

Ghislain de Marsily – Obituary

Born, 18th October, 1939 Mas d’Auge, Provence. Died, 21st April, 2024 Paris.

It is with tremendous sadness that we share the news of the passing of eminent hydrogeologist Professor Ghislain de Marsily. A legendary figure at Paris VI, Ghislain was famed for his seminal contributions to the field of stochastic hydrogeology and for his work as a prominent and persuasive advocate for holistic, equitable and science-driven water management. In addition to his substantial scientific legacy, he is survived by his wife of over 60 years, Gunilla, and their three children, Anne, Antoine and Amélie, and his grandchildren Marco, Ninn, Ainhoa, Axel and Matteo.

Born in Provence to Belgian émigré parents in 1939, Ghislain de Marsily contracted polio as a child. This experience shaped him into the strong, compassionate and tenacious man he became. At 20 years old he left the south to study in Paris at the Ecole des Mines, graduating in 1963 as a civil mining engineer and marrying his love, Gunilla Svensson, in Sweden shortly thereafter. A period with a public works company followed, as did an additional qualification as a geological engineer (1967). But his curiosity to understand more about the world remained unsatisfied and he returned to academia to pursue what would be a life-long relationship with research.

His first internationally significant paper (Emsellem, Y., and Marsily, G. de, ‘An automatic solution for the inverse problem’) was published in *Water Resources Research* in 1971. Professional recognition and leadership roles followed quickly. In 1973 he was appointed to the role of Director of the Centre d’Informatique Géologique at the Ecole des Mines, and during his tenure in this position completed his PhD at the University of Pierre and Marie Curie (also known as Paris VI) in 1978.

In 1985 Ghislain was appointed to the position of Professor of Geology at Paris VI. This heralded a new era of appointments to a variety of governance and management positions that combined his love of research with his skills as a broad thinker and communicator. These included directorship of the Applied Geology Laboratory (1987-2004), foundation director of UMR CNRS SISYPHE (1989-2000) and director of the Geosciences and Natural Resources Doctoral School (2000-2004).

Ghislain became established as an internationally renowned scholar. His teaching and research were characterised by the application of geology, engineering, mathematics and curiosity to understanding the movement of water underground. His research spanned hydrogeology, watershed management, sedimentary basin modelling, fractured rock hydrology, transport of heat and contaminants in porous/fractured media, and waste disposal. His work on inverse methods and stochastic hydrogeology were pioneering and have gone on to shape the discipline of environmental modelling well beyond a tool restricted to hydrogeology. His work continues to reverberate today.

His 1980 paper with Georges Matheron ('Is transport in porous media always diffusive? a counterexample') remains one of the most highly cited papers in hydrogeology, and the field of geostatistics owes an unpayable debt to Ghislain's conceptual innovation and mathematical precision.

Variouly described as an energetic, inspirational and provocative teacher, Ghislain's lectures and conference presentations grew in popularity as his career progressed. Returning to teach as an Emeritus Professor in his later years Ghislain was a much-admired figure whose lectures were the stuff of legend. His commitment to communicating a sound understanding of groundwater to students across a spectrum of engineering, science and mathematics backgrounds is seen nowhere more clearly than in his textbook *Quantitative Hydrogeology*. Many of his students found employment as academics or engineers and it is through them that his passion for communication, intellectual pursuits and academic rigour lives on.

Ghislain stands as a pillar in the academic community. This is reflected in the recognition of his numerous contributions. He was elected to the French Academy of Sciences in 1997 and appointed to its Sciences of the Universe section in 2003, elected an international member of the US National Academy of Engineering (1999), and Fellow of the American Geophysical Union (1989). His honours include the Prix Roubault de l'Union Française des Géologues (2000) and Prix de l'IFP de l'Académie des Sciences (2001), the O.E. Meinzer Award of the Geological Society of America (2004), the Robert E. Horton Award of the American Geophysical Union (1995), the Presidents' Award from the International Association of Hydrogeologists (IAH) (2010), and the Castany's Award from the IAH French Chapter. He is the recipient of honorary doctorates from universities in Canada, Switzerland and Australia, a foundation fellow of the French Academy of Technology and worked often with the United Nations.

