

# The Whispering Trades



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## From the Desk of the Meteorologist In Charge

By: Roberto García



### INSIDE THIS ISSUE:

Fire Weather	2
Summer Weather	2
Spanish Translators	3
Portugués Dam Project	4
LANTEX	5
ARMY Earth Day	6
COOP Award	6
Satellite Tools	7
Hurricane Preparedness	8
Contributing to the cause	8

Since a very early age I have always been interested in weather, especially thunderstorms and hurricanes. My career in the National Weather Service started as a part time employee at the Agricultural Weather Station in College Station, Texas. This office was located within the Texas A&M campus where I was studying for my master's degree. I began working for the National Weather Service just before finishing my master's degree and have grown within the agency through the past 23 years to reach the position I hold today. Just before graduation, a Met Intern position opened in the Weather Forecast Office in San Juan, Puerto Rico. I was selected and started working at the San Juan office in June 1990.

Soon after, an unforgettable event occurred. I had the great opportunity of flying in a reconnaissance plane to the eye of hurricane Gustav in August 1990. An experience not many meteorologists working in a Forecast Office get to have. After almost a decade working and ascending through the ranks to reach the position of Lead Forecaster, I transferred to the Forecast Office in Miami. There I got to work in

close coordination with the National Hurricane Center. In Miami, I had the experience of forecasting weather conditions other than tropical weather, such as winter freezes, severe thunderstorms and even tornadoes. After more than 13 years in Miami, the Meteorologist In Charge position in San Juan became available.



R. García, SJU

After applying and being selected, I was back in San Juan by September 2013. I was born and raised in Santurce, PR.

### Dual Pol Upgrade to Doppler Radar

#### Press Release

The National Weather Service improved its Doppler radar serving Puerto Rico and the U.S. Virgin Islands by installing the latest dual-polarization technology. The Dual Pol installation was completed in May 2013. This technology will give forecasters better information about heavy rainfall in flooding events, hail detection in thunderstorms, and even recognize whether precipitation is in the form of rain or ice. Before Dual Pol, National Weather Service Doppler radars were capable of providing

forecasters information on precipitation intensity and movement. Dual-polarization technology adds new information about the size and shape of airborne objects, which will improve flash flood detection and warnings. "This radar upgrade will help us provide better forecasts and warnings of flooding and severe weather for the residents and visitors of Puerto Rico and the U.S. Virgin Islands," said Roberto García, Meteorologist-In-Charge (MIC) of the National Weather Service office in San Juan, Puerto Rico. The National Weather Service is building a Weather-Ready Nation to support community resilience in the face of increasing vulnerability to extreme weather.



Doppler Radar, Cayey, PR

## Fire Weather News

By: Luis Rosa

The 2013 Winter/Spring Fire season saw significant fire activity with over 4,000 fires and nearly 12,000 acres burned. Fire activity has recently slowed down from the March peak as we moved into the wet season. A study done by the U.S. Forest Service International Institute of Tropical Forestry (ITTF) shows that PR experiences two peaks in fire activity over the course of a year, one in early March and a second peak in mid July. During June and the first half of July, the islands of the northeast Caribbean experience a significant drop in rainfall amounts as the

region comes under the influence of dry, stable air masses originating from the Sahara region in Northwest Africa. The islands also experience an increase in trade winds associated with the strengthening of the Caribbean Low-Level Jet due to strong pressure gradients between the Equatorial Trough and the seasonal westward shift of the Bermuda-Azores High. Over the last two years, the NWS has been providing decision support services to fire weather customers in PR and the USVI. These services are primarily for the PR Fire Corps, the U.S.

Fish and Wildlife Service, and the Virgin Islands Fire Service through Site-Specific (Spot) forecasts and weekly fire weather briefings. A preliminary study of fire occurrence and weather data since 2003 shows that fire activity in PR is mostly driven by fuels and topography with no clear correlation between relative humidity and winds. Large fires can occur at almost any wind speed primarily due to the fuels and topography. New improvements to the local fire weather program include new fire zones,

which came into effect in May 2013 and are delineated based on climate, fuels, and topography, the three concepts that make the fire weather triangle and will help improve the output of the fire weather planning forecast.



Click image above to enlarge.

