

## Brief CV of Dr. Delwyn G. Fredlund, O.C., Ph.D., F.E.I.C., P. Eng., D.GE



Delwyn G. Fredlund has spent over 50 years conducting research into the behavior of unsaturated and expansive soils. Most of his career was spent at the University of Saskatchewan, Saskatoon, where he organized the **Unsaturated Soils Group** for research into all aspects of unsaturated soils behavior. His research studies have involved all areas of unsaturated soil behavior; ranging from the flow of water and air through unsaturated soils to the shear strength and volume change of unsaturated soils.

Del Fredlund is a native of Saskatchewan, Canada. In 1962 he obtained his B.Sc. degree from the University of Saskatchewan, Saskatoon. Immediately following his B.Sc. degree he went to work for the Division of Building Research of the National Research Council in Saskatoon, Sask. He then went on to obtain his M.Sc. degree in 1964 from the University of Alberta, Edmonton. Following his M.Sc. degree, he worked as a geotechnical consulting engineer for R.M. Hardy and Associates, Edmonton, Alberta.

In 1966 Del Fredlund accepted a position in the Department of Civil Engineering at the University of Saskatchewan, Saskatoon, Canada. In 1973 he obtained his Ph.D. after returning to the University of Alberta for his studies. Returning to the University of Saskatchewan, he developed a research program focused around the behaviour of unsaturated soils and the numerical modeling of unsaturated soils problems. During his career he supervised over 65 M.Sc. and Ph.D. graduate students. He became the Head of the Department of Civil Engineering at the University of Saskatchewan from 1989 to 1994. He has also been appointed as the Endowed Tan Swan Ben Professor at Nanyang Technological University, Singapore. He is also an Adjunct Professor at the Hong Kong University of Science and Technology, Hong Kong as well as Adjunct Professor at the

University of Alberta, Edmonton, Canada. In addition, he is an Honorary Professor at the University of British Columbia, Vancouver, B.C. and a Research Professor at Arizona State University, Tempe, Arizona. He was appointed as an Honorary Professor at NHRI, Nanjing, China in 2005. He is also the K.P. Chao Chair at Zhejiang University, Hangzhou, China.

Dr. Fredlund is presently a Senior Geotechnical Engineering Specialist and Principal with Golder Associates, Saskatoon, SK., Canada. He writes for the Golder Unsaturated Soils Group, GUSG, website that has over 300 members worldwide. Golder has about 150 offices worldwide in 40 countries and the GUSG website provides a vehicle for sharing research and experience in solving unsaturated soils problems. The Saskatoon Golder office also has a well-equipped unsaturated soil testing facility with the latest equipment for measuring soil suction and unsaturated soil properties. The GUSG soil testing laboratory also undertakes research studies on unsaturated soils. Laboratory testing protocols have been developed for most unsaturated soil tests. Numerous studies have been undertaken on mining-related problems related to natural resource development. Examples are the design of soil covers, simulation of heap leach operations, expansive soils problems and the numerical modeling of climatic driven concerns.

Throughout his career, Dr. Fredlund's research studies have focused on unsaturated soil mechanics and the behaviour of unsaturated soils. The emphasis has been on studying the fundamental physical behavior of unsaturated soils as well as the numerical modeling of saturated-unsaturated soil systems. Significant contributions has been made in all the classic areas of unsaturated soil systems; including the stability of slopes, flow through saturated-unsaturated soil systems, and the prediction of heave in expansive soils.

He is the author, along with Dr. Harianto Rahardjo, of the book "**Soil Mechanics for Unsaturated Soils**", published by John Wiley & Sons in 1993. This book still remains the key reference on unsaturated soil mechanics. The National Research Council of Canada published a book called, "**The Emergence of Unsaturated Soil Mechanics**", which presented 63 key research papers by Del Fredlund on all aspects of unsaturated soil mechanics. In 2014 Del Fredlund, Harianto Rahardjo and Murray Fredlund published a book titled, "**Unsaturated Soil Mechanics in Engineering Practice**", which was once again published by John Wiley & Sons. This most recent book is 926 pages and assists engineers in implementing unsaturated soil mechanics in routine geotechnical engineering practice. Numerous example problems are solved to illustrate a variety of processes common to unsaturated soil mechanics applications.

