



Water Use in Pennsylvania

Water Resources Advisory Committee Meeting, November 29, 2018

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Planning & Conservation

Office of Water Resources Planning

Tom Wolf, Governor

Patrick McDonnell, Secretary

How do we use water?

The water we use is divided into two basic types:

- Nonwithdrawal use
- Withdrawal use

Nonwithdrawal use is water used in its watercourse and includes activities such as fishing, boating, and other recreation activities. Also referred to as instream use.

Withdrawal use is water pumped or diverted from any water resource, whether or not it's returned to the water resources. Also referred to as off-stream use.

Withdrawal Use

Withdrawal use is divided into the following water use categories:

- Public Water Supply
- Commercial and Institutional
- Industrial
- Irrigation
- Livestock
- Mining
- Oil and Gas
- Thermoelectric Power - Once Through Cooling
- Thermoelectric Power - Recirculated Cooling
- Thermoelectric Power - Noncooling Water
- Wastewater Collection and Treatment
- Hydroelectric Power

How do we get water?

We get water from either a groundwater or surface water source.

Those who withdraw water for their own use are classified as **self-supplied**. Typically mining, livestock, irrigation, thermoelectric and hydroelectric power are self-supplied. Private homeowner wells are also classified as self-supplied.

Other users obtain water from public suppliers; these users are classified as **public-supplied**. Domestic, commercial, and industrial are typically public-supplied, but can also be self-supplied, or both.

Authorities

DEP's Division of Planning and Conservation manages water use reporting for the safe drinking water and oil and gas programs as well as other water users under the following authorities:

- **Chapter 110 Regulations (Water Resources Planning)** - Includes water use Registration, reporting, and record keeping requirement.
- **Chapter 78a Regulations (Unconventional Wells)** - Includes development of Water Management Plans for wells in unconventional formations.
- **Water Rights Act of 1939** - Issuance of Water Allocation Permits to public water supply agencies to take water from surface water sources.

Data Collection Responsibilities

Use Category	Registration Threshold	Reporting Values/Frequency
Community Water Supplier	No floor	<ul style="list-style-type: none"> Groundwater: Monthly values, annual Surface: Daily values, monthly + monthly/annual
Hydropower Facilities	No floor	Monthly values, annual
Unconventional Gas Operators	No floor	Daily values, quarterly
All Others	>10,000 gpd	Monthly values, annual

SRBC	Withdrawals >100,000 gpd or consumptive use > 20,000 gallons per day, all natural gas activities
DRBC	Withdrawals >100,000 gpd or >10,000 gpd within groundwater protected area

Maintaining water use data

Each year DEP water use program collects, reviews, and accepts over 10,000 electronic reports

	Required	Submitted	Due	Due/ Required	REVIEW STATUS				
					Accepted	Pending	Reviewed	Returned	Rejected
5 YEAR TOTALS	47,605	40,839	6,766	14%	40,329	509	1	99	0
2017 TOTALS	9,765	7,969	1,796	18%	7,463	505	1	36	0
Commercial	431	331	100	23%	286	45	0	1	0
Hydroelectric	16	10	6	38%	9	1	0	0	0
Industrial	1,101	944	157	14%	895	49	0	0	0
Irrigation	911	390	521	57%	342	48	0	0	0
Livestock	537	293	244	45%	268	25	0	0	0
Mining	545	258	287	53%	231	27	0	0	0
Public Water Supply	6,105	5,633	472	8%	5,325	307	1	35	0
Thermoelectric	115	107	8	7%	104	3	0	0	0
Wastewater	4	3	1	25%	3	0	0	0	0

How much water do we use?

- In 2015, Pennsylvania ranked 24th among states with a total withdrawal of 6,040 Mgal/d* while ranked 6th in total population.
 - In 1995, we ranked 12th with a total withdrawal of 9,610 Mgal/d.
- In 2016, Pennsylvania water users reported total withdrawals of 5,588 Mgal/d.
 - 94 percent (5,300 Mgal/d) was from surface water.
 - 6 percent (355 Mgal/d) was from groundwater.

**Includes 208 Mgal/d for estimated self-supplied domestic use*

Source: Estimated Use of Water in the United States in 2015, U.S.

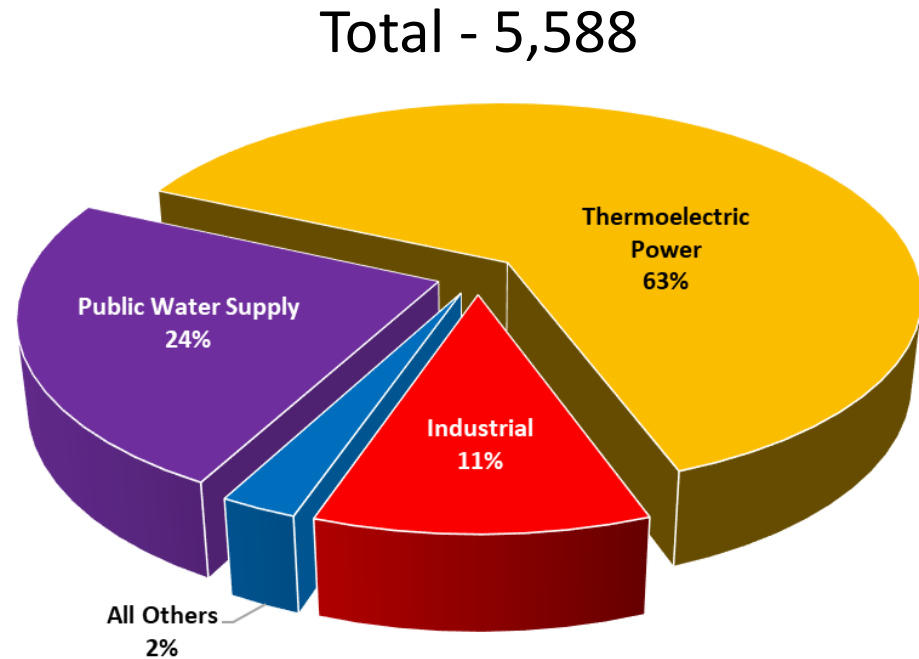
Geological Survey, OFR 2017-1131, 2017.