## Summer Weather Pattern & Local High-Resolution Models

By: Ernesto Rodríguez

Weather patterns change slowly in the summer months compared with winter months. A typical summer weather pattern in Puerto Rico is characterized by the trade winds blowing consistently from east to southeast at a 10-20 mph range. In a 3-5 day cycle, tropical disturbances pass near the islands, causing changes in wind precipitation patterns. In between these tropical disturbances, dry and stable air mass, with some Saharan Dust particles

embedded, is observed across the region. On normal days, local winds around Puerto Rico are influenced by the diurnal heating cycle, which often induces sea breezes along the north, south and west coastal areas. Afternoon convection develops over western Puerto Rico where the sea breeze converges (see Figures 1 and 2). Mostly sunny skies throughout the morning and afternoon hours allow more solar energy to reach the surface and heat the

ground. Warm waters evaporate more water and a warmer atmosphere can accommodate more water vapor. All of these ingredients combine to produce hot and humid conditions across Puerto Rico, USVI and adjacent islands during the summer months. High-resolution models are essential to NWS San Juan, especially because these models are highly configurable and successfully resolve local effects that occur across the local islands. The Weather Research and Forecast (WRF) has been running internally at the NWS San Juan over the last few years. This model allows us to improve our forecast tremendously, helping us to forecast winds and rainfall with more precision than

before. At NWS San Juan, these local models are only used as guidance. Therefore, the official source of weather information continues to be our official forecast and not these operational models. However, if you want to access the output of our high resolution models, please visit:

[www.weather.gov/sju/](http://www.weather.gov/sju/)

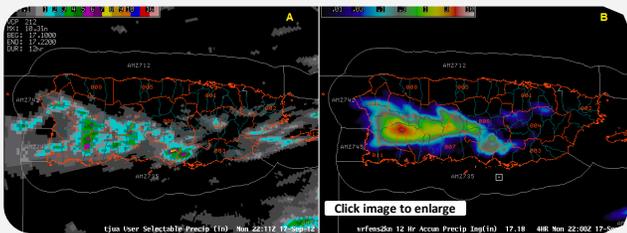


Figure 1: A) rainfall accumulation estimated by TJUA Doppler Radar, and B) WRF model simulating rainfall accumulations over the interior and west sections of Puerto Rico.

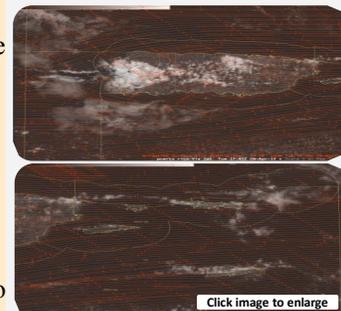


Figure 2: GOES Visible imagery overlay with WRF 2km streamline analysis.

# NWS Hurricane Products Spanish Translators

By: Althea Austin-Smith & Rosalina Vázquez Torres

After the last Census in 2010, the U.S. Census Bureau numbers indicate; "...people of Hispanic origin the nation's largest ethnic or race minority. Hispanics constituted 16.7 percent of the nation's total population. In addition, there are 3.7 million residents of Puerto Rico, a U.S. territory." With this being the case, NWS Spanish products add to the service of many customers especially during extreme events when specific instructions need to be communicated in order to effectively serve the NWS' mission of saving of "life and property".

At the NWS San Juan, there is a team of individuals who are tasked to do Spanish translations during the Hurricane Season. The products that need to be translated routinely are: The Tropical Cyclone Public Advisory which contains a list of all current watches and warnings on a tropical or subtropical cyclone. The Tropical Weather Outlook which is a discussion of significant areas of disturbed weather and their potential for development out to 48 hours. Also included on the Spanish translation list, are the Special Tropical Weather Outlooks which are issued when there are important changes before the next scheduled release of the Outlook. These products are the official NWS Hurricane products issued by National Hurricane Center in Miami for all Atlantic and Eastern Pacific.

It is important to note that the workload can vary vastly depending on how active the Atlantic basin is at any given time during the Hurricane Season. The Public Advisories are normally issued every six hours while the Intermediate Public Advisories may be issued every three hours when coastal watches or warnings are in effect and every two hours when coastal watches or warnings are in effect and land-based radars have identified a reliable storm center. Tropical Weather Outlooks are issued four times a day. Additionally, special Public Advisories may be issued at any time due to any significant changes in the warnings or the cyclone.

