

## **Jamie W. McCaughey**

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### **Education**

#### **PhD, Environmental Systems Science, ETH Zürich, Switzerland**

Thesis accepted Jan 2018: Migration and evacuation in response to coastal hazards.

#### **MS, Geological Sciences, University of Nevada, Reno, USA**

2003, thesis: Pleistocene glaciation of the southwest Tahoe basin, Sierra Nevada.

#### **BA, Geological Sciences, State University of New York at Geneseo, USA**

1998, senior study: Historical migration of Genesee River meanders.

#### **Postgraduate Certificate in Social Research Skills, University of Ulster, UK**

2016

#### **Certificate in Community-Based Development, Colorado State University, USA**

2010, International Institute for Sustainable Development.

#### **Secondary Teacher Preparation Program: Earth, Physical, and General Science**

2003, University of Nevada, Reno, USA.

### **Work experience**

#### **Community Engagement, Earth Observatory of Singapore, Nanyang Technological University, Singapore**

Singapore, 2010-present.

- Co-Investigator on 'Aftermath of Aid', an interdisciplinary social science research project investigating long-term outcomes of the international reconstruction following the 2004 tsunami in Aceh, Indonesia; assisted in managing field team with 41 full-time staff
- In western Sumatra, shared earthquake/tsunami hazard science and collaborated with local government and NGOs for risk reduction programmes
- Co-designed joint EOS / Science Centre Singapore permanent exhibit: 'Earth: Our Untamed Planet (~S\$2.5m, 550 m<sup>2</sup>)
- Led professional development workshops for teachers, developed teaching resources, and reviewed curricula and textbooks for the Singapore Ministry of Education (MoE)

#### **Research Experience for Teachers, Harvard-Smithsonian Center for Astrophysics Solar and Stellar X-Ray Group**

Cambridge, MA, USA, summers 2006-2009. Researched microflares and coronal mass ejections using IDL to process and analyze X-ray image data from Hinode/XRT.

#### **Science Teacher, Acton-Boxborough Regional High School**

Acton, MA, USA, 2005-2010. Taught Accelerated/Enriched and Honors Earth Science, Biology, and Astronomy to students in grades 9-12 (ages 14-18).

## Teacher (Years 6-8), Brookfield School

Reno, NV, USA, 2003-2005. Taught science, math, history, and grammar.

## Publications

- McCaughey, JW, Daly, P, Mundir, I, Mahdi, S, and Patt, A (2018) Socio-economic consequences of post-disaster reconstruction in hazard-exposed areas, *Nature Sustainability* 1 (38-43)  
doi:10.1038/s41893-017-0002-z  
<https://www.nature.com/articles/s41893-017-0002-z>
- McCaughey, JW, Mundir, I, Safrina, L, Rosemary, R, Mahdi, S, Daly, P, and Patt, A (2018) Feelings rather than deliberative perceptions drive protective behavior in a crisis (In review)
- McCaughey, JW, Mundir, I, Daly, P, Mahdi, S, and Patt, A (2017) Trust and distrust of tsunami vertical evacuation buildings: Extending protection motivation theory to examine choices under social influence, *International Journal of Disaster Risk Reduction* 24 (462-473)  
doi:10.1016/j.ijdr.2017.06.016  
<http://www.sciencedirect.com/science/article/pii/S2212420917302108>

