A Gift of Science

Tech Presents Atmospheric Observatory to the Azores

A tiny observatory in the middle of the North Atlantic changed hands last summer, a move that the researchers say could enhance global atmospheric science for years to come.

The PICO-NARE observatory, built by Michigan Tech in 2001, is located at the summit of Pico Mountain, the highest place on Pico Island and also the highest place for miles around, until you reach North America or Europe.

Pico Island is in the Azores, a remote archipelago that is part of Portugal. The misty Azores are an important site for scientists studying the pristine atmosphere above the North Atlantic. It is so remote that PICO-NARE was lowered by helicopter onto its mountaintop home.
The station is the brainchild of Richard Honrath, a professor of civil and environmental engineering. He and Paulo Fialho of the University of the Azores organized its construction with funding from the National Oceanic and Atmospheric Administration (NOAA).

His goal was to gather information on pollutants drifting across the Atlantic from industrial centers in the US and Canada. While the Azores are perfectly situated for such studies, they pose one problem: at lower altitudes, up to about 1,000 meters, the ocean scrubs the atmosphere clean, so detecting the drift of pollutants can be extremely difficult.

At an elevation of 2,225 meters, PICO-NARE (Pico International atmospheric Chemistry Observatory-North Atlantic Regional Experiment) sits where the air is high enough to escape the effects of the ocean environment.

For the last five years, scientists have used the station to gather reams of data on pollutants floating over the Azores, among them ozone, carbon monoxide, and nitrogen oxides.

“I’m really impressed with what Richard and his coworkers have done up there,” said NOAA research chemist David Parrish. “It’s a really exciting site, but it’s on a steep mountain with no roads and no electrical power. It took someone brave and resourceful to take measurements up there, and I don’t think anyone could have pulled it off except Richard.”

PICO-NARE scientists are studying pollution from man-made sources and major forest fires in the US, Canada, and Siberia. One unexpected finding has been that forest fires pour more of the greenhouse gas carbon monoxide into the atmosphere than America’s entire northeastern industrial complex.

“It was a surprise to me how important forest fire plumes are in affecting the atmospheric chemistry of the North Atlantic,” Parrish said.
All that science that depended on PICO-NARE was about to end in 2005 because the money was running out. “We fund short-term projects,” explained Kea Duckenfield, a visiting scientist with the Atmospheric Composition and Climate division of NOAA’s Climate Program Office. “It’s surprisingly difficult to find support for ongoing operations, even for something as valuable as this.”

“PICO-NARE has been a great station,” she added. “It’s a totally different beast because of its elevation. It’s been a very important point for collecting data for the last five years, and without funding from NOAA, that would have ended.”

Honrath found a way to make the science live on. He saved the station by giving it away.

On June 29, 2006, Michigan Tech officially handed over PICO-NARE’s keys to the University of the Azores, which will operate the facility with support from the regional government of the Azores in cooperation with the Portuguese Institute of Meteorology. Eventually, the station could become part of the Global Atmospheric Watch, a United Nations-sponsored network of more than twenty observatories worldwide that provides high-quality atmospheric data to the scientific community.

The Azores are already a hub of activity for scientists interested in the marine environment and volcanology (Pico Island is a dormant volcano). Thus, PICO-NARE fits in very well with the area’s existing research efforts, said Kristian Moore, vice consul at the US Consulate in the Azores. “This is an example of the ongoing, productive partnership between the US, the Azores, and Portugal,” he said. “The station has been producing excellent results, and keeping it going ties in with the regional government’s wish to advance science and technology in the region.”

“It would have been a terrible shame to tear PICO-NARE down,” said Duckenfield, at NOAA. “But this new arrangement gives it even more standing and legitimacy, and it will let us continue to watch the Earth and learn even more.”

Above: It took someone as “brave and resourceful” as Richard Honrath, below, to set up an observatory on the peak of an extinct volcano and then figure out how to keep it going when the funding ran out.