

**Shawn Clark, Ph.D., P.Eng.**  
E1-388 EITC, Department of Civil Engineering  
University of Manitoba, Winnipeg, MB R3T 5V6  
W(204) 474-9046, C(204) 797-7765  
Shawn.Clark@umanitoba.ca

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## **EDUCATION**

**Ph.D. - University of Manitoba** 2007  
Thesis: An Experimental Study of the Formation and Evolution of Frazil Ice  
Certificate in Higher Education Teaching

**B.Sc. - University of Manitoba** 2002  
B.Sc. in Civil Engineering (with Distinction)  
Program Gold Medal in Civil Engineering

## **ACADEMIC WORK EXPERIENCE**

*Associate Professor* 2013 - Present  
University of Manitoba, Department of Civil Engineering

*Assistant Professor* Aug. 2006 – Mar. 2013  
University of Manitoba, Department of Civil Engineering

*Sessional Instructor* Jan. –Apr. 2006  
University of Manitoba, Department of Civil Engineering  
Jan. –Apr. 2005

## **CONSULTING**

*Hydraulic Engineer* 2011 – Present  
Trek Geotechnical

## **TEACHING**

CIVL 2790 Fluid Mechanics (Undergraduate course)  
CIVL 3740 Hydraulics (Undergraduate course)

CIVL 7650 Ice Engineering (Graduate course)  
CIVL 7650 Advanced Hydraulics (Graduate course)

**CONTRIBUTIONS TO RESEARCH****Refereed Journal Publications**

- [J1] Nyantekyi-Kwakye, B., Tachie, M. F., and Clark, S. P. 2016. Flow characteristics of an offset jet over a surface mounted square rib. *Journal of Turbulence*, DOI: 10.1080/14685248.2016.1174779.
- [J2] Nyantekyi-Kwakye, B., Tachie, M. F., Clark, S. P., Malenchak, J., and Muluye, G. 2016. Acoustic Doppler velocimeter measurements of a submerged three-dimensional offset jet flow over rough surfaces. *Journal of Hydraulic Research*, in press
- [J3] Kimiaghalam, N., Clark, S. P., and Ahmari, H. 2016. An experimental study on the effect of physical, mechanical, and electrochemical properties of natural cohesive soils on critical shear stress and erosion rate. *International Journal of Sediment Research*, 31(1): 1-15, Doi: 10.1016/j.ijsrc.2015.01.001.
- [J4] Kimiaghalam, N., Goharrokhi, M., and Clark, S.P. 2016. Estimating Cohesive Sediment Erosion and Deposition Rates in Wide Rivers. *Canadian Journal of Civil Engineering*, 43(2): 164-172. Doi: 10.1139/cjce-2015-0361.
- [J5] Wazney, L., Clark, S.P. 2016. The 2009 flood event in the Red River Basin: causes, assessment, and damages. *Canadian Water Resources Journal*. Vol. 41(1-2), pp. 56-64.
- [J6] Blais, E., Rannie, W., Clark, S.P., Dow, K., Stadnyk, T., Wazney, L. 2016. Background to Flood Control Measures in the Red and Assiniboine River Basins. *Canadian Water Resources Journal*. Vol. 41(1-2), pp. 31-44.
- [J7] Kimiaghalam, N., Goharrokhi, M., Clark, S.P., and Ahmari, H. 2015. A comprehensive fluvial geomorphology study of riverbank erosion on the Red River in Winnipeg, Manitoba, Canada. *Journal of Hydrology*, 529: 1488-1498 Doi: 10.1016/j.jhydrol. 2015.08.033.
- [J8] Nyantekyi-Kwakye, B, Clark, S. P., Tachie, M. F., Malenchak, J., and Muluye, G. 2015. Experimental study of the structures of 3D turbulent offset jets. *Journal of Hydraulic Research*, 53(6), 773-786.
- [J9] Nyantekyi-Kwakye, B., Clark, S. P., Tachie, M. F., Malenchak, J., and Muluye, G. 2015. Flow characteristics within the recirculation region of three-dimensional turbulent offset jet, *Journal of Hydraulic Research*, 53(2), 230-242.
- [J10] Weiss, A., Clark, S.P., Rennie, C.D., Moore, S.A., Ahmari, H. 2015. Estimation of total suspended solids concentration from aDcp backscatter and hydraulic measurements. *Journal of Hydraulic Research*. Vol. 53(1), pp. 670-677
- [J11] Clark, S.P., Toews, J.S., Tkach, R. 2014. Beyond average velocity: Modelling velocity distributions in partially filled culverts to support fish passage guidelines. *Intl. J. River Basin Management*. Vol. 12(2). pp. 101-110.
- [J12] Guo, J., Mohebbi, A., Zhai, Y., Clark, S.P. 2014. Turbulent velocity distribution with dip-phenomenon in conic open channels. *J. Hyd. Res., IAHR*, Published online 10/2014.
- [J13] Hunt, M., Clark, S., Tkach, R. 2012. Velocity distributions near the inlet of corrugated steel pipe culverts. *Canadian J. of Civil Eng.* 39(12), pp. 1243-1251.
- [J14] Toews, J.S., Clark, S.P. 2012. Relative depth effects on corrugated culvert roughness. *J. of Water Resource and Protection*. 4(10), pp. 838-841.

