# Resolutions of Respect

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Orie L. Loucks 1931–2016

Orie Loucks in 2009. Photograph courtesy of John Wolf.

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Orie Loucks, a prominent theoretical and applied ecologist, lost his battle with cancer on September 10, 2016, at the age of 84. He was an inspiration to us for his holistic approach to ecology and for his many substantive papers on topics that ranged from the fundamentals of plant ecology and ecosystem dynamics to the accumulation of DDT, the sustainable management of urban and agroecosystems, and how businesses can achieve sustainability. Orie was a grand synthesizer of information, comfortable with the biological and physical sciences and always taking notes at whatever lecture or discussion he attended. Most importantly, he consistently saw where the field of ecology should go and was a leader in its development.

Born on October 2, 1931, Orie grew up on a farm in southern Ontario. The family raised oats, hay, potatoes, and a small herd of livestock. Two-thirds of their land was covered by maple and hemlock woods, which provided maple syrup and the firewood he and his father split for heating their home. A fascination with those forests led to degrees in forestry from the University of Toronto (B.S. 1953, M.S. 1955). Orie also was on the university wrestling team and worked as the managing editor of the university newspaper. Elinor Bernstein, his future bride, worked for the paper as well. They celebrated their 60th wedding anniversary in 2015.

From Toronto, Orie and Elinor moved to Fredericton, New Brunswick, where Orie began a seven-year stint as a research scientist with the Canadian Forest Service. The data he gathered during this time would

be used for his Ph.D. dissertation. He had decided to pursue an advanced degree in plant ecology and was intrigued by the work of John Curtis, Professor of Botany at the University of Wisconsin. Some of Curtis' students found it a challenge to learn the various methods of gradient analysis, but not Orie. In fact, the scalar approach that Orie applied to integrate the effects of various environmental factors made the challenge even greater. Scalars represented Orie's first step toward the quantitative modeling that he would later urge his students to do whenever possible. After a seminar by Orie on his dissertation research, Curtis stood up and proclaimed that Orie's work was a truly significant advancement for the study of ecology. Other students in attendance could not imagine being honored in this way. Orie's dissertation, published in *Ecological Monographs* in 1962, received ESA's George Mercer Award.

John Curtis died in 1961, a year after Orie received his Ph.D. and had returned to his position with the Canadian Forest Service. Orie was hired to fill Curtis' position. As expected, for several years he conducted research on basic plant ecology and phytosociology. His graduate classes of that era are fondly remembered for their encyclopedic coverage of the plant ecology literature, far exceeding the textbooks then available.

In an oral history recorded in 2014 (now archived with ESA documents in the Hargrett Rare Book and Manuscript Library at the University of Georgia), Orie recollected how Rachel Carson's *Silent Spring*, published in 1962, had "resonated" with him. He became involved with a group of citizens and scientists concerned about the use of DDT. In 1969, this group, the Citizens Natural Resources Association of Wisconsin, convinced a judge to ban DDT from the state, three years before it was banned nationally. By that time, Orie and his associates had developed a model that showed how DDT accumulated in ecosystems. Under oath, he presented this model in court, the last person to testify before the plaintiffs' attorneys rested their case (see Bill Berry's book, *Banning DDT: How Citizen Activists in Wisconsin Led the Way*). The preparation for this testimony led to a paper in *Science*. Just as importantly, the concept of bio-accumulation was discussed in the local newspaper.

About this same time, Orie became involved with the establishment of the International Biological Program. Soon he was the coordinator for the IBP Lake Wingra ecosystem study in Madison, overseeing aquatic ecologists working side by side with terrestrial ecologists on a project involving scientists from more than a dozen departments—meteorologists, hydrologists, limnologists, geologists, engineers, and biologists with expertise on benthos, plankton, fish, and aquatic and terrestrial plants. By that time, Orie's courses focused on the modeling of ecosystem processes rather than plant adaptation and vegetation analysis, adding a new dimension to the "Wisconsin School" of plant ecology. We heard him express frustration that few ecologists were willing to use mathematical models. Orie would refer to the 1970s as a time when a paradigm shift occurred in the way ecosystem research was done. Traditionally, a professor would work alone with the assistance of several students, but by the 1980s teams of professors and their students from various disciplines were collaborating. Orie helped lead and promote this transition.

