

Koji Tominaga

Centre for Ecological and Evolutionary Synthesis (CEES)

Department of Biosciences, University of Oslo

P.O. Box 1066 Blindern • 0316 Oslo • Norway

koji.tominaga@ibv.uio.no • Information as of 23 November 2014

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Summary

I am an environmental scientist with a specialisation in massive computing, currently working as a researcher at postdoc level after my PhD completed in 2013.

My application fields to date have been **bioinformatics**, **climate change**, **anthropogenic pollution**, **biogeochemistry**, and **freshwater systems**. My interests in computing and numerical methods include **machine learning**, **parameter estimation**, **quantification of modelling uncertainty** and **data visualisation**. Highlights in computing experiences:

- Simultaneous control of **1000 computing nodes**,
- **3 HPC platforms** (Notur/Norstore, Sharcnet, Amazon EC2),
- Large data and file management (terabytes), and
- Advanced level skills in **Unix**, **Python** and **R**.

Scientific Topics

- Bioinformatics [16, 17, 18, 19, 20]
- Big data and HPC [2, 3, 5, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 29, 34, 35, 38]
- Model uncertainty [1, 2, 3, 8, 11, 13, 24, 22, 26, 23, 31, 34, 35, 37]
- Parameter estimation [2, 3, 6, 8, 9, 11, 13, 22, 23, 27, 31, 34]
- Lakes [5, 6, 7, 8, 9, 10, 12, 15, 24, 21, 22, 26, 23, 27, 28, 29, 30, 31, 32, 33]
- Eutrophication [2, 6, 9, 24, 21, 22, 25, 26, 27, 32, 33]
- Acidification [1, 3, 11, 13, 31, 34, 35, 36, 37]
- Forest health [4, 14, 34, 35, 36, 37, 38]
- Survival analysis [4, 14, 38]
- Climate change impacts [2, 5, 7, 9, 15, 25, 29]

Education

2009–2013	PhD in Biology, University of Oslo
2007–2009	MSc in Environmental Science, Trent University
2003–2007	BSc in Environmental Science, Trent University

Academic Exchanges

Feb–Mar 2009	Technische Universität München
Apr–Jun 2009	Norwegian Institute for Water Research

Work Experiences

2013–current	Researcher, University of Oslo
2010–2013	Part-time Researcher, Norwegian Institute for Water Research
2006–2009	Research Assistant, Trent University
2007–2008	Teaching Assistant, Trent University <ul style="list-style-type: none">• 4th year climate change course• 2nd year energy science course
2008	Seminar Instructor, Trent University <ul style="list-style-type: none">• R for natural scientists at graduate level
2006–2007	Grader, Trent University <ul style="list-style-type: none">• 2nd year statistics course
2006–2007	Technical Assistant, Kawartha World Issues Centre

Peer-review Contributions

- 2 times for Environmental Science and Technology
- 2 times for Science of the Total Environment
- 1 time for PLOS ONE

Invited Talk

- [1] **Tominaga K**, Aherne J, Watmough SA (2008). Objective assessment of five process-oriented dynamic acidification models at Hubbard Brook. Hubbard Brook Committee of Science Meeting. Invited talk. Presenter.

Theses

- [2] **Tominaga K** (2013) Lake modelling: an interdisciplinary context. PhD thesis, University of Oslo, Oslo, Norway.
- [3] **Tominaga K** (2009) Uncertainty evaluation of four dynamic acidification models: MAGIC, PnET-BGC, SAFE and VSD. MSc thesis, Trent University, Peterborough, Ontario, Canada.
- [4] **Tominaga K** (2007) Monitoring of hardwood forest health in south-central Ontario, Canada: survival analysis and remote sensing analysis. BSc honours thesis, Trent University, Peterborough, Ontario, Canada.

Manuscripts in Preparation

- [5] **Tominaga K**, Finstad AG, Kaste Ø, Andersen T Melting of northern lakes : In revision at PLOS ONE.
- [6] Romarheim AT, **Tominaga K**, Riise G, Andersen T (2014) Natural stochasticity vs. management effort: use of year-to-year variance for disentangling significance of two mutually confounding factors affecting water quality of a norwegian cold dimictic lake. Hydrol Earth Syst Sci Discuss, under peer-review for Hydrol Earth Syst Sci 11: 12489–12518.
- [7] Couture RM, de Wit HA, **Tominaga K**, Kiuru P, Markelov I Reconstructing past oxygen dynamics in boreal lakes in response to long-term changes in climate, ice phenology and doc inputs : In preparation for submission to J. Geophys. Res.: Biogeosciences.
- [8] **Tominaga K**, Engebretsen AM, Starrfelt J, Kaste Ø, Vogt RD, Andersen T Calibration uncertainty in sequential model application : In preparation for submission to PLOS ONE.

