

**CURRICULUM VITAE**  
**James Michael Byrne**  
**June 30, 2014**

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## **Highlights**

James Michael Byrne

Professor of Geography, University of Lethbridge, Lethbridge, Alberta

Doctor of Philosophy in Water Resources, Department of Civil Engineering, University of Alberta

### **Primary Research and work interests**

Climate variability and change; hydrometeorology; hydrology; watershed management; watershed processes; expert witness on water and climate issues, hydroclimate modelling, impacts and adaptation to climate change in Caribbean.

### **Career Highlights - Science**

1. Co-convener, American Geophysical Union Chapman Conference on Climate Change Communication, June 2013.
2. Chair of Department of Geography, July 2009 to June 2012.
3. Supervised 19 Master of Science and Doctor of Philosophy Programs
4. Canadian Water Network - founding member and National Theme Leader for Water Resource Management in the National Centres of Excellence Canadian Water Network (CWN) 2000-04
5. Director, Water Resources Institute, University of Lethbridge, 1991-2004.
6. Several million dollars in research funding to date
7. One hundred and thirty five conferences papers and presentations
8. Forty five invited keynote addresses and featured presentations at Science, Health and Multidisciplinary Conferences and Meetings
9. Chaired/convended twenty two Professional Meetings
10. Numerous refereeing of papers and projects for national and international journals and agencies

### **Career Highlights – Science Education and Communication**

11. Lead scientist and producer for three major science education documentaries that received two awards, three awards nominations and many Screenings at International Film Festivals.
12. Science Education Lead (2010) and Co-lead (2011-12) American Geophysical Union Fall Meeting Conference Committee (AGU Fall Meeting had about 20,000 attendees in 2011)
13. Co-convener, American Geophysical Union Chapman Conference on Communicating Climate Science

### **Science Society Memberships**

1. American Association for the Advancement of Science
2. American Geophysical Union
3. Canadian Meteorological and Oceanographic Society
4. International Water Resources Association, 1990-98
5. Director, Canadian Water Resources Association, Alberta Branch, 1988-98.

## Employment History

- 1991 - Professor of Geography, University of Lethbridge, Lethbridge, Alberta, CANADA.
- 2009 - 2012 Chair of Geography, University of Lethbridge, Lethbridge, Alberta, CANADA.
- 1991 - 2003 - Director, Water Resources Institute, University of Lethbridge, Lethbridge, Alberta, CANADA.
- Sept. 1987 - Dec. 1990 - Coordinator, Water Resources Institute. University of Lethbridge, Lethbridge, Alberta, CANADA.
- March - August 1987 - Research Associate, Department of Geography, University of Lethbridge, Lethbridge, Alberta, CANADA.
- July, 1985 - February, 1987 - Research Associate, Department of Civil Engineering, University of Waterloo, Waterloo, Ontario, CANADA.
- September 1984 - March 1985: Water Resources Consultant, Stanley Associates Engineering Ltd., Edmonton, Alberta, CANADA.
- July, 1983 - June, 1985: Research Associate, Department of Civil Engineering, University of Alberta, Edmonton, Alberta, CANADA
- September 1980 - June 1983: Research and Teaching Assistant, Department of Civil Engineering, University of Alberta, CANADA.
- 1980 - 81 summers: Research Assistant, Soil Science Section, Agriculture Canada Research Station, Lethbridge, Alberta, CANADA.

## Education

- 1990 - Doctor of Philosophy in Water Resources, Department of Civil Engineering, University of Alberta, Edmonton, Alberta. Dissertation - "Three Phase Runoff Model for Small Prairie Rivers."
- 1983 - Master of Science in Water Resources, Department of Civil Engineering, University of Alberta, Edmonton, Alberta. M.Sc. thesis - "Computer Assisted Irrigation Water Management."
- 1978 - Bachelor of Science (Geography/Geology), Departments of Geography and Geology, University of Alberta, Edmonton, Alberta.

## Publications

### Books and Theses

- **Byrne**, James and Catherine Fleming, 1991, Ed. Irrigation Research and Development in the 1990s, Proceedings of the Conference. Water Resources Institute, University of Lethbridge ISBN 0-919555-73-X. 550 p.
- **Byrne**, James, 1990. Three Phase Runoff Model for Small Prairie Rivers. Doctor of Philosophy, University of Alberta, Edmonton, Alberta.
- **Byrne**, James, 1983. Computer Assisted Irrigation Water Management. M.Sc. thesis, Department of Civil Engineering, University of Alberta, Edmonton.

### Publications – OpEds

1. Jan 16, 2014 – Byrne, James, High-stakes climate poker, The Guardian: Climate Consensus. <http://www.theguardian.com/environment/climate-consensus-97-per-cent/2014/jan/16/high-stakes-climate-poker>
2. Mar 14, 2013 – Byrne, James, The world is leaving Canada’s carbon economy behind, iPolitics Insight. <http://www.ipolitics.ca/2013/03/14/the-world-is-leaving-canadas-carbon-economy-behind/>
3. November 08 2010 - Byrne, James, Wealthy nations must curb emissions before expecting China to. Edmonton Journal. <http://www2.canada.com/edmontonjournal/news/opinion/story.html?id=ae6482b1-5a12-4b15-b5c4-8c3eb776761e>

### Refereed Papers and Invited Refereed Book Chapters

1. MacDonald, R.J., Boon, S., and Byrne, J.M. 2014. Process-based stream temperature modelling approach for mountain regions. Journal of Hydrology, in press.
2. MacDonald, R.J., Boon, S., Byrne, J.M., Robinson, M.R., and Rasmussen, J.B. 2013. Potential future climate effects on mountain hydrology, stream temperature, and native salmonid life history. Canadian Journal of Fish and Aquatic Sciences. DOI:10.1139/cjfas-2013-0221.
3. MacDonald, R.J., Boon, S., Byrne, J.M., and Silins, U. 2013. A comparison of surface and subsurface controls on summer temperature in a headwater stream. Hydrological Processes. DOI:10.1002/hyp.9756.
4. Booth, Evan and James M. Byrne, 2012. Climatic Changes in Western North America, 1950 – 2006. Int. J. Climatology, Volume 32, Issue 15, pages 2283–2300.
5. MacDonald, R.J., Byrne, J.M., Kienzle, S. & Boon S., 2012. Modelling the potential impacts of climate change on snowpack in the North Saskatchewan River watershed, Alberta, Water Resour Manage. 26:3053–3076
6. Stefan W. Kienzle, Michael W. Nemeth, James M. Byrne, Ryan J. MacDonald, 2011. Simulating the hydrological impacts of climate change in the upper North Saskatchewan River basin, Alberta, Canada. Journal of Hydrology 4: 76–89
7. Michael W. Nemeth, Stefan W. Kienzle & James M. Byrne. 2012. Multi-variable verification of hydrological processes in the upper North Saskatchewan River basin, Alberta, Canada. Hydrological Sciences Journal, 5, 1:84-102.
8. MacDonald, Ryan J., James M. **Byrne**, Stefan Kienzle, Robert P. Larson, 2011. *Assessing the potential impacts of climate change on mountain snowpack in the St. Mary River watershed, Montana*. J. Hydrometeorology, 12:262-273.
9. Larson, Robert P., James M. **Byrne**, Daniel L. Johnson, Matthew G. Letts and Stefan W. Kienzle, 2011. *Potential climate change impacts on spring runoff in Montane Headwaters of the St. Mary River, Glacier National Park, Montana, USA*, Canadian Water Resources Journal, 2011, 36:(1) 17-34, 10.4296/cwrj3601017
10. Larson, Robert P., James M. **Byrne**, Daniel L. Johnson, Matthew G. Letts and Stefan W. Kienzle, 2011. *Refinement and Validation of a Spring Runoff Model for the Rocky Mountains, Northern Montana*, Canadian Water Resources Journal, 2011, 36:(1) 35-52, 10.4296/cwrj3601035

11. **Byrne**, James, Stefan Kienzle and David Sauchyn, 2011. *Prairie waters and climate change*. In David Sauchyn, Harry Diaz and Suren Kulshreshtha, Eds. *The New Normal: The Canadian Prairies in a Changing Climate*. Canadian Plains Research Centre Press, 400 pp.
12. MacDonald, Ryan, James **Byrne** and Stefan Kienzle, 2011. *The St. Mary River*. In David Sauchyn, Harry Diaz and Suren Kulshreshtha, Eds. *The New Normal: The Canadian Prairies in a Changing Climate*. Canadian Plains Research Centre Press, 400 pp.
13. Kienzle SW, Nemeth MW, Byrne JM and MacDonald RJ 2011: Simulating the hydrological impacts of climate change in the upper North Saskatchewan River basin, Alberta, Canada. *Journal of Hydrology* , doi:10.1016/j.jhydrol.2011.01.058.
14. Forbes KA, Kienzle SW, Coburn CA, Byrne JM and Rasmussen J 2011: Modelling the impacts of selected GCM derived climate scenarios on the future hydrology of a hybrid watershed in the Oldman River watershed, Alberta, Canada. *Climatic Change* 105(3): 555-565.
15. Neilsen, D., Duke, G., Taylor, B., **Byrne**, J.M., and Van der Gulik, T.W. (2010). "*Development and Verification of Daily Gridded Climate Surfaces in the Okanagan Basin of British Columbia*," *Canadian Water Resources Journal/Revue Canadienne des Ressources en Eau*, 35(2), pp. 131-154. doi: 10.4296
16. MacDonald, Ryan, James **Byrne** and Stefan Kienzle, 2009. *A physically based daily Hydrometeorological Model for Complex Mountain Terrain*, *J. Hydrometeorology*, Vol. 10, No. 6.
17. **Byrne**, James M. and Stefan W. Kienzle, 2008. *Water Resources*. Section 3.1 in Sauchyn, D., and Kulshreshtha, S. *The Prairies*. In D.S. Lemmen, F.J. Warren, J., Lacroix and E. Bush, editors. *FROM IMPACTS TO ADAPTATION: Canada in a Changing Climate*, Government of Canada, Ottawa, ON, 2007, p. 16-18.
18. **Byrne**, James M. and Stefan W. Kienzle, 2008. *The energy industry and climate change*. Section 4.6 in Sauchyn, D., and Kulshreshtha, S. *The Prairies*. In D.S. Lemmen, F.J. Warren, J., Lacroix and E. Bush, editors. *FROM IMPACTS TO ADAPTATION: Canada in a Changing Climate*, Government of Canada, Ottawa, ON, 2008, p. 37-39.
19. **Byrne**, James M. and Stefan Kienzle, 2007. *Conserving Water Resources in the Crown of the Continent Ecosystem*. In Prato, Tony and Daniel Fagre, editors. *SUSTAINING ROCKY MOUNTAIN LANDSCAPES: Science, Policy and Management of the Crown of the Continent Ecosystem*. Washington: Resources for the Future, p. 321.
20. **Byrne**, James M. and Stefan Kienzle, 2007. *Water Resources*. In Sauchyn, Dave, 2007. *ALBERTA VULNERABILITY ASSESSMENT: Biophysical Vulnerability*. For Government of Alberta, Department of Environment, p. 11-20.
21. **Byrne**, J., Kienzle, S., Johnson, D., Duke, G., Gannon, V., Selinger, B. and Thomas, J. 2006. *Current and future water issues in the Oldman River Basin, Alberta, Canada*. *Water Science & Technology*: Vol 53 No 10.
22. **Byrne**, James M. *Silent lies and the looming Alberta Water Crisis*. In Trevor W. Harrison, editor, 2005. *THE RETURN OF THE TROJAN HORSE: Alberta and the New World (Dis)Order*, Black Rose Books, ISBN: 1-55164-254-9 346 pp.
23. Lapp, S., Byrne, J., Townshend, I., & Kienzle, S. (2005). Climate warming impacts on snowpack accumulation in an alpine watershed. *International Journal of Climatology*, 25(4), 521-536.

