

**Dr. Katsumasa Tanaka**

RESEARCH SCHOLAR

**I. CONTACT INFORMATION**

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**IIASA – International Institute for Applied Systems Analysis**

Schlossplatz 1, A-2361 Laxenburg, Austria

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**II. WORK EXPERIENCE**

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- 01/2010 – (expected)  
**CICERO – Center for International Climate and Environmental Research**, Oslo, Norway  
Senior Research Scholar
- 04/2009 – 12/2009  
**IIASA – International Institute for Applied Systems Analysis**, Laxenburg, Austria  
Research Scholar
- 04/2007 – 03/2009  
**IIASA – International Institute for Applied Systems Analysis**, Laxenburg, Austria  
IIASA Postdoctoral Fellow 2006
- 07/2003 – 03/2007  
**Max Planck Institute for Meteorology**, Hamburg, Germany  
Ph.D. scholarship (Max Planck Institute for Meteorology: 10/2006 – 12/2006)  
Half-time employment (Max Planck Institute for Biogeochemistry: 06/2006 – 09/2006)  
Half-time employment (University of Hamburg: 09/2005 – 05/2006)  
Ph.D. scholarship (Max Planck Institute for Meteorology: 07/2005 – 08/2005)  
Ph.D. scholarship (Max Planck Institute for Biogeochemistry: 07/2003 – 06/2005)
- 03/2003 – 06/2003  
**University of Oldenburg**, Germany  
Half-time employment
- 03/2001 – 12/2002  
**University of Hawaii at Manoa**, US  
Stipend

**III. FUNDED RESEARCH PROJECTS**

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- 04/2009 – 09/2009  
Project title: “**Geoengineering to avoid overshoot: an uncertainty analysis**”  
Funding source: GGI Program at IIASA (6 person-month; 25,000 Euro)  
URL: <http://www.iiasa.ac.at/Research/GGI/docs/topics.html>

**IV. MAJOR AWARDS**

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- 04/2007 – 03/2009  
**IIASA Postdoctoral Fellowship 2006**  
International Institute for Applied Systems Analysis, Laxenburg, Austria  
[http://www.iiasa.ac.at/Admin/PDOC/fellows\\_iiasa.html](http://www.iiasa.ac.at/Admin/PDOC/fellows_iiasa.html)

V. PEER-REVIEWED PAPERS

1. **Tanaka, K.**, B. C. O'Neill, D. Rokityanskiy, M. Obersteiner, R. S. J. Tol (2009a) Evaluating Global Warming Potentials with historical temperature. *Climatic Change*, **96**, 443–466, doi:10.1007/s10584-009-9566-6.
2. **Tanaka, K.**, T. Raddatz, B. C. O'Neill, C. Reick (2009b) Insufficient forcing uncertainty underestimates the risk of high climate sensitivity. *Geophysical Research Letters*, **36**, L16709, doi:10.1029/2009GL039642.
3. **Tanaka, K.**, F. T. Mackenzie (2005) Ecosystem behavior of southern Kaneohe Bay: a statistical and modelling approach. *Ecological Modelling*, **188**, 296–326.

