

CURRICULUM VITAE

Alexander van Geen
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Education Ph.D. Oceanography, Massachusetts Institute of Technology-Woods Hole Oceanographic Institution, Cambridge, MA, 1989
Thesis title: "Trace metal sources for the Atlantic inflow to the Mediterranean Sea" (Edward A. Boyle, advisor).
B.S. Oceanography, B.S. Chemistry (cum laude), University of Washington, Seattle, WA, 1982

Employment 2010- Lamont Research Professor
2000-2010 Doherty Senior Research Scientist
1997, 2002, Professeur Invité, Université d'Aix-Marseille III, France.
1997-2000 Research Scientist, Lamont-Doherty Earth Observatory
1994-1997 Associate Research Scientist, LDEO
1993 Adjunct Research Scientist, LDEO
1990-1993 Post-doctoral investigator, Water Resources Division, U.S. Geological Survey, Menlo Park, California
1989-1990 Post-doctoral fellow, Department of Civil and Environmental Engineering, Stanford University
1984-1989 Research assistant, Department of Earth, Atmospheric and Planetary Sciences, MIT
1982-1984 Watch officer on Dutch navy research vessel *Tydeman*

Research interests

From chemical oceanography and paleoceanography, my interests have increasingly turned to interactions between the environment and human health. The theme that runs through my ongoing projects is that patterns of contamination, e.g. arsenic (As) in well water of across South Asia or lead (Pb) in soil contaminated with mine tailings in the Peruvian Andes, are spatially highly variable. This complicates prediction but also creates opportunities for mitigation. My students and I promote more widespread deployment of field kits for testing water and soil, developing new kits if necessary, in order to identify and avoid exposure to toxins of children in particular. I tend to focus on the vulnerability of (and access to) uncontaminated water or soil by working with earth scientists and engineers, as well as public health and social scientists.

Selected professional activities

Member of the Earth Institute faculty, January 2011-

Convener of two ICDP workshops to develop new sampling technologies for groundwater studies, Salt Lake City (technical feasibility, 8/2010) and Hanoi (science plan, 4/2011)
Convener, US-Mexico workshop on climate research funded by NSF (August 2009)
Co-convener, AGU Chapman conference on groundwater arsenic (Cambodia, March 2009)
Associate Director, the Earth Clinic of the Earth Institute at Columbia University, 2008-2012
Chair, AQUATRAN advisory committee (EU Research Training Network, 2007-2010).
Panelist, Agence Nationale de la Recherche, Sciences de l'Univers et Geoenv., Paris, 2006
Committee member, the Earth Clinic of the Earth Institute at Columbia University, 2005-
Committee member, Cross-Cutting Initiatives of the Earth Institute at Columbia U, 2005-
Associate Director, Columbia University NIEHS Superfund Basic Research Program, 2000-
US patent 7,336,362 for reagents in arsenic field kit, 2008
Invited by UNICEF to present Columbia arsenic mitigation program, Bangkok, 2002.
Interviewed by the BBC, *Scientific American*, *Science*, *Popular Science*, *Geotimes*, *The Economist*, *La Recherche*, *Frankfurter Allgemeine* and others about arsenic in Bangladesh.
NSF panelist, Marine Geology and Geophysics, 1997 and 2000.
Chief scientist, RV *Melville*, 1999; RV *Pt Sur*, 1995 and 1997.