24. Duke, G., Kienzle, S.W. Johnson, D and **Byrne**, J., 2005. *Incorporating Ancillary Data to Refine Anthropogenically Modified Overland Flow Paths*. Hydrological Processes, 20, 1827-1843.
25. Gannon, V.P.J., Graham, T.A., Read, S., Ziebell, K., Muckle, A., Mori, J., Thomas, J., B. Selinger, B., Townshend, I., **Byrne**, J. 2004. *Bacterial Pathogens in Rural Water Supplies in Southern Alberta, Canada*. *J. Toxicol. Environ. Health Part A*: 67 (#20-22): 1643 – 1653.
26. V.P.J. Gannon, T.A. Graham, Susan Read, Kim Ziebell, Ann Muckle, J. Mori, J. Thomas, B. Selinger, I. Townshend and J. **Byrne** 2003. *Bacterial pathogens in rural water supplies in southern Alberta*. *First International Conference on Water and Health - ICWH 2002 "Towards a New Frontier in the Protection of Drinking Water"* Sept. 22 - 25, 2002 University of Ottawa, Ottawa, Ontario.
27. Duke, G., Kienzle, S.W., **Byrne**, J. and Johnson, D., 2003. *Improving overland flow routing by incorporating ancillary road data into Digital Elevation Models*. *Journal of Spatial Hydrology*, Vol. 3, No. 2, Fall 2003, 27pp.
28. Johnson, J.Y.M., Thomas, J.E., Graham, T.A., Townshend, I., **Byrne**, J., Selinger, B. and Gannon, V.P.J., 2003. Prevalence of Escherichia coli O157:H7 and Salmonella spp. in Surface Waters of Southern Alberta and its Relation to Manure Sources *Canadian Journal of Microbiology*.49: 326-335.
29. Romney Hyland, James **Byrne**, Brent Selinger, Thomas A. Graham, James Thomas, Ivan Townshend and Victor P.J. Gannon, 2003. *Spatial and Temporal Distribution of Faecal Indicator Bacteria within the Oldman River Basin of Southern Alberta, Canada*. *Water Qual. Res. J. Canada*, 38,1:15-32.
30. Lapp, S., J. **Byrne**, S. Kienzle and I. Townshend, 2002. Linking Global Circulation Model synoptics and precipitation for western North America. *Int. J. Climatol.* **22**: 1807–1817.
31. Johnston, Thomas R.R., David E. Kromm, and James M. **Byrne**, 2000. *On-farm water conservation practices in Southern Alberta*. *Journal of the American Water Resources Association*; 37: 737-750.
32. **Byrne**, J.M., A. Berg and I. Townshend, 1999. Linking observed and GCM upper air circulation patterns to current and future snow runoff for the Rocky Mountains. *Water Resources Research*: 35, 3793-3802.
33. Saunders, I.R. and J.M. **Byrne**, 1999. *Using synoptic pressure data for generating grid-scale precipitation*. *Int. J. Climatol.*: 19: 1165-1176.
34. **Byrne**, J.M. and A.A. Berg, 1998. Spatial analysis of strong El Nino event impacts on the Canadian prairies. *CWRJ*: 23(3): 231-243.
35. Berg, A. A. and J.M. **Byrne**, 1998. Water table development due to household and park irrigation in Lethbridge, Alberta, Canada. *CWRJ*, 23:61-75.
36. Berg, Aaron, James **Byrne** and Robert Rogerson, 1996. An urban water balance study, Lethbridge, Alberta: estimation of urban lawn over watering and potential effects on local water tables. *CWRJ*, 21: 355-365.
37. Saunders, I.R. and J.M. **Byrne**, 1996. Generating regional precipitation from observed and GCM synoptic-scale pressure fields, Southern Alberta, Canada. *Climate Research*: 6: 237-249.
38. Saunders, I.R. and J.M. **Byrne**, 1994. Annual and seasonal climate and climatic changes in the Canadian Prairies simulated by the CCC GCM. *Atmosphere-Ocean* 32(3), 621-641.

39. **Byrne**, James and R.B. McNaughton, 1991. *Predicting temporal and volumetric changes in runoff regimes under climate warming scenarios*. Canadian Water Resources Journal, 16:2, 129-141.
40. **Byrne**, James M., René Barendregt and Douglas Schaffer, 1989. *Assessing potential climate change impacts on water supply and demand in southern Alberta*. Canadian Water Resources Journal, 14:4, 1-11.
41. **Byrne**, James M., 1989. Three Phase Runoff Model for Small Prairie Rivers: I. Frozen Soil Assessment, Canadian Water Resources Journal, 14:2,17-28.
42. **Byrne**, James M., 1989. Three Phase Runoff Model for Small Prairie Rivers: II. Modelling the Saturated Soil Phase. Canadian Water Resources Journal, 14:3,18-29.
43. **Byrne**, J.M., E.A. McBean, K.B. Shipley and G.J. Farquhar, 1989. *Statistical long range transport model for simulation of wet sulphate deposition*. Can J Civ E 16(3), 258-266.
44. Wareham, D.G., E.A. McBean and J.M. **Byrne**, 1988. *Linear programming for abatement of nitrogen oxides acid rain deposition*. Water, Air and Soil Pollution, 40:157-175.
45. Shipley, K.B., McBean, E.A., Farquhar, G.J. and J.M. **Byrne**, 1987. *Incorporation of Wind roses in a Statistical Long-Range Pollution Transport Model*. Water, Air and Soil Pollution, 36:115-130.

### **Global Science Communication Leadership**

1. 2013 James Byrne, Natasha Andronova and Philip Rasch, Co-chairs. American Geophysical Union Chapman Conference: Communicating Climate Science: A Historic Look to the Future, June 8-13, Granby, Colorado. This was ground-breaking conference was three years in the planning, and involved extensive and ongoing telephone meetings, almost 2000 email communication through my inbox and many reviews of a complex multidisciplinary conference program. A diverse group - educators, writers, scholars from science, social sciences and humanities, urban planners, film and documentary producers, communication professionals, business leaders and bloggers – came together for five days of presentations and discussion in Colorado.

### **Professional Meetings**

#### **Invited Keynote Addresses to Conferences**

- 1 **Byrne**, James, 2009. Water Health Paradigms: Shift Happens! Canadian Rural Health Research Society Annual Conference, Kingston, Ontario, October 15-18.
- 2 **Byrne**, James, 2007. Cumulative effects on Land and Water resource development in western Canada. Alberta Surface Rights Federation Annual Meeting, February 19.
- 3 **Byrne** James 2006. Canada's water – Under Fire. Lethbridge: Kairos Prairies North Region Annual Meeting, Sept 15.
- 4 **Byrne**, James, 2006. What do we know about watersheds and the Lake Winnipeg watershed? Calgary: Community Foundations and the Lake Winnipeg Watershed Conference, Community Foundations of Canada, October 26.
- 5 **Byrne**, James, 2006. Water under Fire. Calgary: Community Foundations and the Lake Winnipeg Watershed Conference, Community Foundations of Canada, October 25.

- 6 **Byrne** James, 2006. Future of water residential workshop. Science lead and keynote address for the three day residential national workshop for youth hosted by United Nations Water for Life Decade, Bob Sanford, June 24-26.
- 7 **Byrne**, James M. 2005. *Land and water reclamation: the looming crisis in Alberta*. Land and water use for the Oil and gas industry: A Regulatory and Strategic Summit, The Metropolitan Centre, Calgary, November 14-15. Calgary, November 14.
- 8 **Byrne**, J. M., 2000. Climate variability/change: Issues for the Canadian Prairies. Regina: Saskatchewan Soil Conservation Association: Sustainable farming in the new millennium. February 9-10.
- 9 **Byrne**, J.M., 1999. Climate change impacts and adaptation. Regina: Climate change adaptation outreach workshop, Environment Canada, March 1-2.

#### **Invited or Featured Presentations**

- 1 Byrne, James, 2013. High Resolution Hydrometeorology Modelling in Diverse Terrain. Air and Waste Management Association Conference, University of Alberta, April 16-17.
- 2 Byrne, J M, MacDonald, R J, Booth, E, Dalla Vicenza, S A, Boon, S Jiskoot, H Letts, M G, 2011. **High-resolution hydrometeorological modeling in diverse landscapes (Invited)** GC22C-07, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 3 **Byrne**, James M., 2008 **Choking Lake Winnipeg: A Watershed Education Campaign**. Community Foundations of Canada National Conference, Montreal, November 8.
- 4 **Byrne**, James, 2008. **Downscaling Weather and Climate Data for modelling past, recent and future Environmental Change in BC**. Pacific Climate Impacts Consortium Invited Speaker Series, August 19, University of Victoria.
- 5 **Byrne**, James, 2008. **Food Security**. A panel presentation to the Prentice Institute Dialogue Meeting, June 20-21, University of Lethbridge.
- 6 **Byrne**, James, 2008. **Geopolitical Implications of Population Change**. Invited Respondent to a talk by Alan Siaroff, University of Lethbridge. Prentice Institute Dialogue Meeting, June 20-21, University of Lethbridge.
- 7 **Byrne**, James, Ryan MacDonald, and Stefan Kienzle, 2008. **Regional Climate Downscaling: When, How, How Much, What Assumptions?** MTNCLIM 2008 Conference, 9-12 June 2008, Silverton, Colorado, USA.
- 8 **Byrne**, James, 2007. **Resource development in Alberta – Silent lies and the looming environmental crisis**. University of Calgary Invited Speaker Series, Dialogues in Geography, March 19.
- 9 **Byrne**, James M 2006. **The Looming Water Crisis on the Canadian Prairies**. Agriculture and Agri-Food Canada Operated Projects Annual Meeting Cypress Hills Four Seasons Resort, Cypress Park, Alberta, March 1-2.
- 10 **Byrne**, James M 2006. **Water under fire: a virtual tour of Canada's water resource challenges in the coming decade**. AAFC Operated Projects Annual Meeting Cypress Hills Four Seasons Resort, Cypress Park, Alberta. Cypress Hills, March 1-2.
- 11 **Byrne**, James M, 2006. **Alberta's looming water crisis**. Invited presentation to Alberta Research Council Senior Scientists and Management, ARC Main Boardroom, Edmonton, January 31.

- 12 **Byrne, James, 2006. Land and Water Resource Development in Western Canada.** Water and Land Use in Alberta: Sustainable resource management in a Boom Economy. The Metropolitan Centre, Calgary: Dec 4-5, Insight Information.
- 13 **Byrne, James M, 2005. Water under fire: a virtual tour of Canada's water resource challenges.** The Alberta We Want: In Canada and the World. Parkland Institute's Fall Conference, University of Alberta, Edmonton, November 18-20.
- 14 **Byrne, James M and David Schindler, 2005. Water under fire: a virtual tour of Canada's water resource challenges.** Canada Council: Canadian Unity Youth Conference; Edmonton, October 17-19.
- 15 **Byrne, J., Mrazek, R. and Gallant, G. 2005. Water under Fire!** Featured Conference Presentation, Evening Special Plenary Session, Canadian Association of Geographers Annual National Meeting, London, ON, May 2005. Presented by Bob McDonald, CBC, Toronto.
- 16 **Byrne, J., Mrazek, R. and Gallant, G. 2005. Using Water under Fire for Teaching and Learning.** A presentation at the Luncheon Plenary 2005 Western Division of the Canadian Association of Geographers Conference, March. University of Lethbridge. Lethbridge, Alberta.
- 17 **Byrne, James, 2004. Canada's Water – a discussion of challenges for water resource managers across the nation.** Calgary: Setting the Agenda: A Parkland Institute Symposium on the Politics of Water in Alberta. June 18-19, Rozsa Centre, University of Calgary.
- 18 **Byrne, J., D. Johnson, A. Pietroniro, S. Lapp, N. Rabe and N. McKechnie, 2003. Downscaling historical and future precipitation scenarios for western North America.** National Workshop: Development of Scenarios of Climate Variability and Extremes: Current Status and Next Steps, Delta Ocean Pointe Hotel, Victoria, BC, 16-17 October.
- 19 **Byrne, J, M., 2003. Assessing Climate Change Impacts in an Integrated Watershed Management Framework.** Ottawa: Canadian Meteorological and Oceanographic Society (CMOS) Annual Meeting, Session on Impacts of Climate Change on Society, June 1-5.
- 20 **Byrne, J, M., 2003. Theme Address: Water Resources – Managing Impacts to Water Quantity and Quality.** Canadian Water Network First Annual National Symposium and Associated Meetings, St. John Trade and Convention Centre, St. John, NB, March 23-27.
- 21 **Byrne, J.M. and M. Dore, 2003. Forecast Climate Change Impacts on Regional Hydrology and Water Supply in Canada.** Canadian Water Network First Annual National Symposium and Associated Meetings, St. John Trade and Convention Centre, St. John, NB, March 23-27.
- 22 **V.P.J. Gannon, T.A. Graham, S. Read, K. Ziebell, A. Muckle, J. Thomas, B. Selinger, S. Kienzle, S. Lapp, I. Townshend and J. Byrne, 2003. Spatial and Temporal Occurrence Bacterial Pathogens in Rural Water Supplies, Southern Alberta, Canada.** Canadian Water Network First Annual National Symposium and Associated Meetings, St. John Trade and Convention Centre, St. John, NB, March 23-27.
- 23 **Byrne, J., 2002. Climate change and alpine snowpacks.** University of Calgary: Climate Change Action Fund, Meeting on Climate Change Impacts on the South Saskatchewan River basin, Jan 26-27.
- 24 **Byrne, J. Invited participant, 2002. Healthy Water: Where do we go from here?** A drinking water planning forum hosted by British Columbia Centre for Disease Control, February 14-15, Vancouver, B.C.

