

**Curriculum Vitae****Robert Ettema**


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**Profession**

Professor of Civil Engineering  
 Licensed Professional Engineer: Wyoming

**Expertise**

Hydraulic structures, cold-regions engineering, river engineering, engineering history and education

**Education**

- 1980      Ph.D. in Civil Engineering  
             The University of Auckland, New Zealand
- 1977      M.E. (1<sup>st</sup> Class Honors) in Civil Engineering  
             The University of Auckland, New Zealand
- 1975      B.E. (1<sup>st</sup> Class Honors) in Civil Engineering  
             The University of Auckland, New Zealand

**Work Experience**

- 2015<sup>1</sup>      Professor, Dept. of Civil and Environmental Engineering, CSU; and Research Engineer, CSU Hydraulics Laboratory
- 2014 – 2015      Research Engineer and Faculty Affiliate, CSU; and Professor, Department of Civil and Architectural Engineering, the University of Wyoming
- 2013 – 2014      Visiting Professor (Sabbatical), Dept. of Civil and Environmental Engineering, Colorado State University (CSU); and,  
                          Professor, Department of Civil and Architectural Engineering, the University of Wyoming
- 2007 – 2013<sup>2</sup>      Dean, College of Engineering & Applied Science, the University of Wyoming; and Professor Dept. of Civil and Architectural Engineering
- 1999 – 2007      Head, Dept. of Civil and Environmental Engineering, the University of Iowa
- 1991 – 2007      Professor, Dept. of Civil and Environmental Engineering, the University of Iowa
- 1991 – 1994      Interim Director, Iowa Institute of Hydraulic Research, College of Engineering, the University of Iowa
- 1986 – 1991      Associate Director, Iowa Institute of Hydraulic Research, College of Engineering, the University of Iowa
- 1986 – 1991      Associate Professor, Dept. of Civil and Environmental Engineering, the University of Iowa

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<sup>1</sup> August 2015

<sup>2</sup> July 2007 – September 2013

- 1982 – 1986 Assistant Professor, Dept. of Civil and Environmental Engineering, the University of Iowa
- 1980 – 1982 Post-doc., Iowa Institute of Hydraulic Research, (now IIHR-Hydroscience and Engineering), the University of Iowa

### Awards and Recognitions

- 2021 Teaching Award, Civil and Environmental Eng. Dept., Colorado State University
- 2020 Lifetime Achievement Award, Environmental Water Resources Institute, American Society of Civil Engineers, ASCE
- 2019 Harold R. Peyton Award (Cold Regions Engineering), ASCE
- 2017 Fellow, ASCE
- 2016 Whitney Borland Chair, Colorado State University
- 2015 Hans Albert Einstein Award (River and Sedimentation Engineering), ASCE
- 2012 Fellow, Engineering New Zealand
- 2011 Karl Emil Hilgard Hydraulic Prize (Best paper in Journal of Hydraulic Engineering) – “*Detached Eddy Simulation Investigation of Turbulence at a Circular Pier with Scour Hole*”; with Gokhan Kirkil (PhD student) and George Constantinescu (colleague), ASCE
- 2010 ASCE-EWRI Outstanding Service Award as Technical Program Chair, American Society of Civil Engineers, Environmental and Water Resources Institute, Organization of joint IAHR-EWRI-CSCE World Congress, Vancouver, Canada
- 2009 IAHR Outstanding Service Award as Technical Program Chair, World Congress, IAHR (International Association of Hydro-Environment Research and Engineering), ASCE-EWRI-CSCE Congress, August 2009, Vancouver, Canada
- 2005 Outstanding Faculty Member Service Award, College of Engineering, the University of Iowa, IA
- 2002 Hunter Rouse Hydraulic Engineering Award (Hydraulic Engineering), ASCE
- 1995 Task Committee Excellence Award, Symposium on Hydraulics Instrumentation. & Experimentation, Buffalo, NY, ASCE
- 1991 Gustave Willems Award (Best Paper), *Ice-formation Processes in Frequently Transited Navigation Channels*, U.S. Section, Permanent Association for Navigation Congresses (PIANC)

### Service External to Academic Position

- Peer Reviewer (2109-), U.S. Army Corps of Eng., Eng. Research and Development Center
- Vice-President (Americas) and member of Executive Committee (2019-), International Association for Hydro-Environment Engineering and Research (IAHR; formerly the International Association for Hydraulic Engineering and Research)
- Member, Investigation Team (2019-), Failure of Spencer Dam, NE; Assoc. of State Dam safety Officials (ASDSO)
- Member (August 2017-), Executive Committee, Water Center, Colorado State University
- Book Series Editor (2016-) for IAHR Books & Monographs, in partnership CRC Press/Balkema, Taylor & Francis Group
- Member (2016-), Advisory Panel, Mississippi Delta Model, Office of Coastal Protection and Restoration, State of Louisiana

Associate Editor (2015-), American Society of Civil Engineers, Journal of Cold Regions Engineering

Member (2015-16), Alden External Hazard Technical Support Team—Extreme Cold, for Electric Power Research Institute Project: External Hazards Facing the Nuclear Energy Industry

Member (2014-2015), Expert Panel on the Quantification of Uncertainties and Risk to Bridge Waterways from Erosion and Blockage in the UK

Member of scientific and/or planning committees of several conferences (e.g., River Flow 2016 and IAHR Congress 2017)

Member (2014-), Intl. Scientific Board, Polish Polar Studies Centre, Polish Academy of Sciences, and University of Silesia, Poland

Chair, J.F. Kennedy Student Paper Competition (2013, 2015, 2017), 35<sup>th</sup> through 37<sup>th</sup> World Congresses of Hydro-Environment Engineering and Research (IAHR)

Council Member (2011-), IAHR

Member, Scientific Committee, 34<sup>th</sup> World Congress of Hydro-Environment Engineering and Research (IAHR), held in 2011, Brisbane, Australia

Chair of Technical Committee (2004-09), 33<sup>rd</sup> World Congress of International Association for Hydraulic Engineering and Research (IAHR), to be held in 2009, Vancouver, Canada; Congress co-sponsored by American Society of Civil Engineers (ASCE) and Canadian Society of Civil Engineers (CSCE), and locally hosted by the University of British Columbia

Corresponding Member (2005-07) “Body of Knowledge-2” ASCE, Committee on the Academic Prerequisites for Professional Practice

Member of Accreditation Review Team (2005), College of Engineering, The University of Auckland, New Zealand, NZ Institute of Professional Engineers

Member of Organizing Committee (2005), NATO Advanced Research Workshop on Extreme Hydrologic Events, Novosibirsk, Russia

Member of Awards Committee (2003-), Hydraulic Engineering, American Society of Civil Engineers

Editor (1998 –2002), American Society of Civil Engineers, Journal of Hydraulic Engineering

Associate Editor (1992 – 1997), American Society of Civil Engineers, Journal of Cold Regions Engineering

Member of Iowa Highway Research Board (2002-2007), Board Chair (2003-04), Vice-Chair (2006-07)

Member (2000-2006), International Editorial Board, Journal of Civil Engineering, Korean Society of Civil Engineers

Chairman of Task Committee (1997-1999), American Society of Civil Engineers; Task Committee to write ASCE Manual No. 97, “Hydraulic Modeling: Concepts and Practice”

Member of Review Panel (1999), Micro-modeling for the US Army Corps of Engineers,

Member of Review Panel (1998) for Center for Computational Hydroscience and Engineering, University of Mississippi

Member of Review Panel (1996), for National Sedimentation Laboratory, U.S. Agricultural Research Service, National Sed. Lab., USDA, Mississippi.

Chairman of Organizing Committee (1995), Hydraulics Colloquium “Issues and Directions in Hydraulics,” Iowa City, IA, May 22-24, 2005

Member of Organizing Committee (1994), for American Society of Civil Engineers, Hydraulics Instrumentation & Experimentation Symposium, Buffalo, New York

Member (1997-00), Ice Committee, International Association for Hydraulic Research

Member (1989-1994), Board of Consultants on Ice Problems, New York Power Authority, Niagara River Project

Chairman of Organizing Committee (1986), Ice Symposium of the International Association for Hydraulic Research, August 22-26

Chairman (1990-92), Ice-tank Subcommittee, American Towing Tank Association (ATTC);  
 Member (1986-90)  
 Member (1987-91), Ice Problems Subcommittee, International Towing Tank Conference (ITTC)  
 Member (1981-91), Committee on Interaction of Ice with Concrete and Steel Structures,  
 International Union of Testing and Research Laboratories for Materials and Structures  
 (RILEM)

### Consulting Services

US Army Corps of Engineers (several Districts, Engineering Research & Development Center);  
 US National Resource Conservation Service; New York Power Authority; Bechtel Power Corp.;  
 State of Nebraska; Honduras Ministry of Electricity; American Electric Power; Traylor Bros.  
 Tunneling; Lake Panorama Assoc.; Northwest Hydraulic Consultants; Stanley Consultants; Ayres  
 Associates Engineering; Ingram Barge Co.; Pennamaquan Tidal Power Project; Aalto University,  
 Finland; State of Louisiana; Tetra Tech Inc.; Alden Research Inc.; BCG Engineers; U.S. Bureau of  
 Reclamation; Flat Creek Water Improvement District (Jackson, WY); Walsh Construction;  
 AECOM; Assoc. of State Dam Safety Officials; Black & Veatch; Seaman Corporation; Elsevier;  
 Cambridge University Press; R. Hotchkiss LL; several law firms

### Graduate Student (Thesis) Advisees

PhD (1985-2022): Scholz, G.; Urroz, G.; Huang, H.-P.; Yoon, B.; Smith, B.; Tsai, W.-F.; Awad,  
 M.; Zufelt, J.; Barkdoll, B.; Daly, S.; Chen, Z.; Yu, K.; Yorozyua, A., Kirkil, G., Morales, R.,  
 Ho, H.C.; Nowroozpour, A.-R.

MS (1984–2023): Cook, A.G.; Lazero, J.; Lucie, C.; Smith, B.; Pokorny, M.; Bauer, D.; Teal, M.;  
 Tan, C.-A.; Braileanu, F.; Streitz, J.; Kubit, O.; Ooi, S.K.; Li, Z.; Martinez, E.; McAlister, G.;  
 Elkhalfi, M.; Abacci, O., A.; Korkut, R.; Kirkil, G.; Idil, P., Morales, R., Nadimpalli, L.,  
 Oban-Nyarko, K., Basnet, K.; Fuller, J.; Stiver, J.; Chakradhar, R.; Ubong, C.; Armstrong, D.;  
 Zey, S.; Chen, K.; Vandermause, R.; Hogan, S.; Garfield, M.; Siefken, S.; Fakhri, A.;  
 Biethman, B.; Tasdelen, S.; Maddocks, P.; Wittmershaus, A., Knapp-Leiferman, L.; Kepler,  
 J.; Al Sultan, F.

### External Examiner of Doctoral Dissertations

PhD dissertations submitted to universities in the U.S.A., Canada, Finland, Sweden, Britain, India,  
 New Zealand, Singapore, Kuwait, Australia

## PUBLICATIONS

### Books, Monographs and Book Chapters (*Including Editorship of Conf. Proc., and Tributes*)

- [1] Ettema, R., Zhu, D., Mulligan, S., Gaskin, S., Chan, T., Boes, R., Lyons, T., Lee, J.H.-W. (*in review*), Vortex-Flow Intakes”. IAHR Water Monograph.
- [2] Chao, Y.-S., Ettema, R., Lee, Y.-T. and Stern, F. (*in press*), “Louis Landweber, 1912-1998,” in Memorial Tributes, National Academy of Engineers, Washington, D.C.
- [3] Kennedy, S.M. and Ettema, R. (2010), “Rex A. Elder, 1917-2018,” in Memorial Tributes, Vol. 23, National Academy of Engineers, Washington, D.C., 83-87.
- [4] Ettema, R. (2018), “Ice Concerns for Hydraulic Engineering in Cold Mountainous Terrain,” Chapter 2, in Free-Surface Flows and Transport Processes, Eds. Rowinski, P. and Mrokowska, M., Springer Verlag, Berlin, Germany.

- [5] Muste, M., Admiraal, D., Ettema, R., Aberle, J. and Garcia, M. (Eds.) (2017), Experimental Hydraulics: Methods, Instrumentation, Data Processing and Management, IAHR Monographs and Design Manuals, CRC Press, Leiden, Netherlands.
- [6] Muste, M and Ettema, R. (2017), "Introduction," Chapter 1 of the book mentioned in Item [5]. (Also the Preface)
- [7] Ettema, R. and Heller, V., (2017), "Similitude," Chapter 3 of the book mentioned in Item [5].
- [8] Ettema, R. and Mutel, C. (2014), Hans Albert Einstein: His Life as a Pioneering Engineer, ASCE Press, American Soc. of Civil Engineers, Reston, VA.
- [9] Ettema, R. and Kempema, E. W. (2013), "Ice Effects on Sediment Transport," Ch. 9 of River Ice Formation, Ed. by S. Beltaos, Canadian Geophysical Society, Toronto, Canada.
- [10] Daly, S. and Ettema, R., (2012), "Ice Dynamics and Transport," Ch. 19 of Handbook of Environmental Fluid Dynamics, H.J.S. Fernando (Ed.), Taylor & Francis Group, London, UK.
- [11] Ettema, R. and Kempema, E. W. (2012), "Ice Effects on Gravel Bed Rivers," Ch. 37 of Gravel Bed Rivers, Ed. by Church, M., John Wiley & Sons, New York, NY.
- [12] Valentine, E., Apelt, C., Ball, J., Chanson, H., Cox, R., Ettema, R., Kuczera, G., Lambert, M., Melville, B. and Sargison, J. (Eds.) (2011), Balance and Uncertainty: Water in a Changing World, Proc. of the 34<sup>th</sup> Congress of the International Association for Hydraulic Engineering and Research, Brisbane, Australia, June 26-July 1.
- [13] Mutel, C. and Ettema, R. (2010), "Hunter Rouse, 1906-1996," in Memorial Tributes, Vol. 13, National Academy of Engineers, Washington, D.C., 227-230.
- [14] Ettema, R. and Bradley, J. (Eds.) (2009), Water Engineering for a Sustainable Environment, Proc. of the 33<sup>rd</sup> Congress of the International Association for Hydraulic Engineering and Research, Vancouver, Canada, August 10-14.
- [15] Ettema, R., (2008), "Management of River Confluences," Ch. 6 of River Confluences, Tributaries and River Networks, Ed. by Rice, Roy, and Rhoads, John Wiley & Sons, New York, NY.
- [16] Ettema, R., (2008), "Sediment Transport under Ice," Ch. 13 of Sedimentation Manual, ASCE Publications, Reston VA.
- [17] Ettema, R., (2005), "Sediment Transport," Ch. 7 of Ice Engineering Manual, US Army Corps of Engineers, ERDC, MS.
- [18] Marshall, J. and Ettema, R., (2005), "Contact-line Instabilities of Driven Liquids," Ch. 1 of Advances in Fluid Mechanics: Instabilities of Flows, published by Wessex Inst. of Technology, Southampton, UK, pp 1-42.
- [19] Ettema, R. (Ed. and lead author) (2000), ASCE Manual 97, Hydraulic Modeling: Concepts and Practice, ASCE Publications, Reston VA.
- [20] Nakato, T. and Ettema, R. (Eds.), (1996), Issues and Directions in Hydraulics, Proc. of Iowa Hydraulics Colloquium to Recognize Career of Prof. John F. Kennedy, Pub. by A. A. Balkema, The Netherlands.
- [21] Ettema, R. (Ed.), (1986), Proc. of the 8th International Symposium on Ice of the International Association for Hydraulic Research, August 18-22, Iowa City, Iowa (3 volumes).

