

# **VISTA METHANE INVENTORY**

## **Vista-CA Data Documentation**

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*Updated: 11/10/2019*

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## A. DATA INFORMATION, DISCLAIMER, AND RELEASE

This document provides specific information and definitions for every data field found in each Vista-CA spatial data layer. Vista-CA spatial datasets identify and classify potential methane source emitters in California. Vista-CA spatial datasets were created utilizing an assortment of publicly available data sources ranging from local, state, and federal agencies.

This document outlines the Vista-CA spatial datasets according to their designated Intergovernmental Panel on Climate Change (IPCC) sector and each layer is presented alphabetically within each designated IPCC sector. Vista-CA spatial datasets are organized using the IPCC categorization for Greenhouse Gas emissions. IPCC categories utilize a level system, levels 1 to 3, with level 1 relating to general categories (“CH<sub>4</sub> Sectors”) and level 3 relating to specific emission sources (“CH<sub>4</sub> Sources”).

The Vista-CA dataset features 17 spatial layers totaling to 901,008 individual features comprised of geolocated and validated points, polylines, and polygons. This dataset contains 4 point layers, 2 polyline layer, and 11 polygon layers. Vista-CA datasets have been significantly geoprocessed, edited, digitized, and standardized on the ArcGIS 10.6 platform. The standard data formats developed for the released version of the Vista-CA datasets are shapefiles (.shp; Esri vector data storage format). The spatial domain for all these datasets have been geoprocessed to fit within the geographic extent of California. Vista-CA spatial data is georeferenced to the WGS 1984 Geographic Coordinate System and Datum with geographic coordinates set to decimal degrees. Information and delivery of distribution pipelines, pipelines and addresses/names for feed lots and dairies are only accessible through correspondence and approval with the authors.

### Data Source & Contact Information

These datasets were collected as part of the NASA ACCESS Program NNN12AA01C. Additional information for use, disclaimer and release on Vista-CA datasets can be found by contacting the corresponding developers below.

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**Citation**

Duren, R. M., Thorpe, A. K., Foster, K.T., Rafiq, T. , Hopkins, F. M. Yadav, V., Bue, B. D., Thompson, D. R., Conley, S., Colombi, N.K., Frankenberg, C., McCubbin, I. B., Eastwood, M. L., Falk, M., Herner, J. D., Croes, B. E., Green, R. O., Miller, C. E. 2019. California's Methane Super-Emitters. *Nature*.

Duren, R. M., Thorpe, A. K., Foster, K.T., Rafiq, T., Hopkins, F. M. Yadav, V., Bue, B. D., Thompson, D. R., Conley, S., Colombi, N.K., Frankenberg, C., McCubbin, I. B., Eastwood, M. L., Falk, M., Herner, J. D., Croes, B. E., Green, R. O., Miller, C. E. 2019. Vista-CA Final Dataset, submitted to *Oak Ridge National Laboratory Distributed Active Archive Center for Biogeochemical Dynamics (ORNL DAAC)*, (<https://doi.org/10.3334/ORNLDAAC/1726>).

**Fair-use Policy & Metadata Details**

Vista-CA datasets are made freely available to the public and the scientific community in the belief that their wide dissemination will lead to greater understanding and new scientific and policy insights. Vista-CA contains datasets that have undergone significant quality assurance and quality control processes in accordance with strict guidelines. Every effort is made to produce the most accurate and precise data products possible at the time of their acquisition. However, we reserve the right to make future updates. If the data are obtained for potential use in a publication or presentation, we request that you please contact the authors at the onset of the work. If the Vista-CA dataset are essential to the work, or if an important result or conclusion depends on the data, it may be appropriate for those obtaining the data to consider co-authorship and/or to contact the co-authors to obtain more timely products as newer products may be available in the future. To discuss publication, presentation and collaboration, please contact the corresponding authors describing your plans for use.

This metadata document fulfills the NASA Base Metadata Requirements (<https://wiki.earthdata.nasa.gov/display/NASAIISO/NASA+Base+Metadata+Requirements>) as outlined by the Earth Science Division and follows the International Organization for Standardization (ISO) Geographic Information – Metadata standard 19115 (<https://earthdata.nasa.gov/standards/iso-19115>).

