Annual Progress Report to the WV Joint Legislative Oversight Commission on State Water Resources

West Virginia Department of Environmental Protection

Water Use Section

October 18, 2015

By:
Brian A. Carr, P.G.
Program Manager
Water Use Section

Plan History

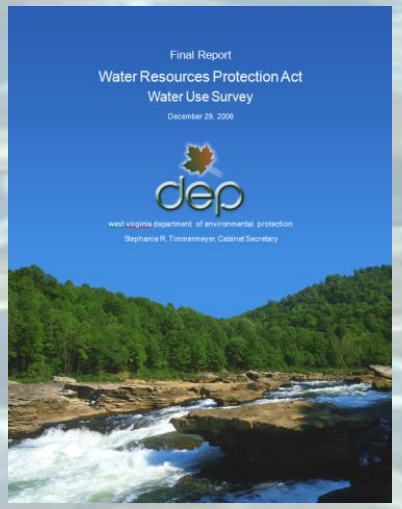
The Act Originally passed on March 13, 2004.

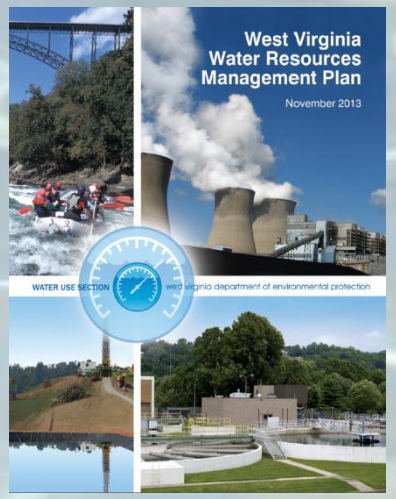
First Large Quantity User Survey completed in 2006.

On March 8, 2008, Senate Bill 641 passed amending the Act and renaming it the Water Resources Protection and Management Act.

The Water Use Section was created in July 2008 to accomplish the additional requirements of the Act.

The West Virginia Water Resources Management Plan was submitted on November 22, 2013 and was adopted as part of Senate Bill 373.

