

Paul Belanger, PhD

Director



613-549-1232x1602
1-800-267-7875

✉ paul.belanger@kflaph.ca

in paulbelanger

🌐 www.kflaphi.ca

📍 220 Portsmouth Avenue
Kingston ON K7M 1V5

RESEARCH INTERESTS

- ◆ multilevel modeling, ecological inference
- ◆ spatial statistics, econometrics
- ◆ standard OLS and logistic regression, cluster analysis
- ◆ data reduction techniques
- ◆ remote sensing analytic techniques

Paul leads KFL&A Public Health's Knowledge Management (KM) Division. He was appointed KM's Director in 2017 following seven years as Associate Director. Paul holds concurrent academic appointments with Queen's University as Adjunct Associate Professor in the Department of Geography and Adjunct Assistant Professor in the Department of Public Health Sciences. With Paul's leadership, KM has strategically focussed on building expertise in public health informatics and programme evaluation. KM's project portfolio includes innovative solutions in public health surveillance, a Big Data/data science research programme, funded informatics and IT solutions, and an allied research portfolio in spatial analytics and social media.

EDUCATION

2002 **PhD, Geography**
The State University of New York (SUNY), Buffalo NY

1994 **Master of Arts, Geography**
University of Kentucky, Lexington KY

1993 **Bachelor of Arts, Geography**
University of Victoria, Victoria, BC

ACADEMIC APPOINTMENTS

2010-present **Adjunct Associate Professor, Department of Geography and Planning**
Queen's University, Kingston ON
Courses Taught: GPHY349 GIS Science and Public Health, GPHY345 Spatial Analysis, GYPHY243 Geographic Information Science (yearly, 2013)

2013-present **Adjunct Assistant Professor, Department of Public Health Sciences**
Queen's University, Kingston ON
Courses Taught: EPID825 Foundations of Public Health Practice (2015)

2006-2009 **External Thesis Reader, Department of Environmental Studies**
Addis Ababa University, Addis Ababa, Ethiopia

2000-2005 **Lecturer, Department of Geography**
University at Buffalo, SUNY, Buffalo NY

PROFESSIONAL EXPERIENCE (selected)

Associate Director

Knowledge Management, KFL&A Public Health, Kingston ON

2010-2017

Design, develop, implement all internal GIS-related projects in support of a broad public health mandate, particularly in the real-time mapping and geovisualization of syndromic surveillance data. Led efforts to establish the agency's knowledge management programme, including public health surveillance, a Big Data/data science research programme, funded informatics and IT solutions, and an allied research portfolio in spatial analytics and social media. Lead architect of several public health data management and geovisualization applications including the Public Health Information Management System (PHIMS), the Acute Care Enhanced Surveillance System (ACES), and implementation of automated processes for monitoring and reporting provincial ED opioid cases. Technical lead on a local and potentially provincial implementation of a public health EMR.

Senior Consultant

Enterprise Solutions, ESRI Canada, Ottawa ON

2005-2009

Design, development, and implementation of medium- to large-scale enterprise GIS solutions for mostly public-sector clients (including the City of Ottawa, Parks Canada, International Boundary Commission, Canadian Coast Guard, and others). Participated in and/or led the entire client engagement ranging from proposal authorship to user needs analysis, business process reengineering, database modeling, system architecture and design, capacity planning, through to application development, testing, documentation, deployment, and user acceptance. As a member of ESRI Canada's Core Competency Resource Centre, provide management consulting services and system design/architecture counsel to our enterprise clients. Offer technical leadership within ESRI Canada on web mapping applications (particularly those using the REST/Flex API for ArcGIS Server).

Geographic Information Systems Officer

United Nations Economic Commission for Africa, Addis Ababa, Ethiopia

2005-2009

Technical and analytical lead on the Commission's GIS operations. Developed an intranet-deployed GIS and database monitoring and evaluation tool to record and analyze the progress of the African Peer Review Mechanism (APRM). Lead architect of ECA's MDG Mapper, an on-line analytical and thematic mapping application to monitor Africa's progress towards the achievement of the Millennium Development Goals. Organized an international workshop on 'GIS and HIV/AIDS in Africa' drawing 115 participants from over 43-member States. Lead architect of EthioGaz, an intranet-based geodatabase application to maintain Ethiopia's National Gazetteer. Lead architect of the Staff Safety GIS, an intranet-based GIS application to solve network analysis problems in real-time such as shortest route problems (time or distance, with directions), calculating the closest designated 'safe areas' from each staff residence, and calculating catchment areas around evacuation assembly areas.

