

## Curriculum Vitae

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### Education:

B. S., Geology, University of Tokyo	1989
M. Sc., Structural Geology, University of Tokyo	1991
Ph. D., Applied Earth Sciences, University of Tokyo	1996

### Positions Held:

1991-1995	Research Associate, Department of Mineral Development Engineering, University of Tokyo
1995-1998	Research Associate, Department of Geosystem Engineering, University of Tokyo
1997-1998	Visiting Researcher, Department of Geology and Geophysics, University of Wisconsin-Madison
1999-2005	Associate Professor, Department of Geosystem Engineering, University of Tokyo
2005-2011	Associate Professor, Department of Environment Systems, University of Tokyo
2011-present	Professor, Department of Environment Systems, University of Tokyo
2011-2013	Head of the Department of Environment Systems, University of Tokyo

### Research Interests:

Poroelasticity and its application to geological engineering problem

Submarine groundwater discharge and its impact on coastal environment

Assessment of long-term stability of geological environment for evaluating the safety of waste disposal program

**Oceanographic Expeditions:**

- 1996                    KAIKO-TOKAI Cruise Leg 1 by R/V l'Atalante  
1996-1997            ODP Leg 171A, Barbados Accretionary Prism LWD

**International Activities and Services:**

- 2000-2001    Member, Hydrogeology Program Planning Group, Ocean Drilling Program  
2001-2003    Member, interim Science Steering and Evaluation Panel (Interior), Integrated Ocean Drilling Program  
2003-2004    Member, Science Steering and Evaluation Panel (Interior), Integrated Ocean Drilling Program  
2007-2010    Member, Science Planning Committee, Integrated Ocean Drilling Program  
2009-2010    Member, Thematic Review Panel (Fluid Flow and Sub-seafloor Life), Integrated Ocean Drilling Program  
2011-2012    Member, International Peer Review Panel of the SKB License-application for Spent Nuclear Fuel Repository in Sweden, Organisation for Economic Co-operation and Development (OECD), Nuclear Energy Agency  
2013-present Member, Expert Panel on Hydrogeology in Singapore, Public Utility Board, Singapore Government  
2014-present Associate Editor, Hydrogeology Journal

**Publications in English:**

- Tokunaga, T., 1992, Two stage foldings developed in the Paleogene Shimanto Supergroup, Southwestern Shikoku, Japan. *Jour. Geol. Soc. Japan*, 98, 275-278.  
Tokunaga, T., 1992, Duplexing and intraprisim deformation of the Paleogene Shimanto Supergroup in western Shikoku, Southwest Japan. *Tectonics*, 11, 1168-1179.  
Moore, J. C., Klaus, A., Bangs, N. L., Bekins, B., Bucker, C. J., Bruckmann, W., Erickson, S. N., Hansen, O., Horton, T., Ireland, P., Major, C. O., Moore, G. F., Peacock, S., Saito, S., Screatton, E. J., Shimeld, J. W., Stauffer, P. H., Taymaz, T., Teas, P. A. and Tokunaga, T., 1998, Consolidation patterns during initiation and evolution of a plate-boundary décollement zone: Northern Barbados accretionary prism. *Geology*, 26, 811-814.  
Tokunaga, T., Hosoya, S., Tosaka, H. and Kojima, K., 1998, An estimation of the intrinsic permeability of argillaceous rocks and the effects on long-term fluid migration. In: Duppenbecker, S. J. & Iliffe, J. E. (eds.), *Basin Modelling: Practice and Progress*. *Geol. Soc. Lond., Spec. Publ.*, 141, 83-94.  
Tokunaga, T., 1999, Modeling of earthquake-induced hydrological changes and possible permeability enhancement due to the January 17, 1995 Kobe Earthquake, Japan. *J.*

Hydrol., 223, 221-229.