#### **Journal Articles (Tech. Papers, Tech. Notes, Book Reviews, Discussions, Forum Articles)**

- [1] Thornton, C., Ettema, R., Tasdelen, S. and Zusi, M. (*accepted for Summer Issue, 2023*). "Stilling Basin for the Steep, Stepped Spillway of Gross Dam, Colorado". U.S. Society of Dams, J. of Dams and Levees.

- [2] Ettema, R. and Ettema, R. (*in review*). Discussion of “Prevention of Water Intake Blockage by Ice during Supercooling Events” by Daly, S.F. and Barrette, P.R., in ASCE J. Cold regions Eng., 37(1).
- [3] Nowroozpour, A., Ettema, R. and Fakhri, A. (2022). “A Reassessment of Contraction Scour at Bridge Waterways”. ASCE Journal of Hydraulic Engineering, 148(12).
- [4] Ettema, R. and Thornton, C.S. (2022). “Hydraulic Model of a Braided Channel to Aid Design of a Grade-Building Structure”. IAHR Journal of Applied Water Engineering and Research, DOI: 10.1080/23249676.2022.2106520.
- [5] Ettema, R., Haycraft, D. and Tonkin, S., (2022). “Forrest Holly’s Last Hydraulics Project”. IAHR Journal of Hydraulic Research, 60(6), DOI: 10.1080/00221686.2022.2076167.
- [6] Ettema, R. (2022). “Harold O. Kester: Builder of Hydropower in the American West”. ASCE Journal of Hydraulic Engineering, 148(2).
- [7] Garfield, M. and Ettema, R. (2021). “Effect of Clearwater Scour on the Flow Field at a Single Bendway Weir: Two-Dimensional Numerical Modeling Supported by Flume Data”. ASCE Journal of Irrigation and Drainage Engineering, 147(12).
- [8] Nowroozpour, A. and Ettema, R. (2021). “Observations from Contraction-Scour Experiments Conducted with a Large Rectangular Channel”. ASCE Journal of Hydraulic Engineering, 147(8).
- [9] Siefken, S., Ettema, R., Posner, A., Baird, D., Holste, N., Dombroski, D. and Padilla, R. (2021). “Optimal Configuration of Rock Vanes and Bendway Weirs for River Bends: Numerical-Model Insights”. ASCE Journal of Hydraulic Engineering, 147(5).
- [10] Biethman, B., Ettema, R., Thornton, R., Hogan, T. and Lan, Y. (2021). “Air Entrained along a Steep, Stepped Spillway: Data and Insights from a Hydraulic Model”. Case-Study Paper, ASCE Journal of Hydraulic Engineering, 147(5).
- [11] Ettema, R., Thornton, C., Julien, P. and Hogan, T. (2021). Closure to “Applied research can enhance hydraulic engineering education”. ASCE Journal of Hydraulic Engineering, Vol. 147(5).
- [12] Fakhri, A., Ettema, R., Alliyari, F. and Nowroozpour, A. (2021). “Large-scale Particle image Velocimetry for Estimating Vena-contracta Width for Flow in Contracted Open Channels”. Water, Vol. 13(1).
- [13] Vandermause, R., Harvey, M., Zevenbergen, L. and Ettema, R. (2021). “River-Ice Effects on Bank Erosion along the Middle Reach of the Susitna River, Alaska,” Journal of Cold Regions Science and Technology, Vol 185(4).
- [14] Baker, M., Ettema, R., Teal, M. and Trojanowski, J. (2021). “Lessons Learned from the Failure of Spencer Dam, Nebraska,” Journal of Dam Safety, Assoc. of State Dam Safety Officers, Lexington, KY, Vol. 18(1).
- [15] Baker, M., Ettema, R., Teal, M. and Trojanowski, J. (2020). “Ice-Run Failure of Spencer Dam, Nebraska,” Intl. Journal of Hydropower and Dams, Vol.
- [16] Palermo, M., Papanicolaou, T., Crookston, B.M., Bomdardelli, F.A. and Ettema, R. (2020). “A New ASCE Monograph: Scour at Channel Control Structures.” Forum Article, ASCE Journal of Hydraulic Engineering, DOI: 10.1061/(ASCE)HY.1943-7900.0001778.
- [17] Ettema, R., Thornton, C., Hogan T. and Julien, P. (2020). “Applied Research Can Enhance Hydraulic Engineering Education”. ASCE Journal of Hydraulic Engineering.
- [18] Ettema, R., AuBuchon, J., Holst, N., Varyu, D., Baird, D., Padilla, R., Posner, A. and Thornton, C. (2020). “Large-Flume Tests on Flow Dislodgment of Rocks Forming Bendway Weirs”. ASCE Journal of Hydraulic Engineering, DOI: 10.1061/(ASCE)HY.1943-7900.0001702.

- [19] Osada, K., Ettema, R., Shimizu, Y. and Wakai, A. (2020). "Influence of Channel Morphology on Ice Conveyance and Bridging: Experiments with a Numerical Model". ASCE Journal of Cold Regions Engineering, Vol. 34, No. 1.
- [20] Solan, B., Ettema, R., Ryan, D. and Hamill, G. (2020). "Scour Concerns at Short-Span Masonry Arch Bridges". ASCE Journal of Hydraulic Engineering, Vol. 146, No. 2.
- [21] von Bock und Polach, R.U.F., Ettema, R., Grahler, S. and Kellner, L. and Stender, M. (2019). "The Non-linear Behavior of Aqueous Model Ice in Downward Flexure". Journal of Cold Regions Science and Technology, Vol. 165, No. 1.
- [22] Ettema, R., Cassidy, J.J., Hay, D., Ryan, P., Odgaard, A.J., Findikakis, A., Alsaffar, A. and Weber, L. (2019). "Challenges in Design: Rex A. Elder and the Advance of Hydraulic Engineering". Forum Article, ASCE Journal of Hydraulic Engineering, Vol. 145, No. 10.
- [23] Ettema, R., Baker, J.L., Howlett, G. and Hudson, B. (2019). "Ice-Floe Impact with a Rubble-Mound Causeway at the Port of Nome, Alaska". ASCE Journal of Cold Regions Engineering, Vol. 33, No. 2.
- [24] Ettema, R. and Armstrong, D. (2019). "Bed-Sediment Transport and Channel Morphology along a Braided Channel: Insights from a Large Flume". IAHR Journal of Hydraulic Research, doi.org10.1080/00221686.2018.155557.
- [25] Ettema, R. (2018). Discussion of "Self-similarity and Reynolds Number Invariance in Froude modelling," by Heller, V., (2018), IAHR Journal of Hydraulic Research, Vol 56, No. 2.
- [26] Zey, S., Nowroozpour, A., Lachhab, A., Martinez, E. and Ettema, R. (2018). "Wall-Porosity Effects on Sediment Deposition and Scour at a Deflector-Wall in an Alluvial Channel". ASCE Journal of Hydraulic Engineering, Vol 144, No. 3, 06018002.
- [27] Ettema, R. (2018), Review of Book Hydraulicians of the USA:1800-2000". by Hager, W.H., ASCE Journal of Hydraulic Engineering, Vol. 144, No. 1, 07517002.
- [28] Idil-Bektur, P. and Ettema, R. (2017), "Large-Flume Observations of Scour at Bridge Abutments with Weak, Compacted-Soil Embankments". ASCE Journal of Hydraulic Engineering, Vol. 134, No. 11.
- [29] Ettema, R. and Fukuoka, S. (2017), "Tatsuaki Nakato: A Bridge between Hydraulics in the United States and Japan". Forum Article, ASCE Journal of Hydraulic Engineering, Vol. 143, No. 9.
- [30] Ettema, R., Constantinescu, G. and Melville, B.W. (2017), "Flow-Field Complexity and Design Estimation of Pier-Scour Depth: Sixty Years since Laursen and Toch". ASCE Journal of Hydraulic Engineering, Vol. 134, No. 9.
- [31] Ettema, R. (2017), "Flume Findings on the Transverse Variation of Wide-Jam Thickness in a Bend". ASCE Journal of Cold Regions Engineering, Vol. 31, No. 4.
- [32] Lucie, C., Nowroozpour, A.R. and Ettema, R. (2017), "Ice Jams in Straight and Sinuous Channels: Insights from Small Flumes." ASCE Journal of Cold Regions Engineering, Vol. 31, No. 3.
- [33] Ubinger, C., Ettema, R. and Thornton, C. (2017), "Baffle-Post Arrays for Flow Control in Open Channels." IAHR Journal of Hydraulic Research, Vol. 55, No. 3.
- [34] Ettema, R., Bergendahl, B., Yorozuya, A. and Idil-Bektur, P. (2016), "Breaching of Bridge Abutments and Scour at Exposed Abutment Columns," ASCE Journal of Hydraulic Engineering, DOI: 10.1061/(ASCE)HY.1943-7900.0001159.
- [35] Ettema, R. and Abt, S. (2016), "The Hydraulics Laboratory at Colorado State University," HydroLink, Intl. Assoc. of Hydro-Environment Engineering and Research (IAHR), Issue 4, No. 1.

- [36] Kempema, E. and Ettema, R. (2015), "Fish, Ice and Wedgewire-Screen Water Intakes." ASCE Journal of Cold Regions Engineering, Doi CR.1943-5495.0000097.
- [37] Yorozya, A. and Ettema, R. (2015), "Three Abutment Scour Conditions at Bridge Waterways." ASCE Journal of Hydraulic Engineering, Vol. 141, No. 12, Doi HY.1943-7900.0001053.
- [38] Kempema, E. and Ettema, R. (2015), "Winter Discharge of Coalbed Methane Water in the Powder River Basin, Wyoming." Intl. Journal of River Basin Management, Vol. 13, No. 3, 377-385.
- [39] Ettema, R. (2015), Discussion of "Morphological Evolution of Dune-Like Bed Forms Generated by Bridge Scour" by Oliveto, G. and Hager, W. H., ASCE Journal of Hydraulic Engineering, Vol 141, No. 8, Doi HY.1943-7900.0000853.
- [40] Ng, K.W., Chakradhar, R., Ettema, R. & Kempema, E.W. (2015), "Geotechnical Considerations in Hydraulic Modeling of Bridge Abutment Scour," Journal of Applied Water Engineering and Research, Vol. 3, No. 2, 132-142.
- [41] Ettema, R., Ng, K., Chakradhar, R., Fuller, J., and Kempema, E.W. (2015). "Failure of Spill-Through Bridge Abutments during Scour: Flume and Field Observations." ASCE Journal of Hydraulic Engineering, Vol. 141 No. 5, Doi HY.1943-7900.06015001.
- [42] Ettema, R. and Nakato, T. (2014), "John Fisher Kennedy: Student and Statesman of Hydraulic Engineering." IAHR Journal of Hydraulic Research, Vol. 52, No. 6, pp 731-743.
- [43] Morales, R. and Ettema, R. (2013). "Insights from Depth-Averaged Numerical Simulation of Flow at Bridge Abutments in Compound Channels," ASCE Journal of Hydraulic Engineering, Vol. 139, No. 5, pp 470-481.
- [44] Ho, H.C., Muste, M. and Ettema, R. (2013). "Sediment Self-cleaning, Multi-box Culverts," IAHR Journal of Hydraulic Research, Vol. 51, No. 1, pp 92-101.
- [45] Altinakar, M., Ettema, R., García, M.H., Melville, B.W., Nikora, V. and Parker, G. (2012), "Stephen Coleman (1966-2012)," Acta Geophysica, Vol 60, No. 6, pp 1500-1501.
- [46] Oben-Nyarko, K. and Ettema, R. (2011). "Pier and Abutment Scour Interaction," ASCE Journal of Hydraulic Engineering, Vol. 137 (12), pp 1549-1705.
- [47] Kempema, E. and Ettema, R. (2011). "Anchor Ice Rafting of Sediment: Observations from the Laramie River," River Research and Applications, Vol. 27, No. 9, pp 1126–1135.
- [48] Kirkil, G., Constantinescu, G., and Ettema, R. (2010), Closure to Kirkil et al (2008), "Coherent Structures in the Flow Field around a Circular Cylinder with Scour Hole," ASCE Journal of Hydraulic Engineering, Vol. 136, No. 1, pp 84-86.
- [49] Kirkil, G., Constantinescu, G. and Ettema, R. (2009). "Detached-Eddy-Simulation Insights into Turbulence and Sediment Transport at a Circular Pier with Scour Hole," ASCE Journal of Hydraulic Engineering, Vol. 135(11), pp 888-901.
- [50] Muste, M., Yu. K., Fujita, I. and Ettema, R. (2009). "Two-phase Flow Insights into Open-channel Flows with Suspended Particles of Different Densities," Journal of Environmental Fluid Mechanics, Vol. 9, No. 2, pp 161-186.
- [51] Mutel, C, Daly, D. and Ettema, R. (2008). "Hunter Rouse's Historical Writings and the History of Hydraulics Collection." ASCE Journal of Hydraulic Engineering, Vol. 134, No. 6, pp 683-687 [Reviewed Forum Article].
- [52] Morales, R., Ettema, R. and Barkdoll, B. (2008). "Large-Scale Flume Tests of Riprap-Apron Performance at a Bridge Abutment on a Floodplain," ASCE Journal of Hydraulic Engineering, Vol. 134, No. 6, pp 800-809.