Graduate advisees:

Zanna Chase (PhD DEES Columbia, 2001), Francesco Fiondella (MS DEES/JS Columbia, 2001), Renee Takesue (PhD DEES Columbia, 2002), Ken Kostel (MS DEES/JS, Columbia, 2002), Alisa Opar (MS DEES/JS Columbia, 2004), Sophie Thorat (Thèse de Doctorat, U. Aix-Marseille III, 2004), Alberto Sanchez (PhD 2006, UABC, Ensenada, Mexico), Allan Horneman (PhD 2005 DEEE, Columbia), Amy Schoenfeld (MS DEES/JS Columbia 2005), Jerome Metral (DESS University of Grenoble, 2005), Ratan Dhar (PhD CUNY 2006), Jessica Leber (MS DEES/JS Columbia, 2007), Karrie Radloff (PhD 2010 DEEE Columbia), Zahid Aziz (PhD 2011 DEES, Columbia U.), Peter Knappet (PhD 2010 Earth and Planetary Sciences, U. Tennessee), Christine George (PhD 2012 MSPH, Columbia), S. Xiah Kragie (MS 2012, DEES Columbia), John Feighery (PhD 2013, DEEE Columbia), Ivan Mihaljov (PhD 2013, DEES Columbia), Meridel Phillips (MS DEEE 2014), Yongfeng Jia (PhD 2015, China University of Geosciences, Beijing), Prabhat Barnwal (PhD 2015 SDEV Columbia U.), Md. Rajib Hassan Mozumder (PhD 2019, DEES, Columbia), Franziska Landes (PhD 2019, DEES, Columbia), Anand Kumar (PhD 2019, TERI University, India), Runti Choudhury (PhD 2017, IIT Guwahati, India), Brittany Huhmann (PhD 2018, MIT), Asif Javed (PhD candidate, Quaid-i-Azam University, Pakistan), Junaid Ali Khattak (PhD candidate, Quaid-i-Azam University, Pakistan), Ursula Ellis (Screenwriting and Directing MFA Thesis, Columbia 2016), Josalynn Smith (Screenwriting MFA Thesis, Columbia 2018), Sarah Inman (PhD candidate Sustainable Development, Columbia, 2019).

Undergraduate advisees:

Anna Schmidt (1995, Boston College), Stefan Petranek (1996, Bowdoin College), Cristina Rumbaitis (1996, Columbia U.), Anna Michel (1996, MIT), Maryann Sapanara (1997, MIT), Elisabeth Scheidecker (U. South Carolina, 1998), Amanda Scdoris (Barnard College, 1999), Dina Stamler (Barnard College, 1999), Julien Emile-Geay (Ecole Normale Superieure, Paris; 2000), Marta Vicarelli (Ecole Normale Superieure, Paris; 2002), Roseline Louis (Ecole Normale Superieure de Chimie, Rennes, France; 2004), Cristina Ortega (U. Chile, Santiago, Chile; 2005), Anya Manning (Barnard College, 2006), Sajaa Ahmed (Columbia College, 2007), Laura Seidman (Columbia College, 2007), Alexandrina Tzanova (Columbia College,

2008), Misheal Artani (Barnard College, 2008); Annael Goupil (Ecole Normale Supérieure de Chimie, Rennes, France; 2010), Lucy Stowe (Columbia College, 2011), Fiona Kinniburgh (Columbia College, 2012); Joelle Boxer (Columbia College, 2016); James Gibson (Vassar College, 2018).

High school advisees:

Stefan Petranek (1995, Horace Greeley High School, Chappaqua, NY), Joy Ann Mahabir (2005, Bronx High School of Science, NY), Thomas Bidal d'Asfeld (2006, Lycée Jean-Baptiste-Say, Paris), Pamela Mishkin (Horace Mann High School, 2010-11), Capucine Le Meur (2013, Lycée Français de New York), Andrew Terraciano, Daniel Dusevic, Evan Sefchick, Jack Dougherty (2018-2020, all at Pelham Memorial High School, Westchester Co.).

Manuscripts in preparation/in review:

Nghiem AA, Y Shen, MO Stahl, J Sun, E Haque, K Nguyen, TT Mai, PT Trang, PH Viet, BJ Mailloux, CF Harvey, A van Geen, BC Bostick. Spectroscopic classification reveals active sediment redox transformations and resulting groundwater arsenic contamination. In review *Nature Geoscience*, February 2020.