VI. SEMI-PEER-REVIEWED PAPERS (Institute Reports and Degree Theses)

1. **Tanaka, K.** (2008) Inverse estimation for the simple earth system model ACC2 and its applications. Ph.D. thesis. Hamburg Universität, Germany. International Max Planck Research School on Earth System Modelling, Hamburg, Germany. 296 pp. <http://www.sub.uni-hamburg.de/opus/volltexte/2008/3654/>
2. **Tanaka, K.**, T. Raddatz, B. C. O'Neill, C. Reick (2008) Is the climate sensitivity even more uncertain? Interim Report at International Institute for Applied Systems Analysis (IIASA) IR-08-012. 79 pp. <http://www.iiasa.ac.at/Admin/PUB/Documents/IR-08-012.pdf>
3. **Tanaka, K.**, E. Kriegler, T. Bruckner, G. Hooss, W. Knorr, T. Raddatz (2007a) Aggregated Carbon Cycle, Atmospheric Chemistry, and Climate Model (ACC2) – description of the forward and inverse modes. Max Planck Institute for Meteorology, Reports of Earth System Science, No. 40. 188 pp. <http://www.mpimet.mpg.de/wissenschaft/publikationen/erdsystemforschung.html>
4. **Tanaka, K.**, B. C. O'Neill, D. Rokityanskiy, M. Obersteiner, R. S. J. Tol (2007b) Evaluating Global Warming Potentials with historical temperature. Interim Report at International Institute for Applied Systems Analysis (IIASA) IR-07-035. <http://www.iiasa.ac.at/Admin/PUB/Documents/IR-07-035.pdf>
5. **Tanaka, K.**, R. S. J. Tol, D. Rokityanskiy, B. C. O'Neill, M. Obersteiner (2006) Evaluating Global Warming Potentials as historical temperature proxies: an application of ACC2 inverse calculation. FNU-118, Hamburg University and Centre for Marine and Atmospheric Science, Hamburg, Germany. [http://www.uni-hamburg.de/Wiss/FB/15/Sustainability/Working\\_Papers.htm](http://www.uni-hamburg.de/Wiss/FB/15/Sustainability/Working_Papers.htm)
6. **Tanaka, K.** (2002) Statistical and stability analysis of ecosystem dynamics in southern Kaneohe Bay. M.S. thesis. Department of Oceanography, University of Hawaii at Manoa, US. 324 pp.
7. **Tanaka, K.** (1998) Demographic change in Wakayama, Japan — Age-cohort model study. B.S. Thesis. Department of Science and Technology, Keio University, Tokyo, Japan. 37 pp.

VII. OTHER PAPERS (Submitted Paper, Project Reports, Extended Abstracts, Papers in Progress)

1. Kvale, K. F., K. Zickfeld, K. J. Meissner, **K. Tanaka**, A. J. Weaver (2009) Carbon dioxide emission pathways avoiding dangerous ocean impacts. *Global Environmental Change*, Submitted.
2. Raddatz, T., **K. Tanaka** (2009) On interdependency of climate sensitivity and aerosol forcing: implications for future warming. Prepared for a re-submission to *Geophysical Research Letters*.
3. **Tanaka, K.**, B. C. O'Neill (2009) How do we learn about climate sensitivity? Prepared for a submission to *Environmental Research Letters*.
4. **Tanaka, K.**, C. Cho, V. Krey (2009c) Geoengineering to avoid overshoot: an uncertainty analysis. Prepared for a submission to *Global Environmental Change*.
5. **Tanaka, K.**, P. Rafaj, S. Rao, F. Wagner (2009d) Uncertainty in the potential warming due to air pollution abatement. Prepared for a submission to *Atmospheric Environment*.

6. Kemfert, C., W. Knorr, L. Criscuolo, M. Farwick, K. Hasselmann, G. Hooss, H. Kremers, K. Ronneberger, N. Kim-Phat, M. Sonnenschein, M. Stadler, **K. Tanaka**, R. Tol, M. Zandersen (2006) Bewertung des Klimawandels anhand von gekoppelten, global vernetzten Ökonomie-Biosphäre-Klima-Modellen ECOBICE (Economy-Biosphere-Climate). Endbericht.
7. **Tanaka, K.**, F. T. Mackenzie (2002) Dynamic interpretation of statistical correlation analysis of three-year chemical and biological dataset, Kaneohe Bay, Hawaii. Extended abstract for Sixth International Symposium on the Geochemistry of the Earth's Surface, Honolulu, Hawaii, US. May 20–24, 2002.

#### VIII. EDUCATIONS

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- 05/2003 – 04/2007  
**Max Planck Institute for Meteorology**, Hamburg, Germany  
**International Max Planck Research School on Earth System Modelling**, Hamburg, Germany  
Ph.D. in Meteorology (advisors: Prof. Dr. Richard Tol and Dr. Thomas Raddatz)  
Thesis “Aggregated Carbon Cycle, Atmospheric Chemistry, and Climate model (ACC2) and its applications” (degree awarded from University of Hamburg)
- 06/1998 – 12/2002  
**University of Hawaii at Manoa**, US  
M.S. in Oceanography (advisor: Prof. Fred T. Mackenzie)  
Thesis “Statistical and stability analysis of ecosystem dynamics in southern Kaneohe Bay”  
Graduate Certificate in Ocean Policy  
Certificate Paper “A hybrid-cycle OTEC system and liquid hydrogen production”
- 04/1994 – 03/1998  
**Keio University**, Tokyo, Japan  
B.S. in Administrative Engineering (advisor: Prof. Hiroshi Yanai)  
Thesis “Demographic change in Wakayama, Japan — Age-cohort model study”
- 04/1991 – 03/1994  
**Osaka Seiko High School**, Osaka, Japan

