



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
CHIEF ADMINISTRATIVE OFFICER

SEP 07 2012

MEMORANDUM FOR:

[REDACTED]
Office of Special Investigations and Analysis

FROM:

SUBJECT:

Inspector General Referral No. PPC-CI-12-0254-H
Re: Reported Flaws in NWS Tsunami Warning Program
Management

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This memorandum responds to your request for administrative resolution of the above mentioned referral. The complainant, [REDACTED] alleged that serious flaws have persisted in the management of the National Weather Service (NWS) Tsunami Program. [REDACTED] also alleged that the NWS-issued service assessment and follow-on action report for the Samoa Pacific Basin contained factual errors.

On behalf of NOAA [REDACTED] and [REDACTED] conducted an inquiry into the facts giving rise to the complaint. In the interest of ensuring objectivity, transparency, and accountability for complaints referred to our office, we assert that [REDACTED] and [REDACTED] is an impartial party, that is, independent of individuals and matters that are the subject of this complaint.

The inquiry addressed all concerns raised by [REDACTED] including the status of each recommendation contained in the six assessments of the NWS Tsunami Program. (See Attachment #1) Additional information has been included to support the claims made in the independent review. For example, NOAA comments on the National Academy of Sciences (NAS) report that includes the recommendation for consolidating the tsunami warning centers is attached. (See Attachment #2) Also included is the NWS Instruction (NWSI) 10-1606 for conducting service assessments. (See Attachment #3) Finally, evidence to support the claim that NWS spent more than \$50,000 to upgrade both the power and cooling at the PTWC facility has been included. (See Attachment #4) All of these issues were raised by [REDACTED]

Our inquiry found the allegations unsubstantiated. If you have additional questions, please contact [REDACTED] on 301 [REDACTED]

Attachments



DECLARATION OF INDEPENDENCE

Assignment Title: _____

Assignment Number: PPC-CI-11-0254-H

I hereby certify that I am aware that in all matters related to this administrative inquiry, I must be free, both in fact and appearance, for the duration of this administrative inquiry, from all personal and external impairments arising from my interaction with any organizations, programs, and individuals involved in this inquiry.

I understand that if any such impairments exist, or arise, they can affect my impartiality in performing the administrative inquiry and reporting the results, and I must therefore withdraw from performing the inquiry.

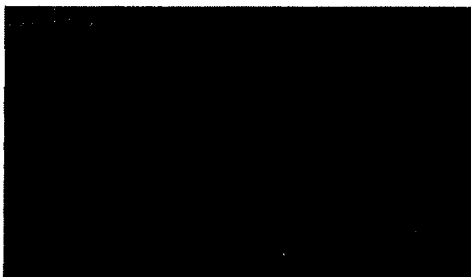
I hereby certify that to the best of my knowledge and belief, I am free from any such impairments to independence and that if any impairment should arise during this inquiry, I will cease performing the inquiry and immediately bring the matter to the attention of my supervisor.

Printed Name

Title and Grade

Signature

Date



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DECLARATION OF INDEPENDENCE

Assignment Title: _____

Assignment Number: PPC-CI-11-0254-11

I hereby certify that I am aware that in all matters related to this administrative inquiry, I must be free, both in fact and appearance, for the duration of this administrative inquiry, from all personal and external impairments arising from my interaction with any organizations, programs, and individuals involved in this inquiry.

I understand that if any such impairments exist, or arise, they can affect my impartiality in performing the administrative inquiry and reporting the results, and I must therefore withdraw from performing the inquiry.

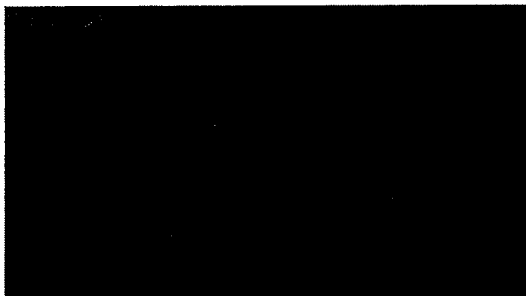
I hereby certify that to the best of my knowledge and belief, I am free from any such impairments to independence and that if any impairment should arise during this inquiry, I will cease performing the inquiry and immediately bring the matter to the attention of my supervisor.

