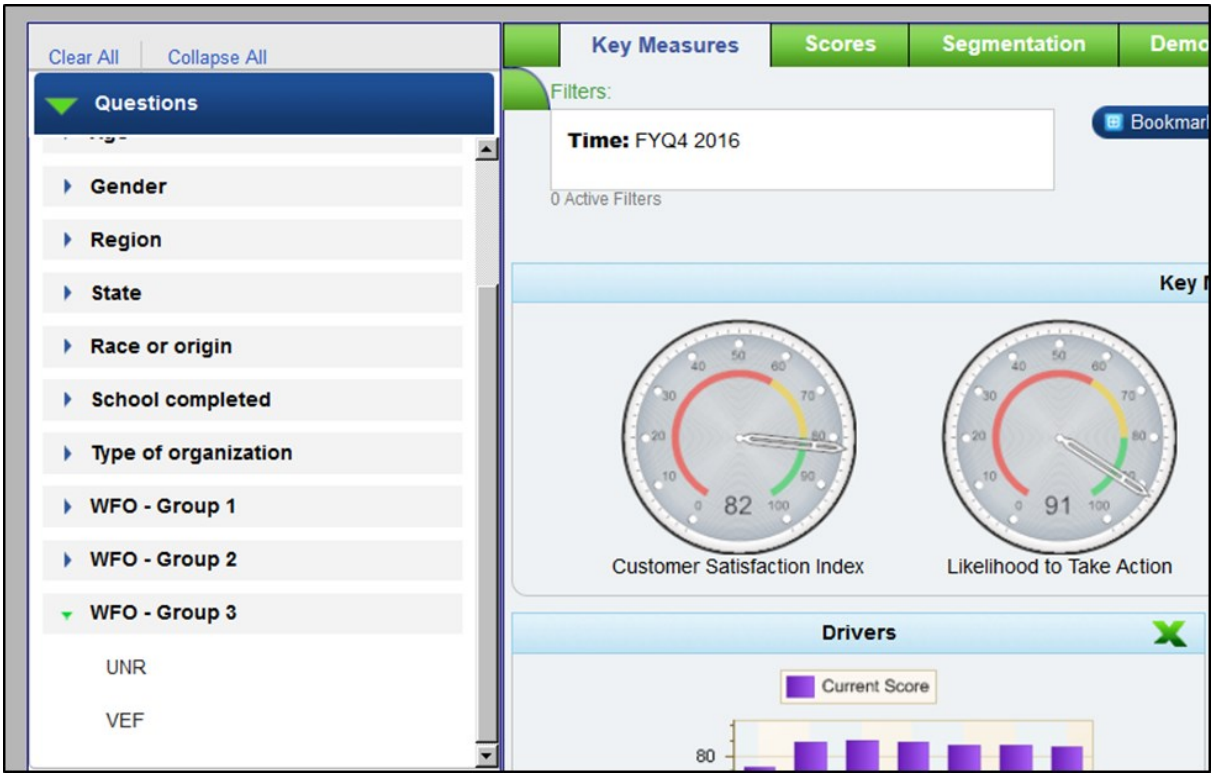


Figure 2. Example of NWS Pop-up Q4 FY 2016 page – Questions and WFO Menu.

A dropdown menu will appear containing three WFO options at the bottom: WFO – Group 1, WFO – Group 2, WFO – Group 3. Each of these options contain about 40 WFO identifiers in alphabetical order. You can obtain the results for one or more particular WFO(s) by selecting the desired identifier(s).

Continued on next page...

NWS FY2016 Q4 Customer Satisfaction Survey Update – Continued from Page 3

You can obtain all of the respondents comments for the selected WFOs at the center, top of the page, by clicking the "Comments" selection tab **(Figure 3)**. Once the "Comments" selection tab is clicked, a page will be displayed on which in the middle there will be a "Comment Selection" option.

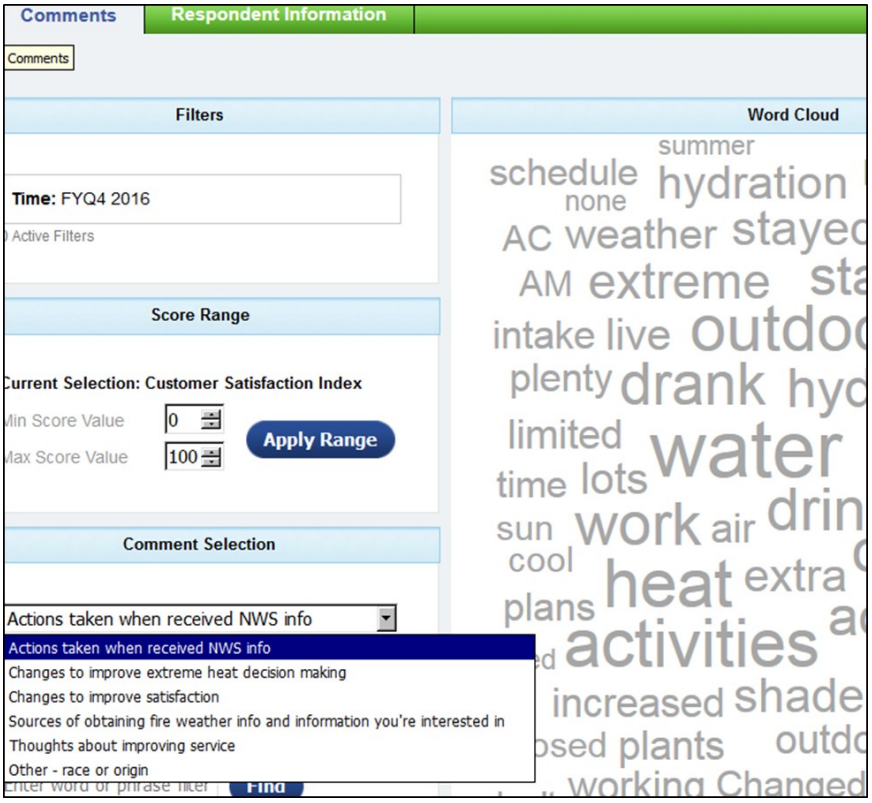


Figure 3. Screen capture of Q4 FY2016 "Comments Selection" page.

