Building a Weather-Ready Nation

2016 Hurricane Season Outlook
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Review of 2015 Atlantic Hurricane Season

Below-Normal Atlantic Season in 2015
Above-Normal Eastern Pacific Season in 2015
Notable Cyclones from 2015 Pacific Hurricane Seasons

Hurricane Patricia (Oct. 20-25, 2015)
- Struck southwest Mexico as a Cat 4, but reached Cat 5 before landfall
- Strongest hurricane ever recorded in either North Atlantic or North Eastern Pacific basins.

Typhoon Soudelor (Jul 29-Aug 12, 2015)
- Struck Saipan (CNMI) as a Cat 2. Later reached Cat 5 strength.
- Most destructive storm to hit Saipan in 29 years.
2016 Hurricane Season Outlook

Atlantic
Near-Normal (45%)
10-16 Named Storms
4-8 Hurricanes
1-4 Major Hurricanes

Eastern Pacific
Near-Normal (40%)
13-20 Named Storms
6-11 Hurricanes
3-6 Major Hurricanes

Central Pacific
Near-Normal (40%)
4-7 Tropical Cyclones
Comparing the 2016 Atlantic Outlook to Last Year

A Near-Normal Atlantic season is most likely in 2016

<table>
<thead>
<tr>
<th>Season Activity and Type</th>
<th>2016 Outlook</th>
<th>May 2015 Outlook (Actual Observed)</th>
<th>1981-2010 Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance Above Normal</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Chance Near Normal</td>
<td>45%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Chance Below Normal</td>
<td>25%</td>
<td>70% (Below-Normal)</td>
<td></td>
</tr>
<tr>
<td>Total Named Storms</td>
<td>10-16</td>
<td>6-11 (11)</td>
<td>12</td>
</tr>
<tr>
<td>Hurricanes</td>
<td>4-8</td>
<td>3-6 (4)</td>
<td>6</td>
</tr>
<tr>
<td>Major Hurricanes</td>
<td>1-4</td>
<td>0-2 (2)</td>
<td>3</td>
</tr>
<tr>
<td>ACE - Accumulated Cyclone Energy</td>
<td>65-140</td>
<td>40-85% (62%)</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: *This is not a forecast of hurricane landfalls.*

There is a 70% probability for each of the predicted ranges.

This year’s hurricane outlook is more challenging than most years, due to uncertainty about how environmental conditions will interact this summer and into the fall.
The AMO sets the backdrop upon which other climate phenomena such as El Niño and La Niña overlay. Due to considerable variability in the AMO during the last three years, it is unclear whether the warm phase AMO (Left) will return this season, or if the Atlantic has shifted into the cold AMO phase (Right). Therefore, it is uncertain whether there will be reinforcing or competing climate factors this season. The AMO is a multi-decadal signal and hard to discern over a short time period.
2016 Atlantic Hurricane Season Outlook

Uncertain Strength and Timing of Transition to La Niña

Sea Surface Temperature (SST) Anomaly Forecast
Predicted sea surface temperature (SST) anomalies (°C) for August-October 2016, from NOAA’s high-resolution (T-382) Climate Forecast System (CFS). Anomalies are departures from the 1981-2010 means.

Tropical Ocean and Global Atmosphere (TAO) Array -- 55 Stations
What’s New for 2016?

- Potential Storm Surge Flooding graphics have gone operational.
- Second year of Experimental Storm Surge Watch/Warning product and graphics.
- Major upgrade to NOAA’s supercomputing capacity.
- National Water Model for inland flooding.
- GOES-R Launch later this year

Supports NOAA’s goal to improve environmental intelligence for better decision-making and stronger community resilience.
• Major upgrade to NOAA’s supercomputing system earlier in 2016, funded by the 2013 Sandy Supplemental.

• Upgrade to NOAA’s Global Forecast System (GFS) provides us hourly forecast guidance (up from every 3 hours) 5 days out.

• Recent enhancements to NOAA’s HWRF model have made it our best-performing intensity model over the 2013-15 period.
• **Operational** in 2016

• Highlights areas where inundation from storm surge could occur and height above ground that the water could reach

• Depicts the reasonable worst-case scenario for any individual location
  
  ○ Displays inundation levels that have a 10% chance of being exceeded.
Potential Storm Surge Flooding Map

Example from Hurricane Arthur in 2014
• Experimental product (2nd year) – Accelerated one year as a result of Sandy Supplemental funds.

• Designed to introduce the concept of a watch or warning specific to storm surge.

• Current hurricane “category” warnings focused on wind threats.

• Separate watches/warnings for wind vs. surge should provide emergency managers, the media, and the general public better hazards guidance.
Inland Flooding

Hurricane Joaquin (Sept. 27-Oct. 7, 2015)
Inland Flooding

- NOAA’s National Water Center opened 2015.
- New National Water Model to debut this summer.
- First national water resources facility
- Partnership with USGS, FEMA, USACE, and academia.
GOES-R
THE FUTURE OF FORECASTING

3X MORE CHANNELS
Improves every product from current GOES Imager and will offer new products for severe weather forecasting, fire and smoke monitoring, volcanic ash advisories, and more.

4X BETTER RESOLUTION
The GOES-R series of satellites will offer images with greater clarity and 4x better resolution than earlier GOES satellites.

5X FASTER SCANS
Faster scans every 30 seconds of severe weather events and can scan the entire full disk of the Earth 5x faster than before.

GOES-R
2016

GOES
2005
Current GOES Imaging

GOES-R Imaging
Video from Japanese Himawari-8
Facebook:  
Twitter:  @NWS  |  @NHC_Atlantic  
Web:  www.weather.gov  
       www.hurricanes.gov
2016 Outlook for the Atlantic Basin:

A near-normal season is most likely in 2016.

