



IN MEMORIAM

Kenneth Tanji
Professor of Water Science , Emeritus
UC Davis
1932 — 2007

Kenneth Kazuo Tanji, professor emeritus of water science, was born January 13, 1932 in Hawaii, and died on September 7, 2007 in Davis. He obtained his B. A. in chemistry at the University of Hawaii in 1954, and subsequently served in the United States Army for two years as a commissioned officer. Returning to school Ken earned a B.S. in soil science from the University of California, Davis in 1958, and an M.S. in soil science from the same university in 1961. In 1997, the Kyoto University, Japan awarded a Sc. D. to Ken.

Over a period of five decades, Ken conducted research and developed concepts spanning the full spectrum of water chemistry and quality in the context of irrigated agriculture, addressing problems of drainage, pollution, and salinity. His approach characterized by a combination of fundamental chemistry blended with laboratory and field measurements. Much of his work was directed at developing new conceptual tools for understanding the complex natural geochemical- physical environment and its application to California's agricultural and environmental needs. In the 1960s, he was among the earliest geochemists to adapt results from physical chemistry based on principles of ion pair association, solubility products, ion activities as modulated by ionic strength, and chromatographic transport to the analysis of movement of calcium, sulfate, and other ions in multi- layered soil and the underlying strata. During that period, he also expanded this quantitative approach to analyze the movement and concentrations of other elements, such as boron, that were particularly important to California's waters high in solutes. This innovative effort, dealing with multi- component chemistry of solutes in solution moving through different layers of solid matrix, contributed substantially to the foundation on which modern comprehensive geochemistry models of water supply are based. Other noteworthy developments by Ken and his associates include state- of- the- art computer models of nitrogen transformation and transport in the soil and crop fields and vadose zone, and models scaled up for application at the watershed and regional levels. Ken also made one of the first successful applications of 3- D finite element model to field conditions. These were truly remarkable developments in water science.

Although well grounded in chemical fundamentals, Ken was deeply involved in solving practical problems confronting irrigated agriculture worldwide. He not only conducted research to develop solutions for many of the problems confronting agriculture in California, but spearheaded outstanding efforts to prepare manuals and books that enhance the effective management of water and salinity world wide. At the request of American Society of Civil Engineers (ASCE), Irrigation and Drainage Division, he served as the editor of ASCE Manual No. 71, "Agricultural Salinity Appraisal and Management," published in 1990 to replace the widely used but obsolete USDA Agricultural Handbook No. 60 published in 1954. This manual has received international recognition as a premier reference book on salinity, and has undergone two printings. At the time of his death, he was again the chair of a new Task Committee to revise this manual. He has authored three other books dealing with water quality in irrigated agriculture. Ken served on four committees of the National Research Council addressing such topics as soil and water quality, irrigation- induced water quality

problems including selenium, opportunities to improve the National Water Quality Assessment Program of USGS, and Columbia River in- stream flows, water withdrawals and salmon survival. He also served on the Research Advisory Board of the National Water Research Institute. Ken was the principle author of a field-validated land reclamation model that was cited by the International Soil Science Society as a Benchmark Paper in Soil Science for Chemistry of Irrigated Soils, as well as, a Benchmark Paper in Soil Science for Chemistry of Soil Solutions. The ASCE Journal of Irrigation and Drainage Engineering has also cited one of his articles as an Outstanding Practice Journal Paper and another article as Outstanding Research Journal Paper.

Ken was awarded the prestigious Royce J. Tipton Award by ASCE in 1993 “for his significant contributions to sustaining irrigated agriculture in California and the western United States, as well as, other countries with increasing water quality and other environmental constraints.” He was the 19th recipient of the award, the first without an engineering degree.

Ken was an outstanding leader, promoting interdisciplinary efforts in the organizations he led. He was the chair of a large interdisciplinary department (54 professors) encompassing atmospheric sciences, water science, and engineering, as well as, soils and plant nutrition. He was the founding director of the UC Salinity/ Drainage Program including concerns on selenium, founding director of University of California’s USDA- ERS Water Quality Program dealing with problems at watershed scales, director of Kearney Foundation of Soil Science, and Assistant Director of Agricultural Experimental Station, Davis. Ken was extremely loyal to the University of California, turning down many potential offers of administrative positions at other universities and research institutions.

Ken recognized early on that agricultural water problems required interdisciplinary efforts between scientists and engineers and was a central cog in promoting and demonstrating such efforts in teaching, as well as, research. From 1972 through 2000, he taught a then innovative graduate level course in Hydrochemical Models to students from three colleges at the University of California, Davis, emphasizing systems level models being built up from linked process level modeling. He also taught from 1972 through 2002 a companion undergraduate level course on Chemistry of the Hydrosphere emphasizing the interactions between hydrologic and geochemical cycles with a focus on dissolved mineral salts in natural waters. As might be expected, he emphasized the fundamental chemistry and physics whenever relevant.

When not hard at work solving the world’s water problems, he loved fishing, gardening and reading. Ken is survived by his loving wife Flora, and daughters Lydia and Lorelei, and son Kenneth.

Professor Tanji made seminal contributions to the interdisciplinary and quantitative understanding of water quality and chemistry in the context of irrigation and drainage. His wisdom, kindness, and support will be missed by all of his colleagues and students; especially those in the Department of Land, Air and Water Resources.

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