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ON THE RECORD

"Carbon dioxide. They call it pollution. We call it life."

Television adverts from the Competitive Enterprise Institute — a group that receives funds from the oil industry — imply that rising levels of CO_2 are nothing to be alarmed about.

"The ads are a deliberate attempt to confuse and mislead the public."

Curt Davis of the University of Missouri, Columbia, criticizes the institute for misusing his findings on the East Antarctic ice sheet.

Sources: CEI, St. Louis Post-Dispatch

SCORECARD

Rampaging elephants Sri Lanka announces plans to tame, rather than kill, unruly wild elephants. It will then use the beasts as tourist attractions.

Race of the clones The first cloned equines — two mules called Idaho Gem and Idaho Star — are ready to run against each other, and others, in competitive mule races.

Rabbit romance Urologists develop prosthetic penises for male bunnies. The implants could have human applications, too.

Tracking whales University of Washington researchers are training failed drug-detecting dogs to sniff out the floating faeces of endangered killer whales.

OVERHYPED

A golf shot round the world

NASA mission planners have delayed a spacewalk to drive a gold-plated golf ball into low Earth orbit. The publicity stunt, sponsored by Canadian golfing firm Element 21, would have made International Space Station Commander Pavel Vinogradov a sporting celebrity. But engineers are worried that Vinogradov's hook could lodge the ball in a solar panel or other piece of vital equipment. NASA wouldn't comment on Vinogradov's handicap, saying only that the swing would be put off for a more thorough safety analysis.

SIDELINES

Q&A

Drilling for truth in New Orleans: a geologist's story

Since Hurricane Katrina hit, David Rogers has travelled to New Orleans 11 times. A geologist from the University of Missouri, Rolla, Rogers has been investigating the failure of the levee system — this collapsed in several places during the storm, flooding the city. On 22 May, Rogers and others in a team funded by the National Science Foundation released a final draft report on the disaster. The report goes beyond explaining the geology and blames penny-pinching for much of the chaos.

What was your role in the team?

I supervised characterization of the failure sites — drilling holes and recreating the foundation conditions. I also had responsibility for historical research on the background of the structures: how the New Orleans flood-protection system has evolved since 1718. Both overwhelming tasks, believe me.

What was it like working in New Orleans?

It was like pictures you see of Hiroshima and Nagasaki after the Second World War. Just complete devastation for mile after mile. No people, no bathrooms, no water. Choking dust; very fine dust on everything.

The drilling was very difficult. A drill rig took six hours to get out of Baton Rouge, through all the traffic. Just horrible.

There were lots of gawkers driving by. And constant media coverage. Sometimes I'd be talking to the grad students and I'd find my words on the front of New Orleans' *Times-Picayune* the next morning. I had so many people asking me to opine on things long before the analysis had even gotten going. They wanted to know, why? Who do I blame?

What went wrong with the levees?

We don't think that everything was due to overtopping. We feel a lot more of it was seepage related. When the storm hit, water was forced under the structures, eroding their bases and knocking them down.

What was really unusual about drilling down there is how permeable the swamp deposits are. I've drilled in the Dead Sea, I've been all over the world and I have never seen anything like the swamp mucks underneath New Orleans. I would be pushing a tube sampler down one hole and 30 feet away water comes squirting up my old bore-holes.

The flow of water through this permeable ground should be cut off by large metal sheets that extend deep into the ground underneath the levees. But a lot of the sheet piles did not extend far enough. Had those sheet piles been just 5 feet deeper, a lot of the failures wouldn't have happened — that's how close they were.

The thing is, you can't just use one average depth for the whole structure, you have to keep evaluating the foundation every foot. Bad assumptions were made in a few places, where the geology dipped down, and they didn't get the cut-off deep enough.

When we looked at the records we saw an increasing drive towards economy in the past 20 years. It would appear that they tried to do more for less, and they saved money, but they sacrificed a lot on safety.

I found the guy who drew the cross-section that was wrong on 17th Street, I actually tracked him down. He feels horrible. He was

Mammoth task: David Rogers says New Orleans is not ready for the hurricane season, which starts this month.

R. WILKING/REUTERS/CORBIS

New Orleans was devastated after Katrina struck on 29 August 2005. But why was the flooding so bad?

told to draw the line where he did. He says he was told to average it. People were generally hired, fired and promoted based on one thing: whether they brought their projects in on time and on budget.

So who is to blame?

There is plenty of blame at all levels, right up to the executive branch. It is very disappointing that the decision-makers have a difficult time appreciating probabilistic risk assessment. When we tell them, as scientists, that something has a 25–40% chance of happening, that seems like a low chance to a layperson. To us, that seems a huge risk.

In my opinion, key decisions seem to have been made by people whose principal concerns were economy and timing, not safety. The local levy boards and the sewage and water boards down there are constantly at cross-purposes. Instead of working out compromises they engage in costly litigation, and these boards tend to be staffed by political appointees, not people with appropriate technical expertise. On the flight home I'd just think, is there anybody with a brain down there overseeing the big picture? It is scary.

We need real experts to advise the president and Congress on long-term stuff and crisis response. National Guard generals aren't sufficient to respond to a tsunami, earthquake or flood. They don't have experience working with these things.

The hurricane season starts on 1 June. Are we ready?

No, the band-aids won't be completed until 30 June. Not for lack of trying — it was just too much damage. But the whole system needs to be re-evaluated, because it is just going to break someplace else. They've got the break sites covered like a glove, but the drainage capacity of the city is diminished.

Here's what your readers need to know. You don't know what a 100-year storm is unless you have 1,000 years of records. When I was drilling that swamp out there, looking at the sediment disposition was just like going through tree rings. It was one hurricane after another, after another, after another. I couldn't even count them all.

How do you feel, now the work is done?

I'm really discouraged right now, because we did not get much response. As far as I can see, none of the elected officials seemed to care. We only had one show up to our press conference. We had the world's finest minds. We have a well-thought-out plan of attack for how to fix the problems that created this, but we don't have an audience for it.

My wife would tell you that working on this has changed me. I am fighting against becoming overly pessimistic. I am really disappointed by my country. ■

Interview by Emma Marris

The report can be found at

www.ce.berkeley.edu/~new_orleans