Estimated Water Withdrawals and Use in Pennsylvania, 1995, USGS Fact Sheet 174-99, 2000.

Who is reporting water use?

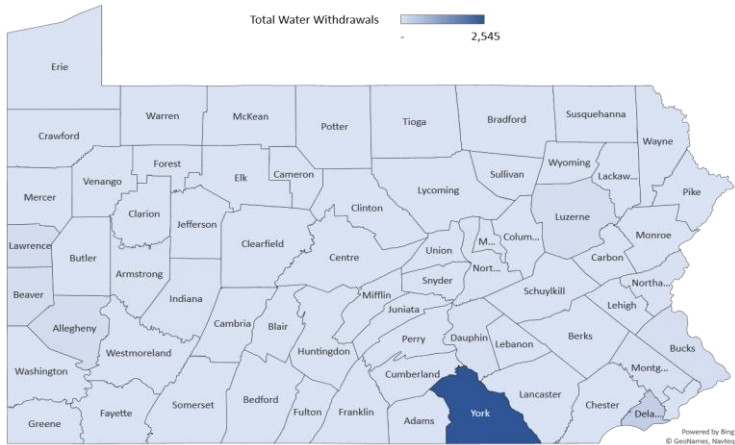
Breakdown of withdrawals by water use category in 2016:

- Thermoelectric Power - 3,503
- Public water supply - 1,337
- Industrial - 607
- All Others - 140
 - Livestock - 77
 - Mining - 33
 - Commercial & Institutional - 7.7
 - Oil and Gas - 6.5
 - Irrigation - 7.2
 - Wastewater Treatment - 12.5