Huhmann BL, CF Harvey, A Navas-Acien, A van Geen. A mass-balance model to re-assess arsenic exposure from multiple wells in Araihasar, Bangladesh. In preparation.

Huhmann BL, CF Harvey, MIT student, A Uddin, I Choudhury, KM Ahmed, JM Duxbury, B. Bostick, A van Geen. Evaluation of a field kit for testing arsenic in paddy soil of Bangladesh. In revision for *Geoderma*, May 2020.

Kumar, A, C K Singh, M S Bhatti, B Mailloux, J Mey, A van Geen. Geogenic arsenic and fluoride in groundwater of the Indus basin. Submitted to *Science of the Total Environment*, February 2017.

Peer-reviewed journal publications:

185. van Geen A., Y. Yao, T. Ellis, A. Gelman. Fallout of lead over Paris from the 2019 Notre-Dame cathedral fire. Submitted to *GeoHealth*, accepted June 2020.

184. Mozumder RH, BC Bostick, M Selim, A Islam, EM Shoenfelt, T Ellis, BJ Mailloux, I Choudhury, KM Ahmed, A van Geen. Similar Retardation of Arsenic in Gray Holocene and Orange Pleistocene Sediments: Evidence from Field-Based Column Experiments in Bangladesh. Submitted to *Water Research*, accepted June 2020.

183. Mailloux B, N Procopio, M Bakker, T Chen, I Choudhury, KM Ahmed, T Ellis, MR Mozumder, S Chillrud, A van Geen. Recommended sampling intervals for arsenic in private wells. *Groundwater*, accepted May 2020.

182. Mozumder MRH, H.A. Michael, I. Mihajlov, M.R. Khan, P.S.K. Knappett, B.C. Bostick, B. J. Mailloux, K.M. Ahmed, I. Choudhury, T. Koffman, T. Ellis, K. Whaley-Martin, R. San

Pedro, G. Slater, M. Stute, P. Schlosser, A. van Geen. Origin of groundwater arsenic in a rural Pleistocene aquifer in Bangladesh depressurized by distal municipal pumping. *Water Resources Research*, accepted April 2020.

181. Mihajlov I, MRH Mozumder, BC Bostick, M Stute, BJ Mailloux, PSK Knappett, I Choudhury, KM Ahmed, P Schlosser, A van Geen. Arsenic contamination of Bangladesh aquifers exacerbated by clay layers. *Nature Communications* 11, 2244 (2020). <https://doi.org/10.1038/s41467-020-16104-z>

180. Javed A, A Farooqi, ZU Baig, T Ellis, A van Geen. Soil arsenic but not rice arsenic increasing with arsenic in irrigation water in the Punjab plains of Pakistan. *Plant and Soil* (2020). DOI: 10.1007/s11104-020-04518-z.

179. Kumar A, B Bostick, A Nghiem, B Mailloux, A van Geen. Regulation of groundwater arsenic concentrations in the Ravi, Beas, and Sutlej floodplains of Punjab, India. *Geochim. Cosmochim. Acta* 276, 384-403 (2020). <https://doi.org/10.1016/j.gca.2020.03.003>

178. Krupoff M, AM Mobarak, A van Geen. Evaluating Strategies to Reduce Arsenic Poisoning in South Asia: A View from the Social Sciences. *Asian Development Review*, accepted March 2020.

177. Tarozzi A, R Maertens, KM Ahmed, A van Geen. Demand for information on environmental health risk, mode of delivery, and behavioral change: Evidence from Sonargaon, Bangladesh. *World Bank Economic Review* lhaa009 (2020). <https://doi.org/10.1093/wber/lhaa009>

176. Filippelli G, S Anenberg, M Taylor, A van Geen, H Khreis. New approaches to identifying and reducing the global burden of disease from pollution. *GeoHealth* <https://doi.org/10.1029/2018GH000167>.