Wisconsin was a good fit for Orie. Within five years he was promoted to professor, and in 1976 he was appointed Director of the Center for Biotic Systems in what is now UW's Nelson Institute for Environmental Studies. The Lake Wingra study was producing results, his plant community research continued, and he was directing a large interdisciplinary study on the impacts of a coal-fired power plant on the Wisconsin River. He helped negotiate the 1972 and 1978 Great Lakes Water Quality Agreements between the USA and Canada, and he was invited to join the National Academy of Science's Board on

Water Science and Technology. He also helped initiate the National Wetland Technical Council to assess wetland functions and identify research priorities. Moreover, during this period he published papers that attracted considerable attention. For example, his 1970 paper, "Evolution of Diversity, Efficiency and Community Stability," suggested that natural disturbances were important and that suppressing them could be the "greatest upset of the ecosystem of all time."

Orie left Wisconsin in 1978 to become the Science Director of The Institute of Ecology at Butler University, allowing him to become even more involved in the application of ecology and the development of broadscale ecosystem science. TIE was then part of Butler's Holcomb Research Institute. Four years later, he became Director of the Institute, a position he held for six years. Founded in 1971, TIE emerged from careful deliberations within the Ecological Society of America. It was an ambitious, complex, multidisciplinary enterprise involving a consortium of founding universities, governing committees, and cooperating agencies. There was widespread support for TIE's mission, namely to advance the application of ecological science to public policy (see Kingsland, 2016, *ESA Bulletin* 96:389–398). TIE fit Orie's vision for how he would like to see his career evolve. In one project, he worked closely with watermelon farmers in southern Indiana to show that the sudden premature collapse of their crop was a consequence of air pollution. At a broader scale, his work with the Forest Response Program (FRP) within the National Acid Precipitation Assessment Program (NAPAP) connected regional forest decline in the northeast to a string of power plants up and down the Ohio River valley. Orie became an expert at using science to connect local ecological changes to regional and global factors.

Orie's challenge at TIE was to generate and maintain support from TIE's founding institutions and affiliates, attend countless meetings with industry and policymakers, and promote the publication of papers and reports that illustrated how the results of ecological research could be applied. There were studies on the movement of contaminants through ecosystems, sustainable agriculture, urban ecology, and the effects of human disturbances. Requests for assistance came from the Council on Environmental Quality, Environmental Protection Agency, and Office of Technology Assessment. Substantial grants were secured. Orie was convinced that this was important work to do and the most important direction for the development of ecology as a discipline—improving human welfare, everywhere on Earth. But TIE did not survive, closing its doors in 1984 after 13 years of operation (Doherty and Cooper, 1990, *ESA Bulletin* 71:6–17). Core funding was a persistent problem and the organizational structure and mission may not have been a good match—or perhaps TIE was ahead of its time. Historians will decide whether TIE can be considered a forerunner of the National Center for Ecological Analysis and Synthesis, founded 11 years later (in 1995)—and also fostered by ESA.

Orie continued his research as the Director of the Holcomb Research Institute. He assembled a cadre of young scientists conducting field studies, modeling at scales ranging from individuals to the globe, and he encouraged Holcomb scientists to interact with the faculty at Butler, teaching courses and participating in research collaborations. With many visiting scientists and lecturers invited by Orie, Holcomb had a short, bright period as an intellectual center in ecology.