Operations Director

Database and GIS Analytical Services, Institute for Local Governance and Regional Growth, Buffalo NY

1999-2005

Led data/technology-centric analytics projects, GIS/database solutions for public sector and not-for-profit clients. PI on the WNY Brownfields Fiscal Impact Assessment, a study to inventory Western New York's brownfields and estimate, using spatial interpolation, forgone tax revenue. These estimates would then be used to support decisions on selective remediation investments. Directed end-to-end solutions, from the initial client consultation to preparing formal proposals (in response to RFIs, RFPs, and grant solicitations), on to project planning, data procurement, analysis, and interpretation, to drafting interim and final reports and delivering client presentations. Production responsibility for GIS and mapping contracts and internal projects and managed or co-managed database services projects. Managed the design, prototyping, and ultimate deployment of Western New York's web-enabled Regional Economic Development Database that provided WNY's economic development agencies with mission-critical data, mapping services, and information resources, enabling them to fulfill requests from prospective firms seeking to (re)locate to/within Western New York. Managed project budgets/resources and lead and trained a team of between 3 and 11 in day-to-day project assignments.

Marketing Database Specialist

Molson Centre for Innovation, Molson Breweries, Toronto ON

1997-1999 Designed and implemented Molson's first sub-provincial market share model that estimated corporate market share for local neighbourhoods in Canada. Led Molson's strategic approach to database marketing through innovative direct-to-drinker campaigns, modeling drinker retention and acquisition, and customer lifetime value analyses. Managed successful data mining research to generate new insights about consumer behaviour in terms of loyalty, consumption, and brand choice from marketing databases. Built category management product mix models to estimate optimal product assortments for individual retail locations.

Geodemographics and Customer Information Analyst

Canada Trust, Toronto ON

1996-1997 Managed corporate branch location research, recommending new branch construction, closures, and overall network optimization. Extracted and analyzed customer-level data from the marketing data warehouse to answer business questions from a variety of units within the bank on customer profitability, cross-sell and up-sell potential, and early defection/attrition. Developed the Asian Business Portfolio Tracking Monitor that entailed writing database queries and reports to identify our Asian customers, calculating the size of their portfolios, analyzing time-series trends, and highlighting strategic differences with the non-Asian portfolio.

Manager, Modelled Data

Compusearch Micromarketing Data and Systems, Toronto ON

1993-1996 Note: position as Site and Network Optimization Analyst from 1993, Project Manager, Site and Network Optimization from 1994. Produced value-added datasets (for sale to corporate clients) such as population and household projections, daytime population estimates, financial products consumption, and net wealth statistics. Built customized site location software systems for clients in the financial services, petroleum, and retail industries. Managed corporate branch location research, recommending new branch construction, closures, and network rationalization.

FUNDING, GRANTS and FELLOWSHIPS (Selected)

- 2018 ♦ A Proposal to Establish a Lyme Disease Research Network Grant, CIHR, \$4,000,000 (Co-Applicant, Awarded)
- ♦ A National Sentinel Surveillance Network for Emerging Vector-Borne Diseases and Climate Change, PHAC, \$495,191 (Co-Applicant, Declined)
- 2017 ♦ Community Hubs, Government of Ontario, \$1,300,000 (PI, Awarded)
- ♦ Needs Assessment for a Pan-Canadian Climate and Health Surveillance System, \$88,000 (PI, Awarded)
- ♦ Report on Health Equity for Renfrew County and District Health Unit (RCDHU), \$37,514 (PI, Awarded)
- ♦ Hospital Surge Monitor for Ontario, Ministry of Health and Long-Term Care, \$74,316 (PI, Awarded)
- 2016 ♦ Proposal for the Development of a Guide for Designing and Implementing Syndromic Surveillance Systems for Extreme Heat in North America, Commission for Environmental Cooperation (CEC), \$71,029 (PI, Awarded)
- ♦ Heat Syndromic Surveillance Pilot Project Subcontract Agreement, Ottawa Public Health and CEC, \$81,219 (PI, Awarded)
- ♦ Implementing the South East Health Integrated Information Portal (SHIIP) in the South East Local Health Integration Network (SE LHIN), PSI Foundation, \$998,642 (Co-Applicant, Declined)
- 2015 ♦ Mapping Ontario's Urban Heat Islands, Health Canada, \$95,000 (PI, Awarded)
- ♦ A Population-Based Emergency Simulation Tool (PBEST) for Public Health & Preventative Medicine (PHPM) residents to enable competency-based medical education, Queen's University, \$33,100 (Co-Applicant, Awarded)

