**Title:** NATCARB Sources (v1302)

**Originators:** NATCARB Map Team, US Dept. of Energy (DOE) National Energy Technology Laboratory (NETL)

**Publication date:** 20130408

**Edition:** v1302

**Data type:** vector digital data

**Other citation details:** http://www.netl.doe.gov/technologies/carbon_seq/natcarb

**Abstract:** The National Carbon Sequestration Database and Geographic Information System (NATCARB) Sources spatial database of stationary sources of atmospheric carbon dioxide (CO2) emissions across the USA and parts of Canada. Sources are classified into nine categories - Agricultural Processing Facilities, Cement and Lime Plants, Electric Generating Plants, Ethanol Production Plants, Fertilizer Production, Industrial Facilities, Petroleum or Natural Gas Transmission, Refineries and Chemical Facilities, and Unclassified. This data layer reflects the best available knowledge regarding stationary CO2 emissions sources in the USA and Canada. Version Log:

- v1101 - Initial release for Atlas III;
- v1103 - CANADA and WESTCARB data updated. Many duplicates among partnerships removed. Metadata revised;
- v1104 - Ethylene and Ethylene Oxide plants reclassified to Refineries/Chemical Plant;
- v1204 - Initial release for Atlas IV. New data submitted by all regional partnerships;
- v1302 - Locations reviewed and corrected for all electric power plants in MGSC, MRCSP and SECARB and some power plants in BSCP and SWP. Metadata revised.

The NATCARB is administered by the US Dept. of Energy (DOE) National Energy Technology Laboratory (NETL) and contains data provided by the Regional Carbon Sequestration Partnerships (RCSP). The NATCARB Team at KGS compiled the regional datasets into a single, seamless layer.

**Purpose:** The NATCARB Sources dataset provides a single, seamless spatial database of stationary sources of atmospheric carbon dioxide emissions across the USA and parts of Canada compiled from regional datasets created by the RCSPs. The spatial distribution of carbon dioxide emission estimates in this dataset are intended to be used as an initial assessment of stationary sources only. Stationary sources are particular, identifiable, localized sources of emissions, and include such operations as power plants, ethanol plants, petroleum and natural gas processing facilities, cement and lime plants, agricultural processing facilities, industrial facilities, iron and steel production facilities, and fertilizer production facilities. Non-stationary sources of CO2, such as transportation, and non-point sources, such as widespread land use practices, are not included in this data set. RCSPs either used emissions estimates from the EPA Greenhouse Gas database or calculated emissions estimates using other publicly-available databases (e.g., eGRID, IEA GHG, and NATCARB) and emissions factors. Calculation methods for a given source type vary by RCSP. Appendix A of The United States 2012 Carbon Utilization and Storage Atlas - Fourth Edition documents the practical quantitative methods used by each RCSP (i.e., emission factors, continuous emissions-monitoring results, emission estimate equations, etc.) to estimate CO2 emissions from each source. Appendix A also includes the data sources used to determine plant capacities, production outputs, and fuel usage.

**Supplemental information:** For a detailed methodology of emissions estimates refer to Appendix A of The United States 2012 Carbon Utilization and Storage Atlas - Fourth Edition (Atlas IV). For data access please contact the US DOE-NETL NATCARB Map Team - NatCarb.Maps@netl.doe.gov For questions regarding how the data were assembled, contact the KGS NATCARB Team - natcarb@kgs.ku.edu

**Dataset credit:** Version 1302 (second quarter release of 2013) of the NATCARB Sources spatial database was created by the NATCARB Team at the Kansas Geological Survey (KGS). The following Regional Carbon Sequestration Partnerships (RCSP) contributed data to the national dataset:

- Big Sky Carbon Sequestration Partnership (BSCSP);
- Midwest Geological Sequestration Consortium (MGSC);
- Midwest Regional Carbon Sequestration Partnership (MRCSP);
- The Plains CO2 Reduction Partnership (PCOR);
Southeast Regional Carbon Sequestration Partnership (SECARB); Southwest Regional Partnership on Carbon Sequestration (SWP); West Coast Regional Carbon Sequestration Partnership (WESTCARB). Data were also provided by NETL.

