



# Using the Visualization Software Qlik for TRI Data Presentation and P2 Outreach

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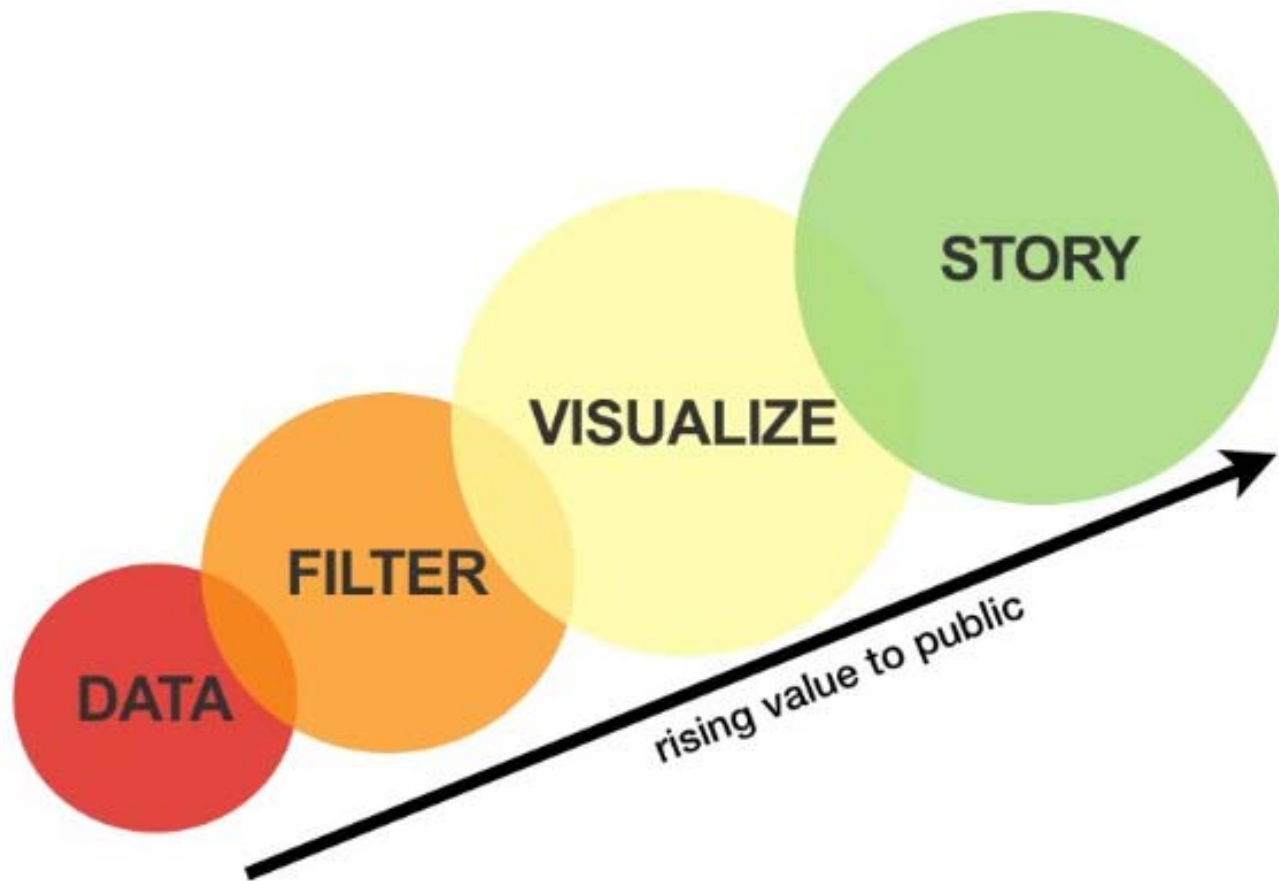
Washington, DC

October 20, 2016





# Data Visualization for Improved Value





## Why Visualization?

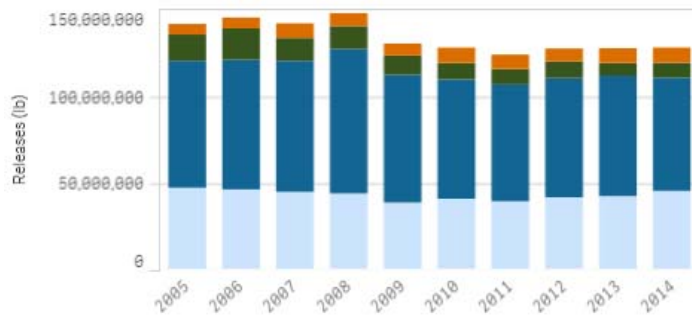
- Study underlying patterns,
- Find relationships,
- Understand data,
- Expand use of underutilized TRI data,
- Integrate more data variables,
- Supplement traditional reports, and
- Promote greater data consumption.