Printed Name

Title and Grade

Signature

Date



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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
1325 East-West Highway
Silver Spring, Maryland 20910-3283
THE DIRECTOR

JAN 31 2002

(b) 7 (c)

MEMORANDUM FOR:

[REDACTED]
NOAA Audits, Internal Control
and Information Management Office,

FROM:

[REDACTED]

SUBJECT:

OIG Complaint Referral No. PPC-CI-11-0254-H
Re: Reported Flaws in NWS Tsunami Warning Program
Management

This memorandum is in response to an Office of Inspector General referral regarding [REDACTED] concerns of the Tsunami Program. We are submitting an impartial assessment of [REDACTED] concerns. This assessment was conducted by [REDACTED] and [REDACTED].

[REDACTED] We are also submitting, as requested, the status for each of the recommendations contained in the six assessments of the NWS Tsunami Program.

If you have any questions, please contact [REDACTED] NWS [REDACTED] at (301) [REDACTED].

Attachments



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Independent Review/Analysis of the Concerns Raised by [REDACTED]

The issues raised by [REDACTED] are addressed below. While there are valid concerns raised by [REDACTED] some of his concerns represent his personal interpretation and perceptions of the NWS Service Assessment Report's findings, rather than an objective critique of the report on NWS's services during September 29-30 2009 tsunami event. The NWS has recognized and acknowledged shortcomings in its tsunami response operations and these have been documented in the findings and recommendations from the six Service Assessments of the NWS Tsunami Program. The status update on each of the recommendations (attached) illustrates the resolve to improve its Tsunami Program.

As for the concern that NOAA is contemplating consolidation of the tsunami warning centers, that is one of the recommendations by the National Academy of Sciences (NAS) report. NWS evaluated all NAS recommendations and performed a cost analysis to determine the fiscal viability of any such consolidation. This cost analysis was part of a broader action to see what efficiencies and cost savings might be gained within the tsunami program. This action was generated by recommendations in the recent NAS study (combined with budget pressures within the agency) to evaluate the program to better organize and streamline components. NWS is continuing to investigate a variety of alternatives with respect to improving and leveraging efficiencies within all of its programs, including Tsunami. Currently, there are no plans to consolidate the centers.

We segregated the response into the four categories highlighted by [REDACTED] the "South Pacific Basin Tsunami – September 29-30 2010," Flawed Makeup of the Assessment Team, the Samoa Tsunami Follow-on Actions Report ([REDACTED] Report), and Flawed Management by the NWS.

South Pacific Basin Tsunami – September 29-30, 2009

The NWS Service Assessment of the South Pacific Basin Tsunami (September 29-30, 2009) is being challenged by [REDACTED] who asserts that the report has factual errors and omissions. The following are responses to the specific assertions made by [REDACTED]

1. [REDACTED] questioned the dissemination time comparison between the Pacific Tsunami Warning Center (PTWC) Regional Watch/Warning (RWW) and the West Coast/Alaska Tsunami Warning Center (WC/ATWC) Tsunami Information Statement (TIS). The difference in the software packages' time stamps provides an objective comparison of the differences in recorded time, as well as the difference in the level of effort necessary to prepare a RWW versus a TIS. However, there is still the matter of information being disseminated by the WC/ATWC before it could be made available by PTWC, leading to inconsistent levels of service provided by the offices. NWS is working to ensure consistent service levels via similar products and procedures for information dissemination.