- [53] Kirkil, G., Constantinescu, G., and Ettema, R. (2008). "Coherent Structures in the Flow Field around a Circular Cylinder with Scour Hole," ASCE Journal of Hydraulic Engineering, Vol. 134, No. 5, pp 572-587.
- [54] Ettema, R., Kirkil, G., and Daly, S. (2008). "Frazil Ice Concerns for Channels, Pump-lines, Penstocks, Siphons, and Tunnels in Mountainous Regions," Cold Regions Science and Technology, Vol. 55 (2), pp 202-211.
- [55] Korkut, R., Martinez, E., Morales, R., Ettema, R., and Barkdoll, B. (2007). "Geobag Performance as Scour Countermeasure at Wing-wall Abutments," ASCE Journal of Hydraulic Engineering, Vol. 133, No. 4, pp 431-439.
- [56] Ettema, R. (2006), "Hunter Rouse – His Work in Retrospect," ASCE Journal of Hydraulic Engineering, Vol. 132, No. 12, pp 1248-1258 [Reviewed Forum Article celebrating the centenary of Hunter Rouse's birth].
- [57] Ettema, R. and Mutel, C. (2006), "Hans Albert Einstein in South Carolina," ASCE Journal of Hydraulic Engineering, Vol. 132, No. 8, pp 754-758 [Reviewed Forum Article].
- [58] Ettema, R., Kirkil, G., and Muste, M. (2006), "Similitude of Large-scale Turbulence in Scour around Cylinders," ASCE Journal of Hydraulic Engineering, Vol. 132, No. 1, pp 33-40.
- [59] Michel, F., Ettema, R., and Muste, M. (2006), "Case-Study: Sediment Control at Water Intake for a Large Thermal-power Station on a small Alluvial River," ASCE Journal of Hydraulic Engineering, Vol. 132, No. 5, pp 440-449.
- [60] Daly, S. and Ettema, R. (2006), "Frazil-Ice Blockage of Intakes in the U.S. Great Lakes," ASCE Journal of Hydraulic Engineering, Vol. 132, No. 8, pp 814-824.
- [61] Ettema, R., Muste, M., Abacci, O., Odgaard, J. (2006), "Outflow Calibration of Vertically Distorted Hydraulic Models of Thermally Stratified Reservoirs," IAHR Journal of Hydraulic Research, Vol. 44, No. 4, pp 450-460.
- [62] Ettema, R. (2005), "Rivers Viewed through Names and Epithets," ASCE Journal of Hydraulic Engineering, Vol. 131, No. 7, pp 535-542 [Reviewed Forum Article].
- [63] McAlister, G., Ettema, R., and Marshall, J. (2005), "Wind-driven Break-off and Droplet Flows in Micro-gravity and Terrestrial Gravity Conditions," ASME, Journal of Fluids Engineering, Vol. 127, pp 257-266.
- [64] Ettema, R. and Nixon, W. (2005), "Ice-tank Tests of Ice-rubble Loads against a Cable-moored Conical Platform," ASCE Journal of Cold Regions Engineering, Vol. 19, No. 4, pp 103-116.
- [65] Muste, Yu, K., Fujita, I., and Ettema, R. (2005), "Traditional versus Two-phase Perspective on Turbulent Channel Flows with Suspended Sediment," AGU, Water Resources Research, Vol. 41, No. 10, pp 161-186.
- [66] Ettema, R. and Mutel, C. (2004), "Hans Albert Einstein: Innovation and Compromise in Formulating Sediment Transport by Rivers," ASCE Journal of Hydraulic Engineering, Vol. 130, No. 6, pp 477-487. [Invited paper to celebrate centenary of Hans Albert Einstein's birth].
- [67] Chen, Z., Ettema, R. and Lai, Y. (2004), "Ice-tank and Numerical Study of Frazil Ingestion by Submerged Intakes," ASCE Journal of Hydraulic Engineering, Vol. 130, No. 2, pp 101-111.
- [68] Ettema, R. and Zabilansky, L. (2004), "Ice Influences on Channel Stability: Insights from Missouri's Fort Peck Reach," ASCE Journal of Hydraulic Engineering, Vol. 130, No. 4, pp 279-292.

- [69] Ettema, R and Muste, M. (2004), "Scale-effects in Flume Experiments on Flow around a Dike in a Flatbed Channel," ASCE Journal of Hydraulic Engineering, Vol. 130, No. 7, pp 635-646.
- [70] Ettema, R., Yoon, B., Nakato, T. and Muste, M. (2004), "An Overview of Scour Conditions and Estimation Difficulties for Bridge Abutments," Korean Society of Civil Engineers, Journal of Civil Engineering, Vol. 8, No. 6, pp 643-650.
- [71] Liggett, J. and Ettema, R. (2003). *Closure to "Civil Engineering Education: Alternative Directions."* ASCE Journal of Hydraulic Engineering, Vol. 129, No. 8, pp 655-656.
- [72] Streitz, J. and Ettema, R. (2002), "Observations from an Aufeis Windtunnel," Cold Regions Science and Technology, Vol. 34, No. 2, pp 85-96.
- [73] Ettema, R. (2002), "Review of River-channel Responses to River Ice." ASCE Journal of Cold Regions Engineering, Vol. 16, No. 4, pp 191-217.
- [74] Liggett, J. and Ettema, R. (2001), "Civil Engineering Education: Alternative Directions," ASCE Journal of Hydraulic Engineering, Vol. 127, No. 12, pp 1041-1052.
- [75] Kubit, O. and Ettema, R. (2001), "Debris and Ice-skimming Booms at Riverside Diversions," ASCE Journal of Hydraulic Engineering, Vol. 127, No. 6, pp 489-499.
- [76] Ettema, R. and Muste, M. (2001), "Ice Jams in River Confluences." ASCE Journal of Cold Regions Engineering, Vol. 15, No. 1, pp 41-51.
- [77] Jasek, M., Muste, M. and Ettema, R. (2001), "Estimation of Yukon River Discharge during an Ice Jam near Dawson," Canadian Society of Civil Engineers, Vol. 28, pp 856-864.
- [78] Zufelt, J. and Ettema, R. (2000), "A Fully Coupled Model of Ice-Jam Dynamics," ASCE Journal of Cold Regions Engineering, Vol. 14, No. 1 pp 24-41.
- [79] Ettema, R. (2000), "Adrift in the Curriculum," ASCE Journal of Professional Issues in Engineering Education and Practice, Vol. 126, No. 1, pp 21-26
- [80] Ettema, R., Braileanu, F. and Muste, M. (2000), "A Method for Estimating Sediment Transport in Ice-covered Channels," ASCE Journal of Cold Regions Engineering, Vol. 14, No. 2 pp 130-145.
- [81] Muste, M., Braileanu, F. and Ettema, R. (2000), "Flow and Sediment-transport Measurements in Simulated Ice-Covered Channel," American Geophysical Union, Water Resources Research, Vol. 36, No. 9, pp 2711-2720.
- [82] Tan, C.-T., Sinha, S., and Ettema, R. (1999), "Ice-Cover Influence on Near-Field Mixing in Dune-bed Channel: Numerical Simulation," ASCE Journal of Cold Regions Engineering, Vol. 13, No. 1, pp 1-20.
- [83] Barkdoll, B., Ettema, R. and Odgaard, A.J., (1999), "Sediment Control at Lateral Diversions: Limits and Enhancements to Vane Use," ASCE Journal of Hydraulic Engineering, Vol. 125, No. 8, pp 855-861.
- [84] Ettema, R., Barkdoll, B. and Melville, B.W. (1998), "A Scale Effect in Pier-scour Experiments," ASCE Journal of Hydraulic Engineering, Vol. 124, No. 6, pp 639-642.
- [85] Ettema, R., Mostafa, E., Melville, B.W. and Yassin, A. (1998), "On Scour at Skewed Piers," ASCE Journal of Hydraulic Engineering, Vol. 124, No. 7, pp 756-759.
- [86] Ettema, R., Schaefer, J., and Huang, H.-P. (1998), "Ice-Tank Data on Brash-ice Loads against Barges," ASCE Journal of Cold Regions Engineering, Vol. 12, No. 3, pp 153-161.
- [87] Smith, B. T. and Ettema, R. (1997), "Flow Resistance in Ice-Covered Alluvial Channels," ASCE Journal of Hydraulic Engineering, Vol. 123, No. 7, pp 592-599.
- [88] Smith, B.T. and Ettema, R. (1997), "Ice-cover Influence on Flow Structure over Dunes," Journal of Hydraulic Research, Intl Association for Hydraulic Research, Vol. 35, No. 5, pp 707-719.

- [89] Ettema, R. (1997), invited book review of River Ice Jams, by Beltaos, S., ASCE Journal of Hydraulic Engineering, Vol. 123, No. 7, pp 672-673.
- [90] Ettema, R., Fujita, I., Muste, M. and Kruger, A. (1997), "Particle Image Velocimetry for Whole-field Measurement of Ice Velocities," Cold Regions Science and Technology, 26, pp 97-112.
- [91] Ettema, R. (1997), invited book review of Cold Regions Hydrology and Hydraulics, by Ryan, W. L. and Crissman, R. D. (Eds), ASCE Journal of Cold Regions Engineering, Vol. 11, No.3, pp 252-254.
- [92] Teal, M., Ettema, R. and Walker, J. (1996), *Closure to* "Estimation of Mean Flow in Ice-Covered Channels," ASCE Journal of Hydraulic Engineering, Vol. 122, No. 8, pp 476-477.
- [93] Ettema, R. (1996), an invited book review, on The Canadian Habbakuk Project, ASCE Journal of Cold Region Engineering, Vol. 10, No. 1, pp. 58-59.
- [94] Yoon, J.Y., Patel, V.C. and Ettema, R. (1996), "A Numerical Model of Flow in an Ice Covered Channel," ASCE Journal of Hydraulic Engineering, Vol. 122, No. 1, pp 19-26.
- [95] Yoon, B. and Ettema, R. (1996), "Icing Loads on Fixed Cables: Laboratory Experiments," Korean Journal of Hydrosiences," Vol. 29, No. 2, pp 249-265.
- [96] Yoon, B., Pokorny, M. and Ettema, R. (1996), "Icing Loads on Fixed Cables: Determination of Length Scale," Korean Journal of Hydrosiences, Vol. 29, No. 4, pp 191-198.
- [97] Crissman, R.D., Ettema, R., Andres, D. and Carson, R. (1995), "Ice Jamming in The Upper Niagara River: Processes and Plan of Study," ASCE Journal of Cold Regions Engineering, Vol. 9, No. 2, pp 89-104.
- [98] Ettema, R. and Crissman, R.D. (1995), *Invited editorial* "Hydropower and Ice on the Upper Niagara River," ASCE Journal of Cold Regions Engineering, Vol. 9 No. 1, pp 1-3.
- [99] Tsai, W.-F. and Ettema, R. (1994), "Modified Eddy Viscosity Model in Fully Developed Asymmetric Channel Flows," ASCE Journal of Engineering Mechanics, Vol. 120, No. 4, pp 720-732.
- [100] Holly, F.M., and Ettema, R. (1994), "Sediment Imbalance in Rivers: Simulation Possibilities and Problems," in Biological Report, Vol. 19, U.S. Fish and Wildlife Service, pp 415-416.
- [101] Urroz, G. and Ettema, R. (1994), "Application of Two-Layer Hypothesis to Fully Developed Flow in Ice-Covered Curved Channels," Canadian Journal of Civil Engineering, Vol. 21, pp 101-110.
- [102] Urroz, G. and Ettema, R. (1994), "Small-Scale Experiments on Ice Jam Initiation in a Curved Channel," Canadian Journal of Civil Engineering, Vol. 21, No. 5, pp 719-727.
- [103] Urroz, G. E., Schaefer, J.A., and Ettema, R. (1994), "Bridge Pier Location and Ice Conveyance in Curved Channels," ASCE Journal of Cold Regions Engineering, Vol. 8, No. 2, pp 6-72.
- [104] Tsai, W.-F. and Ettema, R. (1994), "Ice Cover Influence on Transverse Bed Slopes in a Curved Alluvial Channel," IAHR Journal of Hydraulic Research., Vol. 32, No. 4, pp 561-582.
- [105] Teal, M, Ettema, R., and Walker, J. (1994), "Estimation of Mean Flow in Ice-Covered Channels," ASCE Journal of Hydraulic Engineering, Vol. 120, No.4, pp 1385-1400.
- [106] Nixon, W.A., Ettema, R., Matsuishi, M. and Johnson, R. (1993), "Ice-tank Study of a Floating Moored Platform in Ice," ASCE Journal of Cold Regions Engineering, Vol. 7, No. 1, pp 12-31.