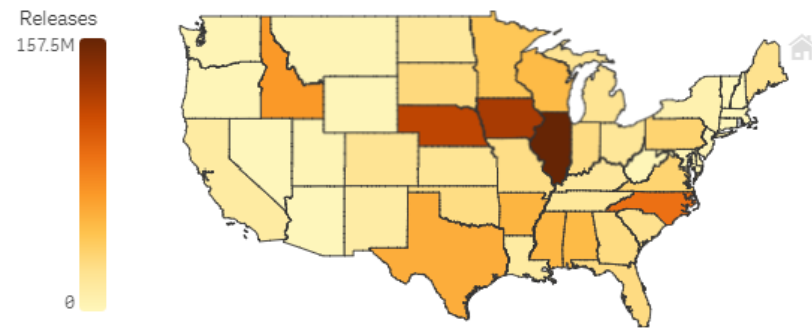
# Types of Visualization

Conventional

### Time Series/Bar Chart

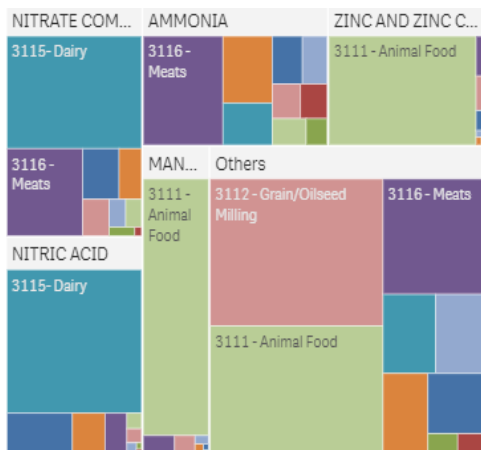


### Choropleth Map

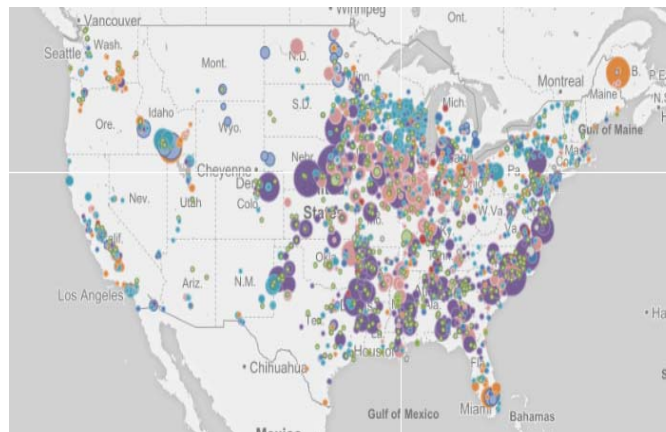


More Elaborate

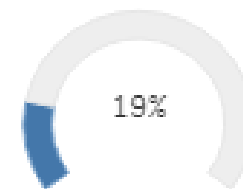
### Tree Map



### Proportional Symbol Map



### Gauge





## Why Create a Food Sector P2 Viz Tool?

- Challenge: Uncoordinated P2 Outreach
- Need
  - Maximize our pollution prevention efforts
  - Focus resources to meet National Emphasis Area (NEA) goals
  - Increase coordination
  - Drive greater innovation



# Food Sector P2 Data Visualization Objectives

Integrate Toxics Release Inventory (TRI), Greenhouse Gas (GHG), and demographic data to help with:

- Targeting
- Amplification
- Barrier Identification



# Demo of Data Visualization using Qlik Sense

[https://qlikviz.epa.gov/extensions/TRI\\_P2\\_Food\\_Manufacturing/TRI\\_P2\\_Food\\_Manufacturing.html](https://qlikviz.epa.gov/extensions/TRI_P2_Food_Manufacturing/TRI_P2_Food_Manufacturing.html)

## TRI Pollution Prevention Profile: Food Manufacturing

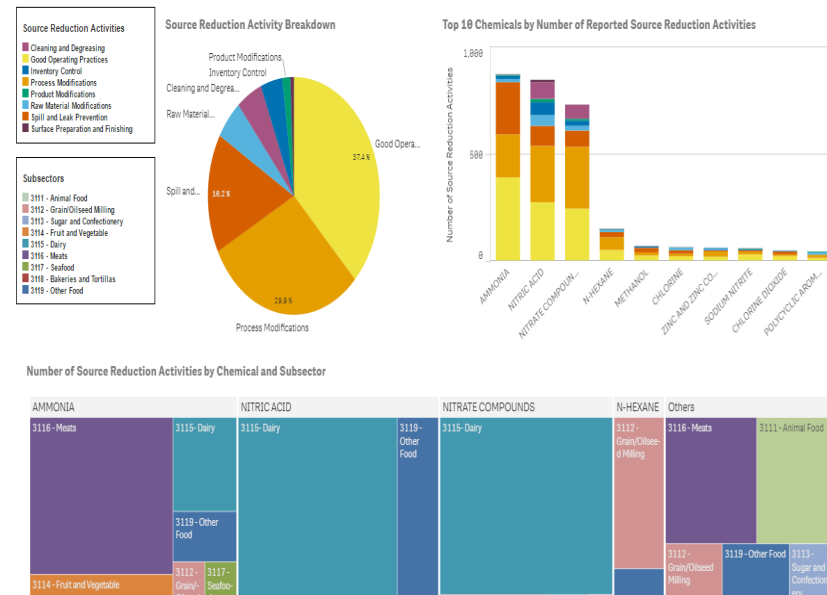
Use the app to:

**learn** about the sector specific data you see

**interact** with the visuals to dig deeper by subsector, chemical and geography

**navigate** through all your information like never before

**draw insight** into pollution prevention approaches





# Facility Map

## TRI Pollution Prevention Profile: Food Manufacturing

Facilities <b>2,236</b>	Facilities with Source Reduction <b>488</b>	Source Reduction Activities <b>3,376</b>	Waste Managed (lb) <b>11.17 billion</b>	Releases (lb) <b>1.34 billion</b>
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[Clear All Selections](#)

[Facility Map](#) | [Source Reduction Activities](#) | [Waste Managed](#) | [Releases](#) | [Chemicals](#) | [Breakdown of Waste Data](#) | [GHGRP and TRI Comparison](#) | [List of Facilities](#)

Quick Stats

Filter options

Tabs

In the default view, all food manufacturing facilities which reported to TRI at some point between 2005 and 2014 are shown. Each bubble denotes a single TRI facility. The size of the bubble is proportional to the amount of releases reported by that facility during the selected time period.

