

Dear CASTNET Site Operator:

This message is your **CASTNET: Eye on Air Quality** newsbrief for Fall 2011  
(best viewed in HTML format in your e-mail reader)

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## **NETWORK NEWS**

### **NPS Retains ARS as Contractor for New Contract Period**

The NPS has selected ARS to perform network operations and manage data for their Gaseous Pollutant Monitoring Program and NPS-CASTNET sites beginning August 1, 2011. ARS has supported NPS network operations for the past 22 years and data management for 16 years, and is pleased to remain the incumbent contractor. Current staff will continue to provide operator support, and will work with the NPS to develop and implement network advancements in coming years.

### **MACTEC officially is now AMEC E&I, Inc. (AMEC)**

The paperwork is complete. MACTEC is now AMEC E&I, Inc. (AMEC). This change will not disrupt CASTNET operations; however, e-mail addresses are being changed from MACTEC to AMEC addresses. Both addresses will be active for a period of time during the transition. The new format for e-mail addresses is `firstname.lastname@amec.com`. If there are multiple employees with the same name, a middle initial will be added:

Kevin Mishoe, Field Operations Manager: [Kevin.Mishoe@amec.com](mailto:Kevin.Mishoe@amec.com)

Mike Smith, Field Coordinator: [Michael.J.Smith@amec.com](mailto:Michael.J.Smith@amec.com)

Garry Price, Laboratory Operations Manager (filter pack shipping): [Garry.Price@amec.com](mailto:Garry.Price@amec.com)

Ruby Wyrosdick (contact for address changes, filter pack shipping): [Ruby.Wyrosdick@amec.com](mailto:Ruby.Wyrosdick@amec.com)

### **ARS and AMEC Team Up**

For the new contract period, ARS and AMEC will team up in providing twice-annual site maintenance visits for a more economical program effort. Since ARS is located in Colorado and AMEC in Florida, swapping the contractor maintenance responsibility of a few eastern and western sites with ones in proximity to our respective offices will provide efficient use of resources and cost-savings to NPS and EPA. The specific stations to be swapped have yet to be determined, but ARS and AMEC field personnel are excited about seeing some new faces and stations in the network.

### **CASTNET Ozone Monitoring Systems Go Regulatory**

As noted in the last issue of this newsbrief, as of the end of May 2011, all CASTNET sites that measure ozone have ozone monitoring systems compliant with 40 CFR Part 58. CASTNET ozone data can now be used for regulatory decisions. Data for each site are submitted to EPA's Air Quality System (AQS) on a regular basis. The AQS database includes ambient air pollution data collected by EPA, state, local, and tribal air pollution control agencies from more than 5,000 active monitoring stations. AQS also contains meteorological data, descriptive information about each monitoring station (including its geographic location and its operator), and data quality assurance/quality control information. EPA and others use AQS data to assess and manage air quality. Data from AQS are also used to prepare reports for Congress. For more information on AQS see <http://www.epa.gov/ttn/airs/airsaqs/>. CASTNET data are available at <http://www.epa.gov/castnet/>

CASTNET was originally established as a non-regulatory network. One effect of the change from non-regulatory to regulatory is that CASTNET measurements can now be used to evaluate an area's compliance with National Ambient Air Quality Standards (NAAQS). The Clean Air Act, which was last amended in 1990, requires EPA to set NAAQS for six criteria pollutants that are considered harmful to public health and the environment. Ozone is one of the criteria pollutants regulated by NAAQS.

The Clean Air Act established two types of NAAQS. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. The Clean Air Act requires periodic review of the science upon which the standards are based and the standards themselves.

