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Sources of Methane Emissions (Vista-LA), South Coast Air Basin, California, USA

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Documentation Revision Date: 2018-01-03

Data Set Version: 1

Summary

This data set provides spatial data products with identified and classified locations of potential methane (CH₄) emitting facilities and infrastructure in the South Coast Air Basin (SoCAB). These data products form a GIS-based mapping database designed to address shortcomings in current urban CH₄ source inventories and is known as Vista Los Angeles (Vista-LA). SoCAB is the air shed for the greater Los Angeles urban area, which includes urbanized portions of the Los Angeles, Orange, Riverside, and San Bernardino Counties, California, USA. Vista-LA consists of detailed spatial maps for facilities and infrastructure in the SoCAB that are known or expected sources of CH₄ emissions and illustrates the spatial distribution of potential CH₄ sources, representing a first step towards developing an urban-scale CH₄ emissions gridded inventory for the SoCAB. Vista-LA spatial data sets were created utilizing an assortment of publicly available data sources from local, state, and federal agencies for the years 2012 to 2017. The final Vista-LA database contains over 33,000 entries, which are presented as thirteen CH₄ emitting infrastructure maps.

This data set includes 13 compressed shapefiles (*.zip). The shapefile data are also provided in .kmz format for viewing in Google Earth.

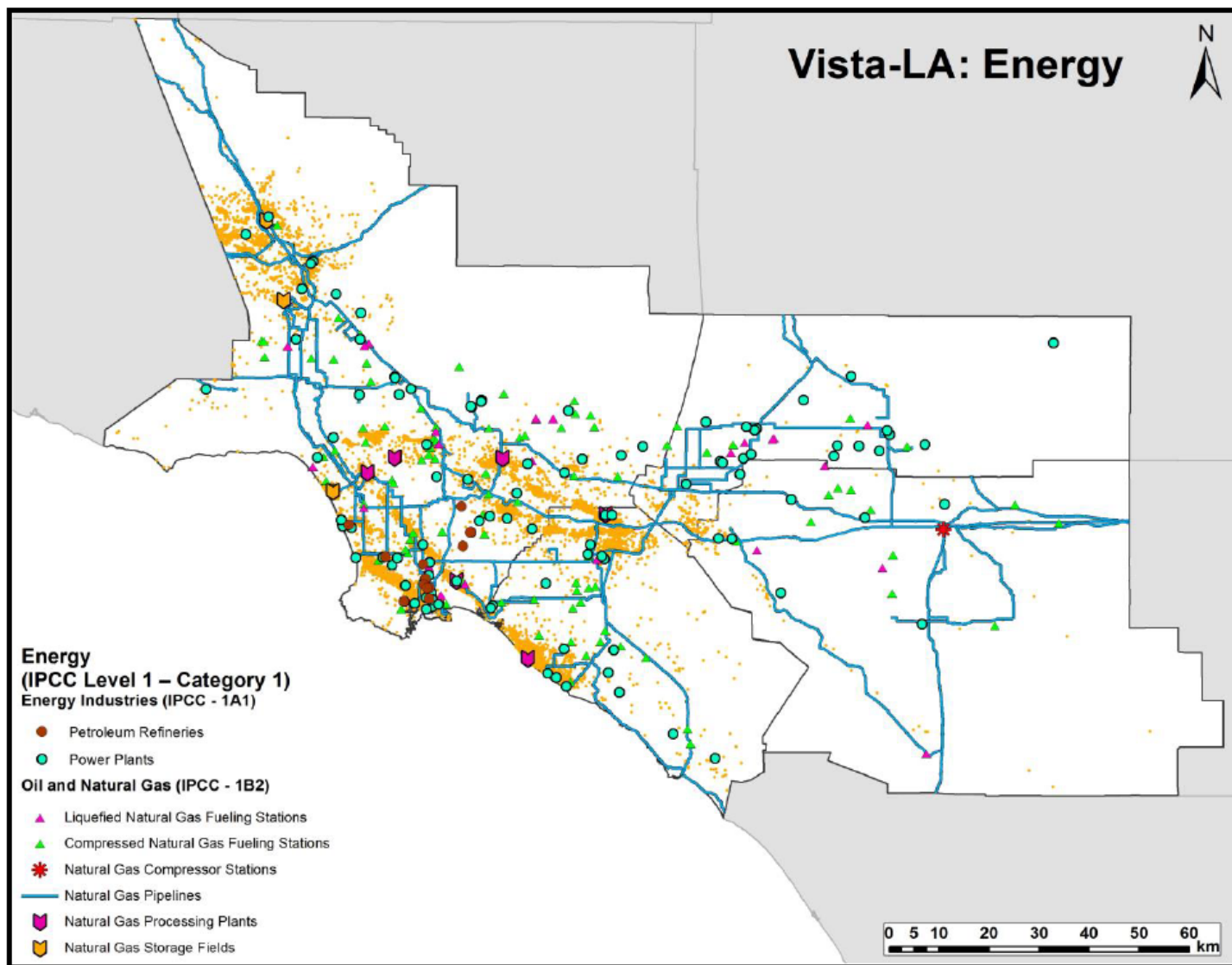


Figure 1. Locations for infrastructures associated with the energy industry with known or expected potential to emit CH₄ in the South Coast Air Basin (SoCAB). Vista-LA includes a total of 33,614 features across 13 layers. From Carranza et al., 2017.