**B. VISTA-CA DATA CATEGORIZATION**

IPCC LEVEL 1	IPCC LEVEL 2	IPCC LEVEL 3
<b>1 Energy</b>	1A Fuel Combustion Activities	1A1 Energy Industries
		1A2 Manufacturing Industries & Construction
		1A3 Transport
		1A4 Other Sources
		1A5 Non Specified
	1B Fugitive Emissions from Fuels	1B1 Solid Fuels
		1B2 Oil & Natural Gas
1B3 Other Emissions from Energy Production		
1C Carbon Dioxide Transport & Storage		
<b>2 Industrial Processes &amp; Product Use*</b>		
<b>3 Agriculture, Forestry &amp; Other Land Use</b>	3A Livestock	3A1 Enteric Fermentation
		3A2 Manure Management
	3B Land	
	3C Aggregate Sources & Non-CO <sub>2</sub> Emissions	
3D Other		
<b>4 Waste</b>	4A Solid Waste Disposal	4A1 Managed Waste Disposal Sites
		4A2 Unmanaged Waste Disposal Sites
		4A3 Uncategorized Waste Disposal Sites
	4B Biological Treatment of Solid Waste	
	4C Incineration & Open Burning of Waste	
	4D Wastewater Treatment & Discharge	4D1 Domestic Wastewater Treatment & Discharge
4D2 Industrial Wastewater Treatment & Discharge		

**Table 1:** This chart describes the Intergovernmental Panel on Climate Change’s (IPCC) National Greenhouse Gas Inventory source categorization from Level 1 to Level 3. The seven (7) highlighted Level 3 categories account for ~99% of California’s inventoried statewide methane emissions in 2016; thus, only these seven Level 3 categories are included in Vista-CA. Level 2 categories marked with an asterisk indicates that there are more Level 3 categories under this level than are shown here. Omitted Level 3 categories do not contribute significantly to inventoried California methane emissions.

### C. VISTA-CA DATA OVERVIEW

**Table 2: Summary of Vista-CA layers.** Vista-CA layers, representing CH<sub>4</sub> sources corresponding to IPCC Level 3, are shown organized by IPCC greenhouse gas emission reporting taxonomy. The source and year of the raw datasets, the maximum spatial coverage, number of features and data format are provided for each Vista-CA layer.

IPCC Level 1	IPCC Level 2	Vista-CA Layers (IPCC Level 3)	Data Source (Year)	Original Data Spatial Coverage	Vista-CA No. of Features	Vista-CA Data Format
1. Energy	1A Fuel Combustion Activities	<b>Energy Industries (IPCC - 1A1)</b>				
		Power Plants	EIA (2016), SCAG (2005, 2012)	CONUS California	433	shapefile polygons
		Refineries	EIA (2016), SCAG (2005, 2012)	CONUS California	26	shapefile polygons
	1B Fugitive Emissions From Fuels**	<b>Oil and Natural Gas (IPCC - 1B2)</b>				
		Compressor Stations	CEC (2017) EPA FLIGHT Tool (2016)	California CONUS	1,120	shapefile polygons
		Distribution Pipelines	NLCD (2018) U.S. Census (2018)	California CONUS	569,609	shapefile polylines
		Natural Gas Fueling Stations*	U.S. DOE AFDC (2017)	CONUS	208	shapefile polygons
		Oil and Gas Facilities	CEC (2018)	California	3,356	shapefile polygons
		Oil and Gas Field Boundaries	CEC (2018)	California	516	shapefile polygons
		Oil and Gas Wells	DOGGR (2017)	California	225,766	shapefile points
Pipelines		CEC (2012) NPMS (2013)	California CONUS	96,823	shapefile polylines	
Processing Plants	EIA (2014)	CONUS	26	shapefile polygons		
Storage Fields	DOGGR (2016) EIA (2016)	California CONUS	12	shapefile polygons		
3. Agriculture, Forestry & Other Land Use	3A Livestock	<b>Enteric Fermentation (IPCC - 3A1)</b>				
		Feed Lots	CIWQS (2018) RWQCB (2017) SJAPCD (2017)	California Rancho Cordova and Fresno Regions San Joaquin Valley	72	shapefile points
		<b>Manure Management (IPCC - 3A2)</b>				
		Digesters	CARB (2016)	California	33	shapefile polygons
4. Waste	4A Solid Waste Disposal	<b>Managed Waste Disposal (IPCC - 4A1)</b>				
		Landfills	CalRecycle (2015) SCAG (2005, 2012)	California California	714	shapefile polygons
	4B Biological Treatment of Solid Waste	<b>Biological Treatment of Solid Waste (IPCC - 4B)</b>				
		Composting Sites	CalRecycle (2015)	California	430	shapefile points
4D Wastewater Treatment & Discharge	<b>Domestic and Industrial Water Treatment &amp; Discharge (IPCC - 4D1 and 4D2)</b>					
	Wastewater Treatment Plants	CARB (2016) SCAG (2005, 2012)	California California	149	shapefile polygons	