- 25 **Byrne, J.**, 2002. CWN and NCE Research at Lethbridge, Invitation to NWRI-NCE water discussions in Saskatoon, SK, July 5-6, NHRC Office, Saskatoon.
- 26 **Byrne, J.M.**, 2002. **Climate change and hydrology**. Lethbridge: Alberta Agriculture and Rural Development Climate Change Meeting, Dec 19. Invited presentation.
- 27 **Byrne, J.M.** Invited participant, 2001. The Canadian Climate Impacts and Adaptation Research Network (C-CIARN) Water Resources Workshop, June 18 and 19, Executive Royal Inn, 2828 - 23 Street NE, Calgary, Alberta.
- 28 **Byrne, J.M., A. Berg and I. Townshend**, 1999. **Linking observed and GCM upper air circulation patterns to current and future snow runoff for Western North America**. Boston: special session on statistical downscaling for climate change impact assessment, AGU Spring Meeting, June 1-4. ***Invited Poster - the session organizer stated our group was one of 20 targeted for invitation among 600 groups worldwide.***
- 29 **Byrne, J.** 1998. **Overview of the Nat Christie Project**. Canada-China Workshop on Climate Change Detection and Impacts, October 27-28, Edmonton.
- 30 **Byrne, James**, 1997. **Climate change implications for agriculture in Western Canada**. Proceedings of the Air and Waste Management Association Conference, '97: Emerging air issues in the 21<sup>st</sup> century: the need for multidisciplinary management. Calgary, Sept. 21-24, 1997.
- 31 **Byrne, James**, 1997. **Regional environmental impacts of global climate change - impacts on the prairies**. Presentation to the Royal Society of Canada Cross-Canada Briefings before Kyoto. Calgary, November 5<sup>th</sup>, 1997.
- 32 **Byrne, J.**, 1996. **The Nat Christie Climate and Agriculture Research Program**. Prairie Climatology Workshop. Co-hosted by the Canadian Climate Program Socio-economics Impacts Committee and the National Climate Advisory Committee on Data and Applications, December 3.
- 33 **Byrne, J.M.**, 1995. A research scientist's reaction to the outcome of the roundtable meetings on building bridges for research in the Saskatchewan River Basin. Partners for the Saskatchewan River Basin, Delta Bessborough Hotel, Saskatoon, Sask., Nov. 29 to Dec. 1. Paper in preparation.
- 34 **Byrne, J.M.**, 1992. **Implications of climate change for agriculture**. Canadian Water Resources Association, statement identifying key issues regarding climate change and its implication for water management and development, Water News, 11,2.
- 35 **Byrne, J.M.**, 1992. The impacts of climate variability on agricultural sustainability in Alberta: an overview of the Nat Christie Research Program. Regina: Second Palliser Triangle Global Change Conference, University of Regina, November 13-15.
- 36 **Byrne, J.M. and R.B. McNaughton**, 1992. **A Regional Climate and Agriculture Research Program; The Nat Christie Foundation Program at the University of Lethbridge**. Ottawa: Agriculture Canada Workshop on Understanding the Contribution of Canadian Agriculture to Greenhouse Gases and Identifying Response Strategies, April 2.
- 37 **Byrne, J.M. and R.B. McNaughton**, 1992. **Weather and Climate Research at the University of Lethbridge**. A presentation to the Alberta Agricultural Research Institute, Weather and Climate Research Programs Review, Edmonton, June 15.

- 38 **Byrne, J.M., 1992. Agricultural Engineering Research at the University of Lethbridge.** A presentation to the Alberta Agricultural Research Institute, Weather and Climate Research Programs Review, Edmonton, June 15.

### **Chairing/Convening Professional Meetings**

1. 2012 James Byrne, Natasha Andronova and Philip Rasch, Co-chairs. Communicating Climate Science—Seeking the Best of Old and New Paradigms I, Fall Meeting, AGU, San Francisco, Calif., Dec 3-7. POSTERS
2. 2012 James Byrne, Stephen Macko, Co-chairs. Education General Contributions, Fall Meeting, AGU, San Francisco, Calif., Dec 3-7. POSTERS
3. 2011 Byrne, J M and Fagre, D B, Co-chairs. Directions in Climate Change Education and Communication, Town Hall, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
4. 2011 Byrne JM and SA Macko, co-chairs. Education General Contributions Session. Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
5. 2011 Byrne, J M and Fagre, D B, Co-chairs. Directions in Climate Change Education and Communication, Poster Session, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
6. 2011 J M Byrne, D B Fagre, T F Pedersen, J D Tenhunen, co-chairs. Climate Change Challenge in Social-Ecological Systems: From Science to Service I, Oral Session, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
7. 2011 J Kim, T F Pedersen, J M Byrne, D B Fagre, J D Tenhunen, Co-chairs. Climate Change Challenge in Social-Ecological Systems: From Science to Service II Posters, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
8. 2011 Byrne, James M, Sarah Boon, Doug Beard, Lisa Crozier, Brian Burke, Maqsahide Kaeriyama, Scott Hinch, 2011. Climate Change and Pacific Salmonids. American Fisheries Society 2011 Annual Meeting, Seattle, September 4-8.
9. 2010 J M Byrne, D B Fagre, T F Pedersen and J A Tindall. Climate Change Adaptation. Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
10. 2010 J M Byrne, P A Fox. Visualization of Geophysical Processes for Science, Education, and Outreach I Posters. Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
11. 2010 J M Byrne, P A Fox. Visualization of Geophysical Processes for Science, Education, and Outreach Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
12. 2010 J M Byrne, F Grifo, D B Fagre, T F Pedersen. Climate Change Adaptation, Education and Communication. Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
13. 2010 J M Byrne, F Grifo, D B Fagre, T F Pedersen. Climate Change Adaptation, Education and Communication – Posters. Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
14. 2009 Byrne James M, James Tindall and Dave Sauchyn. Session Chairs: Water Supply Management and Security I Posters. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
15. 2009 Byrne James M, James Tindall and Dave Sauchyn. Session Chairs: Water Supply Management and Security II. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
16. 2009 Byrne James M. and Daniel Fagre. Session Chairs: Missing Links! Scientists' Communication on Critical Global Environmental Change Issues I Posters. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.

17. 2009 Byrne James M. and Daniel Fagre. Session Chairs: Missing Links! Scientists' Communication on Critical Global Environmental Change Issues [!!](#). American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
18. 2008 Byrne, J M and Dan Fagre. Session Chairs: Defining, Communicating and Protecting Authentic Science in Education, the Public and the Media: New and Expanding Roles for Scientists and Science Societies? Eos Trans. AGU Fall Meet. Suppl.
19. 2008 Byrne, J M, Dan Fagre, Alan Robock and Stephen Schneider, Conveners. Defining, Communicating and Protecting Authentic Science in Education, the Public and the Media: New and Expanding Roles for Scientists and Science Societies? Eos Trans. AGU Fall Meet. Suppl.
20. 2007 Byrne James, Session Chair. Involving Environmental Change Scientists in Education and the Media. Special panel session of the American Association of Geographers Meeting, San Francisco April 17-21.
21. 2007 Byrne James and Rick Mrazek, Conveners,. Involving Environmental Change Scientists in Education and the Media. Special panel session of the American Association of Geographers Meeting, San Francisco April 17-21.
22. 2007 Byrne, J M and Dan Fagre. Session Chairs: Involving Authentic Environmental Change Science and Scientists in Education and the Media. Eos Trans. AGU, 88(52), Fall Meet. Suppl., Session ED33C.
23. 2007 Byrne, J M, Dan Fagre and Stephen Schneider. SESSION CONVENERS: Involving Authentic Environmental Change Science and Scientists in Education and the Media. *Eos Trans. AGU, 88(52)*, Fall Meet. Suppl., Session ED33C.
24. 1997 Organizing Committee Member, Oldman River Basin Water Quality Workshop, December 1-2, Lethbridge Lodge Hotel.
25. 1996 Program Chair, Irrigation Research and Development Conference. Joint conference of the Alberta Irrigation Projects Association and The Water Resources Institute, University of Lethbridge, November 24-28, Lethbridge Lodge Hotel
26. 1993 Invited chair and session organiser. Special session on '*Interdisciplinary assessment of the impact of climate change and variability.*' Thirteenth International Congress of Biometeorology, September 12-18, Calgary. Session featured twelve invited papers from international, interdisciplinary global change projects.
27. 1990 Invited Delegate, Second World Climate Conference, Geneva, October 29-November 3. The SWCC was limited to 500 invited delegates worldwide.
28. 1990 Conference and Program Chair, Irrigation Research and Development Conference. The Water Resources Institute, University of Lethbridge, Lethbridge, Alberta, July 17-20.
29. 1990 Chair, Organizing Committee, International Conference on Irrigation Research and Development in the 1990s, July 17-20, University of Lethbridge.
30. 1988 Organising Committee Member, Public Forum on the Oldman River Dam, University of Lethbridge, March 4-5.

### **Publications, Presentations and Service at Professional Meetings**

- 1 James M. Byrne, Susan McDaniel, James Graham and Leanne Little, 2013. Climate Change: Adaptation and Mitigation Solutions. University of Alberta, 23<sup>rd</sup> Annual Warren E. Kalbach Population Conference, Friday, March 8.

- 2 Ryan MacDonald, James M Byrne, Sarah Boon, 2012. Quantifying stream temperature response to environmental change in a groundwater-dominated catchment, Alberta, Canada. H53E-1578: Fall Meeting, AGU, San Francisco, Calif., Dec 3-7.
- 3 Devin W Cairns, James M Byrne, Daniel L Johnson, 2012 A GIS based geomorphic assessment to quantify spatially distributed groundwater recharge in mountain watersheds GC11A-0969: Fall Meeting, AGU, San Francisco, Calif., Dec 3-7.
- 4 Tanya R Byrne, James M Byrne, Susan McDaniel, 2012. Global Warming and Food Insecurity in Rural Latin America GC21C-0975: Fall Meeting, AGU, San Francisco, Calif., Dec 3-7.
- 5 Brad Goruk, James M Byrne, 2012. Speaking their language: communicating research through new media GC23A-1046: Fall Meeting, AGU, San Francisco, Calif., Dec 3-7.
- 6 James M Byrne, Susan McDaniel, James Graham, Leanne Little, James C Hoggan, 2012. Saving Grace - A Climate Change Documentary Education Program. GC23A-1045 Fall Meeting, AGU, San Francisco, Calif., Dec 3-7.
- 7 Dalla Vicenza, S A, Byrne, J M, Letts, M G, MacDonald, R J. 2011 Forest Fire Vulnerability in the Northern Rocky Mountains under Climate Change, NH33B-1567 *Poster*, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 8 Byrne, J M, McDaniel, S, Graham, J, Hoggan, J C 2011 Conveying researcher knowledge of climate change on multiple new media platforms, ED33B-0778 *Poster*, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 9 Booth, E Byrne, J M, Jiskoot, H MacDonald, R J. 2011 Modeling the Response of Glaciers to Climate Change in the Upper North Saskatchewan River Basin, C53D-0694 *Poster*, Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- 10 Ryan MacDonald, Sarah Boon, James Byrne, 2011. Applying Reach Scale Data to Model Stream Temperature at the Watershed Scale, Climate Change and Pacific Salmonids. American Fisheries Society 2011 Annual Meeting, Seattle, September 4-8.
- 11 Byrne, James M., 2011. High resolution modeling of climate processes in diverse landscapes. Drought Research Initiative (DRI) Extremes Workshop, Feb 7-9, Inn at the Forks, Winnipeg, MN.
- 12 MacDonald, R J, Boon, S, Byrne, J M, 2010. Assessing stream temperature response to environmental change. GC51D-0787 *Poster* presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 13 Booth, E, **Byrne**, J M, Jiskoot, H, MacDonald, R J, 2010. Modeling the Response of Glaciers to Climate Change in the Upper North Saskatchewan River Basin. GC51D-0788 *Poster* presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 14 Dalla Vicenza, S A, **Byrne**, J M, Letts, M G, 2010. Soil moisture dynamics and forest fire risk in the Upper North Saskatchewan Watershed, Alberta. GC51D-0789 *Poster* presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 15 Montain, J, **Byrne**, J M and Elsner, J, 2010. Hazard Risk to Near Sea-Level Populations due to Tropical Cyclone Intensification and Sea-Level Rise. ED43A-0678 *Poster* presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 16 Montain, J, **Byrne**, J M 2010. Social Networking and Smart Technology: Viable Environmental Communication Tools...? ED43A-0669 *Poster* presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.