Citation

Carranza, V., T. Rafiq, I. Frausto-Vicencio, F. Hopkins, K.R. Verhulst, P. Rao, R.M. Duren, and C.E. Miller. 2018. Sources of Methane Emissions (Vista-LA), South Coast Air Basin, California, USA. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1525>

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1. Data Set Overview

The Vista-LA database is a GIS-based CH₄ emissions mapping database designed to address shortcomings in current urban CH₄ inventories. Vista encompasses key CH₄ emissions categories from the Intergovernmental Panel on Climate Change (IPCC) greenhouse gas (GHG) inventory methodology. Vista-LA spatial data identify and classify locations of potential methane emitting facilities and infrastructure in the South Coast Air Basin (SoCAB). SoCAB is the air shed for the greater Los Angeles urban extent, which includes urbanized portions of the Los Angeles, Orange, Riverside, and San Bernardino Counties. Vista-LA spatial data were created utilizing an assortment of publicly available data sources from local, state, and federal

agencies. Vista-LA spatial data 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 (“CH4 Sectors”) and level 3 relating to specific emission sources (“CH4 Sources”). This database contains over 33,000 entries which are presented as CH4 emitting infrastructure maps that will improve understanding of CH4 emissions in the Los Angeles megacity.

Project: [North American Carbon Program \(NACP\)](#)

The North American Carbon Program (NACP) is a multidisciplinary research program to obtain scientific understanding of North America's carbon sources and sinks and of changes in carbon stocks needed to meet societal concerns and to provide tools for decision makers.

Related Publication:

Carranza, V., T. Rafiq, I. Frausto-Vicencio, F. Hopkins, K.R. Verhulst, P. Rao, R.M. Duren, and C.E. Miller. 2017. Vista-LA: Mapping methane emitting infrastructure in the Los Angeles megacity. Submitted to *Earth Syst. Sci. Data*.

Acknowledgements:

This project was funded by the NASA Carbon Cycle Science Program Grant NNN13D504T.

2. Data Characteristics

Spatial Coverage: South Coast Air Basin (SoCAB), California, USA

Spatial Resolution: point, polylines, and polygons

Temporal Coverage: 2005-01-01 to 2017-03-31

Temporal Resolution: One time

Study Area (All latitude and longitude given in decimal degrees)

Site	West	East	North	South
South Coast Air Basin (SoCAB) that includes urbanized portions of Los Angeles, Orange, Riverside, and San Bernardino Counties	-118.913288	-116.676164	34.81774	33.433425

Data File Information:

The Vista-LA data set features thirteen spatial layers totaling to 33,614 individual features comprised of geo-located and validated points, polylines, and polygons. This data set contains 13 compressed shapefiles (.zip) of which three are point layers, one is a polyline layer, and nine are polygon layers. The spatial domain for all the data has been geo-processed to fit the SoCAB extent and all data are georeferenced to the WGS 1984 Datum and UTM Zone 11N Projection. Units for dimensions and activity data has been kept consistent with the original data source.

Companion Files: 13 .kmz files are provided which contain the shapefile data for viewing in Google Earth along with *NACP_Vista_LA_Data_Information.pdf* that provides specific information and definitions for every data field found in each Vista-LA spatial layer

Table 1. Data file names and descriptions

File Names	Description
VistaLA_Anaerobic_Lagoons.zip	The Vista-LA anaerobic lagoons layer contains a total of 228 anaerobic lagoons in SoCAB based on National Agriculture Imagery Program (NAIP) and Google Earth's Time Tool for the year 2015.
VistaLA_CNG_Fueling_Stations.zip	The Vista-LA CNG fueling stations data provides location, extent and site specific information for 109 Compressed Natural Gas (CNG) fueling stations within SoCAB based on USDOE's Alternative Fuels Data Center for the year 2017.
VistaLA_Dairies.zip	The Vista-LA dairy layer contains a total of 110 dairy facilities in SoCAB based on data from California Regional Water Quality Control Board (RWQCB) 2015.
VistaLA_LNG_Fueling_Stations.zip	The Vista-LA LNG fueling stations data provides location, extent and site specific information for 27 liquefied natural gas (LNG) fueling stations within SoCAB based on USDOE's Alternative Fuels Data Center for the year 2017.
	The Vista-LA landfills data provides location, extent, site-specific information (such as