## Conference presentations / workshops

- McCaughey, J, Daly, P, Mundzir, I, Mahdi, S, and Patt, A (2016) Rebuilt risk: involuntary return, voluntary migration, and socioeconomic segregation in post-tsunami Aceh, Global Risk Forum International Disaster and Risk Conference, Davos, 28 Aug - 1 Sep.
- McCaughey, J, Mundzir, I, Patt, A, Rosemary, R, Safrina, L, Mahdi, S, and Daly, P (2016) Social acceptance of unnecessary evacuation, Global Risk Forum International Disaster and Risk Conference, Davos, 28 Aug - 1 Sep.
- McCaughey, J, Mundzir, I, Daly, P, Mahdi, S, and Patt, A (2016) Distrust of tsunami vertical evacuation buildings, Global Risk Forum International Disaster and Risk Conference, Davos, 28 Aug - 1 Sep.
- McCaughey, J, Daly, P, Mundzir, I, Mahdi, S, and Patt, A (2016) Rebuilt risk: involuntary return, voluntary migration, and socioeconomic segregation in post-tsunami Aceh, International Geographical Congress, Beijing, 21-25 Aug.
- McCaughey, J, Daly, P, Mundzir, I, Mahdi, S, and Patt, A (2016) Rebuilt risk: involuntary return, voluntary migration, and socioeconomic segregation in post-tsunami Aceh, European Geosciences Union General Assembly 2016, Vienna, 17-22 Apr.

## Public/policy engagement with science

- McCaughey, J, Dewi, PR, Mundzir, I, Rosemary, R, Safrina, L, Daly, P, and Patt, A (2014) The science between tsunami science and evacuation decisions, 2014 Fall Meeting, AGU, San Francisco, Calif., USA, 15-19 Dec.
- McCaughey, J, and Dewi, PR (2013) University-NGO connections for earthquake and tsunami risk reduction: lessons learned in West Sumatra, 2013 Fall Meeting, AGU, San Francisco, Calif., USA, 9-13 Dec.
- McCaughey, J., Dewi, PR, Natawidjaja, D, and Sieh, K (2012) Constructivist learning at the science-policy interface: tsunami science informing disaster policy in West Sumatra, 2012 Fall Meeting, AGU, San Francisco, Calif., USA, 3-7 Dec.
- McCaughey, J, Lubis, AM, Sinaga, B, Huang, Z, Yao, Y, Hill, E, Dewi, PR, Eriksson, S, Sieh, K, and Natawidjaja, D (2012) [Invited] Partnerships for outreach: earthquake and tsunami hazard in West Sumatra, 2012 AOGS-AGU Joint Assembly, Singapore, 13-17 Aug.
- Yao, Y, Huang, Z, Lubis, A M, Hill, E, McCaughey, J, and Li, L (2012) Numerical simulations of tsunami inundation for the Mentawai Islands, Indonesia - a scenario study using high-resolution topographic data, 2012 AOGS-AGU Joint Assembly, Singapore, 13-17 Aug.
- McCaughey, J, Lubis, A M, Huang, Z, Yu, Y, Hill, EM, Eriksson, S, and Sieh, K (2012) Earthquake and tsunami hazard in West Sumatra: integrating science, outreach, and local stakeholder needs, presented at EGU (General Assembly 2012, Vienna, Austria, 22-27 April).

McCaughey, J, Lubis, A, Qiang, Q, Huang, Z, Hill, E, Natawidjaja, D, and Sieh, K (2011) User-driven science: earthquake and tsunami scenarios for Mentawai Islands, western Sumatra, presented at 2011 Fall Meeting, AGU (American Geophysical Union), San Francisco, Calif., USA, 5-9 Dec.

### Science education

McCaughey, J (2016) The Earth as a physics laboratory. Physics Instructional Programme Support Group, Singapore Ministry of Education, Jan-2016.

McCaughey, J (2014) Technologies for Inquiry-Based Learning in the Geography Classroom. International Conference on Teaching and Learning with Technology, Singapore, Apr-2014.

McCaughey, J, Rubin, CM, Eriksson, SC, Hill, EM, Phua, A, and Yong, F (2013) From direct instruction to inquiry learning in the earth sciences: common challenges and opportunities across cultures in the Singapore context, 2013 Fall Meeting, AGU, San Francisco, Calif., USA, 9-13 Dec.

Eriksson, SC, McCaughey, J, and de Silva, S (2013) Field seminars take inquiry to the volcanoes of Southeast Asia, 2013 Annual Meeting, Geological Society of America, Denver, Colo., USA.

