

# Salton surprise

Daniel Brothers and colleagues had a run in with some killer bees while trying to understand tectonic deformation.

## ■ What was the objective of the project?

We wanted to image the fault networks beneath the Salton Sea in Southern California to understand tectonic deformation patterns in the region. We discovered a series of prominent faults near Bombay Beach during pilot studies in 2006 and 2007, and went on to survey the area more comprehensively in 2008 and 2009.

## ■ Why did you choose this particular location for the fieldwork?

The Salton Sea seemed an ideal location to apply marine geophysical methods to study fault interaction, as tectonic deformation in the region was poorly defined.

## ■ Did you encounter any difficulties?

As so little work has been done in the area, there is very little infrastructure around the sea, including working vessels and areas from which boats can be launched. Thus we needed to be creative with the resources that were available to us. For instance, in 2007 we built a moon pool — an opening in the bottom of our pontoon boat — through which we could lower a chain hoist and deploy our instrument. This worked well, but our maximum speed was less than 3 knots, so we had to ‘camp out’ on the boat and work 24-hour days to reach parts of the lake that were far from the only available boat launch. During these expeditions we were caught in several windstorms with large swells: the sea can go from glassy conditions to 8-foot swells in less than an hour. We had a few tense moments, but made it through safely. In 2008 and 2009 we used a faster boat and were able to outrun the storms.

## ■ Did you have any encounters with dangerous creatures?

We were attacked by a swarm of killer bees in 2006 — right after our first fault discovery. We had to postpone our



Salvation Mountain: Daniel Brothers and colleagues took some time off to visit this artistic artificial mountain — over 10,000 gallons of paint went into its creation — north of Calipatria in California.

excitement to fend off the bees with blasts from fire extinguishers and generator exhaust — our only defence.

## ■ What was the highlight of the expedition?

The highlight of the expedition was when we discovered the first fault in the Salton Sea, just miles offshore from Bombay Beach, and realised that we could acquire high-resolution seismic data in the sea. And during a three-day stretch of bad weather we made a trip to Salvation Mountain — an incredible one-man artistic masterpiece of paint and adobe along the east shore.

## ■ Did you learn anything new about yourself or your team members?

We learnt that, for the sake of harmonic balance, every day spent working in Lake Tahoe requires at least ten days working in the Salton Sea. Everything about doing work in Lake Tahoe is easy: facilities, places to eat and beautiful clear-blue water. On the other hand, the Salton Sea is stark, has few restaurants and the water is completely opaque. But both places have their own special beauty!

## ■ Was it straightforward to get the samples back to shore?

In 2007 we used a small, highly unstable boat to taxi our data from the pontoon vessel to the shore. On multiple occasions the boat nearly capsized in the process, and on one occasion the engine fell off its mounting bracket. It was a little easier in 2008: we stayed in a bunkhouse in the Sonny Bono Salton Sea National Wildlife Refuge, where we were able to process our data in the evenings.

## ■ Did the trip give you any ideas for future research projects?

The results of this study have shown us how tectonic deformation is communicated within the network of faults below the Salton Sea. We were recently funded to map even deeper structures beneath the Salton Sea, using different seismic imaging techniques, to examine the link between the modern deformation and underlying structure... so we are sure to have more field stories in the near future.

*This is the Backstory to the work by Daniel Brothers and colleagues, published on page 581 of this issue.*