

Not My Fault: This week in Humboldt County, it's all about the weather

Lori Dengler/For the Times-Standard

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Atmospheric rivers, sediment slugs and flood warnings – it's been a dramatic week. As I write, the Mad and the Eel River at Fernbridge are both over flood stage and the Eel River/Scotia gage is predicted to cross the flood level soon.

The Scotia gage is a good spot for historic reflection as it has been in operation since 1911 and, being upstream of the Van Duzen confluence, is a good reflection of what is happening in the Eel drainage basin. The expected peak of just over 53 feet at Scotia, will make this the highest stage the river has reached since the El Niño year of 1997. The Mad River likewise has reached its highest level of the past 22 years.

We've had similar water levels in the past, but this is big water. It's the third highest peak for the Mad since the 1964 flood and looks to rank in the Eel's top ten of the historic record. What we used to call the "pineapple express," is now known as an atmospheric river (AR). The name probably came from the advent of satellite imagery where they stand out as concentrated bands of moisture that extend a thousand miles or more in the ocean. When the warm, moist air reaches the coast, rain is the result. The majority of our rainfall is delivered in just a few of these rivers each year.

Large AR events can be deadly for the unprepared. Fortunately, the USGS and NOAA maintain a number of river gages and weather monitoring equipment and continue to improve modeling efforts that allow for credible forecasting of potential flooding. The two most common terms used in forecasts are monitor stage and flood stage. Monitor stage is the river level where localized flooding occurs and water will accumulate in low spots like Tyee City near the Mad River. Flood stage means much more significant and widespread flooding. Whether it's caused by monitor or flood stage, flooded roads are a main cause of death in flooding. When in doubt, turn around and find another route. It only takes a foot of water to float a car and slow flow can quickly move you into a ditch and flip your vehicle over.

It's not just the rivers that are affected by large storm systems. They have a profound impact on the coast as well. Rivers supply sand that is redistributed by wind and waves to make create our beaches. I've been tracking one beautiful redwood stump at Ma-le'l Beach for over two years as the sand buries it and waves expose it once again. The stump is nearly six feet across and last November was almost completely buried. The big storms in December and January exposed about two-thirds of it. But quieter surf conditions allowed sand to begin accumulating and by early February it was nearly covered again. And then another bout of big storms and, as I write this, at least four feet of sand has disappeared and I'm betting the stump will be completely excavated by the end of the week.

What's happening to my stump is a small indication of coastal processes. The general pattern is erosion and sand removal from beaches in the winter – especially during big storm events and high tides - and sand accumulation in the quieter months. But it's affected by offshore conditions and winds. Some beaches may grow in winter and others simultaneously erode in one part and grow in another.

Whether a particular beach builds up or erodes depends on a number of factors. Sand supply is at the top and we have no shortage of that. The Eel River travels through weak and erodible rock that is being uplifted at some of the highest rates on the west coast. Couple this with high rainfall and very energetic atmospheric rivers, and it should be no surprise that the Eel pumps more sand and sediment into the Pacific Ocean than any other western river of similar size. It is the primary supplier of sand to Humboldt County beaches.

In the winter during times of peak Eel river sediment production, storm winds are predominantly from the south, pushing the Eel sediment plume to the north where it slowly settles onto the continental shelf only to be reworked by tides, coastal currents and gravity. Waves constantly transport sand onto the beach and back out again.

If my stump is any indication, this winter has been a particularly dynamic one for the movement of beach sand. The ramifications extend further than my lovely stump. It has affected the Humboldt Bay entrance and navigation channels within the Bay, creating hazards for navigation. Like the beaches, sand both offshore and in the Bay can move quickly and abruptly change a safe channel into a hazardous one. And unfortunately the

channel is particularly treacherous at this time of year and not conducive to dredging.

Note: Sign up for county emergency notifications. Go online and search the name of your county/emergency notification, or call: Del Norte (707) 464-7213), Humboldt (707) 268-2500, Mendocino: (707) 463-5667. The warning system only works if you know what the levels mean and you can be notified.

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