

1. FULL NAME AND DATE

Surname, names: Kummu, Matti Samuli
 Gender: Male

**2. DATE AND PLACE OF BIRTH, NATIONALITY, CURRENT RESIDENCE**

Date and place of birth: 18th of July 1977 in Helsinki, Finland

Citizenship: Finnish

Contact details: Water & Development Research Group
 Department of Built Environment, School of Engineering
 Aalto University
 Tietotie 1E, 02150 Espoo,
 Finland

Email: matti.kummu@aalto.fi; Twitter: [@MattiKummu](https://twitter.com/MattiKummu); Web: people.aalto.fi/matti_kummu

Note: the former Helsinki University of Technology (TKK) now operates within Aalto University (AALTO). The School of Engineering (AALTO ENG) is one of Aalto's 6 Schools.

3. EDUCATION AND DEGREES AWARDED

- 12/2008 **Doctor of Science** in Technology (*with distinction*) from the former Helsinki University of Technology (TKK), Water Research Group. Major subject: Hydrology and water resources. Thesis title: "Spatio-temporal scales of hydrological impact assessment in large river basins: the Mekong case". Supervisor: Prof Olli Varis (olli.varis@aalto.fi).
- 10/2002 **Master of Science** from the former Helsinki University of Technology, Water Research Group. Major subject: Hydraulic Engineering; Minor subject: Geoinformatics. Thesis title: "Roughness characteristics and velocity profile in vegetated and nonvegetated channel". Part of the studies for the M.Sc. degree conducted at: Lund University of Technology (Sweden); University of Zaragoza (Spain); University of Puerto Rico; and Universidad de Chile.

4. OTHER EDUCATION AND TRAINING, QUALIFICATIONS AND SKILLS

- 2015 Aalto University Pedagogical Training I (25 ECTS)
 2012 Participation to Aalto's mentor programme as a mentee
 2011-2012 Aalto Future Research Leaders' Programme

5. LINGUISTIC SKILLS

	Speaking	Writing	Reading
Finnish	Native	Native	Native
English	Excellent	Excellent	Excellent
Spanish	Good	Good	Very good
Swedish	Good	Good	Very good

6. CURRENT POSITIONS

- 2013-present **Assistant professor** (tenure track) at Water & Development Research Group, Aalto University

7. PREVIOUS WORK EXPERIENCE

- 2013-2016 **Academy of Finland Postdoctoral fellow**
 2015-16 **Visiting scholar** at the ETH Zurich, Switzerland (in total 3.5 months)
 2015 **Visiting scholar** at the University of Umeå, Sweden (in total 1 month)
 2009-2013 **Postdoctoral fellow** at Water & Development Research Group, Aalto University, Finland (competitive research post).
 2009-2011 **Visiting postdoctoral fellow** at the Vrije Universiteit Amsterdam, Netherlands (in total 9 months)
 2002-2008 **Research scientist and doctoral candidate** at Water Research Group, former Helsinki University of Technology, Finland
 2003-2006 **Research consultant** under Mekong River Commission, based in Cambodia and Lao PDR, employed by Environmental Impact Assessment Centre of Finland Ltd. (in total 3 years)

8. RESEARCH FUNDING, LEADERSHIP, AND SUPERVISION

MAJOR RESEARCH FUNDING

Large competitive research grants (PI stands for principal investigator):

- 2016-2018 **PI:** Emil Aaltonen foundation; Project funding for 3 yr eat-less-water (210'000 EUR)
2016-2018 **PI:** Academy of Finland key project; funding to establish Water scarcity atlas (300'000 EUR)
2016-2018 **Component leader:** Strategic Research Council of Finland; Food security component in 'From Failand to Winland' -project (280'000 EUR)
2013-2016 **PI:** Academy of Finland Postdoctoral fellow; Funding for 3 yr postdoc project (273'410 EUR)
2014-2017 **Responsible leader:** Research project from *Maa- ja vesitekniikan tuki ry.* (150'000 EUR)
2012-2014 **PI:** Aalto ENG Postdoctoral fellow; Funding for 1+1 yr postdoctoral project (110'000 EUR)
2009-2012 **PI:** TKK Postdoctoral fellow; Funding for 3 yr postdoctoral project (180'000 EUR)

Large competitive research projects (where principal or co-principal investigator):