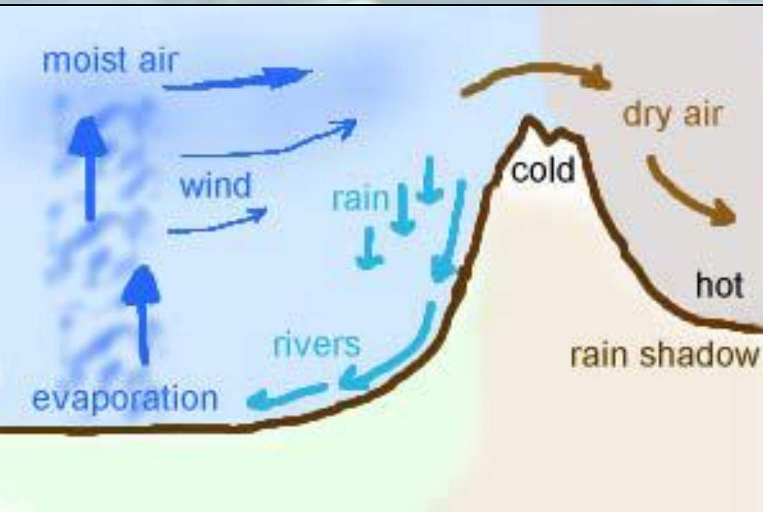


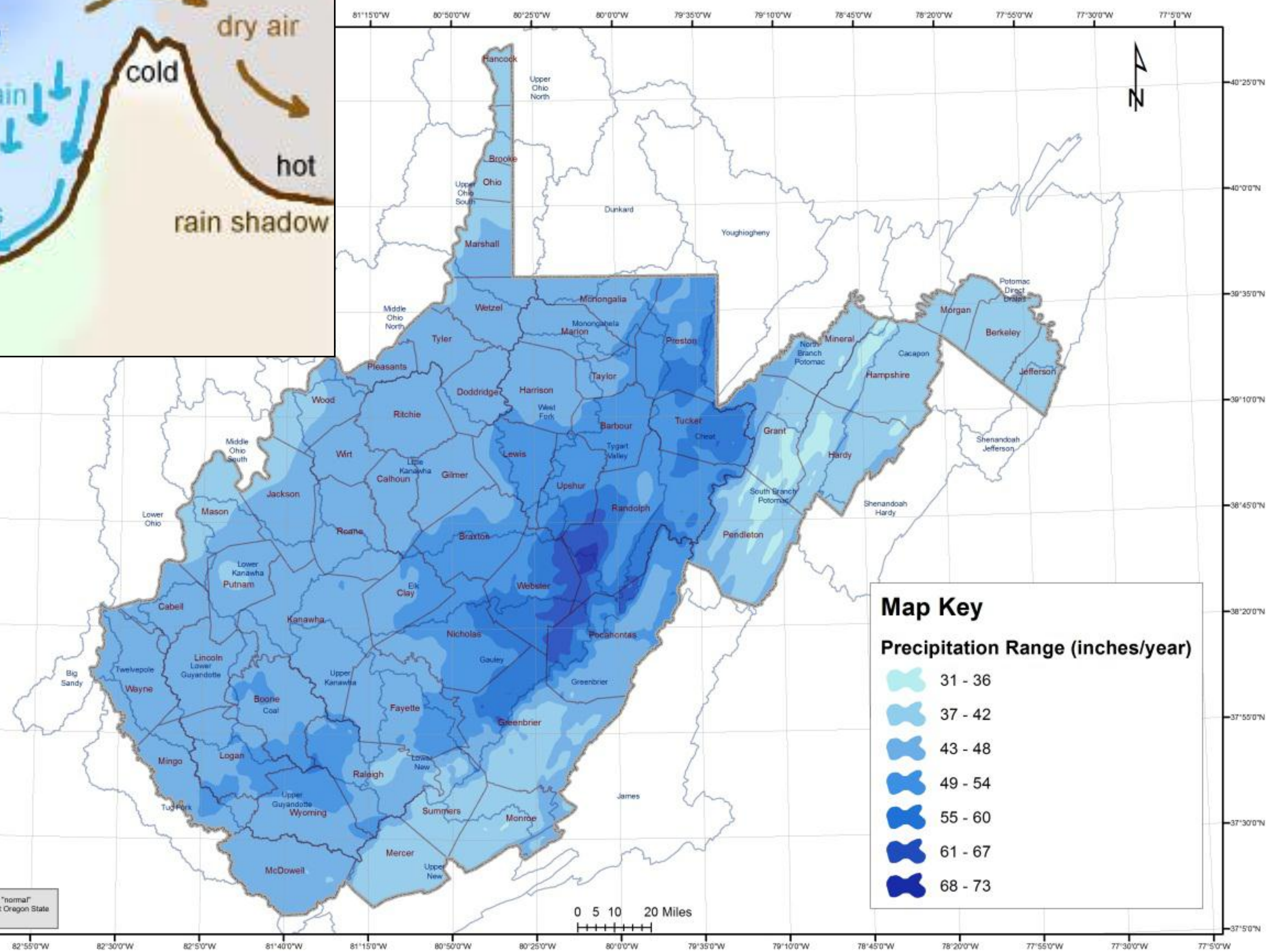


Our Mission Statement is straight from the Act

The WV Water Resources Protection and Management Act identified the need for the protection and conservation of our states water resources. It recognizes that a comprehensive assessment of the availability and use of our states water will benefit the citizens of West Virginia.

Average Annual Precipitation Map





West Virginia Water Facts

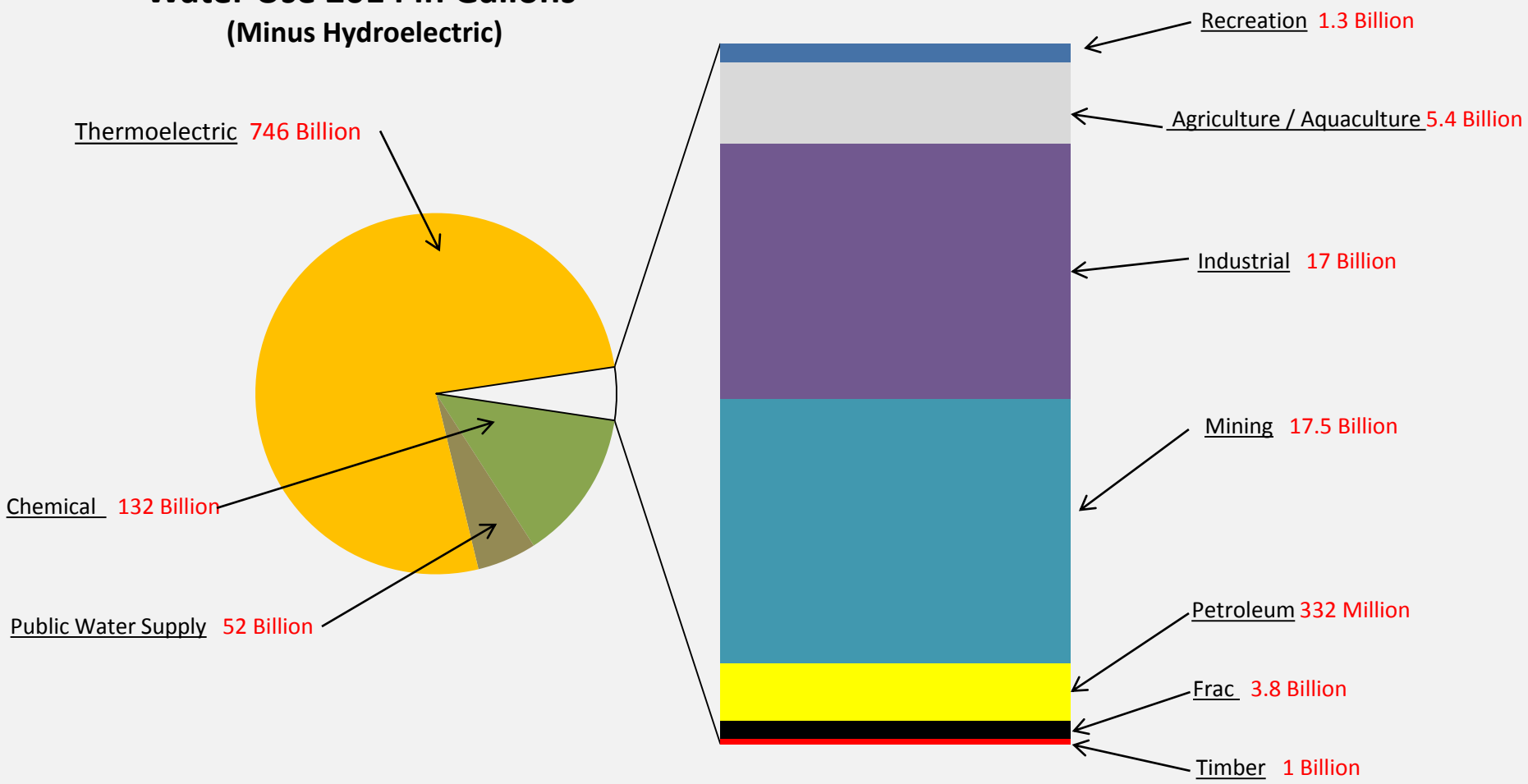
- 19.32 trillion gallons of precipitation – based on 44 in/year
- The record precipitation event in West Virginia is 19.5" of rain in 2 hours and 10 minutes at Rockport in July of 1889 (Our Probable Max Precipitation PMP)
- Maximum storage of dams/lakes - 1.07 trillion gallons
- Estimated mine pool storage - 1.48 trillion gallons
- Large Quantity Users, (excluding hydro-electric) withdraw ~ 978 Billion gallons/yr
- Only ~6% or 59 billion gallons of LQU water is consumed
- We have 54,961 total stream miles in our state
- We have ~ 42 billion gallons per day of available water in our rivers and streams