Chong, E, McCaughey, J, Tan, GCI, Ng, HK, Nadarajah, VR, Costa, F, Bouvet de Maisonneuve, C, Ratdomopurbo, A, and Eriksson, S (2012) An active volcano - where scientists and teachers cause explosive inquiry-based learning to erupt, 2012 AOGS-AGU Joint Assembly, Singapore, 13-17 Aug.

McCaughey, J, Goh, KK, Chong, E, and Tan, D (2012) Earth science, science centre, and classroom: collaboration for communication, 2012 AOGS-AGU Joint Assembly, Singapore, 13-17 Aug.

McCaughey, J, Chong, ESF, and Eriksson, S, (2011) Enhancing the earth-science content and inquiry basis of physical geography education in Singapore schools, presented at 2011 Fall Meeting, AGU, San Francisco, Calif., USA, 5-9 Dec.

### Solar physics

McCaughey, J, Hannah, I, Reeves, KK, Grigis, P, and DeLuca, E (2008) The Neupert effect in microflares with Hinode/XRT and RHESSI, presented at Hinode-2 Science Meeting, Boulder, USA.

Su, Y, van Ballegoijen, A, McCaughey, J, DeLuca, E, Reeves, KK, and Golub, L (2007) What determines the intensity of solar flare/CME events? *The Astrophysical Journal*, 665, 1448. doi:10.1086/519679

### Geoscience

McCaughey, J (2003) Pleistocene glaciation of the southwest Tahoe basin, Sierra Nevada, California: University of Nevada, Reno, M.S. thesis, 179 p.

McCaughey, J, and Schweickert, RA (2000) Relative dating of Pleistocene moraines, southwest Tahoe basin, California. *Abstracts with Programs - Geological Society of America*, 32(7): 67.

### **Invited lectures/workshops: Academic**

Asian School of the Environment, Nanyang Technological University, Singapore, annual guest lecture for 400-600 undergraduate students in *Natural hazards, climate change, and society*, 'Living with natural hazards', 2014-2017.

Graduate Institute of International and Development Studies (IHEID), Geneva, Centre for International Environmental Studies Lunch Seminar, 'Rebuilt risk: involuntary return, voluntary migration, and socioeconomic segregation in post-tsunami Aceh', Mar-2016.

Climate Policy group seminar, ETH Zürich, 'Adjusting to tsunami risk: migration and evacuation decisions in post-tsunami Aceh', Feb-2016.

Earth Observatory of Singapore Seminar Series, 'Adjusting to tsunami risk: migration and evacuation decisions in post-tsunami Aceh', Jan-2016.

Future Cities Laboratory, Singapore-ETH Centre, National University of Singapore, Lunch Talk, 'Living with tsunami risk: migration and evacuation decisions', Nov-2015.

- Environment and Sustainability Research Cluster, Nanyang Technological University, Sustainability Salon, 'Living with tsunami risk', Oct-2015.
- Roundtable with Prime Minister's Scholarships for Asia recipients (New Zealand undergraduates), Banda Aceh, Indonesia, Jun-2015.
- Climate Policy group seminar, ETH Zürich, 'Living with tsunami risk: individual and household decisions', Apr-2015.
- Human-Environment Systems group seminar, ETH Zürich, 'The social side of tsunami early warning', Mar-2014.
- School of Humanities and Social Sciences, Nanyang Technological University, Singapore, guest lecture in The Environment in History, 'Convenient fuels and inconvenient truths: a short history of carbon', Oct-2013.
- Padjajaran University, Bandung, Indonesia, Seminar with Faculty of Communication and the Indonesian Institute of Sciences, 'Salah kaprah dalam komunikasi dan pendidikan ilmu pengetahuan alam: case study pengurangan risiko bencana', Seminar: Diseminasi Informasi Penelitian Kebencanaan Fakultas Ilmu Komunikasi Universitas Padjajaran dan Pusat Penelitian Geoteknologi, Lembaga Ilmu Pengetahuan Indonesia, *Misconceptions in science communication and education: case study of disaster-risk reduction*, Seminar: Dissemination of disaster research, Jatinangor, Java, Indonesia Oct-2013.
- Islamic State University Ar-Raniry, Banda Aceh, Indonesia, Seminar: Towards Improving Islamic Higher Education Quality, 'Pendidikan ilmu pengetahuan alam di universitas: gempa/tsunami di Aceh dan pengintegrasian ilmu alam dengan ilmu sosial' (*Science education at the university level: case study of earthquakes and tsunamis in Aceh integrating earth science and social science*), Sep-2013.
- International Centre for Aceh and Indian Ocean Studies, Banda Aceh, Indonesia, Dialogue Forum Between Science and Religion, 'Gempa dan tsunami di wilayah Aceh: pengetahuan dari perspektif ilmiah' (*Earthquakes and tsunami in Aceh: knowledge from the scientific perspective*), Jun-2013.
- Earth Observatory of Singapore Seminar Series, 'A private universe: the challenge of misconceptions and implications for science communication'. (w/ Susan Eriksson), May-2012.

