



In Memoriam Wallace (“Wally”) S. Broecker 1931–2019

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In Memoriam
Wallace ("Wally") S. Broecker
1931–2019



[Photos courtesy of Lamont-Doherty Earth Observatory, Columbia University]

World-renowned geochemist Wallace “Wally” Broecker, 87, died on February 18, 2019. Wally was born November 29, 1931, in Chicago, Illinois, and later attended Wheaton College and then Columbia University for his graduate work and Ph.D. He was Newberry Professor in the Department of Earth and Environmental Sciences at Columbia University, a scientist at Columbia’s Lamont-Doherty Earth Observatory (LDEO), and a sustainability fellow at Arizona State University (linked to his previous service as chief scientific advisor for Biosphere 2).

Over his career, Wally’s work variously focused on topics related to geochronology, chemical oceanography, the carbon cycle, and climate change. Besides hundreds of publications and numerous awards (including the National Medal of Science in 1996), Wally has been credited with popularizing the term “global warming” (and was known to remark “The climate system is an angry beast, and we are poking it with sticks”), with identifying a world-wide ocean circulation current dubbed the “great ocean conveyor belt” (Thermohaline Circulation, THC), and with developing the hypothesis of how the slowdown of the THC might have contributed to the Younger Dryas cold event 12,000 years ago. He also published more than a dozen books, including *How to Build a Habitable Planet* in 1984 and *Fixing Climate* in 2008. Many more

details of Broecker’s extraordinary life and achievement are described in the tribute penned by LDEO (<https://www.ldeo.columbia.edu/news-events/wallace-broecker-early-prophet-climate-change>).

Given the scope of Wally’s interests in paleoclimate, it should not be surprising to find he made tangible contributions to tree-rings studies. He accomplished this via work with his students, who were soon-to-be colleagues and remarkable scientists in their own right. An early paper in this regard was published in 1963 in the *Geological Society of America Bulletin* concerning radiocarbon dating of wood from the Two Creeks site in Wisconsin, notable as representing the final advance of the continental ice sheet into the United States. Tree-ring stable-carbon isotope records were being examined in the 1970s and 1980s as a proxies for changes in $\delta^{13}\text{C}$ of atmospheric CO_2 going back hundreds of years (direct atmospheric measurements only go back to the late 1950s). In a 1983 paper in the *Journal of Geophysical Research*, Wally, Tsung-Hung Peng, and Sue Trumbore modeled the magnitude of fossil-fuel *versus* land-use change inputs of CO_2 to the atmosphere present in a composite tree-ring $\delta^{13}\text{C}$ record. Finally, Wally participated in mechanistic exploration of hydrogen isotopes in tree rings with Jim White, first in a 1985 paper from Jim’s dissertation research examining H-isotope composition of water in sap as source water for isotopic composition of tree rings and later in a 1994 paper

modeling the factors and processes producing the H-isotope composition of tree rings.

The tree-ring community is grateful for Wally Broecker's many and varied efforts to better understand our planet and its past, present and future changes, and for his insights into how tree rings may be used to advance that understanding.

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—Contributed by *Steven W. Leavitt*