West Virginia

Water Use 2014 in Gallons

(Minus Hydroelectric)

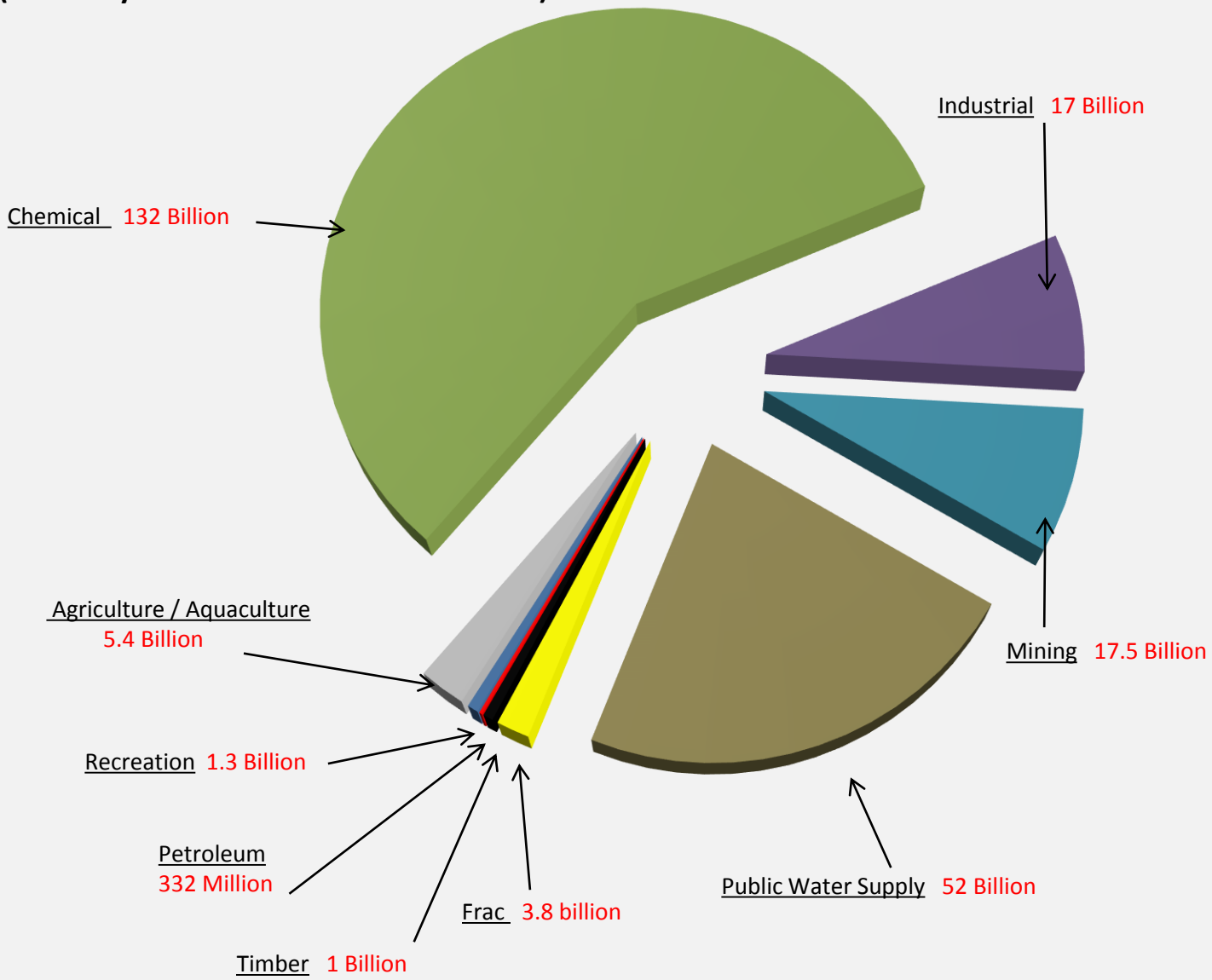
Total amount withdrawn is ~ 978 Billion gallons.



West Virginia

Water Use 2014 in Gallons

(Minus Hydroelectric and Thermoelectric)



2014 WV Bottled Water in Gal/year

• BERKELEY CLUB BEVERAGES INC.	4,168,800
• SWEET SPRINGS VALLEY WATER COMPANY	1,700,000
• GREEN ACRES REGIONAL CENTER INC	800,000
• UNITED DAIRY, INC. (CHARLESTON)	475,000
• WEST VIRGINIA PRIDE OF THE MOUNTAINS CO	200,000
• CAPON SPRINGS & FARMS, INC.	16,000
• TYLER MOUNTAIN WATER COMPANY, INC (now bottled in Oakland, PA)	0
• ALLEGHENY LODGE ENTERPRISES, LLC	Closed
Total	**7,359,800**