\*Sources may also include fugitive emissions that fall under IPCC source type 1B

<sup>a</sup> Source accessible only through correspondence and approval with publishers/authors

<sup>b</sup> Source not currently included in the California Air Resources Board's 2010-2017 GHG Inventory

**NOTE:**

CalRecycle = California Department of Resources Recycling and Recovery

CARB = California Air Resources Board

CEC = California Energy Commission

CONUS = Contiguous United States Region

DOE AFDC = U.S. Department of Energy Alternative Fuels Data Center

DOGGR = California Department of Conservation, Division of Oil, Gas, and Geothermal Resources

EIA = U.S. Energy Information Administration

EPA FLIGHT Tool = U.S. Environmental Protection Agency Facility Level GreenHouse gas Tool

NLCD = U.S. Geological Survey National Land Cover Database

NPMS = National Pipeline Mapping System

RWQCB = California EPA Regional Water Quality Control Board, Fresno, Rancho Cordova, and Santa Ana Region

SCAG = Southern California Association of Governments

SJAPCD = San Joaquin Valley Air Pollution Control District



**D. VISTA-CA METADATA DEFINITIONS**

**1. ENERGY (IPCC 1 LEVEL 3)**

**1.1 ENERGY INDUSTRIES (1A1)**

**1.1.1 POWER PLANTS (IPCC - 1A1)**

**File Name:** Vista\_CA\_Power\_Plants.zip

**Data Format:** polygon shapefile

**Data Source:** Southern California Association of Governments (SCAG) (2005 and 2012) and U.S. Energy Information Administration (EIA) (2015)

**Number of Data Elements:** 433 polygons

**Number of Data Fields:** 12 fields

<b>Field</b>	<b>Description</b>	<b>Type</b>
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.1.2 REFINERIES (IPCC - 1A1)**

**File Name:** Vista\_CA\_Refineries.zip

**Data Format:** polygon shapefile

**Data Source:** Southern California Association of Governments (SCAG) (2005 and 2012) and U.S. Energy Information Administration (EIA) (2015)

**Number of Data Elements:** 26 polygons

**Number of Data Fields:** 12 fields

<b>Field</b>	<b>Description</b>	<b>Type</b>
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2 OIL AND NATURAL GAS (1B2)**

**1.2.1 NATURAL GAS FUELING STATIONS (IPCC - 1B2)**

**File Name:** Vista\_CA\_NG\_Fueling\_Stations.zip

**Data Format:** polygon shapefile

**Data Source:** U.S. Department of Energy Alternative Fuels Data Center (DOE AFDC) (2017)

**Number of Data Elements:** 208 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2.2 NATURAL GAS STATIONS (IPCC - 1B2)**

**File Name:** Vista\_CA\_NG\_Stations.zip

**Data Format:** polygon shapefile

**Data Source:** California Energy Commission (2017) and U.S. Environmental Protection Agency Facility Level GreenHouse Gas Tool (2017)

**Number of Data Elements:** 1,120 points

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2.3 OIL AND GAS FACILITIES (IPCC - 1B2)**

**File Name:** Vista\_CA\_Oil\_and\_Gas\_Facilities.zip

**Data Format:** point shapefile

**Data Source:** California Energy Commission (CEC) (2018)

**Number of Data Elements:** 3,356 polygons

**Number of Data Fields:** 11 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2.4 OIL AND GAS FIELD BOUNDARIES (IPCC - 1B2)**

**File Name:** Vista\_CA\_Oil\_and\_Gas\_Field\_Boundaries.zip

**Data Format:** point shapefile

**Data Source:** California Energy Commission (CEC) (2018)

**Number of Data Elements:** 516 polygons

**Number of Data Fields:** 9 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2.5 OIL AND GAS WELLS (IPCC - 1B2)**

**File Name:** Vista\_CA\_Oil\_and\_Gas\_Wells.zip

**Data Format:** point shapefile

**Data Source:** California Department of Conservation Division of Oil, Gas, and Geothermal Resources (DOGGR) (2017)

**Number of Data Elements:** 225,766 points

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text

VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2.6 PROCESSING PLANTS (IPCC - 1B2)**

**File Name:** VistaCA\_Processing\_Plants.zip

**Data Format:** polygon shapefile

**Data Source:** U.S. Energy Information Administration (EIA) (2014)

**Number of Data Elements:** 26 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**1.2.7 STORAGE FIELDS (IPCC - 1B2)**