### **Invited lectures/workshops: Government agencies and NGOs**

- Sphere Project: Humanitarian Charter and Minimum Standards in Humanitarian Response, Consultation and input on Sphere Handbook 2018 revision, S. Rajaratnam School of International Studies, Nanyang Technological University, Singapore, Nov-2017.
- Bengkulu Province Disaster Management Agency & Indonesian Agency for Meteorology, Climatology, and Geophysics, 'Pengetahuan gempa dan tsunami: Pengalaman dalam hal komunikasi risiko bencana', (*Understanding earthquakes and tsunamis: Experiences in communicating disaster risk*), Bengkulu City, Nov-2013.
- Singapore MoE Security and Emergency Planning Office, 'Singapore: an often-quiet corner of a very active region of our planet', May-2013.
- Padang City Government (convened by Disaster Management Agency w/ Kogami), Indonesia, Workshop Penyusunan Rencana Kontinjensi Menghadapi Bencana Tsunami di Kota Padang, Badan Penanggulangan Bencana Daerah Kota Padang, 'Gempa bumi dan tsunami di Sumatera: bagaimana memperkirakannya?' (*Earthquakes and tsunamis in Sumatra: how can we estimate the hazard?*) Workshop to develop a tsunami contingency plan for Padang City, Padang City Regional Disaster Management Agency, Sep-2012.
- West Sumatra Provincial Government (convened by Disaster Management Agency w/ Danny Hilman & Kogami), Discussion Forum: Skenario Kejadian Tsunami yang Diakibatkan oleh Gemoa 8,8 SR di Provinsi Sumatera Barat (*Discussion Forum: Scenario of a Tsunami and M8.8 Earthquake in West Sumatra Province*), Feb-2012.
- Mentawai Islands Regency Disaster Management Agency (w/ SurfAid), Workshop Membangun Strategi dan Keberlanjutan Rencana Penanggulangan Bencana di Kabupaten Kepulauan Mentawai (*Workshop to develop strategy and planning for disaster-risk reduction in the Mentawai Islands Regency*), 'Ancaman gempa dan tsunami di Kepulauan Mentawai' (*Earthquake and tsunami risk in the Mentawai Islands*), Tuapeijat, Mentawai, Indonesia, Sep-2011.