VistaLA_Landfills.zip	throughput, capacity, and waste types) and operation status for 334 landfills within SoCAB based on data from CalRecycle 2015 and Southern California Association of Governments (SCAG) land use data for the years 2005 and 2012.
VistaLA_NG_Compressor_Stations.zip	The Vista-LA natural gas compressor stations layer contains two verified geolocated natural gas compressor stations located in SoCAB from data obtained from USEPA's facility level information on GHG online reporting Tool (EPA Flight 2016).
VistaLA_NG_Pipelines.zip	The Vista-LA natural gas pipelines layer contains 111 polyline segments located in SoCAB based on data from the US Energy Information Administration (EIA 2017).
VistaLA_NG_Processing_Plants.zip	The Vista-LA natural gas processing plant layer contains verified geolocated polygons of 6 facilities located in SoCAB based on data from US Energy Information Administration (EIA) online database for the year 2014.
VistaLA_NG_Storage_Fields.zip	The Vista-LA natural gas storage field polygon layer contains the spatial and attribute information of the three natural gas storage facilities located within SoCAB based on data for the year 2016 from US Energy Information Administration (EIA) and California's Division of Oil, Gas, and Geothermal Resources (DOGGR 2016).
VistaLA_Oil_Gas_Wells.zip	The Vista-LA oil and gas wells layer contains information on 32,537 oil and gas wells within the SoCAB based on data from DOGGR 2016.
VistaLA_Petroleum_Refineries.zip	The Vista-LA petroleum refinery data provides location and extent data for 12 petroleum refineries within SoCAB based on data from US Energy Information Administration (EIA) 2016 and Southern California Association of Governments (SCAG) land use data for the years 2005 and 2012.
VistaLA_Power_Plants.zip	The Vista-LA power plants data provides location and extent data for 109 power plants within SoCAB based on data from US Energy Information Administration (EIA) 2016 and Southern California Association of Governments (SCAG) land use data for the years 2005 and 2012.
VistaLA_Wastewater_Treatment_Plants.zip	The Vista-LA wastewater treatment plants layer provides accurate location, extent and facility level metrics for a total of 26 largest domestic wastewater treatment plants in SoCAB based on data from California Air Resources Board (CARB) 2016 and SCAG 2005, 2012.

Attributes of the respective shapefiles are provided in Tables 2-14 below.

Table 2: VistaLA_Anaerobic_Lagoons.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Longitude	x-coordinate in decimal degrees
Latitude	y-coordinate in decimal degrees
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 3: VistaLA_CNG_Fueling_Stations.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Fuel_Type	CNG=Compressed Natural Gas
Station_Na	Station Name; Name of the CNG fueling station

Station_Add	Station Address; Address of the CNG fueling station														
City_1	City location of the CNG fueling station														
State	State location of the CNG fueling station														
ZIP	Zip Code of the CNG fueling station														
Status_Cod	Status Code; The current status of the station given as a code; E=Open														
NG_Fill_Ty	<p>The type of dispensing capability available at CNG stations</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Q</td> <td>Quick Fill</td> </tr> <tr> <td>T</td> <td>Timed Fill</td> </tr> <tr> <td>B</td> <td>Both: quick fill and timed fill</td> </tr> </tbody> </table>	Category	Description	Q	Quick Fill	T	Timed Fill	B	Both: quick fill and timed fill						
Category	Description														
Q	Quick Fill														
T	Timed Fill														
B	Both: quick fill and timed fill														
NG_PSI	Natural Gas operating pressure (pounds per square inch)														
Latitude	y-coordinate in decimal degrees														
Longitude	x-coordinate in decimal degrees														
ID_1	CNG fueling station identification number														
Owner_Type	<p>The type of organization that owns the fueling infrastructure</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>Privately Owned</td> </tr> <tr> <td>T</td> <td>Utility Owned</td> </tr> <tr> <td>FG</td> <td>Federal Government Owned</td> </tr> <tr> <td>LG</td> <td>Local Government Owned</td> </tr> <tr> <td>SG</td> <td>State Government Owned</td> </tr> <tr> <td>J</td> <td>Jointly owned (combination of owner type)</td> </tr> </tbody> </table>	Category	Description	P	Privately Owned	T	Utility Owned	FG	Federal Government Owned	LG	Local Government Owned	SG	State Government Owned	J	Jointly owned (combination of owner type)
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T	Utility Owned														
FG	Federal Government Owned														
LG	Local Government Owned														
SG	State Government Owned														
J	Jointly owned (combination of owner type)														
Federal_Ag	Federal Agency; A record for the federal agency that owns the CNG station is displayed if it is owned by one														
Open_Date	Date when the CNG fueling station opened														
NG_Vehicle	<p>Type of vehicles served at the CNG fueling station</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>HD</td> <td>Heavy-duty vehicles</td> </tr> <tr> <td>LD</td> <td>Light-duty vehicles</td> </tr> <tr> <td>MD</td> <td>Medium-duty vehicles</td> </tr> </tbody> </table>	Category	Description	HD	Heavy-duty vehicles	LD	Light-duty vehicles	MD	Medium-duty vehicles						
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HD	Heavy-duty vehicles														
LD	Light-duty vehicles														
MD	Medium-duty vehicles														
Notes	Vista validation notes														
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery														
Vista_Date	Date of most recent update by the NASA JPL Vista Team														