Dr. Fredlund published approximately 500 journal and conference research papers and has delivered many keynote lectures at conferences. Most of his research papers have been related to various aspects of unsaturated soil mechanics ranging from the development of theories for unsaturated soil mechanics to the application of unsaturated soil mechanics in engineering practice. He is the founder of **Unsaturated Soil Technologies Ltd**, Saskatoon, Canada, and is a designer of unsaturated soil testing equipment for GCTS in Tempe, Arizona. He is also a consultant to SoilVision Systems Ltd., a software company dedicated to the modeling of saturated-unsaturated soil

systems. He presently heads the “Golder Unsaturated Soils Group”, assisting with the solution of unsaturated soil mechanics problems worldwide.

Dr. Fredlund has been the recipient of numerous awards such as the:

Endowed Tan Swan Beng Professorship 2014 Award from the Nanyang Technological University, Singapore, for research related to slope stability concerns related to housing development in Singapore.  
Meyerhof Award from the Canadian Geotechnical Society for lifelong foundation engineering research, September 2012.  
Queen’s Diamond Jubilee medal for significant engineering contributions and philanthropic achievements in Canada, September 2012.  
Prime of Life Achievement Award, University of Saskatchewan, September 2011  
C.W. Lovell Lecture, 2009, Purdue University, Lafayette, Indiana.  
Quigley Award, 2009, for the best paper published in the Canadian Geotechnical Journal in 2008.  
Julian Smith Award for lifelong contribution to the engineering profession in Canada, 2009.  
Zen Guo Xi Lecturer, 2007, Zhejiang University, Hangzhou, China.  
T.H. Wu Lecturer, 2007, Ohio State University.  
Order of Canada, 2004, from the Federal Government of Canada for his significant contribution to Canada and other countries around the world  
Commemorative Medal for the Centennial of Saskatchewan, Canada, 2005  
Terzaghi Lecture Award, 2005, given by the American Society for Civil Engineering  
Nominated to the Canadian Academy of Engineering, 2004  
CCPE, 2005, Canadian Council of Professional Engineers Award for Meritorious Service to the Engineering Profession  
Legget Award, from the Canadian Geotechnical Society, 1999.  
Award from the Brazilian Geotechnical Society for “His great contribution to the technical, scientific and educational development of unsaturated soil mechanics”  
Award from the Ministry of Science and Technology, MOSTE, Vietnam, for his contribution to scientific development in Vietnam, 1997.  
Kassiff Award from Israel for geotechnical engineering research.  
Spencer Buchanan Award from Texas A & M, College Station, Texas.  
Stermac Award from Canadian Geotechnical Award  
Canadian Colloquium Award from Canadian Geotechnical Society, 1977

Dr. Fredlund served as the Chairman of TC6 committee on Unsaturated Soils, of the ISSMGE for 12 years. He took early retirement from the University of Saskatchewan in 2000 in order to be able to fully devote his time to research into unsaturated soil behavior and the solution of practical geotechnical engineering problems in various parts of the world. His work on unsaturated soil mechanics has taken him to many countries of the world as a lecturer, a teacher and a consultant. He has undertaken international programs of collaboration with countries such as China, Africa, Malaysia and Vietnam.

During the past 18 years he has travelled to Vietnam each year as part of a technology exchange program between Canada and Vietnam. He has administered (along with Dr. Don Acton, College of Agriculture, University of Saskatchewan) a CIDA program on Land and Water Management in the Red River delta near Hanoi, Vietnam. During this time, he has become well-acquainted with the engineers and officials in the Government of Vietnam. He successfully completed the CIDA project in 1999. The project received the Nova Scotia Bank award for the best Research oriented CIDA project in 1997. He has conducted numerous Lectures and Short Courses in Vietnam over the past 12 years.

Dr. Fredlund is a member in numerous professional societies such as: the Canadian Geotechnical Society, the Engineering Institute of Canada, the American Society of Civil Engineering, and the International Society for Soil Mechanics and Geotechnical Engineering. He is also a member of the Canadian Academy of Engineering.

Presently, the primary focus of Dr. Fredlund's work involves bringing unsaturated soil mechanics into routine geotechnical engineering practice. Unsaturated soil mechanics has developed rapidly over the past few years and is quickly being implemented into routine geotechnical engineering practice. The most common example of the application of unsaturated soil mechanics involves the interaction between the soil and the climate imposed above the ground surface. The rainfall and evaporation from the ground surface produced a moisture flux boundary condition that often results in adverse performance of engineered structures such as highways and buildings.

Dr. Del Fredlund has devoted his professional efforts towards meeting the needs associated with the furtherance and implementation of unsaturated soil mechanics into geotechnical engineering practice; both in Canada and around the world.

Del's pastime hobby is music; having played the saxophone since a young boy. He has also found time to start two Canadian government registered charities in Canada that focus their efforts on meeting the needs of the poor in developing countries around the world. This is done through use of micro loans and development programs.