Tulane expands its world-leading fish collection with donation of rare deepwater species

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The Tulane University Biodiversity Research Institute has received more than 1,000 deep-sea specimens from the DEEPEND Consortium, including deepwater fish species not typically found in coastal sampling efforts and 36 species not previously archived in Tulane's collection. (Photos by Paula Burch)

The Tulane University Biodiversity Research Institute (TUBRI), home to one of the world's largest fish collections, has received more than 1,000 deep-sea specimens from the DEEPEND Consortium, bolstering Tulane's role as a leader in marine biodiversity and conservation research.

The specimens, collected aboard the research vessel *Point Sur* during offshore surveys in the Gulf, include deepwater fish species not typically found in coastal sampling efforts and 36 species not previously archived in Tulane's acclaimed Royal D. Suttkus Fish Collection. The collection is a globally recognized natural history archive of more than 8 million preserved specimens.

"DEEPEND's incredibly thorough and accurate inventory has revealed how the biodiversity of the Gulf changes across time and depth, and in response to human-driven impacts," said Brian Sidlauskas, professor of ecology and evolutionary biology in Tulane's School of Science and Engineering and director of the Biodiversity Research Institute. "The specimens are exquisitely preserved and the DEEPEND team meticulously documented extensive metadata. By archiving these samples in perpetuity, TUBRI can ensure that scientists will be able to discover, access and study this exceptional collection for decades to come."

The DEEPEND research team, which is led by Tracey Sutton of Nova Southeastern University and includes Jon Moore of Florida Atlantic University, genetically barcoded about 550 fish species — many for the first time — to confirm identifications and resolve long-standing taxonomic questions.

"Much of the taxonomic literature for deep-sea fish is more than 50 years old, and roughly one of every five species that DEEPEND has collected and identified is a new record for the Gulf," Sutton said, highlighting the value of making the specimens and their associated genetic data available to taxonomists, ecologists and fisheries biologists. "Genetic reference libraries are only as good as the physical specimens upon which they're based, so it was important to us to deposit ours in a carefully curated collection."

Data from the new specimens will be publicly accessible through TUBRI's online database at www.fishnet2.net, and through GenBank, a global open-access repository.

Located on the west bank of the Mississippi River in Belle Chasse, Louisiana, TUBRI's Royal D. Suttkus Fish Collection is housed in a series of retired World War II–era ammunition bunkers that safeguard millions of preserved organisms.

"Our oldest specimens date back to the 1840s," Sidlauskas said. "When properly maintained, these fish can last for several lifetimes, continuing to inform research long into the future."

In January, Tulane will install a new highly specialized, state-of-the-art scanner in the Stern building on Tulane's uptown campus, which will allow scientists to create 3D models of fish skeletons and other specimens.

TUBRI also plans to use a robotic six-camera system known as the COPIS to produce 3D models of the outer morphology of specimens through photogrammetry, and plans call for use of the technology to image some of the DEEPEND specimens.

"We're so pleased to find such a great home for these valuable specimens," Sutton said. "Tulane's collection is legendary, so adding to it is deeply gratifying. So much remains unknown about the middle and deep-sea ocean, yet the Gulf has become a global center of deep-sea research. We hope to continue these efforts — and our partnership with TUBRI — for years to come."

TUBRI researchers are also exploring artificial intelligence to enhance how biological collections are analyzed and shared. They're developing AI-powered tools to automate image analysis and extract data directly from specimen photographs.

"By combining traditional collection-based science with cutting-edge digital tools, we're creating a bridge between centuries of natural history and the next generation of discovery," Sidlauskas said. "These efforts will help ensure that the specimens we steward today continue to yield new insights for decades, centuries even, to come."

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Brian Sidlauskas, Tulane University Biodiversity Research Institute