**Carbon Storage Open Database (CSOD) Geologic Contours 2023**

**Read Me File**

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**Citation:** Morkner, P., Creason, C., Sabbatino, M., Choisser, A., Wingo, P., DiGiulio, J., Jones, K., Greenburg, R., Bauer, J., and Rose, K, Carbon Storage Open Database, 7/1/2020, https://edx.netl.doe.gov/dataset/carbon-storage-open-database, DOI: 10.18141/1671320

**Disclaimer:**

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**Summary and Description:**

The Carbon Storage Open Database is a collection of spatial data obtained from publicly available sources published by several NATCARB Partnerships and other organizations.

As part of the Carbon Storage Open Database EDX Spatial Collection, the Geologic Contours geodatabase contains 71 geospatial layers. The 71 geospatial layers contained within this geodatabase can be previewed in the EDX Spatial viewer. The Carbon Storage Open Database undergoes regular updates but is not intended to replace more robust analytical mapping and efforts. For additional information regarding this geodatabase and the contents within, please refer to the Catalog file included within the downloaded zip file.

Link for EDX Spatial: <https://arcgis.netl.doe.gov/portal/apps/sites/#/edxspatial>

**The primary data sources for the Carbon Storage Open Database include:**

* The 7 regional carbon sequestration partnerships: WestCarb Partnership, Big Sky Partnership, Southwest Partnership, Southeast Carbon Sequestration Partnership, Midwest Regional Carbon Sequestration Partnership, Midwest Geologic Sequestration Consortium, and the Plains Carbon Reduction Partnership. The partnership data was collected from their websites and ArcREST servers, sometimes with the help of archived data tools. Any public partnership data can be found on [EDX Groups](https://edx.netl.doe.gov/group/?q=rcsp&sort=title+asc).
* The [US Geologic Survey Carbon Dioxide Storage Resources Assessment, 2013](https://pubs.usgs.gov/ds/774/).
* EDX data submissions from projects including the [Basal Cambrian raster layers](https://edx.netl.doe.gov/dataset/basal-cambrian-gis-raster-layers), the [FutureGen 2.0 data](https://edx.netl.doe.gov/dataset/vetted-futuregen-2-0-technical-data) submission, and the [Illinois Basin Decatur Project data](https://edx.netl.doe.gov/group/illinois-basin-decatur-project) submissions.
* The [Texas BEG CO2 Brine Database](https://www.beg.utexas.edu/gccc/co2-data/data-main), 2013

The data was aggregated into a central database, and metadata was captured, and in cases where needed, created, and cataloged to provide detailed metadata about the database publishing to both EDX and EDX Spatial. The geodatabase and the catalog are the primary resources available for this data submission.

**The formation of this database is described in detail in the following resources:**

Morkner, P., Bauer, J., Creason, C., Sabbatino, M., Wingo, P., Greenburg, R., Walker, S., Yeates, D., Rose, K. 2022. Distilling Data to Drive Carbon Storage Insights. Computers & Geosciences. https://doi.org/10.1016/j.cageo.2021.104945

Morkner, P., Bauer, J., Shay, J., Sabbatino, M., and Rose, K. An Updated Carbon Storage Open Database - Geospatial Data Aggregation to Support Scaling -Up Carbon Capture and Storage. United States: N. p., 2022. Web. <https://www.osti.gov/biblio/1890730>

Morkner, P., Rose, K., Bauer, J., Rowan, C., Barkhurst, A., Baker, D.V., Sabbatino, M., Bean, A., Creason, C.G., Wingo, P., and Greenburg, R. *Tools for Data Collection, Curation, and Discovery to Support Carbon Sequestration Insights*. United States: N. p., 2020. Web. <https://www.osti.gov/biblio/1777195>

**Points of Contact**

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**Format and versions:**

The Carbon Storage Open Database was originally published within EDX’s GeoCube version 2.0, on the Energy Data eXchange in July 2020. Since then, there has been a major update to the platform, presented in Morkner et al., 2022.

Original Database Publication Date: July 1, 2020

Last Updated: June 28, 2023

**Changes during last update:** Addition of ~500 additional shapefiles to the geodatabase, projection of all feature classes into WGS 1984 Web Mercator (auxiliary sphere), restructuring of categories, geometry repair of shapefiles, separation of raster files into a separate geodatabase, release of data catalogs to accompany the geodatabases.

