



Join us for a quick CANUE tour! Find out how CANUE works, what we do, how we can help you advance environmental health research in Canada and abroad, and move evidence into policy and practice.

PRESENTED BY:



Jeff Brook Scientific Director



Eleanor Setton Managing Director



Evan Seed Geospatial Data Lead



Dany Doiron Data Linkage Specialist



Mahdi Shooshtari Data Scientist/Developer

MEETING START: 9:00AM PACIFIC | 12:00 noon EASTERN

FOR AUDIO – PLEASE CALL: **1-877-558-8690**























Population (as count and as share of total population) and growth rate of metropolitan and non-metropolitan Canada, 2006 and 2011

					Growth rate		
	2006		2011		2001 to 2006	2006 to 2011	
Statistical Area Classification	Population	%	Population	%	9/	%	
Canada	31,612,897	100.0	33,476,688	100.0	5.4	5.9	
Census metropolitan areas (CMAs)	21,534,063	68.1	23,123,441	69.1	6.9	7.4	
Census agglomerations (CAs)	4,136,342	13.1	4,311,524	12.9	4.0	4.2	
Outside of CMAs and CAs	5,942,492	18.8	6,041,723	18.0	1.0	1.7	
Close to CMAs or CAs ¹	1,521,507	4.8	1,586,681	4.7	4.7	4.3	
Remote from CMAs and CAs ²	4,361,273	13.8	4,393,039	13.1	-0.1	0.7	
Territories ³	59,712	0.2	62,003	0.2	8.9	3.8	

Notes:

Sources: Statistics Canada, censuses of population, 2001, 2006 and 2011.

>80% of

→ Canadians live
in urban areas

35% live in:
Toronto
Montreal
Vancouver

http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-310-x/98-310-x2011001-eng.pdf

Refers to census subdivisions (CSD) outside CMAs and CAs classified as strong metropolitan influenced zone (strong MIZ). See http://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo010-eng.cfm.

Refers to census subdivisions (CSD) outside CMAs and CAs classified as either moderate, weak or no metropolitan influenced zone (moderate MIZ, weak MIZ or no MIZ). See http://www12.statcan.gc.ca/census-recensement/2011/ref/dict/geo010-eng.cfm.

Excludes CAs of Yellowknife and Whitehorse.





1997

ABSTRACT

Objective: Determine the risk of premature mortality due to the urban ambient air pollution mix in Canada.

Methode: The number of daily deaths for non-accidental causes were obtained in 11 cities from 1980 to 1991 and linked to concentrations of ambient gaseous air pollutants

The Effect of the Urban Ambient Air Pollution Mix on Daily Mortality Rates in 11 Canadian Cities

Richard T. Burnett, PhD, Sabit Cakmak, PhD, Jeffrey R. Brook, PhD2

152 REVUE CANADIENNE DE SANTÉ PUBLIQUE

VOLUME 89, NO. 3



Environ Health Perspect. 2003 Nov; 111(14): 1773–1778. Research Article

PMCID: PM

Association between gaseous ambient air pollutants and adverse pregnancy outcomes in Vancouver, Canada.

Shiliang Liu, Daniel Krewski, Yuanli Shi, Yue Chen, and Richard T Burnett





ARTICLE

Year: 2012 | Volume: 14 | Issue: 61 | Page: 287-291

Noise and cardiovascular disease: A review of the literature 2008-2011

Hugh Davies¹, Irene Van Kamp²

University of British Columbia, Faculty of Medicine, School

National Institute for Public Health and the Environment (RIN)



Environmental Research

Volume 115, May 2012, Pages 51-58





A cohort study relating urban green space with mortality in Ontario, Canada *

Paul J. Villeneuve<sup>a, b,

Michael Jerrett^o, Jason G. Su^o, Richard T. Burnett^a, Hong Chen^d, Amanda J. Wheeler^e, Mark S. Goldberg^f</sup>

Body Mass Index in Urban Canada: Neighborhood and Metropolitan Area Effects

Nancy A. Ross, PhD, Stephane Tremblay, MSc, Saeeda Khan, MA, Daniel Crouse, MES, Mark Tremblay, PhD, Jean-Marie Berthelot, BSc

500 | Research and Practice | Peer Reviewed | Ross et al.

American Journal of Public Health | March 2007, Vol 97, No. 3





1991 CanCHEC

The current version 1991 Canadian Census Health and Environment Cohort (CanCHEC) was derived on linkage-based do mpiling socio-economic, demographic, cancer, mortality, and place of residence data (reported on Total Control of Cont

The 199 An Census Health and Environment Cohort contains variables measuring population char?

J, place of residence, cancer incidence, and mortality. These variables were obtained from six diffe

də' عs:

CanCHEC (Canadian Census Health and Environment Cohort)

- 1991 Canadia
 - 1984-2011 His
 - 1981-1983 T1
 - 1969-1991 Ca
 - 1992-2010 Ca
 - 1991-2011 Ca

Description

2001 CanCHEC

The 2001 Canadian Census Health and F

A Cohort (CanCHEC) is a large population-based dataset that allows for the examination of mortality

A census characteristics (i.e. ethnocultural and socioeconomic factors).