Note: Facilities from American Samoa and Guam are not shown.

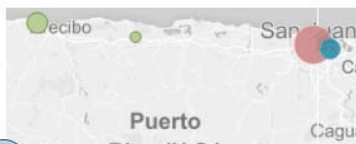
### Food Manufacturing Facilities in Alaska



### Food Manufacturing Facilities in Hawaii



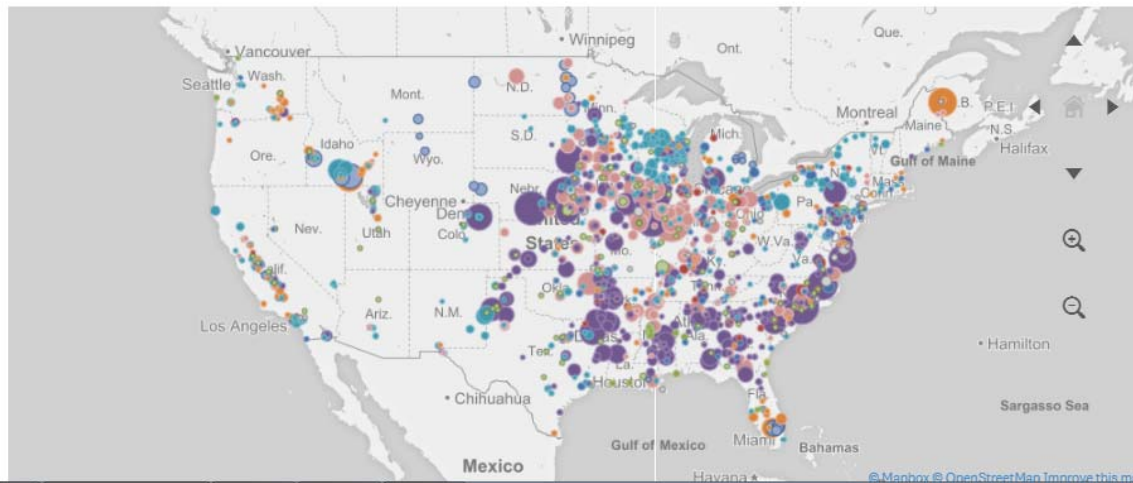
### Food Manufacturing Facilities in Pue...



### Subsectors

- 3111 - Animal Food
- 3112 - Grain/Oilseed Milling
- 3113 - Sugar and Confectionery
- 3114 - Fruit and Vegetable
- 3115 - Dairy
- 3116 - Meats
- 3117 - Seafood
- 3118 - Bakeries and Tortillas
- 3119 - Other Food

### Food Manufacturing Facilities in the Contiguous United States



Proportional map of all food sector facilities reporting from 2005-2014 based on total releases





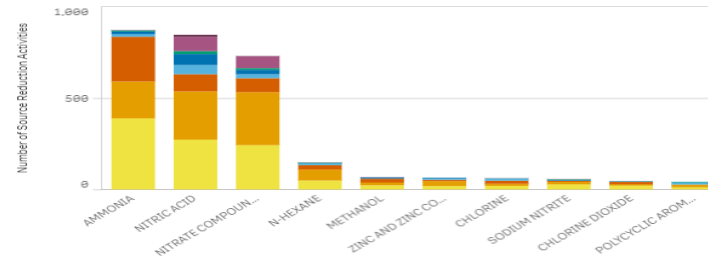
# Source Reduction (SR) Activities

Facility Map | **Source Reduction Activities** | Waste Managed | Releases | Chemicals | Breakdown of Waste Data | GHGRP and TRI Comparison | List of Facilities

- Source Reduction Activities**
- Cleaning and Degreasing
  - Good Operating Practices
  - Inventory Control
  - Process Modifications
  - Product Modifications
  - Raw Material Modifications
  - Spill and Leak Prevention
  - Surface Preparation and Finishing
- Subsectors**
- 3111 - Animal Food
  - 3112 - Grain/Oilseed Milling
  - 3113 - Sugar and Confectionery
  - 3114 - Fruit and Vegetable
  - 3115 - Dairy
  - 3116 - Meats
  - 3117 - Seafood
  - 3118 - Bakeries and Tortillas
  - 3119 - Other Food

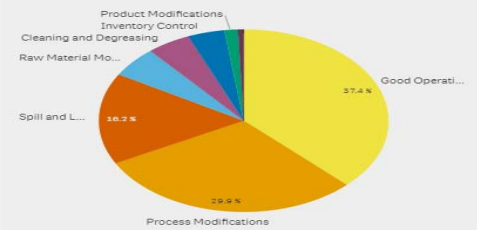
- Cleaning and Degreasing
- Good Operating Practices
- Inventory Control
- Process Modifications
- Product Modifications
- Raw Material Modifications
- Spill and Leak Prevention
- Surface Preparation and Finishing