### Point Of Contact

**Organization:** NATCARB Map Team, US Dept. of Energy (DOE) National Energy Technology Laboratory (NETL)

**Phone:** 304-285-2006

**Phone:** 304-285-1354

**Email:** NatCarb.Maps@netl.doe.gov

**Address type:** mailing and physical

- **Address:** 3610 Collins Ferry Road M/S F04
- **City:** Morgantown
- **State or Province:** West Virginia
- **Postal code:** 26507
- **County:** US

### Data Type

**Data type:** vector digital data

**Native dataset environment:** Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.1.1.3143

### Status

**Data status:** Complete

**Update frequency:** Quarterly

### Key Words

**Theme:**

- **Keywords:** Carbon Dioxide Emissions, US Department of Energy, Energy, NATCARB
- **Keyword thesaurus:** None

**Theme:**

- **Keywords:** climatologyMeteorologyAtmosphere, environment, utilitiesCommunication
- **Keyword thesaurus:** ISO 19115 Topic Categories

**Place:**

- **Keywords:** Canada, USA, North America
- **Keyword thesaurus:** ISO 19115 Topic Category

### Data Access Constraints

**Access constraints:** None

**Use constraints:** See access and use constraints information.

### Spatial Reference Information

#### Horizontal Coordinate System

**Coordinate System Details**
**Geographic coordinate system**

- **Latitude resolution:** 8.983152841195215e-009
- **Longitude resolution:** 8.983152841195215e-009
- **Geographic coordinate units:** Decimal Degrees

**Geodetic model**

- **Horizontal datum name:** D WGS 1984
- **Ellipsoid name:** WGS 1984
- **Semi-major axis:** 6378137.0
- **Denominator of flattening ratio:** 298.257223563

**Spatial Domain**

**Bounding Coordinates**

*In Unprojected coordinates (geographic)*

<table>
<thead>
<tr>
<th>Boundary</th>
<th>Coordinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>-162.852029 (latitude)</td>
</tr>
<tr>
<td>East</td>
<td>-64.703195 (latitude)</td>
</tr>
<tr>
<td>North</td>
<td>70.500001 (longitude)</td>
</tr>
<tr>
<td>South</td>
<td>17.746642 (longitude)</td>
</tr>
</tbody>
</table>

**Data Structure and Attribute Information**

**Overview**

**Direct spatial reference method:** Vector

**Attributes of NATCARB_Sources_v1302**

- **Description:** Vector point features representing major stationary sources of carbon dioxide emissions in the USA and parts of Canada
- **Source:** NATCARB

**Attributes**

**OBJECTID**

- **Definition:** Internal feature number.
- **Attribute values:** Sequential unique whole numbers that are automatically generated.
- **Attribute definition source:** ESRI

**SHAPE**

- **Definition:** Feature geometry.
- **Attribute values:** Coordinates defining the features.
- **Attribute definition source:** ESRI

**PARTNERSHIP**

- **Definition:** Abbreviation for RCSP or other data source

**Attribute domain values**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEW ENGLAND</td>
<td>New England emissions sources derived from EPA data by KGS</td>
</tr>
<tr>
<td>BSCSP</td>
<td>Big Sky Sequestration Partnership</td>
</tr>
<tr>
<td>FRS_ID</td>
<td>Definition: EPA Facility Registry System Code</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Attribute value codeset domain</td>
<td></td>
</tr>
<tr>
<td>Codeset</td>
<td>Description</td>
</tr>
<tr>
<td>Name</td>
<td>Facility Registry System</td>
</tr>
<tr>
<td>Source</td>
<td>US Environmental Protection Agency</td>
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</table>

<table>
<thead>
<tr>
<th>PRIMARY_NAICS</th>
<th>Definition: US Census Bureau North American Industry Classification System code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute value codeset domain</td>
<td></td>
</tr>
<tr>
<td>Codeset</td>
<td>Description</td>
</tr>
<tr>
<td>Name</td>
<td>North American Industry Classification System</td>
</tr>
<tr>
<td>Source</td>
<td>US Census Bureau</td>
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<table>
<thead>
<tr>
<th>EPA_ID</th>
<th>Definition: Internal ID assigned by KGS to EPA GHG data records.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute definition source: KGS</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORIS</th>
<th>Definition: EPA Office of Regulatory Information Systems code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute value codeset domain</td>
<td></td>
</tr>
<tr>
<td>Codeset</td>
<td>Description</td>
</tr>
<tr>
<td>Name</td>
<td>Office of Regulatory Information Systems</td>
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<tr>
<td>Source</td>
<td>US Environmental Protection Agency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LONGITUDE_WGS84</th>
<th>Definition: Longitude (WGS 84) of emission source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute domain range</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>Value</td>
</tr>
<tr>
<td>Minimum</td>
<td>-180</td>
</tr>
<tr>
<td>Maximum</td>
<td>180</td>
</tr>
<tr>
<td>Attribute units of measurement</td>
<td>decimal degrees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LATITUDE_WGS84</th>
<th>Definition: Latitude (WGS 84) of emission source</th>
</tr>
</thead>
</table>

| Attribute definition source: US Environmental Protection Agency |
### Attribute domain range