The 2001 CanCHEC was crez'

- ee different data sources:
- · 2001 Census of Population
- . T1 Universe Files (place of residence only)
- Conadian Mortality Database







300,000 Canadian residents

35-69 years of age

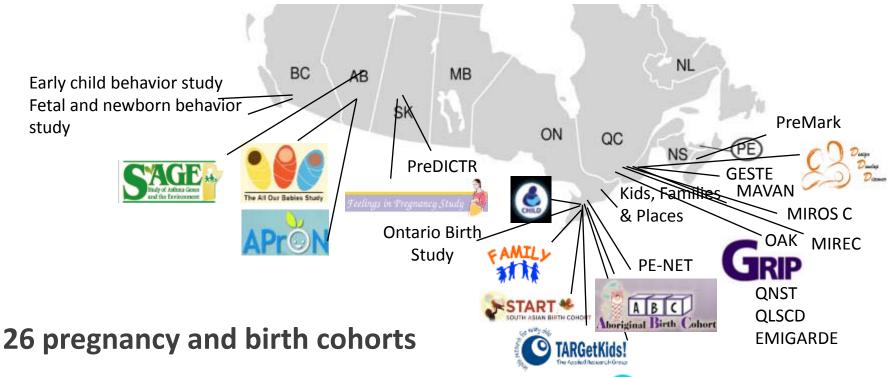
\$150M+











53,300 mother-child dyads 17,800 fathers

Totaling 125,000 participants









Population Data BC

Population Data BC (PopData) is a multi-university, data and education resource facilitating interdisciplinary research on the determinants of human health, well-being and development.

We offer researchers access to one of the world's largest collections of health care, health services and population health data, and a comprehensive education and training service on how to best use those data.





Environment and Planning A 2001, volume 33, pages 955-973

DOI:10.1068/a33137

A GIS-environmental justice analysis of particulate air pollution in Hamilton, Canada

Michael Jerrett

School of Geography and Geology, and McMaster Institute of Environment and Health, McMaster University, 1280 Main Street, West Hamilton, Ontario, Canada L8S 4K1; e-mail: jerrettm@mcmaster.ca

Richard T Burnett

Health Canada, 200 Environmental Health Centre, Health Canada, Tunney's Pasture, Ott Canada K1A 0L2; e-mail: rick_burnett@hc-sc.gc.ca

Pavlos Kanaroglou, John Eyle

School of Geography and Geolog McMaster University, 1280 Main e-mail: pavlos@mcmaster.ca, eyk

Jeffrey R Brook

Air Quality Processes Research D Toronto, Ontario, Canada M3H : Received 11 September 2000; in r

Abstract. The authors address two status, compared with people of h levels of particulate air pollution in Setton et al. Environmental Health 2013, 12:15 http://www.ehjournal.net/content/12/1/15

International Journal of Health Geographics

Research

Mapping the evolution of 'food deserts' in a Canadian city: Supermarket accessibility in London, Ontario, 1961–2005 Kristian Larsen and Jason Gilliland*

Address: The University of Western Ontario, London, ON, N6A 5C2, Canada Email: Kristian Larsen - klarsen2@uwo.ca; Jason Gilliland* - jgillila@uwo.ca * Corresponding author

Published: 18 April 2008

International Journal of Health Geographics 2008, 7:16 doi:10.1186/1476-072X-7-16

This article is available from: http://www.ij-healthgeographics.com/content/7/1/16

Received: 6 December 2007 Accepted: 18 April 2008

RESEARCH Open Access

Risk-based indicators of Canadians' exposures to environmental carcinogens

Eleanor Setton^{1*}, Perry Hystad², Karla Poplawski¹, Roslyn Cheasley¹, Alejandro Cervantes-Larios³, C Peter Keller¹ and Paul A Demers⁴







MEASURING ENVIRONMENTAL EXPOSURES WORKSHOP

ENVIRONMENT,
GENES AND
CHRONIC DISEASE
NATIONAL
WORKSHOP
2012

ENVIRONMENTS AND HEALTH NATIONAL FORUM

2013

- 2011
- Break down some of the existing silos of research in the environment and health field.
- Tackle the real-world complexity of interacting and ubiquitous environmental influences.
- Build research capacity and supporting data platforms.









Welcome to The Canadian Urban Environmental Health Research Consortium

Every location in Canada can be described by a complex set of environmental factors – the amount of nearby traffic, local air quality, access to greenspaces, opportunities for walking and cycling, the amount of noise and light pollution, to name a few.

The Canadian Urban Environmental Health Research Consortium will gather and develop measures of environmental factors for every neighbourhood across Canada.