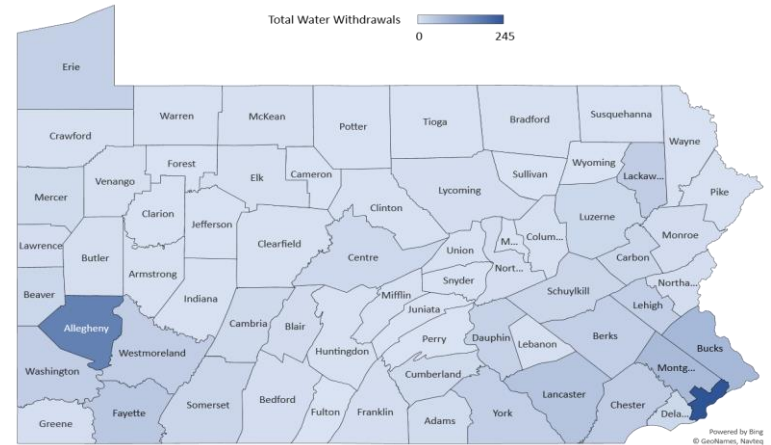


All values shown in million gallons per day

Water Withdrawals by Water Use Category and County, 2016



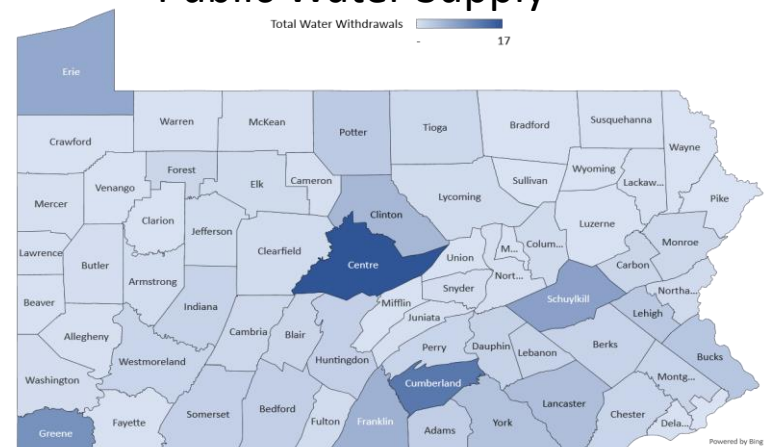
Thermolectric power



Public Water Supply



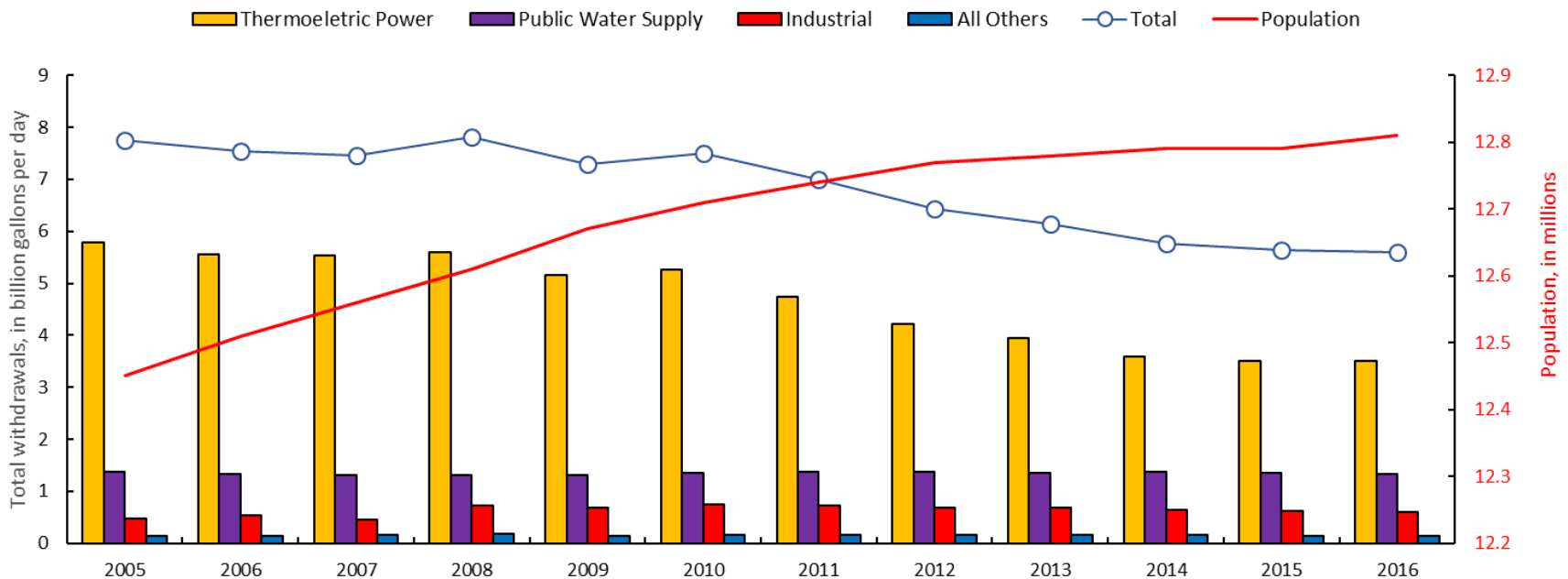
Industrial



All others

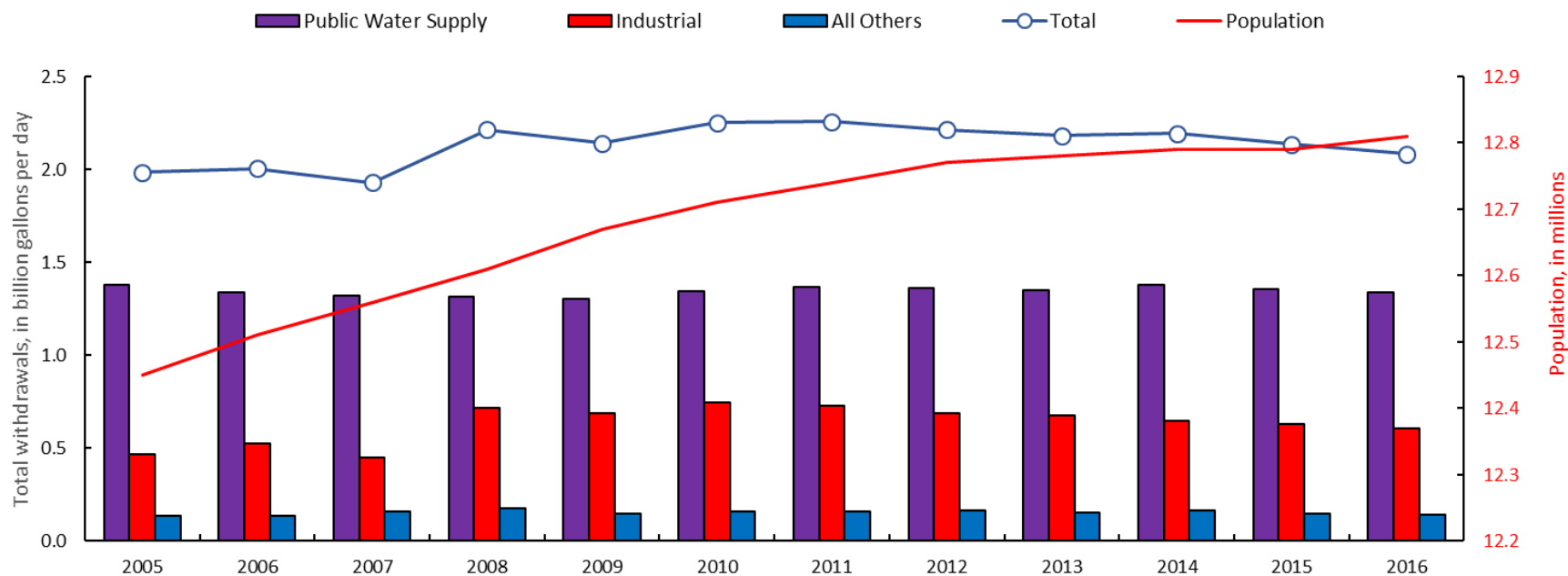
Trends in total water withdrawals by water use category, 2005-2016

Total withdrawals have been steadily decreasing since 2010. From 2005 to 2016 total withdrawals have declined by 28% at over 2.1 billion gallons per day.



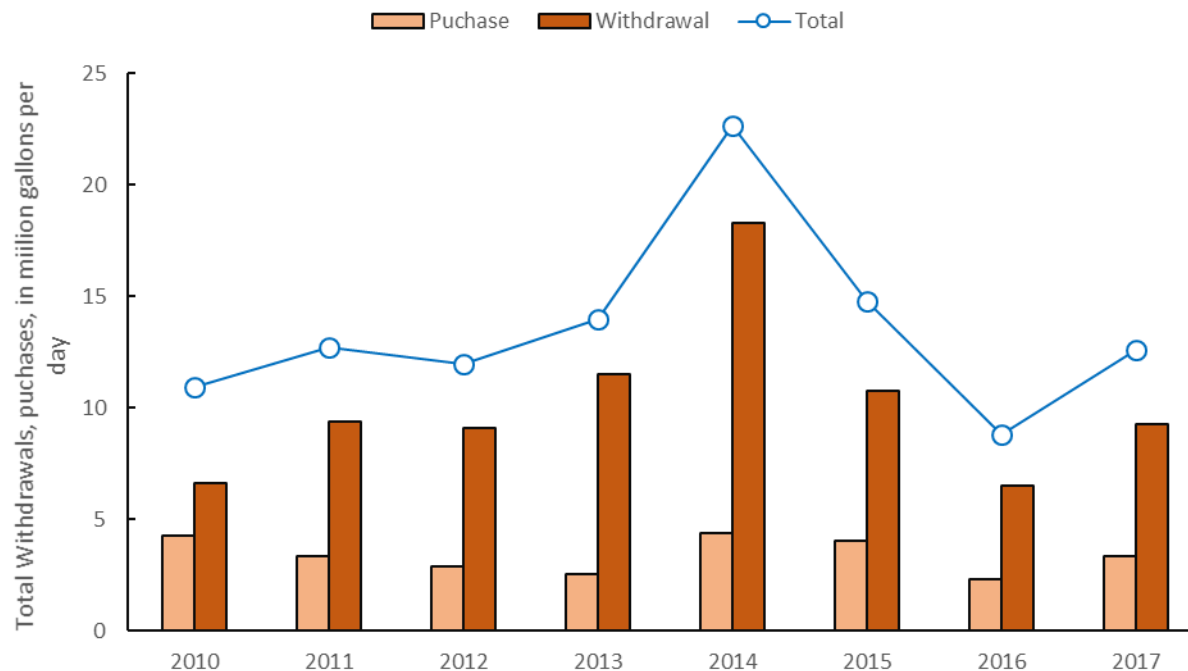
Trends in total water withdrawals by water use category, 2005-2016 (excludes Thermoelectric Power)

Total withdrawals for all water use categories, except thermoelectric power, has slightly increased from 1,985 Mgal/d in 2005 to 2,084 Mgal/d in 2016, but less than the peak year of 2,257 Mgal/d in 2011.



