

# Implementing Digital Object Identifiers (DOIs) to Foster Attribution for Earth Science Data

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Abstract: Persistent identifiers, such as Digital Object Identifiers (DOIs), can contribute to the discovery and access of online scientific data and related web-based resources over time. In addition to enabling continuing access to scientific data when persistent identifiers are maintained, DOIs also can contribute to the attribution of scientific data. Assigning DOIs to datasets and registering them for inclusion in open catalogs enables discovery of the metadata records by facilitating harvesting and indexing by other catalogs where the data can be discovered and accessed through the DOIs that serve as resolvable links to the landing pages for the scientific data. Similar to other publications that are cited in research articles, the DOIs for data can be included in the reference to the data when citing the data used for preparation of a research publication. Examples of landing pages and recommended citations for scientific data that are available from the NASA Socioeconomic Data and Applications Center (SEDAC) demonstrate how access to scientific data can be facilitated through the assignment of DOIs and show how guidance may be provided for users of scientific data to provide attribution to the data that they use in their research.

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Page 1 of 1

Anthropogenic Sulfur Dioxide Emissions, 1850-2005: National and Regional Data Set by Source Category, Version 2.86  
doi:10.7927/H49884X9 Dataset : tabular, map  
Smith, S. J.; van Aardenne, J.; Klimont, Z.; Andres, R. J.; Volke, A.; Delgado Arias, S.  
title: Anthropogenic Sulfur Dioxide Emissions, 1850-2005: National and Regional Data Set by Source  
description: The Anthropogenic Sulfur Dioxide Emissions, 1850-2005: National and Regional Data Set by Source

IPCC Special Report on Emissions Scenarios (SRES) Fluor-Gases Emissions Dataset  
doi:10.7927/H4HD7SKJ Dataset : tabular  
Intergovernmental Panel on Climate Change - IPCC  
description: ), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF6), Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs)

IPCC Special Report on Emissions Scenarios (SRES) 1x1 Degree Gridded Emissions Dataset  
doi:10.7927/H4RV0KMH Dataset : raster, tabular  
Intergovernmental Panel on Climate Change - IPCC  
description: ), along with Sulfur Dioxide (SO2), based on the IPCC SRES Emissions Scenarios Data Set Version 1.1. This

IPCC Special Report on Emissions Scenarios (SRES) Emissions Scenarios Dataset Version 1.1  
doi:10.7927/H4N29TWJ Dataset : tabular  
Intergovernmental Panel on Climate Change - IPCC  
description: sulfur emissions scenarios projected every 10 years beginning in 1990 through 2100. The scenarios are

NASA SOCIOECONOMIC DATA AND APPLICATIONS CENTER (SEDAC)  
A Data Center in NASA's Earth Observing System Data and Information System (EOSDIS) — Hosted by CIESIN at Columbia University

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## Historical Anthropogenic Sulfur Dioxide Emissions

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### Collection Overview

## National and Regional Data Set by Source Category, v2.86 (1850–2005)

### Methods

Set Overview Data Download Maps Documentation Metadata

### Data Sets (1)

National and Regional Data Set by Source Category, v2.86 (1850–2005)

### Map Gallery (36)

### Citations

### Purpose:

To provide annual estimates of anthropogenic global and regional Sulfur Dioxide (SO<sub>2</sub>) emissions in support of climate, atmospheric or other related research.

### Abstract:

The Anthropogenic Sulfur Dioxide Emissions, 1850-2005: National and Regional Data Set by Source Category, Version 2.86 provides annual estimates of anthropogenic global and regional Sulfur Dioxide (SO<sub>2</sub>) emissions spanning the period 1850-2005 using a bottom-up mass balance method, calibrated to country-level inventory data. It includes emissions by country and by source category (coal, petroleum, biomass combustion, smelting, fuel processing, and other processes). This data set is developed at the Pacific Northwest National Laboratory (PNNL) and the maps are produced at the Center for International Earth Science Information Network (CIESIN). The data and maps created using the data set are distributed by CIESIN at Columbia University.

### Recommended Citation(s)\*:

Smith, S. J., J. van Aardenne, Z. Klimont, R. J. Andres, A. Volke, and S. Delgado Arias. 2011. Anthropogenic Sulfur Dioxide Emissions, 1850-2005: National and Regional Data Set by Source Category, Version 2.86. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <http://dx.doi.org/10.7927/H49884X9>. Accessed DAY MONTH YEAR.

Smith, S. J., J. van Aardenne, Z. Klimont, R. J. Andres, A. Volke, and S. Delgado Arias. 2011. Anthropogenic Sulfur Dioxide Emissions: 1850-2005. *Atmospheric Chemistry and Physics* 11:1101-1116. DOI:10.5194/acp-11-1101-2011.

\* When authors make use of data they should cite both the data set and the journal article of record, if available. Such a practice gives credit to data set producers and advances principles of transparency and reproducibility.

† For EndNote users, please check the Research Note field for issues with importing authors that are organizations when using the ENW file format.

### Available Formats:

tabular, map

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**Descriptions**  
**Abstract** The Anthropogenic Sulfur Dioxide Emissions, 1850-2005: National and Regional Data Set by Source Category, Version 2.86 provides annual estimates of anthropogenic global and regional Sulfur Dioxide (SO<sub>2</sub>) emissions spanning the period 1850-2005 using a bottom-up mass balance method, calibrated to country-level inventory data. It includes emissions by country and by source category (coal, petroleum, biomass combustion, smelting, fuel processing, and other processes). This data set is developed at the Pacific Northwest National Laboratory (PNNL) and the maps are produced at the Center for International Earth Science Information Network (CIESIN). The data and maps created using the data set are distributed by CIESIN at Columbia University.

**Resource type**  
**Dataset** tabular, map  
**Subjects** climate  
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