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2. The Service Assessment pointed out the fact that the earthquake parameter assessments by the PTWC and WC/ATWC were provided at different times and different accuracies. [REDACTED] has recommended that the PTWC should not be judged according to the quick assessment of the earthquake and the release of this assessment in an unofficial product, the Observatory Message, which tends to be the initial assessment of the situation. It is accurate to state that information disseminated to the public by PTWC regarding the earthquake's location and magnitude was factually less accurate information than that disseminated by the WC/ATWC. Observatory Messages originated as a way to informally, but quickly, exchange analysis results between some of the world's seismic observatories. That function continues, but the data from those messages now has wider availability through United States Geological Survey (USGS) mechanisms such as the USGS National Earthquake Information Center (NEIC) and the California Information Seismic Network (CISN) website. Both centers use the messages as a way to practice and exercise software and communications regularly, and to let many of our customers (particularly those that utilize the CISN software) regularly know that our communications are functioning. Lastly, since the spin-up of the Indian Ocean Tsunami Warning Center, the Centers are all quickly exchanging preliminary earthquake parameters by various means, and for NWS, that is through the unofficial Observatory Message. It is acknowledged that the NWS service assessment did not make the distinction between the Observatory Message from PTWC and the formal product from the WC/ATWC. However, with the operational usage of the observatory message leading to stakeholder confusion, it was a valid observation to include in the Service Assessment.

3. [REDACTED] asked how it was possible that NWS leadership was not aware of the dearth of seismic sensors available in the Samoa region until after the disaster, as pointed out in the assessment. NWS was and is aware of the location and number of seismic sensors. The NWS works with the USGS to obtain seismic data. The global seismic network density has increased since the Indonesian tsunami of 2004, but more sensors are needed to provide quicker, more accurate assessments of earthquakes around the globe and of the potential for tsunamis. The NWS maintains and operates a relatively small network of seismic stations in Hawaii, Alaska, and Puerto Rico. These additional stations compliment the USGS and international global network. NWS is not funded to expand their seismic stations and the current NWS seismic sensors were located based on risk of tsunami occurrences and damages.

4. The Service Assessment pointed out that there is no redundant backup for the terrestrial communications network previously called NOAANet (NOAANet is now called OPSNet). [REDACTED] has stated that the NWS has not provided enough bandwidth necessary to warn the large Area of Responsibility (AOR) under PTWC's jurisdiction. He also asserted that the WC/ATWC has more bandwidth than the PTWC and thus is better equipped to handle the traffic. The NWS is currently in the midst of assessing the IT services available at both the WC/ATWC and the PTWC. The WC/ATWC assessment is complete and the PTWC assessment is scheduled to be completed by the end of March 2012. However, from current knowledge of PTWC's communications infrastructure, PTWC operated 2 x T1 OPSNet communications lines while WC/ATWC had 1 x T1 line, which was then upgraded to 2 x T1 lines to handle regional traffic. WC/ATWC does have additional fiber capacity outside of the OPSNet connections that is managed locally. The fact that there is no redundant backup of the NOAANet/OPSNet network

is still valid. NWS is conducting a communications analysis at each of the Centers to identify current capabilities and future requirements, and how best to meet these needs.

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██████████ also mentioned that the Pacific region is more "strapped for funding" than the Alaska Region. A quick analysis shows PTWC spending more than WC/ATWC through 2008, and WC/ATWC exceeding PTWC after 2008 due to a \$1M earmark appropriation for tsunami modeling and education and outreach activities from an Alaska senator. There is no longer an earmark for the NWS tsunami program but that funding has continued for WC/ATWC and NWS Alaska Regional Headquarters tsunami program activities due to a commitment to maintain the funding by the NWS tsunami program.

5. ██████████ disagreed with the NWS Service Assessment's characterization of media interactions. The NWS Service Assessment illustrated the breakdown in procedure with respect to media interactions. While the relevant Fact did not give a particular timeline for the appearance of the media, it did point out that the supplementary PTWC staff that arrived at the PTWC interacted with the media, and these media interviews showed that the staff being interviewed were not in possession of all the necessary information that needed to be disseminated. The introductory paragraph of the relevant section, which stated there was a lack of means to efficiently share information among staff, was intended to give context to the Fact, Findings, and Recommendations in that section. In particular, Finding 4b supports the statement. This documented lack of efficiency is the point of the section. The Recommendation that NWS establish better procedures to use its existing resources when communicating with the media is valid.

