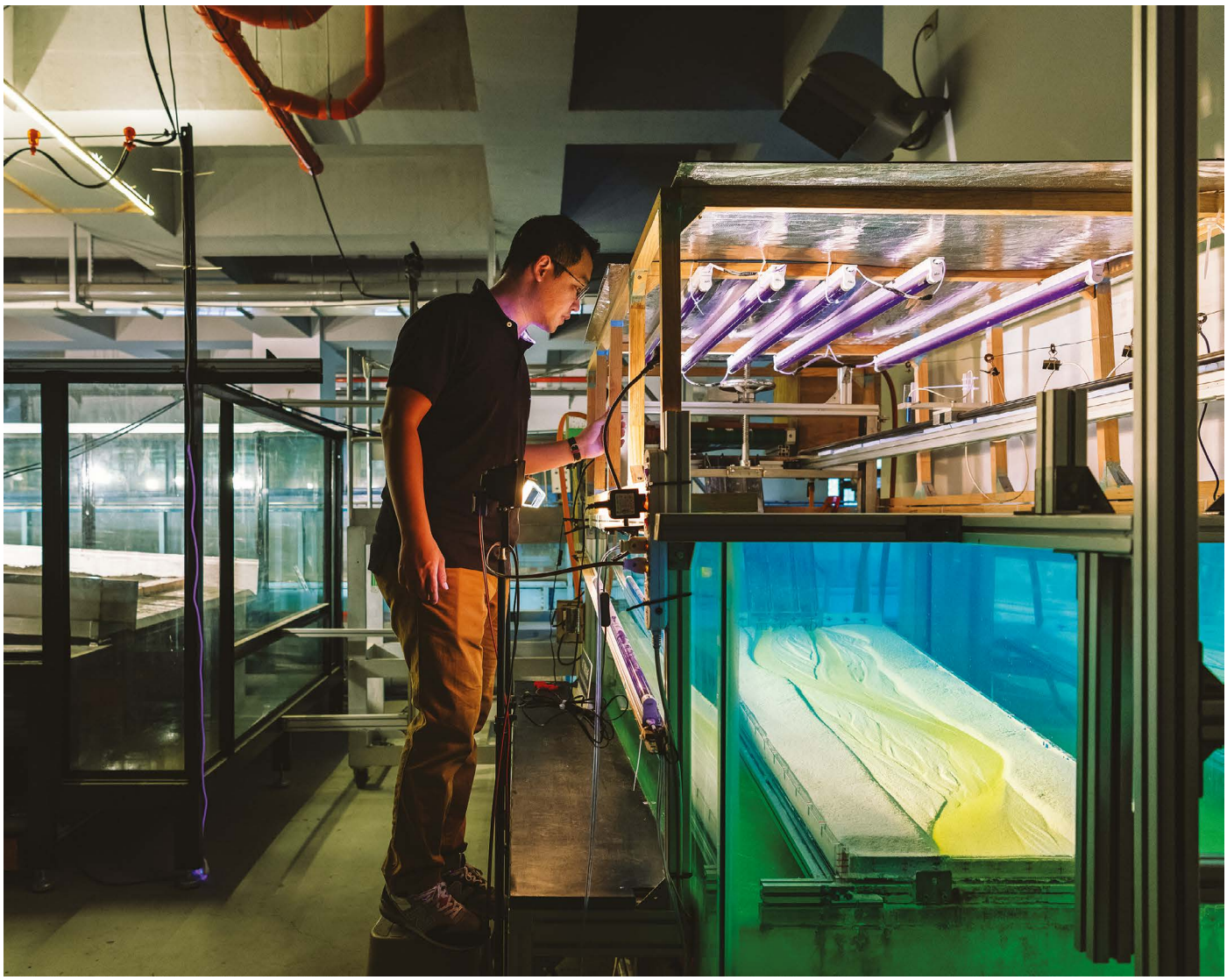

Where I work
Steven Yueh Jen Lai

In my lab, we study the evolution of underwater landscapes. We look at density currents that plunge into an ocean or reservoir, and how sediment and water interact to shape the evolution of deltas, channels and canyons. These kinds of powerful currents occur in extreme events — such as floods or typhoons — and often are too hard to measure from a ship. But we can easily reproduce them here in my lab, using sand and coloured-water flows in a tank.

This is a dream workspace for me. But things were very different in 2014, when my master's student and I were trying to recreate what is essentially a braided river channel on the sea floor. I borrowed space in an old fluid-mechanics lab, and we built a new water tank in a very small corner of this cramped, dark lab.

It was challenging. My student redesigned the small flow boxes that direct the water and tested them again and again. One day, he called me in: "Do you think these look like submarine braided channels?" I said, "My god! You really did it." But even so, working in that old space felt like the end of the world.

We spent a year and a half rebuilding the lab. Now, it is ideal for a flow and sediment experimentalist — wonderful, open and bright. We have enough tools to make an idea become a prototype, and tanks and flumes to test an idea and then to redesign if needed. It's a very positive cycle for me and for my students.

These days, we use very fine-grained sand in a tank to build the continental slope — where the continental shelf dips into the sea — then we inject denser salt water to flow across the slope. We use fluorescent dyes to visualize the water flow and see how it controls erosion or deposition.

During an experiment, this means that the lab is like a darkroom lit up by fluorescent water. It's a wonderful, vivid experience when you see the phenomenon that you generated unfold. In many ways, it's like being on a movie set.

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Photographed for *Nature* by Joe Russo