

Doak Carey Cox
January 16, 1917 - April 21, 2003

I first met Doak Cox in 1964 on a cold, snowy night in Washington DC, when my husband, Gaylord Miller, brought him home for dinner. Doak had been at Harvard finishing his Ph.D. work and was stopping by Washington to put the finishing touches on the development of the first joint agreement between the U.S. Department of Commerce and the State of Hawaii/University of Hawaii to establish the Joint Tsunami Research Effort (JTRE) in 1964. Little did I ever imagine that the next almost 40 years of my life would be so influenced by this "distinguished visitor" in the long, well padded, and very large overcoat who proceeded to crawl around on the floor playing a "big bear" to the delight of our two small daughters. A few months later our family arrived in Hawaii on Friday, June 11, 1965, where Gaylord had been hired as the director of the new JTRE. Being "fresh off the boat," we did not know that June 11th was Kamehameha Day and that the banks would be closed. We arrived with almost zero cash (before the days of credit cards!) and no way to cash a check. Since Doak was the only person we knew in Hawaii, he kindly loaned us money to get us through the weekend. Hence began my long and incredibly fulfilling association with Dr. Doak Cox.

Doak was born January 16, 1917, in Wailuku, Maui but spent much of his childhood on the island of Kauai where his father was a plantation Civil Engineer for the McBride Sugar Plantation. He graduated from the University of Hawaii with a B.S. degree in Physics and Mathematics in 1938. He then moved to the mainland for graduate work at Harvard University where he received his M.A. degree in Geology in 1941. It was while he was a student at Harvard that he met and married Marjorie Greiner, a math student at Radcliffe College of Harvard University. Following completion of his MA degree, he was employed by the U.S. Geological Survey as a field geologist for their strategic minerals investigation program generated by the war. During the years 1941-45, he was in charge of fluorspar investigations in several western states and worked in Cuba helping Cuban geologists locate fluorspar deposits. Doak had many good stories to tell about this period in his life as a geological prospector-investigator tramping the hills and mountains of Colorado and the northwestern states. In 1946, he was offered a position with the Hawaiian Sugar Planters Association (HSPA) to direct their Geology Department and conduct research on geology, hydrology, and water resource development in Hawaii. He and Marj arrived in Hawaii via one of the early PanAm Flying Boat Clippers that took some 24 hours of flying time and landed during a serious storm that precluded the usual docking and disembarkation procedure in Keehi Lagoon. A small boat was sent out to the plane and plucked Doak, Marj and their babies off the wing and took them to shore. Marj was convinced that she would never see her family on the mainland again given the frightening mode of transportation that was required to come and go to Hawaii. Doak worked for the HSPA from 1946 to 1960 and was directly involved with the statewide development of water resources and conservation in Hawaii. During this time, he also participated in a number of hydrological investigations in the Marshall Islands, serving as a hydrologist for the Pacific Science Board Arno Expedition in 1950 and contributing to other expeditions to the Marianas Islands and Western Samoa.

Doak's interest and expertise in tsunami research had their initial beginnings

following the April 1st 1946, devastating tsunami in Hawaii. While working as a hydrologist for the HSPA, he conducted the first modern post-tsunami survey. The 1946 tsunami was generated by an Aleutian earthquake, and Doak realized that the hazards of such tsunamis could be significantly reduced if there were an adequate warning system. His efforts resulted in the establishment of the Seismic Sea Wave Warning System, now known as the Pacific Tsunami Warning System, in 1948.

In 1954, while he was employed by the HSPA, Doak was asked to serve on the initial planning committee for a proposed Geological Institute for the State of Hawaii. This committee was instrumental in developing the administrative and directional framework, which led to the establishment of the Hawaii Institute of Geophysics (HIG) at the University of Hawaii. Doak was not only one of the proposers and "founding fathers" for the establishment of HIG, but served as executive secretary of the committee until HIG was formally established.