Peer-reviewed Journal Articles

- [9] Couture RM, **Tominaga K**, Starrfelt J, Moe SJ, Kaste Ø, Wright RF (2014) Modelling phosphorus loading and algal blooms in a nordic agricultural catchment-lake system under changing land-use and climate. *Environ Sci: Processes Impacts* 16: 1588–1599.
- [10] Trolle D, Hamilton DP, Hipsey MR, Bolding K, Bruggeman J, Mooij WM, Janse JH, Nielsen A, Jeppesen E, Elliott JA, Makler-Pick V, Petzoldt T, Rinke K, Flindt MR, Arhonditsis GB, Gal G, Bjerring R, **Tominaga K**, Hoen J, Downing AS, Marques DM, Fragoso CR, Sondergaard M, Hanson PC (2012) A community-based framework for aquatic ecosystem models. *Hydrobiologia* 683: 25–34.
- [11] **Tominaga K**, Aherne J, Watmough SA, Alveteg M, Cosby BJ, Driscoll CT, Posch M, Pourmokhtarian A (2010) Predicting acidification recovery at the Hubbard Brook Experimental Forest, New Hampshire: evaluation of four models. *Environ Sci Technol* 44: 9003–9009.
- [12] Mooij WM, Trolle D, Jeppesen E, Arhonditsis G, Belolipetsky PV, Chitamwebwa DBR, Degermendzhy AG, DeAngelis DL, Domis LNDS, Downing AS, Elliott JA, Fragoso CR, Gaedke U, Genova SN, Gulati RD, Hakanson L, Hamilton DP, Hipsey MR, 't Hoen J, Huelsmann S, Los FH, Makler-Pick V, Petzoldt T, Prokopenko IG, Rinke K, Schep SA, **Tominaga K**, Van Dam AA, Van Nes EH, Wells SA, Janse JH (2010) Challenges and opportunities for integrating lake ecosystem modelling approaches. *Aquat Ecol* 44: 633–667.
- [13] **Tominaga K**, Aherne J, Watmough S, Alveteg M, Cosby B, Driscoll C, Posch M (2009) Voyage without constellation: evaluating the performance of three uncalibrated process-oriented models. *Hydrol Res* 40: 261–272.
- [14] **Tominaga K**, Watmough SA, Aherne J (2008) Predicting tree survival in ontario sugar maple (*Acer saccharum*) forests based on crown condition. *Can J Forest Res* 38: 1730–1741.

Conference and Seminar Presentations

- [15] **Tominaga K**, Andersen T, Blumentrath S, Englund G, Finstad AG, Hessen DO, Laken BA, Larsen S, Stordal F, Yang H (2015) Physical status of lakes in northern europe for the next 100 years. Granada, Spain. The 2015 ASLO Aquatic Sciences Meeting: Global and Regional Perspective – North Meets South. Oral presentation. Presenting author.
- [16] Wojewodzic MW, Becker D, **Tominaga K**, Zhou X, Zhao J, Shala N, Colbourne JK, Hessen DO (2014) Seeking for transgenerational effects (maternal effects vs epigenetics) of diet quality in clones - ecophysiological and RNA-seq approaches. Lednice, Czech Republic. 10th Symposium on Cladocera. Oral presentation. Not presenting author.
- [17] Wojewodzic MW, Becker D, **Tominaga K**, Zhou X, Zhao J, Shala N, Colbourne JK, Hessen DO (2014) Seeking for transgenerational effects (maternal effects vs epigenetics) of diet quality in clones - ecophysiological and RNA-seq approaches. Camerino, Italy. First European Summer School on Nutrigenomics. Oral presentation. Not presenting author.
- [18] Wojewodzic MW, Becker D, **Tominaga K**, Zhou X, Zhao J, Shala N, Colbourne JK, Hessen DO (2014) Seeking for transgenerational effects of diet quality in clones – ecophysiological and RNA-seq approaches. Oslo, Norway. SocBiN Bioinformatics. Oral presentation. Not presenting author.
- [19] Wojewodzic MW, Becker D, **Tominaga K**, Zhou X, Zhao J, Shala N, Colbourne JK, Hessen DO (2014) Partitioning of transgenerational effects (maternal versus epigenetic) in a clonal model organism for biomedical research. Oslo, Norway. Oslo Epigenetics Symposium. Oral presentation. Not presenting author.