In 1989, Orie joined the faculty of Miami University as an Ohio Eminent Scholar in Applied Ecological Studies. There, with the help of his students, he continued his research on forest decline in the Appalachians and southern Ohio. He also published a widely cited paper challenging the balance of nature concept (Wu and Loucks 1995). With seven faculty members in the School of Business and the

College of Arts and Sciences, he helped found the Miami University Sustainability Project. This group sought to understand the principles of sustainable resource use and how they could enhance business and science education, corporate public policy, and benign production technology. This vision led to an award-winning course at Miami and a textbook, *Sustainability Perspectives for Resources and Business*. As senior author, Orie's voice was clear. Sustainable development was described as an integrated system in which both economic growth and quality-of-life improvements co-occur without degrading natural capital. We see many such books on library shelves now, but Loucks et al. was novel at the time. As an avocation, and looking for ways of using market realities to influence environmental protection, Orie formed a company that ranked corporations in terms of their adherence to environmental principles that he and his colleagues thought were important for sustainability. A prominent environmental economist once commented, "Loucks knows more economics than any ecologist I have ever met. … he [would be] a positive and powerful force in any informed public forum."

Orie retired from Miami University in 2002 with a list of projects he still wanted to complete. He always had much to do and much worth doing. His more recent publications include one in *Frontiers of Ecology and the Environment* (2004) on ecosystem services and the rating of investment opportunities. In 2010 he co-authored a paper in *Science* on the consequences of mountaintop mining (Palmer et al. 2010). Orie and Elinor continued to attend ESA meetings nearly every year until his health began to fail in 2014. His archives include many notes taken during the numerous sessions he attended. At one time or another, he was a member or chair of ESA's Professional Certification Board, Public Affairs Committee, Applied Ecology Section, and the William S. Cooper Award Committee. In his later years, he saw the emergence of the U.S. National Vegetation Classification as a particularly important new mechanism for ecologists to inform resource management and biodiversity protection. He was Chair of the ESA Vegetation Classification Panel from 1996 through 1998, and continued as a member for the rest of his career (see Jennings et al. 2009).

Natural area conservation was another of Orie's passions. He was an early member and Chair of the Wisconsin State Board for the Preservation of Scientific Areas. He also served on the National Governing Board of The Nature Conservancy and as a trustee for TNC's state chapters in Wisconsin, Indiana, and Ohio. In 1994 he received TNC's Oak Leaf Award, the same year he received the Distinguished Service Award from the American Institute of Biological Sciences for his success in applying the biological sciences to societal issues. In "Art and Insight in Native Remnant Ecosystems," one of his many book chapters, Orie compared a natural area to an original painting by one of the masters, referring to natural areas as "a unique art form, and one to be cherished." Speaking to a group of restoration ecologists, he cautioned, "the highest priority must be attached to preserving the [native] species and ecosystems that remain." In 2001 he received the National Conservation Achievement Award from the National Wildlife Federation. Wherever Orie and Elinor lived, they were involved with citizen groups that focused on political and social issues. They were willing committee members in their community and go-to resource people on various aspects of conservation, acid precipitation, controversial land management practices, recycling, climate change, living with a small carbon footprint, and economic approaches for leveraging sustainable business practices. One of their most prized honors was the Hopedale Unitarian Universalist Community Service Award, presented in 2013 to both Orie and Elinor.

Elinor and their children, Eric, Kimberley, and Edward—and all of us who knew Orie—remember him for many reasons, including his tireless work toward solving the biggest problems that modern

society has encountered. His career path required an uncommon level of commitment, and sometimes Orie had to battle with doubters of the science he presented. At the conclusion of the oral history he recorded in 2014, he said: "Sometimes difficult people made life difficult for me. But life is political. You can't let such things get you down." We remember him for his friendship, his path-defining vision, his passion for science and conservation, all that he accomplished, the urgency with which he pursued his career, his interest in joining forces with people from all walks of life, and his eagerness to make a difference, as both a scientist and citizen.

## Representative Publications


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