Trends in Oil and Gas Water Use

Chart of yearly average water use (withdrawals and purchases) for unconventional gas development, 2010 - 2017



National trends in total water withdrawals, 1950-2015

Pennsylvania is following a national trends in water use. The figure below is from the most recent census of estimate water use in the country.

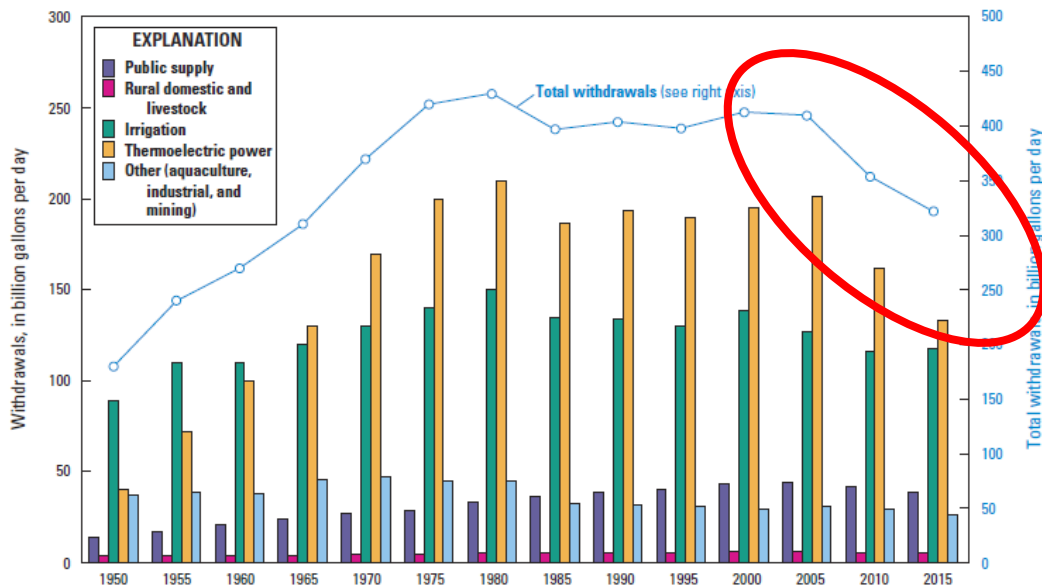
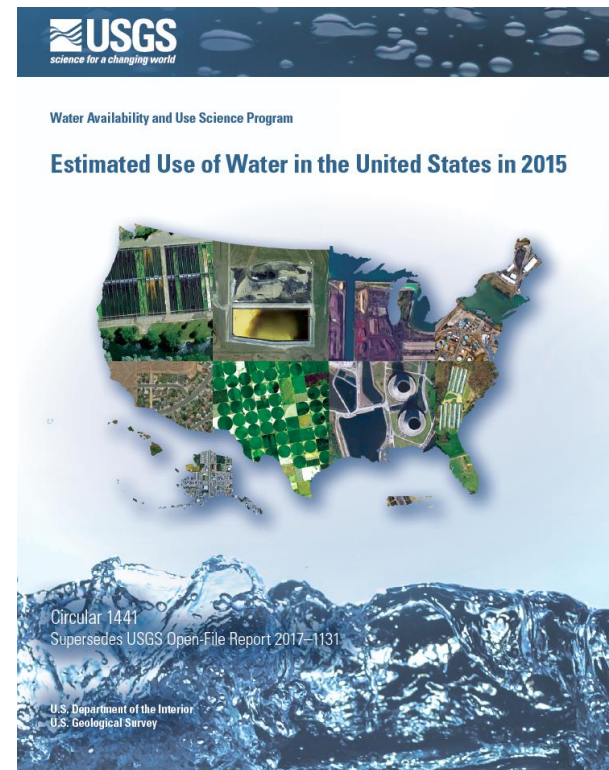
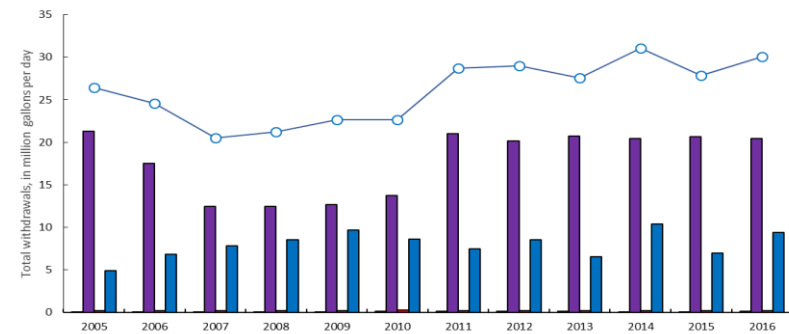
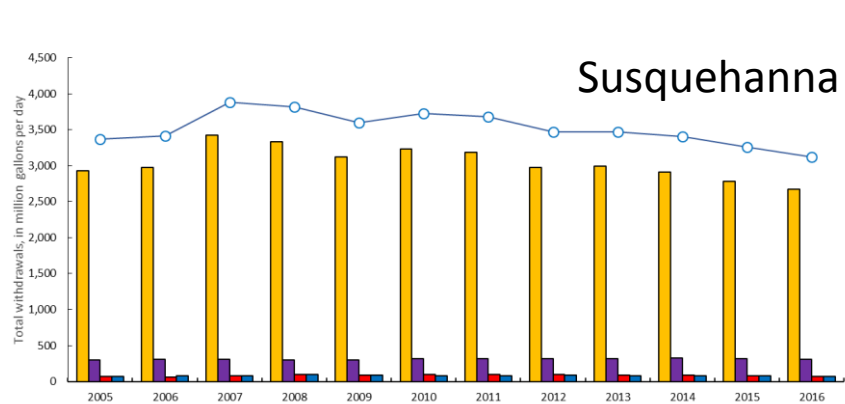
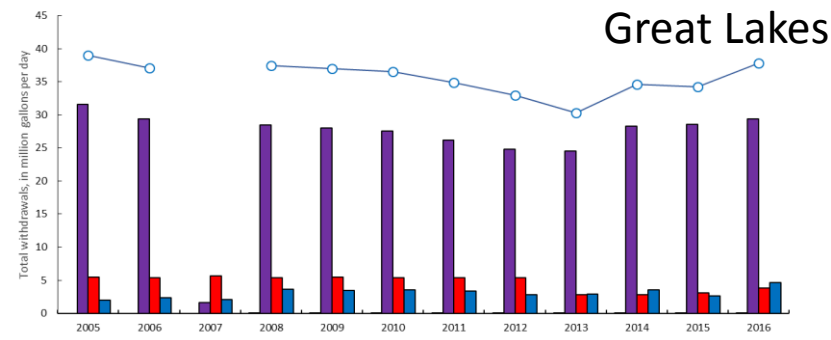
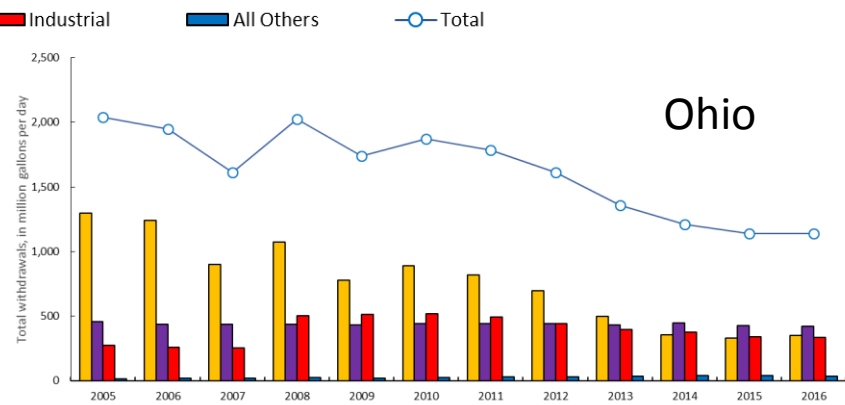
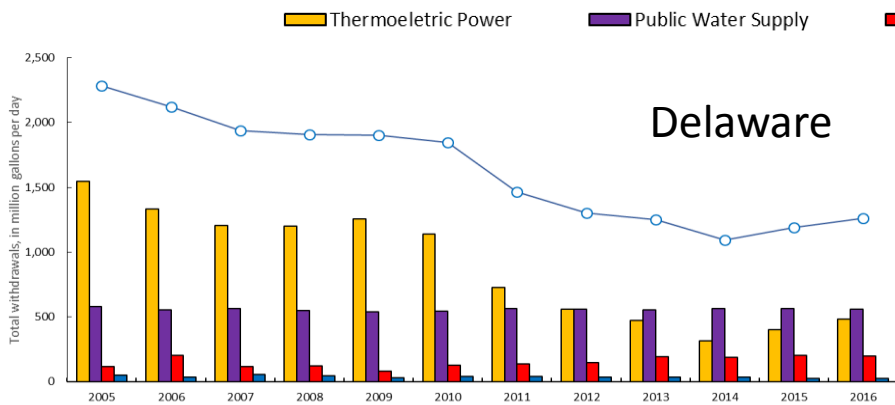