- [107] Ettema, R. and Kennedy, J.F. (1993), "Listening to Research Clients," ASCE Journal of Professional Issues in Engineering Education and Practice, Vol. 119, No. 4, pp 416-421.
- [108] Yoon, B. and Ettema, R. (1993), "Droplet Trajectories and Icing-Collection Efficiencies Determined Using Laser-Doppler Velocimetry," Cold Regions Science and Technology, Vol. 21, pp 381-397.
- [109] Parthasarathy, R.N., Ettema, R., Patel, V.C. (1992), "Calibration Characteristics of a Simplex Pitot-Static Probe and Five Alternative Velocity Probes," Cooling Tower Institute Journal, Paper TP92-15.
- [110] Urroz, G. and Ettema, R. (1992), "Bend Ice Jams: Laboratory Observations," Canadian Journal of Civil Engineers, Vol. 19, pp 855-864.
- [111] Jain, S.C. and Ettema, R. (1991), Closure to "Minimization of Frazil-Ice Production by River Flow Regulation," ASCE, Journal of Hydraulic Engineering, Vol. 117, No. 10, pp 1410-1412.
- [112] Ettema, R., Sharifi, M., Georgakakos, K. and Stern, F. (1991), "Chaos in Continuous-mode Icebreaking," Cold Regions Science and Technology, Vol. 19, No. 2, pp 131-144.
- [113] Ettema, R. (1991), "Ice Formation in Navigation Channels," Permanent International Association of Navigation Congresses, Bulletin (Journal), Vol. 74, pp 57-70.
- [114] Ettema, R. (1990), "Ice Jam Initiation in Unobstructed Channels: Laboratory Observations," IAHR Journal of Hydraulic Research, Vol. 28, No. 6, pp 673-684.
- [115] Schohl, G.A. and Ettema, R. (1990), "Two-Dimensional Spreading and Thickening of Aufeis," Journal of Glaciology, Vol. 36, No. 2, pp 169-178.
- [116] Ettema, R., (1990), *Discussion of* "Design Method for Local Scour at Bridge Piers," by Melville, B. and Sutherland, A.J., ASCE Journal of Hydraulic Engineering, Vol. 116, No. 10, pp 1290-1292.
- [117] Ettema, R., Stern, F., and Lazaro, J. (1989), "Dynamics of Continuous-mode Icebreaking by a POLAR-Class Hull. Part 1: Mean Response," Journal of Ship Research, Vol. 33, No. 2, pp 115-134.
- [118] Stern, F., Ettema, R., and Lazaro, J. (1989), "Dynamics of Continuous-mode Icebreaking by a POLAR-Class Hull. Part 2: Spectral Analysis," Journal of Ship Research, Vol. 33, No. 3, pp 236-251.
- [119] Schaefer, J.A., Ettema, R., and Nixon, W.A. (1989), "Measurements of Icing Hardness," Cold Regions Science and Technology, Vol. 17, No. 3, pp 89-93.
- [120] Ettema, R. and Urroz, G. (1989), "On Internal Friction and Cohesion in Floating Ice Rubble," Cold Regions Science and Technology, Vol. 16, No. 3, pp 237-247.
- [121] Nakato, T., Ettema, R., and Ashton, G.D. (1989), "Unconventional Power Sources for Ice Control at Lock and Dams," ASCE Journal of Cold Regions Engineering, Vol. 3, No. 3, pp 107-126.
- [122] Ettema, R., Johnson, J.K., and Schaefer, J. (1989), "Foam-Ice Initiated Ice Cover Formation on Small Rivers: An Observation," Cold Regions Science and Technology, Vol. 15, No. 2, pp 95-99.
- [123] Jain, S.C. and Ettema, R. (1989), "Minimization of Frazil-Ice Production by River Flow Regulation," ASCE Journal of Hydraulic Engineering, Vol. 115, No. 9, pp. 1256-1274.
- [124] Johnson, C.J. and Ettema, R. (1988), "Passive Intake for Shallow Sand-Bed Rivers," ASCE Journal of Hydraulic Engineering, Vol. 114, No. 6, pp 662-674.

- [125] Ettema, R. and Huang, H.P. (1988), "Ice-rubble Accumulation beneath Barges Moving Through Ice-Covered Waters," IAHR Journal of Hydraulic Research, Vol. 26, No. 4, pp 379-412.
- [126] Ettema, R. (1987). Closure to "Scour at Cylindrical Piers in Armored Beds," by Raudkivi and Ettema, ASCE, Journal of Hydraulic Engineering, Vol. 113, HY3, pp 421.
- [127] Ettema, R. and Urroz, G. (1987), "Simple-shear-box Experiments on Ice Rubble," Cold Regions Science and Technology, Vol. 14, No. 2, pp 185-199.
- [128] Schohl, G. and Ettema, R. (1986), "Theory and Laboratory Observations of Naled Ice Growth," Journal of Glaciology, Vol. 32, No. 111, pp. pp 168-177.
- [129] Ettema, R., Matsuishi, M. and Kitazawa, T. (1986), "Model Tests on Ice-Rubble Size and Ship Resistance in Ice Rubble," Cold Regions Science and Technology, Vol. 12, No. 4, pp 229-243.
- [130] Ettema, R. and Schaefer, J. (1986), "Experiments on Freeze-bonding between Ice Blocks," Journal of Glaciology, Vol. 32, No. 112, pp 397-403.
- [131] Ettema, R. (1986), "A Brief Review of Research Needs for Physical Modeling in Ice Engineering: Reflections from a University Ice Tank," Cold Regions Science and Technology, Vol. 12, No. 1, pp 57-65.
- [132] Kitazawa, T. and Ettema, R. (1985), "Resistance to Ship-Hull Motion in Brash Ice," Cold Regions Science and Technology, Vol. 11, No. 3, pp 219-234.
- [133] Raudkivi, A.J. and Ettema, R. (1985), "Scour at Cylindrical Bridge Piers in Armored Beds around Bridge Piers," ASCE, Journal of Hydraulic Engineering, Vol. 111, HY4, pp 713-731.
- [134] Ettema, R. and Johnson, L.C. (1984), "Wedge-wire Screens for Shallow Rivers," ASCE, Journal of Hydraulic Engineering, Vol. 110, HY8, pp 1139-1144.
- [135] Ettema, R., Karim, F., and Kennedy, J.F. (1984), "A Laboratory Study of Frazil Ice Growth," Cold Regions Science and Technology, Vol. 10, No. 1, pp 43-58.
- [136] Ettema, R. (1984), "Sampling Armor-layer Sediments," ASCE, Journal of Hydraulic Engineering, Vol. 110, HY7, pp 982-986.
- [137] Raudkivi, A.J., and Ettema, R. (1983), "Clear-water Scour at Cylindrical Piers," ASCE, Journal of Hydraulic Engineering, Vol. 109, HY3, pp 338-350.
- [138] Raudkivi, A.J., and Ettema, R. (1982), "On the Stability of Armored Layers in Rivers," ASCE, Journal of Hydraulic Engineering, Vol. 108, No. HY9, pp 1047-1057.
- [139] Raudkivi, A.J. and Ettema, R. (1977), "Effect of Sediment Gradation on Clear-water Scour," ASCE, Journal of Hydraulic Engineering, Vol. 103, HY10, pp 1209-1212.

### Conference Papers in Proceedings

- [1] Ettema, R., Thornton, C., Ellis, J., Hughes, D, Lan, F. and Zusi, M. (2023). "Desirable Vortex Formation at a Spillway Entrance". Proc. 40<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Vienna, Austria, August 21-24.
- [2] Ettema, R. and Kempema, E.W. (2023). "Heat-Flux of River Channels Draining Mountains: An Example from America's Northern Great Plains". Proc. 40<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Vienna, Austria, August 21-24.
- [3] Ettema, R., Wittmershaus, A. and Kharatov, A.N. (2023). "A Correct Method for Experiments on the Livebed Performance of Bendway Weirs and Rock Vanes". Proc.

- ASCE Conf. on Hydraulic Measurements and Experimental Methods, Fort Collins, June 25-29.
- [4] Ellis, J., Thornton, C., Ettema, R. and Zusi, M. (2023). "Communication of Laboratory Model Performance". Proc. ASCE Conf. on Hydraulic Measurements and Experimental Methods, Fort Collins, June 25-29.
  - [5] Ettema, R., Thornton, C.I., Wittmershaus, A., Maddocks, P., Holste, N., Baird, D., Varyu, D., Posner, A., and Padilla, R. (2023). "Livebed Scour at Bendway Weirs and Rock Vanes Formed of Loose Rock". Proc., SEDHYD 2022, 12th Federal Interagency Sedimentation and 7th Hydrologic Modeling Conference, St. Louis, MO, May 8-12.
  - [6] Ettema, R. (2022). "Merging of Civil Engineering and Atmospheric Science: An Example from America's Northern Great Plains," Hydrology and Water Resources Symposium, Engineers Australia, Brisbane, Queensland, Australia, Nov. 30-Dec. 2.
  - [7] Ettema, R. and Kempema, E. (2022). "Winter Thermal Responsiveness of Small Streams in Frigid Winters." Proc. River Flow 2022, Ottawa, Canada, Nov. 8-10.
  - [8] Ettema, R. and Thornton, C. (2022). "Hydraulic Modeling of Braided Channels to Aid Design of Instream Structures." Proc. 39<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Granada, Spain, June 19-24.
  - [9] Ettema, R. (2021). "A Brief Review of Frigid-Winter and Ice Effects on Earthen Embankments." ASCE 19<sup>th</sup> Intl. Conf on Cold Regions Engineering, Boulder, CO, Oct. 21-29, [Online].
  - [10] Ettema, R., Baker, M.E., Teal, M. and Trojanowski, J. (2021). "Ice-Run Destruction of Spencer Dam on Nebraska's Niobrara River". CGU HS Committee on River Ice Processes and the Environment, 21<sup>st</sup> Workshop on the Hydraulics of Ice-Covered Rivers, Saskatoon, Saskatchewan, Canada, August 29-September 1.
  - [11] Kempema, E., Bunte, K. and Ettema, R. (2021). "Revisiting Anchor-Ice Rafting in the Laramie River, Wyoming". CGU HS Committee on River Ice Processes and the Environment, 21<sup>st</sup> Workshop on the Hydraulics of Ice-Covered Rivers, Saskatoon, Saskatchewan, Canada, August 29-September 1.
  - [12] Ettema, R., Maddocks, P., Baird, D., Holste, N., Posner, A. and Padilla, R. and Varyu, D. (2021). "Scour Failure of Bendway Weirs and Rock Vanes: Flume Observations." Proc. ASCE-EWRI Congress, Milwaukee WI, USA, June 7-11 [Online].
  - [13] Kempema, E., Ettema, R. and Bunte, K. (2020). "Anchor-Ice Rafting, An Important Mechanism for Bed-Sediment Transport in Cold-Regions Rivers." Proc. River Flow 2020, Delft, The Netherlands, July 6-10.
  - [14] Osada, K., Shimizu, Y., Ettema, R. and Enkhtur, E. (2020). "A Numerical Model for Simulating 3D Accumulation of Woody Debris at Bridge Piers." Proc. River Flow 2020, Delft, The Netherlands, July 6-10.
  - [15] Ettema, R., Thornton, C., Lan, F., Zusi, M. and Dick, C. (2020). "A Novel Stilling Basin for a Steep, Stepped Spillway: Gross Reservoir Expansion Project". Proc. U.S. Society of Dams, Conf., Denver, CO, April.
  - [16] Baker, M.E. Ettema, R., Teal, M. and Trojanowski, J. (2020). "The Making of the Spencer Dam failure Independent Investigation". Proc. U.S. Society of Dams, Conf., Denver, CO, April.
  - [17] Ettema, R., Haycraft, D. and Tonkin, S. (2019). "Holly's last Hydraulics Project". Proc. 38<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Panama City, Panama, September 1-6.
  - [18] Solan, B., Nowroozpour, A., Clopper, P. Watters, C. and Ettema, R. (2019). "Scour-Induced

- Failure of Masonry Arch Bridges: Causes and Countermeasures". Proc. 38<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Panama City, Panama, September 1-6.
- [19] Osada, K. and Ettema, R. (2019). "Numerical Investigation of the Influences of River Channel Morphology on Ice Conveyance and Ice Bridging". 18<sup>th</sup> Conf. on Cold Regions Eng., Quebec City, Canada, August 18-22.
  - [20] Bunte, K., Swingle, K.W., Ettema, R., Abt, S.R. and Cenderelli, D.A. (2019). "Bedload Traps and Helley-Smith Sampler Collect Different Rates and Particle Sizes of Gravel Bedload". Proc., SEDHYD 2019, 11th Federal Interagency Sedimentation and 6th Hydrologic Modeling Conference, June 24-28, 2019, Reno, NV.
  - [21] Bunte, K., Swingle, K.W., Abt, S.R., Cenderelli, D.A., Ettema, R. (2019). "Estimates of Gravel Transport Rates in Mountain Streams for Normal ( $Q_{1.5}$ ) High-flow Events". Proc., SEDHYD 2019, 11th Federal Interagency Sedimentation and 6th Hydrologic Modeling Conference, June 24-28, 2019, Reno, NV. USA.
  - [22] Kempema, E., Remlinger, B., Osada, K. and Ettema, R. (2019). "Anchor-ice-related Flooding in Flat Creek, Jackson, Wyoming: Insights from Alpine Streams." 20<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Ottawa, Canada, May 14-16.
  - [23] Ettema, R., Solan, B., Ryan, D. and Hamill, G. (2018), "Scour and the Stability of Short-Span, Masonry Arch Bridges: Findings from a Diagnostic, Flume Study". Civil Engineering Research in Ireland, Dublin, Ireland, August 29-30.
  - [24] Clopper, P., Lagasse, P. and Ettema, R. (2018), "NCHRP Project 24-47: Revised Clear-Water and Live-Bed Contraction Scour Analysis." National Hydraulic Conference, Columbus Ohio, August 28-31.
  - [25] Ettema, R. (2018). Ice Overtopping of Embankments: Ice-Tank Experiments and Field Observations." Protections 2018, Grange-Over-Sands, U.K., June 6-8.
  - [26] Ettema, R., Aubuchon, J., Holtse, N., Varyu, D., Baird, D., Padilla, R. and Thornton, C. (2017), "Large-Scale Flume Tests on Flow Dislodgment of Rocks Forming Bendway Weirs," 37<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Kuala Lumpur, Malaysia, August 14- July 18.
  - [27] Tranmer, A., Goodwin, P., Ettema, R., Tiedermann, M.G., Tonina, D. and Ettema, R. (2017). Ice formation and Flow Regimes in Regulated Rivers, Central Idaho, USA." 37<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Kuala Lumpur, Malaysia, August 14- July 18.
  - [28] Vandermause, R. and Ettema, R. (2017), "Aerial Monitoring of Vegetation to Identify Ice-related bank Erosion along the Middle reach of the Susitna River, Alaska," 19<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Whitehorse, Canada, July 9-12.
  - [29] Kempema, E. and Ettema, R. (2017), "Evaluating a Distributed Temperature Sensing System for Anchor-ice Studies." 19<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Whitehorse, Canada, July 9-12.
  - [30] Kempema, E., Remlinger, B., Daly, S. and Ettema, R. (2017), "Ice-related Urban Winter Flooding of Flat Creek, Jackson, Wyoming," 19<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Whitehorse, Canada, July 9-12.
  - [31] Ettema, R. (2017), "Ice Concerns for Hydraulic Engineering in Cold, Mountainous Terrain," XXXVI<sup>th</sup> Intl. School of Hydraulics, Jachranka, Poland, May 23-26.
  - [32] Ettema, R., Armstrong, D.L. Vandermause, R. and Thornton, C.I. (2016), "A Laboratory Investigation of Braided Channel Hydraulics," XXVII Latin-American Hydraulics Congress, Lima, Peru, Sept. 26-30.