Top 10 Chemicals by Number of Reported Source Reduction Activities

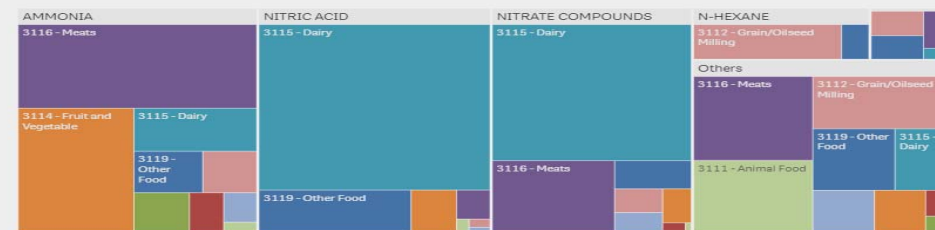


Top chemicals by SR

Source Reduction Activity Breakdown



Number of Source Reduction Activities by Chemical and Subsector



SR by chemical and subsector

Source Reduction Activity by Year, Region, and Subsector

Year	EDR Region	Subsector	Cleaning and Degreasing	Good Operating Practices	Inventory Control	Process Modifications	Product Modifications	Raw Material Modifications	Spill and Leak Prevention	Surface Preparation and Finishing
2005			11	136	19	100	5	11	80	3
2006			11	145	17	84	5	17	60	2
2007			11	123	13	83	2	16	51	4
2008			15	139	12	95	6	28	62	3
2009			12	109	8	89	1	24	39	2
2010			15	105	10	91	1	18	41	3
2011			21	104	9	100	7	21	40	3
2012			27	157	13	116	12	27	64	1
2013			22	150	24	132	13	15	67	1
2014			20	133	14	118	0	13	48	0

Counts

Facility Pollution Prevention Reports for Facilities with Source Reduction Activities

TRIF ID	Chemical	Year	Number of Source Reduction Activities	Facility P2 Report
00039CRBBNSTATE	OZONE	2005	3	P2 Report
00039CRBBNSTATE	OZONE	2006	3	P2 Report
00039CRBBNSTATE	OZONE	2007	3	P2 Report
00039CRBBNSTATE	OZONE	2008	3	P2 Report
00039CRBBNSTATE	OZONE	2009	3	P2 Report
00039CRBBNSTATE	OZONE	2010	3	P2 Report
00039CRBBNSTATE	OZONE	2011	3	P2 Report
00039CRBBNSTATE	OZONE	2012	3	P2 Report
00039CRBBNSTATE	OZONE	2013	3	P2 Report
00039CRBBNSTATE	OZONE	2014	3	P2 Report
00705TRCSNRD14K	NITRATE COMPOUNDS	2007	1	P2 Report
00705TRCSNRD14K	NITRATE COMPOUNDS	2008	1	P2 Report
00705TRCSNRD14K	NITRATE COMPOUNDS	2009	1	P2 Report
00705TRCSNRD14K	NITRATE COMPOUNDS	2010	1	P2 Report
00705TRCSNRD14K	NITRATE COMPOUNDS	2013	1	P2 Report
00918NDLCK198CH	NITRIC ACID	2005	1	P2 Report

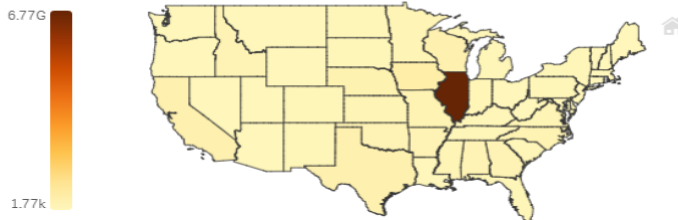
Link to P2 report



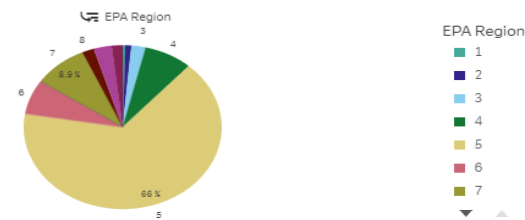
# Waste Managed

Facility Map Source Reduction Activities **Waste Managed** Releases Chemicals Breakdown of Waste Data GHGRP and TRI Comparison List of Facilities

Waste Managed by State (Pounds)

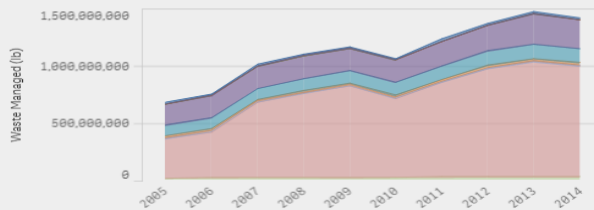


Waste Managed by Location

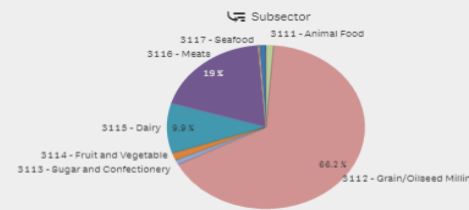


- Subsectors**
- 3111 - Animal Food
  - 3112 - Grain/Oilseed Milling
  - 3113 - Sugar and Confectionery
  - 3114 - Fruit and Vegetable
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  - 3116 - Meats
  - 3117 - Seafood
  - 3118 - Bakeries and Tortillas
  - 3119 - Other Food

