

CURRICULUM VITA

A. PERSONAL

EDWARD A. SUDICKY

Birthdate: September 14, 1953

Professor Emeritus & Adjunct, Department of Earth & Environmental Sciences, University of Waterloo

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Degrees Received:

DEGREE	INSTITUTION	YEAR
B.A.Sc.	University of Waterloo	1977
M.Sc.	University of Waterloo	1979
Ph.D.	University of Waterloo	1983

Honours and Scholarships Received:

- China 1000 Plan Distinguished Visiting Professor, College of Water Resources Engineering, Hohai University, 2013-present
- National Ground Water Association (NGWA) M. King Hubbert Award, 2007
- University of Waterloo, Faculty of Science Alumni Honour Award, 2007
- 2007 Kisiel Memorial Lecture, Department of Hydrology & Water Resources, University of Arizona
- Fellow of the Royal Society of Canada, elected 2005
- Fellow of the Canadian Academy of Engineering, elected 2003
- Marquis Who's Who in Science and Engineering, 2003-
- Canadian Who's Who, 2005-
- Leading Scientists of the World, International Biographical Centre, Cambridge, UK, 2005-
- Honouree, Geological Society of America Special Technical Session on "Twenty Years of Exploration and Innovation in Quantitative Hydrogeology: In Honour of Ed Sudicky", 2003 GSA Annual Meeting, Seattle.
- Canada Research Chair (Tier I), Quantitative Hydrogeology, 2001-2015

- American Geophysical Union, Hydrology Section, Hydrology Award, 2002
- Geological Society of America, O.E. Meinzer Award, 1999
- Fellow of the Geological Society of America, elected 1999
- Fellow of the American Geophysical Union, elected 1995
- Current Contents, ISI Thompson Scientific, *Highly Cited Researcher*, top one half of one percent of all papers published worldwide in the field of Engineering
- Henry Darcy Distinguished Lecturer, Association of Ground Water Scientists and Engineers, 1994 (38 lectures delivered at universities and research institutions in Canada, the United States, Israel and the United Kingdom).
- University Research Fellowship, Natural Sciences and Engineering Research Council of Canada, 1985-1994
- Pearson Medal, University of Waterloo award for outstanding research in Earth Sciences, 1983
- Post-graduate Scholarship, Natural Sciences and Engineering Research Council of Canada, 1980-1983
- Ontario Graduate Scholarship, 1978-1979

EMPLOYMENT HISTORY:

Dates	Position	Institution
2017-present	Professor Emeritus	Department of Earth Sciences University of Waterloo, Waterloo, Ontario
2001-2015	Canada Research Chair (Tier I)	Department of Earth Sciences University of Waterloo, Waterloo, Ontario
2002-2005	Associate Dean of Research	Faculty of Science University of Waterloo Waterloo, Ontario
1997-2000	Chair	Department of Earth Sciences University of Waterloo, Waterloo, Ontario
1994-2017	Professor	Department of Earth Sciences University of Waterloo, Waterloo, Ontario
1991-1994	Associate Professor	Department of Earth Sciences University of Waterloo, Waterloo, Ontario

1989-1991	Research Associate Professor	Department of Earth Sciences University of Waterloo, Waterloo, Ontario
1984-1988	Research Assistant Professor	Department of Earth Science University of Waterloo, Waterloo, Ontario
1983-1984	NSERC Postdoctoral Fellow	Department of Earth Sciences, University of Waterloo, Waterloo, Ontario

B. RESEARCH & SCHOLARSHIP

1. Areas of Interest

Mathematical modelling of groundwater flow and contaminant transport in hydrogeologic systems by numerical and analytical methods. Groundwater remediation. Stochastic analysis of flow and mass transport in heterogeneous porous and fractured geologic media. Field-scale tracer dispersion tests, groundwater hydraulics and statistical characterization of spatial variability of material properties at field sites. Theory and modelling of surface/subsurface flow, solute and energy transport from the watershed to the continental scale.

2. Publications

a) Refereed Journal Articles

- 143 Xu, X., Frey, S.K., Boluwade, A., Erler, A., Khader, O., Lapen, D. and Sudicky, E.A., 2019. Evaluation of variability among different precipitation products in the Northern Great Plains. *Jour. Hydrol.* (accepted pending minor revision).
- 142 Hwang*, H.-T., Park*, Y.-J., Frey, S.K., Pintar, K.D.M, Lapen, D.R., Thomas, J.L., Spoelstra, J., Schiff, S.L. Brown, S.J. and Sudicky, E.A. 2019. Estimating cumulative wastewater treatment plant discharge influences on acesulfame and *Escherichia coli* levels with a fully integrated hydrologic model, *Water Research.* (accepted pending minor revision).
- 141 Hwang*, H.-T., Park*, Y.-J., Frey, S.K., Callaghan, M., Berg, S., Lapen, D.R. and Sudicky, E.A., 2019. Efficient Numerical Incorporation of Water Management Operations in Integrated Hydrosystem Models,: Application to Tile Drainage and Reservoir Operating Systems, *Jour. Hydrol.* (accepted pending minor revision).
- 140 Berg, S.J. and Sudicky, E.A., 2019. Toward Large-Scale Integrated Surface and Subsurface Modeling, *Ground Water*, Guest Editorial, 57(1), pp. 1-2.
- 139 Berg, S.J., Grosso, N.R., Sherrier, M.P., Mudrick, K., Ohr, M., Hwang, H.-T., Park, Y.-J., Callaghan, M.V., Frey, S.K. and Sudicky, E.A., 2019. Natural Stimuli Calibration with Fining Direction Regularization in an Integrated Hydrologic Model, *Ground Water*, 57(1), pp. 21-35.
- 138 Erler, A.E., Frey, S.K., Khader, O., d'Orgeville, M., Park, Y.-J., Hwang, H.-T., Lapen, D., W. Peltier, W.R. and Sudicky, E.A., 2019. Simulating Climate Change Impacts on Surface Water Resources within a Lake Affected Region using Regional Climate Projections, *Water Resour. Res.* (in press).
- 137 Hwang*, H.-T., Park*, Y.-J., Sudicky, E.A., Berg, S.J., McLaughlin, R. and Jones, J.P., 2018, Understanding

- the Water Balance Paradox in the Athabasca River Basin, Alberta, Canada, *Hydrol. Proc.*, 32(6), pp. 729-746.
- 136 Davison*, J.H., Hwang*, H.-T., Sudicky, E.A., Mallia, D.V. and Lin, J.C., 2018. Full Coupling Between the Atmosphere, Surface and Subsurface for Integrated Hydrologic Modeling, *Jour. Adv. Modeling Earth Systems*. 10(1), pp. 43-53.
- 135 Miller, K.L., Berg, S. J., Davison, J.H., Sudicky, E.A. and Forsyth, P.A., 2018. Efficient uncertainty quantification in fully-integrated surface and subsurface simulations, *Adv. Water Resour.*, vol. 111, pp. 381-394, <https://doi.org/10.1016/j.advwatres.2017.10.023>.
- 134 Haslauer, C.P., Bardossy, A. and Sudicky, E.A., 2017. Detecting and modelling structures on the micro and macro scales: Assessing their effects on solute transport behavior, *Adv. Water Resour.*, 107, pp. 439-450.
- 133 Kurtz, W., Lapin, A., Schilling, O.S., Tanga, Q., Schiller, E., Torsten Braun, T., Hunkeler, D., Vereecken, H., Sudicky, E.A., Kropf, P., Hendricks Franssen, H.-J. and Brunner, P., 2017. Integrating hydrological modelling, data assimilation and cloud computing for real-time management of water resources, *Environ. Modelling & Software*, vol. 93, pp. 418-435, <http://dx.doi.org/10.1016/j.envsoft.2017.03.011>.
- 132 Kollet, S., Sulis, M., Maxwell, R., Paniconi, C., Putti, M., Bertoldi, G., Coon, E.T., Cordano, E., Endrizzi, S., Kikinzon, E., Mouche, E., Mügler, C., Park, Y.-J., Simon Stisen, S. and Sudicky, E.A., 2017. The Integrated Hydrologic Model Intercomparison Project, IH-MIP2: A second set of benchmark results to diagnose integrated hydrology and feedbacks, *Water Resour. Res.*, 53(1), pp. 867-890.
- 131 Hwang, H.-T., Park, Y.-J., Frey, S. K., Berg, S. J. and Sudicky, E.A., 2016. A simple iterative method for estimating evapotranspiration with integrated surface/subsurface flow models, *Jour Hydrol.*, 177, 43-53.
- 130 Davison, J.H., Sudicky, E.A. and Lin, J.C., 2015. Coupled atmospheric, land surface, and subsurface modeling: Exploring water and energy feedbacks in three dimensions, *Adv. Water Resour.*, vol. 86, pp. 73-85
- 129 Hwang, H.-T., Jeon, S.-W., Sudicky, E.A. and Illman, W.A. 2015. Determination of rate constants and branching ratios for TCE degradation by zero-valent iron using a chain decay multispecies model, *Jour. Contam. Hydrol.*, <doi:10.1016/j.jhydrol.2015.10.003>, vol. 177-178, pp. 43-53.
- 128 Hou, T., Zhu, Y., Lu, H., Sudicky, E.A., Yu, Z. and Ouyang, F., 2015. Parameter sensitivity analysis and optimization of Noah land surface model with field measurements from Huaihe River Basin, China, *Stochastic Environ. Res. And Risk Assess.*, 29(5), doi: 10.1007/s00477-015-1033-5, pp. 1383-1401.
- 126 Bockhorn, B., Klint, K.E.S., Locatelli, L., Park, Y.J., Binning, P.J., Sudicky, E.A. and Jensen, M.B., 2015. Factors affecting the hydraulic performance of infiltration based SUDS in clay, *Urban Water Jour.*, <doi.org/10.1080/1573062X.2015.1076860>, 9 pp.
- 125 Hwang, H.-T., Park, Y.-J., Sudicky, E.A. and Forsyth, P.A., 2014. A parallel computational framework to solve flow and transport in integrated surface-subsurface flow systems, *Environmental Modelling & Software*, vol. 61, pp. 39-58.
- 124 Yang, T., Wang, X.-Y., Yu, Z., Krysanova, V., Chen, X., Schwartz, F.W., and; Sudicky, E.A., 2014. Climate change and probabilistic scenario of streamflow extremes in an alpine region, *Jour. Geophys. Res. – Atmospheres*, 119(14), pp. 8535-8551.
- 123 Bierkens, M.F.P., Bell, V., Burek, P., Chaney, N., Condon, L., David, C., de Roo, A., Döll, P., Drost, N., Flörke, M., Gochis, D., Houser, P., Hut, R., Kollet, S., Maxwell, R., Reager, T., Samaniego, L., Sudicky, E.A., Sutanudjaja, E.H., van der Giessen, N., Winsemius, N. and Wood, E.F., 2015. Hyper-resolution global hydrological modelling: What is next? “Everywhere and locally relevant”, *Hydrol. Process.*, 29(2), pp. 310-320, DOI: 10.1002/hyp.10391.