Here are explanations of two of the selection options:

First, the "Changes to improve satisfaction" selection is based on the initial question asked of respondents: "First, please consider all of your experiences with the NWS. Using a 10-point scale on which 1 means "Very Dissatisfied" and 10 means "Very Satisfied," how satisfied are you with the NWS?" If the respondent gives a low score (i.e., 6 or lower), then this follow-up question is asked: "Please indicate what the NWS should change to improve your satisfaction."

Second, the "Thoughts about improving service" selection is based on this survey question: "Please share with us any final thoughts you have about the ways the NWS could improve our services to you." This question is asked of all respondents and not just those who gave a low score.

In regard to the Internet Panel, the results are provided for Q4 FY2016 (July 2016) by clicking on "NWS Internet Panel – Q4 FY 2016" from the main portal menu selection screen.

If you receive our CFI NWS Customer Satisfaction Survey pop-up, please take a few moments to complete the survey. **Note:** *A different continuous pop-up survey is being administered for the NWS by the Office of the CFO through ForeSee. That survey focuses on the NWS's weather.gov site and the pop-ups only occur on that website and not on the WFOs' web pages.*

BACKGROUND ON CUSTOMER SATISFACTION SURVEYS VIA CFI GROUP

The Performance and Evaluation Branch in the Operations Division of the Office of Chief Operating Officer continues to contract with the Claes Fornell International (CFI) Group to assist in the development and implementation of the NWS customer satisfaction surveys. The CFI Group staff are experts in the science of customer satisfaction and use the American Customer Satisfaction Index (ACSI) methodology. The ACSI was created by CFI Group's founder, Claes Fornell, under the auspices of the University of Michigan. It is the only uniform measure of customer satisfaction of the U.S. economy and is used by more than 200 companies and government agencies.◆

Did You KNOW ?

By Doug Young, Performance and Evaluation Branch, NWS Headquarters

Did You Know that the Performance and Evaluation Branch (PEB) has implemented a new software program to manage and track service assessments?

While this may be transparent to most NWS employees, it's a leap forward for the agency in our ability to create new assessments, manage ongoing assessment milestones; and create and manage new findings, recommendations, and action items. Among the upgrades of this new software created by ERT, Inc., to support the NWS Operations Division, it has the ability to generate various types of reports to meet user needs and reduce the administrative burden on PEB staff by automatically transmitting email messages to obtain action item status updates from identified points of contact.

This software program is called the *Service Assessment Tracking System* or *SATS* for short. I'd like to share some of the features of the modernized SATS.

Creating a New Service Assessment

Once a service assessment team is chartered and launched, a new service assessment is entered into the system. As shown in **Figure 1** on the next page, the assessment overview is created, which includes the background, team members and consultants, the most recent status of the active team, the general impacted area, and links to the charter. When available, links will also be made available to the signed service assessment report and the related findings and actions. This information is maintained as a permanent record.

Managing Findings, Recommendations, and Actions

When a service assessment report is signed by the executive sponsor (e.g., NWS AA, NWS COO) and publicly released, the recommendations within the service

Continued on next page...

Did You Know? - Continued from Page 5

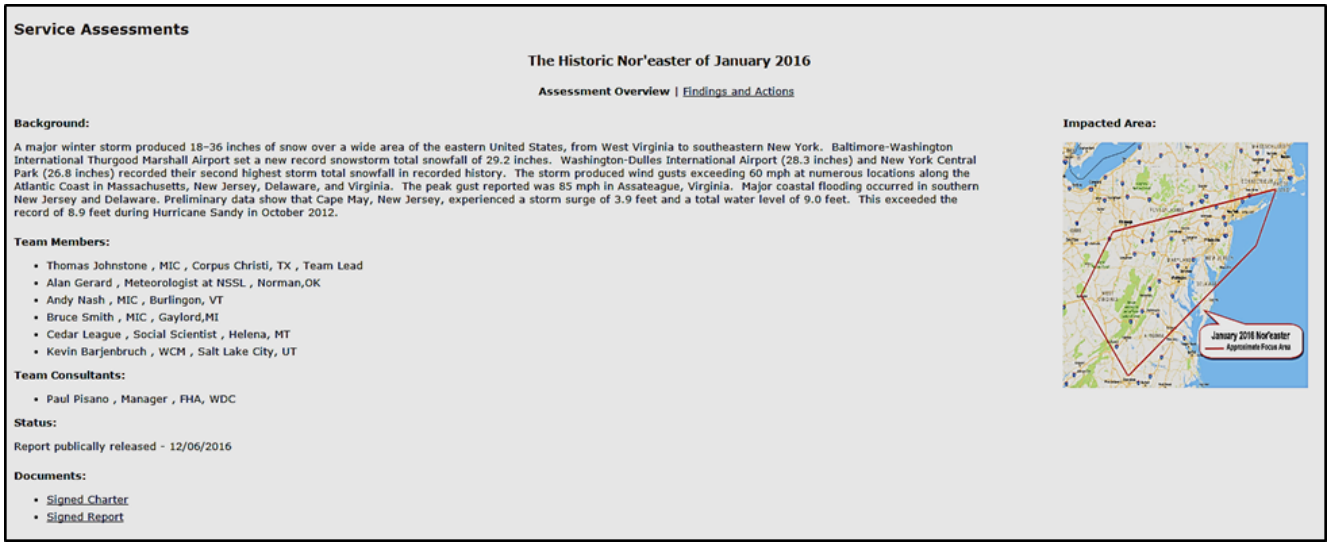


Figure 1. SATS Assessment Overview Graphical User Interface (GUI)