Waste Managed by Subsector and Year

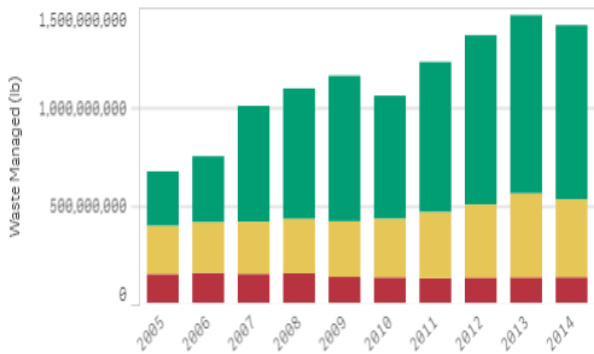


Waste Managed by NAICS Code

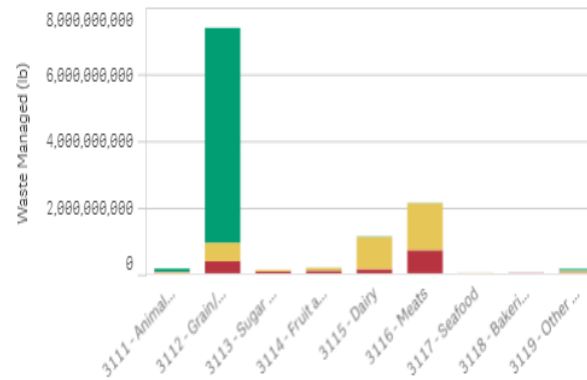


- Waste Management Methods**
- Recycled
  - Energy Recovery
  - Treated
  - Released

Waste Managed by Method and Year



Waste Managed by Method and Subsector



Waste managed by location

by subsector

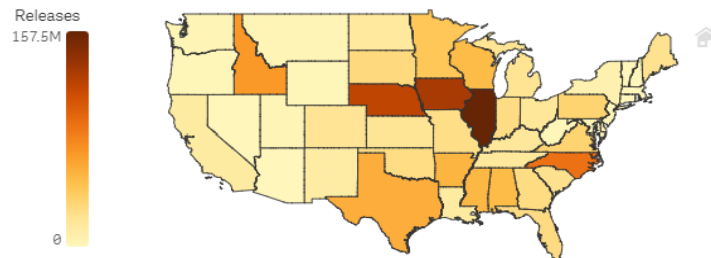
by method



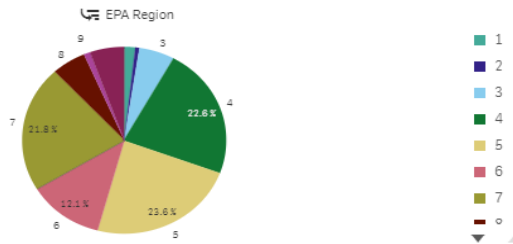
# Releases

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Releases by State



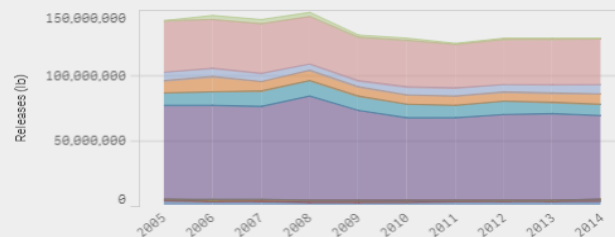
Releases by Location



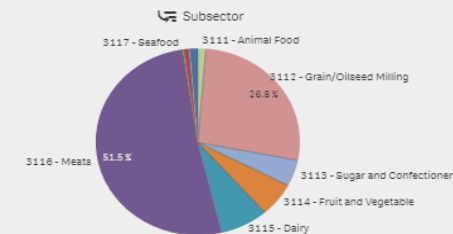
Releases by location

- Subsectors**
- 3111 - Animal Food
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  - 3118 - Bakeries and Tortillas
  - 3119 - Other Food