This San Juan translation group consists of the Observing Program Leader (OPL), Met Interns and a Hydrometeorological technician. These seasonal duties are in addition to the daily routine tasks and responsibilities during their regular shifts, which include; the translation of routine and non-routine local products, activation of the Emergency Alert System (EAS) when needed, the balloon/radiosonde launch two times a day under normal conditions (occasionally, they have to launch the balloon four times a day, if a tropical system approaches the local area), quality control of cooperative weather observations reported by volunteers and airports across Puerto Rico and the U.S. Virgin Islands.



Rosalina Vázquez Torres, HMT

When all products are translated, they are disseminated to NOAA Weather Radio (NWR), and the internet for the public. These Spanish products are vital to the growing Spanish speaking community and is a source of pride that the NWS San Juan staff plays such a vital role in providing this service.

## Helpful Translation Hints of Weather Products:

<b>Warning</b>	⇒	<b>Aviso</b>
<b>Advisory</b>	⇒	<b>Advertencia</b>
<b>Watch</b>	⇒	<b>Vigilancia</b>
<b>Outlook</b>	⇒	<b>Perspectiva</b>

Translations of our products can be found at:  
[www.srh.noaa.gov/sju/?n=forecast\\_text](http://www.srh.noaa.gov/sju/?n=forecast_text)

# Portugues Dam Project Nearing Completion

By: Althea Austin-Smith

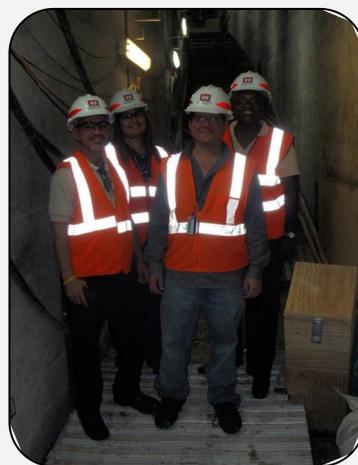


Credit to U.S. Army Corps of Engineers

It is not many times during your career when you are able to be part of a historic event, when you are able to play a small but important role in something truly significant and much greater than you could have envisioned. This opportunity came to our office through a request for “weather alerts” from the Army Corps of Engineers (Jacksonville, FL office) during the construction of their Portugues Dam Project in Ponce, PR. In the Corps of Engineers’ own words: “The U.S. Army Corps of Engineers is making history as the Portugues Dam becomes the first single-centered Roller Compacted Concrete thick arch dam constructed by the Corps in the United States and the Caribbean. The Portugues Dam is the final component of the entire Portugues and Bucana flood risk Management project (P&B) in Ponce, Puerto Rico.” Over the years the San Juan NWS office has provided an alert system to key Corps Water Management and Construction personnel. These

alerts were sent electronically at least once a day (more when necessary) in order to provide weather information which was critical for making decisions that was used to suspend operations and/or move equipment. When surveyed as to whether our “alerts” were useful, a key CORPS coordinator replied, “These messages have been a valuable tool to Corps’ folks stationed in Ponce as well as in Jacksonville. It has certainly helped maintain a heightened situational awareness to all weather-related events, particularly rainfall, which may affect dam construction-related activities in the Portugues Basin... Thank you for providing this service and look forward to continue receiving these messages for all future weather-related events.” Four years later, after many inter-agency meetings and field trips, the Portugues Dam is expected to be completed by the end of 2013. There are a number of lessons learned, but the most

valuable is the understanding of the importance of joint interagency efforts because the whole truly is greater than the sum of its parts. You never know when you may get a small role and are a witness to an historic event.



R García, R. Vázquez, F. Castro, and A. Austin-Smith

# Tsunami Exercise a Success

By: Walter Snell



It is not just children who get to play “make believe” or benefit from it. On March 20, 2013, 30 Members States and 15 of the territories in the Caribbean and adjacent Regions worked together in an exercise called Caribe Wave/LANTEX. LANTEX stands for Northwest Atlantic Tsunami Exercise. The purpose of the exercise was to validate the issuance of tsunami products from the two warning centers: one in Alaska, (which serves Puerto Rico and the U.S. Virgin Islands) and one in Hawaii. They also checked the receipt and dissemination of the products to the Tsunami Warning Focal Points (TWFP) and introduced several new graphical products. The goal was to prove the readiness of persons and equipment in the affected areas. It was encouraging to note that 94% of all countries and territories in the region participated.

