

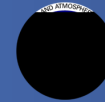
The Whispering Trades



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National Weather Service | San Juan, Puerto Rico

JUNE 2014



From the Desk of the Meteorologist In Charge

By: Roberto García

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Summer is here again. This time of the year always brings up images of festivals or activities under the sun on white sandy beaches. Festivities like San Juan Day on June 23 and Independence Day on July 4 come to mind when large crowds gather at the local beaches in Puerto Rico and The U.S. Virgin islands. Summer is also the season when the daily afternoon shower and thunderstorm activity begins to affect portions of our forecast area with heavy downpours. As the summer progresses, we move deeper into the hurricane season with tropical disturbances moving west across the islands every three or four days. These disturbances could bring with them widespread rainfall. A few of these disturbances will develop into full blown tropical cyclones as we approach the peak of the hurricane season in August and September. Some cyclones could pass close or even directly affect the local islands. The NOAA outlook for the hurricane season this year calls for a slightly below normal season with 8-13 named storms, out of those 3-6 hurricanes and out those 1-3 major hurricanes. A first reaction from most would be to think that, since the numbers are lower than previous years, so also will be the threat to the local area. Nothing could be further from the truth. It does not matter how active or inactive a season is expected to be, it only takes one. We should always be prepared and review our family preparedness plan at the beginning of the season.

Roberto García,
Meteorologist-In-Charge



The National Weather Service Forecast Office in San Juan wants to invite you to enjoy this summer season responsibly. We want you to enjoy the sun and the white sandy beaches and also be aware of the possible dangers that you could face. This year, the forecast office in San Juan wants, not only to continue to increase the awareness of tropical cyclone threats, but also put new emphasis on other threats that are far more common. Rip currents are the leading surf hazard for all beachgoers. Rip currents can occur at any surf beach with breaking waves and these currents can sweep even the strongest swimmer out to sea. Around 30 deaths a year can be attributed to rip currents along the local islands beaches. Summer is also the peak season for one of the deadliest weather phenomena--lightning. There is no safe place outside when thunderstorms are in the area. If you hear thunder, you are likely within striking distance of the storm. For organized outdoor activities, the National Weather Service recommends that organizers have a lightning safety plan, and that they follow the plan without exception.

2013-14 Swell Season is Over!

By: Carlos M. Anselmi and Ernesto Rodríguez

Puerto Rico and U.S. Virgin Islands' wave climate is mainly affected by winter swells, hurricane force waves, and locally generated waves. Each year our coastal areas are influenced by wind waves which can be divided into: wind-seas and swells. Wind-seas are waves generated by local winds. In contrast, swells are waves that travel in groups and are generated by distant weather systems outside of the local area. These swells propagate away from their generation area into our forecast area impacting our coastlines. Locally we can divide the wave seasons in two: the winter season, extending from November to April, and the summer season from May through October. Wave climatology reveals that on the North Coast of Puerto Rico, 40 % of the wind waves come from the east northeast, 21 % from the north east, 22 % from the east, 9 % from the north northeast, 3.5 % from the north with the remaining from other directions, whereas on the south coast more than 70 % range from the southeast to the northeast direction. Long period swells during the winter season impact our coastlines.

The combination of the swell height and swell period can significantly increase the breaking waves. Large breaking waves can generate strong

longshore currents as well as rip currents (Figure 1).

Longshore currents are generated when waves break at the coast inducing currents parallel to the shoreline. On the other hand, rip currents are

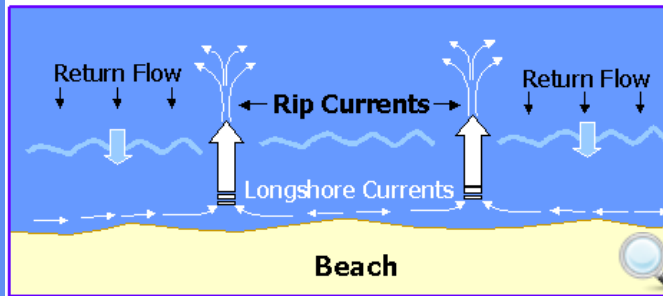


Figure 1. Rip currents and longshore currents diagram. Both currents are generated by breaking wave action. However, rip currents can form in the vicinity of groins, jetties, piers or other man-made structures. Image courtesy of the [Division of Nearshore Research at Texas A&M University](#).

localized currents moving away from the beach at high speed. Other impacts of long period swells are coastal erosion and coastal flooding. In general, the erosion rate tends to increase during the winter season, when large swells hit the coastlines removing sediments from beaches. Coastal flooding occurs when large breaking waves at the coast generate flooding in long lying areas along the shore. These processes endanger the life and safety of beachgoers and negatively impact properties along the coastline.