In 1960, Doak had a busy year. He was invited to spend a quarter as a visiting professor of Groundwater Geology at Stanford University in 1960. This subsequently led to his entry into the academic community. He left the HSPA and officially joined the University of Hawaii faculty where he was appointed to the rank of Professor in the Department of Geology and Geophysics and was put in charge of the Tsunami Research Program at the Hawaii Institute of Geophysics. He held this position until the subsequent establishment of JTRE in 1964. In the 1960's tsunamis were one of the most significant geophysical hazards in Hawaii. There were five major Pacific basin-wide tsunamis between 1946 and 1964, so tsunami research had a clearly perceived social as well as scientific significance.

In addition to his other activities in the early 1960's, Doak was responsible for drafting the original agreement between the State of Hawaii and the U.S. Department of Commerce to establish the Joint Tsunami Research Effort (JTRE) on the Manoa campus. With the establishment of JTRE, the University of Hawaii was recognized nationally and internationally (Japan, Canada, Soviet Union, Central and South America) as the leader in tsunami research. Furthermore, the JTRE served as the prototype for the National Oceanic and Atmospheric Administration (NOAA) cooperative institutes. There are now 8 such institutes in the United States, and one of these, the Joint Institute for Marine and Atmospheric Research (JIMAR) at the University of Hawaii, is a direct outgrowth of JTRE. Doak also helped draft the Memorandum of Understanding establishing JIMAR, and he chaired the search committee for a new director for JIMAR following Gaylord's death in 1976..

Although Doak turned the lead of the Tsunami Research Program over to JTRE following its establishment in 1964, he continued his own research on tsunamis, their sources and frequencies of occurrence, run-up, and particularly the analysis of historical data on earthquakes and tsunamis in the Pacific. During the early 1960's he had edited the report on the Alaskan Earthquake for the National Academy of Science., and in 1965, accepting many of his published papers as a thesis, Harvard University awarded him the long delayed PhD. During a sabbatical leave in 1966, as a visiting professor at Nagoya University in Japan he consulted with other tsunami experts. He also served as the official Tsunami Advisor to the State Office of Civil Defense from 1962 to 1967. In this capacity, he was called upon to assist Civil Defense in determining if a tsunami warning and evacuation order should be issued (in the event of a distantly generated earthquake). He was also called upon

to present continuous live television reporting during tsunami alerts to guide the public in evacuation routes and provide historical run-up data ...all from memory!

In addition to his work on tsunamis, Doak established a Natural Hazards Group at UH Manoa to bring scientists from many different departments together to share ideas on natural hazard research. A sabbatical in 1981 found him delving into natural disasters at the Natural Hazards Research and Applications Information Center of the University of Colorado at Boulder. Doak himself made a significant study of the storm surge associated with Hurricane Iwa. This study generated wide interest in the problems of storm surges near island chains, which until then had received little attention. Upon Doak's retirement from the University in 1985, Dr. Dennis Moore, Director of JIMAR, commented on Doak's accomplishments with the following:

During his entire tenure at U.H. Manoa, Dr. Cox has contributed outstanding research and service in the tsunami and tsunami hazard mitigation area. This has been an area of high social relevance, and his efforts represent an outstanding contribution to the University of Hawaii and the State.

As if his tsunami efforts were not enough, Doak served on the organizing committee for the UH Manoa Water Resources Research Center in 1964 and was appointed the first director of WRRC. Many of the current goals of the WRRC were set in place under Dr. Cox's initial leadership as Director.

Following the establishment and initial operation of the WRRC, Doak's expertise in identifying needs of the state and ways to address those needs was again sought out by the University to meet the rapidly growing awareness of the need for responsible environmental management. His expertise, legendary facility with the pencil, and his communicative talents soon led to the recognition by the legislature of the need to develop the legislative framework and procedures for wise environmental planning and management. The result was the passage, in 1970, of Act 246, which established the Governor's Office of Environmental Quality Control, the Environmental Council and the Environmental Center of the University of Hawaii. Again Doak's leadership abilities were tapped, and he was appointed Director of the UH Environmental Center. Under Doak's direction, the Environmental Center achieved broad statewide recognition for its unbiased, impartial, perceptive and reasoned responses to environmental issues, and his personal research on tsunamis continued as a major focus of the Center's research efforts.

Doak's service to the University included more than two decades of nearly continuous service on the Faculty Senate. He was a faculty senator from 1964 through 1985 with only brief absences when he was away on sabbaticals. He also served on the Chancellor's ad hoc committee on Academic Planning where he accepted the most demanding task of secretary of the ad hoc Committee On Administrative Structure.