assessment report are vetted through the NWS Mission Delivery Council (MDC) and a standardized position (e.g., validated requirement, ongoing activity) is determined for each recommendation. The recommendations are entered into SATS as new action items and the language may be adjusted so that the actions are more pointed, achievable, and closeable. Initial points of contact will then be determined collaboratively and this information will be entered into SATS using the menu screen shown in **Figure 2**.

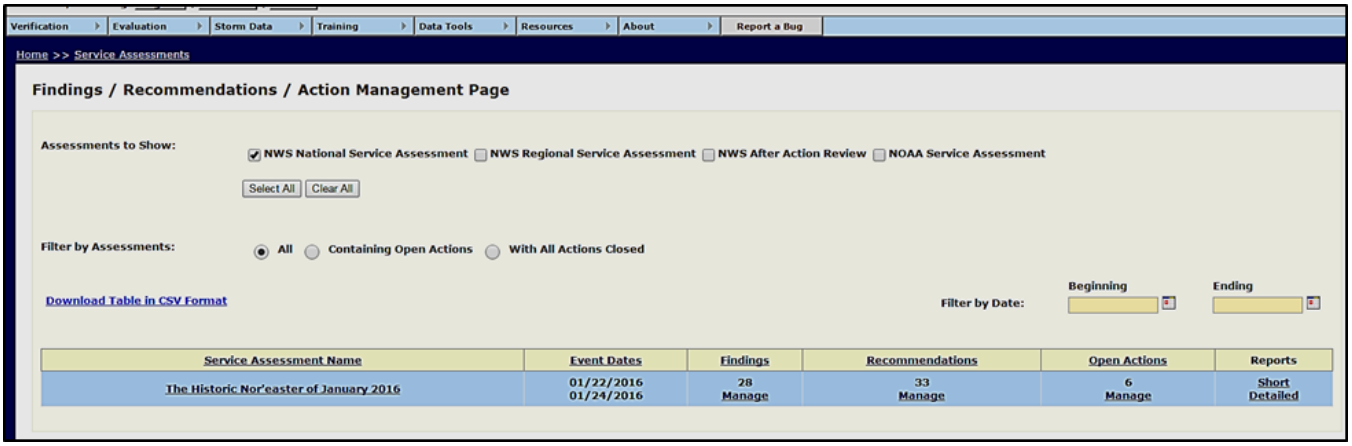


Figure 2. SATS Findings/Recommendations/Action Management GUI

As an example, for *The Historic Nor'easter of January 2016*, clicking on the active link for "Findings" yields the interface in **Figure 3** on page 7, which allows PEB administrators the ability to edit all findings, and manage associated recommendations.

Generating Reports

A useful feature of the new SATS program is the ability to generate specific reports about the service assessment findings and actions. As opposed to a simple "print"

Continued on next page...

Did You Know? – Continued from Page 6

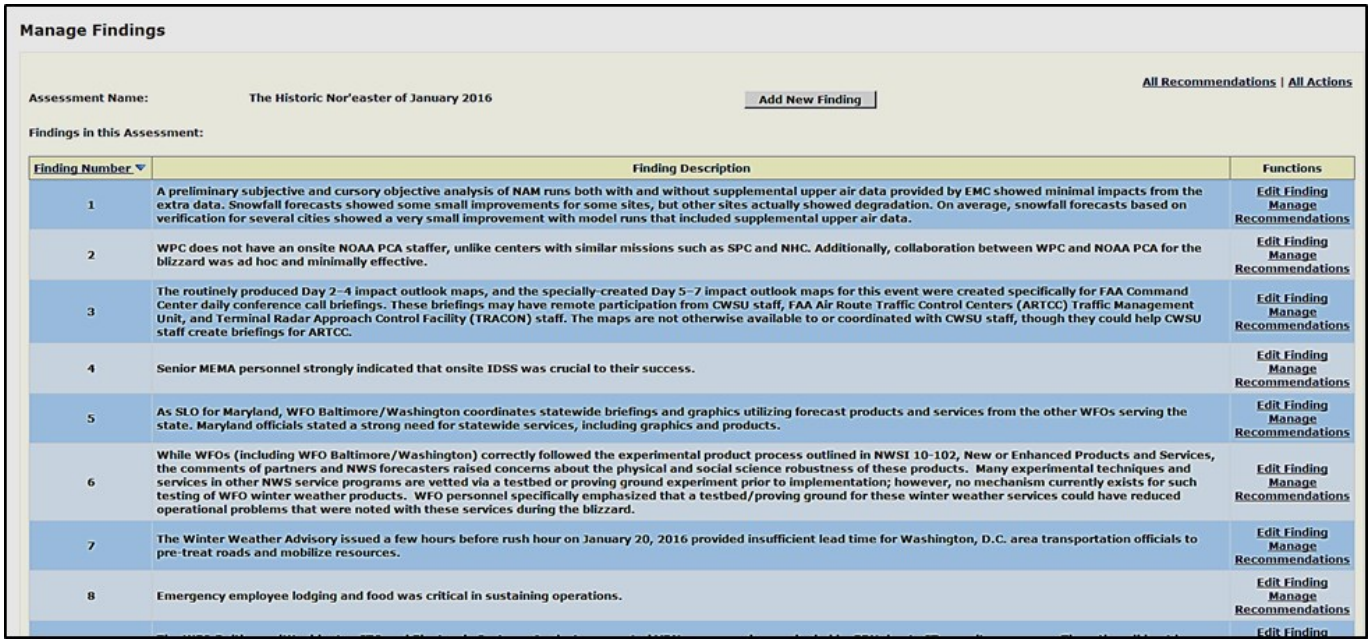


Figure 3. Manage Findings GUI for The Historic Nor'easter of January 2016

command, SATS has a Report GUI to tailor the report based on specified criteria (**Figure 4**). After selecting one or more assessment types, reports can be created based on keywords found in open, closed, or unassigned action items. Those

