



Raouf (Ralph) E. BADDOUR

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Professor

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Professional Affiliations

Professional Engineers Ontario

Canadian Society for Civil Engineering

American Society of Civil Engineers

International Association for Hydraulic Research

The Oceanographic Society

American Geophysical Union

Honors and Awards

2008	Thomas C. Keefer Medal, CSCE
2005	Nominated for USC Award of Excellence in Teaching
2002	University Student Council Teaching Honour Roll
1997	University Student Council Teaching Honour Roll
1996	Faculty of Engineering Award for Excellence in Teaching
1995	Edward G. Pleva Award for Excellence in Teaching

Research Interests

Environmental Hydraulics

Experiments

Analytical Models

$$\frac{dT_1}{dt'} = (T_e - T_1) - (Q' + X_1)\Delta T$$

$$\frac{dT_2}{dt'} = X_2(T_p - T_2) + (X_1 Q' + X_2)\Delta T$$

$$\frac{dS_1}{dt'} = X_4(\bar{S}) - (Q' + X_1)\Delta S$$

$$S_2 = \bar{S} - X_1(S_1 - \bar{S})$$

$$Q' = -C(\Delta\rho)$$

MESc & PhD Projects

- Fountain and jet aeration
- Bubble enhanced dilution
- Hypersaline jets from desalination plants
- Zebra mussel and ice control
- Thermohaline mixing and circulation
- Climate change impacts on hydraulic phenomena

Faculty Advisor: R.E. Baddour PhD, P.Eng, F.CSCE - rbaddour@uwo.ca

Environmental hydraulics
Bubble enhanced dilution
Hypersaline jets
Thermohaline buoyancy and circulation
Nonlinear mixing
Stratified flows
Bubble, fountain and jet aerators
Zebra mussel and ice control at water intakes.

Undergraduate Teaching

Engineering Statics
Municipal Engineering Design
Environmental Hydraulics

Graduate Teaching

Cold Climate Hydraulics
Stratified Flows

Recent Publications (since 2000)

Baddour, R.E. *Head-Discharge Equation for Sharp-Crested Polynomial Weir*, J. of Irrigation and Drainage, ASCE, 134 (2), 260-262, 2008

Gholamreza-Kashi S., Martinuzzi, R. and Baddour R.E. *Comparison of Far-Field Turbulent Structure of a Rectangular Surface Jet to Three-Dimensional Free and Wall Jets*. J. Engrg. Mech., ASCE, 134 (3) 224-233, 2008

Baddour R.E. *Bubble Enhanced Dilution of Turbulent Jets and Plumes*, Proc. 5th Int. Symp. on Environmental Hydraulics, Tempe, Arizona, CD-ROM Dec. 2007

Zare, H. K., and Baddour, R. E. *Three-Dimensional Study of Spatial Submerged Hydraulic Jump*. Can. J. of Civ. Eng, 34, 1140-1148, 2007

Gholamreza-Kashi S., Martinuzzi, R. and Baddour R.E. *Mean Flow Field of a Non-Buoyant Rectangular Surface Jet*, Journal of Hydraulic Engineering, ASCE, Vol. 133 (2) 234-239, 2007

H.K. Zare and R.E. Baddour. *Forced Hydraulic Jump with Perforated Sill*, Proc. CANCAM 2007, CD ROM, Toronto, June 2007

S. Gholamreza-Kashi, Baddour R.E. and Martinuzzi R.J. *Interaction of Coherent Structures with the Free Surface in Rectangular Surface Jets* Proc. CANCAM 2007, CD ROM, Toronto, June 2007

Baddour R.E. Zaghoul A. and Martinuzzi R. *Entrainment Properties of Plane Surface-Jets in Shallow Current*. J. Hydr. Eng, ASCE, Vol. 132(4), pp 363-370, 2006

H.K. Zare and R.E. Baddour. *Three-Dimensional Roller of Spatial Submerged Hydraulic Jump*, Proc. Annual CSCE Conference, CD ROM, Calgary, May 2006

Baddour R.E. *Modeling Thermohaline Plumes in Coastal Environments*. Abstract Book Int. Ocean Research Conf, TOS/UNESCO, pp. 50, Paris 2005.

Baddour R.E. and Zhang H. *Nonlinear Buoyancy and Mixing of Thermohaline Jets*. Proc. 2nd Specialty Conf. on Coastal, Estuary and Offshore Eng, CSCE, CD ROM, Toronto 2005

Gholamreza-Kashi S., Martinuzzi, R. and Baddour R.E. *LDV Measurements in a Rectangular Surface Jet*. Proc. 4th Intl. Symp. on Turbulence and Shear Flow Phenomena, Williamsburg, VA pp 847-852, 2005.

Gholamreza-Kashi S., Martinuzzi, R. and Baddour R.E. *PIV Measurements in a Rectangular Surface Jet*. Abstract Book, Joint ASCE/ASME/SES Conference on Mechanics and Material, Baton Rouge, Louisiana, pp. 200, 2005.

Gholamreza-Kashi S., Martinuzzi, R. and Baddour R.E. “*Turbulence Measurements in a Rectangular Surface Jet*”, Proc. 17th ASCE Eng. Mech Conference, University of Delaware, Newark, DE, CD ROM June 2004

Baddour R.E. “*Effect of Nonlinear Mixing on Thermohaline Circulation*” Abstract book- ASLO/TOS Ocean Research Conference- Honolulu, HI, p.10. Feb. 2004

Gholamreza-Kashi S., Martinuzzi, R. and Baddour R.E. “*An Experimental Study of Rectangular Surface Jets*”, Proc. 16th ASCE Eng. Mech Conference, University of Washington, Seattle, CD ROM July 2003

Carriveau, E.C., Baddour, R.E. and G.A. Kopp “*Entrainment envelope of dye-core vortices at submerged hydraulic intakes*, Can. J. Civ. Eng. Vol 29, 400-408, 2002

Baddour R.E., Martinuzzi, R. and Zaghoul A. “*Entrainment modelling of plane surface jets in weak co-current*”, Proc. of 15th ASCE Engineering Mechanics Conf , Columbia University, NY, CD ROM, June 2002.

Baddour, R.E. “*Investigation of Bubble Devices for the Attenuation of Waves and Improvement of water Quality in Fanshawe Lake*”, Technical Report prepared for the Ontario Trillium Foundation, 2002

Carriveau, E.C., Baddour, R.E. and G.A. Kopp” *Entrainment properties of swirling and non-swirling flows at Submerged water intakes*” Proceedings CSCE Annual Conference, Montreal, CD ROM June 2002.

Baddour R.E. “*Electric-bubble method for controlling zebra mussels at water intakes*”, Abstract book- International Conference on Aquatic Invasive Species, Alexandria, VA, Feb 2002

Carriveau E.C. and Baddour R.E. “*Wildwood Dam Aeration – Modeling Phase*” Technical Report prepared for Upper Thames Conservation Authority, 2001

Baddour, R.E. “*Thermohaline Buoyancy and Mixing*” Proc. 5th Int. Symposium on Stratified Flows, Vol II, 1155-1162, Vancouver BC, 2000