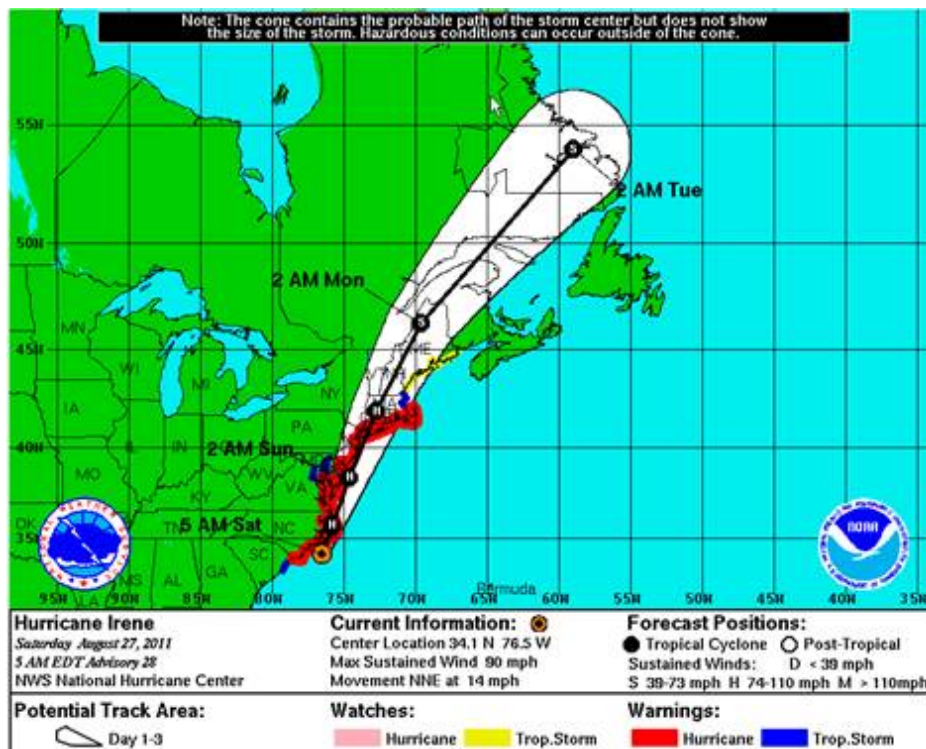
States and tribes submit recommendations to EPA as to whether or not an area is attaining the NAAQS for a criteria pollutant. The states and tribes base these recommendations on air quality data collected from monitors at locations in urban and rural (e.g., CASTNET) settings. After working with the states and tribes and considering the information from air quality monitors, EPA "designates" an area as attainment or nonattainment with the ozone standard. If an area is designated as nonattainment, it informs the public that the air in the area is unhealthy to breathe, and states, local and tribal governments must develop and implement control plans to reduce ozone-forming pollution.

Site operators play an important role in maintaining Part 58-compliant ozone systems at both EPA- and NPS-sponsored CASTNET sites. With CASTNET ozone data being deemed regulatory, maintaining the integrity of the ozone system is a high priority for the network.