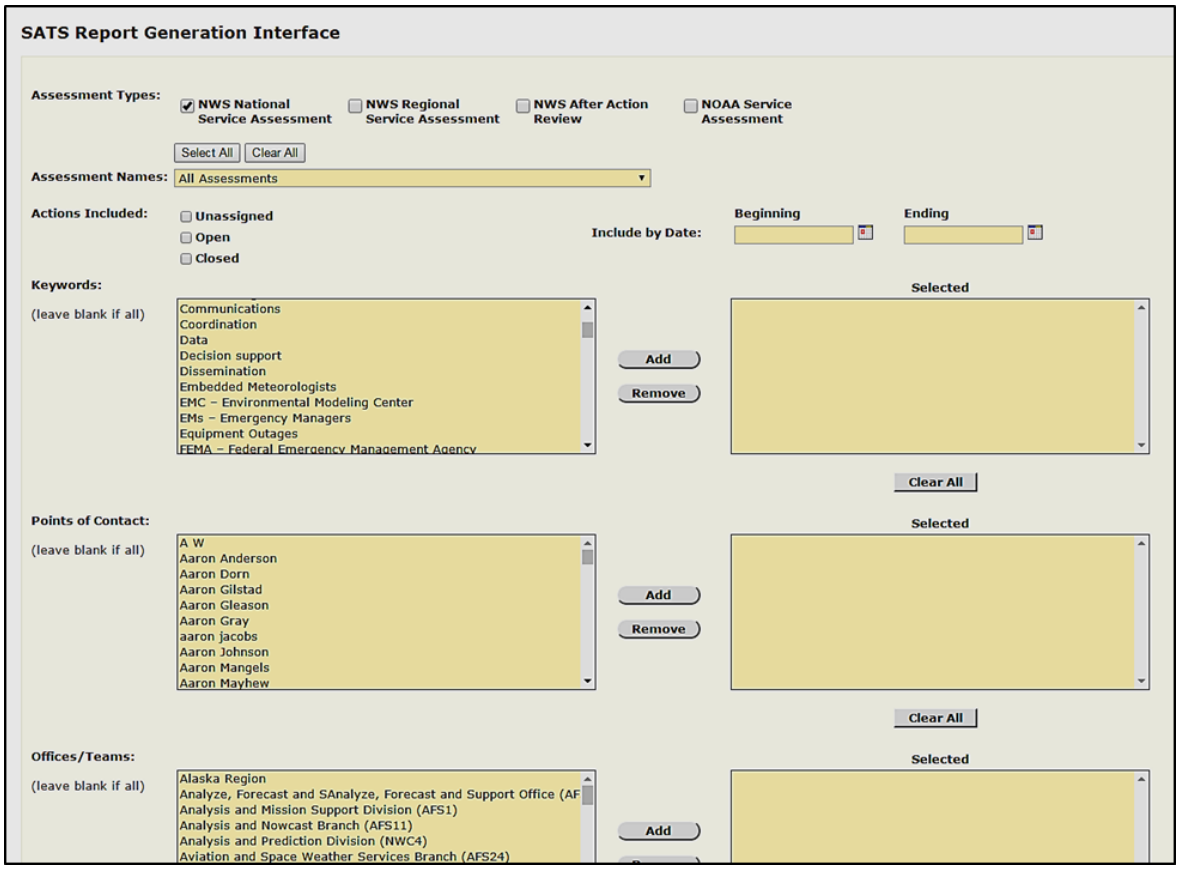


Figure 4. SATS Report Generation Interface

Continued on next page…

Did You Know? – Continued from Page 7

keywords are assigned to action items when they are initially entered. Reports can also be created for action items assigned to a specific point of contact, region, office, or team. Report types may be short or detailed. In addition, a Director's Report is available in a specific format to highlight recurring themes in the action items and the status of those action items.

Automated Email Service

One of the most useful new features in the SATS software is the Automated Email Service (**Figure 5**). This tool allows SATS administrators to create reminder emails for points of contact. The email messages may be set up on a specified schedule and automatically transmitted. Not only will this process save time and effort for PEB staff, but it will help keep action items on track and maintain a communication log for reference.