- [J15] Lozecznik, S., Oleszkiewicz, J.A., Clark, S.P., Sparling, R., VanGulck, J.F. 2012. Effects of turbulence and temperature on leachate chemistry. *J. Env. Eng.* 128(5), pp. 562-569.
- [J16] Lozecznik, S., Sparling, R., Clark, S.P., VanGulck, J.F. and Oleszkiewicz, J.A. 2011. Acetate and propionate impact on the methanogenesis of landfill leachate and the reduction of clogging components. *Bioresource Technology.* 104(1), pp. 37-43.
- [J17] Clark, S.P. and Kehler, N. 2011. Turbulent flow characteristics in circular corrugated culverts at mild slopes. *J. Hyd. Res.* 49(5), pp. 676-684.
- [J18] Clark, S.P., Tsikata, J.M. and Haresign, M. 2011. Discussion of: Experimental study of energy loss through submerged trashracks. *J. Hyd. Res.* 49(3), pp. 392-393.
- [J19] Lozecznik, S., Sparling, R., Oleszkiewicz, J., Clark, S. and VanGulck, J.F. 2010. Leachate treatment before injection into a Bioreactor Landfill: Clogging potential reduction and benefits of using methanogenesis. *J. Waste Mgmt.* Elsevier. 30(11), 2030-2036.
- [J20] Clark, S.P., Tsikata, J.M., and Haresign, M. 2010. Experimental study of energy loss through submerged trashracks. *J. Hyd. Res., IAHR*, 48(1), 113-118.
- [J21] Clark, S.P. and J.C. Doering. 2009. Frazil flocculation and secondary nucleation in a counter-rotating flume. *Cold Regions Sci. and Tech.*, 55(2), 221-229.
- [J22] Clark, S.P. and J.C. Doering. 2008. Experimental investigation of the effects of turbulence intensity on frazil ice characteristics. *Cdn. J. of Civil Eng.*, 35(1), 67-79.
- [J23] Clark, S. and J.C. Doering, 2006. Laboratory experiments on frazil-size characteristics in a counterrotating flume. *ASCE J. of Hyd. Eng.*, 132(1), 94-101.

#### Submitted Journal Articles:

- [S1] Nyantekyi-Kwakye, B., Clark, S. P., Tachie, M. F., Muluye, G., and Malenchak, J. 2016. Submerged turbulent offset jet issuing from a rectangular nozzle with varying expansion ratio. *Journal of Hydraulic Engineering*
- [S2] Kimiaghalam, N., Goharrokhi, M., and Clark, S.P. 2016. Assessment of wide river characteristics using an Acoustic Doppler Current Profiler. *ASCE Journal of Hydrologic Engineering*, HEENG-3272. Minor revision.
- [S3] Kimiaghalam, N. and Clark, S.P. Under review, "Morphodynamics of diversion channels in Northern Manitoba", Canadian Water Resources Journal, TCWR-2016-0018.