175. Khan MR, HA Michael, B Nath, BL Huhmann, CF Harvey, A Mukherjee, M Chakraborty, I Choudhury, MS Ullah, KM Ahmed, SL Goodbred, Jr., P Schlosser, BC Bostick, BJ Mailloux, A van Geen. High-arsenic groundwater in the southwestern Bengal Basin caused by a lithologically controlled deep flow system. *Geophysical Research Letters* 46. <https://doi.org/10.1029/2019GL084767>.

174. Landes, F., Inauen, J. Ponce, J.C., Markowski, K., Ellis, T., van Geen, A. Landes, F. C., Inauen, J., Ponce- Canchihuamán, J., Markowski, K., Ellis, T. K., & van Geen, A. (2019). Does involving parents in soil sampling identify causes of child exposure to lead? A case study of community engagement in mining-impacted towns in Peru. *GeoHealth*, 3, 218–236. <https://doi.org/10.1029/2019GH000200>

173. Nghiem AA, MO Stahl, BJ Mailloux, TT Mai, PT Trang, PH Viet, CF Harvey, A van Geen, BC Bostick. Quantifying Riverine Recharge on Redox Conditions and Arsenic Release in Groundwater Aquifers along the Red River, Vietnam. *Water Resources Research*, 2019. doi.org/10.1029/2019WR024816

172. Landes F, A Paltseva, J Sobolewski, Z Cheng, T Ellis, B Mailloux, A van Geen. A field procedure to screen soil for hazardous lead. *Analytical Chemistry* 91, 8192-8198, 2019. doi.org/10.1021/acs.analchem.9b00681
171. Jamil NB, Feng H, Ahmed KM, Choudhury I, Barnwal P, van Geen A. Effectiveness of different approaches to arsenic mitigation over 18 years in Araihaazar, Bangladesh: Implications for national policy. *Environmental Science and Technology* 53: 5596–5604. 2019. DOI: 10.1021/acs.est.9b01375
170. Huhmann BL, CF Harvey, A Uddin, I Choudhury, KM Ahmed, JM Duxbury, T Ellis, A van Geen. Inversion of high-arsenic soil for improved rice yield in Bangladesh. *Environmental Science and Technology* 53, 3410–3418, 2019.
169. Huhmann BL, CF Harvey, A Navas-Acien, J Graziano, F Parvez, Y Chen, M Argos, A Ahmed, AKMR Hasan, H Ahsan, A van Geen. Changes in arsenic exposure in Araihaazar, Bangladesh from 2001 through 2015 following a blanket well testing and education campaign. *Environment International* 125, 82-89, 2019.
168. van Geen A, A Farooqi, A Kumar, JA Khattak, N Mushtaq, I Hussain, T Ellis, CK Singh. Field testing of over 30,000 wells for arsenic across 400 villages of the Punjab plains of Pakistan and India: Implications for prioritizing mitigation. *Science of the Total Environment* 654, 1358-1363, 2019.
167. Sanchez, T, V Slavkovich, N LoIacono, A van Geen, T Ellis, S Chillrud, O Balac, T Islam, MF Parvez, H Ahsan, J Graziano, A Navas-Acien. Urinary metals and metal mixtures in Bangladesh: Exploring environmental sources in the Health Effects of Arsenic Longitudinal Study (HEALS). *Environment International* 121, 852-860, 2018.
166. Choudhury R, B Nath, MR Khan, C Mahanta, T Ellis, A van Geen. The impact of aquifer flushing on groundwater arsenic across a 35-km transect perpendicular to the Upper Brahmaputra River in Assam, India. *Water Resources Research*, doi:10.1029/2017WR022485, 2018.
165. Wasserman G.A., X. Liu, F. Parvez, Y. Chen, P. Factor-Litvak, N. LoIacono, D. Levy, H. Shahriar, M.N. Uddin, T. Islam, A. Lomax, R. Saxena, E.A. Gibson, M.-A. Kiourmouzoglou, O. Balac, D. Santiago, T. Ellis, A. van Geen, J.H. Graziano. A cross-sectional study of water arsenic exposure and intellectual function in adolescence in Araihaazar, Bangladesh. *Environment International* 118, 304-313, 2018.
164. Sun J, Mailloux BJ, Chillrud SN, van Geen A, Thompson A, Bostick BC. Simultaneously quantifying ferrihydrite and goethite in natural sediments using the method of standard-additions with X-ray absorption spectroscopy. *Chemical Geology* 476, 248-259, 2018.