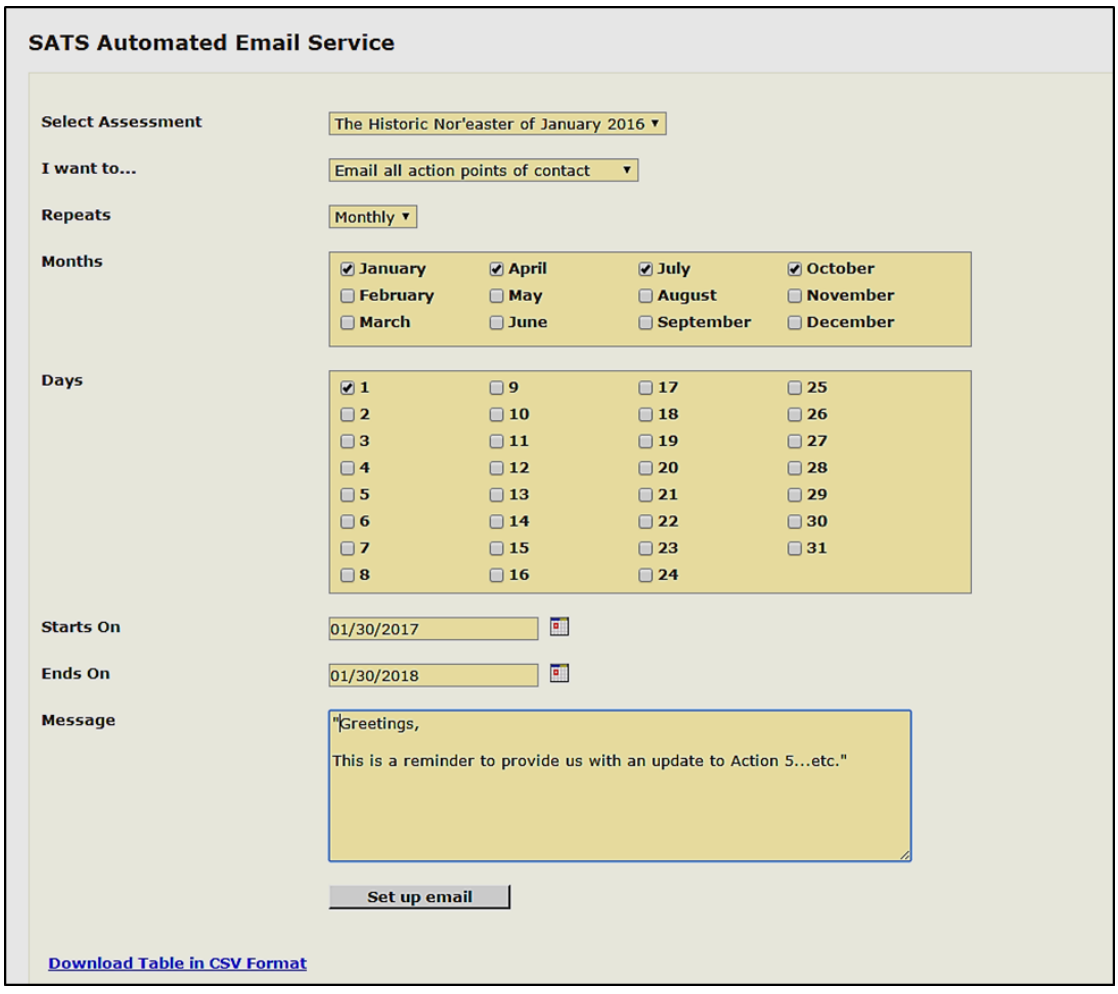


Figure 5. SATS Automated Email Service GUI

Overall, SATS is a welcomed tool to improve the efficiency of managing, tracking, and archiving the history of NOAA NWS service assessment information with the goal of continually improving NWS services to the Nation.◆

ASK CHUCK!

By Chuck Kluepfel, NWS Headquarters

Question: What are examples of good Gerrity and Peirce Skill Scores for marine verification?

Answer: The values of these scores vary with ***location*** and ***time of year*** so it is best to keep these two quantities as constant as possible when comparing scores. Both scores are calculated from a contingency table of observed categories of data (rows) versus the identical forecast categories of data (columns). An example of two categories of ceiling data are (1) less than 200 feet, and (2) 200 to 400 feet. The upper left to lower right diagonal of the contingency table contains all the categorically correct forecasts, where the forecast category equals the observation category to which it was matched in space and time. Ultimately, skill scores measure the closeness of the collective entries in the contingency table to this "clairvoyance diagonal" of categorical hits, but they also subtract a value that estimates how much artificial skill was obtained by randomness or guessing (the dart board effect).

The Peirce score only gives credit for categorical hits that lie on the clairvoyance diagonal, so large errors are treated the same as small errors. The Gerrity score is a little more sophisticated. It provides full credit to each categorical hit on the clairvoyance diagonal and partial credit (or a graduated penalty) for each missed forecast to the right or left of the diagonal. Not surprisingly, large misses receive less credit (or more penalty) than small misses in the same observation category. The Peirce score has no provision for partial credit or graduated penalties so its baselines tend to run lower than the Gerrity score, but both scores use Murphy's equitability constraints, which have the following boundaries: the score equals zero for a full set of no skill forecasts and unity (1.0) for a full set of forecasts with all categorical hits. Negative scores are rare, but possible, especially with very small samples. I am in the process of posting a new set of training modules to the Commerce Learning Center that explains contingency tables and performance measures; part 3 is devoted to skill scores. Part 1 is scheduled to appear in March 2017; parts 2 and 3 will follow. I encourage you to take the training and provide me with your feedback.

The Peirce score assumes all forecasts (and events) are created equal and weights each individual event equally. Conversely, the Gerrity score provides equitable weighting to each category in the contingency table. The result is the Gerrity score weights each individual rare event (e.g., high winds and high waves) substantially more than each individual common event, making the Gerrity score more sensitive to rare event hits than the Peirce score. However, in fairness to all forecasters, the Gerrity scoring equations do not weight the penalties for rare event misses higher than the penalties for common event misses. For the mathematical details of Gerrity and Peirce, see the Verification Procedure Reference Guide, appendix A, sections 2.8 and 2.9.