From the Directors...
September 12, 2016 - 8:52 pm.
Welcome to CANUE! We are very excited to be launching CANUE and our website. It has been a productive few months since our funding support from the Canadian Institutes for Health

Search

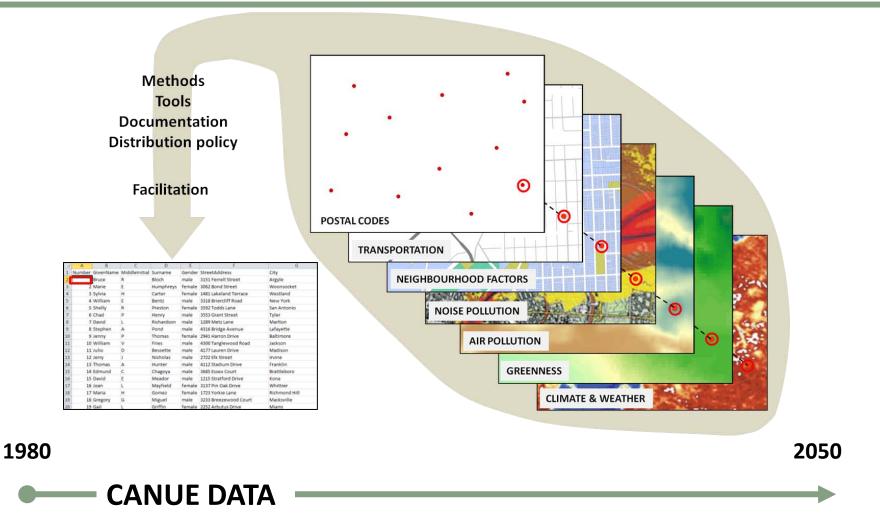
Search

Latest News

www.canue.ca







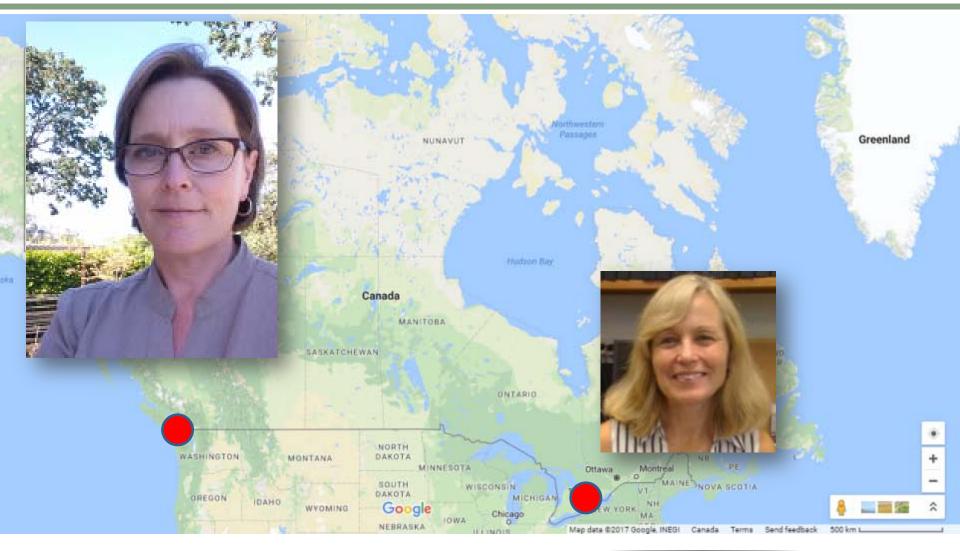


Questions or comments?

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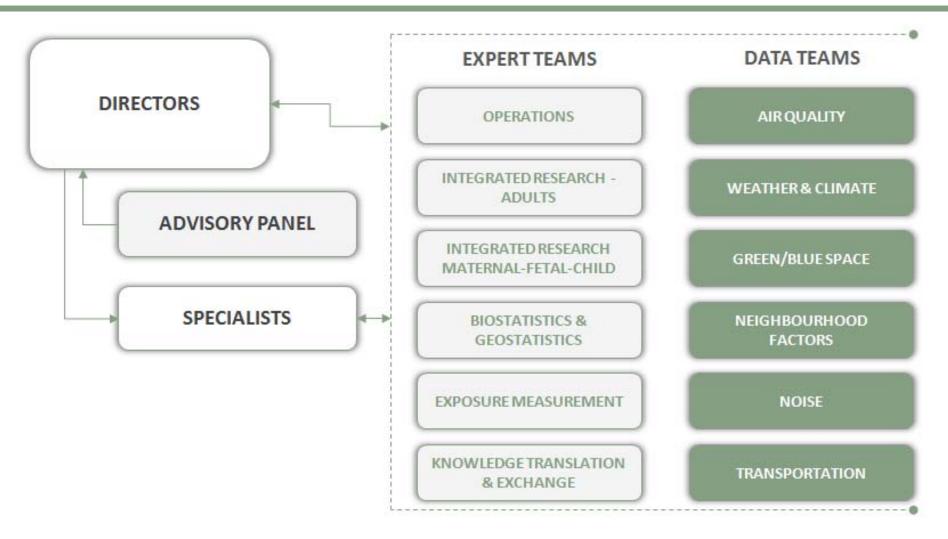
Join

http://canue.ca/join/

- You should be affiliated with an academic institution, government, or non-governmental agency with a mandate related to urban environmental health, or active in the development and implementation of policy that can affect environmental quality and/or land use.
- •You must commit to active involvement on at least one Data or Expert Team