To reduce data redundancy within the Carbon Storage Open Database, 14 of the original geospatial layers are omitted in this updated version. Features contained within these 14 omitted layers persist in this version due to the removed layers being identified individually as subsets of larger retained geospatial layers.

To consolidate data within the Carbon Storage Open Database, select layers from the original geodatabase were identified as suitable candidates for combining into new geospatial layers. Combined layers are listed with their original source information and new associated combined layer file name:

New Layer File Name: “Wells\_By\_Status\_Inactive”  
Original Layers: “inactive\_wells\_577791\_scale”, “inactive\_wells\_72224\_scale”, “inactive\_wells\_288895\_scale”  
Data Source: https://gis2.ohiodnr.gov/arcgis/rest/services/DOG\_Services/Oilgas\_Wells\_10\_Flex/MapServer

**Catalog Information**

The catalog “2023\_CSOD Updated Catalog\_1.1.xlsx” was developed to accompany the Carbon Storage Open Database geodatabase (Carbon\_Storage\_Open\_Database\_2023.gdb) and contains relevant metadata for all 764 geospatial feature layers within the geodatabase.

An additional catalog “2023\_CSOD Raster Catalog\_1.xlsx” was developed to accompany raster data separated from the Carbon Storage Open Database geodatabase in “CSOD\_Raster\_Data.gdb” and contains relevant metadata for all 43 raster layers within the geodatabase.

This distinction between geospatial feature layers and raster data is intended to improve usability and organization for future utilization.

**Catalog headers:**

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| **Header** | **Description** |
| **ID** | Unique ID number for the geospatial layer within the catalog |
| **File Name** | Shapefile name within geodatabase |
| **Layer Name** | Descriptive display name for GeoCube or other mapping applications |
| **Directory Name** | Name of geodatabase file containing the geospatial data |
| **Geometry Type** | Layer geometry - point, polyline or polygon |
| **Last Updated** | Year of last geospatial layer update within geodatabase |
| **Map Extent** | Bounding box/Geographic Extent in decimal degrees  (ex. “[[-84.43030879619567, 38.42963581833682], [-80.50049612514235, 41.8957993253578]]” |
| **Spatial Extent** | Geographic location (World, Continent, Country, State/Province, County/Parish, City/Town, RCSP Boundary - relevant included) |
| **Scale.Max** | Recommended maximum scale (minimum extent) for display within online mapping applications |
| **Scale.Min** | Recommended minimum scale (maximum extent) for display within online mapping applications |
| **ESRI.Symbology** | Recommended symbology for displaying data within ArcGIS Online maps or ESRI mapping applications based on the Federal Geographic Data Committee (FGDC) standards and available symbols within the ArcGIS Online 2D Symbol library  (Format: “[‘Geometry’, ‘ArcGIS 2D Symbol Name’, ‘Point Size’, ‘Outline/Line Weight’, ‘Symbol Rotation’]”) |
| **Outline.Color** | Recommended outline or line color for displaying data within maps or mapping applications based on FGDC online mapping standards in RGBT format. |
| **Fill.Color** | Recommended fill color for displaying data within maps or mapping applications based on FGDC online mapping standards in RGBT format. |
| **Category** | Map category for organizing data into feature classes within geodatabase and into maps for use in EDX Spatial or other mapping applications |
| **Keyword** | Associated keywords for each layer including relevant identification of Continent, Country, State/Province, County/Parish, City/Town, Project, Data Type, and Geometry while preserving all previously included keywords from previous catalog versions (an effort was made to organize Keywords by increasing level of detail/specification in order as described above) |
| **Group.Tags** | Tags developed for grouping of layers within maps for use in GeoCube or other mapping applications |
| **Source** | Original data source URL |
| **Citation** | When available, the original citation for data source |
| **Description** | Description developed either at NETL or data originator (when available) |
| **Comments:** | Any additional comments relating to the geospatial data layer or layer source |
| **File Size (KB)** | File size in KB |
| **Rows** | Feature count, or number of rows within the data attribute table |
| **Columns** | Attribute count, or number of columns within the data attribute table |