Getting back to your question, **Figures 1 thru 4** on pages 10 and 11 provide timelines with over 20 years of wind speed and significant wave height performance, using the NWS National Digital Forecast Database (NDFD) and its predecessors. The *proportion correct* measure is a form of the Government Performance and Results Act (GPRA) measure reported monthly for marine forecasts. A correct wind speed forecast is defined as any forecast with an absolute error less than 5 knots, and a correct significant wave height forecast is defined as any forecast with an absolute error less than 2 feet. When higher observed winds and

Continued on next page... Page 9

Ask Chuck – Continued from Page 9

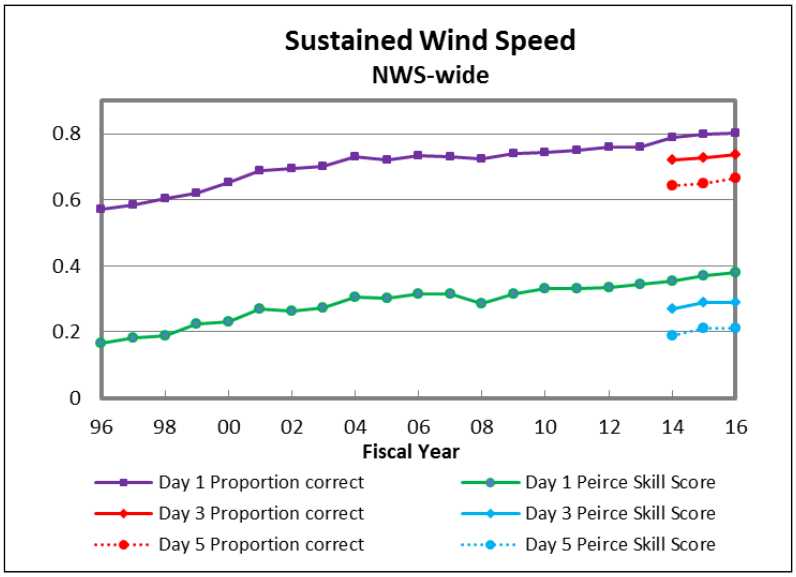


Figure 1. Proportion correct and Peirce Skill Score for NWS sustained wind speed forecasts (coastal, offshore, and Great Lakes waters). Projections are for Days 1, 3 and 5, as labeled. Day 1 is defined as the 3- to 24-hour forecasts; Day 3 as the 51- to 72-hour forecasts, and Day 5 as the 102- to 120-hour forecasts.

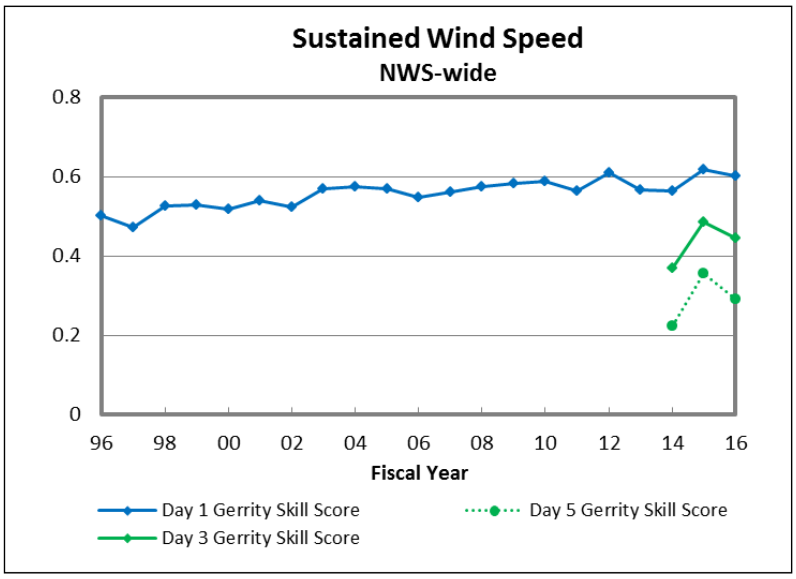


Figure 2. Gerrity Skill Score for NWS sustained wind speed forecasts (coastal, offshore, and Great Lakes waters). Projections are for Days 1, 3 and 5, as labeled.

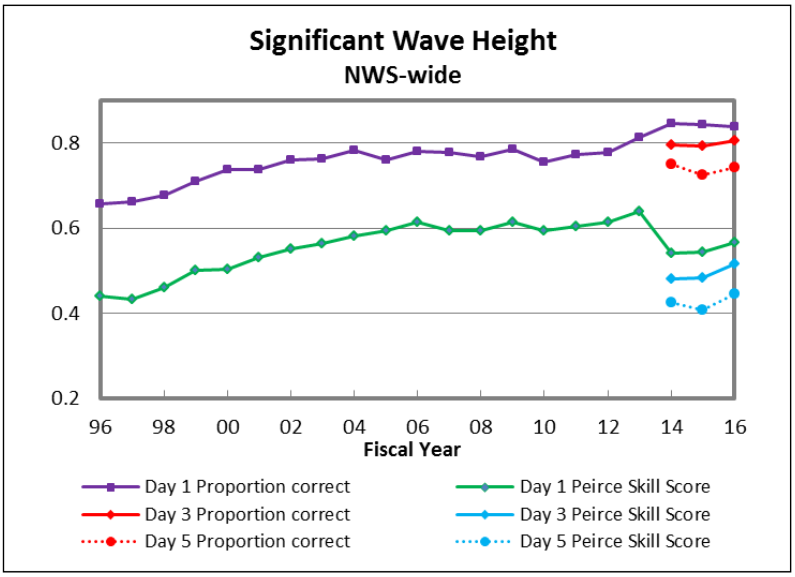


Figure 3. Proportion correct and Peirce Skill Score for NWS significant wave height forecasts (coastal, offshore, and Great Lakes waters). Projections are for Days 1, 3 and 5, as labeled.