- Tokunaga, T., Mogi, K., Matsubara, O., Tosaka, H. and Kojima, K., 2000, Buoyancy and interfacial force effects on two-phase displacement patterns and implications for secondary oil migration. AAPG Bull., 84, 65-74.
- Tokunaga, T., 2000, The role of turbidites on compaction and dewatering of underthrust sediments at the toe of the northern Barbados accretionary prism: new evidence from Logging While Drilling, ODP Leg 171A. Earth Planet. Sci. Lett., 178, 385-395.
- Komatsu, G., Miyamoto, H., Ito, K., Tosaka, H. and Tokunaga, T., 2000, The Channeled Scabland: Back to Bertz?: Comment. Geology, 28, 573-574.
- Miyamoto, H., Itoh, K., Kogure, J., Tosaka, H., Tokunaga, T., Fukui, K., and Mogi, K., 2001, Experimental studies on non-Newtonian fluid flows as analogues of lava flows: Toward a numerical model with a cooling crust, Theol. Appl. Mech., 50, 351-356.
- Tokunaga, T., Kameya, H., Mogi, K. and Aoyagi, R., 2002, A new method to determine hydraulic conductivity and storage coefficient through simultaneous measurements of fluid pressure and strains. Bull. Earthq. Res. Inst., Univ. Tokyo, 76, 443-453.
- Tokunaga, T. and Kameya, H., 2003, Determination of storage coefficient of a porous material from flow-pump experiments: Theoretical analysis and experimental evaluation. Int. J. Rock Mech. Min. Sci., 40, 739-745.
- Miyamoto, H. and Tokunaga, T., 2003, Prospects of engineering applications of submarine-groundwater-discharge research in Japan. In: Taniguchi, M. et al., eds., Land and Marine Hydrogeology, 61-75, Elsevier.
- Miyamoto H., Haruyama, J., Kobayashi, T., Suzuki, K., Okada, T., Nishibori, T., Showman, A. P., Lorenz, R., Mogi, K., Crown, D. A., Rodriguez, J. A. P., Rokugawa, S., Tokunaga, T. and Masumoto, K., 2005, Mapping the structure and depth of lava tubes using ground penetrating radar. Geophys. Res. Lett., 32, L21316, doi:10.1029/2005GL024159.
- Tokunaga, T., Kimura, Y. and Shimada, J., 2007, Existence of stagnant fresh groundwater and diffusion-limited chloride migration in sub-sea formation at Yatsushiro bay, Japan. IAHS Publ., 312, 197-200.
- Binh, N. T. T., Tokunaga, T., Son, H. P. and Binh, M. V., 2007, Present-day stress and pore pressure fields in the Cuu Long and Nam Con Son Basins, offshore Vietnam. Marine Petrol. Geol., 24, 607-615.
- Chen, J., Taniguchi, M., Liu, G., Miyaoka, K., Onodera, S., Tokunaga, T. and Fukushima, Y., 2007, Nitrate pollution of groundwater in the Yellow River delta, China. Hydrogeol. J., 15, 1605-1614.
- Tokunaga, T., 2008, Groundwater Potential in the Central District of Tokyo. In: Takizawa, S. (ed.), Groundwater Management in Asian Cities, Springer, 61-78.

- Kuroda, K., Fukushi, T., Takizawa, S., Murakami, M., Takeda, H., Nakada, N., Aichi, M., Hayashi, T. and Tokunaga, T., 2008, Sources of, and factors influencing groundwater contamination in the Tokyo metropolitan area. *IAHS Publ.*, 324, 16-23.
- Hayashi, T., Tokunaga, T., Aichi, M., Shimada, J. and Taniguchi, M., 2009, Effects of human activities and urbanization on groundwater environments: An example from the aquifer system of Tokyo and the surrounding area. *Sci. Total Env.*, 407, 3165-3172.
- Binh, N. T. T., Tokunaga, T., Nakamura, T., Kozumi, K., Nakajima, M., Kubota, M., Kameya, H., and Taniue, M., 2009, Physical Properties of the Shallow Sediments in the Late Pleistocene Formations, the Ursa Basin, Gulf of Mexico, and their Implications for Generation and Preservation of Shallow Overpressures. *Mar. Petrol. Geol.*, 26, 474-486.
- Obanawa, H., Tokunaga, T., Rokugawa, S., Decughi, T. and Nakamura, T., 2010, Land subsidence at the Kujukuri Plain in Chiba Prefecture, Japan: Evaluation and monitoring environmental impacts. *IAHS Publ.*, 339, 293-298.
- Tokunaga, T., Shimada, J., Kimura, Y., Inoue, D., Mogi, K. and Asai, K., 2011, A multiple-isotope ( $\delta^{37}\text{Cl}$ ,  $^{14}\text{C}$ ,  $^3\text{H}$ ) approach to reveal the coastal hydrogeological system and its temporal changes in western Kyushu, Japan. *Hydrogeol. J.*, 19, 249-258.
- Binh, N. T. T., Tokunaga, T., Goult, N. R., Son, H. P. and Binh, M. V., 2011, Stress state in the Cuu Long and Nam Con Son basins, offshore Vietnam. *Mar. Petrol. Geol.*, 28, 973-979.
- Aichi, M. and Tokunaga, T., 2011, Thermodynamically consistent anisotropic constitutive relations for a poroelastic material saturated by two immiscible fluids. *Intern. J. Rock Mech. Min. Sci.*, 48, 580-584.
- Liu, Q., Tokunaga, T. and He, Z., 2011, Realization of nano static strain sensing with fiber Bragg gratings interrogated by narrow linewidth tunable lasers. *Optics Exp.*, 19, 20214-20223.
- Liu, Q., Tokunaga, T. and He, Z., 2011, Ultra-high-resolution large-dynamic-range optical fiber static strain sensor using Pound-Drever-Hall technique. *Optics Lett.*, 36, 4044-4046.
- Liu, Q., Tokunaga, T. and He, Z., 2012, Sub-nano resolution fiber-optic static strain sensor using a sideband interrogation technique. *Optics Letters*, 37, 434-436.
- Aichi, M. and Tokunaga, T., 2012, Material coefficients of multiphase thermoporoelasticity for anisotropic micro-heterogeneous porous media. *Intern. J. Solid. Struct.*, 49, 3388-3396.
- Mahara, Y., Ohta, T., Tokunaga, T., Matsuzaki, H., Nakata, E., Miyamoto, Y., Mizuochi, Y., Tashiro, T., Ono, M., Igarashi, T. and Nagao, K., 2012, Comparison of stable isotopes,