Following retirement from the University in 1985, Doak's keen awareness of State needs and institutions led him to initiate efforts with State Civil Defense to establish a unique advisory organization for matters relating to seismic hazards in the State. The Hawaii State Earthquake Advisory Board (HSEAB), founded in 1990, was a direct result of his efforts, and Doak served several years as a charter member. Largely as a result of Doak's advice, the organization of this group as an advisory adjunct to the Hawaii State Civil Defense agency comprised an assembly of care-

fully chosen, eminent seismologists, geologists, structural engineers, public sector agency representatives and environmental management specialists who continue to meet quarterly. The efficacy of the HSEAB has been recognized nationally, and its approach to hazard mitigation was widely replicated throughout other states. Through their efforts, seismic hazards, mitigation strategies, and research programs in a variety of areas have made such substantive contributions to earthquake hazard management that the HSEAB was a recipient of the Western States Seismic Policy Council's 2001 Award in Excellence in the category of Mitigation Efforts.

Doak was frequently called on as an expert witness by the judiciary on numerous cases involving water rights and water resource developments on a statewide basis. He was highly sought after for these cases because of his reputation for consistently reflecting an exemplary image of competency and fairness.

Doak held many honorary positions. He was active with the Hawaiian Academy of Sciences for over 50 years and was the only person to serve twice as president of that organization in 1958-59 and again in 1984-85 as well as secretary and on the Board of Directors. He was an honorary life member of the Academy and received the Academy's first Lifetime Achievement Award in 2002. He served as president of Sigma Xi, Chairman of the Board of Hanalei School, President of the Oratorical Society of Honolulu, President of the Conservation Council of Hawaii, and President of the Memorial Society and Treasurer of Honolulu Friends Meeting. In 1960-62, he was a Councilor of the American Association for the Advancement of Science. He held the position of Secretary of the Tsunami Committee of the International Union of Geology and Geophysics from 1960-1966, and was Hawaii's chair for field trips in 1961 for the Tenth Pacific Science Congress. From 1964-72, he was an Alaska Earthquake Committee member and Chair of the Oceanography Panel for the National Academy of Sciences. In 1971, he was the Hawaii Conference Chairman of the International Association of Water Pollution Control. Because of his personal competence, reputation, and demonstrated leadership, he was appointed to the State of Hawaii Governor's State Water Commission from 1977-1979. He also was a member of the Hawaii Water Commission from 1980-81. Doak was a charter member of the Conservation Council and was an active member of the board and select committees since its establishment in Hawaii. In April 1985, he received the prestigious award for Conservation Achievement given by the National Wildlife Federation and the Conservation Council of Hawaii. Doak was an Emeritus Geophysicist and Senior Fellow of the Joint Institute for Marine and Atmospheric research and of the graduate faculty of Geology and Geophysics and a Research Affiliate of the Environmental Center from 1985 to the present. Doak's many accomplishments were formally recognized in 1985 by his receipt of the Governor's Award for distinguished service to the University and State of Hawaii. This award was given:

...to recognize an individual who has excelled and provided leadership of an extraordinary nature, in a multiplicity of fields and endeavors. Throughout his long and productive work efforts, his exceptional perception and personal expertise have provided guidance over a broad spectrum of academic, governmental and societal issues that has resulted in significant long term benefits both to the State of Hawaii and the world.

A complete set of Doak's many publications are available at the University of

Hawaii, Hamilton Library and at the Environmental Center.

I had the good fortune to work closely with Doak at both the Water Resources Research Center and the Environmental Center for nearly 15 years and to benefit from his expertise and friendship for nearly 40. He was a tremendous positive influence on my life and the lives of all those with whom he came in contact. His reasoned, objective and non-judgmental analyses of complex resource management issues were extraordinary and legendary. Deciphering his multifarious pages of hand written notes on the yellow tablets was a challenge to all, but met admirably by Winnie Miura and Charlotte Kato. We all learned from his example and our lives were better for his teachings.

By Jacquelin Miller - with lots of help from Charlotte Kato, John Harrison, Peter Rappa, George Curtis and other friends and colleagues.