- 122 Maxwell, R.M., Putti, M., Meyerhoff, S., Delfs, J.-O., Ferguson, I.M., Ivanov, V., Kim, J., Kolditz, O., Kollet, S.J., Kumar, M., Lopez, S., Niu, J., Paniconi, C., Park, Y.-J., Phanikumar, M.S., Shen, C., Sudicky, E.A. and Sulis, M., 2014. Surface-subsurface model intercomparison: A first set of benchmark results to diagnose integrated hydrology and feedbacks, *Water Resour. Res.*, 50(2), pp. 1531-1549.
- 121 Yu, Z., Lu, Q., Zhu, J., Yang, C., Ju, Q., Yang, T., Chen, X. and Sudicky, E.A., 2014. Spatial and temporal scale effect in simulating hydrologic processes in a watershed, *Jour. Hydrologic Engineering*, 19(1), pp. 99-107.
- 120 Zhu, Y., Ren, R., Horton, R., Lu, H., Chen, X., Jia, Y., Wang, Z and Sudicky, E.A., 2013. Estimating the contribution of groundwater to rootzone soil moisture, *Hydrology Res.*, 44(6), pp. 1102-1113.
- 119 Hwang, H.-T., Park, Y.-J., Sudicky, E.A., Unger, A.J.A., Frappe, S.K. Shouakar-Stash, O. and Illman, W.A., 2013. A multiphase flow and multispecies reactive transport model for DNAPL-involved Compound Specific Isotope Analysis, *Adv. Water Resour.*, vol. 59, <http://dx.doi.org/10.1016/j.advwatres.2013.05.009>, pp. 111-122.
- 118 Sudicky, E.A., Hwang, H.-T., Illman, W.A., Wu, Y.-S., Kool, J. B. and Huyakorn, P., 2013. A semi-analytical solution for simulating groundwater fate and transport of contaminants subject to chain-decay reactions, *Journ. Contam. Hydrol.*, vol. 144, doi.org/10.1016/j.jconhyd.2012.10.001, pp. 2-46.
- 117 Brookfield, A.E. and Sudicky, E.A., 2013. Implications of hyporheic flow on temperature-based estimates of groundwater/surface water interactions, *Jour. Hydrol. Eng.*, 18(10), pp. 1250-1261.
- 116 Sharmeen, S., Illman, W.A., Berg, S.J., Yeh, T.-C., Park, Y.-J., Sudicky, E.A. and Ando, K., 2012. Transient hydraulic tomography in a fractured dolostone: Laboratory rock block experiments, *Water, Resour. Res.*, VOL. 48, W10532, [doi:10.1029/2012WR012216](http://doi.org/10.1029/2012WR012216), 20 pp.
- 115 McLaren, R.G., Sudicky, E.A., Park, Y.-J. and Illman, W.A., 2012. Numerical simulation of DNAPL emissions and remediation in a fractured dolomitic aquifer. *Jour. Contam. Hydrol.*, vol. 136-137, [doi:10.1016/j.jconhyd.2012.05.002](http://doi.org/10.1016/j.jconhyd.2012.05.002), pp. 56-71.
- 114 Haslauer, C.P., Guthke, P., Bardossy, A and Sudicky, E.A., 2012. Effects of non-Gaussian Copula-based hydraulic conductivity fields on macrodispersion, *Water, Resour. Res.*, 48, [doi:10.1029/2011WR011425](http://doi.org/10.1029/2011WR011425), 18pp.
- 113 Moffett, K.B., Gorelick, S.M., McLaren, R.G. and Sudicky, E.A., 2012. Salt marsh ecohydrological zonation due to heterogeneous vegetation-groundwater-surface water interactions. *Water Resour. Res.*, 48, W02516, [doi:10.1029/2011WR010874](http://doi.org/10.1029/2011WR010874), 22 pp.
- 112 Bolger, B.L., Park, Y.-J., Unger, A.J.A. and Sudicky, E.A., 2011. Simulating the pre-development hydrologic conditions in the San Joachuin Valley, California, *Jour. Hydrol.*, vol. 411, [doi:10.1016/j.jhydrol.2011.10.013](http://doi.org/10.1016/j.jhydrol.2011.10.013), 9pp.
- 111 Park, Y.-J., Sudicky, E.A., Brookfield, A.E. and Jones, J.P., 2011. Hydraulic response of catchments to precipitation: Quantification of mechanical carriers and origins of water, *Water Resour. Res.*, vol. 47, DOI: [10.1029/2011WR010075](http://doi.org/10.1029/2011WR010075).
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- 109 Lu, Haishen, Yu, Zhongbo, Zhu, Yonghua, Drake, Sam, Hao, Zhenchun and Sudicky, Edward A., 2010. Dual state-parameter estimation of root zone soil moisture by optimal parameter estimation and extended Kalman filter data assimilation. *Adv. Water Resour.*, *Adv. Water Resour.*, 34(3), <http://dx.doi.org/10.1016/j.advwatres.2010.12.005>, 12pp.