Figure 16. Trends in total water withdrawals by water-use category, 1950–2015.



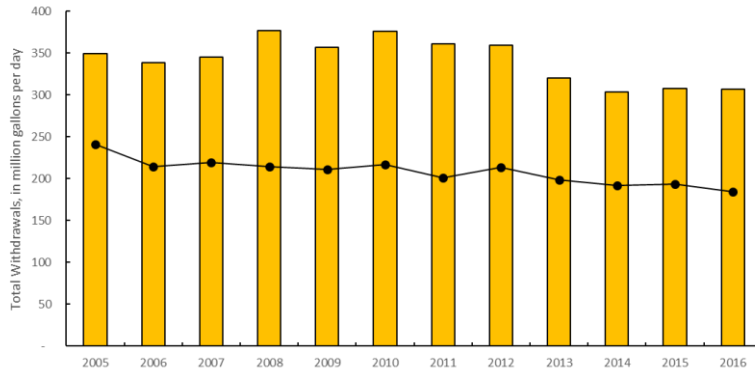
Trends in total water withdrawals by Basin and water use category, 2005-2016



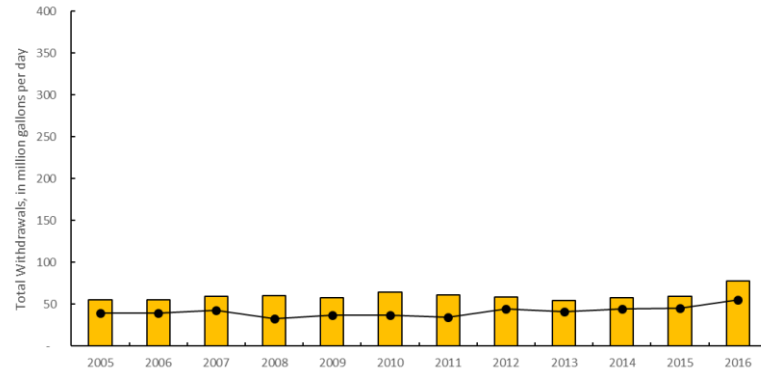
Trends in thermoelectric power water withdrawals and consumptive use by Basin for recirculating cooling types, 2005-2016