Table 4: VistaLA_Dairies.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Site_Descr	Site Description; Name of the farm
Facility_S	Address of the farm
Basin	Basin location of the farm
Place_ID	Unique dairy farm identifier
GPSLat_D	Latitude, y-coordinate in decimal degrees
GPSLong_D	Longitude, x-coordinate in decimal degrees
Report_Y ea	Year the report was generated
No_Milking	Amount of milking cows on the farm
Report_Y_1	Amount of dry cows on the farm
No_Heifers	Amount of young female cows that haven't borne a calf on the farm
No_Calves	Amount of young cows on the farm
No_Horses	Amount of horses on the farm
No_Pigs	Amount of pigs on the farm
Others	Amount of other animals on the farm
Annual_Man	Amount of manure produced (tons/year)
Manure_Hau	Amount of manure hauled (tons/year)
FacilityCr	Amount of crops at a facility (tons) (if available)
Crop	Types of crops grown on the farm (if applicable)
WW	Amount of waste water generated (gallons/day)
ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery
notes	Vista validation notes
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 5: VistaLA_LNG_Fueling_Stations.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
State	State
StAddr	Street Address

City	City														
Postal	Zip Code														
Fuel_Type	Fuel Type used at the fueling station; LNG= liquefied natural gas														
Station_1	Station Name; Name of the LNG fueling station														
Intersecti	Intersection; Location of the nearest intersection														
Station_Ph	Station Phone; Phone number of LNG fueling station (if available)														
Station_C_1	Station Code; The current status of the station given as a code; E=Open														
Latitude_1	Y-coordinate in decimal degrees														
Longitud_1	X-coordinate in decimal degrees														
ID_12	LNG fueling station identification number														
Owner_Ty_1	<p>The type of organization that owns the fueling infrastructure</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>Privately Owned</td> </tr> <tr> <td>T</td> <td>Utility Owned</td> </tr> <tr> <td>FG</td> <td>Federal Government Owned</td> </tr> <tr> <td>LG</td> <td>Local Government Owned</td> </tr> <tr> <td>SG</td> <td>State Government Owned</td> </tr> <tr> <td>J</td> <td>Jointly owned (combination of owner type)</td> </tr> </tbody> </table>	Category	Description	P	Privately Owned	T	Utility Owned	FG	Federal Government Owned	LG	Local Government Owned	SG	State Government Owned	J	Jointly owned (combination of owner type)
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FG	Federal Government Owned														
LG	Local Government Owned														
SG	State Government Owned														
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Open_Date_1	Date when the LNG fueling station opened														
NG_Vehic_1	<p>Type of vehicles served at the LNG fueling station</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>HD</td> <td>Heavy-duty vehicles</td> </tr> <tr> <td>LD</td> <td>Light-duty vehicles</td> </tr> <tr> <td>MD</td> <td>Medium-duty vehicles</td> </tr> </tbody> </table>	Category	Description	HD	Heavy-duty vehicles	LD	Light-duty vehicles	MD	Medium-duty vehicles						
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Notes	Vista validation notes														
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery														
VistaDate	Date of most recent update by the NASA JPL Vista Team														

Table 6: VistaLA_Landfills.zip

Field	Description
Location	Address of the landfill
Placename	Name of the city the landfill resides in
Zip	Zip code the landfill resides in
	Enforcement Agency; the entity responsible for enforcing solid waste handling laws and regulations in a particular

EnforAgent	jurisdiction in the state.	
Owner	Name of the owner of the landfill	
Category	A set of waste management activities that are related through similar waste handling methods. Categories include: Transfer/Process, Composting, Transformation, Disposal, Waste Tire Site	
	Category	Description
	Disposal	The final deposition of solid wastes onto land, into the atmosphere, or into the waters of the state.
Activity	A solid waste facility or site or operation may include one or more waste handling activities.	
	Category	Description
	Solid Waste Disposal Site	"Disposal site" or "site" includes the place, location, tract of land, area, or premises in use, intended to be used, or which has been used for the landfill disposal of solid wastes.
	Solid Waste Landfill	A disposal facility that currently accepts solid waste for land disposal, but does not include a facility which receives only wastes generated by the facility owner or operator in the extraction, beneficiation, or processing of ores and minerals, or a cemetery which disposes onsite only the grass clippings, floral wastes, or soil resulting from activities on the grounds of that cemetery.
RegStatus	Regulatory Status; The state of a particular waste handling facility, operation or site with respect to the requirements that the waste handling activities are to be conducted under the terms and conditions of a permit, closure plan, never been required to have a permit, or currently not required to have a permit.	
	Category	Description
	Exempt	After a public hearing the enforcement agency may grant an exemption from the requirement that a solid waste facility obtain a permit.
	Not Currently Required	Regulatory status is not currently required
	Permitted	Indicates that a facility or site held a solid waste facility permit
	Pre-regulations	Used for those disposal sites that ceased operations prior to August 15, 1977, when solid waste facility permits were required. Pre- regulation may also be used in the interim for those operations/facilities that may come under tiered requirements for permitting at a later date.
	To Be Determined	There is presently not enough information to determine a Regulatory Status or Operational Status
	Unpermitted	Indicates that the facility, operation or site never had or does not have a Solid Waste Facility Permit.
OpStatus	Operation Status of the landfill	
Latitude	y-coordinate in decimal degrees	
Longitude	x-coordinate in decimal degrees	
SiteID	Unique numeric identifier for the landfill site	
UnitID	Unique numeric identifier for the landfill unit	
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery	
Ver_SCAG_0	Y/N Flag to indicate verification with SCAG 2005 land use data	
Ver_SCAG_1	Y/N Flag to indicate verification with SCAG 2012 land use data	