<table>
<thead>
<tr>
<th>Range</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>-90</td>
</tr>
<tr>
<td>Maximum</td>
<td>90</td>
</tr>
<tr>
<td>Attribute units of measurement</td>
<td>decimal degrees</td>
</tr>
</tbody>
</table>

### SOURCE_NAME

**Definition:** Name of emission source

### OPERATOR

**Definition:** Operator (owner) of emission source.

**Attribute values:** Text string

### ADDRESS

**Definition:** Street address of emission source.

**Attribute values:** Text string

### CITY

**Definition:** City of emission source

**Attribute values:** Text string

### STATE_PROV_NAME

**Definition:** Full State or Province name

### STATE_PROV_ABBRV

**Definition:** State or Province abbreviation

### SOURCE_TYPE

**Definition:** Emission source type as submitted by RCSP

**Attribute values:** Text string

**Attribute definition source:** RCSP

### SOURCE_TYPE_COMMON

**Definition:** Classified emission source type

#### Attribute domain values

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>REFINERIES/CHEMICAL</td>
<td>Petroleum refinery or chemical production plant</td>
</tr>
<tr>
<td>ETHANOL</td>
<td>Ethanol plant</td>
</tr>
<tr>
<td>CEMENT PLANT</td>
<td>Cement plant or lime production facility</td>
</tr>
<tr>
<td>AG PROCESSING</td>
<td>Agricultural or food processing facility</td>
</tr>
<tr>
<td>ELECTRICITY</td>
<td>Coal-, oil- or natural gas-fired electric generating plant</td>
</tr>
<tr>
<td>FERTILIZER</td>
<td>Fertilizer or ammonia production facility</td>
</tr>
<tr>
<td>UNCLASSIFIED</td>
<td>Other CO2 source</td>
</tr>
<tr>
<td>PETROLEUM/NATURAL GAS</td>
<td>Petroleum or natural gas processing or transmission</td>
</tr>
<tr>
<td>INDUSTRIAL</td>
<td>Industrial/Manufacturing (non-chemical or petroleum)</td>
</tr>
<tr>
<td>MINING</td>
<td>Mineral mine or mining-related facility</td>
</tr>
</tbody>
</table>

**Attribute definition source:** DOE-NETL

### EPA_IND_SUBPART
**Definition:** Letter code(s) designating facility type (from EPA GHG database).

**Attribute value codeset domain**

<table>
<thead>
<tr>
<th>Codeset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Industry Subpart Code</td>
</tr>
<tr>
<td>Source</td>
<td>US Environmental Protection Agency</td>
</tr>
</tbody>
</table>

**Attribute definition source:** US Environmental Protection Agency

**FUEL**

**Definition:** Fuel type of emission source. This data is under development and should not be used.

**Attribute value accuracy explanation:** Data is under development. Do not use.

**Attribute values:** Text string

**Attribute definition source:** Atlas IV

**CO2_TONNE**

**Definition:** Estimated emission amount in metric tonnes

**Attribute domain range**

<table>
<thead>
<tr>
<th>Range</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>0</td>
</tr>
</tbody>
</table>

**Attribute units of measurement:** metric tonnes

**Attribute measurement resolution:** whole number

**YEAR**

**Definition:** Year for which emissions data were calculated

**Attribute values:** Year

**SDTS Feature Description**

**Spatial data transfer standard (SDTS) terms**

**Feature class**

- **Type:** Entity point
- **Count:** 4289

**Data Source and Process Information**

**Data Sources**

**Data source information**

**KGS**

- **Title:** KGS NATCARB
- **Media:** None
- **Source contribution:** As the primary entity responsible for compiling the NATCARB layers, the Kansas Geological Survey NATCARB Team worked closely with the DOE-NETL NATCARB Team to develop rules and methods for assembling the composite datasets.