#### VIV. PRESENTATIONS

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1. **Tanaka, K.** (2009) Simple climate model ACC2 and its applications. Invited oral presentation at CICERO (Center for International Climate and Environmental Research), Oslo, Norway. November 19, 2009.
2. **Tanaka, K.** (2009) A short introduction to my research career. Invited oral presentation at IPCC WGI Technical Support Unit (TSU), Bern, Switzerland. September 7, 2009.
3. **Tanaka, K.** (2009) Geoengineering to avoid overshoot: an uncertainty analysis. Poster presentation at the EGU General Assembly 2009, Vienna, Austria. April 19–24, 2009.  
<http://meetingorganizer.copernicus.org/EGU2009/EGU2009-14133.pdf>
4. **Tanaka, K.**, B. C. O'Neill (2009) How do we learn about climate sensitivity? Poster presentation at the EGU General Assembly 2009, Vienna, Austria. April 19–24, 2009.  
<http://meetingorganizer.copernicus.org/EGU2009/EGU2009-2978.pdf>
5. **Tanaka, K.**, J. J. Blackstock, C. Cho, V. Krey, B. C. O'Neill, T. Patt (2009) A Combined Mitigation/Geoengineering Approach: An Uncertainty Analysis. Oral presentation at the Greenhouse Gas Initiatives (GGI) Seminar at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. April 16, 2009.  
<http://www.iiasa.ac.at/Research/GGI/index.html>
6. **Tanaka, K.** (2009) Inverse estimation for simple climate model ACC2. Invited oral presentation in the Climate Physics Group (Prof. Reto Knutti), Eidgenössische Technische Hochschule (ETH) Zürich, Switzerland. February 3, 2009.

7. **Tanaka, K.**, B. C. O'Neill (2009) Uncertainty, learning, and climate sensitivity. Poster presentation at Climate Change: Global Risks, Challenges and Decisions, Copenhagen, Denmark. March 10–12, 2009. <http://climatecongress.ku.dk/>
8. **Tanaka, K.**, B. C. O'Neill, T. Raddatz, C. Reick (2009) Uncertainty and learning of climate sensitivity. Poster presentation at Workshop on Reducing the Uncertainty in the Prediction of Global Warming, Jerusalem, Israel. January 12–16, 2009. [http://www.as.huji.ac.il/workshops/global\\_warming/](http://www.as.huji.ac.il/workshops/global_warming/)
9. **Tanaka, K.**, B. C. O'Neill, T. Raddatz, C. Reick (2008) A new methodology to estimate climate sensitivity. Poster presentation at New Methodologies and Interdisciplinary Approaches in Global Change Research, Porquerolles, France. November 5–10, 2008. <http://www.esf.org/conferences/08284>
10. **Tanaka, K.** (2008) On parameter estimation for the climate system. Oral presentation at the Greenhouse Gas Initiatives (GGI) Open Seminar at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria. May 28, 2008. <http://www.iiasa.ac.at/Research/GGI/seminars/>
11. **Tanaka, K.**, Raddatz, T., B. C. O'Neill, C. Reick (2008) Is the climate sensitivity even more uncertain? Oral presentation at the EGU General Assembly 2008, Vienna, Austria. April 13–18, 2008. <http://www.cosis.net/abstracts/EGU2008/02716/EGU2008-A-02716-1.pdf>
12. Raddatz, T., **K. Tanaka** (2008) On the risk of abrupt warming after a shutdown of all emissions. Poster presentation at the EGU General Assembly 2008, Vienna, Austria. April 13–18, 2008. <http://www.cosis.net/abstracts/EGU2008/04362/EGU2008-A-04362-1.pdf>
13. Kriegler E., **K. Tanaka**, H. Held (2007) What is binding when? comparing targets for greenhouse gas concentration, ocean pH, temperature and sea level rise. Oral presentation at International Energy Workshop, Stanford University, California, USA. June 25, 2007. <http://www.internationalenergyworkshop.org/abspdf/Kriegler.pdf>
14. **Tanaka, K.** (2007) Inverse estimation for the simple Earth system model ACC2 and its applications. Ph.D. defense. Hamburg Universität, Germany. April 30, 2007.
15. **Tanaka, K.**, Raddatz, T., Reick, C. (2007) Uncertainty analysis for coupled Earth system: global-annual-mean perspective. Invited oral presentation at Workshop on Climate Risk Assessment, Tsukuba, Japan. March 6–7, 2007
16. **Tanaka, K.**, T. Raddatz, R. S. J. Tol, M. Claussen (2006) Synthesis of the Earth system measurements and modeling for the post-industrial period and future. Invited poster presentation at the Earth System Science Partnership (ESSP) Open Science Conference, Beijing, China. November 9–12, 2006. <http://www.essp.org/ESSP2006/>
17. **Tanaka, K.**, T. Raddatz, R. S. J. Tol, M. Claussen (2006) Synthesis of the Earth system measurements and modeling for the post-industrial period and future. Invited oral presentation at the Second International Young Scientists' Global Change Conference (YSC), Beijing, China. November 5–8, 2006. <http://www.start.org/YSC/YSC2006.html>
18. **Tanaka, K.** (2006) Aggregated Carbon Cycle, Atmospheric Chemistry and Climate (ACC2) Model and its Applications. Oral presentation for the Retreat of the International Max Planck International Max Planck Research School for Earth System Modelling, Schwerin, Germany. October 4–6, 2006.
19. **Tanaka, K.** (2006) Evolution of the natural Earth system during the post-industrial time. Oral presentation at the 1st Interdisciplinary Max Planck Phdnet workshop: Global Change, Cologne, Germany. August 17–19, 2006. <http://www.phdnet.mpg.de/workshop/index.htm>