Continued on next page...

Ask Chuck – Continued from Page 10

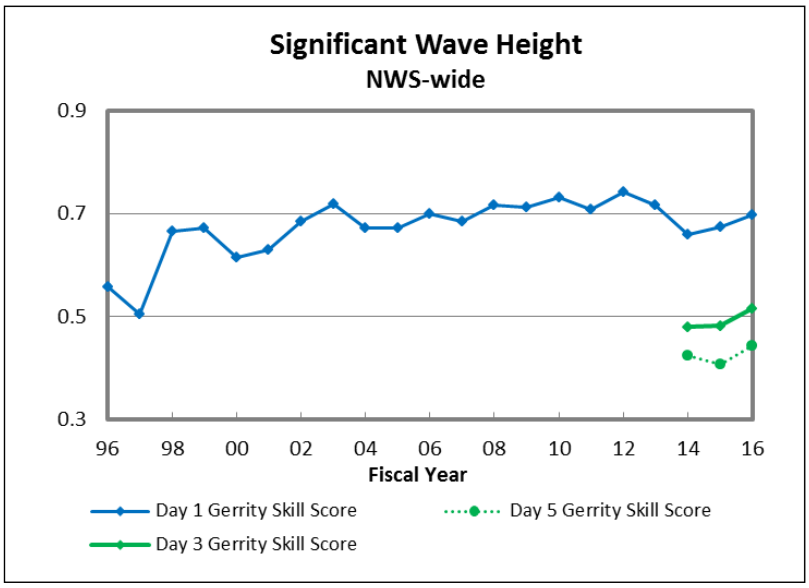


Figure 4. Gerrity Skill Score for NWS significant wave height forecasts (coastal, offshore, and Great Lakes waters). Projections are for Days 1, 3 and 5, as labeled.

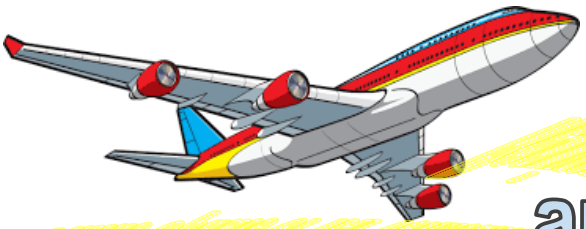
waves are observed, higher absolute error thresholds are used in the definition of a correct forecast (see any marine verification data report for a table that lists these thresholds). Feel free to run stats for your area to get a set of baseline scores for your office, region, or national center. Remember, it isn't wise to compare scores from different parts of the country or different times of the year to one another.

Starting October 2013, when the new marine verification software was launched, we began verifying each 1800 UTC forecast (along with all other times of the day, every 3 hours for short-term winds, and every 6 hours for extended period winds and all waves) with the matching observation from that specific hour. For comparison, in the legacy marine verification program we averaged five consecutive hourly observations (1600 to 2000 UTC) and matched that average to the 1800 UTC forecast. Beginning in FY14, we substantially redefined the significant wave height contingency table categories used for verification, but we only tweaked four of the wind speed categories.

These collective changes in our methodology seem to have caused a permanent dip in the NWS Day 1 baseline scores for these elements. This is not a problem, but you must be aware of this when interpreting a time series of scores.

By summer of 2017, all forecast and observation data will be loaded into the system on a daily basis for near real-time forecast feedback. Currently, users need to wait about two months to view their verification statistics, but that will change this summer when verification data will be available on a near real-time basis (i.e., within a couple days for the Day 1 forecast). How did your office or national center perform? Run the scores and find out, but more importantly, track your future performance and the performance of various guidance products once guidance data are loaded into the system—this should happen by late 2017. This way you'll know how well each guidance product is supporting the forecasts you prepare.◆

Status Update of TAF Verification Requirements and Specifications



By Beth McNulty, NWS Headquarters

Last spring we began the reconstruction of the requirements behind the Stats-on-Demand TAF verification program. By fall we had a fairly complete collection of requirements. During fall we took the requirements list and developed a subset of scientific requirements. From these two reconstructed documents we began developing programming specifications that the Performance and Evaluation Branch programmers will use to update the TAF verification program. Part of the update includes fixing known problems in the TAF verification code. As of mid-January the first draft of the programming specifications was delivered to PEB staff for review, comments, and edits. Assuming all goes well, this project is on schedule for completion by the end of the year.◆

Winter 2016-2017

Peak Performance Newsletter Quote

"Obstacles don't have to stop you.

If you run into a wall,

don't turn around and give up.

Figure out how to climb it, go through it,

or work around it."

Michael Jordan - Basketball player

Service Assessment Program

By Sal Romano, Performance and Evaluation Branch, NWS Headquarters

One Service Assessment Document Publically Released While Another Is In Second Draft

The Historic Nor'easter of January 2016 Service Assessment document was publically released on December 6, 2016. The Hurricane Matthew Service Assessment team was deployed on October 31, 2016 and has completed the second draft of its report.

The Historic Nor'easter of January 2016 Service Assessment

A major winter storm produced 18-36 inches of snow over a wide area of the eastern United States, from West Virginia to southeastern New York. Baltimore-Washington International Thurgood Marshall Airport set a new record snow storm total snowfall of 29.2 inches. Washington-Dulles International Airport (28.3 inches) and New York Central Park (26.8 inches) recorded their second highest storm total snowfall in recorded history. The storm produced wind gusts exceeding 60 mph at numerous locations along the Atlantic Coast in Massachusetts, New Jersey, Delaware, and Virginia. The peak gust reported was 85 mph in Assateague, Virginia. Major coastal flooding occurred in southern New Jersey and Delaware.