According to the registrations for the event, 47,952 people signed up to participate and 45,526 people were from Puerto Rico. The CARIBE WAVE/LANTEX 13 scenario envisioned a magnitude 8.5 earthquake originating 57 miles north of Oranjestad, Aruba in the Caribbean Sea. According to simulated models, the whole Caribbean basin and parts of Western Atlantic would be impacted by a tsunami. The largest waves expected from this scenario were along the coasts of Aruba, Bonaire, Curacao, Venezuela and Colombia and the southern Coast of Hispaniola, with coastal wave forecasts of up to 17 meters. The initial message that signaled the start of the exercise was issued by the two tsunami warning centers at 1302 UTC (9:02 AST) and was disseminated over its standard broadcast channels to all who could be affected and the TWFPs even if they did not register. The Puerto Rico Seismic Network (PRSN) and other national and regional organizations also issued messages for their areas of responsibility.

Sirens, emails, emergency alert systems, text messages, media outlets, NOAA weather radio, and social media were used by many TWFPs to further disseminate the messages, according to Christa G. Von Hillebrandt-Andrade, who was the CARIBE Early Warning System (EWS) Task Team Leader for CARIBE WAVE 2013. From there, participants used an exercise handbook available to simulate the advance of the great waves generated and conduct table top or live simulations of responses, decisions and evacuations necessary to get people to safety. Planning for the exercise took over a year and involved international organizations as well as the U.S. tsunami warning centers and local emergency management agencies. The participants were then requested to provide feedback through a questionnaire, the results of which were presented at the VIII Session of the ICG CARIBE EWS that took place in Port of Spain, Trinidad, April 29 through May 1, 2013. The participants look forward to their findings and recommendations.

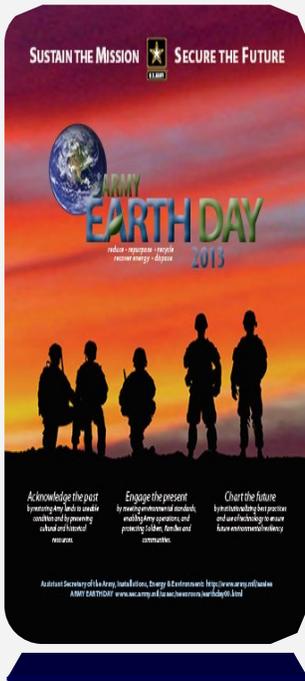
*To see more about tsunamis and what to do before, during, and after one, click on the link. The Facebook images are in English and Spanish.*

<http://goo.gl/zfPw1>



## NWS San Juan Supports Army Earth Day

By: Amaryllis Cotto



On April 19, 2013, the National Weather Service WFO of San Juan proudly attended and exhibited at this year's Army Earth Day Expo at Fort Buchanan, PR. The goal of this annual event is "to educate their visitors by sharing stories which demonstrate how the Army is acknowledging the past by remediating Army lands and protecting and preserving cultural and historical resources, engaging the present by meeting environmental standards, enabling Army operations, and protecting Soldiers, civilians and Families; and Charting the future by

institutionalizing best practices and using technology to ensure future environmental resiliency." The NWS "acknowledged the past" by teaching past instrumentation and methods of collecting vital data for operational and forecasting purposes. They "engaged the present" by presenting the new and updated instrumentation that has replaced the old ones, as well as presenting new methods used today to collect data. Furthermore, they "charted the future" through an interactive game; which educated them about Meteorology, the dangers

involved, and safety procedures. It was a great opportunity to reach and educate the students and staff of Fort Buchanan at this special event.