- [33] Ettema, R. and Ng, K. (2016), "Insights from Laboratory Experiments on the Failure of Earthen Embankments at Bridge-Waterway Abutments," *Protections 2016*, Fort Collins, CO, Sept. 7-9.
- [34] Ryan, D., Hamill, G., Solan, B. and Ettema, R. (2016), "Arch Bridges under Flood Conditions, a Study of the Velocity Distributions, and Resulting Bed Scour," *Civil Engineering Research in Ireland*, Galway, Ireland, August 29-30.
- [35] Ettema, R., Armstrong, D.L., Thornton, C.I., Hughes, S.A. and Abt, S.R. (2016), "Hydraulic Modeling of Braided Channels Self-formed in an Alluvial Plain," 8<sup>th</sup> Intl. Conference on Fluvial Hydraulics, St. Louis, MO, July 10-14.
- [36] Vandermause, R., Ettema, R., Zevenbergen, L. and Harvey, M. (2016), "An Evaluation of Winter Effects Exerted on the Banks of the Middle Reach of the Susitna River, Alaska," 23<sup>rd</sup> Intl. Symposium on Ice, International Association for Hydro-Environment Engineering and Research, Ann Arbor, MI, May 31 - June 3.
- [37] Kempema, E. and Ettema, R. (2015), "Frazil or Anchor Ice Blockage of Submerged Water Intakes?" 18<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Quebec City, Canada, August 17-21.
- [38] Ryan, D., Solan, B. and Ettema, R. (2015), "Stability of Short-span Bridges Subject to Overtopping During Floods: Case Studies from Ireland and the USA," 36<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, The Hague, Netherlands, June 28- July 3.
- [39] Ettema, R., Thornton, C. and Abt, S. (2015), "Hydraulic Modeling of Channel-Control Structures in Self-forming Braided Channels," 36<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, The Hague, Netherlands, June 28- July 3.
- [40] Ng, K., Chakrahda, R., Ettema, R. and Kempema, E. (2015), "Laboratory Investigation of Embankment Soil Strength Influence on Abutment Scour: Early Findings." ASCE-EWRI Conference, Austin, Texas, May 17-21.
- [41] Ubong, C., Ettema, R. and Thornton, C. (2015), "Baffle-Post Arrays for Flow Control in Open Channels," ASCE-EWRI Conference, Austin, Texas, May 17-21.
- [42] Ettema, R. (2015), "Hydropower Influences on River Ice Dynamics and Channel Morphology: A Matter of Thermal and Flow Scales." AGU-CGU Joint Assembly, River Ice Dynamics Session, Montreal, Canada, May 3-7.
- [43] Ettema, R. (2014), "John Fisher Kennedy's Contributions to the Advance of River Engineering," 3<sup>rd</sup> Europe Congress, International Association for Hydro-Environment Engineering and Research, Porto, Portugal, May 14-17.
- [44] Ettema, R. and Nakato, T. (2013), "John Fisher Kennedy – Student and Statesman of Hydraulic Engineering," 35<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Chengdu, China, Sept. 8-13.
- [45] Kempema, E. and Ettema, R. (2013), "Anchor Ice and Wedge-wire Screens," 17<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Edmonton, Canada, July 21-24.
- [46] Ettema, R. and Fuller, J. (2013), "Abutment Failure during Bridge Waterway Scour," 35<sup>th</sup> Congress, International Association for Hydro-Environment Engineering and Research, Chengdu, China, Sept. 8-13.
- [47] Ettema, R., Fuller, J., Kempema, E., Turner, J. (2012), "Laboratory Observations of Geotechnical and Hydraulic Erosion during Bridge Abutment Scour," *Hydraulic Instrumentation and Experimental Methods Conference*, ASCE, Snowbird, Utah, August.
- [48] Ettema, R. and Kempema, E. (2012), "Observations of Anchor Ice Formation on the Bed of a Small River," *Third International Symposium on Shallow Flows*, Iowa City, Iowa, June.



- [49] Kempema, E., Ettema, R., and Stiver, J., (2011), "Effects of CBM Water Discharge on Fluvial and Ice Processes in the Powder River Basin, Wyoming," 15<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, Winnipeg, Manitoba, Canada, September.
- [50] Basnet, K. and Ettema, R. (2011), "Large-scale Particle-image Velocimetry for Resolving Flow Features at Cylinders," 34<sup>th</sup> Congress of International Association of Hydraulic Engineering and Research, International Association for Hydro-Environment Engineering and Research (IAHR), Brisbane, Australia, June.
- [51] Morales, R. and Ettema, R. (2011), "Parametric Estimation of Optimal Mesh Size for Depth-averaged Numerical Flow Models," 34<sup>th</sup> Congress of International Association of Hydraulic Engineering and Research, International Association for Hydro-Environment Engineering and Research (IAHR), Brisbane, Australia, June.
- [52] Ettema, R. and Rennie, C. (2010), "Advances in Hydraulic Modeling and Instrumentation for Bridge Waterways," International Conference on Hydraulic Physical Modeling and Field Investigation, Nanjing, China, September.
- [53] Ettema, R. and Kempema, E. (2010), "River-Ice Effects on Gravel-Bed Rivers," Proc. 7<sup>th</sup> Gravel Bed Rivers Conference, Tadoussac, Quebec, Canada, September.
- [54] Ettema, R. and Nakato, T. (2010), "Geotechnical Limit to Scour at Spill-through Abutments," International Conference on Scour and Erosion, San Francisco, California, November.
- [55] Kempema, E. and Ettema, R. (2009), "Variations in Anchor-Ice Crystal Morphology with River Flow and Atmospheric Conditions," 14<sup>th</sup> Workshop, Canadian River Ice Processes and the Environment, St Johns, Newfoundland, Canada, June.
- [56] Ettema, R. and Kempema, E. (2009), "Observations of Anchor Ice Formation and Bed Sediment Transport in a High-Plains River," Proc., 33<sup>rd</sup> Congress of International Association of Hydraulic Engineering and Research, Vancouver, Canada, August.
- [57] Kempema, E., Daly, S, and Ettema, R. (2008), "Fish Protection, Wedge-wire Intake Screens, and Frazil Ice," IAHR Symposium on Ice, Vancouver, August.
- [58] Kempema, E., Ettema, R., McGee, B. (2008), "Insights on Anchor Ice Formation in the Laramie River," IAHR Symposium on Ice, Vancouver, August.
- [59] Ettema, R. Yorozuya, A, Nakato, T., and Muste, M. (2008), "Three Abutment Scour Conditions Investigated with Laboratory Flumes," International Conference on Scour and Erosion, Tokyo, Japan, November.
- [60] Ettema, R. (2007), "Estimation of Abutment Scour: A New Approach," Transportation Research Board Conference, Washington D.C., January.
- [61] Ettema, R., Yorozuya, A, Nakato, T., and Muste, M. (2006). "A Practical Approach to Estimating Scour Depths at Bridge Abutments," ASCE-EWRI Conference, Omaha, Nebraska, May.
- [62] Mutel, C., Daly, D., and Ettema, R. (2006), "Rouse's Collection of Historic Manuscripts," ASCE-EWRI Conference, Omaha, Nebraska, May.
- [63] Ettema, R. and Kirkil, G. (2006), "Vorticity Similitude in Experiments on Local Scour," International Association for Hydraulic Research, Intl. Symposium on Hydraulic Structures, Ciudad Guayana, Venezuela, October.
- [64] Ettema, R. (2006), "Hunter Rouse, Hydraulician: An Overview of his Work," ASCE-EWRI Conference, Omaha, Nebraska, May.
- [65] Ettema, R. Yorozuya, A, Nakato, T., and Muste, M. (2006), "Abutment Scour: Design Issues," International Association for Hydraulic Research, Intl. Symposium on Hydraulic Structures, Ciudad Guayana, Venezuela, October.
- [66] Kirkil, G., Constantinescu, G., and Ettema, R., (2006), Investigation of the velocity and

pressure fluctuation distributions inside the turbulent horseshoe vortex system around a circular bridge pier. Intl. Conference on Fluvial Hydraulics, Lisbon, Portugal, September.

- [67] Kirkil, G., Constantinescu, G., and Ettema, R., (2005), "The Horseshoe Vortex System Around a Circular Bridge Pier on Equilibrium Scoured Bed." ASCE-EWRI Conference, Anchorage, Alaska, May.
- [68] Ettema, R., (2005), "Information Needs When Estimating ice-jam Floods," NATO Advanced Research Workshop on Extreme Hydrologic Events, Novosibirsk, Russia, July.
- [69] Ettema, R., (2005), "A Continuously Operable Hydraulic Model of Selective Withdrawal from a Stratified Reservoir," 33<sup>rd</sup> Congress, International Association for Hydraulic Research, Seoul, Korea, September.
- [70] Daly, S. and Ettema, R. (2005), "Super-cooled Water Withdrawal from Lake-bed Intakes," 33<sup>rd</sup> Congress, International Association for Hydraulic Research, Seoul, Korea, September.
- [71] Ettema, R. and Mutel, C. (2004), "Hans Albert Einstein in South Carolina," ASCE-EWRI Conference, Salt Lake City, Utah, June.
- [72] Ettema, R. (2004), "Notes on River Names and Epithets," ASCE-EWRI Conference, Salt Lake City, Utah, June.
- [73] Constantinescu, G., Ettema, R., Muste, M. (2004), "An Eddy-resolving Technique to Predict Unsteady Horseshoe Vortex and Wake Flow," International Conference on Scour and Erosion, Singapore, November.
- [74] Kirkil, G., Ettema, R., and Muste, M., (2004), "Similitude of Coherent Turbulence Structures in Flume Studies of Local Scour," International Conference on Scour and Erosion, Singapore, November.
- [75] Ettema, R., Yorozuya, A., Muste, M. and Nakato, N., (2004), "A New Method for Predicting Scour at Bridge Abutments," International Conference on Scour and Erosion, Singapore, November.
- [76] Korkut, R., Ettema, R., and Barkdoll, B. (2004), "Geobags as Scour Countermeasure," International Conference on Scour and Erosion, Singapore, November.
- [77] Ettema, R., Muste, M., Odgaard, A.J., and Abacci, O. (2004), "A Large Vertically Distorted Hydraulic Model of Outflow from a Thermally Stratified Reservoir," Third Environmental Hydraulics Conference, Hong Kong, December.
- [78] Michel, F., Amaya, P., Dannemiller, C., Ettema, R. and Muste, M. (2003), "Correcting Sedimentation Problems at American Electric Power's Conesville Plant River Intake," Annual Conference of Cooling Tower Institute, San Antonio, Texas.
- [79] Nixon, W., Ettema, R., Holly, F., and Stoner, J. (2003), "A Flexible Undergraduate Civil Engineering Curriculum," American Society of Engineering Education, Annual Conference, Nashville, Tennessee.
- [80] Muste, M., Ettema, R., Yu, K., and Gomez, P. (2003), "Web-based Database for Highway Erosion and Sedimentation Control Measures," Mid-continent Transportation Research Symposium, Ames, Iowa.
- [81] Mutel, C. F. and Ettema, R. (2003). "Floyd Nagler: Founder of IIHR." ASCE-EWRI Conference, Darcy Memorial Symposium, Philadelphia, Pennsylvania, June.
- [82] Ettema, R. and Mutel, C. F. (2003), "Hans Albert Einstein's Efforts to Understand and Formulate Bed-sediment Transport in Rivers." ASCE-EWRI Conference, Darcy Memorial Symposium, Philadelphia, Pennsylvania.
- [83] Ettema, R., Muste, M., and Nakato, T. (2003), "An Overview of Scour Types and Scour-estimation Difficulties Faced at Bridge Abutments," Mid-continent Transportation Research

Symposium, Ames, Iowa.