Member Directory

http://canue.ca/directory/uare here: Horn

Show 40¢ entries							Search:
GIVEN NAME	NAME \$	AFFILIATION \$	REGION \$	LEADERSHIP	\$	EXPERT TEAMS	DATA TEAMS
Ahmed	Abd-El-Aziz	PhD Candidate, Environmental Science, University of Prince Edward Island	PE			Integrated Research (Maternal-Fetal- Child), Biostatistics & Geostatistics	Weather & Climate
Alan	Abelsohn	Associate Professor, Dalla Lana School of Public Health, University of Toronto; Air Quality Health Index Program, Health Environments and Consumer Safety Branch, Health Canada	ON			Knowledge Translation & Exchange	Air Quality
Matthew	Adams	Assistant Professor, Department of Geography and Environmental Studies, Ryerson University	ON			Biostatistics & Geostatistics	Air Quality; Transportation





Doodle Poll: Conference call meeting to discuss uses for high resolution modelled weather data - RESPONSE required!



Hello to all! Hope you have been having a great summer! I am emailing to ask about your interest in participating in a Webinar related to potential data for use in environmental health studies, sometime during the last two weeks of September.

Please visit this Doodle poll to indicate your availability. We will schedule accordingly and send out a more formal invite/notice.

https://doodle.com/poll/cc2c4tamwv4pwbis

More information:

CANUE is interested in acquiring a wide range of exposure data for environmental health research purposes. Environment Canada is currently working on the 2.5 km High Resolution Deterministic Prediction system (HRDPS), expected to become operational next year. There may also be opportunities to produce re-analysis of climate over North America at 15km resolution going back to 1981.

This webinar-style meeting will provide an overview of the health databases that CANUE researchers typically use, and an overview of these new weather/climate datasets. The overall objective of the meeting is to explore the utility of these new data sets for conducting health research, and identify which health databases might be of most interest, as a first step in working together to advance our research agendas.





Newsletter

http://canue.ca/newsletter/

August 2017



DON'T MISS OUR ONLINE MEETINGS AND EXPERT WEBINARS!

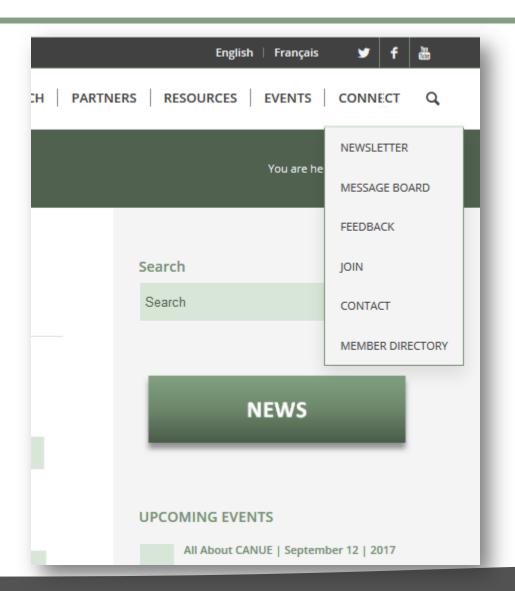
Get our announcements on Twitter or Facebook