6. ██████████ disputed the assertion that a PTWC website slow-down caused communications problems by pointing out that PTWC does not maintain a website. The characterization of the website as the "PTWC's website" remains accurate, as it was a website used to communicate information on behalf of the PTWC. The legacy PTWC webpage was transitioned to the NWS Internet Dissemination System (NIDS) for formal management, with the legacy PTWC coding providing the Web service. Issues with the website stemmed from both inefficient coding and low bandwidth, so the responsibility for the website's performance should be shared between NIDS and the website coders at PTWC. The recommendation for improvements in the bandwidth management of the website and the eventual consolidation to a single tsunami portal (restructured to a single NOAA/NWS tsunami website) has been accomplished. The single site, tsunami.gov, was transitioned into NIDS in December 2011, and is being managed by NWS Headquarters in collaboration with the PTWC and WC/ATWC. The goal is to ensure that this single website provides a "one-stop shop" for the NWS tsunami program.

7. ██████████ has inferred that the fact that the tsunami arrived 17 minutes after the earthquake means that the NWS Service Assessment is suggesting that the PTWC tsunami warning was ineffective. He stated that the first waves of the tsunami were not hazardous and he therefore infers that this Fact in the Assessment was misleading. Despite the lack of hazard with the first waves of the tsunami, it still marked the beginning of the event in Pago Pago, and thus the NWS Service Assessment makes a factually correct statement. The statement here was related to Finding 20a, which gave the context and interpretation of the Fact as evidence that

there was confusion among the public as to which tremor (the original earthquake or the subsequent large aftershock) actually triggered the issuance of the tsunami warning.

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8. The assessment points out that the definition of a "tsunami advisory" differed between PTWC and WC/ATWC. [REDACTED] explained that the difference was due to the PTWC's advisory being a specialized local product. Advisory products do vary across regions and localities. The Fact is correct in pointing out the existence of the difference. However, NWS believes there should be some consistency in these products to avoid public confusion, as recommended in the Assessment. This advisory product has been standardized as an official product as of April 1, 2010.

9. The NWS Service Assessment stated a Fact relating to the failure to issue hourly tsunami watches/warnings. [REDACTED] has countered by explaining there are technical challenges to operating antiquated equipment leading to slow product delivery. [REDACTED] notes that the Aeronautical Fixed Telecommunication Network (AFTN), a worldwide system of aeronautical fixed circuits for the exchange of messages and/or digital data between aeronautical fixed stations, and the NOAA Weather Wire Service (NWWS) have not been updated, and are still running on old computing platforms leading to inefficiencies in producing the hourly products. The Fact is correct in pointing out there was a failure to issue hourly watches/warnings. The NWS responded to the requests for upgrades by planning changes to NWWS via the multi-year NOAA Weather Radio Improvement Project (WRIP). Though NWWS is currently being updated as part of WRIP, there are no plans in place for updates to the AFTN. The pending assessment of IT capabilities at the PTWC will identify equipment for modernization and equalize the IT service levels of the PTWC and WC/ATWC so that they can serve as hot backups for each other and provide consistent levels of service as described in the Tsunami IT modernization project plan.

10. [REDACTED] asserted that the timing of the phone call from WC/ATWC informing the PTWC of the missing watch/warning products occurred at the same time that the staff at PTWC became aware of the dissemination failure. WC/ATWC did the right thing in initiating a phone call, and PTWC did the right thing in monitoring its own communications and then taking steps to correct the issue once discovered. The fact that the phone call was made is an example of the type of coordination that the two Centers should, and do, engage in to support each other. A problem with dissemination of critical products must be fixed.

Flawed Makeup of the Assessment Team

[REDACTED] asserts there were flaws in the makeup of the Assessment Team. When conducting a Service Assessment, the NWS follows directive NWS Instruction (NWSI) 10-1606 (<http://www.nws.noaa.gov/directives/svm/pd01016006curr.pdf>). The directive requires: "Team member selection should be a highly collaborative process to ensure subject matter experts with strong team building and leadership skills are identified. Once the leader is selected, he/she will provide input on team membership." Team leaders are chosen carefully and it is critical to have subject matter experts on the team, as [REDACTED] states. NWS typically looks internally for many experts, but includes outside experts as available and appropriate, to ensure all facets of the particular Service Assessment are covered – science, service, outreach,

media, etc. The Service Assessment in question was no different. In fact, this team of eleven included four members who were non-NWS employees, including three members who were non-NOAA employees