- [84] Ettema, R., Chen, Z., and Doering, J. (2003), "Making Frazil in a Large Tank," Canadian River Ice and the Environment Workshop, Edmonton, Alberta.
- [85] Chiew, Y.M. and Ettema, R. (2003), "Similitude in Laboratory Pier-Scour Studies," 30<sup>th</sup> Congress, International Association for Hydraulic Research, Thessaloniki, Greece.
- [86] Yu, K., Muste, M., and Ettema, R. (2003), "Experiment Observations of Sediment-particle Kinematics using Two-phase-flow Measurements," XXXth Congress, International Association for Hydraulic Research, Thessaloniki, Greece.
- [87] Ettema, R. and Maynard, S. (2002) "Framework for Evaluating Very Small Hydraulic Models of Channel-control Works." ASCE Conference on Hydraulic Measurements and Experimental Methods, Estes Park, Colorado.
- [88] Ettema, R., Mutel, C., and Patel, V. C. (2002), "IIHR, Seventy Years Old and Still Going Strong," ASCE Annual Congress, Washington, D.C.
- [89] Ettema, R. and Muste, M. (2002), "Scale Effects in Hydraulic Models of Flow around Dikes in Flatbed Channels." ASCE Conference on Hydraulic Measurements and Experimental Methods, Estes Park, Colorado.
- [90] Ettema, R. (2002), Invited Lecture: "Flume Experiments on Abutment Scour: Confronting Complexities in Process and Similitude" First Intl. Conference on Scour of Foundations, College Station, Texas.
- [91] Martinez, E., Ettema, R., Lachhab, M. (2002), "Scour Experiments on Dike Angle, Porosity, and Hook for a Thin Dike" First Intl. Conference on Scour of Foundations, College Station, Texas.
- [92] Barkdoll, B. Ettema, R., Melville, B., Kuhnle, R., Pachure, T, Alonso, C., Parola, A. (2002), "Abutment Scour Countermeasures: A Review," First Intl. Conference on Scour of Foundations. College Station, Texas.
- [93] Ettema, R., Chen, Z., and Lai, Y. (2002), "Frazil-ice Ingestion by a Submerged Water Intake: Numerical Model and Ice-Tank Findings." International Association for Hydraulic Research, Symposium on Ice, Dunedin, New Zealand.
- [94] Ettema, R., and Nixon, W.A. (2002), "Rubble-Ice Loads against Cable-moored Structures," International Association for Hydraulic Research, Symposium on Ice, Dunedin, New Zealand.
- [95] McAlister, G., Ettema, R., Marshall, J. (2002), *Poster* "Rivulet Dynamics in Variable Gravity and Shear Flow," NASA Microgravity Conference, Cleveland, Ohio.
- [96] Ettema, R. and Zabilansky, J. (2001), "Ice-cover and Open-lead Formation along the Ft Peck Reach of the Missouri River," Canadian Workshop on River Ice, Ottawa, Ontario.
- [97] Ettema, R., Chen, Z. and Lai, Y. (2001). "Hydraulic Performance of Offshore Water Intakes: Some CFD Findings." Ports and Ocean Engineering under Arctic Conditions Conference, August, Ottawa, Ontario.
- [98] Muste, M., Ettema, R., and Fujita, I. (2000), "Image-Based Technique for Monitoring Ice Motion in Laboratory and Field Conditions," International Workshop on River Environments Considering Hydraulic and Hydrologic Phenomena in Snowy and Cold Regions, Quebec City, Quebec.
- [99] Ettema, R., Zabilansky, J., and Bledsoe, B. (2000), "Ice-Induced Thalweg Oscillations along the Fort Peck Reach of the Missouri River," ASCE Water Resources Conference, Minneapolis, Minnesota.
- [100] Ettema, R., Zabilansky, J., and Wuebben, J. (2000), "Observations on the Winter Performance of Channel-Stabilization Structures," International Association for Hydraulic

- Research, Symposium on Ice, Gdansk, Poland, August.
- [101] Kubit, O. and Ettema, R. (2000), "Ice-skimming Booms for Riverside Diversions," International Association for Hydraulic Research, Symposium on Ice, Gdansk, Poland.
  - [102] Kubit, O. and Ettema, R. (2000), "Debris-Skimming Booms for Riverside Diversions," ASCE Water Resources Conference, Minneapolis, Minnesota.
  - [103] Ettema, R. (1999), "A Review of River-Ice Impacts on Channel Stability," Canadian Workshop on River Ice, Winnipeg, Manitoba.
  - [104] Jasek, M. Muste, M., Ettema, R., and Kruger, A. (1999), "LSPIV and Numerical Modeling Yukon River Discharge at Dawson during an Ice Jam," Canadian Workshop on River Ice, Winnipeg, Manitoba.
  - [105] Ettema, R. (1999), "Loose-Bed Issues in River-Ice Hydraulics," ASCE Cold Regions Engineering Conference, Loon Lake, New Hampshire.
  - [106] Tan, C.-T., Sinha, S., and Ettema, R. (1999), "Numerical Simulation of Ice-Cover Influence on Near-Field Mixing," XXVIIIth Congress, International Association for Hydraulic Research, Graz, Austria.
  - [107] Ettema, R., Muste, M., and Coleman, S. (1999), "Flume Notes on Sediment Transport and Boil Formation in Ice-Covered Channels," XXVIIIth Congress, International Association for Hydraulic Research, Graz, Austria.
  - [108] Ettema, R. and Braileanu, F. (1998), "A Method for Estimating Sediment Transport in Ice-Covered Channels," IAHR Symposium on Ice, Potsdam, New York.
  - [109] Streitz, J. and Ettema, R. (1998), "Influences of Slope and Wind on Initial Aufeis Formation," IAHR Symposium on Ice, Potsdam, New York
  - [110] Barkdoll, B., Ettema, R. and Odgaard, A.J. (1997), "Flow and Sediment Processes at Alluvial Channel Diversions," Conference of Management of Landscapes Disturbed by Channel Incision," Oxford, Mississippi.
  - [111] Ettema, R. (1997), "Adrift in the Curriculum," American Society of Engineering Education, North Midwest Regional Meeting, Iowa City, Iowa.
  - [112] Barkdoll, B., Ettema, R., and Tsou, J. (1997), "Sediment Control at Riverside Water Intakes," ASME, International Joint Power Conference, Denver, Colorado.
  - [113] Braileanu, F., Ettema, R., and Muste, M. (1997), "A Laboratory Study of Suspended Sediment Transport in Ice-Covered Flow," XXVIIth Congress, International Association for Hydraulic Research, San Francisco, California.
  - [114] Ettema, R., Fujita, I., Muste, M., and Kruger, A. (1997), "Particle Image Velocimetry for Ice-Velocity Fields," XXVIIth Congress, International Association for Hydraulic Research, San Francisco, California.
  - [115] Ettema, R., Muste, M., and Kruger, A. (1997), "Ice Conveyance through River Confluences," Canadian Workshop on River Ice, Fredericton, New Brunswick, Canada.
  - [116] Ettema, R., Tsao, J., Huebsch, W., Prusa, J., Hindman, R., Rothmayer, A. (1997), "Icing of Planar and Curved Surfaces," Proc. 7th Annual Iowa Space Grant Conference, Des Moines, Iowa.
  - [117] Braileanu, F., Ettema, R., and Wuebben, J. (1996), "Flow Resistance in Ice-Covered Channels," ASCE Cold Regions Eng. Conference, Fairbanks, Alaska.
  - [118] Ettema, R. and Crissman, R.D. (1996), "Flood Warning Plan for Ice-Affected Flooding of the Niagara River," International Workshop on Floodplain Risk Management, Hiroshima, Japan.

- [119] Tsou, J., Cherian, M.P., Ettema, R., and Nakato, T. (1996), "Review of Sediment Problems at Water Intakes," American Power Generation Conference, Chicago, Illinois.
- [120] Ettema, R., Melville, B.W., and Barkdoll, B. (1996), "Pier Width and Scour Depth", ASCE North American Water and Environment Congress, Anaheim, California.
- [121] Tsou, J., Ettema, R., Nakato, T., Patel, V.C., and Odgaard, A.J. (1996), "A Coupled Laboratory and Computer Study of Flow and Sediment Problems at Water Intakes," Electrical Power Research Institute, Condenser Technology Conference, Boston, Massachusetts.
- [122] Ettema, R., Nakato, T., Tsou, J., Patel, V.C., and Odgaard, A.J. (1996) "A Coupled Laboratory and Computer Study of Pump-sump Problems at Water Intakes," Electric Power Research Institute, Condenser Technology Conference, Boston, Massachusetts.
- [123] Smith, B.T. and Ettema, R. (1995), "Ice-Cover Influence on Flow and Bedload Transport in Dune-Bed Channels," Conference on Winter Environment of Regulated Rivers, Kamloops, British Columbia, Canada.
- [124] Ettema, R., Patel, V.C., Smith, B.T., Yoon, J., Holly, F., Mayer, I., Bakonyi, P., and Starosolszky, O. (1995), "A Multi-Lab Investigation of Ice-Covered Dune-Bed Flow," XXVIth Congress, International Association for Hydraulic Research, London.
- [125] Tsou, J., Melville, B.W., Ettema, R., and Nakato, T. (1994), "Review of Flow Problems at Water Intake Pump Sumps," Joint Power Generation Conference, Phoenix, Arizona.
- [126] Ettema, R. and Latkovich, V. (1994), "Instrumentation Needs and Possibilities: A Dialogue between Suppliers and Users," ASCE National Conference on Hydraulic Engineering, Buffalo, New York.
- [127] Smith, B. and Ettema, R. (1994), "Ice Cover Influence on Flow in Dune-Bed Channels," IAHR Symposium on Ice, Trondheim, Norway.
- [128] Teal, M. and Ettema, R. (1994), "Estimation of Mean Flow Velocity in Ice-Covered Channels," ASCE National Conference on Hydraulic Engineering, Buffalo, USA.
- [129] Ettema, R., Andres, D., Carson, R., and Crissman, R. (1994), "Ice Discharge Capacity of the Upper Niagara River: A Performance Assessment Guideline," International Association for Hydraulic Research, Symposium on Ice, Trondheim, Norway.
- [130] Crissman, R., Ettema, R., Andres, D., and Carson, R. (1994), "Studies of Ice Jamming in the Upper Niagara River: An Introduction and Background," International Association for Hydraulic Research, Symposium on Ice, Trondheim, Norway.
- [131] Urroz, G. and Ettema, R. (1994), "Accumulation Rate and Geometry of Ice Jams in River Bends," ASCE National Conference on Hydraulic Engineering, Buffalo, USA.
- [132] Melville, B.W. and Ettema, R. (1993), "Bridge Abutment Scour in Compound Channels," ASCE Hydraulics Specialty Conference, San Francisco, California.
- [133] Mostafa, E.A., Yassin, A.A., Ettema, R. and Melville, B.W. (1993), "Local Scour at Skewed Piers," ASCE Hydraulics Specialty Conference, San Francisco, California.
- [134] Ettema, R. (1992), invited discussion of "Full-Scale Trials in Level Ice with Canadian R-Class Icebreaker," by F.M. Williams et al., Transactions of Society of Naval Architects and Marine Engineers, Oct, New York, New York.
- [135] Ettema, R., (1992), "An Advanced Introduction to River Mechanics," Workshop on River Mechanics, Taipei, Taiwan.
- [136] Schaefer, J.A., Ettema, R. and Nixon, W.A. (1992), "Development of an Ice Research Laboratory," International Association for Hydraulic Research, Symposium on Ice, Banff, Canada.

- [137] Howard, W., Ettema, R. and Chung, D. (1992), "An Innovative Water Intake Design," ASCE Specialty Conference, Water Forum '91, Baltimore, Maryland.
- [138] Holly, F.M. and Ettema, R. (1992), "Sediment Imbalance in Rivers: Simulation Possibilities and Problems," American Fish Association Conference, Rapids City, South Dakota.
- [139] Yoon, J.Y., Patel, V.C. and Ettema, R. (1992), "Computation of Flow in Ice-Covered Dune-Bed Channels," ASCE Eng. Mech. Conference, College Station, Texas.
- [140] Smith, B., Ettema, R., Patel, V.C. and Yoon, J. (1992), "A laboratory Study of Flow in Ice-Covered Dune-Bed Channels," International Assoc. for Hydraulic Research, Symposium on Ice, Banff, Canada.
- [141] Ettema, R., Crissman, R., Andres, D. and Gerard, R. (1992), "Physical Modeling of Ice Accumulation at Hydraulic Structures," International Association for Hydraulic Research, Symposium on Ice, Banff, Canada.
- [142] Crissman, R.D., Ettema, R., Gerard, R., and Andres, D. (1991), "Ice and Hydropower on the Niagara River: A Study Plan," 6th Workshop on Hydraulics of River Ice, Ottawa, Canada.
- [143] Ettema, R. (1991), "Innovations in Ice Management," Mid-America Regional Conference of the Permanent International Association of Navigation Congresses, Pittsburgh, Pennsylvania.
- [144] Ettema, R. and Kennedy, J.F. (1991), "The Client as Teacher," Management of Hydraulic Research Seminar, XXIV Congress, International Association for Hydraulic Research, Madrid, Spain.
- [145] Ettema, R., and Urroz, G. (1991), "A Review of Friction Angle and Cohesion in Unconsolidated Ice Rubble," 6th International Cold Regions Engineering Specialty Conference, ASCE, Hanover, New Hampshire.
- [146] Tsai, W.-F. and Ettema, R. (1990), "Influence of Ice-Cover on Transverse Slopes in an Alluvial Bend," International Association for Hydraulic Research, 10th Symposium on Ice, Helsinki, Finland.
- [147] Yoon, B. and Ettema, R. (1990), "A Laboratory Study of Droplet Trajectories Using LDV," 5th International Workshop on Atmospheric Icing, Tokyo, Japan.
- [148] Nixon, W.A., Ettema, R., Matsuishi, M. and Johnson, R. (1989), "Model Study of a Cable-Moored Platform in Sheet Ice", Offshore Mechanics and Arctic Engineering Conference, The Hague, The Netherlands.
- [149] Ettema, R., Sharifi, M., Stern, F., and Georgakakos, K.P. (1989), "Chaotic Dynamics in Continuous-Mode Icebreaking," 22nd American Towing Tank Conference, St. John's Newfoundland, Canada.
- [150] Ettema, R. (1989), "Numerical Simulation of Ice Formation in Frequently Transited Navigation Channels," 10th Port and Ocean Engineering under Arctic Conditions, Lulea, Sweden.
- [151] Ettema, R., "Jam Initiation in Unobstructed Channels, (1989), "Ice Jam Seminar, XXIII Congress," International Association for Hydraulic Research, Ottawa, Ontario, Canada.
- [152] Melville, B.W., Ettema, R., and Jain, S.C. (1989), "Measurement of Bridge Scour," Proceedings of Bridge Scour Symposium, Virginia, USA.
- [153] Ettema, R. and Kennedy, J.F. (1989), "University Laboratories and Commercial Projects: Student Training on Unfair Competition," Management of Hydraulic Research Seminar, XXIII Congress, International Association for Hydraulic Research, Ottawa, Ontario, Canada.
- [154] Nakato, T., Toda, K., and Ettema, R. (1988), "Thermal Analysis of Heated Lockwalls for Ice Control," International Association for Hydraulic Research, 9th Symposium on Ice, Hokkaido, Japan.