The service assessment team presented their findings to the NWS upper management on Monday, October 17, 2016. The service assessment document was signed by the NWS Director on November 14, 2016 and then publically released on December 6, 2016.

Hurricane Matthew Service Assessment

From Haiti to North Carolina, Hurricane Matthew left a trail of destruction. The hurricane hugged the east coast of Florida, tracking northward, and making landfall in North Carolina. It was strongest for the United States while in the vicinity of Florida; however, its most powerful winds remained just off the coast. Port Canaveral, Florida observed the highest observed gust in the United States of 107 mph. In the southern United States, enormous amounts of rain and the subsequent flooding induced the greatest damage. Savannah, Georgia received 17.49 inches of rain. In eastern North Carolina, 10-15 inches of rain fell resulting in catastrophic flooding. Storm surge flooded roads, homes, and businesses along the coast. The highest recorded storm surge was 7.8 feet above the ground in Fort Pulaski, Georgia, near Savannah.

The service assessment team was deployed on October 31, 2016 and provided the first draft of its report to the NWS's Performance and Evaluation Branch in January 2017. The Branch is conducting its second editing pass, which will be adjudicated with the assessment team. Afterward, the document will be returned to NWS Headquarters and shared with subject-matter experts (SMES), affected regions, and NCEP for a review and deeper dive into the content.◆

Status of Service Assessment Action Items

Summary

- There are **308** total actions from open events.
- **241** actions are closed.
- **67** actions remain open
- In addition, there are **33** new actions from the release of The Historic Nor'easter of January 2016 Service Assessment document and pending actions from the Hurricane Matthew Service Assessment.

Recent Service Assessments

1) **The Historic Nor'easter of January 2016 Service Assessment:** The Historic Nor'easter of January 2016 Service Assessment document was publically released on December 6, 2016.

2) **Hurricane Matthew Service Assessment:** The Hurricane Matthew Service Assessment team was deployed on October 31, 2016 and has completed the first draft of the report.

Open Service Assessments

⇒ **South Carolina Historic Flooding of October 2-5, 2015**
Released July 28, 2016
44 Total Actions, 1 Unassigned, 11 (26%) Closed Actions
32 *(74%) Open Actions*

⇒ **Colorado Flooding of September 11-17, 2013**
Released June 24, 2014
26 Total Actions, 21 (81%) Closed Actions
5 (19%) Open Actions

⇒ **May 2013 Oklahoma Tornadoes and Flash Flooding**
Released March 21, 2014
29 Total Actions, 20 (69%) Closed Actions
9 (31%) Open Actions

⇒ **Hurricane and Post-Tropical Cyclone Sandy, October 22-29, 2012**
Released May 05, 2013
25 Total Actions, 24 (96%) Closed Actions
1 (4%) Open Actions

⇒ **Historic Derecho of June 29, 2012**
Released February 05, 2013
14 Total Actions, 9 (64%) Closed Actions
5 (36%) Open Actions

⇒ **Hurricane Irene in August 2011**
Released October 05, 2012
94 Total Actions, 85 (90%) Closed Actions
9 (10%) Open Actions

⇒ **The Missouri/Souris River Floods of May – August 2011 (Regional Service Assessment)**
Released June 05, 2012
29 Total Actions, 28 (97%) Closed Actions
1 (3%) Open Actions

⇒ **May 22, 2011 Joplin Tornado (Regional Service Assessment)**
Released September 20, 2011
16 Total Actions, 14 (88%) Closed Actions
2 (12%) Open Actions

⇒ **Spring 2011 Mississippi River Floods**
Released April 11, 2012
31 Total Actions, 29 (94%) Closed Actions
2 (6%) Open Actions

Last Closed Events (all actions completed)

- **Remnants of Tropical Storm Lee and the Susquehanna River Basin Flooding of September 6-10, 2011 (Regional Service Assessment)**
Released July 26, 2012
11 Total Actions - Closed

- **The Historic Tornado Outbreaks of April 2011**
Released December 19, 2011
32 Total Actions - Closed

- **Washington, D.C. High-Impact, Convective Winter Weather Event of January 26, 2011**
Released April 01, 2011
6 Total Actions - Closed

- **Record Floods of Greater Nashville: Including Flooding in Middle Tennessee and Western Kentucky, May 1-4, 2010**
Released January 12, 2011
17 Total Actions - Closed

- **Southeast US Flooding of September 18-23, 2009**
Released May 28, 2010
29 Total Actions - Closed

- **South Pacific Basin Tsunami of September 29-30, 2009**
Released June 04, 2010
131 Total Actions - Closed

Contributors to this Winter 2016-2017 Edition of Peak Performance include . . .

Doug Young
Editor
Performance and Evaluation Branch Chief
NWS Headquarters
Douglas.Young@noaa.gov

Sal Romano
Performance and Evaluation Branch
NWS Headquarters
Service Assessment and Evaluation
Salvatore.Romano@noaa.gov

Beth McNulty
Performance and Evaluation Branch
NWS Headquarters
Aviation Performance and Verification
Beth.Mcnulty@noaa.gov

Freda Walters
Co-Editor and Designer
Performance and Evaluation Branch
NWS Headquarters
Service Assessment and Evaluation
Alfreda.Walters@noaa.gov

Chuck Kluepfel
Performance and Evaluation Branch
NWS Headquarters
Verification Lead
Charles.Kluepfel@noaa.gov

Web Link
Stats on Demand:
https://verification.nws.noaa.gov

Questions and comments on this publication should be directed to Freda Walters.