- 2010-2012 **PI:** Modelling component of the Mekong Project 3 – On multiple use of reservoirs under the CGIAR Challenge Programme on Water & Food (95,000 USD)
2010-2012 **Co-PI:** Exploring Mekong Region Futures: Tonle Sap Lake case study. Project led by CSIRO, funded by AusAID and CSIRO (200,000 AUD)

LEADERSHIP IN RESEARCH WORK

Research project manager or co-manager in international research projects:

- 2016-2018 **Team leader and PI:** Project to study how can we eat less water
2016-2018 **Team leader:** Development of web-based global water scarcity atlas (wasco.lucify.com)
2016-2018 **Component leader:** Food security in Finnish context
2010-2012 **Team leader & co-principal researcher:** Modelling component of the Mekong Project 3 - CGIAR Challenge Programme on Water & Food Programme 2nd phase.
2010-2012 **Co-team leader & co-principal researcher:** Modelling component of the Exploring Mekong Region Futures: Tonle Sap case study. Project led by CSIRO, funded by AusAID and CSIRO.
2008-2009 **Co-team leader and co-principal researcher:** Water and Climate Change in the Lower Mekong Basin: Diagnosis and recommendations for adaptation. Funded by Foreign Ministry of Finland.

SUPERVISION OF POSTDOCTORAL RESEARCHERS

- 2014- Guillaume, J. Graduated 2014 from Australian National University, Australia
2014-2017 Heck, V. Graduated 2017 from Humboldt University of Berlin, Germany
2014-2017 Räsänen, T. Graduated 2014 from Aalto University, Finland

SUPERVISION OF UNDERGRADUATE AND POST-GRADUATE STUDENTS

Supervision of Doctoral theses

- 2009–2014 Räsänen, T: “Anthropogenic impacts on hydrology in the Mekong”. Graduated with distinction; best thesis award 2014 of Aalto ENG. Presently postdoc at Aalto University.
2011–2016 Porkka, M: “Securing global food supply with limited resources: lessons from the past”. Graduated with distinction. Presently postdoc at Lappeenranta University of Technology.
2016- Munia, H: “Water scarcity in transboundary river basins: global study” (-2019)
2016- Lehikoinen, E: “Food security in Finland” (-2021)
2017 Heino, M: “Variability of global food production (-2021)”
2017 Kinnunen, P: “Constraints on trade and their impact on food production (-2021)”

Daily supervision of Doctoral theses:

- 2009–2015 Salmivaara, A: “Water resources vulnerability of Southeast Asian river basins” Graduated with distinction; best thesis award 2015 of Aalto ENG. Presently at Natural Resources Institute.
2013– Jalava, M: “Impact of diet change on global water resources” (-2018)
2017- Kallio, M: “Spatial methods for identifying populations affected by water shortage” (-2021)
2012– Lauri, H: “Modelling monsoon hydrology: case Mekong” (-2018)

Member of a PhD Committee:

- 2010–2013 Arias, M; University of Canterbury, NZ: “Impacts of hydrological alterations in the Mekong Basin to the Tonle Sap ecosystem”. Presently Assistant prof. at University of South Florida.
2014–2017 Long Hoang Phi, University of Wageningen, Netherlands: “The Mekong's future flows: quantifying hydrological changes and developing adaptation options”
2014– Nguyen Van Khan Triet, University of Potsdam, Germany: “Impact of dike development on the flood hazard in the Mekong Delta” (-2018)

Supervised Master's theses:

- 2007-2016 Altogether 9 theses instructed (daily supervision) and 5 supervised

Supervised Bachelor's theses:

- 2008-2016 Altogether 10 theses supervised

9. MERITS IN TEACHING AND PEDAGOGICAL COMPETENCE

PEDAGOGICAL TRAINING

2015 Aalto University Pedagogical Training I (25 ECTS)

INVOLVEMENT IN THE IMPLEMENTATION OF COURSES

2015-present Responsible teacher for Water and people in a changing world –course (5 ECTS)

2013 Responsible teacher for Global Water Problems –course (5 ECTS)

2005- present Various visiting lectures in the following courses at Aalto University: State of the World and Development; Global Water Problems; Vesitalouden perusteet; City in Crisis II

2007 & 2009 Part of the organisation committee of the Global Water Problems –course (5 ECTS)