- 2014** ♦ Harmonization of Public Health Alerting, Health Canada, \$52,000 (PI, Awarded)
- ♦ Partnering with Patients on EMR Data Capture, PHAC, \$757,202 (Co-PI, Declined)
- ♦ Social Media Surveillance for Environmental Public Health, Health Canada, \$52,000 (PI, Awarded)
- ♦ Enhancements to PHIMS, Health Canada, \$45,000 (PI, Awarded)
- ♦ Stage-based implementation of Integrated multicomponent Falls Prevention Framework for older adults in southeast Ontario, CIHR/SPOR, \$800,000 (Co-Applicant, Declined)
- 2013** ♦ Population-Level Health Monitoring Using Social Media, Health Canada, \$99,944 (Co-PI, Declined)
- ♦ Mapping Emerging Infectious Diseases, PHAC, \$37,626 (Co-PI, Declined)
- ♦ Enhanced Environmental Monitoring, PHIMS, Health Canada, \$272,000 (Technical Lead, Awarded)
- ♦ Acute Care Enhanced Surveillance, MOHLTC, \$365,000 (Technical Lead, Awarded)
- ♦ Southeast Health Integration Information Portal, MOHLTC, \$192,000 (Technical Lead, Awarded)
- 2012** ♦ Real-Time SDIs for Public Health Surveillance, GeoConnections, \$405,000 (PI, Declined)
- ♦ Urban Walkability and Environmental Exposures, PHO LDCP, \$99,575 (Co-PI, Awarded)
- 2011** ♦ Barriers to Primary Health Care, SELHIN, \$154,000 (Co-PI, Awarded)

PUBLICATIONS (selected)

Dawson E, Lew J, Mauer-Vakil D, Van Dijk A, **Belanger P**, Moore KM. A longitudinal analysis of temporal and spatial incidence of neonatal abstinence syndrome in Ontario: 2003-2016. *Journal of Opioid Management*, 2018. In Press.

Khan Y, Leung GJ, **Belanger P**, Gournis E, Buckeridge DL, Liu L, Li Y, Johnson IL. Comparing Twitter data to routine data sources in public health surveillance for the 2015 Pan/Parapan American Games: an ecological study. *Canadian Journal of Public Health*. 2018. 10.17269/s41997-018-0059-0

van Dijk A, Dawson E, Moore KM, **Belanger P**. Risk Assessment During the Pan American and Parapan American Games, Toronto, 2015. *Public Health Reports*. 2017;132(1_suppl):106S–110S. 10.1177/0033354917708356

VanStone N, van Dijk A, Chisamore T, Mosley B, Hall G, **Belanger P**, Moore K. Characterizing the Effects of Extreme Cold Using Real-time Syndromic Surveillance, Ontario, Canada, 2010-2016. *Public Health Reports*. 2017;132(1_suppl):48S–52S. 10.1177/0033354917708354

Biro S, Williamson T, Leggett JA, Barber D, Morkem R, Moore K, **Belanger P**, Mosley B, Janssen I. Utility of linking primary care electronic medical records with Canadian census data to study the determinants of chronic disease: an example based on socioeconomic status and obesity. *BMC Medical Informatics and Decision Making*. 2016;16(1). 10.1186/s12911-016-0272-9