2014 LQU Survey Report

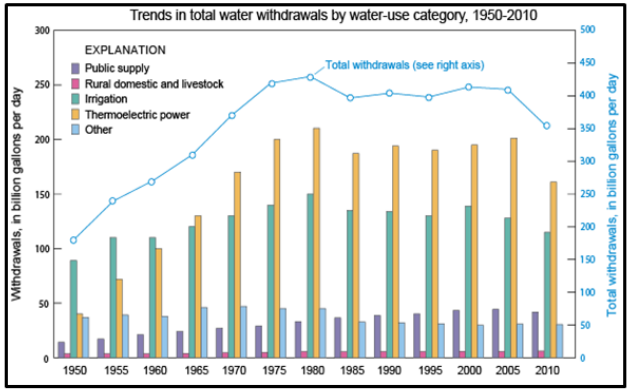
Trends in Water Reporting

WV Department of Environmental Protection

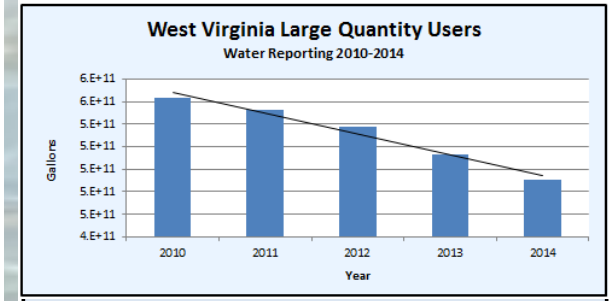
Division of Water and Waste Management

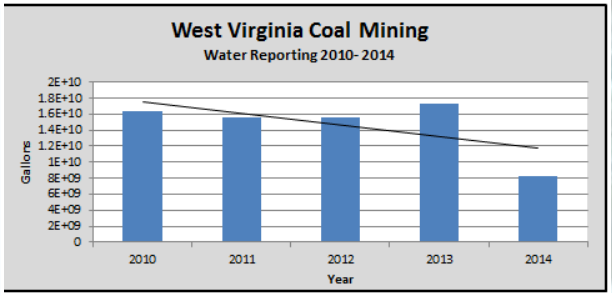
Water Use Section

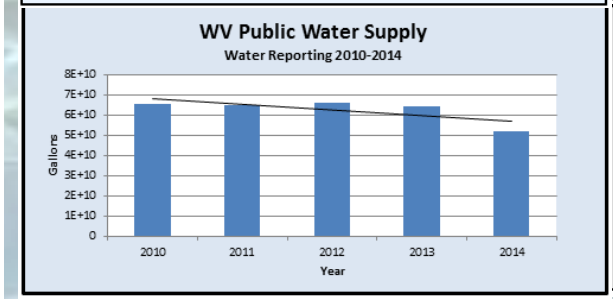
The United States Geological Survey (USGS) has kept trends of national water use since 1950. Since the early part of the new century overall water use in the United States has declined. In 1980 water use peaked in the United States, but then started to decrease a bit, possibly due to the Nation making more use of water-conservation measures.

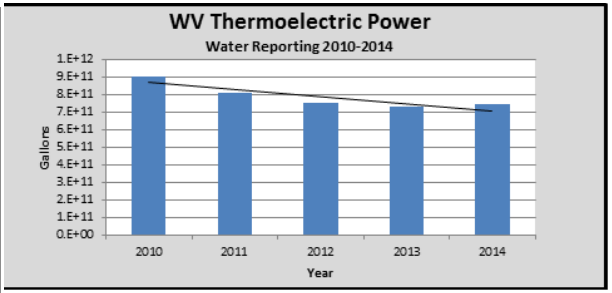


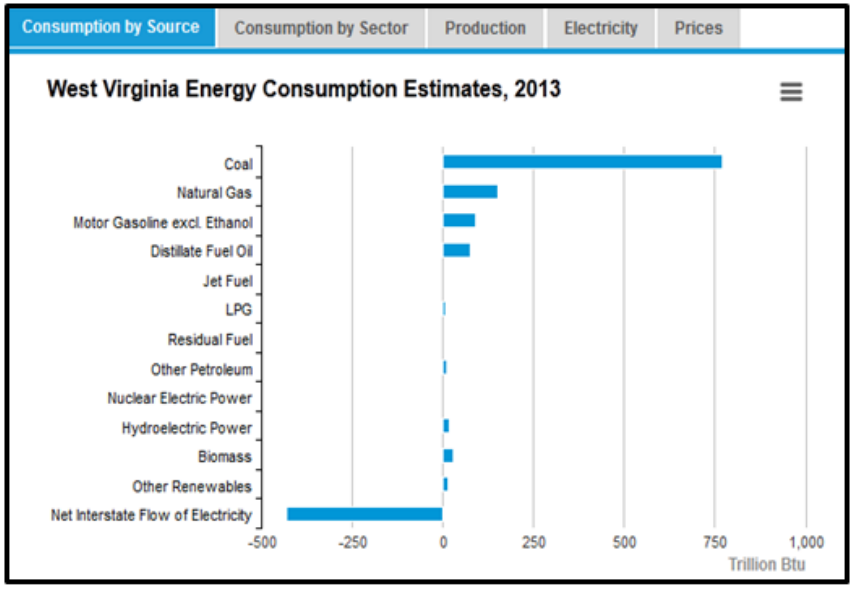
Almost all of the freshwater used in the United States comes from surface water, only 25% comes from groundwater, the largest user of surface water is the thermoelectric power industry (excluding once through hydroelectric facilities). The public-supply sector was the only water-use category that increased continually since 1950.
(http://water.usgs.gov/watuse/wutrends.html)

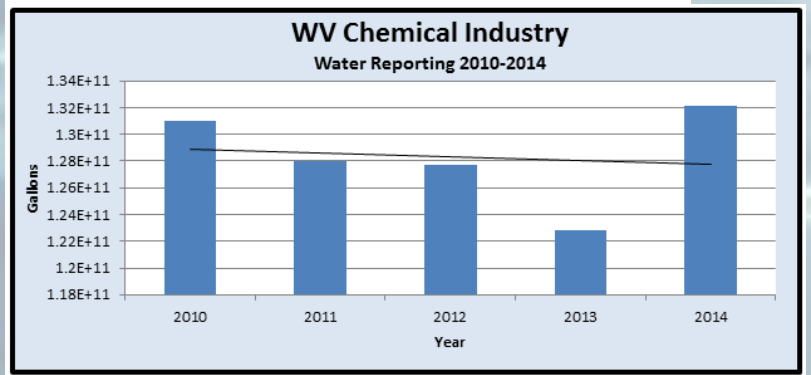












http://www.wvcommerce.org/energy/renewable_energy/hydro.aspx

Searching for the New LQU's

300,000 gallons per 30 days

- 121 Golf Courses
- 318 Nursing Homes
- 66 Mobile Home Parks
- 199 Public Water Supplies
- 162 Campgrounds
- 55 Jails
- 25 College & University
- 9 Resorts
- 88 Parks