- [20] Wojewodzic MW, Becker D, **Tominaga K**, Zhou X, Zhao J, Shala N, Colbourne JK, Hessen DO (2014) Transgenerational effects of diet quality in *Daphnia* assessed by ecophysiological and transcriptomic analysis. Birmingham, UK. EMBO Conference: The mighty *Daphnia*: Past, Present, and Future. Poster presentation. Not presenting author.
- [21] Couture RM, Shafei B, Markelov I, **Tominaga K**, Starrfelt J, Kaste Ø (2013) Linking the benthic cycling of p to its surface water dynamics in lakes. Uppsala, Sweden. 7th International Phosphorus Workshop (IPW7). Poster presentation. Not presenting author.
- [22] Engebretsen AM, **Tominaga K**, Barton DN, Andersen T, Starrfelt J, Kaste Ø, Vogt RD (2013) Modelling of nutrient transport in the morsa catchment: integrating model uncertainty using bayesian networks. In: Miliø2015-konferensen IV. Oslo, Norway. Miliø2015-konferensen IV. Oral presentation. Co-presenter.
- [23] **Tominaga K** (2013) How to make friends with environmental models: three points of view. Oslo, Norway. Final EUTROPIA Conference. Oral presentation. Presenting author.
- [24] Barton DN, Moe SJ, Engebretsen AM, Romstad E, **Tominaga K** (2013) Bayesian networks for assessment of WFD compliance based on lake phytoplankton. Oslo, Norway. Final EUTROPIA Conference. Oral presentation. Not presenting author.
- [25] Kaste Ø, Couture RM, Starrfelt J, **Tominaga K** (2013) The REFRESH project: Modelling possible futures in the hobøl river with the INCA-P model. Oslo, Norway. Final EUTROPIA Conference. Oral presentation. Not presenting author.
- [26] Moe SJ, Barton DN, **Tominaga K** (2013) Bayesian networks for assessment of WFD compliance based on lake phytoplankton. Oslo, Norway. Final EUTROPIA Conference. Oral presentation. Not presenting author.
- [27] **Tominaga K** (2012) Simulating limnological responses to various runoff scenarios using MyLake. Oslo, Norway. EUTROPIA Mid-term Conference. Oral presentation. Presenting author.
- [28] **Tominaga K** (2012) MyLake on Storefjorden and Vestre Vansjø. Frederikstad, Norway. EUTROPIA-REFRESH Modelling Workshop. Oral presentation. Presenting author.
- [29] **Tominaga K**, Finstad AG, Kaste Ø, Andersen T (2012) Future climate change impact on lakes in fennoscandia: A dynamic mechanistic approach. Otsu, Shiga, Japan. 2012 ASLO Aquatic Sciences Meeting. Oral presentation. Presenting author.
- [30] **Tominaga K** (2011) Why you should care about MyLake (or ecological models in general). Sør Nesset, Norway. Bi-annual Meeting Workshop on Environmental and Analytical Chemistry. Oral presentation. Presenting author.
- [31] **Tominaga K** (2010) Ensemble model framework for lake ecosystem modelling - case study from acidification modelling. Silkeborg, Denmark. Lake Ecosystem Modelling Workshop. Oral presentation. Presenting author.
- [32] **Tominaga K** (2009) Modelling eutrophication in Lake Vansjø. Oslo, Norway. MILJØ2015 PhD Seminar. Oral presentation. Presenting author.
- [33] **Tominaga K** (2009) Modelling eutrophication in Lake Vansjø. Sør Nesset, Norway. Bi-annual Symposium on Environmental and Analytical Chemistry. Oral presentation. Presenting author.
- [34] **Tominaga K**, Aherne J, Watmough SA, Alveteg M, Cosby BJ, Driscoll CT, Posch M, Pourmokhtarian A (2009) Predicting future soil and stream chemistry using an ensemble of acidification models at hubbard brook. Lincoln, New Hampshire, USA. 46th Annual Hubbard Brook Cooperators' Meeting. Oral presentation. Presenting author.

