



The Canadian Urban Environmental Health Research Consortium

Canue Metadata - Air Quality Sulfur Dioxide (SO₂)

2024-03-08

DATA SET INFORMATION

Dataset Code: SO2OMI_A_YY

Description:

Ground-level sulfur dioxide (SO₂) concentrations were estimated from the Ozone Monitoring Instrument (OMI) satellite data using SO₂ profiles from the Global Environmental Multi-scale – Modelling Air quality and CHEMistry (GEM-MACH) model over North America for the period of 2005-2015. These annual gridded datasets were aggregated to 3-year running averages and used by CANUE staff to assign values of annual mean concentration of SO₂ to all postal codes in Canada for each year from 2007 to 2015 (DMTI Spatial, 2015). Three-year averages are labelled as the last year in the series, i.e., 2005, 2006, and 2007 were averaged and labelled as the 2007 annual average.

Keywords: SO₂|sulfur dioxide|air quality|satellite monitoring|chemical transport model|gridded surface

Place Keywords: Canada|national

GEOSPATIAL REFERENCE

Upper Left Corner: 65.14N , -141.02W

Lower Right Corner: 41.68N , -52.62W

Coordinate System: GCS_WGS84 - EPSG:4326

Geometry Type: POINT - Units: Decimal Degree

Geometry Data Source: DMTI Spatial Inc. (postal codes)

QUALITY ASSESSMENT

QA/QC Procedures:

CANUE did not assess the quality of the SO₂ data. Users should review the supporting documentation and any recommended citations.

Geographic Coordinate Positional Accuracy:

These metrics are linked to the corresponding annual postal codes files for mapping and analysis purposes. Refer to the postal code metadata file in Supporting Documentation for more information.

Vertical Positional Accuracy: N/A

Attribute Accuracy: N/A

Data Validity: NoData = -9999 (for numeric fields) - NoData=null (for category fields) - Data insufficient to calculate value = -1111

Associated Files: N/A

Data Comment:

N/A

DATA SOURCE

Data Source

Files provided by Environment and Climate Change Canada, Air Quality Research Division, under the Open Government License (open.canada.ca). DMTI Spatial Inc. postal codes.

Spatial Resolution: Source data are provided on a 10km grid, but are at an effective resolution of 20 km.

Data Preparation Date: 2017-10-01

Beginning Date: 2007

End Date: 2015

Sampling Frequency of Data: Annual

Years Available:

2007 - 2008 - 2009 - 2010 - 2011 - 2012 - 2013 - 2014 - 2015

MAINTENANCE

Description: N/A

File Type: Comma separated values(.csv)

File Size: Individual year files are approximately 35 MB in size

Number of Data Files: 9

DATA USE CONDITIONS

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

(iii) complete and sign the CANUE Data Use and Sharing Agreement (available at <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 Sharing and Use 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 Sharing and Use Agreement. Data can be shared only within a project team 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.

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

[1] Environment and Climate Change Canada, 2017. Air Quality Research Division, Toronto, Canada. Data files: OMI_Ground-Level_SO2_NA_2005.nc to OMI_Ground-Level_SO2_NA_2015.nc inclusive, generated 2017-07-05.

[2] McLinden, C. A., Fioletov, V., Boersma, K. F., Kharol, S. K., Krotkov, N., Lamsal, L., Makar, P. A., Martin, R. V., Veefkind, J. P., and Yang, K.: Improved satellite retrievals of NO₂ and SO₂ over the Canadian oil sands and comparisons with surface measurements, Atmos. Chem. Phys., 14, 3637-3656, doi:10.5194/acp-14-3637-2014, 2014.

[3] Kharol, S. K., McLinden, C. A., Sioris, C. E., Shephard, M. W., Fioletov, V., van Donkelaar, A., Philip, S., and Martin, R. V.: OMI satellite observations of decadal changes in ground-level sulfur dioxide over North America, Atmos. Chem. Phys., 17, 5921-5929, doi:10.5194/acp-17-5921-2017, 2017.

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

Include the following acknowledgements:

1. SO₂ metrics indexed to DMTI Spatial Inc. postal codes, were provided by CANUE (Canadian Urban Environmental Health Research Consortium).

SUPPORT DOCUMENTATION

1 - Environment and Climate Change Canada OMI Supplemental Information (<http://canue.ca/wp-content/uploads/2017/10/ECCC-OMI-SO2-and-NO2-Supplemental.pdf>)

2 - Postal Code metadata (<https://canue.ca/wp-content/uploads/2019/09/CANUE-Browser-Metadata-PostalCodes.pdf>)

VARIABLES

SO2OMIYY_01 - 3 Year Annual Average SO₂ Concentration (ppb)

3 year annual average SO₂ concentration, in parts per billion

SUPPORT CONTACT

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Affiliated Organization:

CANUE (Canadian Urban Environmental Health Research Consortium)
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DATA SOURCE CONTACT

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