The 2013-14 swell season was one of the most inactive seasons of the past

few years. Only six events with swell of 8 feet or more were observed from November through April by the local buoy network (Figure 2), with only one of them surpassing the 10 feet mark. The biggest event of the year occurred on the last week of March, where swell

height reached 13 feet with a period of 16 seconds. This event was generated by an intense low pressure system that quickly intensified along

the U.S. northeastern coast, producing winds greater than 70 knots. The low pressure system had a broad wind field that aimed a long period swell toward the northeast Caribbean. These large long period swells battering the coast resulted in high breaking waves, strong coastal currents, coastal erosion and coastal flooding along north facing coastlines of Puerto Rico and the U.S. Virgin Islands. Please keep in mind that even when our coastal areas are not been affected by large long period swells, other factors can create hazardous marine conditions like local waves and winds. That's why we, the San Juan Weather Forecast Office, strongly encourage you to check the forecast before going to the beach.

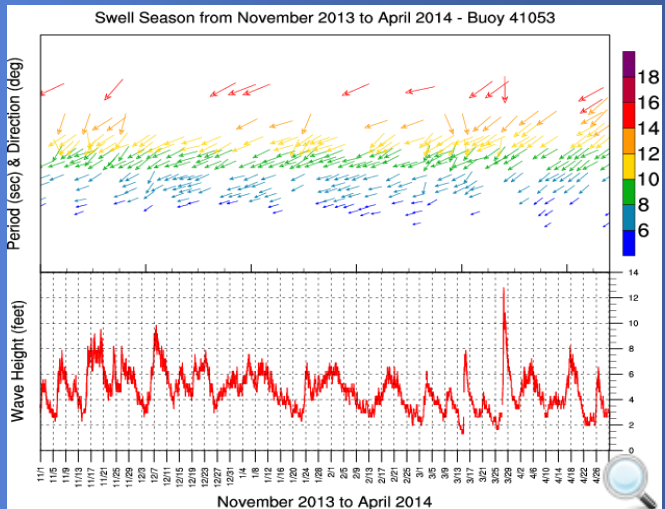
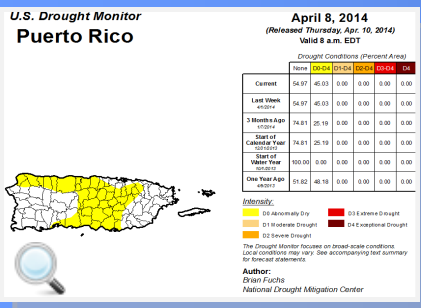
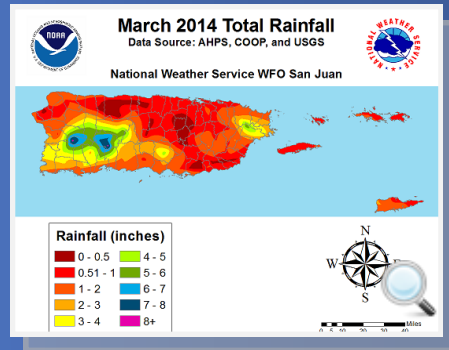


Figure 2. Summary of the 2013-14 swell season at the San Juan buoy (41043). Upper part shows wave period in seconds and direction. The bottom part illustrates wave height in feet.

Dry Season of 2014

By: Althea Austin-Smith

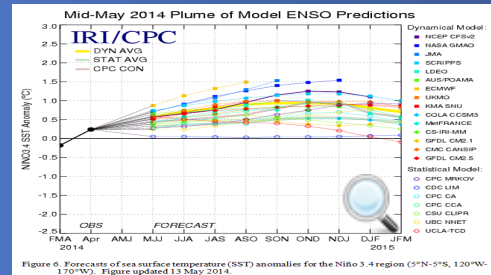
Along with a weak Marine Swell Season came the Dry Season of 2014. The Dry Season was literally hot and dry with all the climatological statistics to support this. The percent of normal rainfall as of April - year to date continued to show rainfall deficits across the majority of Puerto Rico and the U.S. Virgin Islands except for St. Croix where value a slightly above normal. March was incredibly dry across Puerto Rico. Temperature-wise, year to date through April, 2014 ranked as the 2nd warmest start to the year for San Juan, PR and the 6th warmest start of the year for St, Croix USVI. The river and stream levels also showed the



dry trend although as is expected, May brought significant rainfall to much of the region creating the opportunity for some much needed recharge along with some significant localized flash flooding. The question now becomes, what is on tap as we enter into the wet/hurricane season?