Notes	Vista validation notes
Shape_Area	Area of the polygon (square miles)
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 7: VistaLA_NG_Compressor_Stations.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Facility_N	Name of the natural gas compressor station
Operator_N	Name of the operator in charge of the natural gas compressor station
Address	Address of the natural gas compressor station
City	City of the natural gas compressor station
County	County of the natural gas compressor station
State	State of the natural gas compressor station
Zip_Code	Zipcode of the compressor station
Latitude	y-coordinate in decimal degrees
Longitude	x-coordinate in decimal degrees
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 8: VistaLA_NG_Pipelines.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Typepipe	Pipeline extent type, intrastate=within a state, interstate=between states
Operator	Name of Operating Company
Length	Length of pipeline line segment (miles)

Table 9: VistaLA_NG_Processing_Plants.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Facility	Facility name of the natural gas processing plant
Owner	Name of the natural gas processing plant Owner

Operator	Name of the natural gas processing plant Operator
State	State of the natural gas processing plant
County	County of the natural gas processing plant
City	City of the natural gas processing plant
ZipCode	Zip code of the natural gas processing plant
Plant_Flow	Plant flow (Million cubic feet per day)
BTU_Conten	Energy Content (British thermal units)
Dry_Stor	Dry Storage (Million cubic feet)
NGL_Stor	Amount of liquefied natural gas stored at this processing plant (barrel)
Latitude	y-coordinate in decimal degrees
Longitude	x-coordinate in decimal degrees
Capa_MMcfcd	Processing capacity of the natural gas processing plant (Million cubic feet per day)
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 10: VistaLA_NG_Storage_Fields.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
NAME	Name of the natural gas storage field
FIELD_CODE	DOGGR field boundary identifier
AREA_SQ_MI	Area of the natural gas storage field (square miles)
AREA_ACRE	Area of the natural gas storage field (acres)
PERIMETER	Length of perimeter around the natural gas storage field (miles)
District	DOGGR field boundary district number for the state of California (6 total districts)
Statename	Name of the state of the natural gas storage field
Reservoir	Name of the reservoir of the natural gas storage field
Fld_type	Field Type; the type of field the natural gas sits in
Company	Name of the operating company of the natural gas storage field
County	Name of the county of the natural gas storage field
Region	Name of the region of the natural gas storage field
Status	Operational status of the natural gas storage field
Base_gas	Volume of natural gas intended as permanent inventory in a storage reservoir to maintain adequate pressure and deliverability rates throughout the withdrawal season (million cubic feet)
Work_cap	Total gas storage capacity minus base gas (million cubic feet)

Fld_cap	Maximum volume of natural gas that can be stored in an underground storage facility in accordance with its design, which comprises the physical characteristics of the reservoir, installed equipment, and operating procedures particular to the site (million cubic feet)
Maxdeliv	Maximum amount of gas that can be delivered (withdrawn) from a storage facility on a daily basis (million cubic feet per day)
Source	Source of the U.S. EIA survey used to obtain data
Period	Last updated by the U.S. EIA
Latitude	y-coordinate in decimal degrees
Longitude	x-coordinate in decimal degrees
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 11: VistaLA_Oil_Gas_Wells.zip