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NWS typically uses Meteorologists-in-Charge to assess services from Weather Forecast Offices, Hydrologists-in-Charge to assess River Forecast Centers, and in the case of the Tsunami Program, NWS draws from its tsunami expertise, some of which is located at the two tsunami centers. NWS used the tsunami expertise available, including [redacted] and [redacted] as well as many others involved from the services perspective. [redacted] was not part of the NWS at the time of the Service Assessment. She is a [redacted] and was [redacted]

[redacted] The Service Assessment leader provides unbiased, objective supervision and review of the entire Assessment. NWS is currently considering using more non-NWS individuals to help conduct assessments to ensure a non-biased analysis of NWS services. When considering team composition, NWS must weigh the importance of complete objectivity from outside the NWS, with team members that have intimate knowledge of and expertise in NWS policy and operations, typically internal to the NWS.

[redacted] raises the concern that there was an inadequate internal NWS review of the Service Assessment. It is NWS policy to send draft Service Assessments to the affected regions for their review and fact checking. It is up to the region to further distribute for review, as deemed necessary. The American Samoa Tsunami Assessment followed this policy and a draft was sent to the NWS Pacific Region for their review and comment. Also [redacted] a member of the assessment team, is from Pacific Region Headquarters. Comments were addressed by the team.

The Samoa Tsunami Follow-on Actions Report [Follow-On Report]

The team for the Follow-On Report was chartered to not only review the status of the Recommendations in the Service Assessment, but to take a bigger picture view and analysis of the tsunami program. [redacted] expressed concern about the findings on slide #9 in the Follow-On Report. The team stated its findings based on an analysis of the issuance times for international products. The NWS tsunami program is examining current practices, policies, and guidelines to determine the "optimum" time for products to be issued, considering both the need for accuracy and the need to ensure safety. This was addressed in February 2011, at a meeting in Hawaii involving both Tsunami Warning Center (TWC) Directors and the Tsunami Program Manager. The timing for product issuance is part of an update to the directive NWSI 10-701, currently being reviewed by the NWS Employees Organization (NWSEO).

[redacted] asserts that the follow-on team should not have included [redacted] claiming [redacted] has a vested interest in the outcome, since he is the [redacted] is the [redacted] and thus has personal knowledge of the centers' operating procedures. [redacted] understanding of the NWS tsunami program was critical to the Follow-On Report, and it is NWS's belief that [redacted] provided an

objective review. Nowhere does the Follow-on Report recommend any realignment of Center Area of Responsibility (AORs).

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██████████ raises training and facility deficiencies as an issue related to the PTWC response to the event. NWS has identified training as an area needing improvement. NWS plans to ensure appropriate equipment and facilities are available in the new NOAA facility on Ford Island in Pearl Harbor for training, simulations, and test bed functions. ██████████ correctly states space and power/cooling requirements are less than desirable at the current PTWC facility at Ewa Beach. However, in FY11, the NWS spent over \$50,000 to upgrade both the power and cooling at the PTWC facility. The cooling work is completed, and the power work is nearly complete, awaiting contract renegotiations. NOAA contract staff are addressing this issue.

██████████ raises concerns about recommendations on slides 12-14. These are simply recommendations, based on best practices the follow-on team felt were appropriate. The recommendations focus on testing the new system and evaluating the results. NWS believes these recommendations appear to represent an appropriate approach.

██████████ raises concerns about results from a National Institutes of Health (NIH) study on sleep and response cited in the Follow-On Report (slide #17.) The NWS does not believe it is qualified to question the validity of the NIH study. However, NWS is addressing the staffing models at both TWCs to ensure service to the Nation is the primary driver, not individual TWC practices or preferences.