McGolrick D, **Belanger P**, Richardson H, Moore K, Maier A, Majury A. Evaluation of self-swabbing coupled with a telephone health helpline as an adjunct tool for surveillance of influenza viruses in Ontario. *BMC Public Health*. 2016;16(1). 10.1186/s12889-016-3674-9

Belanger P, Moore K. Cloud Computing-Enabled Cluster Detection Using a Flexibly Shaped Scan Statistic for Real-Time Syndromic Surveillance. In: *Analyzing and Modeling Spatial and Temporal Dynamics of Infectious Diseases*. John Wiley & Sons, Inc.; 2015;177–88. 10.1002/9781118630013.ch9

Chen D, Wong H, **Belanger P**, Moore K, Peterson M, Cunningham J. Analyzing the Correlation between Deer Habitat and the Component of the Risk for Lyme Disease in Eastern Ontario, Canada: A GIS-Based Approach. *ISPRS International Journal of Geo-Information*. 2015;4(1):105–23. 10.3390/ijgi4010105

Aliarzadeh B, Greiver M, Moineddin R, Meaney C, White D, Moazzam A, Moore KM, **Belanger P**. Association between socio-economic status and hemoglobin A1c levels in a Canadian primary care adult population without diabetes. *BMC Family Practice*. 2014;15(1). 10.1186/1471-2296-15-7

Krolik J, Evans G, **Belanger P**, Maier A, Hall G, Joyce A, et al. Microbial source tracking and spatial analysis of E. coli contaminated private well waters in southeastern Ontario. *Journal of Water and Health*. 2014;12(2):348. 10.2166/wh.2013.192

Tozer AP, **Belanger P**, Moore K, Caudle J. Socioeconomic status of emergency department users in Ontario, 2003 to 2009. *CJEM*. 2014;16(3):220–5. 10.2310/8000.2013.131048

VanStone N, **Belanger P**, Moore K, Caudle JM. Socioeconomic composition of low-acuity emergency department users in Ontario. *Canadian Family Physician*. 2014;60(4):355-362.

Biro S, Birtwhistle R, Barber D, Moore K, Janssen I, Williamson T, **Belanger P**, Kotech J, Khan S, Kinsella L. A Pilot Study to Develop Processes for Using the Canadian Primary Care Sentinel Surveillance Network to Build a Healthy Weight Surveillance System. *Canadian Journal of Diabetes*. 2013;37:S245. 10.1016/j.jcjd.2013.03.166

Krolik J, Maier A, Evans G, **Belanger P**, Hall G, Joyce A, et al. A spatial analysis of private well water Escherichia coli contamination in southern Ontario. *Geospatial health*. 2013;8(1):65. 10.4081/gh. 2013.55

Belanger P, Graff A. GIS Improves Surveillance, Helps Prepare for Public Health Threats. *Canadian Healthcare Technology* 2012;17(8): 10.

Belanger P, Plunkett G, Nabulsi R, Holstein L. Feasibility Study for a National Spatial Data Infrastructure in Jordan. *InfoDev: World Bank Group*. 2011.

Holstein L, **Belanger P**, Plunkett G, Ori-Okido A, Sirike J, Sadadi O. Feasibility Study for a National Spatial Data Infrastructure in Uganda. *InfoDev: World Bank Group/The International Bank for Reconstruction and Development*. 2011.

Bélanger P, Eagles M. Partisan Cross-Pressure and Voter Turnout: The Influence of Micro and Macro Environments. *Social Science Quarterly*. 2007;88(3):850–67. 10.1111/j.1540-6237.2007.00486.x

Bélanger P, Eagles M. The Geography of Class and Religion in Canadian Elections Revisited. *Canadian Journal of Political Science*. 2006;39(03). 10.1017/s0008423906060227

Eagles M, **Belanger P**, Calkins H. “The Spatial Structure of Urban Political Discussion Networks,” Chapter 10 in Michael Goodchild and Donald Janelle, eds., *Best Practices in Spatially Integrated Social Sciences*, Oxford UP. 2004.