Field	Description																				
FID	Feature identification number																				
Shape	Vector format identification																				
APINumber	Unique, permanent number assigned to each well as standardized by the American Petroleum Institute																				
WellNumber	Operator assigned designation for well																				
WellStatus	Current status of the well																				
	<table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Active (well has been drilled and completed)</td> </tr> <tr> <td>B</td> <td>Buried (older well not abandoned to current standards; location of well is approximate)</td> </tr> <tr> <td>I</td> <td>Idle (well is idle, not producing, but capable of being reactivated)</td> </tr> <tr> <td>N</td> <td>New (recently permitted well; in the process of being drilled)</td> </tr> <tr> <td>P</td> <td>Plugged & Abandoned (Well has been plugged and abandoned to current standards)</td> </tr> <tr> <td>U</td> <td>Unknown (well status not known; mostly older, pre-1976 wells)</td> </tr> </tbody> </table>	Category	Description	A	Active (well has been drilled and completed)	B	Buried (older well not abandoned to current standards; location of well is approximate)	I	Idle (well is idle, not producing, but capable of being reactivated)	N	New (recently permitted well; in the process of being drilled)	P	Plugged & Abandoned (Well has been plugged and abandoned to current standards)	U	Unknown (well status not known; mostly older, pre-1976 wells)						
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U	Unknown (well status not known; mostly older, pre-1976 wells)																				
GISSymbol	Well status code that uses 2-digits to identify type of well																				
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PM	Pressure Maintenance																				

	SC	Cyclic Steam
	SF	Steam Flood
	WD	Water Disposal
	WF	Water Flood
	WS	Water Source
OperatorCo	Operator Company; Unique, permanent number assigned to each operator	
OperatorNa	Operator Name; Name of individual or organization responsible for management of well	
LeaseName	Name of Oil & Gas lease in which well is located	
FieldName	Name of Oil & Gas field in which the well is located	
AreaName	Name of area in which well is located	
District	California Department of Conservation Division of Oil, Gas and Geothermal Resources (DOGGR) district with jurisdiction over the location in which well is located	
County	County with jurisdiction over the location in which well is located	
Section_	Public Land Survey System section number in which well is located	
Township	Public Land Survey System township in which well is located	
Range	Public Land Survey System range in which well is located	
Township_D	Single digit designator for Public Land Survey System township in which well is located	
Range_D	Single digit designator for Public Land Survey System range in which well is located	
BMeridian	Principle meridians required for all California surveys; defines Public Land Survey System base (Base Meridian); SB=San Bernardino	
Latitude	y-coordinate in decimal degrees	
Longitude	x-coordinate in decimal degrees	
Elevation	Surface elevation of the well (feet)	
TotalDepth	Total measured depth of well bore (feet)	
RedrillFt	Total vertical depth of re-drill (feet) (Re-drill Footage)	
RedCanFlag	Represents the number of re-drills for a well (Re-drill Cancel Flag)	
Location	Optional verbal description of well location	
Comments	Optional comments about the well	
GISSource	3-digit code describing the method by which the well location was established (Ranked from most accurate to least accurate)	
	Category	Description
	GPS	Global Positioning System
	OPR	Operator
	SUM	Well summary report
	NOI	Notice of intent to drill

	<table border="1"> <tr> <td>HUD</td> <td>Heads up digitized</td> </tr> <tr> <td>UNK</td> <td>Unknown</td> </tr> </table>	HUD	Heads up digitized	UNK	Unknown
HUD	Heads up digitized				
UNK	Unknown				
DryHole	Y/N flag indicating if a well produced commercial quantities of hydrocarbons				
ConfWell	Confidential Well; Y/N flag indicating if subsurface information for well is held confidential for a period of two years pursuant to Public Resources Code 3234				
DirDrill	Directional Drilling; Indicator of whether well was directionally drilled (NULL for confidential wells)				
HydFrac	Hydraulic Fracturing; BLANK				
	Y/N flag indicating whether a well received hydraulic stimulation treatment (hydraulic fractured)				
BLMWell	Y/N flag indicating whether the Bureau of Land Management (BLM) exercises jurisdiction of well				
EPAWell	Y/N flag indicating whether the Environmental Protection Agency (EPA) exercises jurisdiction of well				
SpudDate	Date on which well drilling commenced				
CompDate	Completion Date; Date on which wellhead oil & gas production equipment was installed				
AbdDate	Abandoned Date; Date on which well was plugged & abandoned to Division standards				
VistaDate	Date of most recent update by the NASA JPL Vista Team				

Table 12: VistaLA_Petroleum_Refineries.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
COUNTYNAME	County where the petroleum refinery resides
Shape_Leng	Perimeter length of the petroleum refinery (miles)
Shape_Area	Area of the petroleum refinery (square miles)
Company	Name of the company operating the petroleum refinery
Corp	Corporation; Name of the corporation in charge of the petroleum refinery
Site	City of the petroleum refinery
ZIP	Zip code of the petroleum refinery
State	State of the petroleum refinery
PADD	Petroleum Administration for Defense Districts; geographic aggregations of the 50 States and the District of Columbia into five districts
AD_Mbpd	Atmospheric Distillation; volume of crude oil processed by the atmospheric distillation chamber (thousands of barrels per day; Mb/d)
VDist_Mbpd	Vacuum Distillation; volume of crude oil processed by the vacuum distillation chamber (thousands of barrels per day; Mb/d)
CaDis_Mbpd	Catalytic Disintegration; volume of crude oil processed by the catalytic disintegration chamber (thousands of barrels per day; Mb/d)