■ Total Withdrawal
 ● Consumptive Use

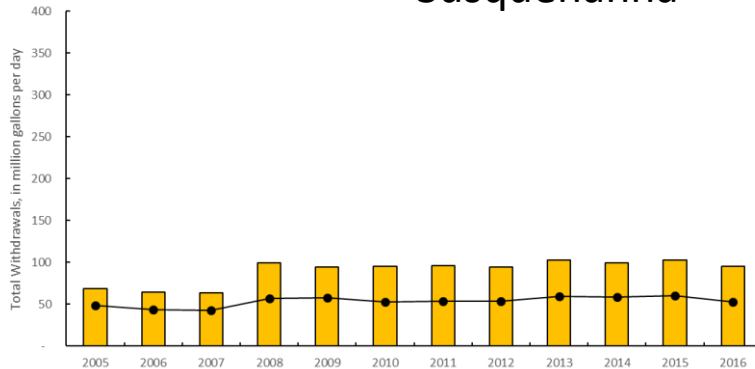
State



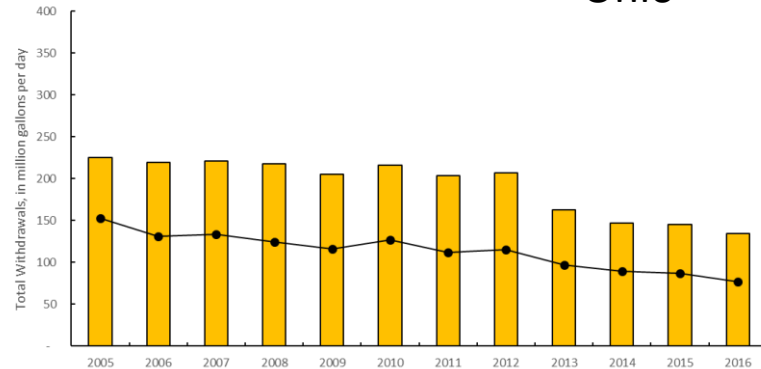
Delaware



Susquehanna

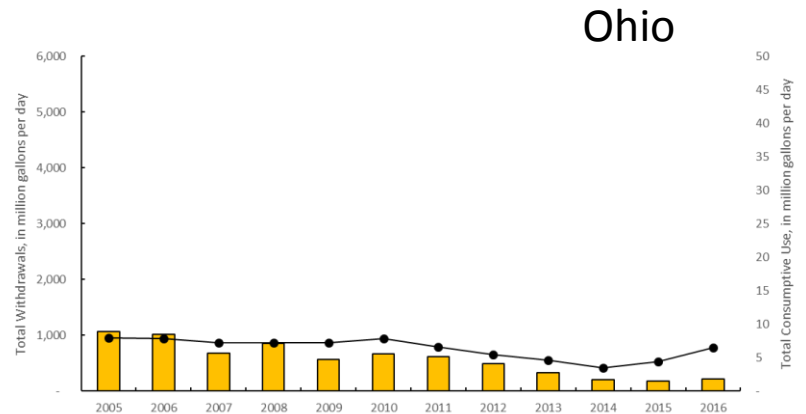
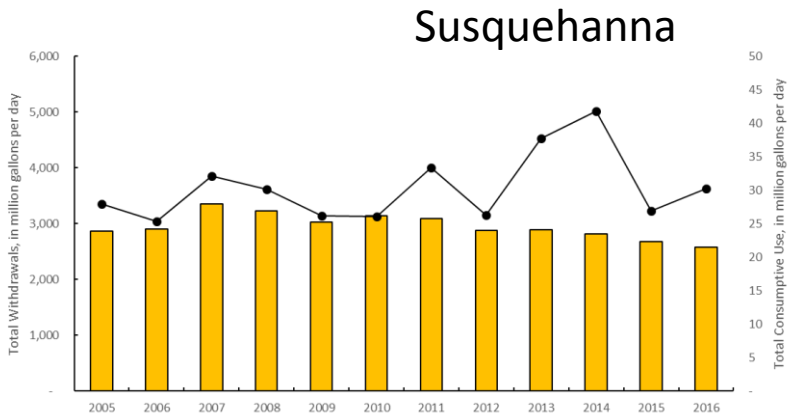
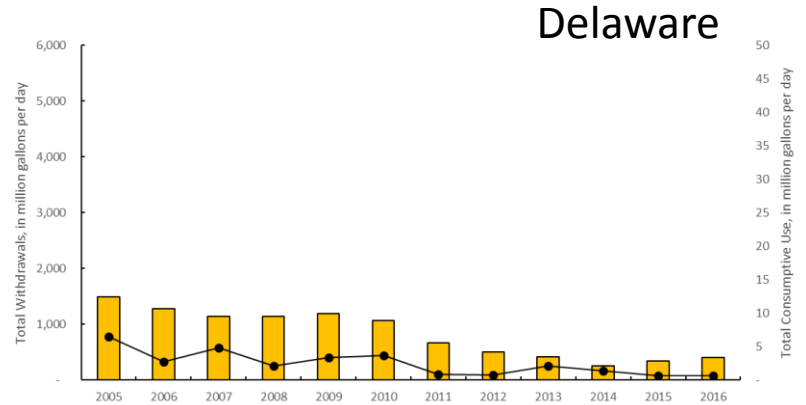
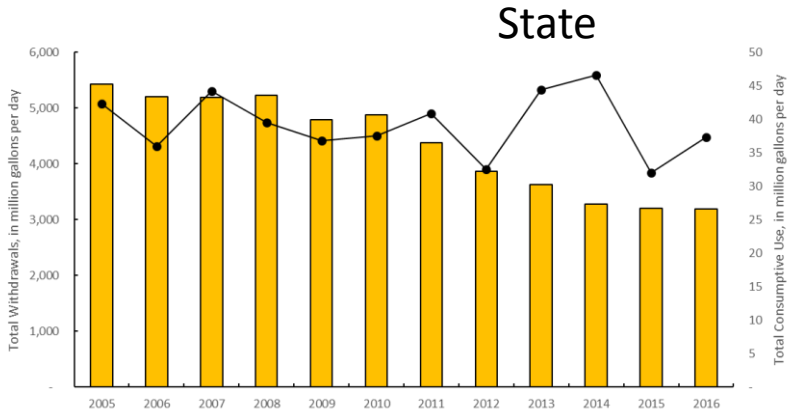