- ratios of  $^{36}\text{Cl}/\text{Cl}$  and  $^{129}\text{I}/^{127}\text{I}$  in brine and deep groundwater from the Pacific coastal region and the Eastern Margin of the Japan Sea, *Appl. Geochem.*, 27, 2389-2402.
- Liu, Q., Tokunaga, T., Mogi, K., Matsui, H., Wang, H. F., Kato, T. and He, Z., 2012, Ultrahigh resolution multiplexed fiber Bragg grating sensor for crustal strain monitoring. *IEEE Photonics J.*, 4, 996-1003.
- Ohta, T., Mahara, Y., Kubota, T., Abe, T., Matsueda, H., Tokunaga, T., Sekimoto, S. and Takamiya, K., 2013, Separation and measurement of  $^{129}\text{I}$  and  $^{127}\text{I}$  in pre-nuclear-era marine algae with ultra-low  $^{129}\text{I}/^{127}\text{I}$  isotopic ratios. *Nucl. Instr. Meth. Phys. Res. B.*, 294, 559-562.
- Mahara, Y., Ohta, T., Tokunaga, T., Matsuzaki, H., Nagao, K., Nakata, E., Miyamoto, Y. and Kubota, T., 2013, Pore-water mobility: Distribution of  $\delta^{37}\text{Cl}$ ,  $^{36}\text{Cl}/\text{Cl}$ ,  $^{129}\text{I}/^{127}\text{I}$  and dissolved  $^4\text{He}$  concentration in the core drilled in the Mobara gas field, Japan. *Nucl. Instr. Meth. Phys. Res. B.*, 294, 597-601.
- He, Z., Liu, Q. and Tokunaga, T., 2013, Ultrahigh resolution fiber-optic quasi-static strain sensors for geophysical research. *Photonic Sensors*, 3, 295-303.
- Kusano, Y., Tokunaga, T., Asai, K., Asai, K., Takahashi, H. A., Morikawa, N. and Yasuhara, M., 2014, Occurrence of old groundwater in a volcanic island on a continental shelf: an example from Nakano-shima Island, Oki-Dozen, Japan. *J. Hydrol.*, 511, 295-309.
- Mahara, Y., Ohta, T., Morikawa, N., Nakano, T., Tokumasu, M., Hukutani, S., Tokunaga, T. and Igarashi, T., 2014, Effects of terrigenous He components on tritium-helium dating: A case study of shallow groundwater in the Saijo Basin. *Appl. Geochem.*, 50, 142-149.
- Goto, H., Tokunaga, T., Aichi, M., Yamamoto, H., Ogawa, T. and Aoki, T., 2014, Quantitative study on experimentally observed poroelastic behavior of Berea sandstone in two-phase fluid system. *J. Geophys. Res.*, 119, 6211-6228.
- Onishi, K., Tokunaga, T., Sugimoto, Y., Yamada, N., Metwaly, M., Mogi, K., Shimoda, I. and Iwasaki, Y., 2014, Identifying damaged areas inside a masonry monument using a combined interpretation of resistivity and ground-penetrating radar data. *Exploration Geophysics*, 45, 177-188.
- Liu, Q., He, Z. and Tokunaga, T., 2015, Sensing the earth crustal deformation with nano-strain resolution fiber-optic sensors. *Optics Express*, 23, A428-A436.
- Chen, H., Ito, Y., Sawamukai, M. and Tokunaga, T., 2015, Flood hazard assessment in the Kujukuri Plain of Chiba Prefecture, Japan, based on GIS and multicriteria decision analysis. *Natural Hazards*, in press.