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- 107 Lemieux, J.-M. and Sudicky, E.A., 2010. Glaciations and groundwater flow systems. In: V.P. Singh, P. Singh and U.K. Haritashya eds. *Encyclopedia of Snow, Ice and Glaciers*, Springer, Heidelberg, Germany (accepted).
- 106 Sudicky, E. A., Illman, W. A., Goltz, I. K., Adams, J. J. and McLaren, R. G., 2010. Heterogeneity in hydraulic conductivity and its role on the macroscale transport of a solute plume: From measurements to a practical application of stochastic flow and transport theory, *Water Resour. Res.*, 46, W01508, doi:10.1029/2008WR007558, 16pp.
- 105 Lemieux, J.-M. and Sudicky, E. A., 2010. Simulation of groundwater age evolution during the Wisconsinian glaciation over the Canadian landscape, *Environmental Fluid Mechanics*, 10(1-2): doi:10.1007/s10652-009-9142-7, pp 91-102.
- 104 Wu, Y.-S., Ming, Y. and Sudicky, E.A., 2010. Fracture-flow-enhanced matrix diffusion in solute transport through fractured porous media, *Transport in Porous Media*, Vol. 81, DOI 10.1007/s11242-009-9383-4, pp 21-34.
- 103 Schwartz, F.W., Sudicky, E.A., McLaren, R.G., Park, Y.-J., Huber, M. and Apte, M., 2010. Ambiguous hydraulic heads and ^{14}C activities in transient regional flow, *Ground Water*, doi: 10.1111/j.1745-6584.2009.00655.x, 14 pp.
- 102 Park, Y.-J., Sudicky, E.A., Panday, S. and Matanga, G., 2009. Implicit sub-time stepping for solving the nonlinear equations of flow in an integrated surface-subsurface system, *Vadose Zone J.*, 8(4), doi:10.2136/vzj2009.0013, pp 825-836.
- 101 Park, Y.-J., Sudicky, E.A., and Sykes, J.F., 2009. Effects of shield brine on the safe disposal of waste in deep Geologic environments, *Adv. Water Resour.*, 32(8), doi:10.1016/j.advwatres.2009.06.003, pp 1352-1358.
- 100 Brookfield, A.E., Sudicky, E.A., Park, Y.-J. and Conant, B. Jr., 2009. Simulation of thermal stream loadings using a fully-integrated surface/subsurface modeling framework, *Hydrol. Processes*, 23(15), DOI: 10.1002/hyp, 15pp.
- 99 Sykes, J.F., Normani, S.D., Jensen, M.R. and Sudicky, E.A., 2009. Regional scale groundwater flow in a Canadian Shield setting, *Can. Geotech. Jour.*, Vol. 46(7), doi:10.1139/T09-017, 15pp.
- 98 Maji, R. and Sudicky, E.A., 2008. Influence of mass transfer characteristics for DNAPL source depletion and contaminant flux in a highly characterized glaciofluvial aquifer, *Jour. Contam. Hydrol.*, 102, doi:10.1016/j.jconhyd.2008.08.005, 15pp.
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- 95 Li, Q., Unger, A.J.A., Sudicky, E.A., Kassenaar, D., Wexler, E.J. and Shikaze, S., 2008. Simulating the multi-seasonal response of a large-scale watershed with a 3D physically-based hydrologic model, *Jour. Hydrol.*, Vol. 357 (3-4), doi:10.1016/j.jhydrol.2008.05.024, 20pp.

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- 70 Slough, K.J., Sudicky, E.A. and Forsyth, P.A., 1999. Numerical simulation of multiphase flow and phase partitioning in discretely-fractured geologic media, *Jour. Contam. Hydrol.*, 40(2), 107-136.
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- 67 Annable, W.K. and Sudicky, E.A., 1998. Simulation of karst genesis: hydrodynamic and geochemical rock water interactions in partially-filled conduits. *Bulletin d'Hydrogéologie*, 16, 211-221.
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Therrien, R. and Sudicky, E.A., 1991. Three-dimensional analysis of variably-saturated groundwater flow and solute transport in discretely-fractured porous media, AGU Fall meeting, San Francisco, December, 1991.

Farrell, D.A., Woodbury, A.D., Sudicky, E.A. and Rivett, M., 1991. Geostatistical analysis of fluctuating waterlevels at the Borden tracer-test site, AGU Fall meeting, San Francisco, December, 1991.

Robin, M.J.L., Sudicky, E.A. and Gutjahr, A.L., 1991. Cross-correlated random field generation with the direct Fourier transform, AGU Fall meeting, San Francisco, December, 1991.

Haley, D.F., Sudicky, E.A. and Tenti, G., 1991. Can the cumulant-discard technique lead to a consistent theory of macrodispersivity in stochastic groundwater transport problems? AGU Fall meeting, San Francisco, December, 1991.

Sudicky, E.A., Y.S. Wu and Z. Saleem, 1991. Semi-analytical approach for simulating transport of a seven-member branched decay chain in 3D groundwater systems, AGU Spring meeting, Baltimore, May, 1991.

Sudicky, E.A., Therrien, R. and Brusseau, M.L., 1990. Three-dimensional analysis of solute transport in heterogeneous aquifers under multiprocess nonequilibrium conditions, Int. conf. on Transport and Mass Exchange Processes in Sand and Gravel Aquifers: Field and Modelling Studies, Ottawa, Ontario, October, 1990.

Robin, M.J.L., Sudicky, E.A. and Gillham, R.W., 1990. Factorial sensitivity analysis of reactive solute transport in heterogeneous porous media, Int. conf. on Transport and Mass Exchange Processes in Sand and Gravel Aquifers: Field and Modelling Studies, Ottawa, Ontario, October, 1990.

Goltz, I.K. and Sudicky, E.A., 1990. Spatial variability of hydraulic conductivity in a sandy aquifer at North Bay, Ontario. Int. conf. on Transport and Mass Exchange Processes in Sand and Gravel Aquifers: Field and Modelling Studies, Ottawa, Ontario, October, 1990.

Woodbury, A.D. and Sudicky, E.A., 1990. A re-examination of the geostatistical characteristics of the Borden aquifer, Int. conf. on Transport and Mass Exchange Processes in Sand and Gravel Aquifers: Field and Modelling Studies, Ottawa, Ontario, October, 1990.

Solomon, D.K., Poreda, R.J., Sudicky, E.A., Schiff, S. and Cherry, J.A., 1990. Tritium and tritiogenic helium-3 as indicators of travel times and dispersion in shallow aquifers, Int. conf. on Transport and Mass Exchange Processes in Sand and Gravel Aquifers: Field and Modelling Studies, Ottawa, Ontario, October, 1990.

Barker, J.F., Hubbard, C.E., Sudicky, E.A., Patrick, G. and Berry-Spark, K., 1990. BTEX persistence in groundwaters: A comparison of results from three natural gradient field experiments, AGU Fall Meeting, San Francisco, December, 1990.

Mase, C.W., McKay, L., Sims, J., Sudicky, E.A. and Unger, A., 1990. Hydrogeology of desiccated fractured clays, AGU Fall meeting, San Francisco, December, 1990.

Sudicky, E.A., 1989. The Laplace transform Galerkin technique for large-scale simulation of mass-transport in discretely fractured porous formations, AGU Fall meeting, San Francisco, December, 1989.

Saleem, Z., Kool, J.B., Sudicky, E.A. and Huyakorn, P.S., 1989. A composite model for simulating multiple species contaminant transport from land disposal units, AGU Fall meeting, San Francisco, December, 1989.

Shutter, S.B., Sudicky, E.A., and Robertson, W.D., 1989. Impact on groundwater of a single family septic system: Mathematical modelling, SETAC, 10th Annual meeting, Toronto, ON, November 1989.

Robin, M.J.L., Gillham, R.W. and Sudicky, E.A., 1989. Spatial variability of strontium distribution coefficients and their correlation with hydraulic conductivity at the C.F.B. Borden aquifer, IAHS/AGU Spring meeting, Baltimore, MD, May, 1989.

Brusseau, M.L., Sudicky, E.A. and Rao, P.S.C., 1989. Solute transport under nonideal conditions, IAHS/AGU Spring meeting, Baltimore, MD, May, 1989.

Sudicky, E.A., Robertson, W.D., Cherry, J.A., Rapaport, R.A. and Shimp, R.J., 1988. Behaviour of consumer product chemicals in the subsurface at septic system sites, SETAC, ninth annual meeting on Reducing Uncertainty in Environmental Risk Assessment, Arlington, VA, Nov. 13-17, 1988.

Sudicky, E.A., 1988. Simulation of biodegradable contaminant transport under oxygen limiting conditions in heterogeneous groundwater flow fields. Interdisciplinary Workshop on Modelling and Computation of Transport Phenomena, University of Waterloo, December, 1988.

3. Invited Addresses at Conferences

The following does not include the 38 invited lectures given by Dr. Sudicky during his 1994 tenure as the AGWSE Henry Darcy Distinguished Lecturer.

Sudicky*, E.A., Frey, S.K., Park, Y.-J., Hwang, H.-T., Callaghan, M.V., Berg, S.J., Khader, O., Stonebridge, G., Boluwade, A., Xu, X., Zhang, D. and Erler, A., 2018. Integrated 3D Surface-Subsurface Hydrosystem Modeling Across Scales, *Invited Speaker, Conf. on Resources for Future Generations (RFG), Vancouver, Canada, June 16-21, 2018.

Sudicky*, E.A., 2017. Modelling Large-scale Basins with HydroGeoSphere: Example Applications and Outstanding Research Topics. *Keynote Speaker, 4th HydroGeoSphere Workshop, University of Bayreuth, Bayreuth, Germany, March 6-8, 2017.

Sudicky*, E.A., 2017. Real-time Cloud-based Hydrologic Risk Assessment Platform Development for Watershed-scale Applications. *Keynote Speaker, IBM-SOSCIP Impact Conference 2017, May 9th, 2017, Toronto, Canada.

Sudicky*, E.A., 2017. Big Models Need Big Data: Integrated Hydrosystem Modelling in Canada, E.A. Sudicky, GAC-MAC Annual Meeting, Kingston, Ontario, May 16, 2017.