163. Huhmann, B. L., C. F. Harvey, A. Uddin, I. Choudhury, K. M. Ahmed, J. M. Duxbury, B. C. Bostick and A. van Geen. Field study of rice yield diminished by soil arsenic in Bangladesh. *Environmental Science and Technology* 51, 11553-11560, 2017.
162. Gnanaprakasamb E T, J R Lloyd, C Boothman, K M Ahmed, I Chowdhury, B C Bostick, A van Geen, B J Mailloux. The microbial community structure and arsenic biogeochemistry in two arsenic impacted aquifers in Bangladesh. *mBio* 8:e01326-17.2017, 2017.
161. Barnwal P, A van Geen, J von der Goltz, CK Singh. Demand for environmental quality information and household response: Evidence from well-water arsenic testing. *Journal of Environmental Economics and Management* 86, 160-192, 2017.
160. Haque E, BJ Mailloux, D De Wolff, S Gilioli, C Kelly, E Ahmed, C Small, KM Ahmed, A van Geen, BC Bostick. Quantitative drinking water arsenic concentrations measured using mobile phone photometry of field kits. *Science of the Total Environment* doi.org/10.1016/j.scitotenv.2016.12.123, 2017.
159. Whaley-Martin K J, B C Bostick, B J Mailloux, A van Geen, KM Ahmed, I Choudhury, G F Slater, Human and livestock waste as a reduced carbon source contributing to the release of arsenic to shallow Bangladesh groundwater. *Science of the Total Environment* 595, 63-71, 2017.
158. Pfaff A, Schoenfeld A, Ahmed KM, van Geen A. Reduction in exposure to arsenic limited by insufficient testing and awareness in Bangladesh. *Journal of Water, Sanitation and Hygiene for Development* 7, 331-339, 2017.
157. Khan M.R., Koneshloo M., Knappett P.S.K. Ahmed, K.M., Bostick B.C., Mailloux, B.J., Mozumder R.H., Zahid A., Harvey C.F., van Geen A., Michael H.A. Megacity pumping and preferential flow threaten groundwater quality. *Nature Communications* 7:12833 doi: 10.1038/ncomms12833, 2016.
156. Stahl, M, C Harvey, A van Geen, J Sun, P K T Trang, M L Vi, T M Phuoung, P H Viet. Stahl, M. O., C. F. Harvey, A. van Geen, J. Sun, P. Thi Kim Trang, V. Mai Lan, T. Mai Phuong, P. Hung Viet, B. C. Bostick. River bank geomorphology controls groundwater arsenic concentrations in aquifers adjacent to the Red River, Hanoi, Vietnam. *Water Resources Research* 52, 6321–6334, doi:10.1002/2016WR018891, 2016.
155. Whaley-Martin, K; Mailloux, B; van Geen, A; Bostick, B; Silvern, R; Kim, C; Ahmed, K; Choudhury, I; Slater, G. Stimulation of microbially-mediated arsenic release in Bangladesh aquifers by young carbon indicated by radiocarbon analysis of bacterial lipids. *Environmental Science and Technology* 50, 7353–7363, 2016.
154. Knappett, PSK, BJ Mailloux, I Choudhury, M Khan, H Michael, S Barua, DR Mondal, M Steckler, H Akter, KM Ahmed, B Bostick, C Harvey, M Shamsudduha, I Mihajlov, R

Mozumder, A. van Geen. Vulnerability of low-arsenic aquifers to municipal pumping in Bangladesh. *Journal of Hydrology* 539, 674–686, 2016.