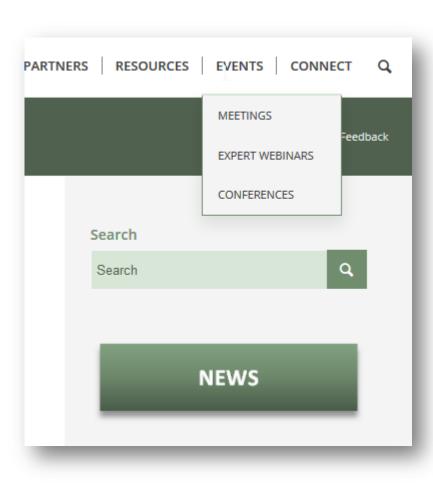














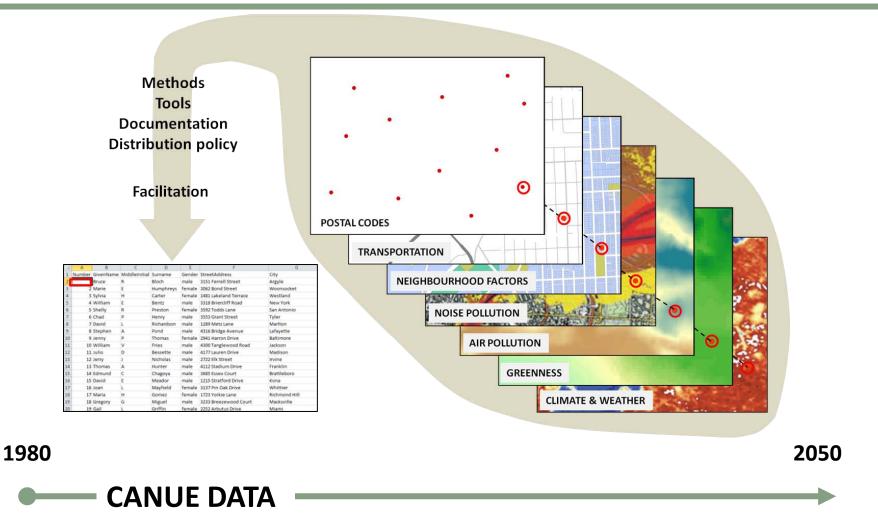


www.facebook.com/CANUEConsortium















Does Living in Greener Areas and Near Water Affect Mortality? | October 10, 2017

9am - 10am pacific | 12 noon - 1pm eastern

REGISTER for WEBINAR

Hear the latest results based on an analysis of the Canadian Census Health and Environment Cohort, from Dr. Dan Crouse and Adele Balram, University of New Brunswick.







Questions or comments?

Please use the chat function, or email info@canue.ca

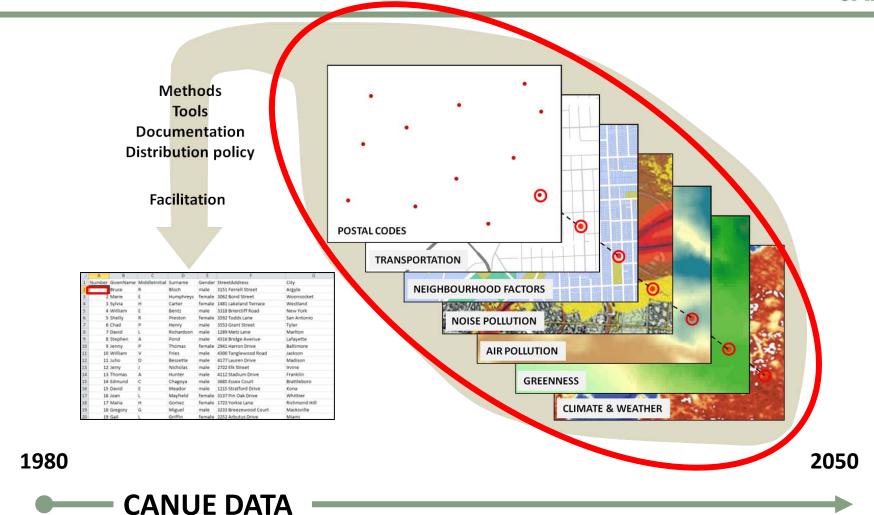














CANUE Data Platform – Data Themes



NEIGHBOURHOOD FACTORS GREEN/BLUE SPACES







CLIMATE







AIR QUALITY

NOISE

TRANSPORTATION

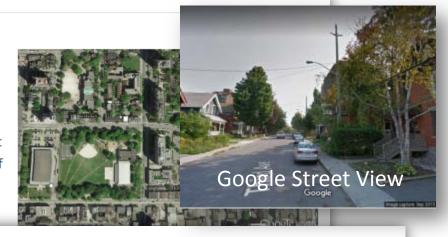


DATA PLATFORM – GREEN /BLUE SPACES

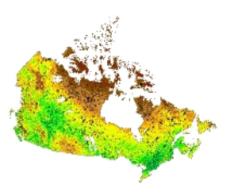


Capturing different greenness qualities

Data from the NDVI only indicate greenness, which prevents us from unraveling the causal pathways between green places and health. We are developing a suite of measures to investigate these pathways, including accessibility of green space, type of vegetation, tree canopy cover, and related estimates of ecosystem services. Building on current work in Vancouver, we will also help to enhance NDVI with measures of green space access and quality by linking municipal data and applying quality appraisal with Google Street.



NDVI: linking to every Canadian neighbourhood



The Normalized Difference Vegetation Index (NDVI) is based on satellite measurements of radiation reflected by the Earth's surface. Different characteristics of the reflected spectra can be combined to identify green vegetation – trees, grass and other plants. The NDVI has been widely used to study greenness and health. We are compiling a complete set of NDVI data covering all of Canada from the 1980s to the present. This will expand our potential to conduct additional studies to see if relationships between greenness and health are similar across Canada and in comparison to other countries.