Amaryllis Cotto, Krizia Negrón, Met Interns

## Coop: Award given to Amaury Pagan

By: Jose A. Estrada



Roberto García, MIC, Amaury Pagán, José A. Estrada, OPL

What an honor it was for any of the NWS San Juan staff to pay a visit to Amaury Pagan, Cooperative observer of Boca station. After looking at the Boca Cooperative station history, located in Guánica, Puerto Rico, Mr. Amaury Pagán was the de facto observer for many years before he was mentioned in the station inspection reports. He was the time-keeper at Central San Francisco and was the official weather observer there until the Sugar Mill was closed. After the Sugar Mill was closed, Mr. Pagán had the SRG (rain gauge) moved to his home, that was near the

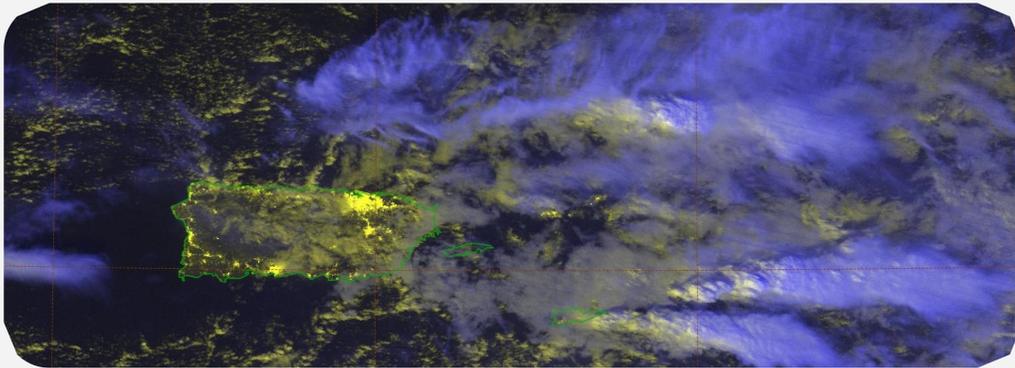
Sugar Mill, and continued taking observations, uninterrupted, till he passed away on February 22, 2013. "Mr Pagán was the most conscientious observer I have met during my 35+ years in the Weather Service." said José Estrada, Observing Program Leader at NWS San Juan. "His reports were always clear, and never late, with the exception of one incident when the equipment was washed away by flood waters." Mr. Pagán, was recognized on many occasions for his dedication to the Cooperative program, winning many awards such as numerous length of service, letters of appreciation, public and special service awards. Among the length of service awards received by Mr. Pagán were the

Edward H. Stoll for 50 years, the Benjamin Franklin for 55 years, the Helmut E. Landsberg for 60 years, and the Albert J. Myer Award for 65 years of service, making him the first observer to receive this award in Puerto Rico. Mr. Pagan was also awarded the Prestigious John Campanius Holm award, the second highest award that can be awarded to a Coop Observer. Mr. Amaury Pagán will be definitely be missed by his family, the NWS family, and the climatology of Puerto Rico.

*"Descansa en Paz, Don Amaury"*

## New Satellite Tools

By: Luis Rosa



The NWS San Juan is very pleased to announce a customized domain of satellite imagery for Puerto Rico courtesy of the Naval Research Laboratory in Monterey, CA (NRL-MRY). The [NexSat \(Next-Generation Weather Satellite Demonstration Project\) website](#) displays high-resolution imagery from the newest sensor Visible Infrared Imager Radiometer Suite (VIIRS) that flies on the Suomi NPP (National Polar-orbiting Partnership) polar orbiter, the Moderate Resolution Imaging SpectroRadiometer (MODIS) on board NASA's Aqua and Terra satellites, the Advanced Very High Resolution Radiometer (AVHRR) from NOAA's and EUMETSAT satellites, and the Operational Linescan System (OLS) from the Defense Meteorological Satellite Program (DMSP). The VIIRS instrument has significant improvements over its heritage instruments AVHRR, MODIS and OLS in which its 3000 km wide scanning swath overlaps previous scans providing complete coverage of tropical regions at least twice daily sometimes twice in less than two hours. The satellite also maintains the same resolution

across the entire swath retaining its sharpness at the scan edges and minimizing the negative impact that edge-of-scan blurring has on derived products from its heritage sensor counterparts. Although nighttime visible imaging was pioneered by DMSP OLS in the 1960s for primarily classified (military) viewing, the VIIRS Day Night Band (DNB) provides the civilian population with a much improved resource in viewing atmospheric and terrestrial features in fine detail, with or without moonlight. Additionally, the VIIRS DNB mitigates much of the solar glare contamination currently present in the OLS imagery. The VIIRS DNB provides unprecedented nighttime viewing capabilities that include monitoring of lightning, volcanic lava, city lights, fishing activity, and fires. With lunar illumination, the VIIRS DNB provides users with additional capabilities to detect cloud texture (similar to daytime viewing), tropical cyclone activity, volcanic ash, and airborne dust. To complement the polar orbiting sensors described above, NexSat provides the Puerto Rico domain with GOES, scatterometer wind, and precipitation products.