Sudicky*, E.A., 2015. Integrated Surface/Subsurface Hydrologic Simulation: Perspectives, Applications and Future Directions. *Invited Speaker, Top-Level Forum on Engineering Science and Technology Development Strategy, Nanjing Hydraulic Research Institute, Nanjing, China, May 29-30, 2015.

Sudicky*, E.A., 2015. Integrated Hydrosystem Modelling: From Theory to Practice. *Invited Speaker, Hydrology Forum Honoring Hohai University's 100th Anniversary, College of Hydrology and Water Resources, Hohai University, China, October 26, 2015.

Sudicky*, E.A., 2015. Integrated Surface/Subsurface Hydrologic Simulation: Perspectives, Applications and Future Directions. *Invited Speaker, International Conference on Integrated HydroSystem Modelling, University of Tuebingen, Tuebingen Germany, April 7-10, 2015.

Sudicky*, E.A., 2014. Integrated surface/subsurface hydrologic simulation: Perspectives, applications and future directions, Source Water Protection Modelling Workshop, Nottawasaga Inn, Alliston, Ontario, November 17, 2014.

Sudicky*, E.A., 2014. Recent advances in coupled climate-hydrology simulation, *Invited Speaker, College of Hydrology and water Resources, Hohai University, China, June 15, 2014.

Sudicky*, E.A., Hwang, H.-T., Berg, S., Park, Y.-J., Erler, A., Peltier, W.R. and McLaughlin, R., 2014. Analyzing the impact of climate change on water resources in the Athabasca River Basin, *Invited Speaker, COSIA Water Conf., Edmonton Alberta, March 11-13, 2014.

Sudicky*, E.A., Frey, S.K., Hwang, H.-T. and Park, Y.-J., 2014. Example applications of a physically-based 3D surface-subsurface hydrologic model over multiple spatial and temporal scales , *Invited Speaker, AGU Fall meeting, San Francisco, December, 2014.

Sudicky*, E.A., 2014. HydroGeoSphere: A 3D physically-based integrated surface/subsurface modelling approach, *Invited Speaker, Hyper-Resolution Hydrologic Modelling Workshop, University of Utrecht, Netherlands, February 13-14, 2014.

Sudicky*, E.A., 2013. A physically-based modelling approach to assess the impact of climate change on Canadian surface and subsurface water resources, *Invited Speaker, InterPore 2013, Prague, May 21-24, 2013.

Sudicky*, E.A., Impact of climate change on Canadian surface water and groundwater resources: A continental-scale hydrologic modelling study using multiple high-resolution RCM projections, *Invited Speaker, School of Hydrology and Water Resources, Hohai University, March 23, 2012

Sudicky*, E.A., 2012. A physically-based modelling approach to assess the impact of climate change on Canadian surface and groundwater resources, *Invited Speaker, University of Nebraska-Lincoln, Water Center, School of Natural Resources and Department of Earth & Atmospheric Sciences, April 20, 2012.

Sudicky*, E.A., 2012. A physically-based modelling approach to assess the impact of climate change on Canadian surface and groundwater resources, *Invited Speaker, International Space Science Institute Workshop on The Earth's Hydrological Cycle, Bern, Switzerland, February 6-10, 2012.

Sudicky*, E.A., Chen, J., Park, Y.-J., Hwang, H.-T., Ross, M., Gula, J. and Peltier, W.R., 2011. A physically-based approach to assess the impact of climate change on Canadian water resources. *Keynote Speaker, Karlsruhe Institute of Technology Sino-German Symposium, Garmisch-Partenkirchen, Germany, October 24-28 2011.

Sudicky*, E.A., Chen, J., Park, Y.-J., Hwang, H.-T., Ross, M., Gula, J. and Peltier, W.R., 2011. A physically-based approach to assess the impact of climate change on Canadian water resources. *Keynote Speaker, ModelCare 2011, Leipzig, Germany, September 18-22 2011.

Sudicky*, E.A., Chen, J., Park, Y.-J., Ross, M., Lemieux, J.-M., Gula, J. and Peltier, W.R., 2011. Simulation of groundwater flow over the Canadian landscape: From an ice age to future climate conditions, *Keynote Speaker, IAHCNC/CANQUA GeoHydro 2011, Quebec City, August 28-31 2011 .

Sudicky*, E.A., 2011. Integrated 3D surface-subsurface modelling to assess the impact of climate change on Canadian water resources, *Invited Speaker, University of Tübingen, June 3, 2011.

Sudicky*, E.A., Chen, J., Park, Y.-J. and Peltier, W.R., 2011. A physically-based approach to assess the impact of climate change on Canadian water resources, *Invited Speaker, Third International Multidisciplinary Conference on Hydrology and Ecology, Vienna, Austria, 2-5, May, 2011.

Sudicky*, E.A., 2011, Impact of climate change on surface and groundwater resources over the Canadian landmass, *Keynote Speaker, 2nd Annual HydroGeoSphere Users Conf., Hannover, Germany, April 11-13, 2011.

Sudicky*, E.A., 2011. Flow, contaminant and thermal energy transport in integrated surface-subsurface flow systems: Model applications over multiple spatial and temporal scales. *Invited Speaker, Technical University of Catalonia, Barcelona, Spain, February 23, 2011.

Sudicky*, E.A., Chen, J., Peltier, W.R. and Park, Y.-J., 2010. A physically-based approach to assess the impact of climate change on Canadian water resources, *Invited Speaker, AGU Fall meeting, San Francisco, December, 2010.

Sudicky*, E.A., Lemieux, J.-M., Chen, J., Park, Y.-J. and Peltier, W.R., 2010. A physically-based approach to assess the impact of climate change on Canadian water resources, *Invited Departmental Speaker, Department of Geological Sciences, University of Nevada, Las Vegas, December 1, 2010.

Park*, Y.-J., Sudicky*, E.A., Colautti, D. and Brookfield, A.E., 2010. Impact of climate change on water resources in the Grand River Watershed and in Canada, *Invited Speakers, A.D. Latonell Conservation Symposium, Nottawasaga Inn, Alliston Ontario, November 17-19, 2010.

Sudicky*, E.A., Chen, J., Peltier, W.R. and Park, Y.-J., 2010. A physically-based approach to assess the impact of climate change on Canadian water resources, *Keynote Speaker , 5th International Symposium on Water Resources Management, Hohai University, Nanjing, China, November 19-21, 2010.

Sudicky*, E.A., 2010. Flow, contaminant and thermal energy transport in integrated surface-subsurface flow systems: Model applications over multiple spatial and temporal scales, *Invited Speaker, National Cheng-Kung University and Central Geological Survey of Taiwan, Taipei, Taiwan, September 12-18, 2010.