Currently, the region is in an “[El Niño Watch](#)” which has a profound impact to the climate of our region. This is all explained by “[The ENSO Cycle](#)”; the state of the ocean and atmosphere across the tropical Pacific. Based on our [local ENSO study](#), an El Niño leads to the possibility of a drier than normal summer.

If that is the case, it is very important that we use the **water saving tips** that are located throughout this Newsletter, which will help to conserve water. Small changes can have a huge impact if millions of people are involved.



Flood Safety Preparedness

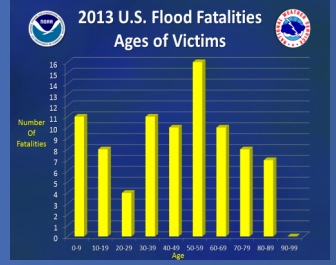
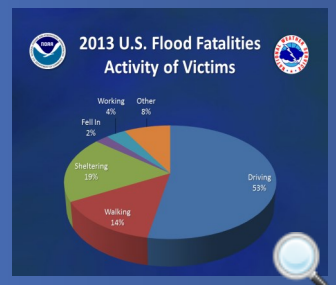
By: Althea Austin-Smith

Every year during the month of March, the National Weather Service (NWS) makes considerable effort to educate our customers about the importance of flood preparation through its [National Flood Safety Awareness Week](#) campaign. The NWS states, “On average, flooding causes more property damage in the United States than any other weather related event. It is a threat to life and

property that can occur in any of the fifty states or U.S. territories at any time of year.” While many of us are prepared for hurricanes and severe weather, many do not think about and/or prepare for the potential devastation of floods until it is too late. There are numerous ways in which floods impact our community so when preparing for the upcoming hurricane season, take the time to extend that preparation

to include Flood Safety Preparation including applying for [Flood Insurance](#) if needed.

Along with the regular campaign this year, we also revealed the local States Pages for PR and the USVI, which give a summary of significant floods which impacted our local islands. If you enjoy a piece of history, visit our [States Page](#). Flooding can be a hazard from many types of weather events which is



why we should always be prepared.

Below Normal Forecast for the 2014 Atlantic Hurricane Season

By: Gary Votaw

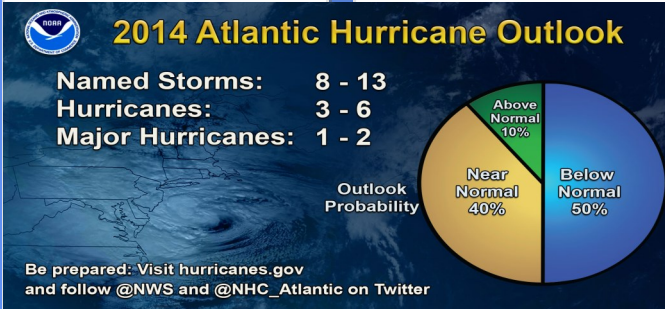
The National Oceanic and Atmospheric Administration (NOAA) issued its final forecast of the number of tropical storms and hurricanes before the start of the hurricane season beginning June 1. The prediction (Fig. 1) includes a 70 percent chance that the number of named storms (winds of 39 mph or higher) in the Atlantic Basin to be from 8 to 13, including 3 to 6 hurricanes (74 mph or higher) and 1 or 2 of those being major (111 mph or more). The forecast also states that there is a 50 percent chance that the season will have below normal activity and only a 10 percent chance that it will be above normal.

The primary reason for the below normal forecast is the probable development of an El Niño. The Climate Prediction Center (also part of NOAA) has issued an El Niño

Watch, stating a 65 percent chance of development by summer. The significance of an El Niño is that it tends to cause wind shear over the Atlantic at various levels, often

Similar to various other organizations (Table 1), NOAA predicts lower than normal activity, but it was careful to point out that this is not a forecast of how many storms will make landfall

other, seasonal outlook. It is also important that one understands the difference between National Weather Service watches and warnings which is critical to preparing for any dangerous weather hazard. Remember, if any tropical storm or hurricane threatens Puerto Rico or the U.S. Virgin Islands, don't wait until the last minute to prepare. 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.

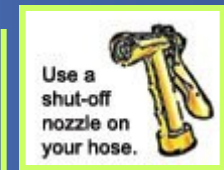


2014 Atlantic Hurricane Forecast (NOAA)

preventing storms from forming or tearing apart existing ones. A secondary reason for forecasting a quieter season is that the Atlantic Ocean water temperatures are near normal rather than above normal as has been the case since 1995. Warmer water provides more potential for evaporation and latent heat to the atmosphere.

and that it only takes a single storm to have disastrous impacts.