Releases by Subsector and Year



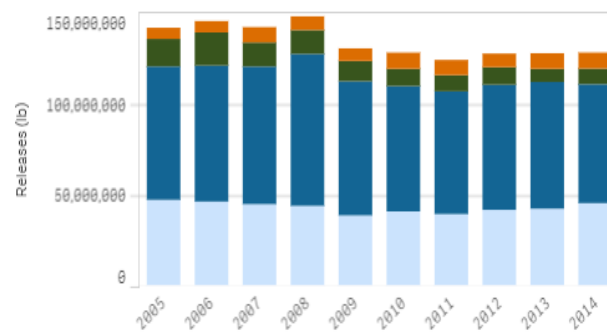
Releases by NAICS Code



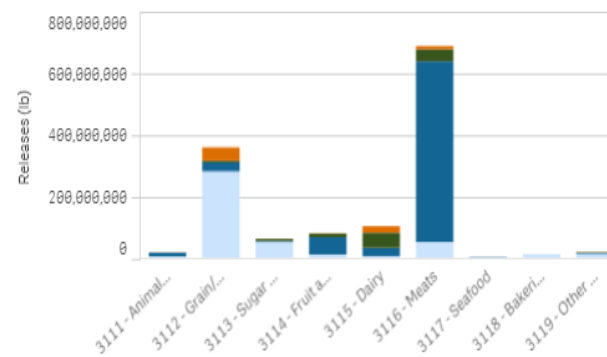
by subsector

- Release Media**
- Off-site Disposal
  - Land
  - Surface Water
  - Air

Releases by Media and Year



Releases by Media and Subsector



by method

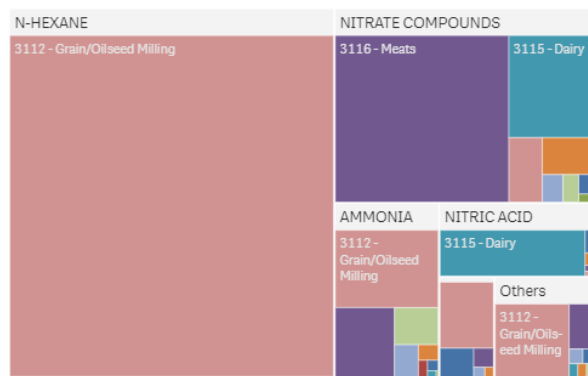


# Chemicals

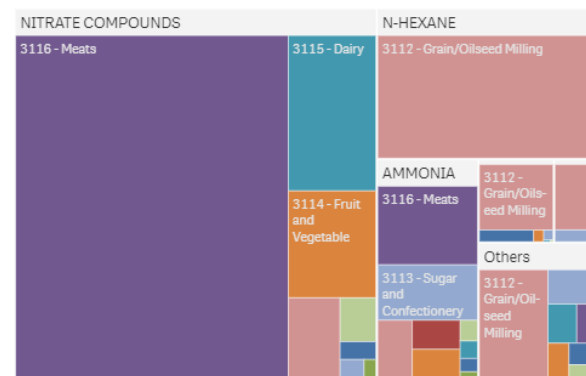
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**Top 5 Chemicals by Waste Managed and Subsector**

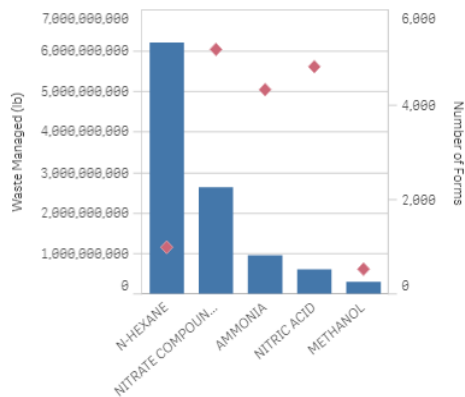


**Top 5 Chemicals by Releases and Subsector**

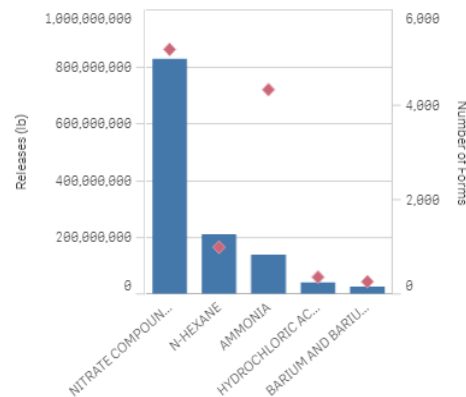


Tree maps of top 5 chemicals by waste managed, releases, forms, and subsector

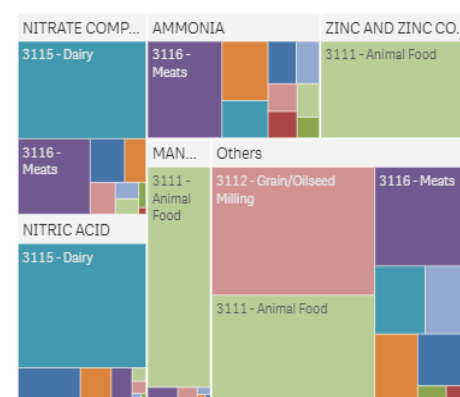
**Top 5 Chemicals by Waste Managed**



**Top 5 Chemicals by Releases**



**Top 5 Chemicals by Forms and Subsector**



# Breakdown of Waste Data



## Facilities, Waste Managed, Releases, and GHG Emissions by Subsector

All Waste Managed and Releases quantities are in pounds. GHG Emissions are in mtCO<sub>2</sub>e.