- 55 Courthouses
- 107 Cemeteries
- 85 Nurseries
- 151 Lumber Facilities
- 7 Paper Manufacturers
- 2 Ammunition Manufacturers
- 314 Concrete Producers
- 12 Meat Processors
- 25 Furniture Makers
- 20 Highway Rest Stops

Total quantity of water withdrawn each month must now be reported annually!

Consumptive Use

West Virginia Department of Environmental Protection

Large Quantity User's (LQU) 2014

Water Use Section

Procedure:

Coefficient Method by SIC Code

(USGS, Scientific Investigations Report 2009, http://pubs.er.usgs.gov/publication/sir20095096)

What is 100% Consumptive Use?

"Consumptive withdrawal" means any withdrawal of water which returns less water to the water body than is withdrawn.

2014 Consumptive Use Totals

Water use category	Total gallons of water withdrawn in 2014	Consumptive use coefficient	Quantity of water consumed
Agriculture/Aquaculture	5,400,000,000	0.12	648,000,000
Chemical	132,000,000,000	0.2	26,400,000,000
Frac Water	3,800,000,000	1	3,800,000,000
Industrial	17,000,000,000	0.13	2,210,000,000
Mining	17,500,000,000	0.17	2,975,000,000
Petroleum	332,000,000	0.27	89,640,000
Public Water Supply	52,000,000,000	0.18	9,360,000,000
Recreation	1,300,000,000	0.1	130,000,000
Thermoelectric	746,000,000,000	0.03	22,380,000,000
Timber	1,000,000,000	0.25	250,000,000

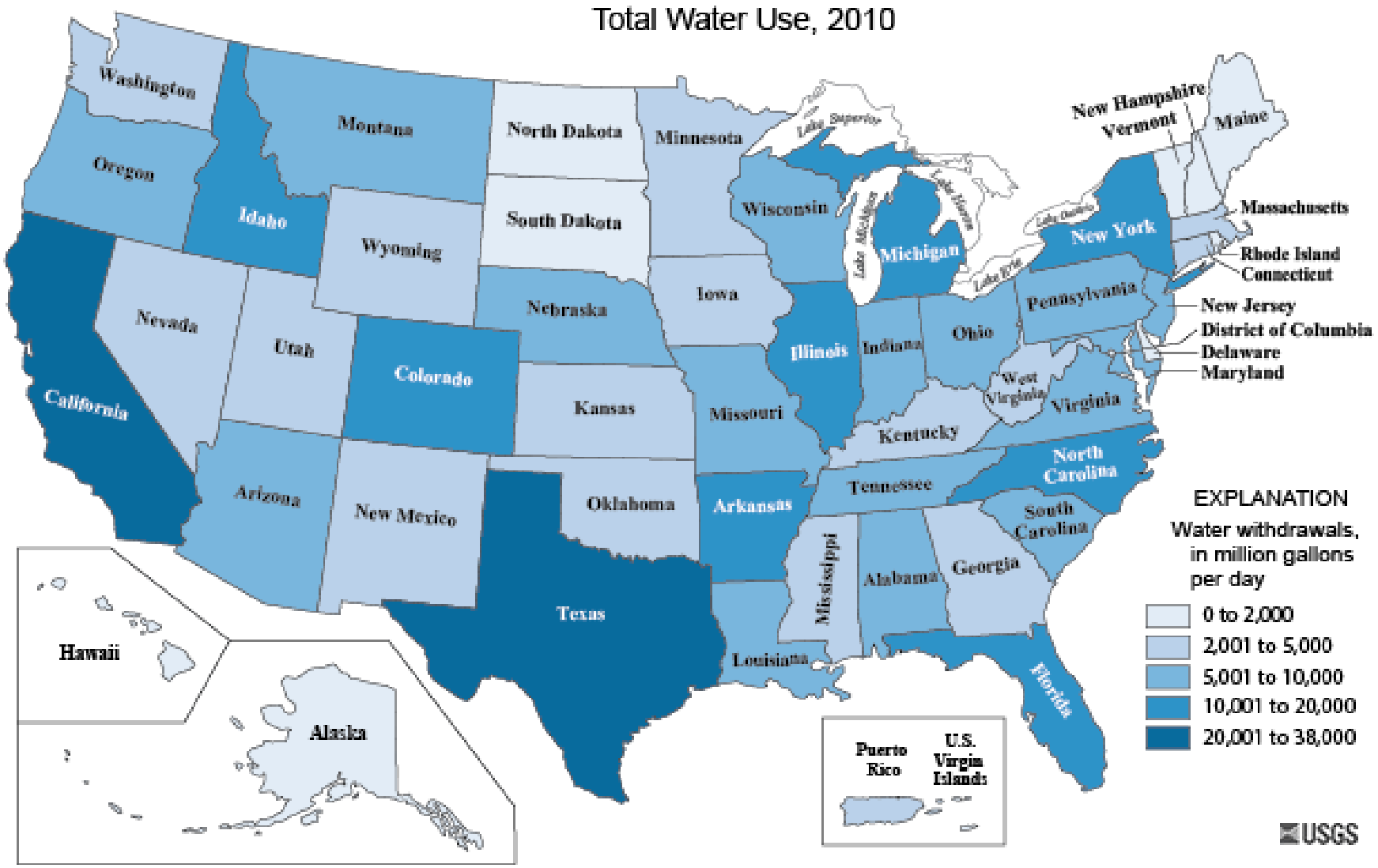
For the purposes of this study a coefficient of 3% was used for thermoelectric power as provided by the USGS. A new national USGS study of thermoelectric power plants consumptive water use has been initiated to verify this data.