20. **Tanaka, K.** (2006) Global-Average Model of the Carbon Cycle, Atmospheric Chemistry, and Climate System and its Applications. Invited oral presentation at the Cost of Inaction Workshop, German Institute for Economic Research, Berlin, Germany. April 10–12, 2006.  
<http://www.diw.de/english/dasinstitut/abteilungen/evu/aktuelles/index.jsp>
21. **Tanaka, K., D. Rokityanskiy.** (2006) Evaluating Global Warming Potentials as a Proxy of Historical Climate Change. Solicited oral presentation at the EGU General Assembly 2006, Vienna, Austria. April 2–7, 2006.  
<http://www.cosis.net/abstracts/EGU06/10527/EGU06-J-10527-1.pdf>
22. **Tanaka, K., R. Tol, W. Knorr, T. Bruckner, E. Kriegler, T. Raddatz.** (2006) Uncertain Analysis using Aggregated Carbon Cycle, Atmospheric Chemistry, and Climate Model (ACC2). Poster presentation at the EGU General Assembly 2006, Vienna, Austria. April 2–7, 2006.  
<http://www.cosis.net/abstracts/EGU06/10526/EGU06-J-10526-1.pdf>
23. **Tanaka, K.** (2006) Inverse Calculation of the Global-Mean Evolution of the Carbon Cycle and Climate System since 1750. Oral presentation for the Gemeinsames Seminar of the Meteorological Institute, University of Hamburg, Germany. March 29, 2006.  
[http://www.mi.uni-hamburg.de/Gemeinsames\\_Seminar.571.0.html](http://www.mi.uni-hamburg.de/Gemeinsames_Seminar.571.0.html)
24. **Tanaka, K.** (2006) Inverse Calculation of the Global-Mean Evolution of the Carbon Cycle and Climate System since 1750. Oral presentation for the Land in the Earth System Seminar of the Max Planck Institute for Meteorology, Hamburg, Germany. March 6, 2006.
25. **Tanaka, K.** (2005) Aggregated Carbon Cycle, Atmospheric Chemistry and Climate (ACC2) Model and Uncertainty Analysis (in Japanese). Oral presentation at the National Institute of Environmental Study (NIES), Tsukuba, Japan. December 27, 2005.
26. **Tanaka, K.** (2005) Aggregated Carbon Cycle, Atmospheric Chemistry and Climate (ACC2) Model and its Applications. Oral presentation for the Retreat of the International Max Planck International Max Planck Research School for Earth System Modelling, Bremen, Germany. October 12, 2005.
27. **Tanaka, K., D. Rokityanskiy, M. Obersteiner, B. C. O’Neill** (2005) Global-Mean Climate Model Application: GWP Test against Historical Data. Oral presentation for the Young Scientist Summer Program, International Institute for Applied Systems Analysis, Laxenburg, Austria. July 20, 2005. <http://www.iiasa.ac.at/Admin/YSP/index.html>
28. **Tanaka, K., W. Knorr, R. Tol, T. Bruckner, G. Hooss.** (2005) Simple climate model developed for ECOBICE Integrated Assessment project. Oral presentation at the Fourth International Symposium on Non-CO<sub>2</sub> Greenhouse Gases: Science, Control, Policy, and Implementation, Utrecht, The Netherlands. July 4–6, 2005. <http://www.milieukundigen.nl/pages/ncgg4/>
29. **Tanaka, K., T. Bruckner, W. Knorr, R. Tol, G. Hooss.** (2005) Uncertainty analysis of carbon cycle and climate parameters using a simple climate model. Poster presentation at EGU General Assembly 2005, Vienna, Austria. April 25–31, 2005.  
<http://www.copernicus.org/EGU/ga/egu05/index.htm>
30. **Tanaka, K.** (2004) Aggregated Carbon Cycle, Atmospheric Chemistry, and Climate Model for ECOBICE. Oral presentation at the Retreat for International Max Planck Research School for Earth System Modelling, Luebeck, Germany. November 3, 2004.
31. **Tanaka, K.** (2004) Forthcoming Aggregated Carbon Cycle, Atmospheric Chemistry, and Climate Model for ECOBICE Project. Oral presentation for the Oberseminar of the International Max Planck Research School for Earth System Modelling, Hamburg, Germany. September 21, 2004.  
<http://www.uni-hamburg.de/Wiss/FB/15/Sustainability/oberseminar.html>
32. **Tanaka, K., T. Bruckner, K. Wolfgang, R. Tol, G. Hooss.** (2004) Simple climate model for the ECOBICE Integrated Assessment Project. Poster presentation at the 2nd ENVISAT Summer School: Earth System Modelling and Monitoring, Frascati, Italy. August 16–26, 2004.  
[http://envisat.esa.int/envschool\\_2004/](http://envisat.esa.int/envschool_2004/)