- 17 **Byrne, J M**, Little, L J, Dodgson, K, 2010. Science documentary video slides to enhance education and communication. ED43A-0668 Poster presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 18 Dodgson, K, **Byrne, J M**, Graham, J R, 2010. Delivering Global Environmental Change Science Through Documentary Film. ED43A-0667 Poster presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 19 Sauchyn, D, Lapp, S L, St. Jacques, J, Vanstone, J R, MacDonald, R J, Byrne, J M, 2010. Developing paleoclimate, historical and GCM based future scenarios of moisture indices for upper sub-basins in the Canadian Rockies. A31D-0086 *Poster* presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- 20 Suzan L. Lapp, David J. Sauchyn, James M. **Byrne** and Ryan J. MacDonald, 2010. Developing paleoclimate, historical and GCM based future scenarios of moisture indices for upper basin watersheds in western Canada. 2010 Annual Meeting of the Canadian Association of Geographers, University of Regina, Regina, Sask, June 1-5.
- 21 MacDonald, R. J., **Byrne, J. M.**, and Boon, S. (2010) Stream temperature response to environmental change. MTCLIM Bi-Annual meeting, H. J. Andrews Forest, Oregon June 7-11.
- 22 James M **Byrne**, Evan Booth, Sarah Dalla Vicenza and Ryan J MacDonald, 2010. Historical and Future environmental change indices – Upper North Saskatchewan Watershed, Alberta. CWRA Alberta Branch Annual Conference, March 28-30, 2010, Edmonton Alberta.
- 23 Ryan J. MacDonald, Ivan Townshend, James M. **Byrne**, 2010. Potential effects of climate change on the spatial characteristics of mountain hydrometeorology in the upper North Saskatchewan River watershed, Alberta. CWRA Alberta Branch Annual Conference, March 28-30, 2010, Edmonton Alberta.
- 24 D. Sauchyn, J. **Byrne** and S. Kienzle, 2010. Past, Recent and Future Hydroclimatic Variability: North Saskatchewan River Basin. CWRA Alberta Branch Annual Conference, March 28-30, 2010, Edmonton Alberta.
- 25 K. A. Dodgson; J. M. **Byrne**; L. J. Little; J. Graham, 2009. Delivering Global Change Science through Documentary Film and New Media Technologies. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
- 26 J. M. **Byrne**; L. J. Little; K. A. Dodgson; R. J. MacDonald; J. Graham, 2009. Choking Lake Winnipeg. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
- 27 J. Graham; J. M. **Byrne**, 2009. The 2D Hyperlink/Geocaching hybrid as a New Method for Improving Communication and Educational Delivery in Environmental Science. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
- 28 J. M. **Byrne**; R. J. MacDonald; S. W. Kienzle, 2009. Simulating hydrometeorological processes in large diverse watersheds. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
- 29 E. Booth; J. M. **Byrne**; R. J. MacDonald; S. W. Kienzle, 2009. Analysis of Historical Changes in Extreme Temperature and Precipitation on the Great Plains of North America. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.
- 30 R. J. MacDonald; J. M. **Byrne**; S. W. Kienzle; D. Sauchyn, 2009. Testing the sensitivity of snowpack to climatic change in a large physiographically diverse watershed. American Geophysical Union Fall Meeting, Eos Trans. AGU Fall Meet. Suppl.

- 31 S. L. Lapp; J. M. **Byrne**; R. J. MacDonald; D. Sauchyn, 2009. Linking Paleoclimate, historical and GCM based future scenarios to a fine scale hydrometeorology model. American Geophysical Union Fall Meeting, *Eos Trans. AGU Fall Meet. Suppl.*
- 32 **Byrne**, J. M., S.W. Kienzle, and D.J. Sauchyn, 2009. Linking GCM driven hydrology simulations to paleo-hydrology in mountain watersheds. *Geophysical Research Abstracts*, Vol. 11, EGU2009-13098, April 20-24.
- 33 **Byrne**, J.M., 2009. Choking Lake Winnipeg: A Documentary Web Based Education Program. *Geophysical Research Abstracts*, Vol. 11, EGU2009-12865, April 20-24.
- 34 **Byrne**, James, Ryan MacDonald, Stefan Kienzle, 2008. The Development of the GENESY hydrometeorological model for mountain environments. *Eos Trans. AGU Fall Meet. Suppl.*
- 35 MacDonald, Ryan, James **Byrne** and Stefan Kienzle, 2008. Assessing potential environmental change impacts in the St. Mary River watershed, Montana. *Eos Trans. AGU Fall Meet. Suppl.*
- 36 Campbell, Karley, Katherine Nesbitt, Ryan MacDonald, James **Byrne** and Stefan Kienzle, 2008. Sensitivity analysis of GENESYS Model simulations in an alpine environment. *Eos Trans. AGU Fall Meet. Suppl.*
- 37 **Byrne**, James, Stefan W. Kienzle, Ryan J. MacDonald, 2008. Modeling Detailed Hydro-Climatic Surfaces and Runoff Response in Large Diverse Watersheds. Montreal: Water Management 2008 Climate Change Impacts on Hydroelectric Water Resource Management, CEATI International.
- 38 Sauchyn, David and James **Byrne**, 2007. Delivering Climate Change Science: The Prairie Provinces Chapter of Canada's National Assessment of Climate Change. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract ED33C-05.
- 39 Robock, A and J **Byrne**, 2007. Defining New Roles for Scientific Professional Organizations in Society? *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract ED33C-08.
- 40 **Byrne** J M and R Mrazek, 2007. Authentic Water Science Education through WWW Video Lesson Plans. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract ED33A-0883.
- 41 MacDonald, R J, J M **Byrne** and S Kienzle, 2007. Deriving high resolution historical and future climate databases for mountainous environments. *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract GC31C-04.
- 42 **Byrne**, James M, Stefan W Kienzle and David W Schindler, 2006. Global change and rampant land and water resource development – a case study in western Canada. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract GC51A-0460 and Poster.
- 43 Larson, R P, J M **Byrne**, S Kienzle, M Letts, Johnson, D, 2006. TI: Modeling Climate Change impacts on Snow Water Equivalent (SWE) in Alpine Headwaters, Glacier National Park, MT. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract C33C-1283 and Poster.
- 44 Forbes, K, Kienzle, S, Coburn, C, **Byrne**, J, 2006. Parameterization of the ACRU model for estimating biophysical and climatological change impacts, Beaver Creek, Alberta. *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract H21D-1411 and Poster.
- 45 Kienzle SW, **Byrne** J, Schindler D and Komers P 2005: Do massive oil sands developments in a northern watershed lead to an impending crisis? Poster, [EOSTransactions](#), American Geophysical Union, 2005 Fall Meeting, Dec. 05-09, 2005 Vol. 85, 2005/Supplement and Poster.

- 46 **Byrne** J, Kienzle SW, Duke G, Lapp S, Taylor B, Neilson, D 2005: High resolution modelling of snow accumulation and ablation in alpine regions. Poster, EOS,Transactions, American Geophysical Union, 2005 Fall Meeting, Dec. 05-09, 2005 Vol. 85, 2005/Supplement and Poster.
- 47 Lapp, S, Sauchyn, D, **Byrne**, J, Kienzle, S, 2005. Precipitation scenarios using dendroclimatic, historical and GCM based precipitation records. Poster, EOS,Transactions, American Geophysical Union, 2005 Fall Meeting, Dec. 05-09, 2005 Vol. 85, 2005/Supplement and Poster.
- 48 McKechnie, N. J. **Byrne**, I Townshend, N Rabe, S Kienzle, A Shepherd, 2004. Downscaling spatial and temporal variation in precipitation for western North America. American Geophysical Union Fall Meeting, San Francisco, Dec 13-17, abstract and poster.
- 49 **Byrne**, J, S Kienzle and D Sauchyn, 2004. Global change and drought severity in the Battle River Basin, Alberta. American Geophysical Union Fall Meeting, San Francisco, Dec 13-17.
- 50 Duke, G, S W Kienzle and J **Byrne**, 2004. Snowpack and streamflow simulation of an eastern slopes watershed using WATFLOOD, MTCLIM and GLUE. American Geophysical Union Fall Meeting, San Francisco, Dec 13-17, abstract and poster.
- 51 Lapp, S. and J. **Byrne**, 2003. Topographically based estimates of Historical and Future Snow Accumulations for Key Watersheds in Western North America. San Francisco: American Geophysical Union, 2003 Fall Meeting, Dec. 7-12, Moscone Convention Center, abstract and poster.
- 52 Rabe, N., N. McKechnie and J. **Byrne**, 2003. Occurrence, Frequency and Persistence of Historical Upper Air Flows and Precipitation Trends in Western North America. San Francisco: American Geophysical Union, 2003 Fall Meeting, Dec. 7-12, Moscone Convention Center, abstract and poster.
- 53 Mrazek, R., J. **Byrne**, N. Rabe and G. Gallant, 2003. Water Under Fire: A Seven Part Video Series on Canada's Water San Francisco: American Geophysical Union, 2003 Fall Meeting, Dec. 7-12, Moscone Convention Center, abstract and poster.
- 54 Gannon, V.P.J, T.A. Graham, S.Read, K. Ziebell, J. Thomas, B. Selinger, I. Townshend, L. Chui and J. **Byrne**. 2003. *Escherichia coli* O157:H7 in Waters of the Oldman River Basin in Alberta, Canada. VTEC 2003, Edinburgh June 8-11.
- 55 **Byrne**, J., 2003. South Saskatchewan River Basin, Climate Change Action Fund: Climate Change Research Group Meeting, May 22-23, Regina, SK.
- 56 **Byrne**, J., I. Townshend, S. Lapp and S. Kienzle, 2002. Linking the CICS CGCM1 Upper Air Winter Synoptics to Winter Precipitation in Western North America. Winnipeg: 55th Annual CWRA Conference, June 11 to 14, Fairmont Hotel, Winnipeg, Manitoba.
- 57 **Byrne**, J., I. Townshend, S. Lapp and S. Kienzle, 2002. GCM Upper Air Winter Synoptic Links to Winter Precipitation in the Western United States. Granby, Colorado: 70th Annual Meeting of the Western Snow Conference, Sol Vista Resort, May 20-23.
- 58 Lapp, S., J. **Byrne**, I. Townshend, S. Kienzle, 2002. Modeling Future Snow Accumulation for the Upper Oldman Basin, Southern Canadian Rockies using the CCC CGCM1. Winnipeg: 55th Annual CWRA Conference, June 11 to 14, Fairmont Hotel, Winnipeg, Manitoba.
- 59 Lapp, S.L., J. **Byrne**, I. Townshend, S. Kienzle, 2002. Modeling Future Spring Snowpacks for Rocky Mountain Watersheds Using the CCC CGCM1. Granby, Colorado: 70th Annual Meeting of the Western Snow Conference, Sol Vista Resort, May 20-23.

- 60 Gannon V, Graham T, Read S, Ziebell K, Muckle A, Thomas J, Selinger B, Kienzle SW, Lapp S, Townshend I, **Byrne** J, 2002: Spatial and temporal occurrence of bacterial pathogens in rural water supplies, Southern Alberta, Canada. Poster, EOS, Transactions, American Geophysical Union, 2002 Fall Meeting, Dec. 6-12, 2002 Vol. 82, 2002/Supplement, abstract and poster.
- 61 Duke G, Kienzle SW, **Byrne** J, Johnson D 2002: Application of ancillary road, ditch, and culvert data into DEM derived flow direction matrices. Poster, EOS, Transactions, American Geophysical Union, 2002 Fall Meeting, Dec. 6-12, 2002 Vol. 82, 2002/Supplement, **abstract and poster**.
- 62 **Byrne**, J.M., Townshend, I.J., Lapp, S.L., and Keinzle, S., 2001. "Linking the CICS CGCM1 Upper Air Winter Synoptics to Winter Precipitation in the Western U.S.". Poster presented at American Geophysical Union meeting, San Francisco, December, abstract and poster.
- 63 Lapp, S., **Byrne**. J., Townshend, I. Keinzle, S., 2001. "Modeling Future Snow Accumulation for a Small Alpine Watershed in the Southern Canadian Rockies Using the CCC CGCM1". Poster presented at American Geophysical Union meeting, San Francisco, December, abstract and poster.
- 64 Mrazek, Richard, James **Byrne** and Dawna Cerney, 2001. Global Change in Western North America: ATV Media Series for the Classroom. Poster presented at American Geophysical Union meeting, San Francisco, December, abstract and poster.
- 65 Thomas, J.E., Gannon, V., **Byrne**, J., Selinger, B., Mori, J., Townshend, I., Stevenson, S., Hyland, R., and Graham, T. (2001). "Impact of Residential and Agricultural Land Use on Water Quality within Southern Alberta". American Society for Microbiology conference, July 2001.
- 66 S. Lapp, J. **Byrne**, S. Kienzle, D. Sheppard, 2000. **Historical and Future Winter Precipitation Scenarios for Western North America Using the CCC CGCM1**. San Francisco: American Geophysical Union Fall Meeting, Dec. 14-19.
- 67 D. Sheppard and J. **Byrne**, 2000. Validating a GIS Based Distributed Alpine Snowpack Model for the Reynolds Creek Experimental Watershed, Idaho. San Francisco: American Geophysical Union Fall Meeting, Dec. 14-19.
- 68 **Byrne**, J.M., D. Cerney and R. Mrazek, 2000. Just the Facts: A Teaching Video Series on the Science of Global Environmental Change. San Francisco: American Geophysical Union Fall Meeting, Dec. 14-19. Abstract and poster presentation.
- 69 Hyland, R., J. **Byrne**, V. Gannon, I. Townshend, J. Mori, J. Thomas, T. Graham and B. Selinger, 2000. Assessing the impacts of ecological and anthropogenic variables on water chemical and microbial quality. San Francisco: American Geophysical Union Fall Meeting, Dec. 14-19 – accepted for presentation. Abstract and poster presentation.
- 70 **Byrne**, J.M., A. Berg and I. Townshend, 1999. Synoptic Typing of Historical and GCM 50kPa Surfaces for Forecasting Winter Precipitation in Western North America. Lethbridge: Canadian Association of Geographers, Annual Meeting, University of Lethbridge, June 1-5.
- 71 **Byrne**, J.M., B. Michelson, J. Mori, B. Selinger, I. Townshend, J. Thomas and V. Gannon, 1999. Microbial ecology of the Oldman River Basin. University of Lethbridge: June 29 meeting of the Oldman River Water Quality Initiative.
- 72 **Byrne**, J.M., A. Berg and I. Townshend, 1999. Forecast Changes in Runoff for the Western U.S. using GCM Synoptic Patterns. San Francisco: American Geophysical Union Fall Meeting, Dec. 13-18, abstract and poster.