**Atlas IV**

- **Title:** The United States 2012 Carbon Utilization and Storage Atlas
- **Publisher:** US Department of Energy (DOE) National Energy Technology Laboratory (NETL)
- **Publication place:** 3610 Collins Ferry Road, Morgantown, WV, 26507-0880, US

**SWP**

**Title:** SWP Coal 10K Carbon Sequestration Potential  
**Originators:** Southwest Regional Partnership on Carbon Sequestration  
New Mexico Institute of Mining and Technology  
**Data type:** vector digital data  
**Source contribution:** Southwest Regional Partnership on Carbon Sequestration provided data for the Southwestern United States (Eastern Arizona, Colorado, Kansas, New Mexico, Western Texas and Utah).

**DOE-NETL**

**Title:** US Department of Energy (DOE) National Energy Technology Laboratory (NETL) NATCARB Team  
**Source contribution:** As the responsible authority for the National Carbon Sequestration Database and Geographic Information System (NATCARB), the US Department of Energy (DOE) National Energy Technology Laboratory (NETL) NATCARB Team provided data, methodological guidance and expertise in handling issues specific to creation of the composite NATCARB data layers.

**PCOR**

**Title:** PCOR Coal 10K Carbon Sequestration Potential  
**Originators:** University of North Dakota, Energy and Environmental Research Center  
The Plains CO2 Reduction Partnership  
**Data type:** vector digital data  
**Source contribution:** The Plains CO2 Reduction Partnership provided data for the upper Midwest and Central Canada (Iowa, Minnesota, Missouri, Eastern Montana, Nebraska, North Dakota, Eastern South Dakota, Wisconsin, Eastern Wyoming, Alberta, Northeastern British Columbia, Manitoba and Saskatchewan).

**BSCSP**

**Title:** BSCSP Coal 10K Carbon Sequestration Potential  
**Originators:** Big Sky Sequestration Partnership  
Montana State University  
**Data type:** vector digital data  
**Source contribution:** Big Sky Carbon Sequestration Partnership provided data for the Intermountain West region of the Northwestern United States (Idaho, Eastern Montana, Eastern Oregon, Western South Dakota, Eastern Washington and Wyoming).

**WESTCARB**

**Title:** WESTCARB Coal 10K Carbon Sequestration Potential
Originators: California Energy Commission
West Coast Regional Carbon Sequestration Partnership
Data type: vector digital data
Media: None
Source contribution: West Coast Regional Carbon Sequestration Partnership provided data for the Western United States and Canada (Alaska, Western Arizona, Western British Columbia, California, Hawaii, Nevada, Western Oregon and Western Washington).

**SECARB**

Title: SECARB Coal Carbon Sequestration Potential
Originators: Southeast Regional Carbon Sequestration Partnership
Southern States Energy Board
Data type: vector digital data
Media: None
Source contribution: Southeast Regional Carbon Sequestration Partnership provided data for the Southeastern United States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Eastern Texas, West Virginia and Virginia).

**MRCSP**

Title: MRCSP Coal 10K Carbon Sequestration Potential
Originators: Batelle Memorial Institute
Midwest Regional Carbon Sequestration Partnership
Data type: vector digital data
Media: None
Source contribution: Midwest Regional Carbon Sequestration Partnership provided data for the Ohio Valley and Northeastern United States (Eastern Indiana, Eastern Kentucky, Maryland, Michigan, New Jersey, New York, Ohio, Pennsylvania and West Virginia).

**MGSC**

Title: MGSC Coal 10K Carbon Sequestration Potential
Originators: Midwest Geological Sequestration Consortium
Illinois State Geological Survey
Data type: vector digital data
Media: None
Source contribution: Midwest Geological Sequestration Consortium provided data for Illinois, Western Indiana and Western Kentucky.

**WVU NATCARB**

Title: University of West Virginia NATCARB Team
Originators: West Virginia GIS Technical Center, Department of Geology and Geography
Data type: vector digital data
Media: None
Source contribution: The NATCARB Team at the University of West Virginia validated and edited some emission source features.

**Process Steps**

**Process step information**

**Process Step 1**
**Process description:** The NATCARB Team at the Kansas Geological Survey assembled GIS datasets from the regional partnerships (and other sources where necessary) into a single layer using ESRI’s ArcInfo (v10.0) software in the Summer and Fall of 2012. Other alterations to the data include identifying overlapping and duplicate data submitted by adjacent partnerships and making corrections to values in text fields (spelling, capitalization, etc.) when errors were noticed.