33. **Tanaka, K.** (2004) Use of a Simple Climate Model for Uncertainty Analysis. Oral presentation at the potential project workshop by Hasselmann and Jaeger, Sylt, Germany. May 7, 2004.
34. **Tanaka, K.**, G. Hooss, W. Knorr, R. Tol (2003) Simple Climate Model for Integrated Assessment on Global Change. Oral presentation at the Retreat for International Max Planck International Max Planck Research School for Earth System Modelling, Wismar, Germany. October 27, 2003.
35. Hoover, D. J., **K. Tanaka**, S. Ringuet, F. T. Mackenzie. (2003) Nutrient loading and response in southern Kaneohe Bay, Oahu, Hawaii: point- and non-point-source inputs and impacts. Oral presentation at the 2003 ASLO Aquatic Sciences Meeting, Salt Lake City, Utah, USA. February 8–14, 2003. <http://aslo.org/meetings/slc2003/index.html>
36. **Tanaka, K.** (2002) Statistical and stability analysis of ecosystem dynamics in southern Kaneohe Bay. MS thesis defense at the Department of Oceanography, University of Hawaii at Manoa, USA. November 15, 2002.
37. **Tanaka, K.**, F. T. Mackenzie. (2002) Dynamic interpretation of statistical correlation analysis of three-year chemical and biological dataset, Kaneohe Bay, Hawaii. Poster presentation at the Sixth International Symposium on the Geochemistry of the Earth's Surface, Honolulu, Hawaii, USA. May 20–24, 2002. <http://www.soest.hawaii.edu/oceanography/ges-6/>

