Late start to monsoon season? Maybe not.

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Monsoon storms are definitely on their way to Southern Arizona, though predictions of when they will start vary. Credit: Pete Gregoire/NOAA Weather in Focus Photo Contest 2015

Fireworks atop "A" Mountain on July 4 commemorate Independence Day, but also usually mark the start of monsoon thunderstorms, according to local wisdom.

The National Weather Service officially defines monsoon season as the period between June 15 and September 30. Roughly 50 percent of the

time, though, southern Arizona's first thunderstorms roll between July 1 and July 8, dropping an average of 6.12 inches of rain on Tucson, says Zack Guido, a research scientist at the University of Arizona's Institute of the Environment and School of Natural Resources and the Environment.

That's why UA climatologists are so surprised by the national narrative that has emerged this summer, predicting that monsoon storms will be late to the party.

"Forecasts predict that the next couple weeks are going to be dry, but that's pretty typical for June, climatologically," said Michael Crimmins, a professor in the College of Agriculture and Life Sciences and Arizona Cooperative Extension specialist in climate science. "I'm not going to worry until the first week of July when the one- to two-week forecast still looks dry."

Tropical storm Bud, which drenched the region on the monsoon start date last year, wasn't really monsoon activity, but it might have made people expect June 15 to mean storms are right around the corner, Crimmins said.

Moreover, many people are citing a trend that emerged from research about 10 years ago that found winter and summer rains are inversely related, he added. Yet, he maintains that this pattern is not borne out in long-term studies of monsoon and winter rainfall.

Guido and Crimmins collaborate on the monthly Southwest Climate Podcast, which is produced by Ben McMahan, a research, outreach and assessment specialist with the Climate Assessment for the Southwest in the Institute of the Environment. The show breaks down regional forecasts, weather events and climate patterns for non-experts.

During the most recent episode, Guido and Crimmins discussed their predictions for the 2019 season based on forecasts and climate patterns, and how difficult it can be to predict the exact onset of the monsoon.

There are multiple climatological factors that shape the Southwest monsoon, Guido said. A high-pressure system that moves from south of the border to northern Arizona can allow storms to slip into the region from the east. Warm waters in the East Pacific Ocean and high dew points are also important ingredients for thunderstorms. But each of these factors may also be in states that suppress rains, too. Week to week, conditions can change.

"There are some indicators right now that have not yet progressed as they have in the past to the point where we'd say 'Storms are right around the corner,'" Guido said.

There are about 100 days in a monsoon season with an average of 25 storm events, he said. A delay of about a week would mean two less storms, skimming inches off rainfall totals by season's end.

"If I had to bet, I predict it's going to start maybe a little later, which we might say would mean about July 10, but I also think it's within the realm of possibility for the next two weeks for the conditions to change and the monsoon to come in around July 4," Guido said.

Right on time.

Despite Guido predicting a slightly late start, he thinks the storms will bring more rain than average. He cites that national forecasters expect East Pacific Ocean waters to warm up, driving increased chances for tropical storms and hurricanes which can drop moisture in the latter part of monsoon season.

Crimmins doesn't agree; He's not convinced of a late start and expects an average amount of rainfall.

"I'm going with climatology," Crimmins said. "I feel like the East Pacific forecast won't hang in there. It's a bit cooler than it was last year, which was a big driver, but I'm also not convinced of a late onset. A lot could change in the next couple of weeks. All those pluses and minuses bring me to the climatological average."

Provided by University of Arizona