Measures	Subsector ▼							
	Totals	3111 - Animal Food	3112 - Grain/Oilseed Milling	3113 - Sugar and Confectionery	3114 - Fruit and Vegetable	3115 - Dairy	3116 - Meats	3117 - Seafood
Facilities	2,236	541	254	46	200	539	445	34
Facilities with Source Reduction	480	22	69	17	48	163	99	8
Waste Managed	11,166,011,868	137,801,404	7,390,020,284	105,407,682	162,041,096	1,105,315,022	2,118,515,632	8,777,503
Recycled	6,629,385,332	92,979,693	6,467,825,646	19,132	4,473,982	11,096,656	7,688,114	67,539
Energy Recovery	6,985,278	57,613	3,761,906	216,188	29,821	1,337,223	792,207	0
Treated	3,156,393,900	27,040,056	557,015,969	42,860,711	77,642,152	969,799,433	1,414,397,595	6,667,971
Disposed of or Otherwise Released	1,373,247,358	17,724,042	361,416,763	62,311,651	79,895,140	123,081,710	695,637,717	2,041,993
Total Disposal or Other Releases	1,338,666,680	17,062,996	358,857,477	61,465,469	78,955,522	102,308,893	688,842,881	2,237,014
On-site	1,261,390,849	16,588,370	315,591,041	60,955,132	78,200,868	80,991,383	678,320,761	2,230,541
Air	426,509,494	4,080,824	281,011,098	50,663,795	10,326,165	5,050,267	51,032,177	772,608
Water	720,265,797	12,425,577	29,056,703	3,249,859	56,151,529	26,778,215	588,253,747	1,448,661
Land	114,615,558	81,969	5,523,240	7,041,477	11,723,173	49,162,900	39,034,838	9,271
Off-site	77,275,831	474,626	43,266,436	510,337	754,655	21,317,510	10,522,120	6,473
GHG Emissions	36,705,489	232,474	21,218,433	5,794,931	2,465,272	1,007,757	4,463,249	80,760

Data table

# GHGRP and TRI Comparison



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**[GHGRP and TRI Comparison](#)**
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GHGRP data in this visualization is only linked to TRI data by subsector and location.

GHGRP Facilities in 2014

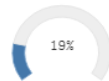
**324**

GHGRP Emissions (mtCO<sub>2</sub>e)

**36.71 million**

Percent of TRI Facilities in 2014

Portion of TRI Facilities with 2014 GHGRP Emissions



GHGRP/TRI Facility Overlap

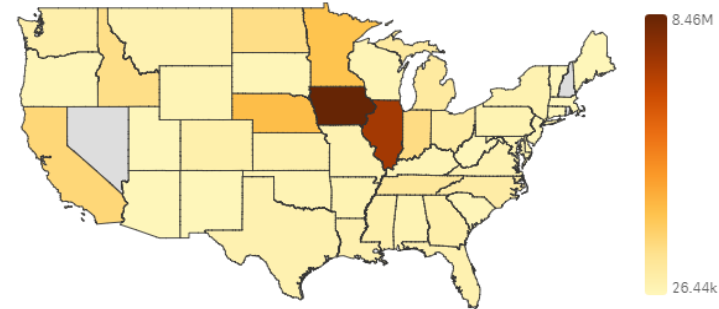
**292**

GHGRP/TRI Emissions Overlap (mtCO<sub>2</sub>e)

**35.29 million**

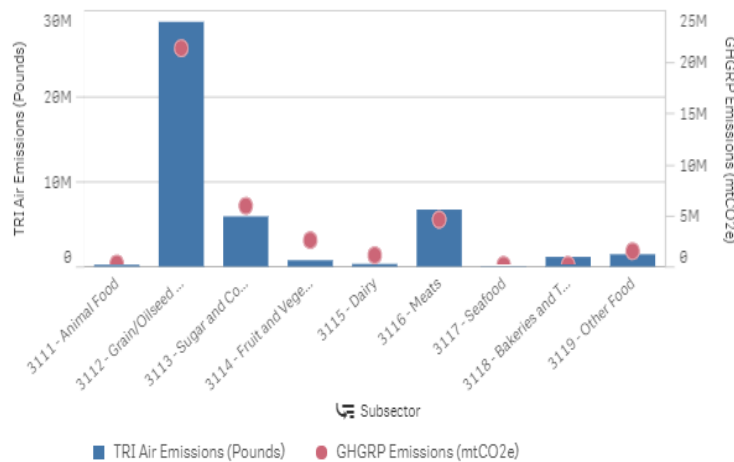
2014 GHG Emissions by State (mtCO<sub>2</sub>e)

(Hawaii and Alaska not shown)

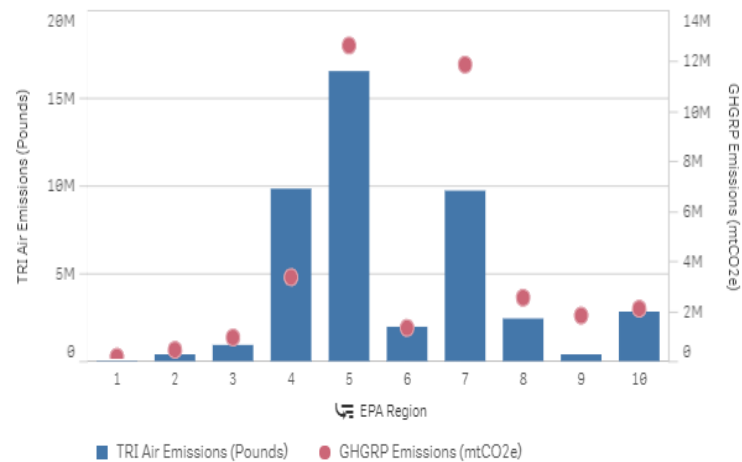


Choropleth state map of GHG emissions

GHGRP Emissions and TRI Air Releases from TRI Facilities by Subsector in 2014



GHGRP Emissions and TRI Air Releases from TRI Facilities by Region in 2014



Double axis bar charts - GHG and TRI Air emissions

# List of Facilities



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## Magnifying glass for filtering