Ohio

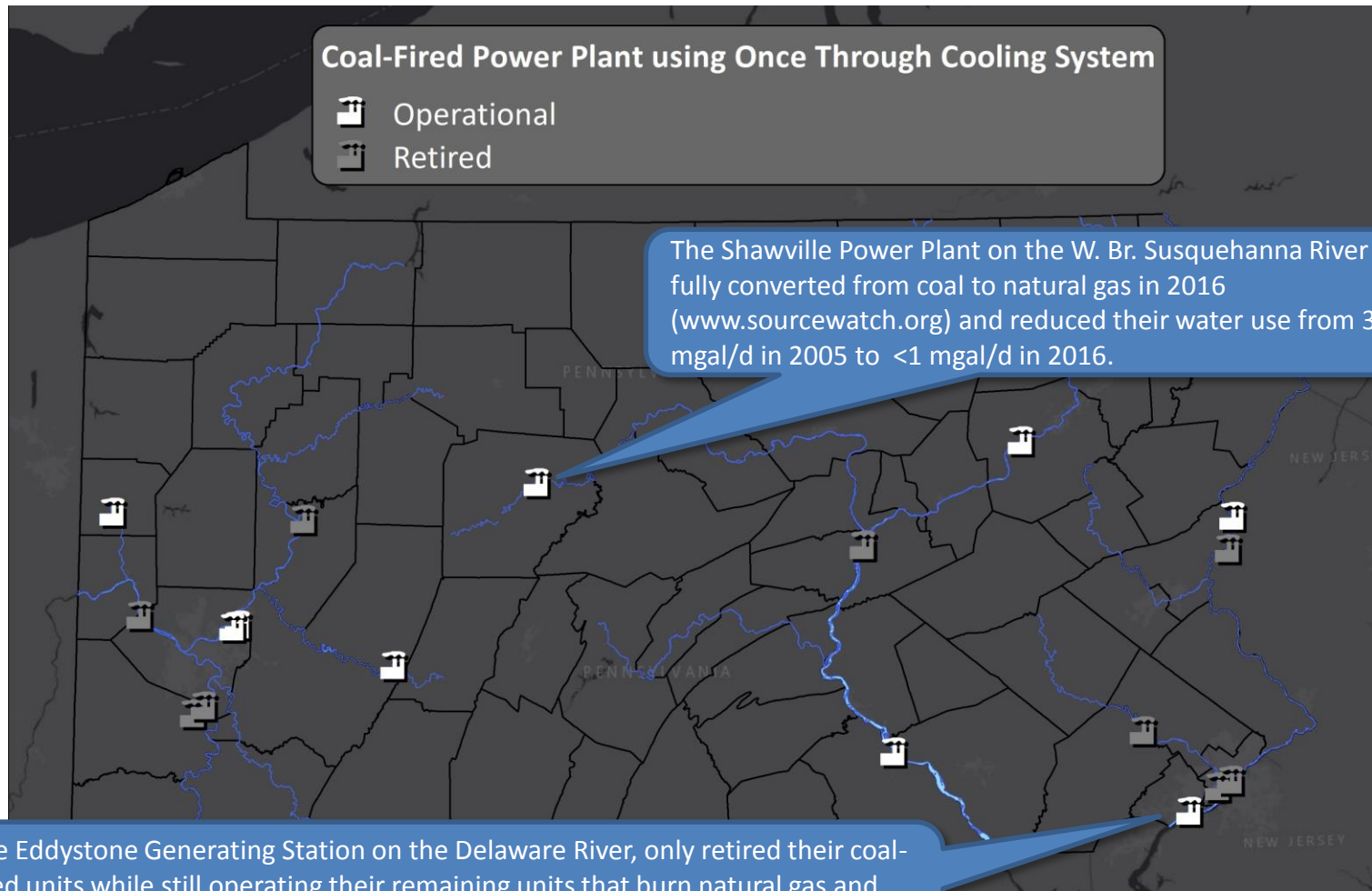


Trends in thermoelectric power water withdrawals and consumptive use by Basin for once-through cooling types, 2005-2016

■ Total Withdrawal
 ● Consumptive Use (see right axis)



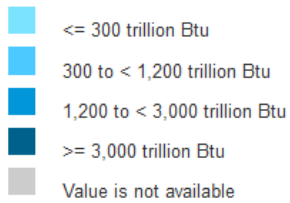
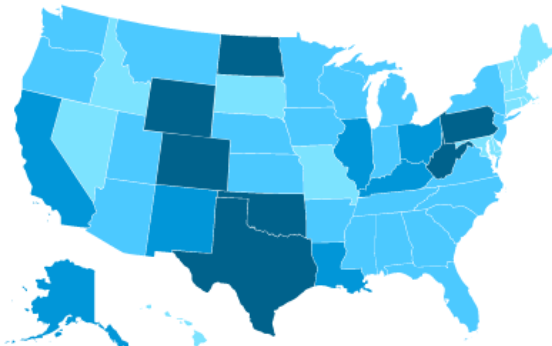
Locations of CFPP in PA



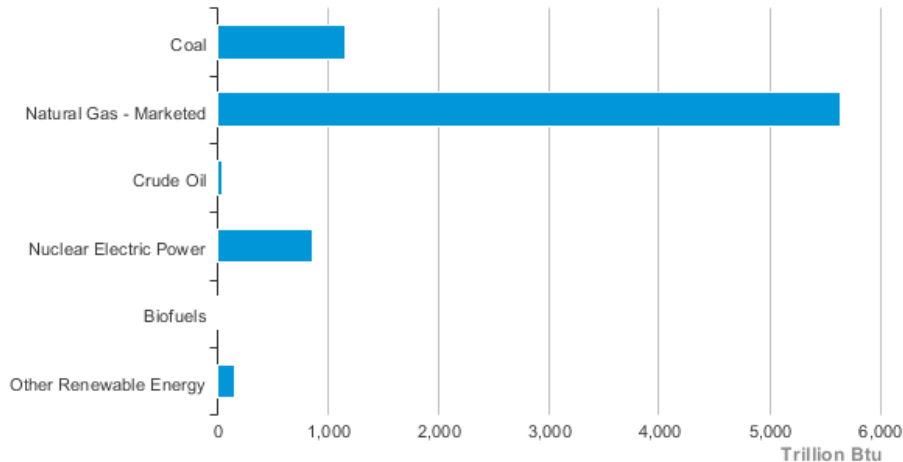
▶ Reduced water use but not energy production

Although Pennsylvania is one of the top three generators of electricity in the nation, one-third of the state's coal-fired electric generating plants have shut down between 2010 and the end of 2017, while natural gas-fired capacity grew by nearly two-thirds.