#### X. WORKSHOPS, SUMMER SCHOOLS, AND CONFERENCES (Without Presentations)

- Workshop: The successful way to a Marie-Curie-Fellowship, Bern, Switzerland. July 21, 2009  
<http://www.euresearch.ch/>
- Applied Inversion Conference, Vienna, Austria. July 20–24, 2009  
<http://www.ricam.oeaw.ac.at/conferences/aip2009/>
- International Energy Conference 2009, Vienna, Austria. June 22–24, 2009  
<http://www.viennaenergyconference.org>
- Summer School on Environmental Dynamics: Climate Forcings and Global Patterns, Venice, Italy. June 13–20, 2008  
<http://www.istitutoveneto.it/ssed/>
- Advanced large scale GAMS modeling, Laxenburg, Austria. May 5–8, 2008  
<http://www.gams.com/mccarl/iiasa.htm>
- IIASA Conference '07 Global Development: Science and Policies for the Future, Vienna, Austria. November 14–15, 2007  
<http://www.iiasa.ac.at/iiasa35/>
- EGU General Assembly 2007, Vienna, Austria. April 15–20, 2007  
<http://meetings.copernicus.org/egu2007/>
- Young Scientists Summer Program (YSSP), International Institute for Applied Systems Analysis, Laxenburg, Austria. June 1–August 31, 2005  
<http://www.iiasa.ac.at/Admin/YSP/index.html>
- Abrupt Climate Change Strategy Workshop, Paris, France. September 30–October 1, 2004  
<http://www.acstrategy.org/>
- Asia-Europe Environment Forum Third Roundtable “Technology Partnerships for Renewables: Key to Energy Security”, Stockholm, Sweden. August 26–28, 2004  
<http://env.asef.org/>
- 2nd ENVISAT Summer School: Earth System Modelling and Monitoring, Francati, Italy. August 16–26, 2004  
[http://envisat.esa.int/envschool\\_2004/](http://envisat.esa.int/envschool_2004/)

- TIAS Summer School: Integrated Assessment for Environment Management, Osnabrück, Germany. July 25–31, 2004  
[http://www.usf.uni-osnabrueck.de/projects/TIAS/start\\_pics/start.html](http://www.usf.uni-osnabrueck.de/projects/TIAS/start_pics/start.html)
- International Conference on Earth System Modelling, Hamburg, Germany. September 15–19, 2003  
<http://www.mpg.de/english/illustrationsDocumentation/events/eventsCalendar/meteorologie/veranstaltung1/index.html>
- Grand Combine Summer School on Paleoclimate, Aosta, Italy. June 16–26, 2003  
[http://corto.to.isac.cnr.it/grandcombin/grand\\_combin\\_2003/](http://corto.to.isac.cnr.it/grandcombin/grand_combin_2003/)
- Effects of Climate and Climate Change on Society, Hamburg, Germany. April 3–4, 2003  
<http://w3g.gkss.de/staff/storch/confer.htm>
- Pacific Asian Management Institute (PAMI) Summer Certificate Program at University of Hawaii at Manoa, USA. May–August 1999  
<http://pami.hawaii.edu/>

#### XI. REVIEWED JOURNALS

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Ecological Modelling (April 2006, February 2009)  
 Environmental Research Letters (September 2009 (requested but canceled from the editor))  
 Geophysical Research Letters (December 2009)  
 Mitigation and Adaptation Strategies for Global Change (January 2005 (for Special Issue))

#### XII. SCIENTIFIC FIELD WORKS

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Assistant for water quality monitoring for Kaneohe Bay, Hawaii (2001 – 2002)  
 Assistant for HOT Cruise sampling off the coast of Hawaii (HOT-127) (June 21–27, 2001)

#### XIII. SCIENTIFIC AFFILIATIONS

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American Geophysical Union (since 2002)  
 System Dynamics Society (between 2003 and 2007)  
 Japan Operations Research Society (between 1998 and 2004)

#### XIV. LANGUAGE SKILLS

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<i>Language</i>	<i>Proficiency</i>	<i>Proof</i>
Japanese:	Native	
English:	Fluent	MS degree and Graduate Certificate from a US university
German:	Advanced	C1 ÖSD – Österreichisches Sprachdiplom Deutsch (December 2009) B2 ÖSD – Österreichisches Sprachdiplom Deutsch (November 2009) B1 Goethe-Zertifikat Deutsch (February 2007)