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



	Normal (seasonal average)	NOAA	Met Office (U.K.)	The Weather Channel	Colorado State University
Named storms	12	8-13	7-13	11	9
Hurricanes	6	3-6	3-9	5	3
Major Hurricanes	3	1-2		2	1

Forecasts of the 2014 hurricane season in the Atlantic Basin by selected groups.

4th Cooperative Weather Observer Appreciation Day

By: Rosalina Vázquez-Torres

On May 3 2014, in honor of our cooperative weather observers, we celebrated the 4th Cooperative Weather Observer Appreciation Day. This activity was performed with gratitude and recognition of the hard work of the volunteer observers who collect important and reliable daily data for our agency.

The National Weather Service (NWS) Cooperative Observer Program (COOP) is truly the Nation's weather and climate observing network of, by and for the people. More than 11,000 volunteers take observations on farms, in urban and suburban areas, National Parks, seashores, and mountaintops. A group of 55 observers comprises the COOP network in Puerto Rico and 12 in the U.S. Virgin Islands. The data are truly representative of where people live, work and play. Its mission is to provide observational meteorological data; usually consisting of daily maximum and minimum temperatures, and 24-hour precipitation totals required to define the climate of the United States. This data helps measure long-term climate changes while also providing observational, meteorological data in near real-time to support forecast, warning and other public service programs of the NWS.

A cooperative station is a site where observations are taken or other services rendered by volunteers or contractors. Observers generally record temperature and precipitation daily and electronically send those reports to the NWS and the National Climatic Data Center (NCDC). Additionally, COOP data plays a critical role in efforts to recognize and evaluate the extent of human impacts on climate from local to global scales. The work done by these observers is very important to climatology.

During the activity held at our office in Carolina, some of our observers with their families attended educational lectures such as "The importance of the observations for Climatology" and "Skywarn" presented by two of our meteorologists. They and their families also received a tour of our office followed by an Awards the NWS.



Presentation of awards by Ernesto Morales, NWS San Juan WCM and Rosalina Vazquez, NWS San Juan Hydrometeorological Technician.

Thank you!
¡Gracias!



4th Cooperative Weather Observer Appreciation Day (.cont)

By: Rosalina Vázquez-Torres

"I want to thank the NWS for allow me be part of the group", commented Mr. Isaac Vélez, cooperative weather observer of Palmarejo, Vega Baja, "It's an honor for me to be part of the volunteer group".

"You can always count on me. I am always available for the NWS's needs", commented Mr. Jorge Cintrón, observer of Juana Díaz.

"The job you do to our community is much appreciated. It's been a pleasure for me to be part of this group for 10 yrs", added Mr. Ángel Torres observer of Levittown, Toa Baja.

With these statements from some of the observers, we concluded the successful 4th Cooperative Weather



Observer Appreciation Day.

To our entire official Cooperative Weather Observers:

We publicly express our sincere gratitude for the work, effort and contribution performed by you in a completely voluntary and consistent manner. The uninterrupted data reported are essential to establish our historical climatological records. It is a pleasure for us to have you as part of our family. There are not enough words to thank all of you for your contributions.

2014 Media Workshop

By: Krizia Negrón

We, the National Weather Service, are a Federal agency with over 120 Forecast Offices throughout the United States, Alaska, Hawaii and Guam. It is important that we interact with



other federal agencies, local government and the public in order to fulfill our mission of saving life and property. This mandate only works if we maintain a close working relationship with our local media.

On April 2nd, NWS San Juan hosted a Media Workshop involving reporters from television, newspaper and the web. Those present were experienced leaders in reporting local weather conditions in their respective specialty. Some of the topics presented were: our new fire weather products, routine and non-routine marine products, local modeling being developed in our office, the differences in the hydrology products most commonly used and the reasons when these are used. We also explained how to use our webpage to obtain climatology data for Puerto Rico and the U.S. Virgin Islands and how the NWS is using Social Media to reach the public.

"This was a great opportunity for our staff to interact with the local media and for the reporters to know each other." said Ernesto Morales, Warning Coordinator Meteorologist and organizer of this year's workshop. "This is the best way to build strong bonds between the community who have the same goal which is to save life and property."

"The workshop...was excellent, as they explained the main tools journalists can use to improve the publication of news articles relating to weather and climate." said Frances Rosario, an El Nuevo Dia news reporter. She also added that the presenters, "...also offered ideas on different angles that should be highlighted to improve the transmission of the message."

The overall feedback was positive from our guests and our staff, as we had a great opportunity to discuss ideas and concerns which has definitely improved both our relationship and the content of weather information shared with the general public.