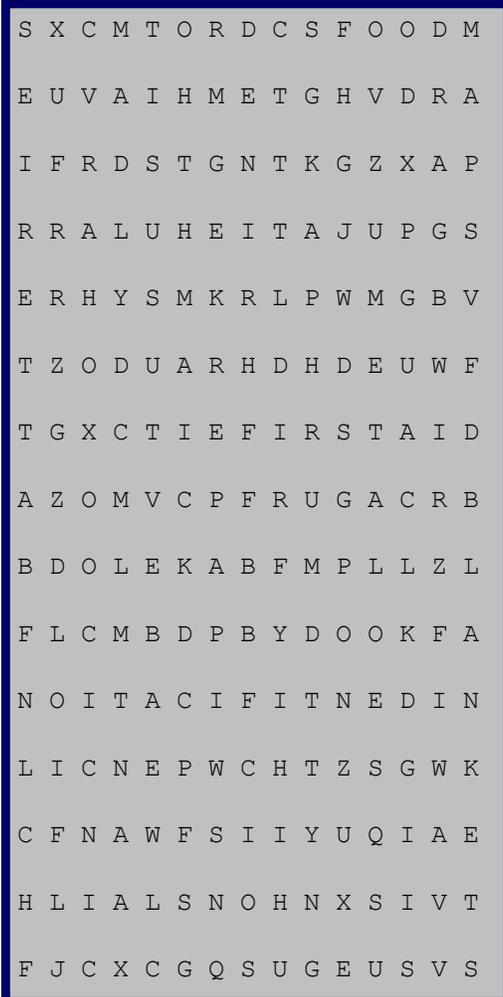
NRL-MRY encourages everyone including media and universities to make use of NexSat; the website is freely available to the general public for non-commercial use, but they require proper acknowledgment and feedback on how you use their products. Several new VIIRS products and tools will be added in the near future to the PR domain that will make the website a great source of satellite imagery. In addition, NexSat contains training buttons that explain the strengths and limitations of each satellite product.

If you would like to have a satellite product added that is not currently available, please send an email to [luis.rosa@noaa.gov](mailto:luis.rosa@noaa.gov) with a short explanation of how you would be using it and we will make every effort to have it installed or you could also email the NRL-MRY by clicking [the feedback button on their webpage](#) and make the request yourself.

# Hurricane Season 2013

## Hurricane Preparedness Word Search

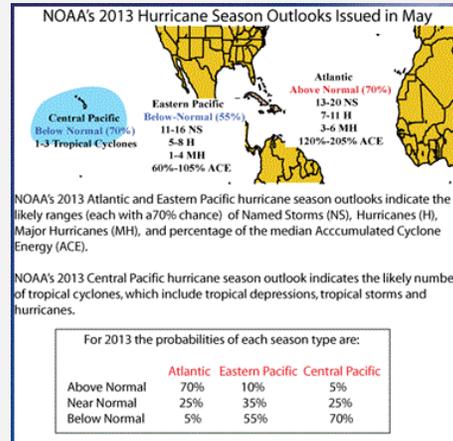
By: Xiomara Cruz



- |                       |                 |
|-----------------------|-----------------|
| <b>BATTERIES</b>      | <b>FOOD</b>     |
| <b>BLANKETS</b>       | <b>WATER</b>    |
| <b>CASH</b>           | <b>MAPS</b>     |
| <b>CLOTHING</b>       | <b>MEDICINE</b> |
| <b>DOCUMENTS</b>      | <b>PAPER</b>    |
| <b>FIRSTAID</b>       | <b>PENCIL</b>   |
| <b>FLASHLIGHT</b>     | <b>RADIO</b>    |
| <b>IDENTIFICATION</b> |                 |

## NOAA Predicts Active 2013 Atlantic Hurricane Season

By: Odalys Martínez



Click image to enlarge.