Bélanger P, Carty RK, Eagles M. The geography of Canadian parties’ electoral campaigns: leaders’ tours and constituency election results. *Political Geography*. 2003;22(4):439–55. 10.1016/s0962-6298(02)00113-0

Bélanger P. Commissioned ridings: designing Canada’s electoral districts. *Political Geography*. 2003;22(1):121–3. 10.1016/s0962-6298(02)00003-3

Belanger P. The ‘Two Worlds’ Hypothesis Extended: An Electoral Geography of Provincial and Federal Party Support in Canada, unpublished doctoral dissertation, Department of Geography, University at Buffalo, The State University of New York. 2002.

Bélanger P, Eagles M. The compactness of federal electoral districts in Canada in the 1980s and 1990s: an exploratory analysis. *The Canadian Geographer*. 2001;45(4):450–60. 10.1111/j.1541-0064.2001.tb01495.x

CONFERENCE or WORKSHOP PRESENTATIONS and INVITED LECTURES (selected)

VanStone N, van Dijk A, **Belanger P**, Moore K. Lessons Learned from an Extreme Heat Event using ACES for Situational Awareness, Ontario, Canada. *Online Journal of Public Health Informatics*. 2019;11(1):e311. (Conference: 2019 ISDS Annual Conference, 29 January–1 February 2019, San Diego, CA)

VanStone N, **Belanger P**. Monitoring Health Impacts of Climate Change: A GIS Application to Display Real-Time Surveillance of Environmental Data and Health Outcomes Combined with Demographic Information. *NCCEH Environmental Health Seminar, BC Centre for Disease Control, Online Webinar, 26 April 2018*.

Maier A, Cole D, Dickson H, Wowk C, Carter M, **Belanger P**. Continuous monitoring of a parenting Facebook Page. The Ontario Public Health Convention (TOPHC), 4-6 April 2016, Toronto ON

Moore K, **Belanger P**. Real-Time Surveillance of Environmental and Demographic Data in Ontario with PHIMS. Online Journal of Public Health Informatics. 2016;8(1). dx.doi.org/10.5210/ojphi.v8i1.6440 (Conference: 2016 ISDS Annual Conference, 6-8 December 2016, Atlanta GA)

Moore K, **Belanger P**. Surveillance Systems that Include Deprivation Indices & Social Determinants of Health. Online Journal of Public Health Informatics. 2016;8(1). Available from: <http://dx.doi.org/10.5210/ojphi.v8i1.6601> (Conference: 2016 ISDS Annual Conference, 6-8 December 2016, Atlanta GA)

Belanger P. The KFL&A Public Health Information Management System. Occupational and Environmental Health Seminar Series, Public Health Ontario, 16 October 2014, Toronto ON.

Caudle JM, VanStone N, **Belanger P**, Moore K. The socio-economic composition of low acuity emergency department users in Ontario. CAEP 2013: Leadership from Sea to Sky, Vancouver, BC, June 2013 (Poster).

Belanger P. Leveraging Web 2.0 technologies for enhanced syndromic surveillance: KFL&A's emergency department. The Ontario Public Health Convention (TOPHC), 5-8 April 2011, Toronto ON.

Belanger P. Syndromic surveillance. Small Hospital Summit, September 2010, Sault Ste Marie ON.

Belanger P. Syndromic surveillance and emergency department syndromic surveillance. Association of Ontario Public Health Administrators Annual Conference, September 2010, Owen Sound ON.

Belanger P. Syndromic surveillance. 2010 York Region Education Day. October 2010, Markham ON.

PROFESSIONAL CERTIFICATIONS and MEMBERSHIPS

2007 Geographic Information Systems Professional (GISP), Certification No. 00056273, GIS Certification Institute, Park Ridge IL

2013-present International Society for Disease Surveillance

2006-present EIS-Africa

2000-present Canadian Association of Geographers

1993-present Association of American Geographers

PROFESSIONAL CONSULTANCIES, GOVERNANCE AND COMMITTEE EXPERIENCE

2010-2012 World Bank, Kampala, Uganda. Consultant to the Bank on a technical assistance programme to the Government of Uganda for the development of a national spatial data infrastructure (NSDI) in the monitoring and evaluation of development outcomes .

2010-2012 World Bank, Amman, Jordan. Consultant to the Bank on a technical assistance programme to the Government of Jordan for the development of a national spatial data infrastructure (NSDI).