- Sudicky*, E.A., 2010. Surface/Subsurface Hydrological Model Development and Data Integration: Need for a Community Effort, *Keynote Speaker, 1st Helmholtz-UFZ Water Research Horizon Conference: “New Initiatives in Water Research”, Berlin, Germany, July 12-14.
- Sudicky*, E.A., 2010. Perspectives on Three Decades of Field Experiments at the Borden Site, *Keynote Speaker, Thirty Years of Stochastic Hydrology, Monte Verita, Switzerland, June 28-July 2, 2010.
- Sudicky*, E.A., 2010. Insights from Coupled Surface/Subsurface Hydrological Simulations: From the Scale of a Rainfall-runoff Experiment to the Continental Scale, *Invited Speaker, IAHS Symposium, “Groundwater Quality 2010”, Zurich, Switzerland, June 13-18, 2010.
- Sudicky*, E.A., 2010. Insights from Coupled Surface/Subsurface Hydrological Simulations: From the Scale of a Rainfall-runoff Experiment to the Continental Scale, *Invited Speaker, Helmholtz-UFZ Centre for Environmental Research, Leipzig, Germany, March 22, 2010.
- Sudicky*, E.A., 2010. Recent *HydroGeoSphere* Applications Involving Temperature Simulations, *Keynote Speaker, Workshop of HydroGeoSphere Users in Europe, Université de Liège, Liège, Belgium, March 25-26, 2010,
- Sudicky*, E.A., 2010. Insights from Coupled Surface/Subsurface Hydrological Simulations: From the Scale of a Rainfall-runoff Experiment to the Continental Scale, *Invited Speaker, Australian National Centre for Groundwater Research and Training, Flinders University, Adelaide, Australia, , February 8-11, 2010.
- Sudicky*, E.A., Chen, J., Peltier, W.R. and Park, Y.-J., 2009. A Physically-based Approach to Assess the Impact of Climate Change on Canadian Water Resources, AGU Fall meeting, San Francisco, December, 2009.
- Sudicky*, E.A., 2009. Flow, Contaminant and Thermal Energy Transport in Integrated Surface-subsurface Flow Systems: Model Applications over Multiple Spatial and Temporal Scales, *Invited Speaker, Geological Society of America Annual Meeting, Portland, Oregon, October 18-21, 2009.
- Sudicky*, E.A., 2009. Flow, Contaminant and Thermal Energy Transport in Integrated Surface-subsurface Flow Systems: Model Applications over Multiple Spatial and Temporal Scales, *Keynote Speaker, International Conference on Water Conservation in Arid Regions, Jeddah, Saudi Arabia, October 12-14, 2009.
- Sudicky*, E.A., 2009. Flow, Contaminant and Thermal Energy Transport in Integrated Surface-subsurface Flow Systems: Model Applications over Multiple Spatial and Temporal Scales, *Keynote Speaker, ModelCare09: International Conference on Model Calibration and Reliability, Wuhan, China, September 20-23, 2009.
- Sudicky*, E.A., Brookfield, A.E. and Park, Y.-J., 2009. Analysis of Factors Affecting the Spatio-temporal Patterns of Thermal Exchange Fluxes Between Streams and Groundwater, *Keynote Speaker, HydroEco 2009, Hydrology and Ecology: Ecosystems Interfacing with Groundwater and Surface Water, Vienna, Austria, April 20-23, 2009.
- Sudicky*, E.A., 2009. Flow, Contaminant and Thermal Energy Transport in Integrated Surface-Subsurface Flow Systems: Model Applications over Multiple Spatial and Temporal Scales, *Keynote Speaker, Aquaterra Final Conference on Processes-Data-Models-Future Scenarios, Tübingen, Germany, March 25-27, 2009.
- Sudicky*, E.A., 2009. Perspectives on Community Modeling of Integrated Ground Water And Surface Water, *Keynote Speaker, CUAHSI 2nd Workshop on a Community Hydrologic Modeling Platform, University of Memphis, March 31 – April 1, 2009.
- Sudicky*, E.A., Brookfield, A.E., Park, Y.-J. and McLaren, R.G., 2009. Analysis of Factors Affecting the Spatio-temporal Patterns of Thermal Exchange Fluxes Between Streams and Groundwater, *Invited Speaker, University of Bayreuth, Germany, January 22, 2009.
- Sudicky*, E.A., Brookfield, A.E., Park, Y.-J. and McLaren, R.G., 2009. Analysis of Factors Affecting the Spatio-

temporal Patterns of Thermal Exchange Fluxes Between Streams and Groundwater, *Invited Speaker, University of Tübingen, Germany, January 16, 2009.

Sudicky*, E.A., Brookfield, A.E., Park, Y.-J. and Conant Jr., B., 2008. Simulation of thermal stream loadings using a fully-integrated surface/subsurface modelling framework, *Keynote Speaker, HydroPredict 2008, Prague, Czech Republic, September 15-18, 2008.

Sudicky*, E.A., 2008. Integrated Modelling of Surface-Subsurface Flow Systems Over Multiple Scales, *Invited Speaker, Computational Methods in Water Resources XVII International Conference, San Francisco, CA, July 6-10, 2008.

Sudicky*, E.A., 2008. Simulation of Flow and Contaminant Transport in Surface-Subsurface Flow Systems in a Fully-Integrated Framework, *Keynote Speaker, National Ground Water Association "Groundwater Summit", Memphis, Tennessee, March 30-April 3, 2008.

Sudicky*, E.A., 2007. Surface and Subsurface Hydrology in the Ice Age, *Invited Union Lecture, Union Session US008, Our Changing Planet, International Union of Geodesy and Geophysics, Perugia, Italy, July 2-13, 2007

Sudicky*, E.A., Lemieux, J.-M., Unger, A.J.A., Therrien, R., Peltier, W.R. and Tarasov, L., 2007. Flow and Contaminant Transport in Integrated Surface-subsurface Flow Systems: Model Applications Over Multiple Spatial and Temporal Scales, *Keynote Speaker, ModelCARE 2007, 6th International Conference on Calibration and Reliability in Groundwater Modelling, Copenhagen, Denmark, September 10-13, 2007.

Sudicky*, E.A., Park, Y.-J., Unger, A.J.A., Jones, J.P., Brookfield, A.E., Colautti, D., Therrien, R. and Graf, T., 2006. Simulating Complex Flow and Contaminant Transport Dynamics in an Integrated Surface-subsurface Modelling Framework, Geological Society of America Annual Meeting, Philadelphia, Pennsylvania, October 22-25, 2006.

Sudicky*, E.A., Brookfield, A.E., Colautti, D., Jones, J.P., Park, Y.-J., Therrien, R. and Graf, T., 2006. Simulating Flow, Heat and Contaminant Transport in Integrated Surface-subsurface Flow Systems, *Keynote Speaker, IAHS International Symposium "HydroEco'06", Karlovy Vary, Czech Republic, September 11-14, 2006.

Sudicky*, Park, Y.-J., Sykes, J.F., Jones, J.P., Brookfield, A.E. and Colautti, D., 2006. Simulating Complex Flow and Transport Dynamics in an Integrated Surface-Subsurface Modelling Framework, *Invited speaker, International Symposium on "Our Future Resources, Groundwater" Jeju, Korea, May 24-26, 2006.

Sudicky*, E.A., Jones, J.P., Lemieux, J.-M., Park, Y.-J., Colautti, D., McLaren, R.G., Therrien, R., Diouf, C.W. and Panday, S., 2006. Simulating Flow and Contaminant Transport in Integrated Surface-subsurface Flow Systems: Model Applications at Multiple Catchment Scales, *Invited speaker, 3rd Federal Interagency Hydrologic Modeling Conference, Reno, Nevada, April 2-6, 2006.

Sudicky*, E.A., 2005. On the Challenge of Simulating Integrated Surface-subsurface Flow and Contaminant Transport at Multiple Catchment Scales, Invited speaker*, Symposium Celebrating New Fellows of the Royal Society of Canada, Fields Institute, University of Toronto, November 14, 2005.

Sudicky*, E.A., Therrien, R., Park, Y.-J., McLaren, R.G., Jones, J.P., Lemieux, J.-M., Brookfield, A.E., Colautti, D., Panday, S., Guvanase, D., 2005. On the Challenge of Integrated Surface-subsurface Flow and Transport Modelling at Multiple Catchment Scales, Invited speaker*, Geological Society of America Annual Meeting, Salt Lake City, Utah, October 16-19, 2005.

Sudicky*, E.A., 2005. Simulating Flow and Contaminant Transport in Integrated Surface-subsurface Flow Systems: Model Applications at Multiple Catchment Scales, Keynote speaker*, UNESCO IHP VI workshop on Groundwater-Surface Water Interactions and Nutrient Behaviour in River Corridors, Oxford University, UK, September 11-14, 2005.

Sudicky*, E.A., Jones, J.P. and Brookfield, A.E., 2005. Quantifying Groundwater Contributions to Streamflow

Generation: The Reliability of Tracer-based Hydrograph Separation Techniques, Keynote speaker*, ModelCARE 2005, 5th International Conference on Calibration and Reliability in Groundwater Modelling: From Uncertainty to Decision Making, The Hague, Netherlands, June 6-9, 2005.

Sudicky*, E.A., Di Iorio, T.A., Jones, J.P., R.G. McLaren and Therrien, R., 2004. Holistic Simulation of Flow and Contaminant Transport in Integrated Surface-subsurface Flow Systems at the Catchment Scale, Invited speaker*, 57th Canadian Geotechnical Conference, Quebec City, October 24-26, 2004.

Sudicky*, E.A., Di Iorio, T.A., Jones, J.P., Park, Y.-J., Lemieux, J.-M., Brookfield, A., McLaren, R.G., Therrien, R. and Panday, S., 2004. Flow and Contaminant Transport in Integrated Surface-subsurface Flow Systems at the Catchment Scale: Numerical Solution Strategy and Application, Invited speaker*, FEM_MODFLOW International Conference on Finite Element Models, MODFLOW and More, Karlovy Vary, Czech Republic, September 13-16, 2004.

Sudicky*, E.A., Di Iorio, T.A., Jones, J.P. and McLaren, R.G., 2003. A Holistic Approach for Simulating Flow and Contaminant Transport in Integrated Surface-subsurface Flow Systems, Invited speaker*, Geological Society of America Annual Meeting, Seattle, Washington, November, 2003.

Sudicky*, E.A., Di Iorio, T.A., Jones, J.P. and McLaren, R.G., 2002. Three-dimensional analysis of surface-subsurface water and solute exchange fluxes near streams: An integrated modelling approach, Geological Society of America Annual Meeting, Denver, Colorado, November, 2002.