- 73 Gannon, V.P.J., Mori, J., Thomas, J., Graham, T.A. and J. **Byrne**, 1999. Prevalence of *Escherichia coli* O157:H7, Verotoxigenic *E. coli* (VTEC) and *Salmonella* in irrigation water and the Oldman River in southern Alberta. Winnipeg: Interagency Food Safety and Nutrition Research Meeting, Oct. 4-5.
- 74 Kromm, David, Tom Johnston and James **Byrne**, 1999. Changing on-farm water conservation practices in Southern Alberta. Lethbridge: Canadian Association of Geographers, Annual Meeting, University of Lethbridge, June 1-5.
- 75 Lapp, S., J. **Byrne**, D. Sheppard and R. Johnson, 1999. Climate Warming Impacts on Snowpack Accumulation in Alpine Watersheds: A GIS Based Modeling Approach. San Francisco: American Geophysical Union Fall Meeting, Dec. 13-18, abstract and poster.
- 76 Michelson, B., J. **Byrne**, B. Selinger, I. Townshend, J. Thomas and P. Hasselback, 1999. Spatial analysis of human infections with enteric pathogens in Southern Alberta. Lethbridge: Canadian Association of Geographers, Annual Meeting, University of Lethbridge, June 1-5.
- 77 Michelson, B., J. **Byrne**, B. Selinger, I. Townshend, J. Thomas and P. Hasselback, 1999. Spatial analysis of human infections with enteric pathogens in Southern Alberta. San Francisco: American Geophysical Union Fall Meeting, Dec. 13-18, abstract and poster.
- 78 Pinder, S. and J. **Byrne**, 1999. A Comparative Analysis of Groundwater Conditions in two Subdivisions on Glacial and Lacustrine Soils, Lethbridge, Alberta. Lethbridge: Canadian Association of Geographers, Annual Meeting, University of Lethbridge, June 1-5.
- 79 Berg, A., J. **Byrne** and I. Townshend, 1998. GIS assessment of GCM forecasts of upper air circulation and expected impacts on winter precipitation in Western North America. Proceedings of the annual meeting of the Western Snow Conference at Snowbird, Utah: April 20 – 22.
- 80 **Byrne**, J. Sheppard, D. and R. Johnson, 1998. Spatial and temporal modeling of alpine snowpacks using a linked GIS simulation model. Presentation to the annual meeting of the Western Snow Conference at Snowbird, Utah: April 20 – 22. (Originally submitted as Johnson and Byrne)
- 81 Berg, A. and J. **Byrne**, 1998. Modeling climate change impacts on alpine snowmelt runoff – a synoptic patterns approach in western North America. American Geophysical Union Fall Meeting, San Francisco, Ca., December 6-10. Abstract and poster presentation.
- 82 Mori, J., J. **Byrne** and R. McKenzie, 1998. Development of a holistic management model for intensive livestock operation planning. American Geophysical Union Fall Meeting, San Francisco, Ca., December 6-10. Abstract and poster presentation.
- 83 Pinder, S. and J. **Byrne**, 1998. Analysis of surface and groundwater interactions in an urban environment. American Geophysical Union Fall Meeting, San Francisco, Ca., December 6-10. Abstract and poster presentation.
- 84 **Byrne**, J. and D. Sheppard, 1997. GIS based hydrometeorological model for forecasting alpine snow accumulation and ablation. San Francisco: AGU Fall Meeting, December 8-12. **Abstract** and poster presentation.
- 85 Berg, Aaron A. and James M. **Byrne**, 1997. Application of GCM 50 kPa pressure fields to create future precipitation scenarios for North America. San Francisco: AGU Fall Meeting, December 8-12. **Abstract** and poster presentation.

- 86 Johnson, Ryan and James M. **Byrne**, 1997. Snow distribution and accumulation in the Crowsnest pass, Alberta. San Francisco: AGU Fall Meeting, December 8-12. **Abstract** and poster presentation.
- 87 **Byrne**, James, 1997. Modelling climate variability impacts on water resources and agriculture in western Canada. Presentation to the American Water Resources Association Summer Symposium, June 30-July 3, 1997, Keystone, Co. **Abstract.**
- 88 Berg, Aaron and James M. **Byrne**, 1997. Urban Turf Grass Irrigation and Perched Water Table Development in Lethbridge Alberta. Presentation to the AAG Regional Meeting, September, 1997, Bozeman, Montana.
- 89 Delegate, Alberta Irrigation Projects Association Annual Meeting, November 16-18, 1997. Lethbridge Lodge Hotel.
- 90 Berg, A.A. and James M. **Byrne**, 1997. Application of GCM 50 kPa pressure fields to create future precipitation scenarios for North America. San Francisco: AGU Fall Meeting, December 8-12, 1997, abstract and poster paper presentation.
- 91 Johnson, Ryan and James M. **Byrne**, 1997. Snow distribution and accumulation in the Crowsnest Pass, Alberta. AGU Fall Meeting, December 8-12, 1997, abstract and poster paper presentation.
- 92 **Byrne**, J. and D.L. Sheppard, 1997. GIS based hydrometeorological model for forecasting alpine snowpack accumulation and ablation. San Francisco: AGU Fall Meeting, December 8-12, 1997, abstract and poster paper presentation.
- 93 Session Chair, Urbanism in Ancient Canaan and Israel, 1996. Archaeology Conference on the Rise of Urbanism in the Ancient Near East, University of Lethbridge, January 26-27.
- 94 Session Chair, Climatology I, Canadian Association of Geographers, Western Division Annual Meeting, University of Lethbridge, Lethbridge, Alberta, March 8-9, 1996.
- 95 Panellist, Innovations in teaching physical geography at the University level. Canadian Association of Geographers, Western Division Annual Meeting, University of Lethbridge, Lethbridge, Alberta, March 8-9, 1996.
- 96 Saunders, I. and J.M. **Byrne**, 1996. The utility of synoptic scale pressure fields for generating regional precipitation. Canadian Association of Geographers, Western Division Annual Meeting, University of Lethbridge, Lethbridge, Alberta, March 8-9.
- 97 Berg, Aaron, James **Byrne** and Robert Rogerson, 1996. An urban water balance study: estimation of urban lawn and garden over watering and potential effects on local water tables in Lethbridge, Alberta. Canadian Association of Geographers, Western Division Annual Meeting, University of Lethbridge, Lethbridge, Alberta, March 8-9.
- 98 Sheppard, Dennis and James **Byrne**, 1996. A spatio-temporal alpine microclimate simulation model for Southwester Alberta. Canadian Association of Geographers, Western Division Annual Meeting, University of Lethbridge, Lethbridge, Alberta, March 8-9.
- 99 Delegate, Western Snow Conference, 64th Annual Meeting, Bend, Oregon, April 15-18, 1996. Sheppard, Dennis and James **Byrne**, 1996. Modelling the spatial distribution of snow pack accumulation and ablation in an alpine environment of Southwestern Alberta. Annual meeting of the Canadian Geophysical Union, Banff, Alberta, May 5-9.
- 100 Saunders, I. and J.M. **Byrne**, 1996. A simple downscaling approach to derive precipitation time series. Annual meeting of the Canadian Geophysical Union, Banff, Alberta, May 5-9.
- 101 Delegate, Canadian Water Resources Association, Provincial Conference, October 6-8, 1996.

- 102 Invited participant, Metropolitan Water District of Southern California Tour of the Colorado River Aqueduct, November 14-17, 1996.
- 103 Program Chair and Delegate, 1996. The 1996 Conference on Irrigation Research and Development. November 24 to 28, Lethbridge, Alberta, November 24-28.
- 104 Sheppard, D. and J. **Byrne**, 1996. A GIS based Hydrometeorological Model for Forecasting Alpine Snowpack Accumulation and Ablation. The 1996 Conference on Irrigation Research and Development. November 24 to 28, Lethbridge, Alberta, November 24-28.
- 105 Aaron Berg, James **Byrne**, Robert Rogerson, 1996. Urban Impacts on a Prairie Groundwater System. The 1996 Conference on Irrigation Research and Development. November 24 to 28, Lethbridge, Alberta, November 24-28.
- 106 Saunders, I.R and J.M. **Byrne**, 1994. Assessing future climate scenarios for the Canadian Prairies. Twentieth Annual Meeting of the Canadian Geophysical Union, Banff, Alberta, May 13-16.
- 107 Delegate, Canadian Water Resources Association, Alberta Chapter Annual Conference, Red Deer Lodge Hotel, October 2-4, 1994.
- 108 Invited discussant, Environmental Council of Alberta Public Meeting on the proposed new Water Resources Legislation, Government of Alberta, November 18, 1994.
- 109 Saunders, I.R. and J.M. **Byrne**, 1994. Assessing future climate scenarios for the Canadian Prairies. Twentieth Annual Meeting of the Canadian Geophysical Union, Banff, Alberta, May 13-16.
- 110 **Byrne**, J.M. and D.L. Cerney, 1993. Evaluating human emotional/behavioral sensitivity to environmental conditions. WCAG, Vancouver, March 17-20.
- 111 Hopkins, H.K. and J.M. **Byrne**, 1993. Temperature relations in the Rocky Mountains of Alberta. WCAG, Vancouver, March 17-20.
- 112 Saunders, I.R. and J.M. **Byrne**, 1993. Climate Change in the Canadian Prairies forecast by the CCC GCM. WCAG, Vancouver, March 17-20.
- 113 Thomas, F.F. and J.M. **Byrne**, 1993. Historical trends of measured air temperature in Southern Alberta. WCAG, Vancouver, March 17-20.
- 114 Delegate, *Water and the Wilderness: Development, Stewardship, Management*. Canadian Water Resources Association National Conference, June 16-19, 1993, Banff Centre.
- 115 **Byrne**, J.M., 1993. The impacts of climate variability on agricultural sustainability in Alberta. Theme paper: Special session on 'Interdisciplinary assessment of the impact of climate change and variability.' Thirteenth International Congress of Biometeorology, September 12-18, Calgary.
- 116 Saunders, I.R. and J.M. **Byrne**, 1993. Developing future climate scenarios from GCM output and historical data. Special session on 'Interdisciplinary assessment of the impact of climate change and variability.' Thirteenth International Congress of Biometeorology, September 12-18, Calgary.
- 117 **Byrne**, J.M. and R.B. McNaughton, 1992. A Regional Climate and Agriculture Research Program; The Nat Christie Foundation Program at the University of Lethbridge. A Report to the Agriculture Canada Workshop on Understanding the Contribution of Canadian Agriculture to Greenhouse Gases and Identifying Response Strategies, Ottawa.