### Hurricane Irene Brings in Clean Air

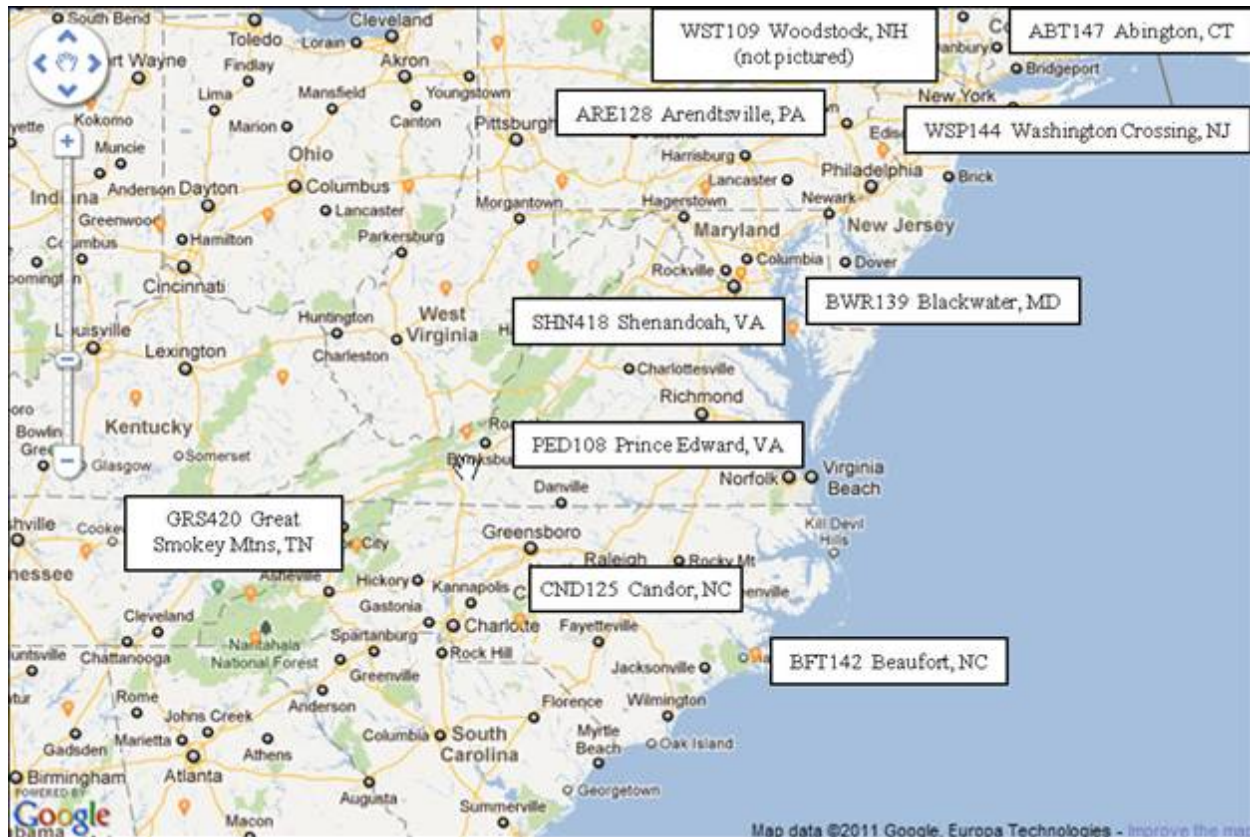
Hurricanes are usually a problem for CASTNET stations because the high winds and heavy rainfall often lead to power outages and sometimes damage to the station. When we are lucky enough to get data during an event, we can also see that cleaner air is associated with the event. This could be from ocean air, air from aloft, and maybe just from a reduction in emissions as normal human activity in an area is disrupted. Hurricane Irene made landfall in North Carolina on Saturday, August 27 and had a significant effect on the Washington DC and New York City areas on August 28. CASTNET stations documented an interesting effect on air quality during this time.

### Storm track for hurricane Irene from NOAA



Source: National Oceanic and Atmospheric Administration (NOAA)  
[http://www.nhc.noaa.gov/archive/2011/graphics/al09/loop\\_3W.shtml](http://www.nhc.noaa.gov/archive/2011/graphics/al09/loop_3W.shtml)