VRedu_Mbpd	Viscosity Reduction; volume of crude oil processed by the viscosity reduction chamber (thousands of barrels per day; Mb/d)
CaRef_Mbpd	Catalytic Reformation; volume of crude oil processed by the catalytic reformation chamber (thousands of barrels per day; Mb/d)
Isal_Mbpd	Alkylation and Isomerization; volume of crude oil processed by the alkylation and isomerization chambers (thousands of barrels per day; Mb/d)
HDS_Mbpd	Hydroesulphurization; volume of crude oil processed by the hydroesulphurization chamber (thousands of barrels per day; Mb/d)
Cokin_Mbpd	Coking; volume of crude oil processed by the coking chamber (thousands of barrels per day; Mb/d)
Asph_Mbpd	Asphalt Production; maximum production of asphalt products (thousands of barrels per day; Mb/d)
Source	Source Agency; source of the data
Period	Date of last update
Latitude	y-coordinate in decimal degrees
Longitude	x-coordinate in decimal degrees
Notes	Vista validation notes
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 13: VistaLA_Power_Plants.zip

Field	Description																
FID	Feature identification number																
Shape	Vector format identification																
Plant_Code	Office of Regulatory Information Systems (ORIS) in the Department of Energy (DOE) Code, unique identification number for each plant																
Plant_Name	Name of the power plant																
Utility_Na	Utility Name; Name of the utility company that owns/operates the power plant																
Utility_ID	Identification number of the utility company that owns/operates the power plant																
Sector_nam	Sector Name; Type of entity that owns the powerplant facilities to generate electric power for sale to utilities and end users																
	<table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Commercial CHP</td> <td>Commercial applications using combined heat and power (CHP) generation methods</td> </tr> <tr> <td>Commercial Non-CHP</td> <td>Commercial applications using Non- combined heat and power (Non-CHP) generation methods</td> </tr> <tr> <td>Electric Utility</td> <td>Utilities engaged in the generation, distribution and sale of electricity</td> </tr> <tr> <td>Industrial CHP</td> <td>Industrial applications using combined heat and power (CHP) methods</td> </tr> <tr> <td>Industrial Non-CHP</td> <td>Industrial applications using Non-combined heat and power (Non-CHP) methods</td> </tr> <tr> <td>IPP CHP</td> <td>Independent Power Producer (IPP) using combined heat and power (CHP) generation methods</td> </tr> <tr> <td>IPP Non-CHP</td> <td>Independent Power Producer (IPP) using Non- combined heat and power (Non-CHP) generation methods</td> </tr> </tbody> </table>	Category	Description	Commercial CHP	Commercial applications using combined heat and power (CHP) generation methods	Commercial Non-CHP	Commercial applications using Non- combined heat and power (Non-CHP) generation methods	Electric Utility	Utilities engaged in the generation, distribution and sale of electricity	Industrial CHP	Industrial applications using combined heat and power (CHP) methods	Industrial Non-CHP	Industrial applications using Non-combined heat and power (Non-CHP) methods	IPP CHP	Independent Power Producer (IPP) using combined heat and power (CHP) generation methods	IPP Non-CHP	Independent Power Producer (IPP) using Non- combined heat and power (Non-CHP) generation methods
	Category	Description															
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	IPP CHP	Independent Power Producer (IPP) using combined heat and power (CHP) generation methods															
IPP Non-CHP	Independent Power Producer (IPP) using Non- combined heat and power (Non-CHP) generation methods																

