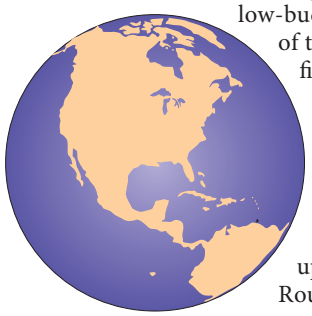
Mississippi mud bath

Torbjörn Törnqvist and several teams of students ventured into the wilds of the Louisiana coast to investigate Mississippi Delta sediments, armed with only a hand-corer and a fifteen-year-old station wagon.

What was the initial objective of the work? Did it change as work progressed?
This is an example of a research project that had entirely different goals at the outset, before veering off in unexpected directions. When we started working in the Mississippi Delta, my students and I were based at Utrecht University in The Netherlands. The main purpose was to compare so-called 'anastomosing' distributary channel patterns in the Mississippi and Rhine-Meuse deltas. But a large chunk of the data we collected was never published. The recent surge in interest in coastal subsidence persuaded us to revisit this dataset, which turned out to be ideally suited for quantifying sediment compaction rates over millennial timescales, something that hadn't been done before. So the key was having a well-managed archive of field data, ready to tap into for unanticipated purposes. If we had initiated this work from scratch, it would have taken years to complete.

What sorts of data or samples were you after?
We wanted to understand the sedimentology of the shallow subsurface, and we collected the data by hand-coring. People are sometimes surprised at how effective this method can be, but the depth range we covered (typically 5–15 m) is actually well within reach, especially with a very experienced field crew. Our record depth is almost 22 m, but admittedly that was rather extraordinary!

Did you encounter any difficulties?
One of the main challenges was the low-budget nature of the first major field campaign, although this definitely added to the charm of the project. My first group of students showed up in Baton Rouge, Louisiana (our 'base camp') in late August with a giant 15-year-old Chevy station wagon that they had purchased for US$1,500 on arrival in Atlanta a week earlier. I watched it with an odd mix of amusement and concern, realizing that if this car broke down it would wreck our project. Miraculously, despite getting stuck in the mud on several occasions, it survived the next two months of fieldwork.



TORBJÖRN TÖRNQVIST

The perils of mud. Here, the researchers hit a gas pocket as they core, creating a miniature mud volcano.

Did you have encounters with dangerous animals?
Although the Gulf Coast is probably best known for alligators, the creatures we were most wary of were snakes, notably rattlesnakes and water moccasins. Fortunately there were no incidents, although on one of the very first field days we witnessed a snake chase down and catch a giant grasshopper. It was pretty graphic and definitely got our adrenaline rushing.

Any unusual incidents?
The most bizarre and somewhat scary experience occurred when we hit swamp gas 15 m below the surface. It was quite a violent explosion of methane, water and mud, probably released from peat trapped under impermeable mud. It squirted at least 3 m above the ground, and built a mud volcano over the next few hours. We ended up being completely covered with mud.

What was the highlight of the project?
The 'moment of truth' occurred after the actual fieldwork, specifically when the radiocarbon dating results came in. In this case, the radiocarbon data were as beautiful and consistent as one could wish for. Better yet, they matched amazingly well with archaeological data. This allowed us to revise the chronology of the Mississippi Delta, which constituted the main result of the original project. But the consistency of the geochronology was equally critical to the success of the current study.

Did the fieldwork give you any ideas for future research projects?
They were plentiful! Most of my current research programme originated from those first years working in the Mississippi Delta. After relocating to the United States, I resumed fieldwork in this region, primarily focusing on Holocene sea-level change. Without the sea-level data that we collected in the subsequent years, we would never have been able to carry out the analysis of compaction rates as presented in this paper. In a broader sense, coastal Louisiana is a goldmine for studies on sea-level change and its connection to climate variability, primarily because of the extremely low tidal range. I expect our investigations here to continue for many more years.

This is the Backstory to work by Torbjörn Törnqvist and colleagues, published on page 173 of this issue.