## CASTNET Sites Used in Analysis of Irene Effects

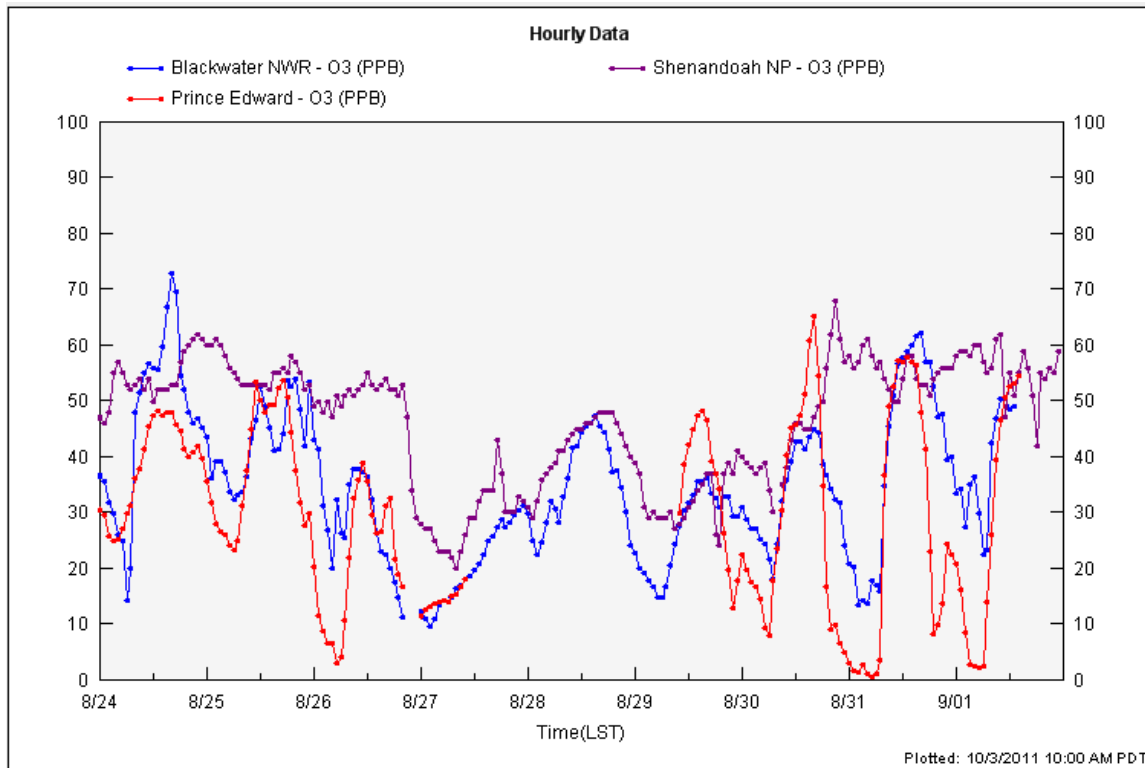


Source: John Ray, National Park Service

Beaufort, NC (BFT142) saw the first effects of Hurricane Irene late on August 24 with a rapid drop in ozone by 30 parts per billion (ppb). The station lost power two days later. Prince Edward, VA (PED108) ozone dropped by 45 ppb late on August 25, and Blackwater, MD (BWR139) dropped 30 ppb on the morning of August 26. About 12-18 hours later than the Blackwater site, which is near the coast, Shenandoah, VA (SHN418), which is farther inland but at high elevation, saw the hurricane effects late on August 26 when ozone dropped 30 ppb. Progressing up the coast northward, the Arendtsville, PA (ARE128) and Washington's Crossing, NJ (WSP144) sites saw a rapid drop in ozone of about 55 ppb late on August 26. In each case, diurnal changes in ozone continued to occur, but at reduced concentrations. At each of these sites, the ozone depression lasted about 3 days followed by a recover day and then a return of more normal day-night concentration cycles.

At SHN418, VA, the drop in ozone corresponded most strongly to the shift in wind direction from west to east on August 26, ending late on August 27. Rainfall and high relative humidity occurred during this period, but the high winds didn't occur at SHN418 until August 28, after the hurricane had progressed to the north. The highest winds were from the northwest, basically the backside of the low pressure area, which was centered somewhere north of New York. During this time, the northeast US had low ozone (see archive maps at <http://airnow.gov/index.cfm?action=airnow.mapsarchivecalendar>).

## Comparison of Hurricane Irene on Ozone Concentrations at Two Coastal Sites and One Inland Site



Source: John Ray, National Park Service

The picture that emerges is that Irene had the effect of depressing ozone concentrations, but not taking values down to zero. Since air even over the remote Atlantic Ocean is mostly in the 15-25 ppb range, one would not expect ocean dominated winds to be extremely low. When we get ozone concentrations below 20 ppb, it is caused by dry deposition or reaction with fresh emissions of nitric oxide (NO) with ozone directly. Daily cycling of ozone concentrations continued, which indicates that regional and local pollutant emissions still produced enough precursors for photochemical ozone production of ozone to occur. The depression of ozone concentrations was 15-40 ppb of ozone depending on location. That was enough to take ozone concentrations to well below the standard into a healthy air quality range. Unfortunately, the good air quality didn't last, and things returned to the same conditions as before as hurricane Irene moved north out into the Atlantic Ocean again.