Consumptive Use

State of West Virginia 2014

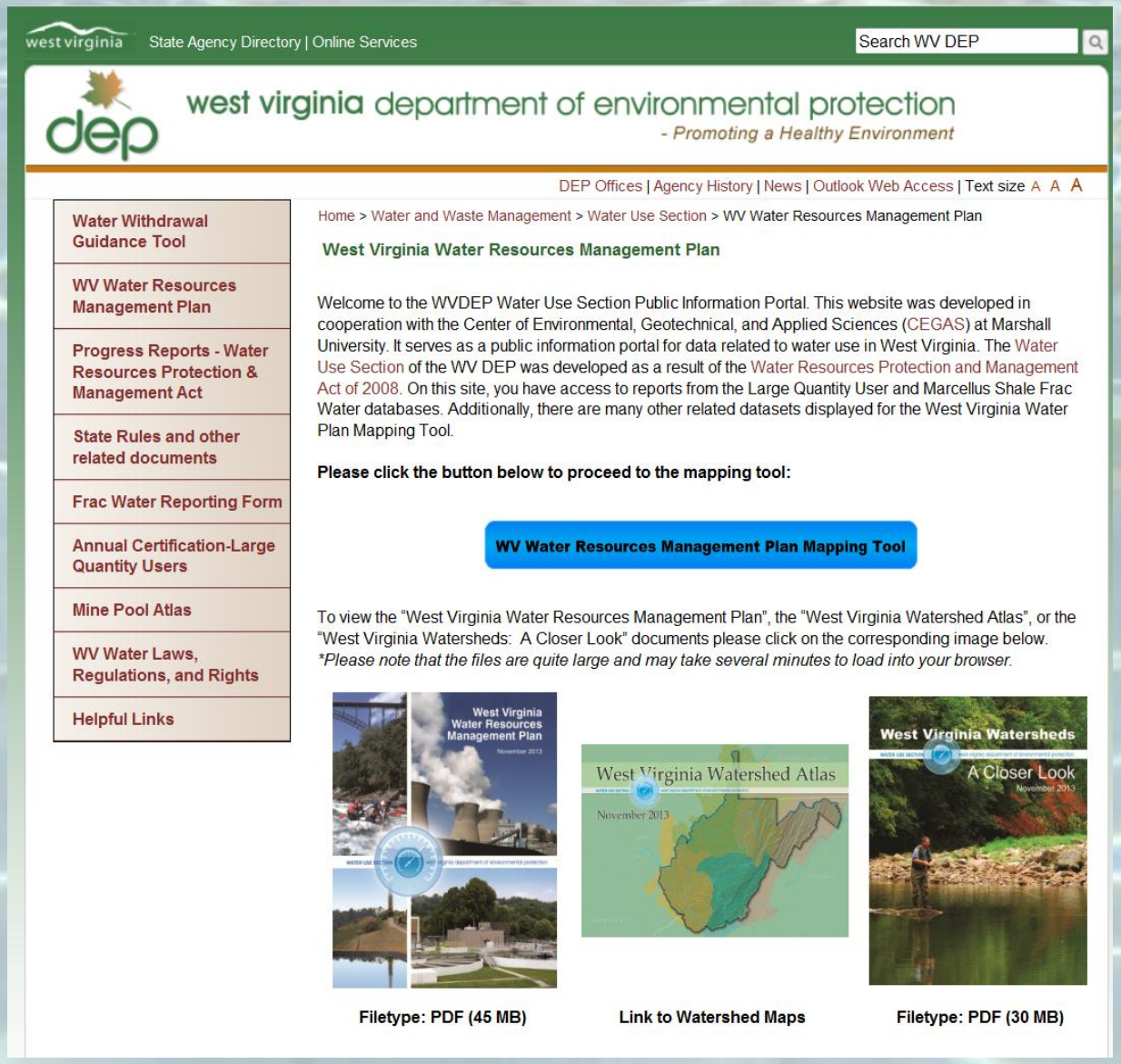
Total Gallons of Water Withdrawn in 2014	976,332,000,000
Total Gallons of Water Consumed in 2014	68,242,640,000
Percent Consumptive	6.99%