██████████ expresses a concern that ██████████ is attempting "empire building" and is trying to transfer PTWC's area of responsibility to WC/A/TWC. NWS fails to see where such statements are made in ██████████ report. To the contrary, the Follow-On Report recommends technical improvements, training and test bed capability at PTWC, and service enhancements. This is not consistent with the issue raised by ██████████

Flawed Management by the NWS

The NWS Tsunami Program was managed regionally with little national oversight before the Indonesian tsunami of December 26, 2004. While tsunamis are important natural events, there had not been a significant tsunami in many years, and NWS efforts were focused on the more frequent high-impact weather events. Since the Indonesian tsunami event, both the administration and Congress recognized the critical importance of the NWS tsunami program. NOAA hired a GS-15 senior Tsunami Program Manager in FY 2011 to oversee the program. After the Indonesian tsunami, the U.S. tsunami program (including USGS earthquake monitoring systems) received significant funding increases which facilitated tremendous strides to improve the tsunami warning program, from increased staffing at each of the TWCs, to installing 39 operational Deep-ocean Assessment and Reporting of Tsunamis (DART) stations, to vastly increased preparedness efforts and extensive tsunami modeling efforts. In addition, the number of TsunamiReady communities has increased from approximately 20 in 2005, to 92 in 2011. NWS believes these large strides in the program are in large part the direct result of good management.

In FY 2011, NWS provided funding to replace aged equipment at the PTWC to mitigate the PTWC's most pressing IT challenges. This is a stop-gap measure until the complete technology refresh occurs, currently planned for FY 2013.

Developing and transitioning research to operations is the function of the NWS Office of Science and Technology (OST). In the case of the tsunami program, OST has the lead for new science and technology, relying heavily on program experts, including the tsunami program manager and field staff, to ensure mission requirements are met.

In 2005, additional funds were appropriated to NWS to strengthen the Tsunami Warning Program. As part of these funds, NWS increased staff at the TWCs to allow for 24x7 coverage. PTWC chose to use one of the additional staff to fill a Watchstander position, rather than an Information Technology Officer (ITO) position. Funding for the TWCs is approximately equal, with some additional funds provided to the WC/ATWC at the direction of Senator Stevens (now deceased). These funds increased the NWS base budget for the WC/ATWC beyond what was needed to operate the Center, ostensibly for specific programs in Alaska for outreach, education, and modeling. Subsequent budget requests to include an additional ITO position for PTWC have not been supported. Given the current budget climate, we expect additional resources to be very limited at best.

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With respect to IT security, it is not the NWS intention to "shut PTWC down," as [REDACTED] states, but rather to identify and document the security risks, and then to address them as expeditiously and efficiently as possible. NWS [REDACTED] does not set the guidelines for IT Security; rather all Federal agencies must abide by and implement the National Institutes of Science and Technology (NIST) IT security standards, as mandated by the Office of Management and Budget.

As stated earlier, the NWS Tsunami Program had been managed regionally with little national oversight until the Indonesian tsunami woke the world to the ever present, although rare, threat from tsunamis. With political and funding support, the NOAA and the world tsunami efforts have improved dramatically over the past decade. The recent Japanese tsunami is an example of how far the U.S. has come. After that earthquake, NWS issued tsunami warnings for Hawaii and the West Coast. People in Hawaii and Crescent City, CA, took appropriate action to protect their lives and property. Evacuation orders were issued and the fishing fleet at Crescent City set to sea so as to not be in port when the tsunami arrived. While the coastal inundation was not extreme, many docks and ports were damaged or destroyed and many fishing boats would also have been destroyed had it not been for extensive preparedness efforts and excellent forecasts from the NWS Tsunami Warning Centers and local Weather Forecast Offices.

The two NWS TWCs were established at Congressional direction following major tsunamis in Hawaii and Alaska. The Centers were managed separately and developed their own funding stream, procedures and technology. NWS has made significant changes to ensure a unified tsunami program with one funding stream, plans to have the same modernized technology at both Centers, integration of the same science, and implementation of consistent procedures and policies to manage the program. However, more still needs to be accomplished, as evidenced by the status of the recommendations from the many reviews. Given the austere budget climate

facing the NWS, the NWS Tsunami Program requirements and functions must be prioritized to ensure that there is no degradation of service to the people and communities that we serve.