2008-2009 UN Statistics Division, Addis Ababa, Ethiopia. Local coordinator of the 25th Session of the UN Group of Experts on Geographical Names.

Nov 2008 Ministry of Lands, Country Planning, and Environment, Freetown, Sierra Leone. Advisory services and counsel to the Minister on rebuilding Sierra Leone's geomatics capacity.

Oct 2008 Ministry of Lands, Country Planning, and Environment, Freetown, Sierra Leone. Advisory services and counsel to the Government of Sierra Leone on developing a national spatial data infrastructure integrated (NSDI) with a national information and communications infrastructure (NICI).

- Sep 2008** UN Economic Commission for Africa, Addis Ababa, Ethiopia. Member of the Advisory Selection Panel for a P3 Statistician with the African Centre for Statistics.
- Feb 2008** South African Development Community (SADC), Gaborone, Botswana. Member of ECA project team to develop the Regional Poverty Reduction Framework, leading the monitoring and evaluation (M&E) component.
- June 2007** UN Economic Commission for Africa, Addis Ababa, Ethiopia. Drafted hardware specifications for the procurement of a new GIS hardware platform. Principal evaluator of the seven (7) bids submitted.
- Apr 2007** UN Economic Commission for Africa, Addis Ababa, Ethiopia. Member of the Advisory Selection Panel for a G7 Information Systems Assistant.
- Feb 2007** UN Population Fund (UNFPA), Addis Ababa, Ethiopia. Chaired the tender review committee for the purchase of satellite imagery, processing services, and training to delimit census enumeration areas for the 2007 Ethiopian census.
- Jan-Apr 2007** UN Economic Commission for Africa, Addis Ababa, Ethiopia. Co-chaired the CODI-V Subcommittee on Logistics.
- Fall 2006** GIS for Development Conference (GISDECO), Addis Ababa, Ethiopia. Local events organizer.
- May 2006** Nile Basin Initiative, Addis Ababa, Ethiopia. Recruitment committee member for an IT/GIS/Database Specialist.
- May 2006** UNOCHA Humanitarian Information Centre, Monrovia, Liberia. Invited speaker on SDIs for reconstruction in post-conflict countries.
- Feb 2006** La Geomatique, un Outil de Gouvernance, Dakar, Senegal. ECA Representative.
- 2005-2009** UN Economic Commission for Africa, ISTD/GiSS, Addis Ababa, Ethiopia. Variously the First and Second Reporting Officer and Additional Supervisor for four (4) Geoinformation Systems Assistants.
- 2005-2009** African Organization for Cartography and Remote Sensing (AOCRS), Algiers, Algeria. Represent ECA/Executive Secretary on the Administration Council.
- 2005-2009** Regional Centre for Training in Aerospace Surveys (RECTAS), Ile Ife, Nigeria. Represent ECA/Executive Secretary on the Governing Council.
- 2005-2009** Regional Centre for the Mapping of Resources for Development (RCMRD), Nairobi, Kenya. Represent ECA/Executive Secretary on the Governing Council.
- 2005-2009** International Standards Organization (ISO), Lysaker, Norway. ECA Representative to the Technical Committee on Geographic Information/Geomatics (TC 211).

TECHNICAL SKILLS

- ◆ GWR 4.0, GeoDa, Ezi, SPSS 11,
- ◆ R 3.1
- ◆ ANSI SQL, SQL Server, Oracle 10gR2, PostgreSQL
- ◆ ArcGIS Suite
- ◆ ERDAS Imagine 8.6, ER-Mapper 6.4, Google Earth KML, GDAL, FWTtools
- ◆ GPS
- ◆ Java 7, Adobe Flex 4.6, ActionScript 3.0, BlazeDS, LiveCycle Data Services 3.0
- ◆ ColdFusion 8, JBoss 4.2.2, Tomcat 6.0+, Glassfish Java Application Server 4.0
- ◆ MS Office Suite
- ◆ Windows Server 2008, SUSE Linux, OpenSolaris pr Services (SOAP and REST), Service Oriented Architectures
- ◆ UML using Visual Paradigm 6.2
- ◆ MS-Project Productivity applications
- ◆ XML, Web