Total Countrywide Water Use

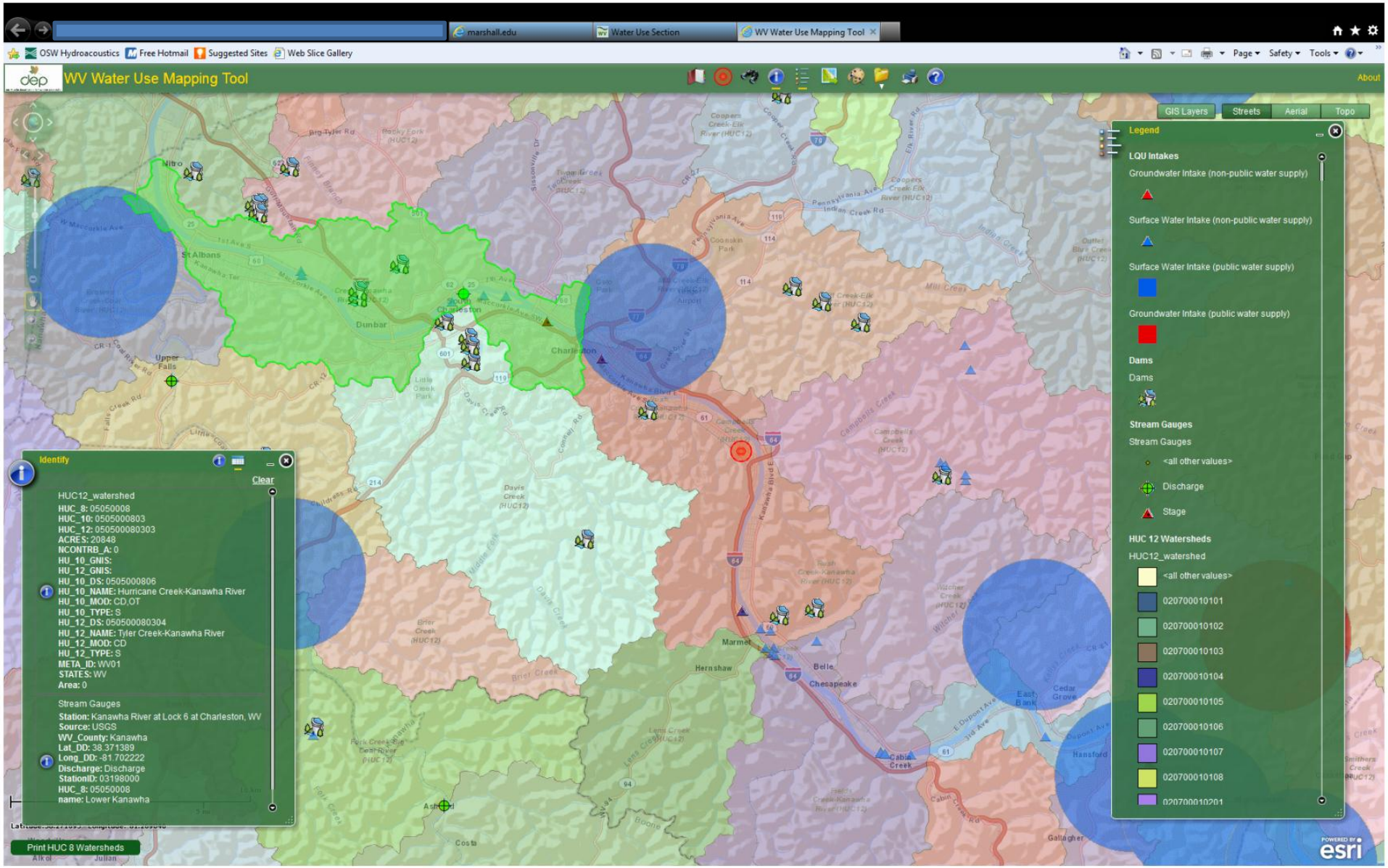


WVWRMP Mapping Tool

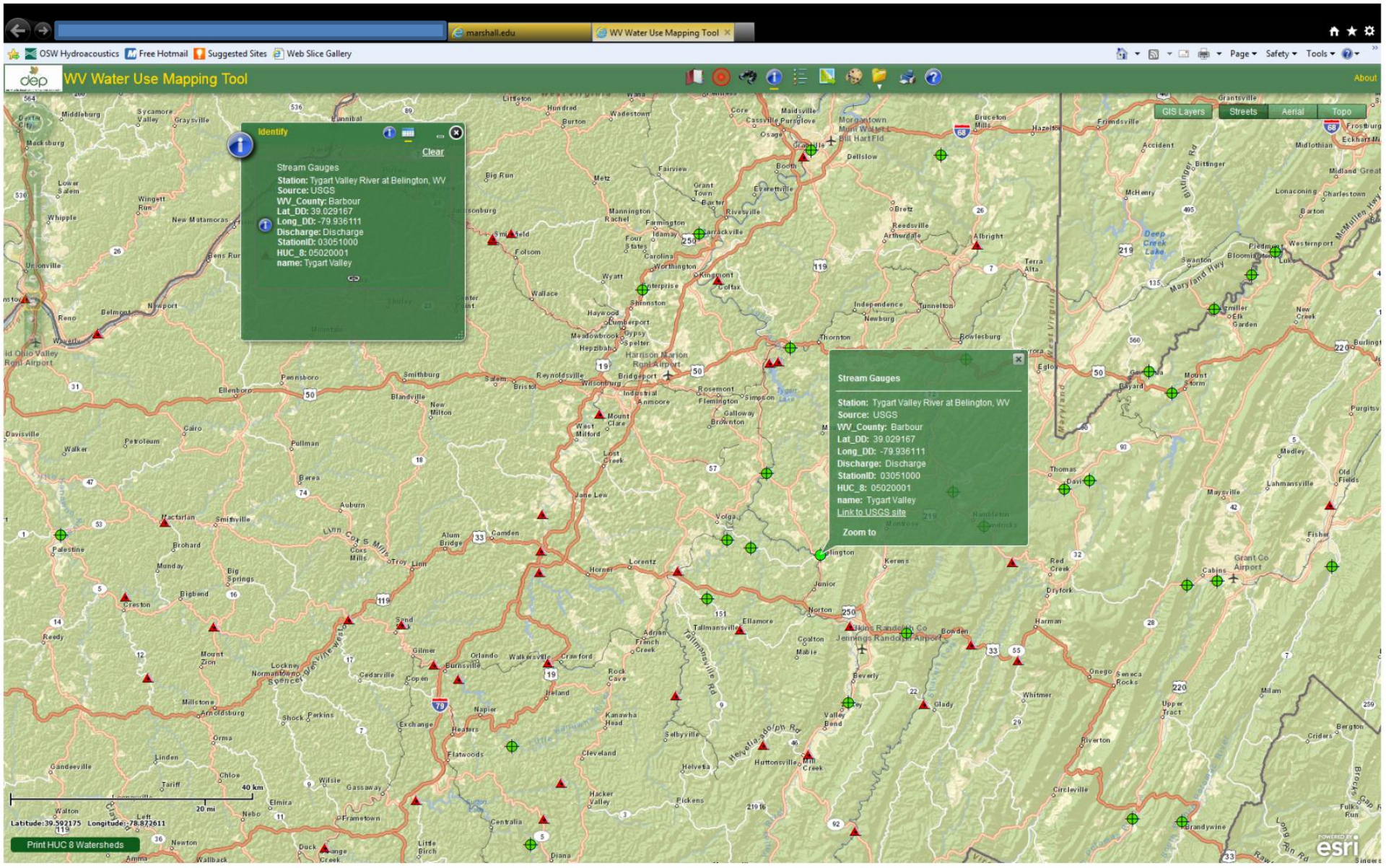
Google search: wvwaterplan and click the Blue Button



