UW study: Northwest nighttime heat waves are increasing

Researchers were inspired to conduct the study after Seattle’s evening heat-wave record in July 2009. But compared with other parts of the country, even above-average temperatures in the Northwest are probably nothing to sweat about.

By Sandi Doughton

Seattle Times science reporter

Most Northwest heat waves are bearable, thanks to the cool breezes that blow in at night. But according to a new analysis from the University of Washington, hot spells that linger after dark are becoming more common across the region.

According to more than a century’s worth of data from 39 stations across Western Washington and Oregon, the region has experienced three times more nighttime heat waves in the past 30 years than in the previous eight decades.

Between 1901 and 1980, the researchers found four episodes that met their criteria of exceptionally warm temperatures for at least three consecutive nights.

Since 1980, the region has experienced about a dozen nighttime heat waves.

The most extreme was in 2009, when the daytime high of 103 degrees on July 29 set a record at Seattle-Tacoma International Airport, and sultry conditions prevailed for eight nights in a row. The night of July 29 was the warmest on record in Seattle, with a low of 71 degrees.

It was that hot spell that inspired Karin Bumbaco and her colleagues to delve into the region’s heat-wave history.

“People were complaining about how difficult it was to cool off at night,” said Bumbaco, of the UW’s Joint Institute for the Study of the Atmosphere and Ocean. “We were getting a lot of questions about how it compared to the historical record, so we decided to take a look.”

The study, published in the July issue of the Journal of Applied Meteorology and Climatology, found no evidence the region is being hit with more frequent or more severe daytime heat waves.

That was a bit of a surprise, said Bumbaco. Climate change is expected to boost the frequency and intensity of hot spells at all times of day.
Average temperatures across the region have increased about one degree Fahrenheit throughout the past century, because of a combination of natural and man-made effects, said UW meteorologist Cliff Mass, who was not part of the study.

But nighttime temperatures have been climbing more rapidly — so the increase in hot spells after dark makes sense, Bumbaco said.

“We’re not ready to say that what we’ve seen in the past century here is definitely climate change, but it’s consistent with that — and we expect to see more in the future.”

What qualifies as a nighttime heat wave in the Pacific Northwest would have folks in Houston, New Jersey and Phoenix rolling on the floor with laughter — if they weren’t too lethargic from days of triple-digit temperatures. A few weeks ago, overnight lows in Las Vegas hovered around 90 degrees.

In their study, Bumbaco and her colleagues set the threshold at the top 1 percent of temperatures on record. For Seattle, that means overnight lows of roughly 62 degrees or higher would meet the definition if they persisted for three nights in a row.

“All minimum temperatures here are wimpy compared to other places,” Mass said.

Nevertheless, a preliminary check of hospital records in Western Washington found a 50 percent jump in heat-related illness in summers with a heat wave, the study reported. And the number of heat-related hospitalizations was highest in 2006 and 2009 — the years with the longest and most intense nighttime heat waves.

All jokes aside, there’s a good reason Northwesterners wilt when the mercury climbs, Bumbaco pointed out. "People aren’t acclimated, and homes don’t have air conditioning, and health studies show that really makes a difference."

The most dangerous situation is when both temperature and humidity are high and things don’t cool down enough at night — which is what happened in 2009, she added.

Mass cautioned that some of the data used for the new study could be compromised by the heat-trapping effects of urban areas, changes in temperature sensors and poorly located stations that heat up more than their surroundings.

“I’m not saying it’s a fatal problem,” he said, “but you’ve got to be careful about this stuff.”

Bumbaco said she and her team relied on statistical techniques to reduce the impact of local conditions on their conclusions.

Climate models predict that greenhouse warming will be more gradual in the Northwest than other parts of the globe, thanks to the cooling influence of the Pacific Ocean, Mass pointed out.

Heat waves may become more frequent, but they’re not likely to reach Death Valley levels anytime soon. “We probably won’t have super-deluxe heat waves here, even under global warming,” he said.

Sandi Doughton: 206-464-2491 or sdoughton@seattletimes.com