- Mentawai Islands Regency Department of Education, joint teacher workshop with SurfAid (NGO), Sikakap, Mentawai, Indonesia, 'Memasukkan pengurangan risiko bencana ke dalam mata pelajaran sekolah dasar: gempa bumi dan tsunami di wilayah Kepulauan Mentawai'. (*Integrating disaster-risk reduction in the elementary-school curriculum: earthquakes and tsunamis in the Mentawai Islands*), Aug-2011.
- Ready Mentawai (NGO), Sikakap, Mentawai field office, 'Ancaman gempa dan tsunami di Kepulauan Mentawai' (*Earthquake and tsunami risk in the Mentawai Islands*), Aug-2011.
- SurfAid (NGO), Sikakap, Mentawai field office, 'Ancaman gempa dan tsunami di Sumatera Barat' (*Earthquake and tsunami risk in West Sumatra province*), Aug-2011.
- Tsunami Alert Community (Kogami, NGO), 'Ancaman gempa dan tsunami di Sumatera Barat' (*Earthquake and tsunami risk in West Sumatra province*), Aug-2011.
- Disaster Management Agency for West Sumatra Province (w/ Kogami), 'Ancaman gempa dan tsunami di Sumatera Barat' (*Earthquake and tsunami risk in West Sumatra province*), May-2011.
- Disaster Management Agencies for Mentawai Islands Regency and West Sumatra Province, joint workshop with MercyCorps, Padang, 'Kesempatan kerjasama di antara para ilmuwan dan para pemangku kepentingan dalam pengurangan risiko bencana.' (*Collaboration between scientists and stakeholders in disaster risk reduction.*) Workshop Semiloka Peningkatan Kapasitas Pemerintah Dalam Penganggulangan Bencana, Padang, Indonesia, May-2011.

### **Invited lectures/workshops: Teacher professional development provided**

- Singapore Ministry of Education & Academy of Singapore Teachers, 'Volcanoes and plate tectonics in the classroom' (w/ Dawn Ruth), Jul-2016.
- Singapore Ministry of Education & Physics Instructional Programme Support Group, 'The Earth as a physics learning laboratory', Jan-2016.
- Singapore Ministry of Education, Educational Technology Division, 'Technologies of scientific inquiry, technologies of inquiry learning', Apr-2014.
- Singapore Ministry of Education & Science Centre Singapore, 'Weather and climate through inquiry learning', Apr-2014.
- Singapore Ministry of Education, Educational Technology Division, 'Interactive GIS applications to help students learn plate tectonics', Feb-2014.
- Singapore Ministry of Education & Academy of Singapore Teachers, 'Plate tectonics through inquiry learning', Feb-2014.
- Singapore Ministry of Education, Academy of Singapore Teachers, & National Institute of Education, 'Volcanology field seminar at Batur volcano' (w/ Antonius Ratdomopurbo, Kaler Surata), Kintamani/Tampaksiring/Ubud, Bali, Indonesia, Jun-2013.
- Singapore Ministry of Education & Academy of Singapore Teachers, 'Plate tectonics through inquiry learning' (w/ Susan Eriksson), Jan-2013.
- Academy of Singapore Teachers, 'MRT to magma chamber: field inquiry on plate tectonics and the rock cycle at Little Guilin, Singapore', Mar-2013.
- Singapore International Science Teachers Conference, Singapore Ministry of Education & Science Centre Singapore, 'Using science to understand how the Earth works', Nov-2012.
- Southeast Asian Geography Association 11th Conference, 'MRT to magma chamber: field inquiry on plate tectonics and the rock cycle at Little Guilin, Singapore', Nov-2012.
- Singapore Ministry of Education, Academy of Singapore Teachers, & National Institute of Education, 'Volcanology field seminar on Merapi volcano' (w/ Antonius Ratdomopurbo, Fidel Costa, Caroline Bouvet de Maisonneuve, Susan Eriksson) Yogyakarta, Indonesia, Jun-2012.
- Humanities Educators Conference, Singapore Ministry of Education, Raffles Institution, 'Simple messages are not simple: connecting earthquake and tsunami hazard research to risk-mitigation practice in West Sumatra', May-2012.
- Humanities Educators Conference, Singapore Ministry of Education, Raffles Institution, 'Volcanoes, earthquakes, and plate tectonics in Sumatra: an inquiry workshop with authentic data. (w/ Susan Eriksson), Singapore, May-2012.
- Singapore Ministry of Education, Academy of Singapore Teachers, & Science Centre Singapore, 'Secondary geography classroom integration of the exhibition Earth: Our Untamed Planet', Apr-2012.