City	City in which the power plant resides										
County	County in which the power plant resides										
StateName	State in which the power plant resides										
Zip	Zip code in which the power plant resides										
Street_Add	Street address of the power plant										
PrimSource	Primary Source; Primary energy source of the power plant										
	<table border="1"> <thead> <tr> <th>Category</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Biomass</td> <td>Electricity generated from the combustion of or gasification of organic materials</td> </tr> <tr> <td>Natural Gas</td> <td>Involves natural gas fired turbine, which runs a generator to produce electricity</td> </tr> <tr> <td>Other</td> <td>A plant using energy storage technologies, purchased steam, waste heat not directly attributed to a fuel source, and tire-derived fuels</td> </tr> <tr> <td>Petroleum</td> <td>A plant fueled by a broadly defined class of liquid hydrocarbon mixtures.</td> </tr> </tbody> </table>	Category	Description	Biomass	Electricity generated from the combustion of or gasification of organic materials	Natural Gas	Involves natural gas fired turbine, which runs a generator to produce electricity	Other	A plant using energy storage technologies, purchased steam, waste heat not directly attributed to a fuel source, and tire-derived fuels	Petroleum	A plant fueled by a broadly defined class of liquid hydrocarbon mixtures.
	Category	Description									
	Biomass	Electricity generated from the combustion of or gasification of organic materials									
	Natural Gas	Involves natural gas fired turbine, which runs a generator to produce electricity									
Other	A plant using energy storage technologies, purchased steam, waste heat not directly attributed to a fuel source, and tire-derived fuels										
Petroleum	A plant fueled by a broadly defined class of liquid hydrocarbon mixtures.										
Total_MW	Total capacity; the total design capacity of the power plant (megawatts/hour; MW/hr)										
Coal_MW	Design capacity of the power plant for energy derived from coal (megawatts/hour; MW/hr)										
NG_MW	Design capacity of the power plant for energy derived from natural gas (megawatts/hour; MW/hr)										
Crude_MW	Design capacity of the power plant for energy derived from crude oil and petroleum products (megawatts/hour; MW/hr)										
Bio_MW	Design capacity of the power plant for energy derived from biomass (megawatts/hour; MW/hr)										
Hydro_MW	Hydroelectricity; Design capacity of the power plant for energy derived from hydroelectricity (megawatts/hour; MW/hr)										
HydroPS_MW	Hydroelectricity Pumped Storage; Design capacity of the power plant for energy derived from pumped storage (megawatts/hour; MW/hr)										
Nuclear_MW	Nuclear Power; Design capacity of the power plant for energy derived from nuclear (megawatts/hour; MW/hr)										
Solar_MW	Solar Power; Design capacity of the power plant for energy derived from solar (megawatts/hour; MW/hr)										
Wind_MW	Wind Power; Design capacity of the power plant for energy derived from wind (megawatts/hour; MW/hr)										
Geo_MW	Geothermal; Design capacity of the power plant for energy derived from geothermal (megawatts/hour; MW/hr)										
Other_MW	Design capacity of the power plant for energy derived from other sources (megawatts/hour; MW/hr)										
Tech_desc	Description of the technology/methodology used to generate power										
Source	The designated Energy Information Administration (EIA) data collection forms where the power plant data was obtained from										
Period	Period the data was collected for (YYYYMM)										
Latitude	y-coordinate in decimal degrees										
Longitude	x-coordinate in decimal degrees										
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery										
Ver_SCAG_0	Y/N Flag to indicate verification with SCAG 2005 land use data										
Ver_SCAG_1	Y/N Flag to indicate verification with SCAG 2012 land use data										
Notes	Vista validation notes										

Shape_Area	Area of the polygon (square miles)
VistaDate	Date of most recent update by the NASA JPL Vista Team

Table 14: VistaLA_Wastewater_Treatment_Plants.zip

Field	Description
FID	Feature identification number
Shape	Vector format identification
Shape_Area	Area of the polygon (square miles)
Plant	Name of the wastewater treatment plant
Location	Address of the wastewater treatment plant
City	City of the wastewater treatment plant
County	County of the wastewater treatment plant
State	State of the wastewater treatment plant
ZIP	Zip code of the wastewater treatment plant
Latitude	y-coordinate in decimal degrees
Longitude	x-coordinate in decimal degrees
DesignFlow	Amount of intake of wastewater in the treatment plant (million gallons/day)
Notes	Vista validation notes
Ver_Google	Y/N Flag to indicate verification with Google Earth aerial imagery
VistaDate	Date of most recent update by the NASA JPL Vista Team

3. Application and Derivation

The Vista-LA data product is a key tool for CH₄ emissions research and mitigation efforts; by (1) mapping areas of CH₄ emitting infrastructure, (2) identifying targets for CH₄ surveys, and (3) enabling interpretation of atmospheric observations, including source attribution, and comparison of measured emissions to permitted or reported emissions. Combined with atmospheric observations, Vista enables systematic study of urban CH₄ emission sources.

4. Quality Assessment

Vista-LA data have been significantly geoprocessed, edited, digitized, and standardized on the ArcGIS 10.4 platform. Point source locations and spatial extents of infrastructure known or expected to emit methane were extensively validated by comparing multiple data sets which had varying degrees of spatial accuracy. The uncertainty in the final data has been reduced relative to the original data through comparisons of the existing publicly available data and more recent aerial imagery. Where applicable, the point source locations or spatial extents were modified using the best available information, which significantly reduced the uncertainty in the locations of individual facilities and/or infrastructure.

5. Data Acquisition, Materials, and Methods

The Vista-LA database extends over SoCAB, the air-shed for the greater Los Angeles urban extent, including the urbanized parts of Los Angeles, Orange, Riverside, and San Bernardino Counties. It follows the IPCC CH₄ emissions reporting framework (IPCC, 2006) and is compatible with the State of California CH₄ emissions reporting. The database comprises of infrastructures associated with emissions from primarily three sources: energy; agriculture, forestry and other land use; and waste. Spatial data on these infrastructures were compiled from reliable and verified public databases on government and federal/state research agency portals. For more information refer to Carranza et al 2017.

6. Data Access

These data are available through the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC).

[Sources of Methane Emissions \(Vista-LA\), South Coast Air Basin, California, USA](#)

Contact for Data Center Access Information:

- E-mail: uso@daac.ornl.gov
- Telephone: +1 (865) 241-3952

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