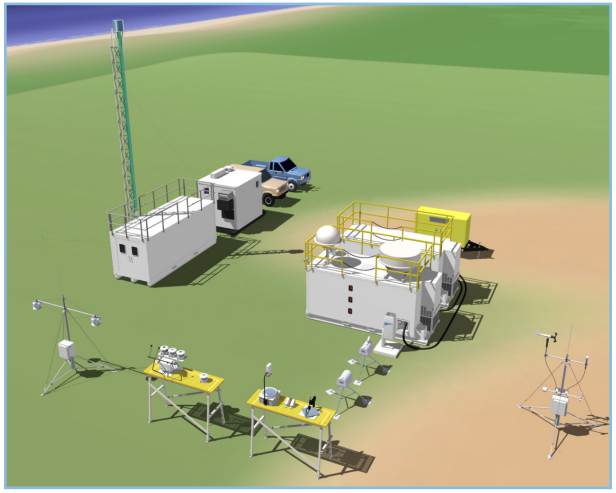
## TCAP Summary

The National Park Service (NPS) Atlantic Research Center is the host of a year-long "Two-Column Aerosol Project" (TCAP) funded by the Department of Energy's Atmospheric Radiation Measurement (ARM) Climate Research Facility. From July 2012 to June 2013, the ARM Mobile Facility—a portable observatory with nearly two dozen instruments for monitoring clouds, aerosols, and atmospheric radiation—will be deployed at the Highlands Center at Cape Cod National Seashore in North Truro, Mass.

Throughout this deployment, weather balloons will be launched from the coastal bluff site four times a day. In addition, two aircraft carrying a suite of climate-related scientific instruments will obtain complementary measurements of aerosol and cloud properties during research flights a few times a week in July 2012 and again in February 2013.

Scientists will use data obtained during this yearlong effort to study the effect of aerosols at a location subject to both clear and cloudy conditions and clean and polluted conditions. Their analyses will be used to improve how these effects are simulated by climate models.



## Where can we find more information?

TCAP website: ***http://campaign.arm.gov/tcap***

The TCAP website contains planning and operations information, as well as outreach materials and links to additional information. This website is updated as more information becomes available. Here are some examples of the types of information you can find there:

- **Experiment Planning** – campaign proposal and scientific posters and presentations
- **Deployment Operations** – science plan and research instruments
- **Outreach** – images, news, and press
- **Contacts** – lead scientists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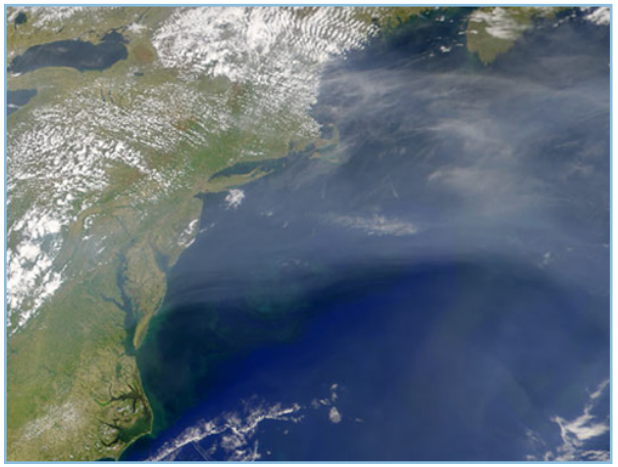
ARM
CLIMATE RESEARCH FACILITY

# FREQUENTLY ASKED QUESTIONS

## Two-Column Aerosol Project (TCAP)

## 2012–2013



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## Why did you choose this location?

The site was selected so that we could measure cloud and aerosol properties as air moves between North America and the Atlantic Ocean. Cape Cod's unique geography—a long isolated coastal spit downwind of major metropolitan areas—makes it an ideal location to collect the data we need.

## What do you mean by "Two Columns"?

Most ground-based instruments collect data from the atmosphere by using sensors that obtain measurements from the sky directly overhead—kind of like cupping your hands around your eyes and looking straight up. The instruments measure anything inside this "column"—clouds, wind, sun, dust, etc. So column #1 is the sky directly above the ARM Mobile Facility.

The second column is over the ocean, about 155 miles off the coast. The research aircraft will fly through this column to take measurements for comparison to those gathered over column #1 at the ground site.

## This sounds like a big effort—what kind of community impacts will we see?

The mobile facility team typically hires a handful of local people to assist with balloon launches, and local companies play an important part in providing goods and services throughout these campaigns. You might notice a modest increase in traffic during the installation and decommissioning phases (June 2012 and July 2013). Otherwise, the mobile facility requires only a few technicians for operations and maintenance, and various researchers may visit from time to time.

## Will we see or hear anything unusual during these operations?

**Research aircraft:** One of the research aircraft will depart from the Barnstable Airport and fly at lower altitudes than commercial aircraft, so you might see it if you know where to look. However, because it's white, it can be difficult to spot against a bright sky. The lowest it will fly is 1,000 feet over land and 300 feet over the sea. Under very calm conditions, you may be able to hear it from land. People at sea will have a better chance of seeing and hearing the aircraft. These flights are coordinated through the FAA with the required area notifications, and they follow all FAA regulations.

**Radar, lidar, and sodar:** These instruments emit different types of waves—radio, light, and sound waves, respectively—into the sky and convert the return signals into specific measurements. On a lightly cloud night, you might see a faint beam of greenish light from the lidar if you are within 50 feet or so. You can also hear a beeping noise from the sodar as it transmits sound waves into the sky, but you must be within a few hundred feet to hear it.

**Weather balloons:** You may see the weather balloons as they rise into the sky, but they leave visual range within a minute or two as they ascend into strong winds aloft. It is highly unlikely any balloons launched from the bluff will land anywhere close to the seashore because of the westerly winds that quickly carry them eastward over the ocean.

## Couldn't the balloons pop and end up in the ocean? Are they hazardous to marine life?

At about 65,000 feet, the balloons generally burst. They are made from 100 percent biodegradable natural latex and will disintegrate within a few days in saltwater. It is extremely unlikely balloon debris will wash up or injure marine life.

The balloons, constructed to FAA specifications, are very similar in size and weight to those launched twice a day from 70 locations across North America. Of the hundreds of weather balloons launched each day around the world, reported accidents caused by these balloons are extremely rare.