Reggina Cabrera visits NWSFO San Juan

By: Althea Austin-Smith

Reggina Cabrera, the Hydrologist –in-Charge of the Southeast River Forecast Center in Atlanta, recently spent a week visiting NWSFO, San Juan. It was a busy week for all involved and it provided an opportunity to share policy, exchange ideas, and observe local hydrologic operations while also getting to know our local forecasters and their hydrology concerns. Reggina believes that hydrologic support for the hydrologic service area can be improved with the developing of new tools, “it is time to evaluate the feasibility of implementing new tools with the objective of improving the warning capabilities for Puerto Rico and the US Virgin Islands”.

The visit concluded with a meeting between the managers and representatives from the NWS and some faculty from University of Puerto Rico in Mayaguez to discuss a collaborative project. After the meeting, Reggina expressed her enthusiasm, “Faculty from the UPRM is definitely interested in continuing these conversations and to participate in the development of a hydrologic model that is adequate to represent the hydrography and particularities of the Island(s).”

The week was productive and numerous goals and objectives were met. The next step is to secure the commitment and the collaborative effort for the long haul as we work towards implementing new hydrologic forecasting tools and procedures for Puerto Rico and the U.S. Virgin Islands. *This is only the beginning.*



NWS meets with UPR faculty in Mayaguez. From left: Eric Harmsen, Reggina Cabrera, Roberto García, Althea Austin-Smith, and Jay Alamo .

Puerto Rico CoCoRaHS New Chapter

By: Odalys Martínez



The National Weather Service and The Office of the State Climatologist are looking for volunteers scattered across the island to measure and report the rain that falls on their homes, farms, or businesses.

On June 1, Puerto Rico joined the Community Collaborative Rain, Hail and Snow Network, better known as CoCoRaHS. This nationwide network of volunteer weather observers helps to improve maps, records and predictions as well as assist in filling in a piece of the climate puzzle through the collection of daily rainfall. This effort in Puerto Rico is especially important given the great variation in rainfall with 170 to 175 inches of rain on an annual average at Sierra de Luquillo and El Yunque to only 25 inches of rain on an annual average in the most arid areas of Southern Puerto Rico.



This is truly a fun, educational community-based project. Here are the basic requirements:

- (1) Have access to the internet.
- (2) Have an official-type CoCoRaHS rain gauge.
- (3) Have a good site on your property with good exposure.
- (4) Be willing to enter your rainfall data on a daily basis.

The non-profit CoCoRaHS network is sponsored in part by the National Oceanic and Atmospheric Administration (NOAA), the National Weather Service (NWS) and other individual contributors and organizations. The long-term goal of CoCoRaHS is ultimately to recruit one volunteer observer per square mile in urban areas and one volunteer observer per 36 square miles in rural. For more information on the Puerto Rico CoCoRaHS chapter and how do you become a CoCoRaHS observer, please visit: <http://www.cocorahs.org/state.aspx?state=pr> and contact one of the commonwealth coordinators. Eventually, this program will be also expanded to the U.S. Virgin Islands on 2015!

The U.S. Virgin Islands are Tsunami Ready

Submitted by: Ernesto Morales- based on the Official USVI Press Release



During the opening of the Ninth Session of the UNESCO Intergovernmental Coordinating Group on Tsunamis, Governor John P. de Jongh, Jr. announced that the U.S. Virgin Islands have been designated as Tsunami Ready by the NOAA National Weather Service. "We have worked long and hard for this recognition and as a result of our efforts, the territory is better prepared to save lives from the onslaught of tsunamis through our extensive planning, education and public awareness. It is not a matter of if, but a matter of when," de Jongh said. TsunamiReady is granted by NOAA once certain requirements are met such as establishing an

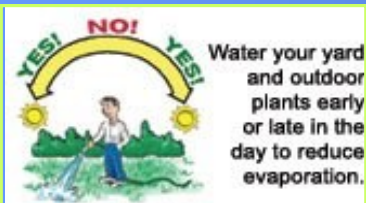
emergency operations center and a 24-hour warning point to receive tsunami information.

Over the last several years, The VITEMA director Elton Lewis has worked together with the Puerto Rico Seismic Network and the National Weather Service personnel to develop an emergency plan for the local Islands. The Virgin Islands has made significant achievements to reach Tsunami-Ready status, installation of an early warning siren system and tsunami signs, implementing a mass notification system, VI Alerts, for instant alerts and enhancing tsunami education outreach and training programs. While no community is tsunami proof,

de Jongh said, being deemed Tsunami Ready can help save lives. The recognition is valid for three years or through March 2017. The governor used his remarks to welcome more than 50 scientists and emergency managers representing 17 countries and four scientific search organizations, coming together to continue the group's work to develop a Caribbean Tsunami Warning System. Countries represented at the conference included: Barbados, Colombia, Curacao, Dominican Republic, France, Haiti, Mexico, Netherlands, Panama, Saint Lucia, Saint Maarten, the United Kingdom, United States and Venezuela.