TRIFID	Facility Name	Subsector	State Postal Code	Included in GHGRP	Facility P2 Report
00617PRCSNTMASD	ADM ALLIANCE NUTRITION OF PUERTO RICO LLC	3111 - Animal Food	PR	No	<a href="#">P2 Report</a>
00659CNTRLRD2KM	ADM ALLIANCE NUTRITION OF PR LLC	3111 - Animal Food	PR	No	<a href="#">P2 Report</a>
00771TRCSLSTATE	TO-RICOS LTD LAS PIEDRAS FEED MILL	3111 - Animal Food	PR	No	<a href="#">P2 Report</a>
1345WKNTNT7593R	GOLD STAR FEED & GRAIN	3111 - Animal Food	NY	No	<a href="#">P2 Report</a>
1360WKNTNT1RICH	GOLD STAR FEED & GRAIN	3111 - Animal Food	NY	No	<a href="#">P2 Report</a>
1390WBNGHM44MNT	BINGHAMTON - VENTURE MILLING	3111 - Animal Food	NY	No	<a href="#">P2 Report</a>
1442WLNDLK2773C	LAND O'LAKES PURINA FEED LLC - CALEDONIA (CRC)	3111 - Animal Food	NY	No	<a href="#">P2 Report</a>
1487WLNDLK894AD	LAND O'LAKES PURINA FEED LLC - ERWIN	3111 - Animal Food	NY	No	<a href="#">P2 Report</a>
1720WCRGLL542VE	CARGILL INC	3111 - Animal Food	PA	No	<a href="#">P2 Report</a>
1997WLLNSH2799A	ALLEN HARIM FARMS LLC- SEAFORD MILL	3111 - Animal Food	DE	No	<a href="#">P2 Report</a>
2174WKNTNT11431	KENT NUTRITION GROUP INC	3111 - Animal Food	MD	No	<a href="#">P2 Report</a>
2753WTHMSC845CM	THE IAMS CO	3111 - Animal Food	NC	No	<a href="#">P2 Report</a>
2839WTRKYM564TU	TURKEYMILL	3111 - Animal Food	NC	No	<a href="#">P2 Report</a>
2845WNSHJH3362H	NASH JOHNSON & SONS FARMS INC ROSE HILL FEED MILL	3111 - Animal Food	NC	No	<a href="#">P2 Report</a>
2850WSNDRS168PA	SANDERSON FARMS INC	3111 - Animal Food	NC	No	<a href="#">P2 Report</a>
3055WHSFRF11BUR	HOUSE OF RAEFORD COLUMBIA FARMS OF	3111 - Animal Food	GA	No	<a href="#">P2 Report</a>



Scroll bar



## Highlight of Select Features in Qlik

Navigate to a previous selection

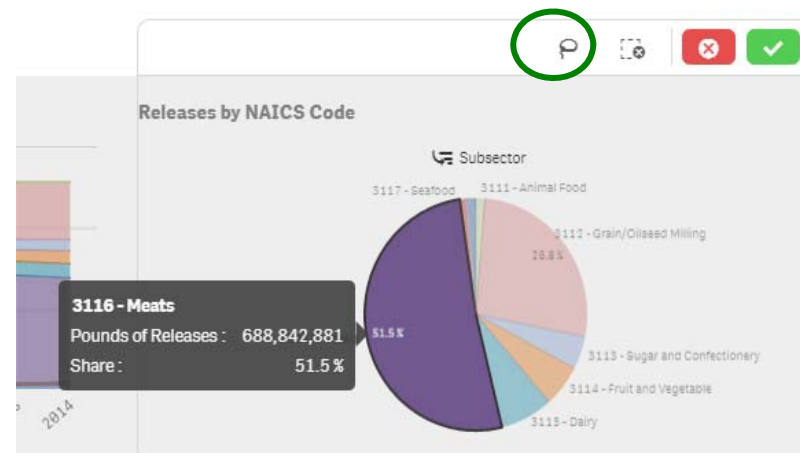
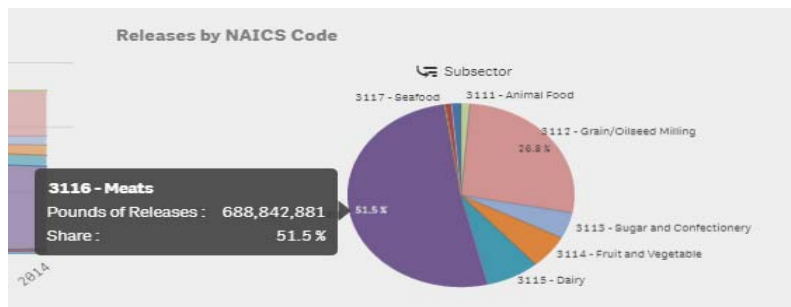
Black bar tracks selections. Selections apply to all tabs. Click x to deselect.

Query data using any terms



Interact with the visuals – mouse over to see details or click to filter

Lasso for multiple selections.







# Thank You!

Sandra Gaona: [Gaona.Sandra@epa.gov](mailto:Gaona.Sandra@epa.gov)

Jeff Kohn: [Kohn.Jeffrey@epa.gov](mailto:Kohn.Jeffrey@epa.gov)

Pollution Prevention (P2) Program: [www.epa.gov/tri/p2](http://www.epa.gov/tri/p2)

TRI P2 webpage: [www.epa.gov/tri/p2](http://www.epa.gov/tri/p2)

For EPA and Regions, Qlik Access: <https://qlikviz.epa.gov>