

# **A test of science in a sand dune playground**

**Lois Henry, Bakersfield Californian, 12-17-11**

Well, it's happened.

In the pell-mell quest for "clean air" a government agency is now attempting to regulate the wind.

OK, technically the San Luis Obispo Air Pollution Control District is saddling the Oceano Dunes State Recreational Vehicle park with its new regulations.

But it's really the wind that has the starring role in this little drama.

I bring this situation up for two reasons. One, it clearly illustrates how science can be mangled to achieve a desired policy.

And two, Oceano Dunes has long been Kern County's favorite sandbox. You might want to play in it while you still can.

The San Luis Obispo air district didn't like PM10 levels on the Nipomo Mesa, which lies just inland of the Oceano Off Highway Vehicle park. PM10 is tiny bits of dust or soot 10 microns in size.

We haven't heard much about it lately because the smaller PM2.5 has become the lead air pollution bugaboo, but PM10 is still in the mix.

The federal standard for a 24-hour average of allowable PM10 is 150 micrograms per cubic meter. California, of course, has a much lower standard of 50 micrograms per cubic meter.

Whether there are any true health effects from exposure at either level is an interesting question, which we'll come back to.

PM10 levels on the Nipomo Mesa were regularly exceeding the 50 microgram mark on windy days, according to Air Pollution Control Officer Larry Allen. And looking at the hourly levels, he said, there were spikes of 200 to 700 micrograms.

"These are hours when people are active during the day," he said. "That was of high concern to us."

So, they tracked the source and determined it was dust blowing off the dunes.

## **Pinning down the culprit**

They looked more closely trying to see if the true underlying culprit was OHV riders kicking excessive sand into the air, which the wind then carried to Nipomo Mesa.

But, no. There was no correlation between busy park days and increased PM10 levels.

Let me repeat that: There was no pattern of heavy riding days and elevated PM10 levels.

The air district then commissioned a second study, now known as Phase 2, "...to try and determine what role the vehicle activity was playing on dust getting to Nipomo Mesa," Allen told me.

Because it couldn't possibly be the wind, which blows about 500 million pounds of sand onshore each year to form the dunes in the first place. Not to mention, the Nipomo Mesa is itself a massive sand sheet created by what? Wind blowing sand onshore.

No, couldn't be that.

Anyhoo, the Phase 2 study concluded that while wind does blow sand and dust inland from lots of places, it blows more from the OHV park.

The study says the OHV riding area causes more dust overall because it's been "disturbed."

It's also much wider than other dune areas studied and simply has more sand. But that wasn't part of the conclusion's reasoning.

Rather, researchers conjectured the vehicles break up a crust on the sand.

When that crust is broken, it makes it easier for the wind to whip more dust into the atmosphere.

The crust idea comes from studies of Owens dry lake bed in eastern California. Mountain streams carry silt and minerals to the lake bed and when the water evaporates the minerals harden into a crust. When that crust is broken, the fine silt beneath can be carried into massive dust storms on the high desert.

That's the high desert, however. Not beach dunes.

There is no crust on beach dunes. It does not exist.

### **Understanding dune "morphology"**

That's not just me talkin', I got that from senior engineering geologist Will Harris with the California Geological Survey.

He was astounded at this crust theory and lack of understanding of dune morphology (how they form etc.) when he read the Phase 2 study. The California Geological Survey works closely with State Parks and other state agencies when issues of geology come up. Which is how they got involved.

What Phase 2 researchers mistakenly labeled as "crust," was regular dune layering, Harris said. Wind does a very good job of sorting sand into coarse, medium and fine layers packed tightly together. When the wind picks up or blows in a new direction, the sand sorts again, always in layers.

"That's how dunes form and how they migrate," Harris said.

In extensive comments on the Phase 2 study, Harris pointed out this error in geologic understanding, but the air district never responded to the crust concerns.

And that was just one of many problems pointed out by Harris and others.

As a side note, several people I interviewed gave the impression that the Geological Survey was "in the pocket" of state parks and that's why Harris was so critical of the Phase 2 study.

Sorry guys, but Harris is the same fellow who killed a proposed OHV park north of Bakersfield. State Parks wanted that park bad. So did the local OHV crowd, the City of Bakersfield and the County of Kern.

There were nothing but green lights until Harris did a soil survey and said no way. The dirt was too fine and had too much potential to carry not just dust but valley fever spores to populated areas.

Believe me, State Parks and most of Bakersfield was unhappy with Harris. But he proved himself to be independent and absolutely aligned with science over popularity or politics.

Back to the Phase 2 study.

Another key problem was that researchers measured sand movement and wind speeds in different locations. In fact, wind speeds for the riding area were measured 2.5 miles inland at a California Department of Forestry building.

They measured sand movement in the midst of the OHV park but measured wind speeds 2.5 miles inland (where speeds are naturally lower) and concluded that sand moves more easily at lower wind speeds in the riding area compared to undisturbed dune areas.

Please read that a second time to let it sink in.

Amazingly, even after district staff admitted measuring sand movement and wind speeds in different locations was a screw up, they still insisted it didn't matter.

"We agree that winds measured at the CDF site may not be representative of the winds experienced at the (OHV park) where the Phase 2 sand flux sensors were located," the district wrote in its response to comments, which was included in a 220-page staff report given to board members just days before the Nov. 16 vote on the new regulations

Call me crazy, but since determining how much sand the vehicles are supposedly flinging into the wind was the entire point of the Phase 2 study, that admission screams "DO OVER!"

But no.

The district glossed over that glaring flaw by saying there are lots of other studies (which they don't cite) showing "disturbed sand/soil has a greater potential for windblown dust than undisturbed soil."

Oh come on, now. If that's true, then why do the Phase 2 study at all?

Bruce Gibson, chairman of the air board and a San Luis Obispo County Supervisor, said he looks forward to obtaining accurate sand movement and wind speed information, as that is one of the measures the OHV park must now implement.

"But lacking that information doesn't change the basic findings of the study," he said.

Yeah, who needs accurate baseline information? Sheesh.

## **Assessing the health threat**

Allen and Gibson both told me it was absolutely not the air district's intent to shut the park down.

"But we have a solemn responsibility to protect the air quality of this county," Gibson said.

C. Arden Pope, the grand pooh-bah of air pollution and health effects research, told me not all PM is created equal.

"Some sources don't seem to be as toxic," he said. "Such as windblown dust and natural particles."

Like from a sand dune, maybe?

Oh, and another thing the San Luis air district apparently failed to take into consideration -- oceanic salt, which is a component of PM10.

In some areas measured in the Phase 2 study, salt made up 50 percent of particulate mass. Windblown oceanic salt is also not a threat to human health and should be discounted in PM calculations, according to the California Air Resources Board.

The new OHV park rules imposed by the air district make no allowances for that.

Then there's the vegetation issue. The Phase 2 study alludes to OHV activity causing de-vegetation when, in reality, there are 650 more acres of vegetation at Oceano Dunes than existed historically, aerial photos and studies show.

It just goes on and on.

So, ultimately, the OHV haters may finally get their wish. If the state can't somehow wrestle enough PM10 out of the wind, it may not be able to afford to keep the park open.

No matter how much they try, though, the wind will still be there, blowing sand.