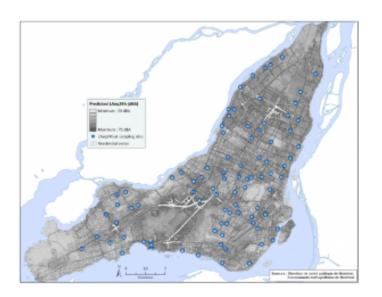


DATA PLATFORM - NOISE



High resolution models of urban noise

Assessing and preventing urban noise are major challenges in environmental management. One of the ways our team members are addressing this challenge is by developing Land-Use Regression (LUR) models. These models use field measurements to explain the association between urban features and corresponding urban noise in three major cities: Montreal, Halifax, and Toronto. We will expand on this work by designing a field monitoring campaign to either calibrate new LUR models in other cities or evaluate the results from noise propagation models.



Goudreau S, Plante C, Fournier M, Brand A, Roche Y and Smargiassi A. (2014). Estimation of Spatial Variations in Urban Noise Levels with a Land Use Regression Model. Environment and Pollution Vol. 3, No. 4. Pages 48-58.



DATA PLATFORM – WEATHER AND CLIMATE



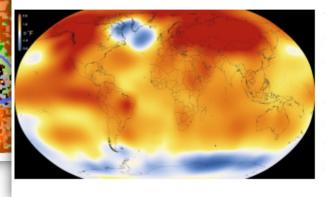
Mapping local climate zones

We are investigating the Local Climate Zones (LCZ) concert which uses urban characteristics to estimate the magnitu of urban heat islands and other hazards. It is possible to define multiple LCZ classes at the neighborhood scale and link them to air quality, pollen exposure, urban flooding, a other hazards.

Climate change and allergies



Finding new uses for climate model data



The CANUE Weather & Climate Team will investigate how to use regional climate models to resolve features such as micro-heat islands, including: observations of daily maximum and minimum temperatures and precipitation produced by the Canadian Forest Service and Environment and Climate Change Canada (ECCC); reanalysis data (a systematic approach to produce data sets for climate monitoring and research) from the Climate Forecast System Reanalysis or the Japanese 55-year Reanalysis; and high resolution observation data that is gridded, such as data for British Columbia from our partners at the Pacific Climate Impacts Consortium (PCIC), or that covers the



DATA PLATFORM – AIR QUALITY



High resolution models of key pollutants



Our team members have modeled NO_2 using land-use regression (LUR) for the past ten years. We plan to standardize and document the models, and temporally adjust them to monthly and annual periods (2000 to present). Looking forward, a new suite of temporally-adjusted LURs incorporating a

Historical air pollution estimates

Our team members recently developed a nationwide, satellite-derived estimate of PM_{2.5} concentrations for multiple time

windo pollur windo

A new index of air pollution

ilable on our portal. To support analyses of multiple , and for the first time, SO₂. Different exposure time

By combin we are exp componen traffic, indi industry-re associated Looking ahead - data from the world's first geostationary satellite

In 2019 the world's first geostationary satellite (TEMPO) for measuring air pollution will produce high resolution (-5km) maps every daytime hour of tropospheric NO $_2$, SO $_2$, and aerosols. These maps can be used to estimate pollutant concentrations for all Canadian cities. CANUE members Randall Martin and Chris McLinden are part of the TEMPO science team. Prior to the launch, we will develop algorithms to access these data in real-time to map surface concentrations.





DATA PLATFORM – NEIGHBOURHOOD FACTORS



A compendium of urban form measures

We have plans to develop a wide range of urban form measures at three and six digit postal code levels for al Canada. This database will include GIS calculations of various measures of land use mix, street connectivity, walkability, and access to transit services. Our team has expertise in measuring and validating these measures and linking them to national health surveys.



Looking at nighttime light



New metrics of the social and physical environment

We are currently experiencing a revolution in the availability of digital information about our environment; we can 'see' and sample neighbourhoods like never before using virtual auditing techniques from sources such as Google Streetview. The CANUE team will develop and validate new, nationally-consistent and 'analysis-ready' metrics of the social and physical environment. One of the ways we will achieve this is by exploring approaches to developing relevant indices from available data (such as the Canadian Marginalization Index, Community Change Index, Deprivation Index).



DATA PLATFORM - TRANSPORTATION



Understanding traffic



Leveraging our compile all avai data, which ste develop new ex CANUE team m density by vehi

Big data – real time traffic and air pollution

The CANUE project will take on big data analyses that promise to improve our understanding of the interplay between urban form, traffic, air pollution, and ultimately health. By leveraging strong connections to two sources of big data related to NO₂, we can feasibly link the temporal and spatial patterns in urban levels of this pollutant. The sources are satellite data from TEMPO (a space-based instrument that monitors major air pollutants across the North American continent every daylight hour at high resolution) and real-time traffic flow patterns from the University of Toronto's Transportation Research Institute and Dalhousie University's Transportation Collaboratory (obtained from tracking mobile phone locations).

.



