



# Canadian Urban Environmental Health Research Consortium

CANUE Metadata National NO<sub>2</sub> LUR V1.0

2017-10-23

## DATA SET INFORMATION

Data Set Title: **National Nitrogen Dioxide (NO<sub>2</sub>) Regression-based estimate**

Description: The national NO<sub>2</sub> (ppb) land use regression model was developed from 2006 national air pollution surveillance (NAPS) monitoring data, following methods reported in Hystad et al. (2011) (see Required Citation below). Background and regional components were estimated in the LUR using satellite-derived NO<sub>2</sub> estimates and geographic variables, while local scale variation was modeled using deterministic gradients. The final LUR model includes: road length within 10 km; 2005-2011 satellite NO<sub>2</sub> estimates; area of industrial land use within 2 km; and summer rainfall. This model explained 73% of the variation in NAPS measurements with a root mean square error (RMSE) of 2.9 ppb. Local scale variation was modeled using deterministic gradient from the literature and kernel density measures and added to the final LUR model results to produce the final NO<sub>2</sub> estimates in this dataset.

Dr. Perry Hystad (Oregon State University) produced the final estimates for all unique locations of DMTI Spatial Inc. single link postal codes active at any time between 1983 and 2015.

The estimates represent NO<sub>2</sub> concentrations circa 2006, although satellite data from 2005-2011 were incorporated. Annual measured NO<sub>2</sub> levels from National Air Pollution Surveillance monitoring stations have been used to adjust the estimated levels for 1984 through 2011 (See Crouse et al 2015, in Supporting Documentation).

Researchers wishing to adjust these data to represent exposure in other years should contact CANUE staff at [info@canue.ca](mailto:info@canue.ca) to initiate discussion on the best approach for doing so.

Theme Keywords: NO<sub>2</sub>, nitrogen dioxide, land use regression, air quality

Place Keywords: Canada, national

Data preparation date: 10/1/2017

File Names: NO2LUR\_A\_06.csv

File Type: Comma separated values (.csv)

Beginning Date: 2006

End Date: 2006

Sampling Frequency of Data: Annual

Number of Data Files: 1

File Size: 75 MB

Data Sources:

Spatial Resolution: Individual 6-digit postal code locations

Detection Range or Limit: N/A

Log of Changes: N/A

Maintenance Description:

## GEOSPATIAL REFERENCE

Geographic Coverage: Canada

West Bounding Coordinate: N/A

East Bounding Coordinate: N/A

North Bounding Coordinate: N/A

South Bounding Coordinate: N/A

Geometry Type: N/A



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Point Data Source:	N/A
Coordinates have Z values:	N/A
Geographic Coordinate System:	N/A
Datum	N/A
Unit:	N/A

## QUALITY ASSESSMENT

QA/QC procedures:	CANUE did not assess the quality of the NO <sub>2</sub> estimates data. Users should review the documentation provided in the recommended citation, and in the supporting documentation listed below.
Geographic Coordinate Positional Accuracy:	These metrics can be linked to the corresponding annual postal codes files for mapping and analysis purposes, using the 6-digit postal code as a unique identifier in both files. Refer to the following metadata file for additional information on opportunities for assessing the spatial representativeness of postal code locations when these metrics are linked:  <a href="#">CANUE Metadata Postal Codes V1.0.pdf</a>
Vertical Positional Accuracy:	N/A
Attribute Accuracy:	N/A
Data Validity :	N/A
Associated Files:	N/A
Data Comment:	N/A
Data Comment:	N/A

## SUPPORTING DOCUMENTATION

Additional documentation:	<a href="#">Hystad Canada NO2 LUR description.pdf</a>
	Crouse DL, Peters PA, Hystad P, Brook JR, van Donkelaar A, Martin RV, Villeneuve PJ, Jerrett M, Goldberg MS, Pope III CA, Brauer M. Ambient PM <sub>2.5</sub> , O <sub>3</sub> , and NO <sub>2</sub> exposures and associations with mortality over 16 years of follow-up in the Canadian Census Health and Environment Cohort (CanCHEC). Environmental health perspectives. 2015 Nov;123(11):1180.)

## DATA DICTIONARY

Field Name:	Description	Data Type
NO2LUR06_PC	6 digit postal code with no space between the FSA and LDU. (i.e. L1R2H2).	Text
NO2LUR06_01	Annual average concentration at postal code in parts per billion	Numeric

## DATA SET CONTACTS

Data Support:	Contact CANUE via the email below.
Email:	<a href="mailto:info@canue.ca">info@canue.ca</a>
Affiliated Organization:	CANUE (Canadian Urban Environmental Health Research Consortium) Dalla Lana School of Public Health, University of Toronto
Website:	<a href="http://www.canue.ca">www.canue.ca</a>
City:	Toronto
Prov/State:	Ontario
Country:	Canada
Exposure Data Source Contact:	Dr. Perry Hystad
Email:	<a href="mailto:perry.hystad@oregonstate.edu">perry.hystad@oregonstate.edu</a>
Phone:	



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First Name: Perry

Last Name: Hystad

Affiliated Organization: Oregon State University

City: Corvallis

Prov/State: Oregon

Country: USA

### DATA USE CONDITIONS

Conditions of Use: The Data User is REQUIRED:

- (i) to acknowledge data sources listed under Acknowledgement(s);
- (ii) cite the publication(s) listed under Recommended Citation(s) as the providers and source of these data when using them in support of research, analysis, operations, policy decision or any other undertaking including publication; and
- (iii) complete and sign the CANUE Data Use and Sharing Agreement (<http://canue.ca/data/>) in which the name and signature of the researcher/analyst who takes responsibility for ensuring all conditions are met.

Data Sharing Restrictions: These data files are provided solely for the purposes stated in the CANUE Data Use and Sharing Agreement and should not be re-distributed for any reason. These data also contain proprietary postal code data and may only be used for the project named in the CANUE Data Use and Sharing Agreement.

Data can be shared within a project team with those members and Collaborators who have access to a Research Data Centre (RDC) or are affiliated with an academic institution for the exclusive purposes of teaching, academic research and publishing, and/or planning of educational services in accordance to DMTI End User Agreement associated with the Spatial Mapping Academic Research Tools (SMART) Program.

Required Citation: Include the following references in any publications resulting from the use of these data:

[1] Hystad P, Setton E, Cervantes A, Poplawski K, Deschenes S, Brauer M, et al. 2011. Creating National Air Pollution Models for Population Exposure Assessment in Canada. *Environ. Health Perspect.* 119:1123–1129; doi:10.1289/ehp.1002976.

[2] CanMap Postal Code Suite v2015.3. [computer file] Markham: DMTI Spatial Inc., 2015.

Acknowledgment: Include the following acknowledgements:

1. Nitrogen dioxide data were indexed to DMTI Spatial Inc. postal codes , were provided by CANUE (Canadian Urban Environmental Health Research Consortium);

2. Nitrogen dioxide data used by CANUE were provided by: Dr. Perry Hystad, Oregon State University.