

Seasonal Weather Outlook: Late Fall 2016

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Mid- to late October is a time of distinct seasonal transition, when the strength of cool arctic air over the northern latitudes begins. Some years it is subtle and gradual and some years there is a sharp transition into autumn. Here's what's happening now.

No extended summer

The transition to cooler arctic air began earlier than usual this year, which means that we are not going to enjoy any of the extended summer that we sometimes experience, a very sharp contrast with 2015 and 2014. This summer, temperatures were below average and rainfall was slightly above average. This appears to be the trend for autumn as well. Although I do think we will still have some nice weather in late October maybe.

First seasonal frost

This year, the first seasonal frost has already come to some of our neighborhoods on October 11 and 12. It was a very light frost, but enough to kill the pumpkin leaves and other tender garden leaves. If it hasn't hit your area yet, expect it any day now. Interestingly, since 2001 the number of frost-free days in the Olympia area has increased by almost 20 days. In other words, that's 20 fewer days of freezing weather per year. This year will lower the average a tiny bit.

More storms

As I write this article we just missed (mostly) what was predicted to be a weekend of very potent early season wind and rain storms. All the prediction models were in agreement - this was the lowest pressure we've experienced in maybe five years. Weather gurus are surprised by what didn't happen, and I'm baffled too. I can tell you that the storm did not dissipate. Perhaps it swung north - I'm still reviewing the latest data to see what happened. The bottom line is that it wasn't as fierce as expected.

These types of strong storms actually begin their lives as typhoons or strong storms over the tropical Pacific SW of Hawaii. Some of them get caught in the northern jet stream of fast moving air and they sail right over to the Pacific NW. That might be what happened to the brunt of this one.

This year, the conditions are right for more of these types of storms to hit us since the ocean is very warm. That means the warm ocean water is breeding many late season tropical storms. Also, the jet stream - that narrow band of very strong air currents that encircles the globe several miles above the earth - is pointed directly at us. That gives those storms a free ride across the Pacific at speeds over 180 mph at 30,000 feet.

The strong Jet also gives these types of storms an added kick of energy to get them to generate very low pressures like a whirl pool in the atmosphere (think of water swirling down a drain). That very low pressure causes a “vacuum effect” and creates a very strong pressure differential with the air around it. That differential pressure is what causes wind as the surrounding atmosphere tries to correct the difference between the low pressure and high pressure. This also drags water vapor into the mix and bands of pressure waves swing off of the low pressure center like arms. These arms pick up a lot of water vapor over the warm ocean as they are rotating around the whirlpool center. That’s what weather forecasters call “fronts.”

Climate change effects in Thurston County

I often get asked if climate change is real and if it’s affecting our local weather or environment. Yep. It is. Below I’ve summarized a few effects -- topics that I have not seen much discussion on. That is partly because the data isn’t readily available or published yet.

I touch on it because Thurston County tracks this type of data as part of our groundwater Monitoring Program (through monitored wells and gauges placed in streams and rivers). Here’s what the data indicate:

Groundwater and stream temperatures have increased steadily since 2010. It’s not warm enough to kill your grass or steam like a hot spring, but it is increasing gradually and subtly beneath our feet. In the groundwater monitoring wells that the County has been collecting data on for about 15 years, we have recorded approximately a 2-degree Fahrenheit increase in overall groundwater temperature. That is actually pretty amazing because in order to warm the water below the ground surface, you have to put a lot of energy into the whole system. That energy comes from the rain that turns into the groundwater, and also from the soil and rocks that the water flows through. In other words, the whole system has to warm up to affect this change. And the data indicate that it is.

That matters because some leaching of iron, lead, calcium and other minerals increases dramatically with small increases in water temperature. This puts more minerals into the groundwater and ultimately into the streams and sea. Who knows where that what effects this will have?

Certain types of bacteria also are very sensitive to water temperature and can multiply rapidly if the water temperature increases by only a degree or so.

The reason for these increases, as far as we can tell, is a general increase in winter air temperatures. Winters have been warming steadily in Western Washington for about a decade. This is translating into warmer soil temperatures, warmer rain and warmer river temperatures. All of these systems interact in very fundamental but complex ways.

The earth is changing. Study of geology or the natural world reveals change is nothing new. It seems to be the natural state of the earth. By measuring the environment, we can learn more about the changes. And being informed and educated is a great way to understand a little bit more about what happens all around us every second of every day.