

 **Spotlight on Climate**

Why Are We Getting More Mosquitoes in Flagstaff?

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When you hear the high-pitched buzz of a mosquito do you flee indoors? Twenty years ago, we could sit outside on a summer evening in Flagstaff and not worry about pesky mosquitoes. What has changed? Well, for one thing, Flagstaff has grown. Growth means more wading pools, empty flowerpots, clogged gutters, discarded tires, and other great places for mosquito larvae to grow. But that's not all: Flagstaff's climate has changed too, in ways that make life easier for mosquitoes.

Mosquito life cycles are affected by their environment: particularly temperature, precipitation, and humidity. Warmer temperatures can speed up the life cycle of mosquitoes, like our floodwater species, *Ochlerotatus trivittatus*, permitting faster growth and more generations per year. With climate change, spring comes earlier and winters are now shorter and milder. Hard freezes that kill mosquitoes and their eggs have become less frequent, allowing more mosquitoes to survive. *O. trivittatus* lays its eggs in moist soil and these eggs are more likely to survive now because Flagstaff's winter temperatures have gotten warmer.

While Flagstaff's average annual precipitation has not changed much, we can all attest to the fact that we have been getting less snow and more intense downpours during monsoon season. Those downpours provide larger, longer-lasting pools of standing water, where mosquito larvae can grow. Between downpours we have seen periods of more intense drought, which can reduce small creeks to isolated puddles. Mosquitoes will not lay eggs in flowing water, but stagnant puddles are prime egg-laying territory.

So, we have more mosquitoes, what's there to worry about? Well, the greater numbers of *O. trivittatus* are already disturbing our peace. More importantly, this mosquito species can also carry West Nile Virus and Western Equine Encephalitis, which both affect humans, and also Heart Worm which affects our doggy friends.

Will this get worse as temperatures continue to rise? It's hard to say exactly how *O. trivittatus* will grow in the future, but many other mosquito species have been moving northward year after year. Some of these are tropical species that carry particularly nasty diseases. The Yellow Fever mosquito, *Aedes aegypti*, has already become well established in Maricopa County and has now reached Yavapai County just to the south of us. In addition to Yellow Fever, this species can carry Zika, Dengue Fever, and Chikungunya viruses. Zika is a particularly gruesome disease that causes cerebral deformities in young children.

Our state and county health departments regularly sample mosquito populations. In April – July, 2021, Arizona counties set a total of 12,548 mosquito traps. Results of yearly sampling

indicate that *Aedes aegypti* has migrated northward in our state. Dr. Kathleen Walker, an entomologist at the University of Arizona, states: "Over the past 7 years, there is a clear northern expansion of the ankle-biting mosquito *Aedes aegypti*. It is moving northward which may be due to milder winters. It is a very aggressive biter that prefers humans to other animals, so you really notice it!"

Two mosquito species in the genus *Culex* also occur in Arizona and have the potential to spread with climate change. *C. quinquefasciatus* and *C. tarsalis* can both carry West Nile Virus, St. Louis Encephalitis, and Western Equine Encephalitis.

Anopheles hermsi is an Arizona mosquito capable of carrying Malaria, a disease that kills about half a million people each year worldwide. Malaria was brought to the U.S. by slave traders. Abraham Lincoln suffered from the disease. In the 1930's, the federal government set up huge public works projects to clear out mosquito habitat (standing water) in southern states and in 1946 the CDC was established to prevent Malaria from spreading across the country. Climate change could undo that success.

In order to slow climate change, and mosquito migration, we need to reduce our carbon footprint in any way we can. We can leave the car at home 2 days a week by carpooling or riding the bus to work. We can plan ahead to combine errands so we don't have to leave the driveway repeatedly. One day a week, instead of driving somewhere to exercise, we can walk or run in our neighborhoods. And we need to let our elected representatives know we want them to get serious about mitigating climate change.

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