In Memoriam – Donald R. Nielsen, July 24, 2020

There are no words to describe the professional dedication and achievements of Don. Throughout his career at the University of California in Davis (UC Davis) and beyond, he has influenced countless people, colleagues, students, career staff and others who had an opportunity to spend time with him. Many of us at UC Davis, and so many others nation-wide and abroad across countries and continents have benefited from his interactions. All of those who have known him, will remember his unique and outspoken personality, his candidness that perhaps has not always been appreciated but spoken with his intent to better others, his dedication to the student education and professional service, as well as his friendlessness throughout.

Donald Rodney Nielsen was born on October 10, 1931, in Phoenix, Arizona. He gained an early appreciation for soils and agriculture through his father's farming of vegetables in Arizona. Don received a BS degree in agricultural chemistry and soils in 1953 and an MS degree in soil microbiology in 1954 from the University of Arizona. In 1958 he received his PhD in soil physics at Iowa State University under the supervision of Don Kirkham, after which he took a position at UC Davis. After his retirement in 1994, he established himself a home office, from where he continued to interact with students and colleagues around the globe.

Don died on July 24, 2020, after a short stay in the hospital because of complications after surgery related to a fall. He is survived by his wife Joanne, their five children, 10 grandchildren and 3 great-grandchildren. Don was a giant within the field of soil physics as such, as well as far beyond. He voiced strongly for integration of soil science with related environmental fields of agronomy, hydrology, and other disciplines. He was not shy to make his case, always with convincing arguments. Yet in doing so he was not always successful, which could frustrate him enormously. In all, he has made lasting impacts on many people and the profession because of his dedication, inspiration and tremendous work ethics. Let us briefly account for some of his accomplishments.

Don Nielsen spent his entire career at UC Davis, where he contributed enormously to all levels of the university through his teaching, research, and service. He shepherded the UC approval of M.S. and Ph.D. degrees in Earth Sciences and Resources, as well as in Hydrologic Science. He was internationally renowned for his innovative achievements in the areas of chemical transport in soils, in spatial variability of field soils, determining nitrogen pollution levels from agricultural operations, quantifying the hydrological properties of soils, and studying how soil management affects microbial transformations. He was instrumental in designing alternative agronomic experiments using ‘non-aggie’ statistics to derive management decisions that are meaningful to farmers. He authored more than 300 publications and was an invited speaker at numerous national and international conferences. Very significant early in the 1960s was his work with Jim Biggar on formalizing the theory of miscible displacement in unsaturated soils, which did lead to some 100 joint publications. Continued collaboration with Jim in the 1970s involved their pioneering work on the characterization of field soil variability and implications for water movement and solute transport. Even with an extensive research program on these and related topics, he carried out a full teaching load in the classroom, while serving simultaneously at several levels of administration within the College and the UC Academic Senate. He further served as statewide Director of the Kearney Foundation of Soil Science and Director of the Food Protection and Toxicology Center. He also served as Chair of two of the largest campus departments (Land, Air and Water Resources, and Agronomy & Range Science) and was Executive Associate Dean of the College of Agricultural and Environmental Sciences.

Don has been the advisor for many outstanding graduate students and has been the host to more than 90 international scientists from nearly 40 different countries. Through his teaching, research and administrative efforts, as well as his service on countless national and international organizations, he has had a tremendous impact not only in the soil and hydrological sciences, but also on agricultural and environmental sciences in general. He was President of the Soil Science Society of America (SSSA) and the American Agronomy Society (ASA), as well as President of the Hydrology Section of the American Geophysical Union (AGU). He also served on the National Research Council's (NRC) Board on Agriculture and chaired the U.S. National Committee of Soil Science, thereby representing the National Academy of Science (NAS) and U.S. soil scientists to the International Union of Soil Science (IUSS). Don held many contributing positions at the IUSS, being President of the Soil Physics Commission from 1978-82, member of its Budget and Finance Committee, and organizing or chairing several of its symposia. Many other roles can be cited, such as being a long-time consultant for the International Atomic Energy Agency, or his work for other national and international agencies. For example, he served on panels of Remote Sensing for Soil and Water Resources of the Space Applications Board of NRC and the Geophysics Board of the Water Resources Review Committee of the Food and Agriculture Board of the NAS. He further served on numerous journal editorial boards and review panels of universities and research organizations, as well as consulted for national and international government agencies. Particularly noteworthy was his service on the editorial board of Water Resources Research and becoming its editor-in-chief in 1965.

Because of his unique accomplishments in research, student education and professional service, Don Nielsen was honored with numerous awards. He became a Fellow of ASA, SSSA and AGU. He received the M. King Hubbert Award of the National Ground Water Association, was made a Honorary member of IUSS and the European Geophysical Society. He further received the very prestigious Horton Medal of AGU's Hydrology section "for his fundamental and pioneering work in hydrology, combined with his uncanny love for the profession". In 2008 he was awarded the Don and Betty Kirkham International Soil Physics Medal, which is awarded once every 8 years.

Don has been an unselfish servant to the soil, hydrologic and environmental communities worldwide. Throughout his career, he guided, challenged, moved, supported, and inspired people and organizations alike. Clearly, his vision, energy, skills, impact, and legacy are beyond words. Through his service and mentoring of junior scientists, Don Nielsen has directed research needs and opportunities in soil physics and hydrology. He always had very strong views on studying, appreciating, and managing soils. For example, he was very active, through his leadership roles within the U.S. Committee on Soil Science, to introduce soil science in grade and high schools. He also was adamant for graduate students to be innovative and creative, and to follow through on their own ideas without being overly constrained by their professor's need to execute funded proposals. His inspiration to students and colleagues was largely founded by his conviction that there is a universal need to protect and maintain soils globally, and to develop science and technologies that enable management of the globe's natural resources without soil exhaustion. His ultimate wish was for this to be accomplished by upcoming generations of scientists and to avoid regional and global conflicts because of this.

Let us all take time to digest his aspirations and to direct our energy and resources towards similar goals that serve our society.

Jan W. Hopmans, Martinus Th. van Genuchten, and Ole Wendroth – Friends and Colleagues of Don Nielsen