Singapore Ministry of Education, Academy of Singapore Teachers, & Science Centre Singapore, 'A-level geography classroom integration of the exhibition Earth: Our Untamed Planet', Apr-2012.

Hwa Chong Institution, Singapore, 'How can we live safely and sustainably on this dynamic planet?' Apr-2012.

Republic Polytechnic, Singapore, Science Congress 2012, 'GPS: a new view of earthquakes', Jan-2012.

Rotary Club of Singapore West, 'Singapore: an often-quiet corner of a very active region of our planet', Sep-2011.

Singapore Ministry of Education & Raffles Institution, 'Climate-change science: an inquiry approach', Apr-2011.

Singapore Ministry of Education & Raffles Institution, 'Atmosphere and weather: an inquiry approach', Mar-2011.

Hwa Chong Institution, Singapore, 'Earth systems science', Mar-2011.

Singapore Ministry of Education, Academy of Singapore Teachers, & National Institute of Education, 'Volcanology field seminar on Merapi volcano', (w/ Chris Newhall, Antonius Ratdomopurbo) Yogyakarta, Indonesia, Nov-2010.

## Grants

### **Aftermath of Aid (Earth Observatory of Singapore Research Grant)**

SS\$570,000, 2013-2017, Co-Investigator, interdisciplinary social science research project on long-term outcomes following 2004 tsunami and international reconstruction in Aceh, Indonesia.

### **Education for disaster risk reduction, Mentawai Islands and Padang City, Indonesia (Earth Observatory of Singapore Research Grant)**

SS\$75,300, 2011-2014, Co-Investigator, supported efforts to communicate earthquake/tsunami hazard and collaborate with local stakeholders for risk reduction.

### **Geological Society of America Summer Research Grant**

US\$2440, 2000-2001, supported field work for my M.S. thesis on the glacial geology of the southwest Tahoe basin.

## Awards

### **Outstanding Student Poster and PICO Award**

2017, European Geosciences Union General Assembly, for 'Societal acceptance of unnecessary evacuation'.

### **Outstanding Masters Degree Student in Geological Sciences**

University of Nevada, Reno, academic year 2000-2001.

### **Women's Auxiliary to the American Institute of Metallurgical Engineers Scholarship-Loan**

2000-2001, supported academic and living expenses during the academic year, US\$8000.

### **Megathlin Award for Outstanding Senior in Geological Sciences**

1998, SUNY Geneseo.

## Skills

### **Languages:**

English: *native*

Indonesian: *fluent*

Malay, French, Spanish: *intermediate*

German: *basic*

Swedish: *stored somewhere in long-term memory*

**Computer:**

*Proficient:* R (statistical programming), LaTeX (typesetting), HTML, MaxQDA (qualitative data analysis)

*Some experience:* GMT (Generic Mapping Tools), SQL (database language), IDL (Interactive Data Language), ArcGIS, QGIS, NetLogo

**Laboratory:**

Luminescence dating, SEM, sedimentology, rock thin-section preparation, petrographic analysis, paleomagnetism

**Other service**

**Conference organiser:**

Co-convener, Society for Risk Analysis Europe Annual Meeting, 2016, symposium: 'The social side of early warning and evacuation decisions' (w/ Anna Scolobig)

Co-convener, American Geophysical Union Fall Meeting 2014, Seismology session: 'Science and societal lessons from a decade of giant megathrust earthquakes'. (w/ Andrew Newman, Lujia Feng, Aron Meltzner)

Selection committee, International Centre for Aceh and Indian Ocean Studies 5th Conference, 2014

**Reviewer:**

International Journal of Disaster Risk Reduction

Asian Journal on Environmental and Disaster Mangement

**Committees:**

International Advisory Board, International Centre for Aceh and Indian Ocean Studies, Indonesia

Hiring committee for Education and Outreach Director, Earth Observatory of Singapore

Co-chair, Northeastern Association for Schools and Colleges (NEASC, USA) Accreditation Committee for Curriculum and Instruction, Acton-Boxborough Regional High School, MA, USA