#### **Recent Conference Publications**

- [C1] Clark, S.P., Wall, A. 2016. Freeze-up monitoring on the Dauphin River, Manitoba, Canada. *23<sup>rd</sup> IAHR International Symposium on Ice*. May 31-June 3. 10 pages.
- [C2] Clark, S.P., Peters, M., Dow, K., Malenchak, J., Danielson, D. 2016. Investigating the effects of ice and bed roughness on the flow characteristics beneath a simulated partial ice cover. *23<sup>rd</sup> IAHR International Symposium on Ice*. May 31-June 3. 9 pages.
- [C3] Pahlavan, H., Clark, S.P., Malenchak, J., Wang, M. 2016. Effects of ice and bed roughness on turbulent flow characteristics beneath a simulated ice jam. *23<sup>rd</sup> IAHR International Symposium on Ice*. May 31-June 3. 10 pages.
- [C4] Kimiaghalam, N. and Clark, S.P. 2016. River morphodynamics in the Canadian Prairies: an overview of recent studies in Manitoba. *River Flow 2016: 8<sup>th</sup> International Conference on Fluvial Hydraulics*. July 12-15, St. Louis, MO. 8 pages.

- [C5] Nyantekyi-Kwakye, B., Shajid, M. S., Boila, S., Clark, S. P., and Tachie, M., F. 2015. PIV study of a 3D turbulent offset jet flow over square ribs. *Ninth International Symposium on Turbulence and Shear Flow Phenomena (TSFP-9)*, The University of Melbourne, Australia, June 30 – July 3.
- [C6] Clark, S. P., Nyantekyi-Kwakye, B., Shajid, M. S., Boila, S., and Tachie, M. F. 2015. Structure of 3D offset jets over a surface mounted square rib. *Ninth International Symposium on Turbulence and Shear Flow Phenomena (TSFP-9)*, The University of Melbourne, Australia, June 30 – July 3.
- [C7] Harms, S.M., Blatz, J.B. & Clark, S.P. 2015. Field testing large sand-filled geotextile containers used as a temporary flood protection system. CGS Conference, Quebec
- [C8] Goharrokhi, M., Clark, S.P. 2015. Using suspended sediment particle size distributions to characterize sediment transport on the Red River. Proc. 21<sup>st</sup> Canadian Hydrotechnical Conference, Montreal, PQ. April 29-May 2. 10 pages.
- [C9] Wazney, L., Clark, S.P., Malenchak, J., Shen, H.T., Knack, I. 2015. Two-dimensional modeling of river ice cover formation during freeze-up. Proc. CRIPE Workshop on the Hydraulics of Ice Covered Rivers. Quebec City, QC. Aug. 18-20. 13 pages.
- [C10] Peters, M., Dow, K., Clark, S.P., Danielson, D., Malenchak, J. 2015. Velocity distribution characterization in channels with partial ice cover. Proc. CRIPE Workshop on the Hydraulics of Ice Covered Rivers. Quebec City, QC. Aug. 18-20. 17 pages.
- [C11] Pahlavan, H., Clark, S.P., Wang, M., Malenchak, J. 2015. An experimental investigation of turbulent flow characteristics beneath and ice jam. Proc. CRIPE Workshop on the Hydraulics of Ice Covered Rivers. Quebec City, QC. Aug. 18-20. 14 pages.
- [C12] Pahlavan, H., Clark, S.P. 2015. An experimental investigation of water velocity distribution beneath a simulated ice jam. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and poster only.
- [C13] Peters, M., Clark, S.P., Dow, K. 2015. A re-examination of the impact of a partial ice cover on velocity distribution in a channel. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and poster only.
- [C14] Wazney, L., Clark, S.P., Malenchak, J. 2015. Numerical modeling of ice processes for design of temporary structures for construction of hydroelectric generating stations. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and poster only.
