# Saving oysters' future by digging up their paleo past

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On an oyster reef near Cherry Grove Beach, South Carolina, Cornell's Steve Durham conducts geohistorical research. Credit: Jansen Smith

Despite long odds in the struggle to restore oyster reefs and boost the bivalves' survival, marine restoration professionals may wish to add a tool: paleontological history.

Restoring oyster reefs is not an easy task, but by digging deep and examining centuries-old reefs, marine restoration professionals may stand a better chance at bringing oysters back, said a new Cornell University and Paleontological Research Institution (PRI) study published in the August issue of the *Journal of Shellfish Research*.

Stephen R. Durham, a Cornell doctoral student in the field of earth and atmospheric sciences, with Gregory P. Dietl, curator of Cenozoic invertebrates at the Cornell-affiliated PRI and a Cornell adjunct assistant professor of earth and atmospheric sciences, sought how geohistorical data – information gathered from sources such as fossils and the sediments – could be used in the conservation and restoration of oysters.

Durham and Dietl surveyed oyster biologists and restoration practitioners across the United States to assess their familiarity with data available from geohistorical records. Their research is published as "Perspectives on Geohistorical Data Among Oyster Restoration Professionals in the United States," in the journal.

"Oysters today face a variety of threats, including climate change, coastal development, and harvest pressure," said Durham. "Understanding how oyster reefs functioned in the past, even before human influence, can help us decide what can or should be done to manage and restore oyster populations in the face of these diverse stresses. We were curious to know what oyster restoration professionals thought about using geohistorical data to do this."

Durham, foreground, and Greg Dietl pick up oysters for geohistorical research at Calcasieu Lake in Cameron Parrish, Louisiana. Credit: Jansen Smith

By digging into an oyster reef, scientists can access the shells of previous generations from centuries – and even millennia – gone by. Shells offer many clues about oyster biology to restoration professionals, including how fast they grew, how long they lived and how oyster reefs functioned under differing climatic conditions.

Survey respondents recognized the potential of information from the past and expressed a willingness to use this data if it became available, particularly to bolster baseline knowledge of ecological conditions.

"When you're trying to assess the condition of an ecosystem, such as an

oyster reef, you need some kind of baseline to compare to. Often in oyster conservation those baselines come from other natural, relatively undisturbed oyster reefs… but such baselines lack temporal context," said Durham.

"Providing baseline data is one area where conservation paleobiology may be able to help significantly – geohistorical records can provide local data on timescales ranging from decades to millennia that can help us understand the extent of habitat change," said Durham.

Conservation paleobiology – the application of data from geohistorical records to conserving biodiversity and ecosystems – has potential to save oysters.

"The survey results are encouraging for future data integration … This collaboration [between biologists and paleontologists] will take time and patience, but the potential rewards are great," said Dietl, referring to the ancient oyster shells research, "It's time for us to put the dead to work."

**More information:** "Perspectives on Geohistorical Data among Oyster Restoration Professionals in the United States." *Journal of Shellfish Research* 34(2):227-239. 2015 doi: dx.doi.org/10.2983/035.034.0204

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