2007 Tutor in Sustainable Global Technologies studio –course (10 ECTS)

2004-2005 Teacher and coordinator in several 1-3 day intensive courses and workshops on hydrological and hydrodynamic modelling for impact at the following universities: Institute of Technology of Cambodia, Rural University of Phnom Penh (Cambodia), National University of Laos, Khon Kaen University (Thailand), Can Tho University (Vietnam), HCMC University of Natural Sciences (Vietnam), HCMC University of Technology (Vietnam), Water Resources University (Vietnam)

SUPERVISION OF THESES

See above, under Section 8

10. AWARDS, PRIZES AND HONOURS

2017 Publication award of 2017 by Water Association of Finland

2017 Water International Best Paper 2015 Award with Kattelus et al. 2015

2011 Environmental Research Letters' best article award 2010 with Kummu et al. 2010.

2009 Best doctoral thesis award 2008 from Oskari Vilamo foundation (award for best DSc thesis in Civil engineering in Finland)

11. SCIENTIFIC AND SOCIAL MERITS

EVALUATION OF FUNDING APPLICATIONS

2014 - 2017 Evaluator for the Netherlands Organisation for Scientific Research (NWO) grant application

2012 Evaluator for The Leverhulme Trust (UK) grant application

2008 Evaluator for National Geographic Society (USA) grant application

PROFESSIONAL MEMBERSHIPS AND POSITIONS OF TRUST

2009- Member of the Finnish Association for Hydrology

2008-2010 Board member of WaterFinns NGO (member since 2003)

SERVICES OF PROFESSIONAL EXPERTISE

2014-2016 Member of Finnish Publication Forum (*Julkaisufoorum*) panel 5 'Geosciences and environmental sciences'

2013 Invited presentation at 'Väestön kasvu ja väestöpolitiikka -luentosarja' & 'Tieteen päivät 2013'

03/2012 Invited expert hearing in Foreign Affairs Committee of the Parliament of Finland

09/2010 Invited expert presentation in Finnish water protection days

JOURNAL EDITORIAL

2017- Specialty Chief Editor for *Frontiers in Sustainable Food Systems*

REFeree FOR SCIENTIFIC AND SCHOLARLY JOURNALS (frequency: ca. 5-10 requests / month)

Ambio, Boreal Environment, Climatic Change, Ecohydrology, Environmental Management, Environmental Research Letters, Geophysical Research Letters, Geoscientific Model Development, Global and Planetary Change, Global Environmental Change, Hydrology and Earth Systems Sciences, Hydrological Processes, International Journal of Water Resources Development, Journal of Environmental Management, Journal of River Basin Management, Landscape Ecology, Natural Hazards, Physical Geography, PLoS ONE, Quaternary International, Science, Water, Water Resources Management, Water Resources Research

INVITED LECTURES ABROAD

EFE0 (École française d'Extrême-Orient) Cambodia, ETH Zurich (2), National University of Singapore (2), UNESCO-IHE Delft, University of Southampton, University of Wageningen, University of Zurich (2), UPMC Paris, VU University Amsterdam

INTERNATIONAL CONFERENCE AND WORKSHOP ORGANISING

11/2016 **Scientific committee:** Water security and climate change, AIT, Thailand (100+ participants)

05/2007 **Co-organiser:** Mekong at the Crossroads, Chiang Mai, Thailand (60 participants)

02/2006 **Main organiser:** Modern myths of the Mekong, Vientiane, Lao PDR (40 participants)

02/2005 **Co-organiser:** IWRM on the Tonle Sap Lake, Phnom Penh, Cambodia (30 participants)

12. SCIENTIFIC AND SOCIETAL IMPACT OF RESEARCH

NUMBER OF PUBLICATIONS (as of Jan 18th 2018)

Scientific publ. 173 of which 109 are peer-reviewed (see table below for details)

	TOTAL	Of which journal articles
A. Peer-reviewed scientific articles	109	91
B. Non-refereed scientific articles	38	10
C. Scientific books		
- edited books	2	
- edited journal special issues	2	
D. Publications intended for professional communities	19	
E. Publications intended for general public	-	
F. Public artistic and design activities	1	
G. Academic thesis and dissertations	2	
	167	95

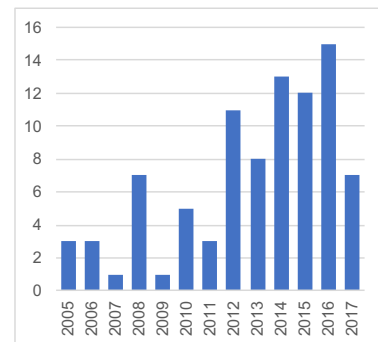


Figure 1. Number of published items (according to Web of Science)