Ghislain's impact was significant and sustained. He travelled throughout the world lecturing and spending time with colleagues at numerous universities. He spoke widely – and published broadly – on the urgent need to understand water resources and control their exploitation to ensure an equitable and liveable planet. Climate change, population growth and increasing resource contamination have only heightened the significance of de Marsily's message. Unable to shed his engineering training and working experience Ghislain resisted the temptation to become completely theoretical in his outlook, always seeking the application of his methods. This grounded perspective led him to work on water quality problems with industry partners and assisting governments, community, and advocacy groups on issues such as the environmental impact of the proposed airport at Notre Dame des Landes to ensure they had access to the best science upon which to base their judgements. Ghislain believed science should be available, up to date and relevant, and he led by example. He was particularly proud of his popular book *L'eau* (Water) that explained basic concepts of

hydrology and water for society. In this book he discussed the hydrologic cycle and how this perpetual cycle maintains a precious ecosystem. He showed that the development of water to meet our needs can significantly modify this natural pattern.

His scientific contributions informed public debates on nuclear waste disposal and continues to help understand the movement of contaminants and other solutes in a variety of groundwater environments. de Marsily's ideas – such as hydrogeological national parks, productive use of predictive models and the importance of sharing scientific data and access to resources in an equitable way – are concepts that continue to resonate today. For this and other services to France, academia, and science Ghislain received numerous national distinctions, including Chevalier de la Légion d'honneur, Chevalier de l'Ordre national du Mérite, Chevalier des Palmes académiques and Chevalier du Mérite Agricole. The diversity of the recognition he received serves to demonstrate the breadth of his interests, the extraordinary impact of his work and the depth of his commitment to making the world a better place.

Ghislain's legacy is one of technical mastery combined with intellectual curiosity and absolute integrity. Never one to shy away from topical, controversial, or contentious issues, Ghislain was often called upon by the French Government, the Organisation for Economic Co-operation and Development (OECD), the United Nations and numerous international agencies for assistance and advice. Ghislain served as a member of the International Atomic Energy Agency (IAEA) review team of the Mururoa-Fangataufa French nuclear tests in the mid- to late-1990s. For the French Government he provided advice regarding the storage of industrial waste in Montchanin and spent over a decade serving on the legally mandated governance commission overseeing the disposal of radioactive waste. Ghislain worked with international energy agencies and the OECD to explore seabed storage of radioactive material and was appointed to the Yucca Mountain Project by the United States Department of Energy. Always a man of principle, Ghislain resigned from the Yucca Mountain Project on March 19th, 2003, the day when the US army invaded Iraq.

Ghislain was known for his humanity. A passionate advocate – and committed practitioner – of equity in action, he gave, shared and promoted opportunities, connection and information. Many of us have stories of Ghislain's extraordinary character, curiosity, and lust for life: the midnight car rides, the American motorcycle, biking throughout Paris in rain or shine, snorkelling in Mururoa, and his personal array of books.

Ghislain will be remembered with love and admiration. He believed in the importance of diversity, and he lived by his convictions. He was present for his students, attentive to his colleagues and impossibly generous to his friends. He was a true gentleman scientist with a vast global network of collaborators, colleagues and friends, a

testament to his positive spirit and willingness not only to teach, but to learn from those who shared his enthusiasm and diverse interests.

A ceremony to commemorate the life of Professor Ghislain de Marsily will be held in Paris at the Crematorium in Père Lachaise, on the 25th of April 2024 from 4 – 5pm.

Further information

Ghislain de Marsily was one of a handful of eminent hydrogeologists interviewed for the International Association of Hydrogeologists (IAH) Hydrogeologist Timecapsule Project. Recorded in July 2019, the interview is available to watch here:

<https://timecapsule.iah.org/person/ghislain-de-marsily/>

A special edition of the French Academy of Sciences' *Comptes Rendus: Geosciences* 'In honour of Ghislain de Marsily' was published in 2023. It discusses the impact of de Marsily's work and explores the future his research has enabled. It is available here:

https://comptes-rendus.academie-sciences.fr/geoscience/item/CRGEOS_2023_355_S1/

Ghislain de Marsily's CV for the French Academy of Sciences is available here:

https://www.academie-sciences.fr/pdf/membre/MarsilyG_bio300311.pdf

Ghislain de Marsily's Biography written by Craig T. Simmons in 2021 is available here: Simmons, C.T. (2021). Marsily, Ghislain de. In: Daya Sagar, B., Cheng, Q., McKinley, J., Agterberg, F. (eds) Encyclopedia of Mathematical Geosciences. Encyclopedia of Earth Sciences Series. Springer, Cham. https://doi.org/10.1007/978-3-030-26050-7_371-1

https://link.springer.com/referenceworkentry/10.1007/978-3-030-26050-7_371-1



Professor Ghislain de Marsily. (Photo by Antoine Meyssonier 2014)