**File Name:** Vista\_CA\_Storage\_Fields.zip

**Data Format:** polygon shapefile

**Data Source:** California Department of Conservation Division of Oil, Gas, and Geothermal Resources (DOGGR) (2016), U.S. Energy Information Administration (EIA) (2016)

**Number of Data Elements:** 12 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**2. AGRICULTURE, FORESTRY, AND OTHER LAND USES (IPCC 3 LEVEL 3)**

**2.1 ENTERIC FERMENTATION (3A1)**

**2.1.1 FEED LOTS (IPCC - 3A1)**

**File Name:** Vista\_CA\_Feed\_Lots.zip

**Data Format:** point shapefile

**Data Source:** California Regional Water Quality Control Board (RWQCB) Rancho Cordova, Fresno, and Santa Ana Region (RQWCB) (2017), State Water Resource Control Board Regulated Facility Report (California Integrated Water Quality System Project) (2018)

**Number of Data Elements:** 72 points

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**2.2 MANURE MANAGEMENT (3A2)**

**2.2.1 DIGESTERS (IPCC - 3A2)**

**File Name:** Vista\_CA\_Digesters.zip

**Data Format:** polygon shapefile

**Data Source:** California Air Resources Board (CARB) (2016)

**Number of Data Elements:** 33 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**2.3 ENTERIC FERMENTATION & MANURE MANAGEMENT (3A1 and 3A2)**

**2.3.1 DAIRIES (IPCC - 3A2)**

**File Name:** Vista\_CA\_Dairies.zip

**Data Format:** point shapefile

**Data Source:** California Regional Water Quality Control Board (RWQCB) Rancho Cordova, Fresno, and Santa Ana Region (RWQCB) (2017), State Water Resource Control Board Regulated Facility Report (California Integrated Water Quality System Project) (2018)

**Number of Data Elements:** 1,715 points

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**3. WASTE (IPCC 4 LEVEL 3)**

**3.1 MANAGED WASTE DISPOSAL (4A1)**

**3.1.1 LANDFILLS (IPCC - 4A1)**

**File Name:** Vista\_CA\_Landfills.zip

**Data Format:** polygon shapefile

**Data Source:** California Air Resources Board (CARB) (2014), California's Department of Resources Recycling and Recovery's Solid Waste Information System (CalRecycle) (2015), Southern California Association of Governments (SCAG) (2005 and 2012)

**Number of Data Elements:** 714 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista_ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text

VistaDate	Date of most recent update	Date
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**3.2 BIOLOGICAL TREATMENT OF SOLID WASTE (4B)**

**3.2.1 COMPOSTING SITES (IPCC – 4B)**

**File Name:** Vista\_CA\_Composting\_Sites.zip

**Data Format:** point shapefile

**Data Source:** California's Department of Resources Recycling and Recovery's Solid Waste Information System (CalRecycle) (2015)

**Number of Data Elements:** 430 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

**3.3 DOMESTIC AND INDUSTRIAL WATER TREATMENT AND DISCHARGE (4D1 and 4D2)**

**3.3.1 WASTEWATER TREATMENT PLANTS (IPCC - 4D1 and 4D2)**

**File Name:** Vista\_CA\_Wastewater\_Treatment\_Plants.zip

**Data Format:** polygon shapefile

**Data Source:** California Air Resources Board (CARB) (2016), Southern California Association of Governments (SCAG) (2005 and 2012)

**Number of Data Elements:** 149 polygons

**Number of Data Fields:** 12 fields

Field	Description	Type
FID	Feature identification number	Object ID
Shape	Shapefile format	Text
Latitude	y-coordinate in decimal degrees	Double
Longitude	x-coordinate in decimal degrees	Double
City	City where the Vista feature exists	Text
State	State where the Vista feature exists	Text
Source	Source of original data	Text
Vista ID	Unique alphanumeric Vista feature identifier	Text
VistaIPCC	IPCC sector designation of the Vista feature	Text
VistaName	Name of the Vista feature	Text
VistaSType	Type of methane source	Text
VistaDate	Date of most recent update	Date

## E. REFERENCES

1. California Department of Conservation Division of Oil Gas and Geothermal Resources. GIS Mapping <http://www.conservation.ca.gov/dog/maps/Pages/GISMapping2.aspx>.
2. California Department of Resources Recycling and Recovery (CalRecycle). SWIS Facility/Site Search <http://www.calrecycle.ca.gov/SWFacilities/Directory/Search.aspx>.
3. California Energy Commission, GIS Open Data. <https://cecgis-caenergy.opendata.arcgis.com/>.
4. CARB. *GHG Inventory Technical Documentation*; 2014.
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