- [C15] Clark, S.P. 2015. The NSERC / Manitoba Hydro IRC in river ice engineering research program. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and poster only.
- [C16] Goharrokhi, M., Clark, S.P. 2015. Detailed field measurements of flow characteristics on the Red River. CSCE Canadian Hydrotechnical Conference, Regina, SK. May 27-30. 10 pages.
- [C17] Goharrokhi, M., Clark, S.P. 2015. Application of entropy theory to flow in the Red River. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and presentation only.
- [C18] Goharrokhi, M., Clark, S.P. 2015. Assessing the erosion and deposition patterns of the Red River in Winnipeg using an ADCP. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and presentation only.
- [C19] Goharrokhi, M., Clark, S.P. 2015. Estimation of the Red River roughness to model average applied shear stress. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and presentation only.
- [C20] Kimiaghalam, N., Clark, S.P. 2015. Cohesive riverbank erosion in cold regions: Case studies in Northern and Southern Manitoba. CWRA National Conference. Winnipeg, MB, June 2 – 4. Abstract and poster only.
- [C21] Kimiaghalam, N., Clark, S.P., Ahmari, H., Hunt, J. 2014. Wave-current induced erosion of cohesive riverbanks in Northern Manitoba. Proc. Sediment Dynamics from the Summit to the Sea, IAHS Publ. 367, pp. 134 – 140. New Orleans, LA. Dec. 11-14, 2014.
- [C22] Durand, Z.M.J., Clark, S.P., Tachie, M.F., Malenchak, J., Muluye, G. 2014. Experimental Study of Reynolds number effects on three-dimensional offset jets. Proc. ASME Joint US-European Fluids Engineering Division. Chicago, Illinois, 12 pages.
- [C23] Essel, E.E., Nyantekyi-Kwakye, B., Clark, S.P., Tachie, M.F. 2014. Experimental study of shallow open channel turbulent flows over rough walls. Proc. ASME Joint US-European Fluids Engineering Division. Chicago, Illinois, 9 pages.
- [C24] Nyantekyi-Kwakye, B., Clark, S.P., Tachie, M.F., Malenchak, J., Muluye, G. 2014. Flow characteristics and structure of 3D turbulent offset jets. Proc. ASME Joint US-European Fluids Engineering Division. Chicago, Illinois, 9 pages.

- [C25] Nyantekyi-Kwakye, B., Durand, Z., Clark, S., Tachie, M.F., Malenchak, J. and Muluye, G. 2013. Flow characteristics of an offset jet. Proc. 21<sup>st</sup> Canadian Hydrotechnical Conference, CSCE, Banff, Alberta. May 14 – 17. 11 pages.
- [C26] Kimiaghalam, N., Goharrokhi, M., Clark, S. and Ahmari, H. 2013. Riverbank erosion on the Red River in Winnipeg. Proc. 21<sup>st</sup> Canadian Hydrotechnical Conference, CSCE, Banff, Alberta. May 14 – 17. 8 pages.
- [C27] Harms, S., Blatz, J. and Clark, S. 2013. Evaluation of Syn-Tex Wave Breakers under wave-induced hydrodynamic and debris impact loading. Proc. 21<sup>st</sup> Canadian Hydrotechnical Conference, CSCE, Banff, Alberta. May 14 – 17. 10 pages.
- [C28] Essel, E.E., Nyantekyi-Kwakye, B., Clark, S. and Tachie, M.F. 2013. PIV study of shallow open channel turbulent flows over rough beds. Proc. 21<sup>st</sup> Canadian Hydrotechnical Conference, CSCE, Banff, Alberta. May 14 – 17. 10 pages.
- [C29] Clark, S.P., Toews, J.S., Hunt, M. and Tkach, R. 2012. Physical and numerical hydraulic modeling in support of fish passage regulations. Proc. 9<sup>th</sup> International Symposium on Ecohydraulics, IAHR, Vienna, Austria. [MH], NSERC, MIT