Sudicky*, E.A., Jones, J.P., Di Iorio, T.A., Park, Y.-J., McLaren, R.G. and VanderKwaak, J.E., 2002. Recent Computational advances and applications in the area of fully-integrated surface-subsurface flow and transport. Invited speaker*, ModelCARE 2002, 4th International Conference on Calibration and Reliability in Groundwater Modelling, June 17-20, 2002, Prague, Czech Republic.

Sudicky*, E.A., VanderKwaak, J.E., Jones, J.P., Keizer, J.P., and McLaren, R.G., 2002. Fully-integrated modelling of surface and subsurface water flow and solute transport: Model overview and applications, Invited speaker*, 28th Annual Meeting of the Canadian Geophysical Union, Banff Alberta, May 18-21, 2002.

Sudicky*, E.A., VanderKwaak, J.E., Jones, J.P., Keizer, J.P., McLaren, R.G., and Matanga, G.B., 2002. Fully-integrated modelling of surface and subsurface water flow and solute transport: Model overview and applications. Invited speaker*, Dubai International Conference on Water Resources and Integrated Management in the Third Millennium, February 2-6, 2002, Dubai, United Arab Emirates.

Sudicky*, E.A., Keizer, J.P. and Jones, J.P., 2001. Analysis of the impact of subsurface contaminant plumes on stream water quality under natural and managed conditions. Keynote speaker*, GQ'01, Third International Conference on Groundwater Quality, University of Sheffield, Sheffield, UK, June 18-21, 2001.

Sykes*, J.F., Sudicky*, E.A., Normani, S. and McLaren, R.G., 2001. Integration and evaluation of processes in basin-scale models of radionuclide transport. Invited speakers*, GEOTRAP 5 Workshop on Geological Evidence and Theoretical Bases for Radionuclide-Retention Processes in Heterogeneous Media, Oskarshamn, Sweden, May 7-9, 2001.

Sudicky*, E.A., 2001. Influence of Fracture Network and Rock Matrix Properties on DNAPL Migration in Fractured Rock. Keynote speaker*, Fractured Rock 2001, Ontario Ministry of the Environment, US department of Energy and US Environmental Protection Agency sponsored International Conference on Groundwater Flow, Solute Transport, Multiphase Flow and Remediation in Fractured Rock, Toronto, Ontario, March 26-28, 2001.

Sudicky*, E.A., Jones, J.P., Brunner, D.S., McLaren, R.G. and VanderKwaak, J.E., 2000. A fully-coupled model of surface and subsurface water flow: Model overview and application to the Laurel Creek watershed. Keynote speaker*, XIII International Conference on Computational Methods in Water Resources, Calgary, Alberta, July 26-29, 2000.

Sudicky*, E.A., 2000. Perspectives on two decades of tracer and organic chemical injection experiments in a sandy

aquifer at the Borden field site., Keynote speaker*, Groundwater'2000, IAHS International Conference on Groundwater Research, Copenhagen, Denmark, June 6-8, 2000.

Sudicky*, E.A., 2000. Perspectives on two decades of tracer and organic chemical injection experiments in a sandy aquifer at the Borden field site., Invited speaker*, TraM'2000, IAHS International Conference on Tracers and Modelling in Hydrogeology, Liege, Belgium, May 23-26, 2000.

Sudicky*, E.A., 1999. Perspectives on flow and mass transport in fractured porous media. Invited speaker*, Geological Society of America, Annual meeting, Denver, CO, October, 1999.

Sudicky*, E.A., 1999. On modelling coupled groundwater-surface water flow and transport, Invited speaker*, ModelCARE 99, IAHS International Conference on Model Calibration and Reliability, Zurich, Switzerland, September 20-23, 1999.

Sudicky*, E.A., 1999. Influence of fracture network and rock matrix properties on DNAPL migration in fractured rock. Keynote speaker*, Symp. on Dynamics of Fluids in Fractured Rocks in Honour of Paul A. Witherspoon's 80th Birthday, Feb. 10-12, 1999, Berkely, CA.

Sudicky*, E.A., 1998. Contaminant migration in complex structured porous and fractured-porous geologic media: A simulation perspective. Invited speaker*, Darcy Symposium, NGWA Annual Convention and 50th Anniversary, Las Vegas, NV, December, 1998.

Sudicky*, E.A., 1998. DNAPL migration in fractured porous rock: Parameter sensitivity, prediction uncertainty and implications for remediation. Invited speaker*, IAHS Int. Conf. on Groundwater Quality: Remediation and Protection, Tubingen, Germany, September 21-25, 1998.

Sudicky*, E.A. and VanderKwaak, J.E., 1996. A holistic approach to modeling hydrologic systems: Integrating models of stream, 2D overland and 3D variable-saturated subsurface flow and transport, Keynote speaker*, ModelCARE 96 meeting on Model Calibration and Reliability, Golden, Colorado, September, 1996.

Sudicky*, E.A., Forsyth, P.A., Unger, A.J.A. and Slough, K.J., 1996. Multiphase flow and interphase mass transfer processes in heterogeneous porous and fractured porous media, Invited speaker*, Gordon Research Conf. on Modeling Flow in Permeable Media, Andover, New Hampshire, August 4-8, 1996.

Sudicky*, E.A., Unger, J.J.A. and Forsyth, P.A., 1995. Efficiency and robustness of vacuum extraction coupled with air sparging to remediate heterogeneous sandy aquifers contaminated with DNAPL: Multi-realization simulation results, Invited speaker*, AGU Fall meeting, San Francisco, December, 1995.

Sudicky, E.A. and van Genuchten, M.Th., 1995. Recent advances in vadose zone flow and transport modeling, Invited speakers, Kearney Foundation of Soil Science International Conference on Vadose Zone Hydrology: Cutting Across Disciplines, Davis, California, September 6-8, 1995.

Sudicky*, E.A., 1995. Contaminant migration in complex-structured porous and fractured-porous geologic media: A simulation perspective, Invited speaker*, Mexico Forum on Ground Water Remediation, Mexico City, December 5-6, 1995.

Sudicky*, E.A., 1994. Status of groundwater flow and transport modelling in fractured unlithified aquitards, Invited speaker*, Geological Society of America Penrose Conf. on Fractured Unlithified Aquitards: Origins and Transport Processes, Racine, Wisconsin, June 15-20, 1994.

Sudicky*, E.A., Haley, D.F. and Naff, R.L., 1993. Three-dimensional Monte Carlo analysis of nonreactive and reactive solute transport by groundwater: Spatial spreading and prediction uncertainty in heterogeneous aquifers, Invited speaker*, AGU Fall meeting, San Francisco, December, 1993.

Sudicky*, E.A., VanderKwaak, J.E., and Therrien, R., 1993. Numerical simulation of contaminant plume formation and remediation in discretely-fractured porous media, Keynote speaker*, IAHS Intern. Conf. on Groundwater Quality Management, Tallinn, Estonia, September 6-9, 1993.

Sudicky*, E.A., 1993. Perspectives on contaminant transport by groundwater in complex-structured porous media, Keynote speaker*, Inst. of Indust. and Math. Sciences Conf. on Porous Media and the Environment, Winnipeg, May 7-8, 1993.

Sudicky*, E.A., 1993. Monte Carlo analysis of nonreactive and reactive solute transport in three-dimensional heterogeneous porous media: Mean displacement, plume spreading and uncertainty, Invited speaker*, SIAM Conf. on Math. and Comput. Issues in the Geosciences, Houston, April 19-21, 1993.

Sudicky*, E.A., 1992. Contaminant migration in complex-structured geologic media: From local-scale processes to field-scale behaviour, Invited speaker*, Special Session on Frontiers of Chemical Mass Transport in Contaminant Systems, Geological Society of America, Annual Meeting, Cincinnati, Ohio, October, 1992.

Sudicky*, E.A., 1992. Field and numerical experiments on contaminant migration in heterogeneous geologic media, Invited speaker*, Gordon Research Conference on Modeling of Fluids in Permeable Media, Plymouth State College, Plymouth, NH, August 10-14, 1992.

Sudicky*, E.A., 1992. Contaminant migration in complex-structured geologic media: From local-scale processes to field-scale prediction, Invited speaker*, Inst. for Math. and Applic., Summer Prog. on Environ. Studies: Math., Comp. and Stat. Analysis, Univ. Minn., July 1-31, 1992.

Sudicky*, E.A., 1992. Modelling of contaminant plumes in heterogeneous imperfectly known aquifers, Invited speaker*, Inter. Symp. on Groundwater Pollution at Waste Disposal Sites: Detection, Attenuation, and Remediation, Copenhagen, Denmark, May 20-22, 1992.

Sudicky*, E.A., 1989. Tracer tests in heterogeneous porous and fractured porous media. Invited speaker*, NATO/ASI Workshop on Transport Processes in Porous Media, Pullman, WA, July 9-18, 1989.

