

Scientists drill into Clear Lake to see future

David Perlman, San Francisco Chronicle, 5-4-12

Drilling deeply into ancient sediments beneath Clear Lake, UC Berkeley scientists are seeking vital clues to the future of plant and animal life by investigating how changing climates have altered life in the distant past.

The drilling will end next week, and then the 17 scientists on the project will begin analyzing thousands of tiny pollen grains brought up in drill cores from far beneath the lakebed to learn how plant species large and small met the challenge of survival during past periods of climate change.

Significant episodes of global warming - and cold waves, too - hit the Earth many thousands of years ago, leaving records of the past.

Those records, in microscopic bits of plant matter, make up the evidence the researchers will study.

"We know that climate change is happening now" said Cindy Looy, a UC Berkeley plant pathologist who oversees the drilling project team. "By understanding how it affected plant life long ago, when changes were even stronger, we'll be better able to predict the future."

Looy's drillers have been working for a week, and from a platform on Clear Lake's upper arm they have pulled up 500 feet of 3-inch coring, which they are cutting into 10-foot chunks. The drilling will stop Sunday at 650 feet, a depth that will yield evidence of 130,000 years of life in the region, Looy said. Then a duplicate core will be drilled nearby a few days later so comparisons can be made.

Long-ago warming

The team's plant life samples will come from a warming period known as the last interglacial that began about 130,000 years ago and lasted about 15,000 years when Earth was much warmer than it is now - perhaps as much as 5 to 9 degrees Fahrenheit higher than today's temperatures, according to some estimates by researchers who have studied glacial cores.

The Berkeley team is also focusing on a more recent period of mysterious climate change called the Younger Dryas that began about 13,000 years ago and lasted a little more than 1,000 years. Global average temperatures in the beginning of the period fell quickly by a full 5 degrees, and scientists now call that time "The Big Freeze." Then, within 1,000 years, the Earth suddenly warmed again by as much as 18 degrees.

Theories abound for what caused that striking cold-hot period, and Looy and her colleagues believe that knowing just how plant species evolved or died off can help to predict what could happen in the near-term future as the current pace of global warming speeds up.

That kind of prediction should be valuable now in many ways, Looy said. It could affect farm policies in preparation for future warming and forest policies for future timber cutting, for example. Even wine growers will be better able to decide what grapes to grow as warming affects their crops, just as other forms of plant life were affected in the past, Looy said.

"I'm super glad about what our drill cores will give us," she said.

Doing the analysis

The cores are being shipped to the University of Minnesota's cold storage facility called LacCORE, or the

National Lacustrine Core Facility. There, Looy's team members will split the core sections, photograph the halves, and bring half of each chunk back to Berkeley for students and faculty to analyze in detail.

The details are fine indeed, for each half-inch of drilled sediment represents 10 years of the past.

At the same time Anthony Barnosky, a UC paleontologist, and his team are poring over animal fossils from a half-dozen caves in the Clear Lake region that are stored in the Berkeley Museum of Paleontology. Tens of thousands more fossils collected from all over the world are also stored there, and they, too, can reveal how past climate changes have played a role in the evolution and extinction of animal life.

"We're working with everything from mammoths to mice to paint a picture of a past and go into a future we haven't seen," Barnosky said.