Exposure Measures Imputed Using Postal Code Locations



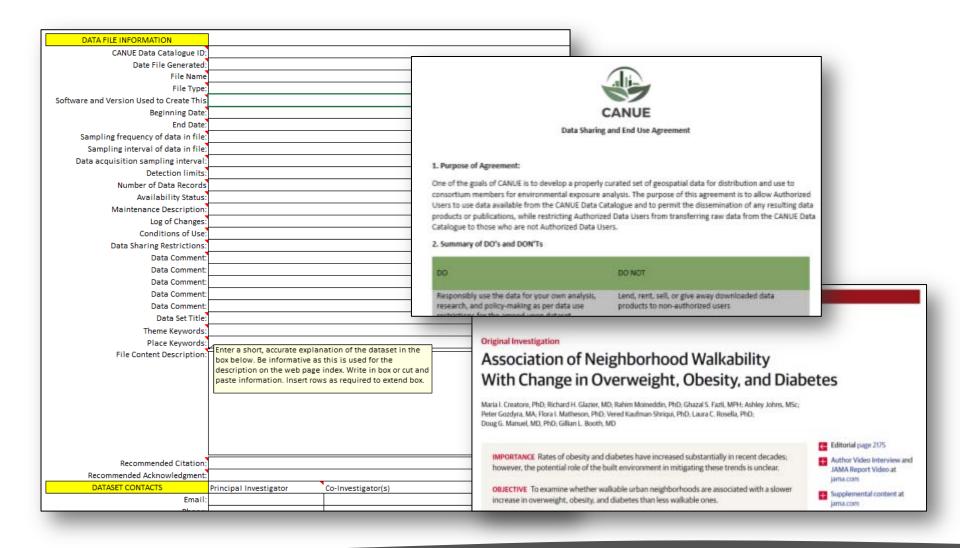


- Exposure metrics are spatially imputed using 6digit postal codes
- Includes urban and rural communities from 1983 onward
- National and regional scale data sets



Data Documentation and User Agreements









Questions or comments?

Please use the chat function, or email info@canue.ca











Input file (Environmental Factors)

Data processing in CANUE

Output file (standard format)

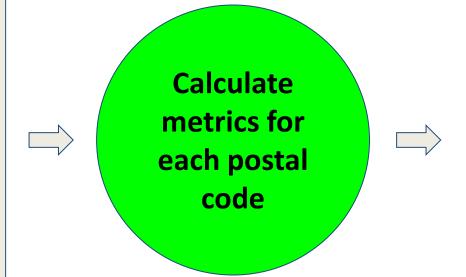
Air pollution (Grib)

Weather (NetCDF)

Satellite Images (GeoTIFF)

Google Street View (jpeg/png)

GIS derived data (DBF)



Results and Metadata







Use only cloud free pixels
Delete water features
Export annual/growing season

For each postal code, calculate Annual average Seasonal average Seasonal maximum

For each postal code, calculate average and maximum within 100m, 250m, 500, 750m and 1km





Google Street View Images

 Create training data sets – javascript interface

 Classify images around postal codes – neural network/machine learningalgorithms







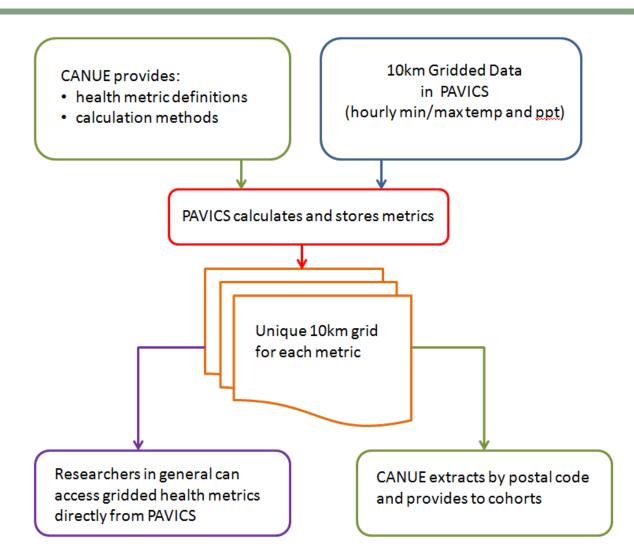






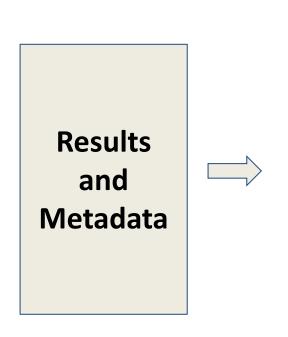












Private Tools

or

Online Interface



Registered Users/Researchers



Questions or comments?