Image courtesy USVI Press Release.



WFO SJU awarded SPoRT Collaborative Partner of the Year

By: Luis Rosa

On December 2013, NASA's Short-term Prediction Research and Transition Center (NASA SPoRT) awarded the National Weather Service San Juan Forecast Office (NWS SJU) the SPoRT Collaborative Partner of the Year for extraordinary efforts in demonstrating the utility of experimental products in Weather Forecast Office (WFO) operations. Luis Rosa, Lead Forecaster, was also awarded the SPoRT Blog Post of the Year award for creativity and innovation in the blog post entitled "Tropical Rains Brings Historic Rains to San Juan, PR" for the historic rain event on July 18, 2013, in which, almost 10 inches of rain fell in a six-hour period.

During the period July-December 2013, WFO SJU evaluated the GOES-R Quantitative Precipitation Estimate (QPE) product. The GOES-R QPE product is a satellite-based precipitation estimation product that is derived from both infrared (IR) and microwave data. GOES-R QPE is a GOES-R baseline product, and it is currently produced from GOES-East and GOES-West data as an experimental product. Its greatest utility is in data-deprived regions, like mountainous terrain, offshore, or over ocean areas and is intended to be used for rainfall events of significance areal coverage, duration, and intensity such as tropical cyclones and mesoscale convective systems (MCS's).



The evaluation demonstrated the product has a significant low bias in rainfall estimates over PR primarily due warm-cloud and orographic rainfall in PR. The QPE algorithm was originally developed in the CONUS and assigns a rain rate based on cloud top temperature, in general, the colder the cloud top, the higher the rain rates. However, tropical islands such as PR and Hawaii can get much heavier rainfall from warm cloud tops than one would expect because of significant differences in composition between continental and maritime clouds (i.e. much bigger particles in the maritime clouds since they have their water locked up in a relatively small number of bigger droplets, thus heavier precipitation for a given cloud-top height) whereas the continental clouds have their water spread out among a much larger number of smaller droplets that are less likely to give in to the pull of gravity.

The main challenge in improving the algorithm is figuring out how to enable the algorithm to correctly identify these clouds with large particles and assign them heavier rainfall than one would expect from a continental cloud with similar brightness temperatures. Orographic rainfall is another factor that contributed to the low bias in rainfall estimates and is not currently accounted for in the GOES-R QPE algorithm. Resolution is another factor in the low bias in rainfall estimates; the coarse spatial resolution of the GOES-IR channel (currently 4km) is going to miss the smaller-scale extremes that will show up in individual gauge reports since the satellite represents an average value over an entire pixel.

WFO SJU also evaluated the Layered Precipitable Water (LPW) product from the Cooperative Institute for Research in the Atmosphere (CIRA). This product is a composite of water vapor retrievals for multiple layers using microwave sensors on polar orbiting satellites, mapped to a 16km grid. This product fills the gaps left by radiosondes and infrared channels which are only focused on upper level moisture. The LPW can be used to examine atmospheric rivers, understand the depth of moisture, show gradients in water vapor, and to judge confidence in model initialization. The evaluation indicated this product to be very accurate when compared to regional radiosondes and very useful in flooding and fire weather applications.

Future projects between WFO SJU and NASA-SPoRT involve the use of the Land-Information System (LIS) and the Green Vegetation Factor (GVF) from the Visible Infrared Imaging Radiometer Suite (VIIRS) expected to become available in July 2014 to help improve short-term fire weather, marine, and hydrology forecasts and improve situational awareness.

Hurricane Returned Periods for Puerto Rico and the U.S. Virgin Islands

By: Ernesto Rodríguez

Many of us ask the same question every year before the hurricane season starts; when the next hurricane or major hurricane will impact our region? Looking back to history, the official NOAA/WMO database of hurricanes (IBTrACS) can give us a rough idea of hurricane return periods. Hurricane return periods are the frequency at which a certain intensity of hurricane can be

expected within a given distance of a given location. In this case, the return periods were calculated using a 100 nautical mile radius from Puerto Rico (see Fig. 1). Even with these return

period estimates, it should be noted that there is high uncertainty of when a hurricane might strike a given island but it will be close enough to impact your local area in some way.

After obtaining the trajectory plots (above), we were able to compute the return periods for the different categories which are listed in the table below.