**Organization:** GIS Support Section, Kansas Geological Survey

**Position:** NatCarb Team

**Phone:** 785-864-3965

**Email:** natcarb@kgs.ku.edu

**Hours of service:** 8 am - 5 pm M-F

**Address type:** mailing and physical

- **Address:** 1930 Constant Ave
- **City:** Lawrence
- **State or Province:** KS
- **Postal code:** 66047-3726
- **County:** US

**Process date:** 20121029

---

**Process Step 2**

**Process description:** The NATCARB Team at the University of West Virginia verified and corrected the locations of all electric power plants in the MGSC, MRCSP and SECARB regions and some in the BSCSP and SWP regions.

**Organization:** West Virginia GIS Technical Center, Department of Geology and Geography

**Phone:** 304-293-6694

**Email:** NATCARB@mail.wvu.edu

**Address type:** physical

- **Address:** 330 Brooks Hall
- **Address:** 98 Beechurst Avenue
- **Address:** University of West Virginia
- **City:** Morgantown
- **State or Province:** WV
- **Postal code:** 26506-6300
- **County:** US

**Process date:** 20130228

---

**Process Step 3**

**Process description:** Metadata updated

**Organization:** GIS Support Section, Kansas Geological Survey

**Position:** NATCARB Team

**Phone:** 785-864-3965

**Email:** natcarb@kgs.ku.edu

**Hours of service:** 8 am - 5 pm M-F

**Address type:** mailing and physical

- **Address:** 1930 Constant Ave
- **City:** Lawrence
- **State or Province:** Kansas
- **Postal code:** 66047-3726
- **County:** US

**Process date:** 20130329

---

**Data Distribution Information**
### General

*Distribution liability:* See access and use constraints information.

### Distribution Point of Contact

**Organization:** NATCARB Map Team, US Department of Energy (DOE) National Energy Technology Laboratory (NETL)

**Phone:** 304-285-2006

**Phone:** 304-285-1354

**Email:** NATCARB.Maps@NETL.DOE.GOV

**Address type:** mailing and physical

- **Address:** 3610 Collins Ferry Road M/S F04
- **City:** Morgantown
- **State or Province:** West Virginia
- **Postal code:** 26507
- **County:** US

### Standard Order Process

**Digital form:**

- **Format name:** ESRI File Geodatabase
- **Format version number:** 10.1
- **File decompression technique:** zip

**Digital transfer option:**

**Online option:**

- **Computer information:**
  - **Network address:** http://www.netl.doe.gov/technologies/carbon_seq/natcarb/download.html

**Fees:** None

**Ordering instructions:** GIS datasets in ESRI file geodatabase and shapefile format are available online. Please contact the DOE-NETL NATCARB Map Team for custom requests.

### Metadata Reference

**Metadata Date**

- **Last updated:** 20130401
- **Future metadata review date:** 20130701

**Metadata Point of Contact**
<table>
<thead>
<tr>
<th><strong>Organization:</strong></th>
<th>GIS Support Section, Kansas Geological Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Position:</strong></td>
<td>NATCARB Team</td>
</tr>
<tr>
<td><strong>Phone:</strong></td>
<td>785-864-3965</td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><a href="mailto:natcarb@kgs.ku.edu">natcarb@kgs.ku.edu</a></td>
</tr>
<tr>
<td><strong>Hours of service:</strong></td>
<td>8 am - 5 pm M-F</td>
</tr>
<tr>
<td><strong>Address type:</strong></td>
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</tr>
<tr>
<td><strong>Address:</strong></td>
<td>1930 Constant Ave</td>
</tr>
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<td><strong>City:</strong></td>
<td>Lawrence</td>
</tr>
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<td><strong>State or Province:</strong></td>
<td>Kansas</td>
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<td>66047-3726</td>
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<tr>
<td><strong>County:</strong></td>
<td>US</td>
</tr>
</tbody>
</table>

**Metadata Standards**

- **Standard name:** FGDC Content Standard for Digital Geospatial Metadata
- **Standard version:** FGDC-STD-001-1998
- **Time convention:** local time

**FGDC Plus Metadata Stylesheet**

Federal Geographic Data Committee