- 118 **Byrne**, J.M. and R.B. McNaughton, 1992. Weather and Climate Research at the University of Lethbridge. A report to the Alberta Agricultural Research Institute, Weather and Climate Research Programs Review, Edmonton, June 15.
- 119 Hopkins, Keith, James **Byrne** and Ross McKenzie, 1991. Assessing nitrate pollution potential from intensive animal husbandry operations. Water Resources Institute, University of Lethbridge Occasional Paper No. 2.
- 120 **Byrne**, James M., 1991. Water balance assessments for Southern Alberta under forecast climate warming. Water Resources Institute, University of Lethbridge Occasional Paper No. 3.
- 121 **Byrne**, James M., 1991. The Impact of Irrigation on Development of the Intensive Livestock Industry in Southern Alberta. Brief presented to the EARP Hearings on the Oldman River Dam. Report prepared for The County of Lethbridge No. 26.
- 122 **Byrne**, James M. and Lincoln Chew, 1991. Assessment of Potential Changes to the Oldman River Aquatic Environment below the Three Rivers Reservoir. Brief presented to the EARP Hearings on the Oldman River Dam. Prepared for the Southern Alberta Water Management Committee.
- 123 Johnston, T. and J. **Byrne**, 1991. Climate variability and agricultural sustainability. Workshop on Land Surface Processes and Climate, National Hydrology Research Institute, Saskatoon, December 12-13.
- 124 **Byrne**, James M., 1990. Irrigation Research and Development in the 1990s - A Summary of the Final Conference Reports. Presentation to the Rawson Conference on Aquatic Ecosystems in Semi-Arid Environments, Saskatoon, Sask., August 27-30, 1990.
- 125 Thomas, F.F., James **Byrne**, Keith Hopkins and R.J. Rogerson, 1990. Assessing surface and groundwater pollution potential from intensive animal husbandry operations - a GIS application. Presentation to the Rawson Conference on Aquatic Ecosystems in Semi-Arid Environments, Saskatoon, Sask., August 27-30, 1990.
- 126 **Byrne**, James, 1990. Modelling potential climate change effects on water supplies and demands. Presentation to the Conference on Irrigation Research and Development in the 1990s, Lethbridge, Alberta, July 17-20.
- 127 Thomas, F.F., James **Byrne**, R.J. Rogerson and E. Ellehoj, 1990. Assessing surface and groundwater pollution potential from intensive animal husbandry operations - a GIS application. Presentation to the Seminar on GIS and Prairie Agriculture, Regina, April 11-12.
- 128 **Byrne**, James, and Douglas Schaffer, 1990. Water supply, demand and crop yield responses to climate change scenarios for the Saskatchewan River basin. Presentation to the Canadian Water Resources Association National Convention, Penticton, B.C., May 16-18.
- 129 **Byrne**, James and René Barendregt, 1990. Potential effects of forecast climate change on snowmelt runoff and water demands. Presentation to the Canadian Association of Geographers, Western Division Meeting, University of British Columbia, Vancouver, B.C., March 9-11.
- 130 Thomas, Fred, James **Byrne**, Robert Rogerson and Erik Ellehoj, 1990. Assessing surface and groundwater pollution potential from intensive animal husbandry operations - a GIS application. Presentation to the Canadian Association of Geographers, Western Division Meeting, University of British Columbia, Vancouver, B.C., March 9-11.

- 131 **Byrne**, James M., 1989. Problems in defining potential effects of climate warming on irrigated areas: water supply and demand changes. Presentation to the World Conference on Preparing for Climate Change, Cairo, Egypt, December 17-21.
- 132 **Byrne**, James M., D. Schaffer and R.B. McNaughton, 1989. Predicting temporal and volumetric changes in runoff regimes under climate warming scenarios. Cairo: International Seminar on Climatic Fluctuations and Water Management. United Nations Environmental Program, December 11-14.
- 133 **Byrne**, James M. and René Barendregt, 1989. Tomorrow's weather: "local" implications and realities. Presentation to "Tomorrow's Weather ... man-made or man-managed." Oldman River Regional Planning Commission 30th annual workshop, Lethbridge, Alberta, March 30.
- 134 **Byrne**, James, 1989. Potential Changes in Water Supply and Demand Curves under Climate Warming - Oldman River Basin. Presentation to the Canadian Association of Geographers, Western Division Meeting, Medicine Hat, Alberta, March 12-13.
- 135 **Byrne**, James M. and René Barendregt, 1988. Assessing potential climate change impacts on water supply and demand in southern Alberta. AIPA/CWRA Joint Conference on Water Management. Lethbridge Lodge Hotel, November 21-22.
- 136 **Byrne**, James M., 1988. Climatic Factors Affecting Water Supply and Demand in Southern Alberta. Proceedings: Public Forum on the Oldman River Dam. Lethbridge: University of Lethbridge, March 4-5.
- 137 **Byrne**, J.M. and E.A. McBean, 1987. Impact of Seasonal Meteorologic Variability on Acid Rain Management. ASCE - Proceedings of the Conference - Energy '87, Atlantic City, April.
- 138 Wareham, D., McBean, E.A. and J.M. **Byrne**, 1986. Emission Controls for Nitrogen Oxides in Acid Rain Abatement. Poster Paper, OMOE Technology Transfer Conference, Toronto, December 8-9.
- 139 **Byrne**, J.M., McBean, E.A., Donald, J. and G.J. Farquhar, 1986. Study of the Spatial Distribution of the Impact of Sudbury Smelting Emissions. OMOE Technology Transfer Conference, Toronto, December 8-9.
- 140 Farquhar, G.J., McBean, E.A., **Byrne**, J.M., Abbott, W. and R. Kell, 1986. Numerical and Laboratory Modelling of Two-Phase Flow in Porous Media, I. Two-phase gas flow. II. Two-phase liquid flow. OMOE Technology Transfer Conference, Toronto, December 8-9.
- 141 **Byrne**, J.M., 1986. Analysis of Frozen and Saturated Soil Contributing Areas for Small Prairie River Basins. Interim Report 2 - Prairie Hydrology Project; for Alberta Environment, Research Management Division.
- 142 Allan, R.E., **Byrne**, J.M., Farquhar, G.J., McBean, E.A. and J.R. Yardley, 1985. Assessing the Impact of Hazardous Immiscible Liquids on Soil and Groundwater. Report prepared for the Ontario Ministry of the Environment under Research Contract #104-PL.

### **Recent Research Initiatives**

- **Byrne**, James M., Mitigation and adaptation to climate change in the developing world.
- **Byrne**, James M., Member, The alpS Strategy Board. Centre for Climate Change Adaptation Technologies. A \$10 million Euro University of Innsbruck climate change and mountains research proposal. The Strategy Board contributes to the general strategic orientation of alpS and its participation in international Global Change research programmes. It ensures

international visibility and devises the knowledge transfer and dissemination policy of alpS. Funded fall 2010.

- **Byrne**, James M. National Education and Communication program Leader, 2010. Canadian Water Security and Community Solutions Network (WSCSNet/ResSESC) – A \$29 million base budget NCE Proposal under Andrew Weaver, University of Victoria, not funded.
- **Byrne**, James M. Co-leader of Prairies Research Node with D. Sauchyn, University of Regina. Canadian Water Security and Community Solutions Network (WSCSNet/ResSESC) – A \$29 million base budget NCE Proposal. Decision fall 2009, not funded.

### Research Funding

1. MITACS 2013-15 – Byrne PI, A Geomatics based integrated resource management model for watersheds, \$182,000.
2. Byrne, James, Susan McDaniel and James Graham, 2011-14. *Conveying Researcher Knowledge of Climate Change on Multiple New Media Platforms*. SSHRC Grant \$128,000.
3. Byrne, James, 2008-9. Choking Lake Winnipeg. Documentary television and web-based education program, \$90,000.
4. Boon, Sarah and James Byrne, Alberta Conservation Association, \$30000.
5. Boon, Sarah, Ryan MacDonald and James Byrne Trout Unlimited coldwater conservation fund - \$10,000.
6. Sauchyn, Byrne, Kienzle, 2008-10. Past, recent and future hydroclimatic variability, North Saskatchewan River. NSERC CRD Grant, \$100,000.
7. Sauchyn, Byrne, Kienzle, 2008-10. Past, recent and future hydroclimatic variability, North Saskatchewan River. EPCOR, \$100,000.
8. Kienzle, Byrne, Sauchyn, 2006-09. Water resources risk assessment for watersheds in Alberta under paleo-, present and future climate conditions. Alberta Ingenuity Centre for Water Research, \$176,000.
9. Byrne, Kienzle, Johnson, 2005-06. Provincial Climate Change Assessment, Water Resources, Energy and ecology. Alberta Environment \$ 40,000.
10. Byrne, Kienzle, 2004-06. Modelling Snow Water Equivalent (SWE) in the Okanagan Basin under Forecast Climate Change. Environment Canada \$25,000.
11. Byrne, Johnson, Pietroniro, 2002-04. GCM based high resolution spatial temporal precipitation scenarios for western Canada. NRCan, Climate Change Action Fund (CCAF), \$72,738.
12. Byrne (Leader), Dore, Gan, Karney, Kienzle, Sauchyn, 2001-04 – Canadian Network Centre of Excellence, Forecast Climate Change Impacts on Regional Hydrology and Water Supply in Canada. \$218,848.
13. Byrne (Leader), Gannon, Selinger, Thomas, Van Leeuwen, 2001-04 – Canadian Network Centre of Excellence, Agriculture, ecology and urban/industrial activities - Cause and effect associations in the Occurrence of Waterborne Pathogens. \$218,848.
14. Byrne, Thomas, Selinger, Gannon, 1999-00 - Alberta Agriculture Research Institute, Assessment of water quality of irrigation waters from the Oldman River Basin. \$25,000.
15. Byrne, 1997-00. Urban hydrology and water quality research program. City of Lethbridge, \$80,000.

16. Byrne, 1997-98 - Alberta Advanced Education. \$15 000 in support of development for a television series on Global Change with ACCESS TV, Edmonton.
17. Byrne, 1997-98 - Environment Canada, Science Horizons Youth Internship Program. \$12 000 to employ A. Berg to work on global change impacts on alpine climate and hydrology.
18. Byrne and others, 1992-96 - Nat Christie Foundation Research Award. The impacts of climate variability on agricultural sustainability in Alberta. Grant in support of the Climate and Agriculture Research Work with the Water Resources Institute and the Agriculture Canada Lethbridge Research Station. \$1,000,000.
19. Byrne, 1995-96 - City of Lethbridge, Urban Influences on a Prairie Groundwater System - West Lethbridge, \$36,900.
20. Byrne, 1992-93 - NSERC New Faculty Grant, University of Lethbridge. *Remote sensing of snowpack data for hydrologic forecasting.* \$4700.
21. Byrne, 1992 - City of Lethbridge. 'Funding committed in support of an NSERC Research Chair in the Water Resources Institute, University of Lethbridge.' \$20,000.00
22. Byrne, 1991-92 - City of Lethbridge. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$15,000.00
23. Byrne, 1991-92 - Taber Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$1500.
24. Byrne, 1991-92 - Raymond Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$888.13
25. Byrne, 1991-92 - St. Mary River Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$6,781.82
26. Byrne, 1991-92 - Lethbridge Northern Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$2,323.70
27. Byrne, 1991-92 - Eastern Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$5,015.28
28. Byrne, 1990-91 - City of Lethbridge. Grant in support of production costs for the television program "Just add water?" a video on irrigation research and development needs in the next decade. 2,500.00
29. Byrne, 1990-91 Alberta Environment Grant in support of production costs for the television program "Just add water?" a video on irrigation research and development needs in the next decade. \$4,000.00
30. Byrne, 1990-91 Canada Department of Environment, Inland Water Directorate. Grant in support of production costs for the television program "Just add water?", a video on irrigation research and development needs in the next decade. \$4,000.00
31. Byrne, 1990-91 Ducks Unlimited Canada. Grant in support of production costs for the television program "Just add water?" a video on irrigation research and development needs in the next decade. \$1,000.00
32. Byrne, 1990-91 Alberta Irrigation Council. Grant in support of production costs for the television program "Just add water?" a video on irrigation research and development needs in the next decade. \$7,500.00
33. Byrne, 1990-91 Irrigation Council of Alberta. Conference grant in support of "Irrigation Research and Development in the 1990's" - to be held July 17-20, 1990. \$11,935.00