### **Non-refereed Publications**

#### Book Chapters:

- [Ch1] Clark, S.P. 2013. *Chapter 3: Border and Skim Ice*. River Ice Formation. S. Beltaos (Ed.). Edmonton, AB: Committee on River Ice Processes and the Environment.
- [Ch2] Malenchak, J.J. and Clark, S.P. 2013. *Chapter 5: Anchor Ice*. River Ice Formation. S. Beltaos (Ed.). Edmonton, AB: Committee on River Ice Processes and the Environment.

#### Invited Lectures:

- [L1] Clark, S.P. 2014. Physical and Hydraulic Characteristics of Netley Libau Marsh. Netley Libau Marsh Workshop, Lake Winnipeg Foundation, University of Winnipeg. Sept. 29, 2014.
- [L2] Clark, S.P. 2013. Temporary Flood Protection Measures. Prairie Flood Management and Mitigation Seminar, Yorkton, Saskatchewan, March 27, 2013.
- [L3] Clark, S.P. 2010. Flow Characteristics in Corrugated Metal Pipe Culverts. Leverhulme Trust International Network Meeting: Bridging the Gap Between Fish Behaviour and Hydraulics. Freshwater Institute. Sept. 1, 2010.
- [L4] Clark, S.P. 2010. Planning a Marsh Hydraulics Study. The Manitoba-Israel Water Experts Symposium 2010. Jerusalem, Israel.
- [L5] Clark, S.P. 2008. Hydrodynamic modeling of Lake Winnipeg. CWRA Luncheon Presentation Series. Oct. 31, Winnipeg, MB.
- [L6] Clark, S.P. and H. Jonasson. 2008 Understanding Lake Winnipeg: Local knowledge and hydrodynamic modeling. The Red Zone: Currents, chemicals and change. (symposium). Oct. 26, Winnipeg, MB.

**AWARDS / DISTINCTIONS**

- Rh Award for Outstanding Contributions to Scholarship and Research in the Applied Sciences 2014
- University of Manitoba Merit Award in Teaching 2014
- Students' Teacher Recognition Award 2014
- Students' Teacher Recognition Award 2013
- Class of 2011 Teaching Excellence Award 2011
- University of Manitoba Merit Award in Teaching 2009

**PROFESSIONAL AFFILIATIONS AND SERVICE****Member:**

- Canadian Society for Civil Engineering
- Canadian Water Resources Association (CWRA)
- Canadian Geophysical Union (CGU)
- CGU Committee on River Ice Processes and the Environment
- Association of Professional Engineers and Geoscientists of Manitoba

**Current Service Activities:**

- Associate Editor – Canadian Water Resources Journal
- Committee Member: CSCE Hydrotechnical Committee
- CWRA Manitoba Branch Board of Directors
- CWRA Manitoba Branch Profiles Committee member
- CWRA Student and Young Professionals Manitoba Branch Faculty Advisor

**Past Service Activities:**

- Technical Program Chair – CWRA Annual Conference 2015
- CSCE Manitoba Section Chair 2012-2014
- Promotions Committee Chair – 21<sup>st</sup> Canadian Hydrotechnical Conference 2013
- Technical Program Chair - CRIPE conference 2011 2011
- Program Committee Member – CWRA Manitoba Branch 2011 Conference 2011
- Co-chair IAHR Congress, Vancouver 2009
- 18<sup>th</sup> Canadian Hydrotechnical Conference (CSCE) Technical Program Chair 2007
- CWRA Manitoba Branch National Director 2006
- CWRA Student and Young Professionals Manitoba Branch team leader 2006
- Civil Engineering Department Head search committee member 2006
- Canadian Society of Civil Engineers, student chapter president 2001/2002
- University of Manitoba Great Northern Concrete Toboggan Race team captain 2001/2002