Sudicky*, E.A., 1989. Field tests and numerical experiments of tracer migration in fractured clay. Keynote speaker*, NWWA Symp. on Solving Ground Water Problems with Models, Indianapolis, Indiana, Feb. 7-9, 1989.

Sudicky*, E.A., 1988. Micro-scale model comparison of the behaviour of conservative and biodegradable solutes in heterogeneous porous media. Invited paper*, special session on Hierarchy of Scales in Subsurface Transport, AGU Fall meeting, San Francisco, December, 1988.

MacQuarrie, K.T.B. and Sudicky*, E.A., 1987. Numerical simulation of biodegradable organic contaminants in groundwater. Invited paper*, Symposium on Geochemical Reactions and Related Physical Processes Associated with Organic Contaminants in Groundwater, GSA Annual Meeting, Phoenix, October, 1987.

Barker, J.F., Cherry, J.A. and Sudicky*, E.A., 1987. Role of natural gradient field injection experiments in studies of organics behaviour in sand aquifers. Invited paper*, Symposium on Geochemical Reactions and Related Physical Processes Associated with Organic Contaminants in Groundwater, GSA Annual Meeting, Phoenix, October, 1987.

Sudicky*, E.A., 1987. A natural-gradient experiment on solute transport in a sand aquifer: spatial variability of hydraulic conductivity and its role in the dispersion process. Invited paper*, Symposium on Field Approaches and Measurement Techniques for Quantifying Spatial Variability in Porous Media, AGU Spring Meeting, Baltimore, May, 1987.

Sudicky*, E.A., 1985. Field measurement of spatial variability of hydraulic conductivity at a tracer test site. Invited presentation* at the 14th Annual Rocky Mountain Groundwater Conference, Fort Collins, Colorado, April 18-19, 1985.

Sudicky*, E.A., 1984. Results of mathematical and laboratory studies of matrix diffusion effects during solute migration in fractured rock. Invited presentation* at the Geological Society of America Penrose Conference on Transport Processes in Fractured Rock, Park City, September 23-28, 1984.

Sudicky*, E.A., 1984. Theoretical field and laboratory studies of contaminant dispersion in stratified porous media. Invited presentation* sponsored by Auburn University/U.S. EPA, Atlanta, Georgia, January 31- February 2, 1984.

C. TEACHING ACTIVITIES

1. Record of Courses Taught:

Undergraduate and Graduate Courses Taught:

Earth 355, Statistical Methods in Geology, (undergraduate), approx. class size: 30.

Earth 458, Physical Hydrogeology, (undergraduate), approx. class size: 40.

Earth 650, Theory of Porous Media Flow, (graduate), approx. class size: 25-40.

Earth 661, Analytical Methods in Mathematical Geology, (graduate), approx. class size: 10-15.

2. Contributions to the Training of Highly Qualified Personnel

(a) Post-doctoral Students Supervised

i) Completed:

3. Cornaton, F., 2004-2005. Research topic: Analysis of water age and exit time probability density functions and mean ages in fractured crystalline rocks in the presence of geologic uncertainties and uncertain flow system transients.
2. Ji, S.-H., 2005-2006. Research topic: Three-dimensional modeling of surface/subsurface flow and transport in integrated in an integrated framework.
1. Park, Y.-J., 2002-2006. Research topic: Three-dimensional modelling of fluid flow and mass transport in fractured crystalline rock. Now Research Assistant Professor, Department of Earth Sciences, University of Waterloo

(b) Ph.D.

i) Completed:

18. Davison, J., Defended: September 2016. Thesis title: Incorporating Advanced Surface and Subsurface Processes in Mesoscale Climate Models. Currently Assistant Professor, Catholic University of America, Washington, DC.
17. Chen, J., Convocated: June, 2015. Thesis title: Impact of Climate Change on Canadian Water Resources: A Continental-Scale Hydrologic Modelling Study Using Multiple RCM Projections. Currently employed by Nuclear Waste Management Organization, Toronto, Ontario.
16. Hwang, H.T., Convocated: June, 2012. Thesis title: Development of a Parallel Computational Framework to Solve Flow and Transport in Integrated Surface-subsurface Hydrologic Systems. Currently senior modelling analyst, Aquanty, Inc.
15. Colautti, D., Convocated: June, 2010. Thesis title: Modelling the effects of climate change on the surface and

subsurface hydrology of the Grand River Basin. Currently working as environmental consultant.

14. Brookfield, A. Convocated: June, 2009. Thesis title: Simulation of thermal energy transport in a fully-integrated surface/subsurface framework. Currently Research Scientist, Kansas Geological Survey and Assistant Professor, University of Kansas.
13. Lemieux, J.-M. Convocated: June, 2007. Thesis title: Impact of the Wisconsinian Glaciation on Canadian Continental Groundwater Flow. Currently Assistant Professor, University of Laval.
12. Maji, R., Convocated: June 2006. Thesis title: Conditional Stochastic Modelling of DNAPL Migration and Dissolution in a High-resolution Aquifer Analog. Currently employed by Golder Associates, Calgary, Alberta.
11. J.P. Jones, Convocated: June, 2005. Thesis title: Simulating Hydrologic Systems Using a Physically-based Surface-Subsurface Model: Issues Concerning Flow, Transport and Parameterization. Currently Adjunct Professor, Department of Earth and Environmental Sciences, University of Waterloo and research staff, Alberta Research Council.
10. W. Annable, Convocated: June, 2003. Thesis title: Numerical Analysis of Conduit Evolution in Karstic Aquifers. Currently Assistant Professor, Dept. of Civil Engineering, University of Waterloo.
9. D. Cecil (with S.K. Frappe), Convocated: June, 2001. Thesis title: The ^{36}Cl Isotopic Composition of U.S. Western Basinal Fluids as Indicators of Age. Currently Senior Research Scientist, US Geological Survey.
8. J. VanderKwaak, Convocated: May, 1999. Thesis title: Numerical Simulation of Flow and Chemical Transport in Integrated Surface-Subsurface Systems. Currently private consultant, Stanford, California.
7. K. MacQuarrie, Convocated: October, 1997. Thesis title: Multicomponent Simulation of Wastewater-derived Nitrogen and Carbon in Shallow Unconfined Aquifers. Currently Professor and Canada Research Chair (Tier I), Dept. of Civil Engineering, University of New Brunswick.
6. S. Young (with J.A. Cherry), Convocated: May, 1997. Thesis title: Application of Pump Tests and Sedimentological Models to Characterize the Hydrological Properties of Fluvial Aquifers. Awarded Pearson Medal for excellence in research. Currently employed in consulting industry, USA.
5. A. Unger (NSERC Postgraduate Scholar), Convocated: October 1995. Thesis title: Vacuum Extraction Coupled with Air Sparging for Remediation of Sandy Aquifers Contaminated by Volatile Chlorinated Solvents: A Multiphase Compositional Approach. Currently Associate Professor, Dept. of Earth Sciences, University of Waterloo.
4. M. Ibaraki (Government of Canada Award), Convocated: May 1994. Thesis title: Colloid-facilitated Contaminant Transport in Discretely-fractured Porous Media. Awarded Pearson Medal for excellence in research. Currently Associate Professor, Dept. of Geology, Ohio State University.
3. C. Mendoza (NSERC Postgraduate Scholar), Convocated: May 1993. Thesis title: Capillary Pressure and Relative Transmissivity Relationships Describing Two-phase Flow Through Rough-walled Fractures in Geologic Materials. Awarded Pearson Medal and University of Waterloo Alumni Gold Medal for excellence in research and University of Waterloo Outstanding Achievement in Graduate Studies Honour. Currently Associate Prof., Dept. Geology, University of Alberta.
2. R. Therrien (NSERC Postgraduate Scholar) Convocated: May 1992. Thesis title: Three-dimensional Analysis of Flow and Solute transport in Fractured Porous Formations, Awarded University of Waterloo Governor General's Gold Medal for highest standing in a graduate degree program. Currently Full Prof. Dept. Geology, University Laval.

1. M. Robin, Convocated: October 1991, Thesis title: Migration of Reactive Solutes in Three-dimensional Heterogeneous Porous Media. Currently Associate Prof., Dept. Geology, University of Ottawa.