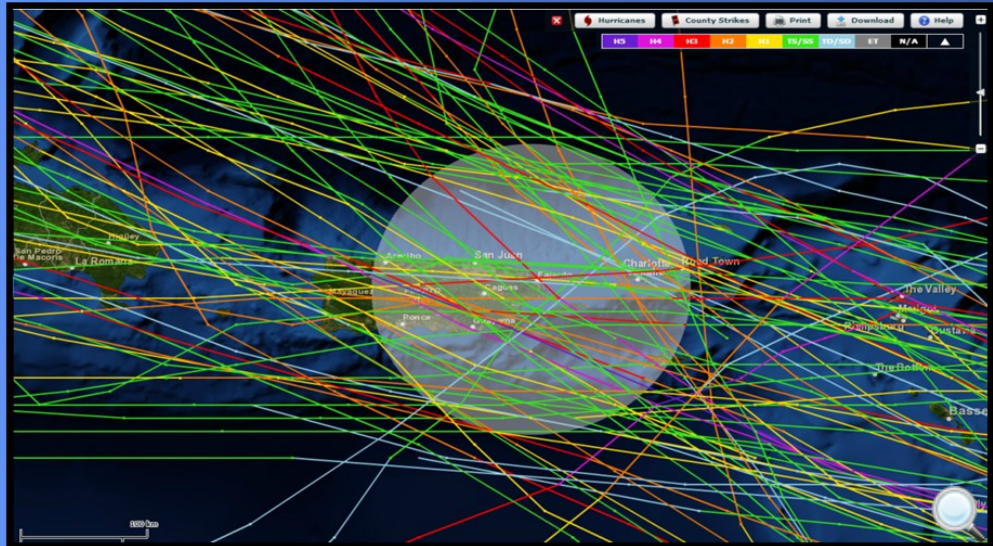


Figure 1: Tropical storms and hurricanes that passed about 100 n mi of Puerto Rico since 1842. A chronological list of all known hurricanes that formed across the Atlantic basin from 1842-2013 can be found in this link: <http://maps.csc.noaa.gov/hurricanes>.

Table 1 lists these return periods for hurricanes and major hurricanes and shows that the most probable hurricane that could affect our area is a hurricane Category 2 with a return period of 8.2 years. Some examples of hurricanes Category 2 that affected the Puerto Rico and the U.S. Virgin Islands in the last few decades were Hurricane Omar (2008), Hurricane Georges (1998) and Hurricane Marilyn (1995). Puerto Rico and the U.S. Virgin Islands have not experienced a major hurricane for almost 25 years when Hurricane

Hugo made landfall over Saint Croix, USVI as Category 4, weakening to Category 3 when it made landfall in Vieques and Eastern Puerto Rico on September 18, 1989. Another example, the notorious San Felipe hurricane of 1928 was the only category 5 hurricane that directly impacted Puerto Rico since 1900. In conclusion, hurricane return periods do not mean that our region cannot be impacted

directly by a hurricane in successive years or twice in a given year, but based on history, this is not probable.

Return Period in Years for Hurricanes

Category	Wind Speed	Return Period
1	74-95 mph	9.1 years
2	96-110 mph	8.2 years
3	111-129 mph	12.3 years
4	130-156 mph	24.6 years
5	> 156 mph	86.0 years

Table 1: Mean Hurricane Return Periods – northeast Caribbean area. Considering 171 year (1842-2013) of data for hurricanes passing near or through Puerto Rico and U.S. Virgin Islands. Considering hurricanes that pass at 100 miles or less of PR & USVI.

Effective Communication: To protect life and property during Hurricane Season

By: Félix Castro

“Science is not finished until it’s communicated” – UK chief scientist - Professor Sir Mark Walport, Chief Scientific Advisor to the UK government.

The previous quote is the key: Our job at the National Weather Service is not done until we effectively communicate to our customers what are the risks during any hazardous weather condition. With this in mind, our office participated in the “Effective Hurricane Messaging Course” from February 24-28, 2014 at the National Hurricane Center in Miami, Florida. Lead forecaster, Felix Castro, was our representative as he joined colleagues from 14 other coastal offices which are at risk during the hurricane season, which runs from June 1, through November 30.

The main purpose of this course was to learn how to effectively communicate our message to our

customers about the hazards produced by a hurricane or any tropical system. Some of the topics covered were: the Hurricane Problem, the High Wind, Coastal Flood and other hazards and Crisis Communications. The challenge is how we achieve success during the hurricane season when things get very dangerous and our goal is to protect life and property but we are unable to effectively communicate the danger to the population. Without proper communication, even with the best science, we don’t accomplish our mission and therefore we fail.