153. Sanchez T.R., Levy D., Siddique A.B., Shahriar M.H., Uddin M.N., Lomax-Luu A., Graziano J., van Geen A., Gamble M.V. Provision of well-water treatment units to 600 households in Bangladesh: A longitudinal analysis of urinary arsenic indicates fading utility. *Science of the Total Environment* 563–564, 131–137, 2016.

152. Mihajlov I., M. Stute, P. Schlosser, B. J. Mailloux, Y. Zheng, I. Choudhury, K.M. Ahmed, A. van Geen. Recharge of low-arsenic aquifers tapped by community wells in Araihasar, Bangladesh, inferred from environmental isotopes. *Water Resources Research* 52, doi:10.1002/2015WR018224, 2016.

151. Aziz, Z., B. Bostick, Y. Zheng, M.R Huq, M.M. Rahman, K.M. Ahmed, and A. van Geen, Evidence of decoupling between arsenic and phosphate in shallow groundwater of Bangladesh and potential implications, *Applied Geochemistry* doi:10.1016/j.apgeochem.2016.03.001, 2016.

150. Choudhury, I., K.M. Ahmed, M. Hasan, M.R.H. Mozumder, P.S.K. Knappett, T. Ellis, A. van Geen. Evidence for elevated levels of arsenic in public wells of Bangladesh due to improper installation. *Groundwater* DOI: 10.1111/gwat.12417, 2016.

149. Wasserman, GA, X Liu, F Parvez, P Factor-Litvak, J Kline, AB Siddique, H Shahriar, M Nasirrudin, A van Geen, J Mey, O Balac, JH Graziano. Child intelligence and reductions in water arsenic and manganese: A two-year follow-up study in Bangladesh. *Environmental Health Perspectives*, DOI: 10.1289/ehp.1509974, 2015.

148. Radloff, KA, Y Zheng, M Stute, B Weinman, B Bostick, I Mihajlov, M Bounds, MM Rahman, MR Huq, KM Ahmed, P Schlosser, A van Geen. Adsorption and flushing of arsenic in a rapidly recharged shallow aquifer of Bangladesh. *Applied Geochemistry* DOI: 10.1016/j.apgeochem.2015.11.003 NIHMSID747884, 2015.

147. van Geen A, KM Ahmed, EB Ahmed, I Choudhury, MR Mozumder, BC Bostick, BJ Mailloux. Inequitable allocation of deep community wells for reducing arsenic exposure in Bangladesh. *Journal of Water, Sanitation and Hygiene for Development* 6, 142-150, 2016. DOI: 10.2166/washdev.2015.115. NIHMSID747882

146. Peters, BA, MN Hall, X Liu, P Factor-Litvak, F Parvez, A van Geen, JL Mey, AB Siddique, MH Shahriar, MN Uddin, MT Islam, V Slavkovich, V Ilievski, JH Graziano, MV Gamble. Folic acid and creatine as therapeutic approaches to lower blood arsenic: A randomized-controlled trial. *Environmental Health Perspectives* 123, 1294–1301, 2015.

145. Guillot S, L Charlet, D Tisserand, B Weinman, C France-Lanord, M Garcon, S Chakraborty, JRS Huyghe, A van Geen, BN Upreti, AP Gajurel. Origin of arsenic in Late Pleistocene to Holocene sediments in the Nawalparasi District (Terai, Nepal). *Environmental Earth Sciences* 74, 2571-2593, 2015.