The 2013 Atlantic Hurricane Season promises to be an active one. Statistics indicate a 70% chance of an above-normal season, a 25% chance of a near-normal season, and only a 5% chance of a below-normal season. Based on the current and expected conditions, combined with model forecasts, the following range of activity is anticipated: 13-20 Named Storms, 7-11 Hurricanes and 3-6 Major Hurricanes. Note that the expected ranges are centered well above the official NHC 1981-2010 seasonal averages of 12 named storms, 6 hurricanes, and 3 major hurricanes. This Atlantic hurricane season outlook will be updated in early August, which coincides with the onset of the peak months of the hurricane season.

The NOAA's 2013 seasonal hurricane outlook reflects a combination of climate factors that have historically produced above-normal Atlantic hurricane seasons. The three main climate factors for this outlook are: the ongoing set of atmospheric conditions that have been producing increased Atlantic hurricane activity since 1995, above-average sea surface temperatures (SSTs) across the tropical Atlantic Ocean and Caribbean Sea, and ENSO-neutral conditions. However, hurricane disasters can occur whether the season is active or relatively quiet. It only takes one hurricane (or tropical storm) to cause a disaster. Residents, businesses, and government agencies are urged to prepare for every hurricane season regardless of this, or any other, seasonal outlook. It is also important that one understands the difference between National Weather Service watches and warnings which is critical to being prepared for any dangerous weather hazard. Remember, if any tropical storm or hurricane threatens Puerto Rico and the U.S. Virgin Islands, don't wait until the last minute to get prepared. NOAA, the Federal Emergency Management Agency (FEMA), the National Hurricane Center (NHC), and the American Red Cross all provide important hurricane preparedness information on their web sites.

[www.nhc.noaa.gov/prepare/](http://www.nhc.noaa.gov/prepare/)

# The NWS San Juan Family



*"The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy.*

*NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, public, and global community."*



## WFO San Juan Contributing to the Cause

By: Odalys Martínez

Department of Natural Resources took the initiative to create the Puerto Rico Climate Change Council (PRCCC), which includes local and federal agencies as well as universities. The PRCCC was created in order to address observed trends and future projections due to climate change. WFO San Juan is part of it providing historical data and technical knowledge. This collaboration between agencies successfully resulted in a source of reliable climate change information focused in Puerto Rico for the scientific and non-scientific community. In addition, WFO San Juan began to collaborate with the Caribbean Institute for Meteorology and Hydrology in November 2012 to elaborate a precipitation outlook.

The [Precipitation Outlook for the Caribbean](#) is prepared on a monthly basis with contributions from regional Meteorological Services, which include: Antigua & Barbuda, Bahamas, Barbados, Belize, Cayman Islands, Cuba, Curacao, Dominica, Dominican Republic, French Guiana, Grenada, Guadeloupe, Guyana, Jamaica, Martinique, St. Barth's, St. Lucia, St. Maarten/St. Martin, Suriname, Trinidad and Tobago and now WFO San Juan. This has resulted in a three month precipitation outlook that is delivered to our users and stakeholders. In terms of research, a technical paper about Temperature Patterns during summer 2012 is currently in progress in collaboration with the University of Puerto Rico and our main goal is to discover the criteria for heat advisories and/or warnings across the local islands.

## Credit to Our 1st Edition Newsletter Team:

Althea Austin-Smith, Service Hydrologist  
Xiomara Cruz, Administrative Support Assistant  
Odalys Martínez, Senior Forecaster  
Krizia Negrón, Meteorologist Intern  
Rosalina Vázquez-Torres, Hydrometeorologic Technician  
Walter Snell, Senior Forecaster  
Amaryllis Cotto, Meteorologist Intern

Looking forward to our next edition? Here are some of our upcoming articles:

- 2013 Hurricane Review
- Tropical Climate



The radiosonde is a small, expendable instrument package that is suspended 25 meters (about 80 feet) or more below a large balloon inflated with hydrogen or helium gas. As the radiosonde rises at about 300 meters/minute (about 1,000 feet/minute), sensors on the radiosonde measure profiles of pressure, temperature, and relative humidity. All data is used for forecasting purposes.



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