- [155] Yoon, S.E., Ettema, R., and Lucie, C. (1988), "Ice-Jam Topography in a Sinuous Channel," International Association for Hydraulic Research, 9th Symposium on Ice, Hokkaido, Japan.
- [156] Ettema, R., and Huang, H.P. (1988), "Travel Frequency Effects on River Ice Formation," International Association for Hydraulic Research, 9th Symposium on Ice, Hokkaido, Japan.
- [157] Jain, S.C., and Ettema, R., (1988), "Flow Regulation for Controlled Ice-Cover Formation," International Association for Hydraulic Research, 9th Symposium on Ice, Hokkaido, Japan.
- [158] Chen, H.C., Ettema, R., and Yoon, B. (1988), "Atmospheric-ice Loading of Power-Transmission Cables: Laboratory Experiments," 4th International Workshop on Atmospheric Icing, Paris, France.
- [159] Ettema, R. (1987), "Ice-Engineering: Research after the Rush," ASCE, Engineering Mechanics Division, Specialty Conference, Buffalo, New York.
- [160] Ettema, R. and Huang, H.P. (1987), "Ice Rubble Accumulation beneath Barges in Ice-Covered Waters", 9th Conference on Port and Ocean Engineering under Arctic Conditions (POAC), Fairbanks, Alaska.
- [161] Ettema, R. and Urroz, G. (1987), "Ice Conveyance in a Curved Channel: Small-Scale Experiments", International Association for Hydrologic Sciences, River Ice Workshop, Vancouver, B.C., Canada.
- [162] Ettema, R. and Schohl, G. (1987), "A Note on Hydraulics of Culvert Ice Formation", 20th Congress of International Association for Hydraulic Research, Lausanne, Switzerland.
- [163] Kitazawa, T. and Ettema, R. (1986). "Rubble-Ice Resistance for Ships Moving with Creeping Speed," Offshore Mechanics and Arctic Engineering (OMAE) Conference, Tokyo, Japan.
- [164] Matsuishi, M. and Ettema, R. (1986). "Model Tests on the Dynamic Behavior of a Floating, Cable-Moored Platform Impacted by Ice Floes," Offshore Mechanics and Arctic Engineering (OMAE) Conference, Tokyo, Japan.
- [165] Matsuishi, M. and Ettema, R. (1986), "Model Study of a Floating Moored Platform in a Moving Field of Mushy Ice Rubble," 8th Ice Symposium of the International Association for Hydraulic Research, Iowa City, Iowa.
- [166] Kotras, T., Humphreys, D. and Ettema, R. (1986), "Comparison of USCG Polar Class Icebreaking Patterns: Full Scale Trials, Physical Model Tests, and Analytical Predictions," 21st American Towing Tank Conference, Washington, D.C.
- [167] Schohl, G. and Ettema, R. (1986), "Experiments on Naled Ice Growth," 8th Ice Symposium of the International Association for Hydraulic Research, Iowa City, Iowa.
- [168] Schaefer, J.A. and Ettema, R. (1986), "Experiments on Freeze-Bonding Between Ice Blocks," 8th Ice Symposium of the International Association for Hydraulic Research, Iowa City, Iowa.
- [169] Jovic, S., Ettema, R., Kennedy, J.F. (1986), "Performance Requirements, Design and Operation of the Iowa Icing Wind Tunnel," 3<sup>rd</sup> International Workshop on Atmospheric Icing of Structures, Vancouver, Canada.
- [170] Horton, M., Perdichizzi, P., Ettema, R., Frankenstein, G., and Kennedy, J.F. (1985), "Performance of Concrete Marine Structures in Arctic Conditions," Permanent International Association of Navigation Congress, Brussels, Belgium.
- [171] Ettema, R., Matsuishi, M. and Kitazawa, T. (1985), "Influence of Ice-Rubble Size or Resistance to Ship-Hull Motion Through a Thick Layer of Ice Rubble," Port and Ocean Engineering under Arctic Conditions (POAC) Conference, Narssarssuaq, Greenland.
- [172] Mueller, A., and Ettema, R. (1984), "Dynamic Response of an Icebreaker Hull to Ice Breaking," International Association for Hydraulic Research, Symposium on Ice, Hamburg, W. Germany.

- [173] Kitazawa, T. and Ettema, R. (1984), "Ship Hull Motion through Brash Ice," International Association for Hydraulic Research, Symposium on Ice, Hamburg, W. Germany.
- [174] Ettema, R., Mueller, A., and Cook, A.G. (1984), "Observations on Urea Ice Growth in a Shallow Basin," International Association for Hydraulic Research, Symposium on Ice, Hamburg, W. Germany.
- [175] Johnson, J.C. and Ettema, R. (1984), "Passive Intake System for a Shallow Sand-Bed River," ASCE Hydraulics Division Specialty Conference, Coeur d'Alene, Idaho, August.
- [176] Johnson, J.C. and Ettema, R. (1984), "A Water Intake System for a Shallow Sand-Bed River," Joint Power Generation Conference, Toronto, Canada, September.
- [177] Ettema, R., Holly, F.M., and Kennedy, J.F. (1984), "Current Hydraulics Research at the Iowa Institute of Hydraulic Research," ASCE, Hydraulics Division Specialty Conference, Coeur d'Alene, Idaho.
- [178] Ettema, R., Schohl, G., and Klindera, B. (1983), "A Laboratory Study of Ground Icings," ASCE, Hydraulics Division Specialty Conference, Massachusetts.
- [179] Ettema, R., Horton, M., and Kennedy, J. F. (1983), "Ice Study for the Port Development at Nome, Alaska," Seventh International Conference on Port and Ocean Engineering under Arctic Conditions, Helsinki, Finland.
- [180] Ettema, R., Horton, M. and Kennedy, J. F. (1983), "Ride-up and Pile-up of Ice Sheets on Sloped Structures," Twentieth Congress of the International Association for Hydraulic Research, Moscow, USSR.
- [181] Raudkivi, A. J. and Ettema, R. (1982), "Scour at Bridge Piers," Third Congress of the Asian and Pacific Regional Division of the International Association for Hydraulic Research, Bandung, Indonesia.
- [182] Ettema, R., Kennedy, J. F. and Karim, F. (1982), "Influence of Turbulence and Temperature on Frazil Ice Formation," Workshop on Hydraulics of Ice-Covered Rivers, Edmonton, Alberta, Canada.

## Reports

- [1] Ettema, R. and Thornton, C.I. (2022), "Bendway Weirs and Rock Vanes for the Middle Rio Grande; Summary of Findings", CSU Hydraulics Laboratory Report 22-4, U.S. Bureau of Reclamation, Denver, CO.
- [2] Ettema, R., Thornton, C.T., Wittmershaus, A. and Khazratov, A. (2022), "Design of Bendway Weirs and Rock Vanes to Accommodate Livebed Scour", CSU Hydraulics Laboratory Report 22-3, U.S. Bureau of Reclamation, Denver, CO.
- [3] Maddocks, A., Thornton, C.I., Ellis, J. and Ettema, R. (2022), "Hydraulic Modelling and Erodibility Study for Whittier Narrows Dam, California", CSU Hydraulics Laboratory Report 22-2, Stantec Inc., Lexington, KY.
- [4] Maddocks, P. and Ettema, R. (2022), "Livebed Failure of Bendway Weirs and Rock Vanes in Straight and Curved, Sand-Bed Channels", CSU Hydraulics Laboratory Report 22-1, U.S. Bureau of Reclamation, Denver, CO.
- [5] Lagasse, P.F., Ettema, R., DeRosset, W.M., Nowroozpour, A. and Clopper, P. (2021). "Revised Clear-Water and Live-Bed Contraction Scour Analysis", Res. Report 971, National Cooperative Highway Program, National Academy of Sciences, Washington, D.C.



- [6] Thornton, C.I., Ettema, R., Ellis, J., Volt, C. and Hogan, T. (2021). “Los Vaqueros Reservoir Expansion: Hydraulic Model Study of spillway and sluice”, CSU Hydraulics Laboratory Report Submitted to AECOM, Denver, CO, and San Francisco, CA.
- [7] Ettema, R. (2021). “Potential Reservoir Ice Issues for The Labyrinth Weir Planned for The Redesigned Emergency Spillway at Pipestem Dam, ND”, Report Submitted to Omaha District, US Army Corps of Engineers, NE.
- [8] Ettema, R. (2021). “Enbridge Oil Pipeline (Line 5) Wisconsin: An Estimate of Possible Maximum Ice Load against The Pipeline”, Report Submitted to Dr R. Hotchkiss and Enbridge Gas Inc., Calgary, Canada.
- [9] Ettema, R. (2020). Gordon Butte Pump-Storage Project, Montana: Ice Loads on Reservoir Geomembrane-Liner”, Report submitted to Seaman Corp., Wooster, OH.
- [10] Lagasse, P.F., Ettema, R., DeRosset, W.M., Nowroozpour, A. and Clopper, P. (2020). “Revised Clear-Water and Live-Bed Contraction Scour Analysis”, Report Submitted to the National Cooperative Highway Program, National Academy of Sciences, Washington, D.C.
- [11] Baker, M., Ettema, R., Teal, M. and Trojanowski, J. (2020). “Spencer Dam Failure Investigation Report”, Report Submitted to the Assoc. of State Safety Officials, Lexington, KY.
- [12] Ettema, R., Thornton, C.I., Hogan, T. and Biethman, B. (2019), “Gross Dam Expansion Project: Hydraulic Model Study of Spillway Design”. CSU Hydraulics Laboratory Report submitted to AECOM, Denver, CO.
- [13] Siefken, S. and Ettema, R. (2019), “Optimal Configurations of Rock Vanes and Bendway Weirs in The Middle Rio Grande,” CSU Hydraulics Laboratory Report submitted to the U.S. Bureau of Reclamation, Denver, CO.
- [14] Siefken, S. and Ettema, R. (2019), “Construction, Calibration and Validation of A 3-D Numerical Model for Simulating Flow in Channel Bends Fitted with Configurations of Rock Vanes and Bendway Weirs,” CSU Hydraulics Laboratory Report submitted to the U.S. Bureau of Reclamation, Denver, CO.
- [15] Shin, K.-S., Thornton, C.A. and Ettema, R. (2018), “Three-Dimensional Computational Modeling of Flow in a Meandering Channel Fitted with Bendway Weirs,” CSU Hydraulics Laboratory Report submitted to the U.S. Bureau of Reclamation, Denver, CO.
- [16] Kempema, E. and Ettema, R. (2018), “Analysis of Ice-Related Flooding on Flat Creek, Wyoming, Winter 2017-2018.” Report submitted to the Flat Creek Water Improvement District, Jackson, WY, July.
- [17] Ettema, R. and Thornton, C.A. (2017), “Flume Tests to Assess Rock Size for Bendway Weirs on Fixed Beds,” CSU Hydraulics Laboratory Report submitted to the U.S. Bureau of Reclamation, Denver, CO., June.
- [18] Ettema, R. (2017), “Minidoka Dam – Gate Ice Loading Risk Analysis,” Waterways and Concrete Dams Group, U.S. Bureau of Reclamation, Denver, November.
- [19] Ettema, R., Thornton, C.A., Armstrong, D.L., Hughes, S.A. and Abt, S.R. (2016), “Hydraulic Model Study of Grade-building Structures for the North Fork of the Toutle River, Washington,” CSU Hydraulics Laboratory Report submitted to the Portland District of the U.S. Army Corps of Engineers, OR, and Alden Research Inc., MA, June.

- [20] Holly, F.M. and Ettema, R. (2015), “Analysis of Hydraulic Conditions in the Illinois River at Marseilles Lock & Dam,” Consultants Report, Liskow & Lewis, New Orleans, LA, November.
- [21] Ettema, R., Ng, K., Chakradhar, R. and Kempema, E. (2014), “Laboratory Investigation of Coupled Geotechnical and Hydraulic Processes Influencing Bridge Abutment Scour,” Report 14-354, Mountain Plains Consortium, North Dakota State University, ND.
- [22] Sturm, T., Ettema, R., and Melville, B.W., (2012), “Evaluation of Bridge Scour Research: Abutment and Contraction Scour Processes and Predictions,” Web-Doc. 181, National Cooperative Highway Research Program, Final Report for NCHRP Project 24-27(02), Transportation Research Board, Washington D.C.
- [23] Morales, R. and Ettema, R. (2011), “Insights from Depth-Averaged Numerical Simulation of Flow at Bridge Abutments in Compound Channels,” Report 11-237, Mountain Plains Consortium, North Dakota State University, ND.
- [24] Ettema, R., Constantinescu, G., and Melville, B.W., (2011), “Evaluation of Bridge Scour Research: Pier Scour Processes and Predictions,” Web-Doc. 175, National Cooperative Highway Research Program, Final Report for NCHRP Project 24-27(01), Transportation Research Board, Washington D.C.
- [25] Ettema, R., Nakato, T., and Muste, M. (2010), “Estimation of Scour Depth at Bridge Abutments,” National Cooperative Highway Research Program, Final Report for NCHRP Project 24-20, Transportation Research Board, Washington D.C.
- [26] Barkdoll, B., Ettema, R., and Melville, B. (2007), “Countermeasures to Protect Bridge Piers from Scour,” National Cooperative Highway Research Program, NCHRP Report 593, Transportation Research Board, Washington D.C.
- [27] Ettema, R., Nakato, T. and Muste, M. (2006), “An Illustrated Guide for Monitoring and protecting Bridge Waterways against Scour,” IIHR Technical Report 439, IIHR-Hydrosience and Engineering, The University of Iowa, Iowa City, IA.
- [28] Marshall, J.S. and Ettema, R., (2004), “Rivulet Dynamics with Variable Gravity and Wind Shear,” IIHR Technical Report 440, IIHR-Hydrosience and Engineering, The University of Iowa, Iowa City, IA.
- [29] Daly, S. and Ettema, R. (2004), “Frazil-ice Concerns for a Water Intake in Lake Michigan,” IIHR Limited Distribution Report 317, IIHR- Hydrosience and Engineering, The University of Iowa, Iowa City, IA
- [30] Lai, Y., Ettema, R., Odgaard, A., and Muste, M. (2004), “Lake Almanor Cold-water Feasibility Study: Numerical Models,” IIHR Technical Report 439, IIHR- Hydrosience and Engineering, The University of Iowa, Iowa City, IA.
- [31] Ettema, R., Muste, M., Odgaard, A.J., and Lai, Y. (2004), “Lake Almanor Cold-water Feasibility Study: Hydraulic Model,” IIHR Technical Report 438, IIHR- Hydrosience and Engineering, The University of Iowa, Iowa City, IA.
- [32] Ettema, R. and Daly, D. (2004), “Sediment Transport under Ice,” ERDC Technical Report 04-20, U. S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover New Hampshire.
- [33] Zabilansky, L.J., Ettema, R.J., Wuebben, J. and Yankielun, N.E. (2002). “Survey of River-Ice Influences on Channel Bathymetry along the Fort Peck Reach of the Missouri River,