- [35] **Tominaga K**, Aherne J, Watmough SA, Alveteg M, Cosby BJ, Driscoll CT, Kieckbusch J, Posch M, Pourmokhtarian A, Weis W, Huber C (2009) Modelling acidification recovery at long-term monitoring sites: a multi-model evaluation. Helsinki, Finland. 6th International Symposium on Ecosystem Behaviour BIOGEOMON 2009. Poster presentation. Presenting author.
- [36] **Tominaga K**, Aherne J, Watmough SA (2008) Modelling the chemistry of soil and surface water at Hubbard Brook, New Hampshire, USA. Gananoque, Ontario, Canada. 22nd Annual Gananoque Conference on Environmental Science and Engineering. Oral presentation. Presenting author.
- [37] **Tominaga K**, Aherne J, Watmough SA, Alveteg M, Cosby BJ, Driscoll CT, Posch M (2008) Evaluation of process-oriented acidification models at Hubbard Brook. Durham, New Hampshire, USA. Northeastern Ecosystem Research Cooperative Conference. Poster presentation. Presenting author.
- [38] **Tominaga K**, Watmough SA (2007) Survival analysis of hardwood trees in southern Ontario. Gananoque, Ontario, Canada. 21st Annual Gananoque Conference on Environmental Science and Engineering. Poster presentation. Presenting author.

I have also participated in several other international and domestic conferences and meetings, including: • University of Birmingham (November 2014) • International Centre for Theoretical Physics, Trieste, Italy (October–November 2014) • SYKE, Helsinki, Finland (May 2012) • EU WFD meeting, Sitges, Spain (March 2012) • Tianjin Academy of Environmental Sciences, Tianjin, China (September 2011) • RCEES, Chinese Academy of Sciences, Beijing, China (September 2011) • Instituto Superior Técnico, Lisbon, Portugal (April 2011) • Technische Universität München, Freising, Germany (March 2009) • Trent University, Peterborough, Ontario, Canada (November and December 2007, February, April and October 2008 and November 2009) • RIVM, Bilthoven, The Netherlands (May 2008) • Lund University, Lund, Sweden (May 2008) • Syracuse University, Syracuse, New York, USA (November 2007) • Hubbard Brook Experimental Forest, Lincoln, New Hampshire, USA (July 2007) • University of New Hampshire, Durham, New Hampshire, USA (October 2006) • Ontario Ministry of the Environment, Toronto, Ontario, Canada (October 2006)

Achievements

Biogeomon Symposium 2009, Finland

2009 | Student scholarship

Research Council of Norway (Norges Forskningsråd)

2009 | Norwegian Government Scholarship April-June 2009

German Academic Exchange Service (Deutscher Akademischer Austausch Dienst, DAAD)

2009 | Short-term Study Scholarship February-March 2009

Northeastern Ecosystem Research Cooperative, USA

2008 | Travel support for graduate students at the NERC Conference

Trent University (non-student), Canada

2008 | Academic Innovation Fund. “Introductory seminar on R for biologists and environmental scientists”

Trent University (graduate)

2007–2009	Graduate Teaching Assistantship and Research Assistantship (declined for 2009)
2007–2009	Research Fellowship Award
2007–2008	Graduate Studies Bursary

At Trent University (undergraduate)

2007	President's Role
2007	J.D. Page Scholarship in Environmental and Resource Studies (ERS)
2003–2007	Dean's Role (4 times)
2003–2007	Entrance Scholarship (automatically renewable)
2003–2007	Trent International Program (TIP), Board of Governors Bursary (4 times)
2004–2007	In-Course Scholarship (TIP, 3 times)
2004–2007	Trent International Student Association Bursary (3 times)
2006	J. Percy MacNaughton Prize (ERS)
2006	Catherine Parr Traill College Principal's Prize
2006	Honorarium, Kawartha World Issues Centre
2005	Cyril and Jenny Carter Scholarship in Environmental Studies (ERS)
2004	Graham Hartley Chemistry Prize (Chemistry Department)

Computing

HPC and super computer facilities

I have handled more than 1000 computing nodes at the same time, and have handled terabytes of data at the following facilities:

- Notur Abel, Norway
- Amazon Elastic Computing Cloud, Ireland
- Shared Hierarchical Academic Research Computing Network (SHARCNET), Ontario, Canada

Skills Listed by Familiarity

Python, R, Unix, Linux, SSH, \LaTeX , Git, NetCDF, HDF5, GIS (GRASS, QGIS), Matlab/Octave, XML, HTML, SQL, Fortran, C, MPI, OpenMP, C++, HTTP.

Miscellaneous

Natural Languages

English	fluent
Japanese	native
Norwegian	elementary
Chinese	elementary

Travels

As resident	Japan, Canada, Germany, Norway, Malaysia
Assignment	United States, Ireland, Sweden, Netherlands, Finland, Denmark, Portugal, Spain, China (Mainland), Italy, United Kingdom
As tourist	Singapore, Thailand, Laos, Myanmar, Czech Republic, Austria, France, Belgium, Indonesia, Qatar, China (Hong Kong and Macau), Australia, India