Rank	State	Total Energy Production (trillion Btu)
1	Texas	17,080
2	Pennsylvania	7,888
3	Wyoming	7,518



Pennsylvania Energy Production Estimates, 2016



eia Source: Energy Information Administration, State Energy Data System



Water Use Data Sharing

DEP > Data and Tools > Reports > Water Reports

WATER REPORTS

Searchable wastewater-related reports, including electronic discharge monitoring reports (eDMR), have been moved to the new [Wastewater Reports](#) page.

WATER USE REPORTS

DEP collects electronic self-monitoring water use reports from public water supply agencies, hydropower facilities and each person whose total withdrawal exceeds an average rate of 10,000 gallons per day in any 30-day period.

- [Instructions and Data Dictionaries \(PDF\)](#)
- [Water Source Registration](#)
A report of water use source registration. Information includes the identification of the registrant, the name, description, and location of water sources, and the amounts of water withdrawal or water purchased or sold. Note: water uses quantities collected during registration was discontinued in 2012.
- [Water Quantity Report by Source](#)
An annual report of source level information, monthly water withdrawals for each type of source, and monthly purchases and sales amounts through public water supply interconnections.

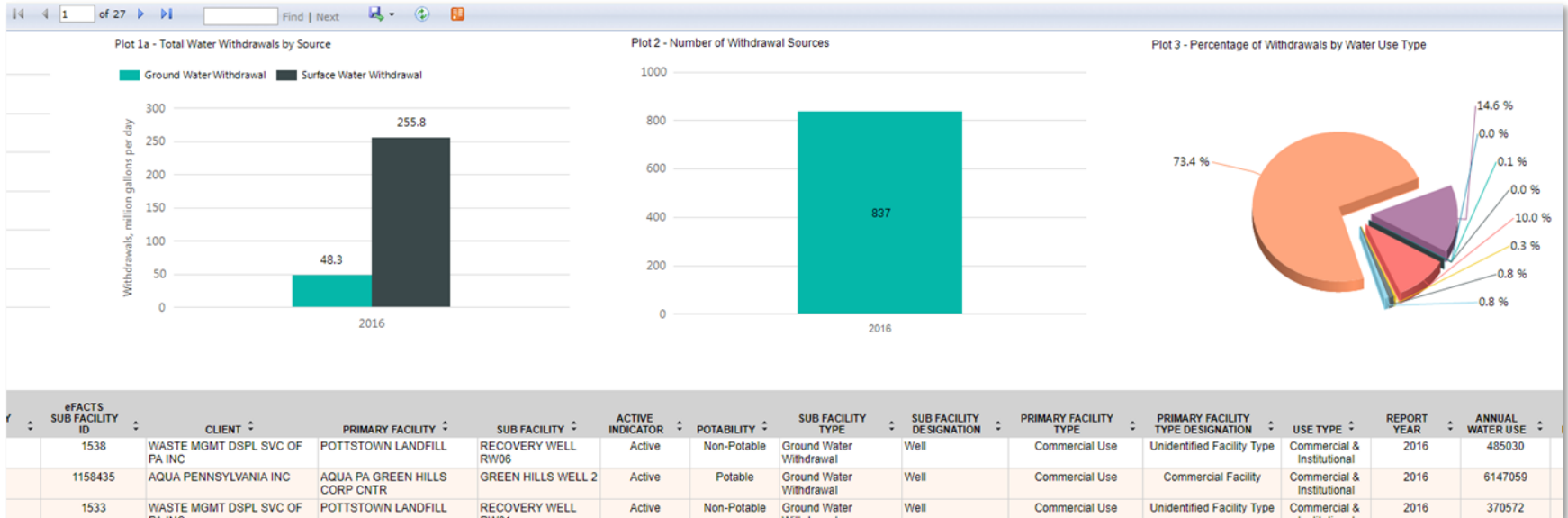
RELATED INFORMATION

- OIL AND GAS REPORTS
- LAND RECYCLING REPORTS
- RADIATION PROTECTION REPORTS
- STORAGE TANK REPORTS
- WATER REPORTS
- LABORATORY REPORTS

www.dep.pa.gov/DataandTools/Reports/Pages/Water.aspx



Water Use Data Sharing



www.dep.pa.gov/DataandTools/Reports/Pages/Water.aspx

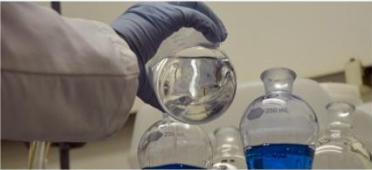


Improvements

- In 2015, USGS announced the Water-Use Data and Research program (WUDR) to provide financial assistance with state water resource agencies to improve the availability, quality, compatibility, and delivery of water-use data.*
- The program was authorized \$12.5 million over a five year period.
- For the first year each state who applied received funding.
- For subsequent years, funding is distributed under a competitive proposal process.
- Pennsylvania is the only state awarded a grant for each subsequent year.

Grant Year	Project	Amount Awarded
2015	Developed workplan	\$26,000
2016	Online data sharing website	\$52,480
2017	QA enhancements to DEPGreenPort	\$71,461
2018	Conversion of paper registration forms to online forms	\$81,742
	Total	\$231,683

*water.usgs.gov/wausp/wudr/index.html



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