10-16 Named Storms
4-8 Hurricanes
1-4 Major Hurricanes (CAT 3 or greater)

Remember…

*It Only Takes One!*

Be Ready! Take Action!

Help Build a Weather-Ready Nation
For additional information:

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2016 Hurricane Season Overview:
FEMA Office of Response and Recovery

June 1, 2016
FEMA App

- Weather Alerts
- Emergency Checklist
- Share Disaster Photos
- Open Shelters
- Open Recovery Centers

Get tips to survive natural disasters, customize your emergency checklist, and save meeting locations.

Receive alerts from the National Weather Service.

Locate open shelters and Disaster Recovery Centers, and apply for assistance.

Upload and share your disaster photos.

Stay connected on social media and the FEMA blog.

Available on the App Store

Available on Google Play
Ready.gov Campaign

TV  Web  Social  Outdoor  Graphics  Radio  Newsletter

BUILD A KIT
Include enough food, water, and medical supplies for your needs in your emergency kit to last for at least 72 hours.

Don’t Wait. Communicate.
Make your emergency plan today.

Visit Ready.gov

Ready.gov/myplan

FEMA
National Hurricane Program

USACE
NATIONAL PROGRAM MANAGEMENT
DISTRICT OFFICE PROJECT MANAGERS

FEMA
NATIONAL PROGRAM MANAGER
REGIONAL PROGRAM MANAGERS
LIAISONS TO NHC

NHC
HURRICANE SPECIALIST UNIT
TECHNOLOGY AND SCIENCE BRANCH

Response and Evacuation Planning Technical Assistance
Operational Technical Assistance and Decision Support
to Tribal, Local, State, and Federal Emergency Managers
National and Regional Plans

- Yearly refresh to hurricane plans in Regions 4 & 6
- All other hurricane prone regions have a hurricane annex
- Guam/CMNI Typhoon update
Training and Exercises

- NHP provides specific hurricane training to State, local, tribal, and territorial partners
- FEMA conducts recurring National Exercises to validate plans and prepare Federal response
Logistics Staging

In hurricane-prone States and Territories:

- 53 pre-identified Federal Incident Support Bases (ISBs) and Federal Staging Areas (FSAs)
- 78 pre-identified State/Territorial Logistical Staging Areas (LSAs)
American Red Cross
Hurricane Season 2016
Mission

The American Red Cross prevents and alleviates human suffering in the face of emergencies by mobilizing the power of volunteers and the generosity of donors.
**Disaster Cycle Services**

**Mission:** Disaster Cycle Services is America’s partner and a leader in mobilizing communities to help people prepare for, respond to and recover from disasters and other life-threatening emergencies.

**Range of responses:** The Red Cross responds to nearly 66,000 disasters every year, including:

- House fires and apartment fires
- Natural events, such as tornadoes, floods, winter storms, hurricanes, wildfires and earthquakes
- Human-made events, such as transportation incidents
Key Services

What we do when disasters occur:

- Feeding, sheltering
- Distribution of emergency supplies
- One-on-one casework, assistance, referrals
- Health services
- Mental health services
- Family reunification
- Community recovery and resilience building
- Blood and blood products
- Lead and convene partner organizations and mobilize communities
Sheltering and Feeding Capabilities

Sheltering Resources
- Stock supplies (cots, blankets and comfort kits) to support 500,000 shelter residents
- National Shelter System (NSS) shows 60,000+ potential shelters with capacity to shelter millions

Feeding Resources
- Total capacity of 1 million meals per day served using a combination of the following:
  - 5 trailer-based kitchens with capacity of 50,000 meals/day
  - 100+ Southern Baptist Field Kitchens
  - Local vendors and caterers, and our own shelf-stable meals
- 500+ Red Cross Emergency Response Vehicles to serve meals and distribute supplies on mobile routes
Partnerships

- Federal, state, tribal and local government alignment
  - Leveraging resources
- Long-term alliances
  - Southern Baptists
- National Mass Care Strategy
  - Partner shelters
- National Youth Preparedness Education Strategy
- America’s PrepareAthon!
- Joint exercises and planning
- Shared workforce and training
A Unified Network

To minimize duplication of efforts and ensure there are no gaps in services, the Red Cross works with hundreds of government and nongovernment partners.
Readying the Workforce

- More than 47,000 trained disaster workers enrolled in “Volunteer Connection” (92% volunteer)
- Incident Command (ICS) training for all disaster leadership across 7 divisions
- 21 Disaster Response Management Teams (advance leadership teams)
- Advanced volunteer intake process in development (Event-based volunteers)
- New trainings and resources to educate workforce
Preparedness Actions – Get a Kit, Make a Plan, Be Informed

• Red Cross Mobile Apps
  • Free, available for iPhone and Android, English/Spanish
  • Provide expert emergency information and weather alerts
  • *On average, the Red Cross sends 1.13 million weather alerts every day through mobile apps*

• Emergency App
  • 35 NOAA/USGS severe weather and emergency alerts
  • Monitor several locations across U.S. for alerts
  • Notify loved ones that alert has been issued in their area
  • Review resources for before, during, and after disaster
  • Activates Shelter Finder, showing open shelters in area
Preparedness Actions

- Resources and training to help Red Cross workers & communities to be ready and become prepared at home
- Customized resources for Red Cross regions to help their communities prepare
- Children & youth engagement in classrooms and after school with technology, challenges, and science-based education
Resources for constituents

- **Volunteer**- Reach out to local chapters/regions or redcross.org
- **Be prepared** – download Red Cross apps at the Android/iTunes app stores
- **Get trained** – check out redcross.org/take-a-class for opportunities
- **Stay Informed** – Follow Red Cross on Social Media @RedCross
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