- Winter 1998 – 1999,” CRREL Technical Report 02-14, U. S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover NH.
- [34] Ettema, R. and Muste, M. (2002), “Scale Effects in Hydraulic Models of Flow Thalweg and Separation at Dikes in Flat-bed Channels,” IIHR Report 426, IIHR- Hydrosience and Engineering, The University of Iowa, Iowa City, IA.
- [35] Ettema, R. and Odgaard, J. (2002), “Site-visit Report: Sediment Accumulation at River-water Intake for Duane Arnold Energy Center,” IIHR Limited Distribution Report 308, IIHR- Hydrosience and Engineering, The University of Iowa, Iowa City, IA.
- [36] Kubit, O., and Ettema, R. (2001), “Debris Control at Riverside Diversions,” Report No. 414, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [37] Ooi, S.K, Ettema, R. and Muste, M. (2001), “Deflection Booms for Debris Protection of Riverside Locations,” Report No. 415, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [38] Ettema, R. (2001), “A Framework for Evaluating Micro-Models.” Limited Distribution Report 295, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [39] Lachhab, A., Martinez, E., and Ettema, R. (2001), “Wall-porosity Effects on Sediment Deposition and Scour at a Flow Guidewall,” Limited Distribution Report 306, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [40] Ettema, R. (2001). Observations of Channel Conditions along the Fort Peck Reach of the Missouri River: Winter 00-01.” Limited Distribution Report No. 292, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [41] Ettema, R., and Muste, M. (2001), “Sediment and Debris Control for Muskingum Power Station, Muskingum River, Ohio,” Limited Distribution Report 289, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [42] Ettema, R. and Muste, M. (2000), “Sediment and Debris Control at Muskingum Station, Muskingum River, Ohio.” Report No. 409, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [43] Muste, M., and Ettema, R. (2000), “River-Sediment Control at Conesville Power Station, on the Muskingum River, Ohio,” Report No. 410, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [44] Bridges, M. and Ettema, R. (1999), “Management of Long-shore Sand Transport at Commonwealth Edison’s Waukegan Power Station, Lake Michigan,” Report No. 403, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.
- [45] Simon, A., Shields, F. D., Ettema, R., Alonso, C., Marshall-Garsjo, M., Curini, A., and Steffen, L., (1999), “Channel Erosion on the Missouri River, Montana, between Fort Peck Dam and the North Dakota Border,” Technical Report, USDA-Agricultural Research Service, National Sedimentation Laboratory, Oxford, MS.
- [46] Ettema, R., Muste, M., and Kruger, A. (1999), “Factors Influencing Ice Conveyance at River Confluences,” Report No. 99-154, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, NH.
- [47] Tan, C.-A., Sinha, S., and Ettema, R. (1998), “Numerical Simulation of Near-Field Mixing in Ice-Covered Channels,” Report No. 391, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, IA.

- [48] Ettema, R. and Nakato, T. (1998), "Bed-Sediment Control at Riverside Water Intakes: A Guide For Utility Engineers," Report No. TR-110551, Electric Power Research Institute, Palo Alto, CA.
- [49] Ettema, R., Nakato, T., and Patel, V.C. (1998), "Flow Conditions in Pump Bays: A Guide For Utility Engineers," Report No. TR-110948, Electric Power Research Institute, Palo Alto, California.
- [50] Ettema, R. and Jain, S.C. (1997), "Sediment Accumulation in the Service-Water Tunnel and Bypass Pipe at LaSalle Nuclear Power Station," Limited Distribution Report No. 256, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [51] Muste, M. and Ettema, R. (1997), "Marmara Power Station, Ereglisi, Turkey, Part I: Model Study of Circulating-Water Pump Structure," Limited Distribution Report No. 258, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [52] Barkdoll, B., Ettema, R., and Odgaard, A.J. (1997), "Sediment Control at Lateral Water Diversions," Report No. TR-108621, Electric Power Research Institute, Palo Alto, California.
- [53] Zufelt, J. and Ettema, R. (1997), "Ice Jam Dynamics," Report No. 97-10, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [54] Ettema, R., Muste, M., and Kruger, A. (1997), "Factors Influencing Ice Conveyance at River Confluences: Preliminary Findings," Report No. 97-34, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [55] Tsai, W.-F. and Ettema, R. (1996), "A Study of Flow in an Ice-covered River Bend," Report No. 376, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [56] Ettema, R., Jain, S.C., Nakato, T. and Schaefer, J. (1996), "Hydropower Development at Lock and Dam 14, Mississippi River," Limited Distribution Report No. 241, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [57] Muste, M. and Ettema, R. (1996), "Hydraulic Model Study of Cooling Tower Pump Sump for Salt City Energy Center," Limited Distribution Report No. 245, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [58] Ettema, R. (1996), "Sediment Concerns for Mussel Beds in Sylvan Slough, Mississippi River," Limited Distribution Report No. 245, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [59] Zufelt, J. and Ettema, R. (1996), "Model Ice Materials," Report No. 96-1, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [60] Nakato, T., Rosenberger, H., Ettema, R. (1996), "Inverted Draft Tubes to Improve Suction Performance of Vertical Pumps," Report No. TR-106266, Electric Power Research Institute, Palo Alto, California.
- [61] Jain, S.C., Choi, T.-H. and Ettema, R. (1995), "Hydraulic Model Study of Circulating-Water Pump Sump for Tambok Lorok Power Plant, Indonesia," Limited Distribution Report No. 227, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [62] Cherian, M.P., Ettema, R., and Nakato, T. (1995), "Review of Sediment Problems at Water Intakes," Report No. TR-105201, Electric Power Research Institute, Palo Alto, California.

- [63] Smith, B.T. and Ettema, R. (1995), "Flow in Ice-covered Alluvial Channels," Report No.374, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [64] Teal, J. T. and Ettema, R. (1995), "Estimation of Mean Velocity for Flow under Ice Cover," Report No.373, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [65] Ettema, R., Wang, Y. and Ali, M. (1994), "Hydraulic Model Study of Water Intake for Havana Power Station, Illinois," Limited Distribution Report No. 216, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [66] Parthasarathy, R.N., and Ettema, R. (1994), "Hydraulic Model Study of Circulating-Water Intake for Muara Karang Power Station, Indonesia," Limited Distribution Report No. 217, Iowa Institute of Hydraulic Research, The University of Iowa, Iowa City, Iowa.
- [67] Melville, B.W., Ettema, R. and Nakato, T. (1994), "Review of Flow Problems at Water Intake Pump Sumps," Report No. Tr-105200, Electric Power Research Institute, Palo Alto, California.
- [68] Jain, S.C., Ettema, R. and Park, I. (1993), "Flow Regulation for River Ice Control," Special Report 93-12, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [69] Nakato, T., Ettema, R., and Toda, K. (1992), "Unconventional Energy Sources for Ice Control at Lock and Dams," Special Report 92-30, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [70] Landweber, L., Ettema, R. and Shashahan, A. (1992), "A Study of Ice-Mass Interaction Hydrodynamics," IIHR Limited Distribution Report 202, The University of Iowa, Iowa City, Iowa.
- [71] Parthasarathy, K., Ettema, R. and Patel, V.C. (1991) "Calibration Characteristics of Five Velocity Probes," IIHR Limited Distribution Report No. 186, The University of Iowa, Iowa City, Iowa.
- [72] Ettema, R., Tsai, W.F. and Odgaard, A.J. (1991), "Hydraulic Model Study of a Water Intake at the Raritan River, New Jersey," IIHR Limited Distribution Report 197, The University of Iowa, Iowa City, Iowa.
- [73] Ettema, R. and Huang, H.P. (1990), "Travel-Frequency Effects on River Ice Formation," Special Report 90-40, U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [74] Ettema, R. and Nakato, T. (1990), "Hydraulic Model Studies of Circulating-Water and Essential-Service-Water Pump-Intake Structures, Korea Electric Power Corporation Yonggwang Station, Units 3 and 4," IIHR Limited Distribution Report No. 173, The University of Iowa, Iowa City, IA.
- [75] Ettema, R. (1990), "Bathymetric Survey of the Cedar River at the Duane Arnold Energy Center," IIHR Limited Distribution Report No. 166, The University of Iowa, Iowa City, Iowa.
- [76] Odgaard, A.J., Spoljaric, A., and Ettema, R. (1990), "Intake-Structure Model Study for Philadelphia Electric Company Eddystone Station Units 1 and 2," IIHR Limited Distribution Report No. 167, The University of Iowa, Iowa City, Iowa.

- [77] Ettema, R., Odgaard, A.J., and Yeh, K.-C. (1990), "Hydraulic Model Study of a Pump Sump for U.S. Department of Energy's Savannah River Site," IIHR Limited Distribution Report No. 179, The University of Iowa, Iowa City, Iowa.
- [78] Jain, S.C. and Ettema, R. (1990), "Hydraulic Model Study of Circulating-Water Pump Sump for Paiton Power Station, Indonesia," IIHR Limited Distribution Report No. 185, The University of Iowa, Iowa City, Iowa.
- [79] Jain, S.C. and Ettema, R., (1989), "Calibration of a Flow-Nozzle Assembly," IIHR Limited Distribution Report No. 155, The University of Iowa, Iowa City, Iowa.
- [80] Ettema, R. (1989), "Calibration of Industrial-Grade Pitot-Static Tubes," IIHR Limited Distribution Report No. 156, The University of Iowa, Iowa City, Iowa.
- [81] Ettema, R. and Harland, L. (1989), "Diagnostic Calibration of a Simplex Pitot-Static Tube," IIHR Limited Distribution Report No. 157, The University of Iowa, Iowa City, Iowa.
- [82] Nixon, W.A. and Ettema, R. (1988), "Ice Rubble Impact with a Cable-Moored Platform," IIHR Limited Distribution Report No. 147, The University of Iowa, Iowa City, Iowa.
- [83] Nixon, W.A. and Ettema, R. (1988), "Ice Sheet Interaction with a Cable-Moored Platform," IIHR Limited Distribution Report No. 148, The University of Iowa, Iowa City, Iowa.
- [84] Ettema, R., Stern, F. and Lazaro, J. (1987), "Dynamics of Icebreaking by a POLAR Class Icebreaker Hull," IIHR Report No. 314, The University of Iowa, Iowa City, Iowa.
- [85] Schohl, G.A. and Ettema, R. (1986), "Naled Ice Growth," IIHR Report No. 298, The University of Iowa, Iowa City, Iowa.
- [86] Ettema, R., Matsuishi, M., and Kitazawa, T. (1985), "Model Tests on Ice Rubble Size and Ship Resistance in Ice Rubble," IIHR Report No. 293, The University of Iowa, Iowa City, Iowa.
- [87] Matsuishi, M. and Ettema, R. (1985), "The Dynamic Behavior of a Floating Cable-Moored Platform Continuously Impacted by Ice Floes," IIHR Report No. 294, The University of Iowa, Iowa City, Iowa.
- [88] Matsuishi, M. and Ettema, R. (1985), "Ice Loads and Motions Experienced by a Floating, Moored Platform in Mushy Ice Rubble," IIHR Report No. 295, The University of Iowa, Iowa City, Iowa.
- [89] Schaefer, J.A. and Ettema, R. (1985), "Experiments on Freeze-Bonding Between Ice Blocks in Floating Ice Rubble," IIHR Report No. 296, The University of Iowa, Iowa City, Iowa.
- [90] Mueller, A. and Ettema, R. (1984), "Dynamic Response of an Icebreaker Hull to Ice Breaking," IIHR Report No. 273, The University of Iowa, Iowa.
- [91] Ettema, R., Karim, M.F., and Kennedy, J.F. (1984), "A Study of Frazil Ice Formation," CRREL Report 84-18, U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.
- [92] Kitazawa, T. and Ettema, R. (1984), "Resistance to Ship Hull Motion through Brash Ice," IIHR Limited Distribution Report No. 122, The University of Iowa, Iowa.
- [93] Kitazawa, T. and Ettema, R. (1984), "Level-Ice Resistance of an Icebreaking Ship with a Long Parallel Middlebody," IIHR Limited Distribution Report No. 120, The University of Iowa, Iowa City, Iowa.

- [94] Ettema, R. (1983) "Ice-Floe Collision: Model Studies," IIHR Limited Distribution Report No. 116, The University of Iowa, Iowa.
- [95] Ettema, R., Jain, S.C., and Kennedy, J.F., (1982), "Hydraulic Design of Dropstructures: A State-of-the-Art Review," IIHR Limited Distribution Report No. 98, The University of Iowa, Iowa City, Iowa.
- [96] Ettema, R. and Kennedy, J.F. (1982), "Ice Study for the Port Development at Nome, Alaska," IIHR Limited Distribution Report No. 260, The University of Iowa, Iowa City, Iowa.
- [97] Ettema, R. (1982), "Estimation of Ice Loads on Piles for the Small-Boat Harbor at Nome, Alaska," IIHR Limited Distribution Report No. 102, The University of Iowa, Iowa City, Iowa.
- [98] Ettema, R. and Nakato, T. (1981), "Sediments in the Byron Power Plant," IIHR Limited Distribution Report No. 82, The University of Iowa, Iowa City, Iowa.
- [99] Ettema, R. and Nakato, T. (1981), "Model Study of the River Intake for the Jeffrey Energy Center," IIHR Limited Distribution Report No. 88, The University of Iowa, Iowa City, Iowa.
- [100] Ettema, R. (1981), "Investigation of River Sediment Ingestion at the Duane Arnold Energy Center," IIHR Limited Distribution Report No. 90, The University of Iowa, Iowa City, Iowa.
- [101] Ettema, R., Goss, J., and Nakato, T. (1980), "Essential-Water Cooling-Tower Basin Model Study for Byron Power Plant," IIHR Limited Distribution Report<sup>3</sup> No. 79, The University of Iowa, Iowa City, Iowa.
- [102] Ettema, R. (1980), "Scour at Bridge Piers," Report No. 216, School of Engineering, University of Auckland, Auckland, New Zealand.
- [103] Ettema, R. (1976), "Influence of Bed Gradation on Local Scour," Report No. 124, School of Engineering, University of Auckland, New Zealand.

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<sup>3</sup> Limited Distribution Reports require client's permission for release.