I asked David Sharp, the Science & Operations Officer at NWS in Melbourne, FL, who was one of the instructors at the course, the following question:

“What do we as an agency, need to do to effectively communicate our science information to our customers?” He responded: “Whenever the lives and livelihoods of our citizens are significantly threatened by hurricanes, the National Weather Service must be effective in prompting the right people to do the right things at the right time. To be successful, we must provide critical support to our emergency management partners so that they can readily make key decisions which address the hurricane hazards at hand. Then, together with our media partners, we must communicate a corresponding public safety message in which related scientific jargon about the latest hurricane forecast and its uncertainty has been translated into statements of potential impact along with proportional calls-to-action.”

If we can accomplish these key components, we have more of a chance of being successful in our “mission”. We continue to work with our partners to prepare so that together we can effectively communicate with you, our customers, in event of a hurricane threat. We want to take this opportunity to emphasize the importance of you also getting ready for the upcoming 2014 Hurricane Season. If you live in Puerto Rico or the U.S. Virgin Islands [get prepared and have a family plan](#). Remember, **it only takes one** to hit the area to cause devastation and a serious threat to life and property.



Effective Hurricane Messaging Course at National Hurricane Center, Miami, FL.

When an Earthquake Strikes...

By: Walter Snell

Having lived in California, I have experienced many tremors from slight to moderate. No matter how steeled you are, to feel the earth move beneath your feet is an unnerving experience. The uncertainty! When will it stop? Okay! Okay, when will it stop getting stronger?! Do I run outside? Hide under a desk or bed or in a doorway? Knowing what to do and planning ahead of time with your family is a wise thing to do.

The National Weather Service also has a checklist of things to do after an earthquake and it probably looks quite different from yours. After taking care of local safety issues, information usually begins streaming in from many locations including the National Tsunami Center in Anchorage, Alaska and the Pacific Tsunami Warning Center, the Caribbean Tsunami Warning Program and

the Puerto Rico Seismic Network. Information may also come in from the United States Geologic Survey's National Earthquake Information Center (USGS/NEIC) in Golden, Colorado and local law enforcement agencies. The staff at our local office immediately sends out a Special Weather Statement with a tone alert to make sure you have the latest information. It then calls this information in to the emergency management agencies in Puerto Rico and the U.S. Virgin Islands and the United States Coast Guard. They also inform the regional office in Fort Worth, Texas.

Soon information from all over the world is analyzed to determine the magnitude, location, depth and orientation of the fault line and the direction that the slabs of the earth moved along the fault line. The information is fed automatically into computers in the major national tsunami and earthquake centers. This information is used to

create bulletins to inform you of whether the earthquake was in the right place and strong enough to generate a tsunami. As soon as they are released, forecasters at the National Weather Service again write radio scripts for broadcast on NOAA Weather Radio, and send out additional statements. This continues until all danger is past.

So who would you call if you feel a strong earthquake? Actually it would be better not to call anyone unless you have a real emergency. The airwaves and lines will be crowded with panicky people. After you have determined that you are safe, (remember in a really strong earthquake you should leave beach and coastal areas or move up in a strong building to at least the third or fourth floor) you can help us by filling out the questionnaire called, "Did you feel it?" on the USGS site at this URL: <http://earthquake.usgs.gov/earthquakes/dyfi/>. You



Don't Forget:

Drop

Cover

Hold On

will find the questionnaire by pressing the large orange button under the map that says, "REPORT UNKNOWN EVENT". This will help us know how the community here felt the earthquake and what damages may have occurred. Then listen to NOAA Weather Radio for the latest information or monitor the National Tsunami Warning Center site on the internet. If the internet is down, local radio and TV stations will carry important information as will the Puerto Rico and Virgin Island Emergency Management Agencies.



Here is a little quiz in Spanish. See if you can fill in the letters.
¿Qué hacer durante un terremoto?

1) A _ Á _ _ A T E 2) C _ _ _ E T E 3) S _ J _ T E 4) M _ N T _ N L A _ A _ _ A.

National Weather Service's Mission



“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.”



Did you know?



Did you know that there are a lot of fun meteorology activities for kids to do during their summer vacation? Many of our cooperating agencies have kids' activities. These are just a few and they are FREE!

From the NWS:

www.youngmeteorologist.org/game/index.html

From UCAR: <http://eo.ucar.edu/webweather/>

From the USGS: <http://education.usgs.gov/kids/>

From FEMA: <http://www.ready.gov/kids/games>

From NASA: <http://climatekids.nasa.gov/>

If you would like some more fun stuff for the summer for your kids ... search around the web. You might just be surprised at what goodies you might find.



Use plants that require less water.



Mulch around plants to hold water in the soil.

Reference for Water Saving Tips : Water Conservation Coalition of Santa Cruz County
<http://www.watersavingtips.org/tips.html>

Answers to Earthquake Quiz:

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CUBRETE
SUJETE
MANTÉN LA CALMA

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