

JOHN D. BREDEHOEFT, Ph.D., N.A.E.

Contaminate Transport
Numerical Models of Flow and Transport
Water Resource Development
Nuclear Waste Disposal
Role of Fluids in Geologic Processes

John Bredehoeft started work in ground water in the 1950's. He worked as a research geologist and as the Manager of the U.S. Geological Survey Western Division for 32 years. He is the author of more than 100 research papers in the refereed scientific literature. In the 1970s, Dr. Bredehoeft managed the entire water research program of the USGS. In the early 1980s, he was the West Coast Regional Manager for the USGS, responsible for all water activities of the agency in the eight western states of Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, and Washington. In 1995 Bredehoeft left the USGS to start The *HYDRODYNAMICS* Group.

EDUCATION

1955 BSE GEOLOGICAL ENGINEERING, Princeton University (Honors)
1957 MS GEOLOGY, University of Illinois
1962 PhD GEOLOGY, University of Illinois (minor in Civil Engineering); Thesis:
The Hydrogeology of the Lower Humboldt River Basin, Nevada.

EXPERIENCE

1995- Consultant/Principal--The HYDRODYNAMICS Group, LLC, Sausalito, CA
1984-94 Research Geologist--U.S. Geological Survey (USGS), Menlo Park, CA (Supergrade)
1989-91 Consulting Professor--Applied Earth Sciences Department, Stanford University
1980-84 Regional Hydrogeologist--USGS, 8 State Western Region Manager, Menlo Park, CA
1970-79 Deputy Chief Hydrologist for Research--USGS, Reston, VA
1968-70 Resources for the Future--USGS (employee cooperative studies), Washington DC
1967-68 Visiting Associate Professor--Geology Department, University of Illinois, IL
1962-67 Research Geologist--USGS, Water Resources Division, Arlington, Virginia
1961-62 Ground-Water Hydrologist--Nevada Department of Conservation and Natural Resources

and the Desert Research Institute, University of Nevada, Reno, NV
1957-59 Exploration Geologist--Humble Oil, Vernal, UT

SCIENTIFIC COMMITTEES

1995- Council for International Exchange of Scholars (Fulbright Scholars)--Advisory Board
1995- Lawrence Livermore National Laboratory--Advisory Committee for Environmental Programs
1992- Board of Directors--Association of Ground Water Scientists and Engineers, National Ground Water Association
1992- Editor--*GROUND WATER*, Journal of the Association of the Ground Water Scientists and Engineers, National Ground Water Association.
1984-94 National Research Council--Member, Committee on the Waste Isolation Pilot Plant (WIPP)
1990-93 National Science Foundation--Member, Advisory Committee for Earth Science
1990-92 National Research Council--Member, HYTEC Panel for the Yucca Mountain Nuclear Repository (Chair, Modeling Subcommittee)
1970-95 Numerous UNESCO, CRC, DOE, NSF, AGU, GSA, and USGS Advisory Committees

SCIENTIFIC SOCIETIES

American Association of Petroleum Geologists
Geological Society of America
American Geophysical Union
Association of Ground Water Scientists and Engineers, (National Ground Water Association)
Russian Academy of Natural Sciences
U.S. National Academy of Engineering

MEDALS and AWARDS

1969 HORTON AWARD--American Geophysical Union (G.F. Pinder and J.D. Bredehoeft)
1974 INTERDISCIPLINARY AWARD--U.S. Committee for Rock Mechanics
1975 O.E. MEINZER AWARD--Geological Society of America (J.D. Bredehoeft and G.F. Pinder)
1978 MERITORIOUS SERVICE AWARD--Department of the Interior
1981 DISTINGUISHED SERVICE AWARD--Department of the Interior
1984 BOGGESS AWARD--American Water Resources Association (E.G. Reichard and J.D. Bredehoeft)
1991 FOREIGN ASSOCIATE--Russian Academy of Natural Sciences, Moscow, Russia
1991 M. KING HUBBERT AWARD--National Ground Water Association
1994 MEMBER--U.S. National Academy of Engineering
1997 PEMROSE MEDAL--Geological Society of America (Nobel Prize for Geologist)
2002 Life Time Achievement Award-Geological Society of America

Flow & Transport Models

Dr. Bredehoeft developed the first widely used numerical models for flow and transport, with George Pinder. He taught training courses and consulted on numerous model applications within the USGS in the States of California, Colorado, Georgia, Idaho, New Jersey, Virginia, Washington. Dr. Bredehoeft received the Horton Award of the American Geophysical Union (AGU) for the work on flow models (Pinder and Bredehoeft, 1968), and the Meinzer Award of the Geological Society of America (GSA) (Bredehoeft and Pinder, 1973) for contaminant transport model (MOC) that is widely used. He currently markets his own ground-water flow and transport computer code (JDB-2/3D, MOC), and teaches numerous courses on the use of computer models for ground-water studies.

Economic Studies

Dr. Bredehoeft participated in investigations of the economics of ground water development at Resources of the Future with R.A. Young (Bredehoeft & Young, 1970, 1983; Young & Bredehoeft, 1972). They studied both ground water and conjunctive ground water and surface water development. He was the first to use distributed parameter, numerical ground-water models for the economic analysis of optimal ground-water development.

Nuclear Waste Studies

Dr. Bredehoeft co-authored a USGS Circular that was critical of DOE's handling of geologic disposal. He proposed an alternative for disposal in crystalline rocks below a blanket of sediment. He was a 10-year member of the NAS/NRC advisory committee on the WIPP facility (1984-1994). He published a paper suggesting that bedded salt at the Waste Isolation Pilot Plant (WIPP) in New Mexico is not dry as previously supposed (Bredehoeft, 1988). Dr. Bredehoeft was a member of the NAS/NRC Committee that reviewed ground water conditions at Yucca Mountain, Nevada (1990-92). He was a consultant to Inyo and Esmeralda Counties on ground water issues at the Yucca Mountain repository.

Hydrodynamics of Deep Sedimentary Basins

Dr. Bredehoeft conducted a series of investigations of the hydrodynamics of fluid movements in the deep subsurface. These investigations included 1) a model of the Dakota Sandstone and associated aquifers in South Dakota; 2) a study of the Denver Basin; 3) an analytical model of flow in the Caspian basin; 4) a study of the Big Horn basin, Wyoming; and 5) an analysis of the Uinta basin, Utah.

Contamination Remediation

Dr. Bredehoeft conducted remediation studies of the F and H Area Disposal Ponds at the Savannah River Plant site. The F and H ponds received nuclear wastes for almost 40 years. Wastes were deliberately allowed to infiltrate the underlying aquifer. DOE is obligated to remediate the aquifer in the vicinity of the ponds. Dr. Bredehoeft served on a newly formed Citizens Advisory Board for the Savannah River Site, and was responsible for analyzing ground-water remediation options.