TEN MOST IMPORTANT PUBLICATIONS (full publication list is available under link: <http://bit.ly/2hsY7hS>)

- i. Darby S, Hackney CR, Leyland J, **Kummu M**, Lauri H, Parsons DR, Best JL, Nicholas AP, Aalto R. In press. Fluvial sediment supply to a mega-delta reduced by shifting tropical-cyclone activity. *Nature*. doi: 10.1038/nature19809
- ii. Gerten G, Hoff H, Rockström J, Jägermeyr J, **Kummu M**, and Pastor A. 2013. Towards a bottom-up planetary boundary for freshwater. *Current Opinion in Environmental Sustainability* 5: 551-558.
- iii. Jalava M, **Kummu M**, Porkka M, Siebert S, Varis O. 2014. Diet change – a solution to reduce water use? *Environmental Research Letters* 9: 074016.
- iv. **Kummu M**, Guillaume JHA, De Moel H, et al. 2016. The world's road to water scarcity: shortage and stress in the 20th century and pathways towards sustainability. *Scientific Reports* 6: 38495.
- v. **Kummu M**, Gerten D, Heinke J, Konzmann M, and Varis O. 2014. Climate-driven interannual variability of water scarcity in food production: a global analysis. *Hydrology and Earth System Sciences* 18: 447-461.
- vi. **Kummu M** et al. 2012. Lost food, wasted resources: global food supply chain losses and their impacts on freshwater, cropland, and fertiliser use. *Science of the Total Environment* 438: 477-489.
- vii. **Kummu M**, Lu XX, Wang JJ and Varis O. 2010. Basin-wide sediment trapping efficiency of emerging reservoirs along the Mekong. *Geomorphology* 119: 181-197.
- viii. Porkka M, **Kummu M**, Siebert S and Varis O. 2013. From food insufficiency towards trade dependency: A historical analysis of global food availability. *PLoS One* 8(12): e82714.
- ix. Siebert S, **Kummu M**, Porkka M, Döll P, Ramankutty N, and Scanlon BR. 2015. A global dataset of the extent of irrigated land from 1900 to 2005. *Hydrology and Earth System Sciences* 19: 1521-1545.
- x. Ward, PJ, Jongman B, **Kummu M**, et al. 2014. Strong influence of El Niño Southern Oscillation on flood risk around the world. *Proceedings of the National Academy of Sciences – PNAS* 111: 15659-15664.

CITATIONS (as of Jan 18th 2018)

	Published items	Citations	h-index
Web of Science (WoS) ¹	90	2060	29
Scopus ²	94	2313	30
Google Scholar ³	134	3953	34

¹ www.researcherid.com/rid/C-4797-2011

² goo.gl/B19Ke

³ goo.gl/hZF14

Number of co-authors in journal articles (according to Scopus): 150+

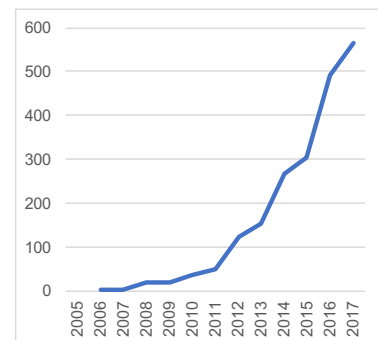


Figure 2. Number of citations (WoS)

PUBLIC AWARENESS PROJECTS

- 2012 Ta-daa dataa! Helsinki World Design Capital 2012 data visualisation campaign; openhelsinki.fi
- 2011 Wonderwater Café at Tian Hai, Beijing. Part of water footprint project; www.wonderwater.fi
- 2009 www.dropler.org –project together with AKVA (association of water students)
- 2008 Kun kylä kelluu –photo exhibition with M. Käkönen and M. Keskinen
- 2008 www.waterclock.org –project together with AKVA
- 2007 www.vesijalanjalki.org –project together with AKVA

MERITS IN SCIENCE COMMUNICATION AND EXPERT ASSIGNMENTS IN THE MEDIA

- 3 times interviewed by national and international radio
- over 20 interviews by print media, both national and international (inc. Science, YLE)
- regular tweets [@MattiKummu](https://twitter.com/MattiKummu)