

README document for **CMS GOSAT and ObsPack L4 Top-down yearly methane emissions for individual sectors at 0.5x0.625 degrees for North America V1** (CMS\_GO\_CH4\_SEC\_TDYC\_NA)

## Data Product Description

The data product includes methane emissions from 2010–2017 by sector in the contiguous United States (CONUS), Canada, and Mexico by inverse analysis of in situ (GLOBALVIEWplus CH<sub>4</sub> ObsPack) and satellite (GOSAT) atmospheric methane observations. The inversion uses as a prior estimate the national anthropogenic emission inventories for the three countries reported by the US Environmental Protection Agency (EPA), Environment and Climate Change Canada (ECCC), and the Instituto Nacional de Ecología y Cambio Climático (INECC) in Mexico to the United Nations Framework Convention on Climate Change (UNFCCC) and thus serves as an evaluation of these inventories in terms of their magnitudes and trends. Emissions are optimized with the GEOS-Chem chemical transport model at 0.5 ° × 0.625 ° resolution and for individual years.

**Shortname:** CMS\_GO\_CH4\_SEC\_TDYC\_NA

**Longname:** CMS GOSAT and ObsPack L4 Top-down yearly methane emissions for individual sectors at 0.5x0.625 degrees for North America

**DOI:**10.5067/N4AEHY0KPHGO

**Version:**1

**Format:**netCDF

**Spatial Coverage:** -130.0, 15.0, -55.0, 65.0

**Temporal Coverage:** 2010-01-01 to 2017-12-31

**File Size:** 0.6 MB per file

### Data Resolution

**Spatial:** 0.5 ° x 0.625 °

**Temporal:**1 year

More details about the algorithm used to create this dataset can be found in the following paper:

Lu, X., Jacob, D. J., Wang, H., Maasakkers, J. D., Zhang, Y., Scarpelli, T. R., Shen, L., Qu, Z., Sulprizio, M. P., Nesser, H., Bloom, A. A., Ma, S., Worden, J. R., Fan, S., Parker, R. J., Boesch, H., Gautam, R., Gordon, D., Moran, M. D., Reuland, F., Villasana, C. A. O., and Andrews, A.: Methane emissions in the United States, Canada, and Mexico: evaluation of national methane emission inventories and 2010–2017 sectoral trends by inverse analysis of in situ (GLOBALVIEWplus CH<sub>4</sub> ObsPack) and satellite (GOSAT) atmospheric observations, *Atmos. Chem. Phys.*, 22, 395–418, <https://doi.org/10.5194/acp-22-395-2022>, 2022.

## How to cite this dataset

Lu, X. and Jacob, (2023), CMS GOSAT and ObsPack L4 Top-down yearly methane emissions for individual sectors at 0.5x0.625 degrees for North America V1, Greenbelt, MD, USA, Goddard Earth Sciences Data and Information Services Center (GES DISC), Accessed: [*Data Access Date*], <https://doi.org/10.5067/N4AEHY0KPHGO>

## Dataset Variables

<b>variable</b>	<b>standard_name/long_name</b>	<b>units</b>
lon	longitude	degrees_east
lat	latitude	degrees_north
time	time	days since 2010-01-01
CH4_TER	methane emissions from termites	Mg km-2 a-1
CH4_LAK	methane emissions from lakes	Mg km-2 a-1
CH4_SEE	methane emissions from seeps	Mg km-2 a-1
CH4_WTL	methane emissions from wetlands	Mg km-2 a-1
CH4_BBN	methane emissions from biomass burning	Mg km-2 a-1
CH4_OTA	methane emissions from other anthropogenic activities	Mg km-2 a-1
CH4_RIC	methane emissions from rice	Mg km-2 a-1
CH4_WST	methane emissions from wastewater	Mg km-2 a-1
CH4_LDF	methane emissions from landfills	Mg km-2 a-1
CH4_LIV	methane emissions from livestock	Mg km-2 a-1
CH4_COL	methane emissions from coal mining	Mg km-2 a-1
CH4_GAS	methane emissions from natural gas industry	Mg km-2 a-1
CH4_OIL	methane emissions from oil industry	Mg km-2 a-1