Please use the chat function, or email info@canue.ca



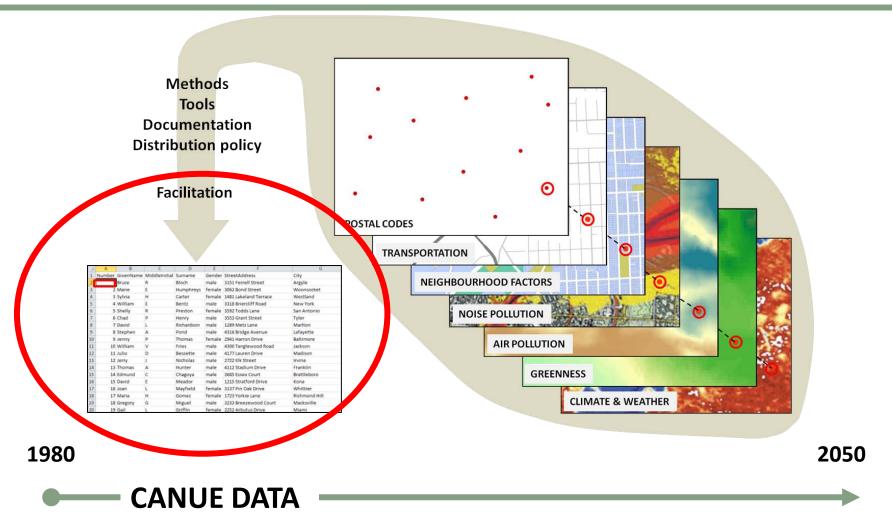






The CANUE DATA PLATFORM









PROPOSED DATA MERGING PROCESS

Original database



- UID1
- Postal codes
- Assessment dates
- Health data

Environ. exposures files



- Postal codes
- Assessment dates
- Environmental exposure data

Merged database



- UID1
- Health data
- Environmental exposure data



Environ. exposures files



- Postal codes
- Assessment dates
- Environmental exposure data

Researcher's work environment

3



Merged data (to researchers)



- UIDx
- Health data
- Environmental exposure data





DATA MERGING STAKEHOLDER INTERVIEWS

Objective:

To identify data transfer model that works best for Canadian health data holders



Key results:

Preference for bulk data transfers on routine basis.

Interest in a hybrid model, with "high interest" data being transferred routinely and other less "in-demand" data being left at CANUE central to be pulled as needed





Two scheduled yearly environmental exposure data deliveries:



FALL – National datasets



SPRING – regional datasets



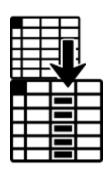






Data format:

Tabular format



 Most data will be provided as standard measures at every postal code, by year



Annual averages



Postal code level data

CANUE will also provide on demand custom time/spatial resolution

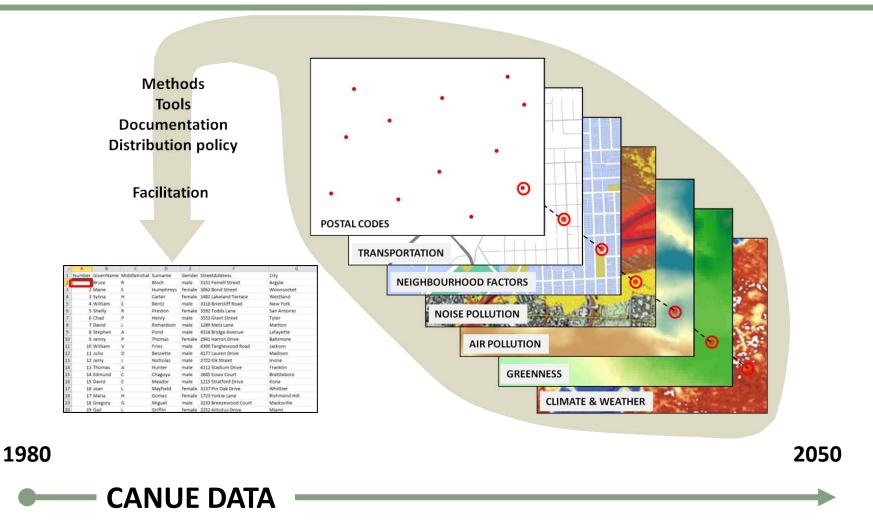


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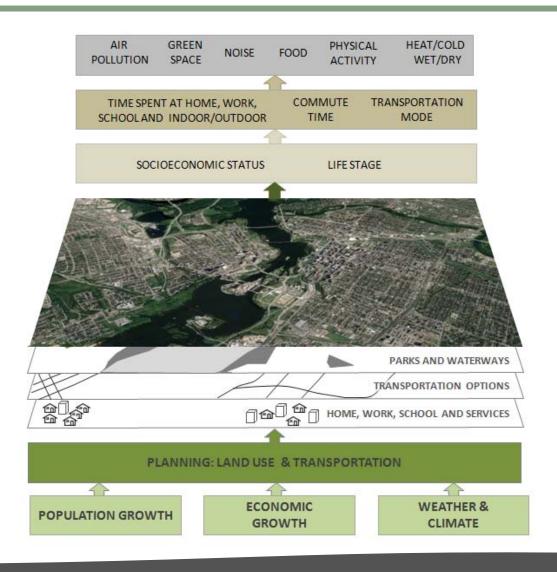














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THANK YOU