### Impacts of Hurricane Irene on CASTNET Sites

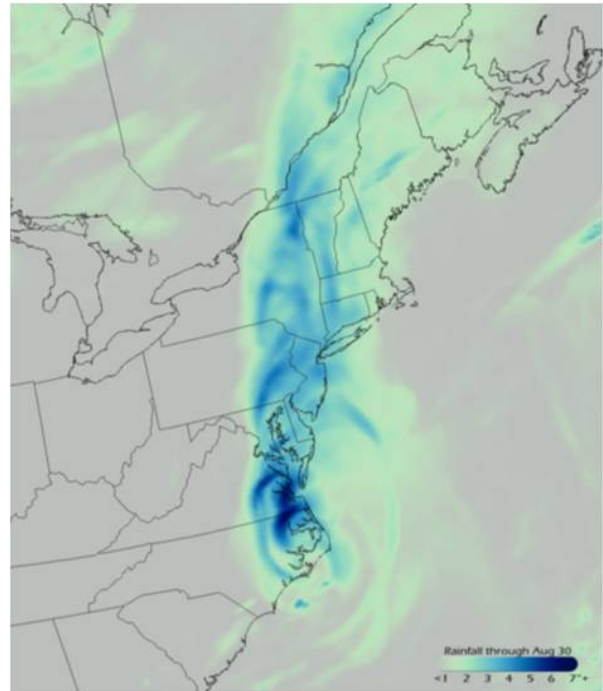
Of all the storms during the 2011 hurricane season, Irene had the most impact on CASTNET sites. Site operators located in the southeastern United States have encountered hurricane damage before, but many of the Mid-Atlantic and northeastern CASTNET site operators may have been surprised to find themselves cleaning up after a hurricane at sites as far north as New England. Irene formed on August 20 just east of the Lesser Antilles Islands and became the first major hurricane of the season. Well before arriving in the United States, Irene was a notable storm that left a trail of severe flooding and significant property damage as well as causing the deaths of seven people.

Irene first made landfall in the continental US in eastern North Carolina near Cape Lookout on August 27 before moving back out over water and making a second landfall near Little Egg Inlet in New Jersey on the morning of August 28. Downgraded to a tropical storm, Irene made its third US landfall around Coney Island in Brooklyn, New York on the morning of August 28 and moved inland impacting areas of eastern upstate New York and Vermont causing the worst flooding in these areas in centuries. The death toll from Irene was estimated at 43 people across 12 states (New York, New Jersey, North Carolina, Pennsylvania, Virginia, Vermont, Connecticut, Delaware, Maryland, Florida, Massachusetts, and New Hampshire) and at least 2.83 million people were without power during Irene's 3-day sweep up the East coast.

CASTNET sites in Irene's path were Beaufort, NC (BFT142); Prince Edward, VA (PED108), Blackwater National Wildlife Refuge, MD (BWR139); Beltsville, MD (BEL116); Washington's Crossing, NJ (WSP144); Abington, CT (ABT147); Claryville, NY in the Catskills Mountains (CAT175); and Huntington Wildlife Forest, NY (HWF187). The BFT142 site received the most damage. The site experienced substantial flooding with water approximately a foot high in the shelter. Outside the shelter, it is approximated that the water reached a height of around 3 feet based on the water mark on the NADP rain gauge and debris that was found in the rain gauge which stands about 4 feet tall. Three vacuum pumps and a compressor were damaged and had to be replaced as well as the baseboard heater. Power at the site was out from 0100 on August 27 through 0600 on August 29. It took an additional two days to get the temperature, ozone, and flow systems back on line. The NADP rain gauge also had to be replaced due to damage caused from flooding.

Most of the sites mainly experienced power outages. Moving north up the coast from BFT142, PED108 was without power for 45 hours, BEL 116 for 85 hours, WSP144 for 66 hours, and ABT147 for 76 hours. HWF187 lost power on and off for about 6 hours on August 28. CAT175, being a solar powered site, was not impacted by power outages, but the site was not accessible on August 30 for the Tuesday visit due to flooded roads.

### Hurricane Irene Rainfall through August 30



Source: NOAA

## **OPERATOR TIPS & TRICKS**

### **What to do when your site is damaged**

Hurricanes are not the only things that can damage a site. Major storms with lightning, wind, and torrential rain or blizzards with wind, blowing snow, and extreme cold can also affect site operation. Still other problems are related to wildfires and vandals. Keep in mind that safety is the primary goal. If you approach your site and see potentially dangerous conditions (e.g., the tower lying on the shelter), call AMEC or ARS before proceeding further.