34. Byrne, 1990-91 City of Lethbridge. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$15,000.00
35. Byrne, 1990-91 Taber Irrigation District. Funding in support of the Water Resources Institute, University of Lethbridge. \$1,500.00
36. Byrne, 1990-91 Raymond Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$888.13
37. Byrne, 1990-91 St. Mary River Irrigation District 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$6,781.82
38. Byrne, 1990-91 Lethbridge Northern Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$2,323.70
39. Byrne, 1990-91 Eastern Irrigation District. 'Funding in support of the Water Resources Institute, University of Lethbridge.' \$5,015.28
40. Byrne, 1989-90 - Irrigation Council of Alberta. \$8,700.00 Conference grant in support of "Irrigation Research and Development in the 1990's" - to be held July 17-20, 1990.
41. Byrne, 1989-90 - Alberta Agriculture, Farming for the Future. \$15,000.00 'Management program for Optimising Irrigation Reservoir Supply Levels.'
42. Byrne, 1989-90 - Magrath Irrigation District. \$300.00 'funding in support of the Water Resources Institute, University of Lethbridge.'
43. Byrne, 1989-90 - Taber Irrigation District. \$1,300.00 'funding in support of the Water Resources Institute, University of Lethbridge.'
44. Byrne, 1989-90 - Raymond Irrigation District. \$888.13 'funding in support of the Water Resources Institute, University of Lethbridge.'
45. Byrne, 1989-90 - St. Mary River Irrigation District. \$6,781.82 Funding in support of the Water Resources Institute, University of Lethbridge.'
46. Byrne, 1989-90 - Lethbridge Northern Irrigation District. \$2,323.70 'funding in support of the Water Resources Institute, University of Lethbridge.'
47. Byrne, 1989-90 - Eastern Irrigation District. \$5,015.28 'funding in support of the Water Resources Institute, University of Lethbridge.'
48. Byrne, 1989-90 - City of Lethbridge. \$15,000.00 'funding in support of the Water Resources Institute, University of Lethbridge.'
49. Byrne, 1989-90 - Province of Alberta. \$3,712.50 Student Temporary Employment Program, Alberta Career Development and Employment. In support of a GIS programmer position. Held jointly with R. Rogerson, University of Lethbridge.
50. Byrne, 1988-89 - Alberta Agriculture, Farming for the Future. \$10,000.00 'Management program for Optimizing Irrigation Reservoir Supply Levels.'
51. Byrne, 1988-89 - Irrigation Council of Alberta. \$8,000.00 'Management program for Optimising Irrigation Reservoir Supply Levels.'
52. Byrne, 1988-89 - St. Mary River Irrigation District. \$6,685.71 'funding in support of the Water Resources Institute, University of Lethbridge.'
53. Byrne, 1988-89 - Raymond Irrigation District. \$888.13 'funding in support of the Water Resources Institute, University of Lethbridge.'
54. Byrne, 1988-89 - Taber Irrigation District. \$1,473.08 'funding in support of the Water Resources Institute, University of Lethbridge.'

55. Byrne, 1988-89 - Lethbridge Northern Irrigation District. \$2,323.70 'funding in support of the Water Resources Institute, University of Lethbridge.'
56. Byrne, 1988-89 - Eastern Irrigation District. \$5,015.28 'funding in support of the Water Resources Institute, University of Lethbridge.'
57. Byrne, 1988-89 - City of Lethbridge. \$15,000.00 'funding in support of the Water Resources Institute, University of Lethbridge.'
58. Byrne, 1988-89 - Alberta Advanced Education \$31,385.90. 'Funding in support of the Water Resources Institute, University of Lethbridge.'

## **Research Service**

### **Refereeing**

- 1 2012 - Review of Manuscript ID AO-2012-0012 for Atmosphere-Ocean: "Projected changes in climate, snowpack, evaporation, and stream flow in the Canadian portion of the Columbia River Basin"
- 2 2013 – Re-review of Revised Manuscript ID AO-2012-0012 for Atmosphere-Ocean: "Projected changes in climate, snowpack, evaporation, and stream flow in the Canadian portion of the Columbia River Basin"
- 3 2010 Bocchiola, D., Groppelli, B. Spatial estimation of Snow Water Equivalent at different dates within the Adamello Park of Italy. Review for Cold Regions Science and Technology.
- 4 2009 Schreier et al Water Conservation in Three Communities on the Sunshine Coast in BC. Review for Province of British Columbia Natural Resources and Applied Sciences (NRAS) Endowment Research Team Program.
- 5 2009 White et al - Developing a Decision Support Tool for Snowpack and Water Availability for Agencies, Communities, and Utilities. Review for NOAA Climate Test Bed (CTB) Research Program.
- 6 2008 NSERC's Strategic Projects Program. Dr. Sarah Dorner, "Micropollutant and pathogen sources and dynamics in urban waters."
- 7 2007 NSERC Strategic Grant. Aaron Berg, "Real-time assimilation of soil moisture and precipitation for enhanced streamflow and stormflow prediction."
- 8 2007 NSERC Special Research Opportunities Program. Nguyen, Van-Thanh-Van, "Probabilistic assessment of regional changes in climate variability and extremes".
- 9 2006 External Review for The Ohio State University, Department of Geological Sciences review of an Assistant Professor, promotion and tenure, October.
- 10 2005 NSERC Discovery Grant - Phillippe Gachon, UQUAM. "Development and evaluation of statistical downscaling methods and analysis of present and future climate extremes". Co-applicants: Charles Lin, McGill, Van-Than-Van Nguyen, McGill, Taha Ouarda, INRS, André St-Hilaire, INRS, Elaine Barrow, Environment Canada, Jennifer Milton, Environment Canada, Vicky Slonosky, Ouranos, Clair Goodess, University of East Anglia, UK, Phil Jones, University of East Anglia, UK.
- 11 2004 Walter & Duncan Gordon Foundation. Canadian Institute of Resources Law, Water Management under Stress: Legal and Policy Implications of Alberta's *Water for Life* Initiative.
- 12 2004 Walter & Duncan Gordon Foundation. Pembina Institute, Water Use by the Oil and Gas Industry in Alberta: environmental impacts and policy option.

- 13 2003 Canadian Water Network Project Reviews – reviewed all twenty seven CWN projects in summer 2003, including detailed reviews for ten projects where I was the National Theme Leader or was assigned as a principal reviewer – on file.
- 14 2003 October 30 –External referee for an Application for Promotion to Full Professor: Referee Report to the Dean of Science, University of Winnipeg.
- 15 2003 Trias, M., Z. Hu, M. Mortula, R. J. Gordon and G. A. Gagnon. Impact of seasonal variation on the treatment of swine wastewater. Reviewed for *J. Environmental Technology*, fall – on file.
- 16 2003 Sept 24-26 - Expert Witness and Expert Testimony, Alberta Energy and Utilities Board Public Hearing on the Environmental Impacts of the proposed Canadian Natural Resources Limited Horizon Oil Sands Mine, Fort McMurray, Alberta.
- 17 2003 Oct 8-10 - Expert Witness, Alberta Energy and Utilities Board Public Hearing on the Environmental Impacts of the proposed Shell Oil Jackpine Oil Sands Mine, Fort McMurray, Alberta.
- 18 2003 March 31 – Nomination of Daniel Johnson for a Canada Research Chair, University of Lethbridge – Joint with I. MacLachlan.
- 19 2002 Lenormand, F., C. Duguay and R. Gauthier. Development of a historical ice database for the study of climate change in Canada. Manuscript reviewed for *J. Hydrological Processes*, July, on file.
- 20 2002 Refereed nine Alberta Heritage for Medical Research Travel Grants Application for Research Services, U of Lethbridge – on file.
- 21 2002 Neufeld, Stephanie. Effects of conversion of boreal forest to agricultural land on small stream ecosystems in the Lac La Biche watershed. Challenge grants in Biodiversity, Biological Sciences, University of Alberta – on file.
- 22 2001 Refereed: research proposal for U of Lethbridge Research Services.
- 23 2001 Refereed approximately **thirty** NCE research proposals as part of my duties as theme leader in water resources management.
- 24 2001 Refereed **six** Alberta Heritage for Medical Research Travel Grants Application for Research Services, U of Lethbridge.
- 25 2000 Refereed approximately **forty** NCE research proposals as part of my duties as incoming theme leader in water resources management.
- 26 2000 Refereed **ten** Alberta Heritage for Medical Research Travel Grants Application for Research Services, U of Lethbridge.

### Highly Qualified Personnel (HQP) Supervision

- 1 Mirmasoudi, S., 2014-16. Integrated watershed management, PhD Candidate.
- 2 Mansouri Kouhest, F. 2014-16. Mitigation and adaptation of climate change enhanced urban flooding, PhD Candidate.
- 3 Barnes, Celeste, 2014-16. Mitigation and adaptation to climate change at watersheds scale, PhD Candidate.
- 4 Byrne, Tanya, 2012-14. Vulnerability to Climate Change in Nicaragua, MSc Spring, 2014.
- 5 Cairns, Devin, 2012-14. Geomorphic based groundwater modelling in the Rocky Mountains, MSc Spring, 2014.

- 6 Barnes, Celeste, 2011-13. Modelling tropical cyclone impacts on Caribbean populations, MSc Spring, 2014.
- 7 Doria, Rufa, PDF, 2013. Modelling crop water use and yield in Central America
- 8 MacDonald, Ryan, 2009-13. Modelling climate change impacts on stream ecology. PhD Spring, 2014.
- 9 Booth, Evan, 2011-12. Modeling the Response of Glaciers to Climate Change in the Upper North Saskatchewan River Basin. MSc 2012.
- 10 Dalla Vicenza, Sarah, 2011-12. Soil moisture dynamics and forest fire risk in the Upper North Saskatchewan Watershed, Alberta. MSc 2013.
- 11 Goruk, Brad, 2012. Entered MSc program for four months and dropped out.
- 12 Kyle Dodgson, 2009-11. Delivering Global Environmental Change Science Through Documentary Film. Incomplete.
- 13 MacDonald, Ryan, 2007-08. Applying High Resolution Climate Model Output to Hydrologic Impact Assessment for the South Saskatchewan River Headwaters. M.Sc. 2009
- 14 Larson, Robert, 2005-07. Climate Change Impacts on Water Availability in Western North America. M.Sc. 2008.
- 15 McKechnie, Nicole, 2003-05. Predicting Climate Change Impacts on the South Saskatchewan River Basin. M.Sc. 2005.
- 16 Provost, Tobias, 2001-02. Integrating Traditional Ecological Knowledge into GIS based resource management. M.A. on hold.
- 17 Fox, Paulette, 2001-04. Using GIS to link ecological databases to Blackfoot Traditional Knowledge. M.Sc. 2004
- 18 Lapp, Suzan, 2001-02. Climate warming impacts on alpine snowpacks and spring runoff water supplies in western North America. M.Sc. 2002
- 19 Reid, Jennifer, 1999-2001. Education and Policy Approaches to Water Conservation for the City of Lethbridge. Master of Environmental Design thesis, University of Calgary, 2001.
- 20 Mori, Julie, 1999-01. Prevalence of *Escherichia coli* and Coliforms in a Southern Alberta River System and Survival of *Escherichia coli* O157:H7 in the Environment. M.Sc. 2001.
- 21 Michelson, Brett, 1999-00. Spatial and temporal analysis of human infections with enteric pathogens in Southern Alberta. Withdrew from program.
- 22 Pinder, Shawn, 1998-99. A Comparative Analysis of Groundwater Conditions in Two Subdivisions on glacial till Soils, Lethbridge, Alberta. M.Sc. 2000.
- 23 Berg, Aaron, 1996-97. Urban impacts on a prairie groundwater system. M.Sc. 1997.
- 24 Sheppard, Dennis L., 1995-96. Modelling hydrometeorology in the Upper Oldman River basin. M.Sc. 1996.

All of the above are supervised or co-supervised. I have been a committee member for many more HQP Programs.

### **Canadian Water Network**

I was a founding member and National Theme Leader for Water Resource Management in the National Centres of Excellence Canadian Water Network (CWN). This position required extensive involvement and time commitments to a federally funded national research network. CWN was a professional commitment of forty to fifty working days per annum, as I was heavily involved in:

- Building the initial research plan and proposal. This process involved extensive refereeing, editing and merging of many independent research proposals into a clear and meaningful long term research plan for submission to the National Centres of Excellence Program in Ottawa. As Theme Leader for Water Resource Management, I oversaw a number of research programs and met with the researchers on numerous occasions.
- Program Development and Review – I was directly involved in CWN redeveloping a Strategic Plan that incorporates many of the ideas and direction I developed and presented to CWN at the March 2003 annual meeting in Saint John, NB.
- Team building – I was the lead on the Integrated Watershed Management (IWM) initiative in CWN. This program focused CWN resources on five or six study watersheds across Canada, and the national coordinating team features the best water scientists in Canada.
- As Theme leader I took part in 6-12 Research Management Committee Meetings annually from 2000 through 2004. Most were face-to-face meetings involving travel to the eastern or western Canada. In 2004 I was quite happy to pass the leadership role to others and enjoy my 2004-05-study leave.

Canadian Water Network was one of my best contributions in research service. I am pleased to have been one of the key participants that created a National Research Network that is thriving today.