144. Khan K, EB Ahmed, P Factor-Litvak, X Liu, Z Rahman, HA Ferdous, AB Siddique, GA Wasserman, V Slavkovich, D Levy, J Mey, A van Geen, JH Graziano. Evaluation of an elementary school-based educational intervention for reducing arsenic exposure in Bangladesh. *Environmental Health Perspectives* 123, 1331–1336, 2015.
143. Layton, A; A Chauhan, D Williams, B Mailloux, P Knappett, A Ferguson, L McKay, MJ Alam, KM Ahmed, A van Geen, G Sayler. Metagenomes of microbial communities in arsenic and pathogen contaminated well and surface water from Bangladesh. *Genome Announcements (genomeA)*. 2(6):e01170-14. doi:10.1128/genomeA.01170-14, 2014.
142. Deutsch C, Berelson W, Thunell R, Weber T, Tems C, McManus J, Crusius J, Ito T, Baumgartner T, Ferreira V, Mey J, van Geen A. Centennial changes in North Pacific anoxia linked to tropical trade winds. *Science* 345, 665-668, 2014.
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139. Harper, K.N., X. Liu, M.N. Hall, V. Ilievski, J. Oka, L. Calancie, V. Slavkovich, D. Levy, J.L. Mey, A. van Geen, J.H. Graziano, M.V. Gamble. A dose-response study of arsenic exposure and markers of oxidative damage in Bangladesh. *Journal of Occupational and Environmental Medicine* 56: 652-8, 2014.
138. van Geen A, EBA Sumon, L Pitcher, JL Mey, H Ahsan, JH Graziano, KM Ahmed. Comparison of two blanket surveys of arsenic in tubewells conducted 12 years apart in a 25 km² area of Bangladesh. *Science of the Total Environment* 488-489, 484-92, 2014.
137. van Geen A, KH Win, T Zaw, W Naing, JL Mey, B Mailloux. Confirmation of elevated arsenic levels in groundwater of Myanmar. *Science of the Total Environment* 478, 21-24, 2014.
136. Chen Y, Wu F, Parvez F, Ahmed A, Eunus M, McClintock TR, Patwary TI, Islam T, Ghosal AK, Islam S, Hasan R, Levy D, Sarwar G, Slavkovich V, van Geen A, Graziano JH, Ahsan H. Arsenic exposure from drinking water and QT-interval prolongation: results from the Health Effects of Arsenic Longitudinal Study. *Environ Health Perspect.* 2013 Apr;121(4):427-32. PMID: PMC3620737.
135. Knappett, P.K., J. Du, P. Liu, V. Horvath, B. J. Mailloux, J. Feighery, A. van Geen, P. J. Culligan. Importance of reversible attachment in predicting *E. coli* transport in saturated aquifers from column experiments. *Advances in Water Resources* <http://dx.doi.org/10.1016/j.advwatres.2013.11.005>, 2013.

134. Balasubramanya S, A Pfaff, L Bennear, A Tarozi, KM Ahmed, A Schoenfeld, A van Geen, Evolution of households' responses to the groundwater arsenic crisis in Bangladesh: information on environmental health risks can have increasing behavioral impact over time. *Environment & Development Economics*, doi:10.1017/S1355770X13000612, 2013.
133. Niedzwiecki, MN, MN Hall, X Liu, J Oka, KN Harper, V Slavkovich, V Ilievski, D Levy, A van Geen, JL Mey, S Alam, AB Siddique, F Parvez, JH Graziano, MV Gamble. A dose–response study of arsenic exposure and global methylation of peripheral blood mononuclear cells in Bangladeshi adults. *Environmental Health Perspectives* DOI:10.1289/ehp.1206421, 2013.
132. van Geen, BC Bostick, PTK Trang, VM Lan, NN Mai, PD Man, PH Viet, K Radloff, Z Aziz, JL Mey, MO Stahl, CF Harvey, P Oates, B Weinman, C Stengel, F Frei, R Kipfer, M Berg. Retardation of arsenic transport through a Pleistocene aquifer. *Nature* 501: 204–207, 2013.
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