If your site is damaged, but does not pose a safety hazard, please note the damage in the Site Logbook, and assess the situation to determine if it is something that can be easily fixed or if a visit from an AMEC or ARS field technician is necessary. Provide as much information as possible on the Tuesday call to AMEC/ARS. If the site has been vandalized, please call the appropriate authorities to report the incident and note what is damaged or missing when you call AMEC/ARS. If possible, take photographs of the damage and send to AMEC/ARS.

Safety is our goal. If a wildfire or wild weather is heading your way, remember to stay safe. If you have warning of an impending storm, on your Tuesday site visit, check that the shelter is weatherized, and equipment is secured. If you see loose items, including trash or debris, which might be blown by the wind, please secure or remove the item(s) from the vicinity. If an active situation is underway when it is time for the site visit, make sure you are prepared for the trip to the site. If it is something inconvenient but not threatening, be prepared and continue to the site. If it is a dangerous situation (e.g., wildfire, blizzard, flooding) consider your safety first. Lightning, hailstorms, heavy rain, blizzards, or other conditions may pose an unreasonable hazard. Before arriving at the site, check local conditions to avoid danger from avalanche, wildfire, or other natural hazards. If you can safely go to the site, please do so. If not, please don't. If your site visit is canceled, please inform AMEC/ARS upon making the determination.

### **Holiday plans and changes of address for filter pack shipments**

The holidays are just around the corner. Many of our site operators are sponsored by universities and businesses that close over the holidays. Other site operators go on vacation at various times of the year and rely on their backup site operator to receive the filter pack shipments and make site visits. Filter packs are shipped to the sites on the Thursday two weeks before the Tuesday sampling date. During Thanksgiving week, filter packs are shipped out on the Wednesday before Thanksgiving.

If you are not going to be available to receive your filter pack, please notify AMEC at least three (3) weeks in advance or as soon as you are aware that the delivery needs to be directed elsewhere. If your absence is temporary, please also provide the date of your return.

The best way to notify AMEC's laboratory of a change of address for a filter pack delivery is to contact one of the following via telephone or e-mail. Direct dial numbers are listed. You can also call 352-332-33318 and enter the last four digits of the telephone number or extension when prompted.

Garry Price, 352-333-1612, [Garry.Price@amec.com](mailto:Garry.Price@amec.com)  
Ruby Wyrosdick, 352-333-1603, [Ruby.Wyrosdick@amec.com](mailto:Ruby.Wyrosdick@amec.com)  
Helen Reed, 352-332-3318, ext. 1173, [Helen.Reed@amec.com](mailto:Helen.Reed@amec.com)

## **OUTSTANDING SITES**

National Park Service (NPS) sites that achieved 95%-100% validated ozone data for June 2011 through August 2011 and U.S. Environmental Protection Agency (EPA) sites that achieved 95%-100% validated ozone data for November 2010 through January 2011:

ALC188, TX ALH157, IL ANA115, MI BBE401, TX	HOX148, MI HWF187, NY	PRK134, WI PSU106, PA ROM406, CO SAL133, IN
CAD150, AR CAN407, UT CDZ171, KY CHE185, OK	JOT403, CA KEF112, PA KNZ184, KS LAV410, CA	SEK430, CA SHN418, VA SND152, AL SPD111, TN
CKT136, KY CON186, CA CVL151, MS DEN417, AK	LRL117, PA MCK131, KY MCK231, KY MEV405, CO	STK138, IL UVL124, MI VIN140, IN VOY413, MN
ESP127, TN GLR468, MT GRB411, NV GRC474, AZ	MKG113, PA MOR409, WA PAR107, WV PED108, VA	VPI120, VA WSP144, NJ WST109, NH
GRS420, TN GTH161, CO	PET427, AZ PIN414, CA PND165, WY PNF126, NC	YEL408, WY YOS404, CA

Please contact us with topics and tips of what you want us to explore next time in your **CASTNET: Eye on Air Quality** newsbrief.

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For monitoring site assistance, please contact:

NPS CASTNET sites: contact Air Resource Specialists Telephone: 1-800-344-5423 (Mountain Time)

EPA CASTNET sites: contact AMEC Telephone: 1-888-224-5663 ext. 2602 or ext. 6620 (Eastern Time)