(c) M.Sc.

i) Completed:

25. Ajmera, T., Defended: 08/10. Thesis title: Site Investigation and Modelling of DNAPL Migration in a Fractured-Porous Media.
24. E.A. Sykes, Defended: 11/07. Thesis title: Hydrogeologic modelling in support of OPG's Deep Geologic Repository, Tiverton, Ontario.
23. Brunner, D., 2004, Convocated: June 2004. Thesis title: Application of transition probability geostatistics to a 3-D ground-penetrating radar data set in a highly heterogeneous fluvial setting, Whiteman's Creek, Ontario.
22. Di Iorio, T., 2004, Convocated: June, 2004. Thesis title: Impact of Surficial Contaminant Loading on Streamwater Quality in an Integrated Surface-Subsurface Modelling Framework.
21. Stotler, R., 2003. Convocated: June, 2003. Thesis title: Changes in geochemistry, isotopes and residence times within the Waterloo moraine complex (co-supervised with S. Frapè).
20. Bickerton, G., 2001. Convocated: October, 2001. Thesis title: Optimal decision analysis for investments in municipal water-service infrastructure (co-supervised with P. Forsyth). Awarded Dean's Award for excellence in research.
19. Muhammad, D., 2000. Convocated: June, 2000. Thesis title: Delineation of three-dimensional capture zones for the well fields of Waterloo Region (co-supervised with E. Frind).
18. R. Pockar, 2000. Convocated: June, 2000. Thesis title: Development of a regional-scale numerical model of groundwater flow and a local-scale numerical model of groundwater flow and solute transport at the former Canadian Waste Management Ltd. Chemical storage facility at Smithville Ontario.
17. D. DeMarco, 1998. Convocated: May 1998. Thesis title: On the parameterization of dual-porosity and equivalent-continuum theories describing mass transport in fractured rock: A stochastic analysis.
16. P. Lapcevik, Convocated: October, 1997. Thesis title: A Tracer Experiment Conducted in a Discrete Horizontal Fracture Plane Under Conditions of Natural Groundwater Flow.
15. K. Slough (NSERC Postgraduate Scholar), Convocated: October, 1996. Thesis title: A Numerical Analysis of Multiphase Flow and Phase Partitioning in Discretely Fractured Geologic Media.
14. S. Lacombe, Convocated: October, 1994. Thesis title: Influence of Leaky Boreholes on Cross-formational Groundwater Flow and Contaminant Transport. Awarded Dean's Award for excellence in research.
13. Y. Chen, Convocated: October, 1994. Thesis title: Capture Zone Experiment in the Borden Aquifer.
12. R. Schmidt, Convocated: May, 1994. Thesis title: Stochastic Analysis of Groundwater Flow and Mass Transport Through Fractured Aquitards into Underlying Aquifers.
11. J. VanderKwaak, Convocated: October, 1993, Thesis title: Dense Nonaqueous-Phase Contaminant Dissolution in Discretely-fractured Geologic Media.
10. S. Shikaze, Convocated: May 1993, Thesis title: Simulation of the Migration of Dense Vapours in Discretely-

fractured Geologic Media. Awarded Dean's Award for excellence in research.

9. D. Burr, (NSERC Postgraduate Scholar) Convocated: October, 1992. Thesis title: Numerical Experiments on Nonreactive and Reactive Solute Transport in Three-dimensional Heterogeneous Porous Media.
8. D. Haley, (NSERC Postgraduate Scholar) Convocated: May 1992, Thesis title: Stochastic Analysis of Solute Transport in Heterogeneous Porous Media: Review, Synthesis and Extension.
7. C.J. Neville, Convocated: May 1992, Thesis title: Modelling the Transport of Solute Influenced by Multi-process Nonequilibrium Sorption: Analytical Solutions and Applications.
6. I. Goltz, Convocated: May 1992, Thesis title: Spatial Variability of Hydraulic Conductivity in a Sandy Aquifer at North Bay, Ontario.
5. M. Moncur, Convocated: October, 1991. Project title: Simulation of Contaminant Movement and Pump-and-treat Remediation in Fractured Porous Media.
4. B. Harrison, Convocated: May 1990, Thesis title: Numerical Analysis of solute Migration Through Fractured Clayey Deposits into Underlying Aquifers.
3. S. Shutter, Convocated: May, 1990, Thesis title: Analysis of Chemical Plume Migration in Groundwater at a Domestic Septic System.
2. K.T.B. MacQuarrie, (NSERC Postgraduate Scholar) Convocated: May, 1988, Thesis title: Simulation of Biodegradable Organic Contaminants in Groundwater, Awarded University of Waterloo Alumni Gold Medal, Ontario Ministry of the Environment Award for excellence in research. Currently Associate Professor, Dept. Civil Eng., University of New Brunswick.
1. S.L. Schellenberg, (NSERC Postgraduate Scholar) Convocated: May, 1987, Thesis title: Groundwater Flow and Nonreactive Tracer Motion in Heterogeneous Statistically Anisotropic Porous Media.

D. SERVICE

1. Major Committees

- Member, International Scientific Advisory Committee, Helmholtz German Water Alliance, (2010-2012).
- Member, International Scientific Advisory Committee, Australian National Groundwater Research & Training Centre (2009-2013).
- Member, Canadian Geotechnical Society Farvolden Award Committee, 2006-2008.
- Member, AGU Hydrological Sciences Award Committee, 2005-2008.
- Member, AGU/CGU Joint Assembly Program Committee Member, Hydrology Section, 2004 AGU/CGU Spring Meeting, Montreal.
- Member, External Project Review Panel, German Science Foundation, 2004.
- Member, External Review Panel of the Department of Earth Sciences, Simon Fraser University, 2004.
- Member, NSERC Strategic Project Committee, Environment and Sustainable Development, Panel B, 2001-2003.
- Member, NSERC GSC 09 Reallocation Steering Committee, 2000-2001.
- Member, US DOE Vadose Zone Roadmap Committee on Flow and Transport Processes, 2000.
- Member, US Department of Defence Grant Selection Committee for Strategic Environmental Research and Development Program, 1997.
- Member, US Department of Energy Grant Selection Committee for Environmental Management Science Program, 1996.
- Member, Natural Sciences and Engineering Research Council of Canada Grant Selection Committee for

Environmental Earth Sciences, 1991-1994

- Member, Earth Sciences Graduate Committee, 1988 - 1991.
- Earth Sciences Department Promotion and Tenure Committee, 1993.
- Chair, Earth Sciences Department Building Committee, 1997.
- Board Member, Geological Engineering, University of Waterloo, 1997-2000.
- Board Member, Environmental Engineering, University of Waterloo, 1997-2000.

E. PROFESSIONAL ACTIVITIES

Scholarly and Professional Activities:

1. Societies

- Chair, Hydrogeology Division, Geological Society of America, 2007-08
- Vice-Chair, Hydrogeology Division, Geological Society of America, 2006-07
- 2nd Vice-Chair, Hydrogeology Division, Geological Society of America, 2005-06
- President, International Commission on Ground Water of the International Association of Hydrological Sciences, 1997-2001
- Professional Engineers of Ontario
- American Geophysical Union
- Geological Society of America
- Canadian Geotechnical Society
- Canadian Geophysical Union
- Association of Ground Water Scientists and Engineers
- National Ground Water Association
- International Association of Hydrogeologists
- International Association of Hydrological Sciences

2. Reviewing

- Water Resources Research: approx. 5 papers reviewed per year
- Journal of Hydrology: approx. 2 papers reviewed per year.
- Advances in Water Resources: approx. 5 papers reviewed per year.

3. Editorial Duties

- Editor-in-Chief, Journal of Contaminant Hydrology, 1997-2000.
- Associate Editor, Vadose Zone Journal, 2001-2003.
- Associate Editor, Journal of Contaminant Hydrology, 1985-1997, 2001-present.
- Associate Editor, Advances in Water Resources, 1989-1997.
- Associate Editor, Ground Water, 1996

4. Thesis Examiner

Dr. Sudicky has served as examiner of numerous M.Sc. and Ph.D. theses in the Department of Earth Sciences, as well as Ph.D. theses in Chemical and Civil Engineering at Waterloo. He has also served as external examiner of Ph.D. theses presented by candidates from North America and Europe.

5. Consulting Activity

- Advising Hydrogeologist, Gartner Lee Assoc. Ltd., Markham, Ontario, 1983 - 2005.
- Advising Hydrogeologist, HydroGeoLogic, Inc., Herndon, Virginia, 1987 - 2008.
- Partner, Groundwater Simulations Group, Waterloo, Ontario, 1990 - 2012.

6. Commercial Software Development

Dr. E.A. Sudicky is the developer or co-developer of more than a dozen copyrighted software packages made available to consulting firms, government agencies and research organizations and licensed by the University of Waterloo. The codes include both analytical and numerical models describing groundwater flow and subsurface chemical migration and are designed to assist professionals in the quantitative analysis of hydrogeological problems. For example, the codes *HydroGeoSphere* and FRAC3DVS are licensed by users on essentially all continents of the globe. Dr. Sudicky is a Founding Partner and Board Chair in the University of Waterloo spin-off company Aquanty, Inc., Waterloo, Ontario, Canada.

February 24, 2019