### **Science Communication and Education - Television and New Media Productions**

- 1 Byrne, James and Leanne Little, 2014. Climate Solutions Centre: Multimedia Education Video production and online education website featuring numerous teaching videos and many online talks on climate science communication by global research leaders. <http://climatesolutionscentre.com/>
- 2 Byrne, James, Leanne Little and Brad Goruk, 2012. Climate Change: DO THE MATH! Twelve minute HD video communicating (1) recent climate change impacts on humanity, and (2) a comparison of the cost of addressing climate change as defined in the Stern report compared to the costs we currently incur every year to continue using fossil fuels. This video went viral and has been seen in over 120 countries. Video shared here <http://vimeo.com/53979295>
- 3 Byrne, James, Leanne Little and Brad Goruk, 2012. Saving Grace. Invited short submission to the Sundance Film Festival for Independent producer funding of \$50,000. Not funded. Video shared here <https://vimeo.com/45468849>
- 4 Dodgson, Kyle and James Byrne, 2011. KTOC - Kyle Talks Oceans, Climate. Is climate change our entire fault? KTOC explores the history of climate science since the 1980s. Who took action, who did not and why are we now overheating the planet, the atmosphere and the oceans. Features interviews with internationally renowned members of the climate science community. Video shared here <https://vimeo.com/46323192>
- 5 Byrne, James. 2010. *Choking Lake Winnipeg*. Documentary television and web based education program. <http://scientiaproductions.com/clw/introduction>
- 6 Byrne, James, Richard Mrazek and George Gallant, 2008. *Water under Fire* Teaching Webisodes and Public Service Announcements. See <http://waterunderfire.ca/>

- 7 Byrne, James, Richard Mrazek and George Gallant, 2004. *Water under Fire* (WUF) Television Production. I was the Originator, Science Lead and Producer for the series. WUF is a television production on Canada's water resources. See <http://waterunderfire.com/>
- 8 Byrne, James, Richard Mrazek and George Gallant, 2002. *Global Change* TV Series.
- 9 Byrne, James and Global Television Lethbridge, 1992. *Just add water?* A video addressing irrigation development in Alberta, in a context for the general public and the science community. The video has been broadcast on a regional television network, and has been distributed to education institutions and government departments.

#### **Awards for Educational Research/Creative Activity**

- 1 Byrne, James, Richard Mrazek and G. Gallant, Producers, 2002. *Global Change* TV Series. Alberta Motion Picture Industries Award for Best Educational Television Series.
- 2 Byrne, James, Richard Mrazek and G. Gallant, Producers, 2003. Summit International Achievement Award. *Global Change: Witnessing the Impacts*.

#### **Award Nominations for Educational Research Activity**

- 1 Byrne, James and Leanne Little, Producers, 2010. *Choking Lake Winnipeg*. AMPIA Award Finalist Best Education Production.
- 2 Byrne, James and Leanne Little, Producers, 2010. *Choking Lake Winnipeg*. AMPIA Award Finalist Best Education Prod
- 3 Byrne, James and Leanne Little, Producers, 2010. *Choking Lake Winnipeg*. AMPIA Award Finalist Best Director Doc under 30 minutes.
- 4 Byrne, James, Richard Mrazek and G. Gallant, Producers, 2005. *Water under Fire*. Alberta Motion Picture Industries Finalist for Best Educational Television Series.
- 5 Byrne, James, Richard Mrazek and G. Gallant, Producers, 2005. *Water under Fire*. Alberta Motion Picture Industries Finalist for Best Writing in an Educational Television Series.
- 6 Byrne, James, Richard Mrazek and G. Gallant, Producers, 2003. *Global Change*. International Mountain Film Festival, Banff for best production in the Environmental Video Production category.

#### **Invited Educational Screenings at International Film Festivals**

- 1 Byrne, James, Richard Mrazek and G. Gallant, Producers. 18<sup>th</sup> Annual Landscape Ecology Conference, 2003. *Global Change*. International Association for Landscape Ecology, Banff: The Banff Centre, April 2-6.
- 2 Byrne, James, Richard Mrazek and G. Gallant, Producers. Go Figure International Science and Film Festival, Quebec, 2003. *Global Change: Witnessing the Impacts*, November 20-30, Montreal, Quebec, Laval, Sherbrooke.
- 3 Byrne, James, Richard Mrazek and G. Gallant, Producers. Lethbridge 18<sup>th</sup> International Film Festival, 2003. *Global Change*. USC Canada. Lethbridge: Public Library, Feb 24-28.

#### **Science Talks and Forums for Public Audiences**

- 1 April 9, 2013 – Invited one-hour talk to Rotary Club of Lethbridge East on Climate Change.
- 2 March 27, 2012: Invited panel speaker, Calgary Telus Science Centre– Science Café – see <http://www.arctic.ucalgary.ca/event/mar-27-2012/telus-spark-science-caf%C3%A9>

- 3 March 21, 2012: Byrne, James, Invited Climate Change Panel Presentation, Prentice Institute Panel on Climate Change, Café Conversation, Lethbridge: see online <http://www.youtube.com/watch?v=Rbp3wUb1t-g>
- 4 March 15, 2013 – One hour presentation on climate change: Fort Macleod Justice Film festival
- 5 January 27, 2012: Panel Members, Prentice Brownbag Series - #1 Fragile Systems & Perfect Storms: Science, Politics and Food Security, see <http://www.uleth.ca/prenticeinstitute/events/prentice-brownbag-series-spring-2012-1-fragile-systems-perfect-storms-science-politics-and-fo>
- 6 2008 Alberta’s Environment under Fire. Plaza Theatre, Calgary for Pat Murray, Alberta Liberal Party, January 31.
- 7 2008 That dirty environment! Five things we can do! Lethbridge Liberal Party Presentation, March 5.
- 8 2008 Corporatization of Universities. Invited presentation to the Southern Alberta Council of Public Affairs, April 24.
- 9 2006 Water under fire: a virtual tour of Canada’s water resource challenges. Southern Alberta Environmental Summit # 3, Winston Churchill High School - Lethbridge, Alberta, Lethbridge, April 20.
- 10 2006 Alberta’s looming water crisis. Invited presentation to Public Forum on Energy and Water - hosted by Dr. David Swann, Alberta Liberal MLA, Calgary, April.
- 11 2002 Lethbridge ProBus Club - Invited Breakfast Speaker “Water in Canada – and Beyond.” Fifty minute talk. June 19
- 12 2002 Our water – a Canadian perspective. Trojan Technologies, London ON. 25<sup>th</sup> Anniversary Celebration, Ten minutes Invited Presentation to international audience. June 25
- 13 2002 Water in Canada and beyond. Trojan Technologies, London ON. 25<sup>th</sup> Anniversary Celebration, One hour Invited Presentation to Trojan Science Staff. June 26
- 14 2002 Water in Canada and beyond. Rotary Club of Lethbridge. Sept 30
- 15 2002 Kyoto and Climate Change Science. Lethbridge ProBus Club - Invited Breakfast Speaker Fifty minute talk. Nov 20
- 16 2002 Kyoto and Climate Change Science. SACPA. Invited Luncheon Speaker. Fifty minute talk. Nov 28.
- 17 2000 Invited discussant on Global Change, 15<sup>th</sup> International Film Festival, Lethbridge.
- 18 1997 October 29, and November 26; with N. Mirau and T. Provost. Organized two public panel presentations to discuss issues and perspectives on First nation water resources. These were well attended by students, staff from Alberta Agriculture and Alberta Environmental Protection, First Nations people and members of the public.

### **Teaching**

My teaching philosophy is simple: engage. The following quotation describes my teaching:

*The best learning occurs in a stimulating, active, challenging, interesting, engaging environment. It’s how the brain works. The best learning occurs when you move at least some*

*part of your body. The best learning occurs when you're actively involved in co-constructing knowledge in your own head, not passively reading or listening.*<sup>[1]</sup>

Consequently, I work hard to provide engagement and body motion at every level and in every class. Creative teaching is interactive learning. The concept of teaching as a compelling cocktail party: metaphorically “. . . creative teaching is a complex and invigorating cocktail . . . depending on the vigour of the mixing and the individual experiences of those who attend each cocktail party”. . . it is intriguing and appropriate. The themes that make teaching a success are contextualization; using metaphor; style and pace of delivery; tutor confidence and ability to inspire; valuing students; emotional engagement; and challenging students to reflect upon their own learning.<sup>[2]</sup> I pursue each of these themes in my classes in the following ways. Please note specific techniques to enhance teaching and learning are in highlighted in **bold**.

**Contextualisation** – the material is relevant and important for my students, and the discussions always include a relevancy theme. In Weather and Climate, the material is meaningful on all time scales – today’s weather affects many of our decisions; and climate change alters life plans for individuals and the societies in which we live. We have frequent check backs in my classes to determine if students see the material and discussion as relevant. This is one place where **interim evaluations** make sense – students can provide anonymous feedback on what is working and what might not be working, and in the case of the latter, how can we improve the situation. I have used anonymous interim evaluations to provide such feedback.

**Metaphors** – are used to clarify difficult concepts. Examples include mass evacuations used to protect public safety from extreme natural events such as hurricanes, firestorms or flooding. Comparisons of lifestyle choices and consumption of resources between developed and developing worlds is often compared to student and regular citizen (or parental) lifestyles.

**Style and pace of delivery** is a process I enjoy and use to advantage. This is much more than lecturing at an even pace – delivery of concepts in my classroom means using lecture interspersed with group work.

**Group discussion** is used to test and build understanding. Concepts presented in class are moves to short group interactions with specific goals – did you and your colleague understand the concept(s)? If not what was not clear? Discussion in the group allows students to share knowledge – or the lack thereof – in a safer place; and if the group members are confused or needs clarification, they may achieve this through peer discussion or bring the question back to the class from a position of security.

I also use a variety of presentations – **PowerPoint** is the key tool but **video** (web based and DVD) provides illustration that is much more alive. I have produced several TV series for use in my classrooms; and I acquire other videos that provide additional data and illustration. This is particularly effective in Geog 2105 Weather and Climate; Geog 3070 Hazards, Disasters and Global Change; and Geog 4015 Integrated Watershed Management. In each class I have a range of videos that are used in whole or in parts to enhance style and pace of delivery.

**Group quizzes** encourage review of core material and create an enjoyable means of reinforcing concepts. I use **closed book pop group exams** – students solve the problem together and effectively re-teach the material to each other while compiling the response.

In junior classes I have used **dual examinations** – two students are allowed to prepare one examination response, speaking in low whispers only. The collaboration enhances their understanding while they are preparing their response, and the discussion creates a learning environment where they share ideas and discuss and debate the best response to the questions.

**Tutor confidence and style** is a virtue that inspires learning as long as one maintains an open mind and willingness to entertain other viewpoints. I strongly believe in the material presented in lecture, discussions, texts, videos and other interactions, but students have to be encouraged to bring forward points and know they will be welcomed to share their experiences. This point is linked to the need to **Value Students**. The strength of classroom interactions is based on the students' perception of instructor appreciation for them and their personal and educational welfare. This is a joy to me as I like students and enjoy interacting with them on the class material – and on their day to day life.

**Emotional engagement** in the classroom and core material is critical in teaching. My classes address a range of critical environmental problems – global warming, contamination of a water supply/ecosystem or major societal disasters. These issues engage me and my students when presented with passion. However, emotional engagement cannot cloud objectivity, but there is an onus on instructors to make material relevant and engage the student on “why” this material is important.

**Challenging students to reflect upon their own learning** - this is challenging! Reflection is by definition (Funk and Wagnalls Cdn Ed) a “meditation; careful consideration; thought.” This happens most often in group assignments and discussions. **Field trips** also serve to focus a greater quantity of time explicitly and totally on the core material of the course. **Field observation** and discussion stays with students for years, even decades; and many of my students have said their field trips have been life changing experiences.

#### **Courses Taught at University of Lethbridge**

- 2<sup>nd</sup> year - Weather and Climate; Climatology
- 3<sup>rd</sup> year - Fluvial geomorphology; Meteorology; Natural hazards; American Southwest Field Courses; Palliser Triangle; Hydrometeorology
- 4<sup>th</sup> year – Hydrology; Integrated watershed management; Introduction to soils; Irrigation science;
- Many independent and applied studies at all levels;
- Graduate courses in earth science modelling, hydrology, climate and water resource management.

### **University and Community Service**

- Education Co-Lead 2011 and 2012, American Geophysical Union (AGU) Fall Meeting Program Committee (FMPC).
- Member, Global Climate Science Rapid Response Team. The team is made up of approximately 160 leading climate scientists from around the world. See <http://www.climaterapidresponse.org/>
- Science Advisor, Tom Mulcair, National NDP Party Leader Candidate, winter 2011-12
- Service on many University of Lethbridge Department and Faculty Committees.
- Resource Conservation Research Committee, Alberta Agricultural Research Institute, 1991-93.
- Southern Alberta Water Management Committee 1990-98.
- Graduate Student Committee, Department of Civil Eng., University of Alberta, 1982-84
- Academic Planning Committee, Department of Civil Eng., University of Alberta, 1984.
- President - Civil Engineering Graduate Students Association, University of Alberta, 1983-84. There were approximately 200 graduate students in Civil Engineering at the University of Alberta.