Overlap multiple GIS Layers



Stream Gauge Layers



Climate_Features
Climate_Features.zip
County
County.zip
Dams
Dams.zip
Demographics
Demographics.zip
EcoRegions
EcoRegions.zip
Geology_Type
Geology_Type.zip
Groundwater
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Groundwater_Monitoring
Groundwater_Monitoring.zip
Industrial
Industrial.zip
Land_Features
Landcover
Landcover.zip
Layouts
LQU_intakes_buffer
LQU_intakes_buffer.zip
New folder
NHD_Streams
NHD_Streams.zip
NPDES
NPDES.zip
OG_Wells_WMAS
OG_Wells_WMAS.zip
Precipitation

Downloadable shape files are available for individuals, companies, consultants and economic development professionals.

Precipitation.zip
PublicLandsByDNR
Regions
Rivers
Rivers.zip
Springs
Springs.zip
Stream_Gauges
Stream_Gauges.zip
Surface_Water
Surface_Water.zip
SWAP
SWAP.zip
Temperature
Temperature.zip
Tier3
Tier3.zip
Watershed_HUC06
Watershed_HUC06.zip
Watershed_HUC08
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Watershed_HUC10
Watershed_HUC10.zip
Watershed_HUC12
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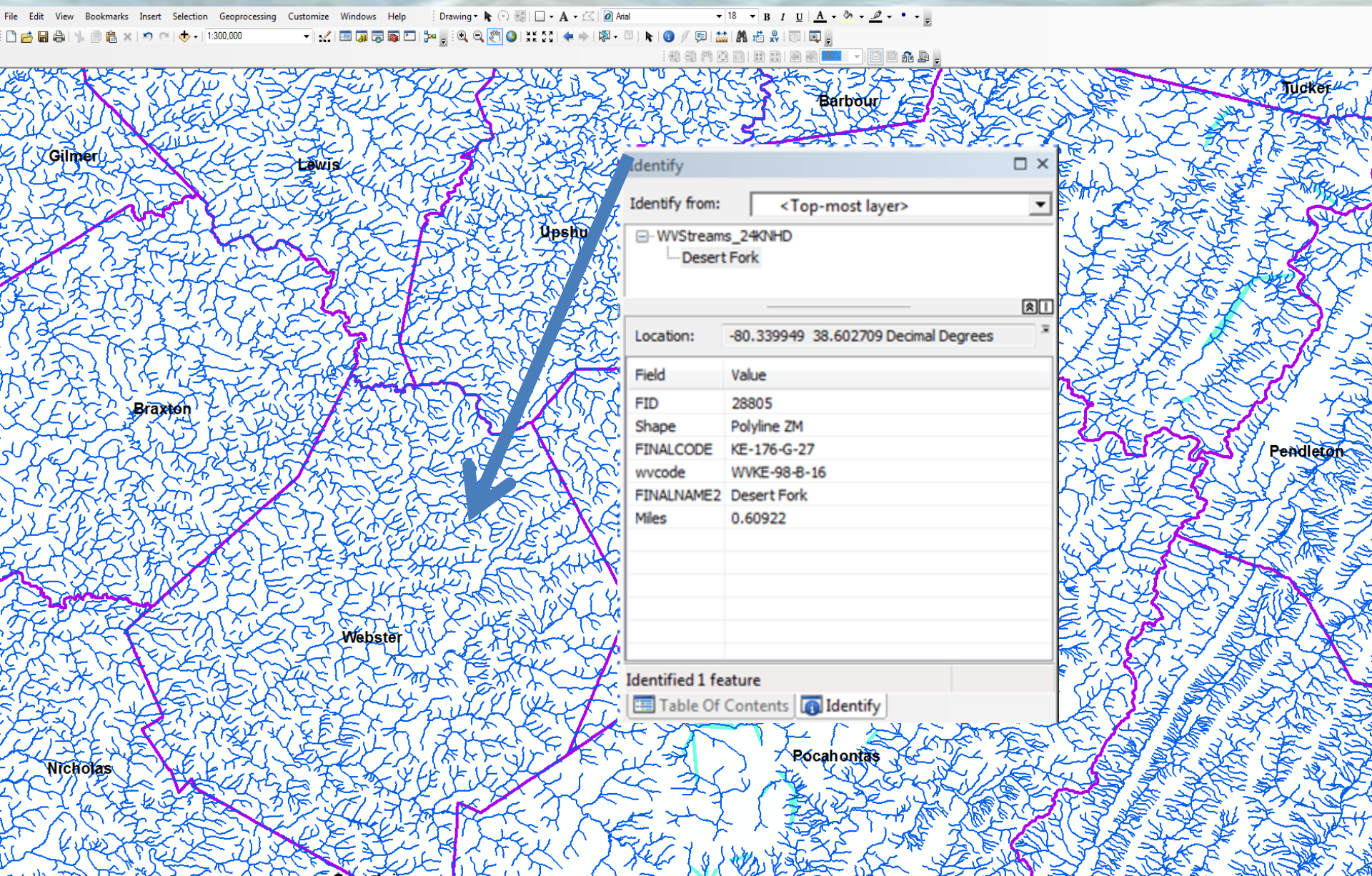
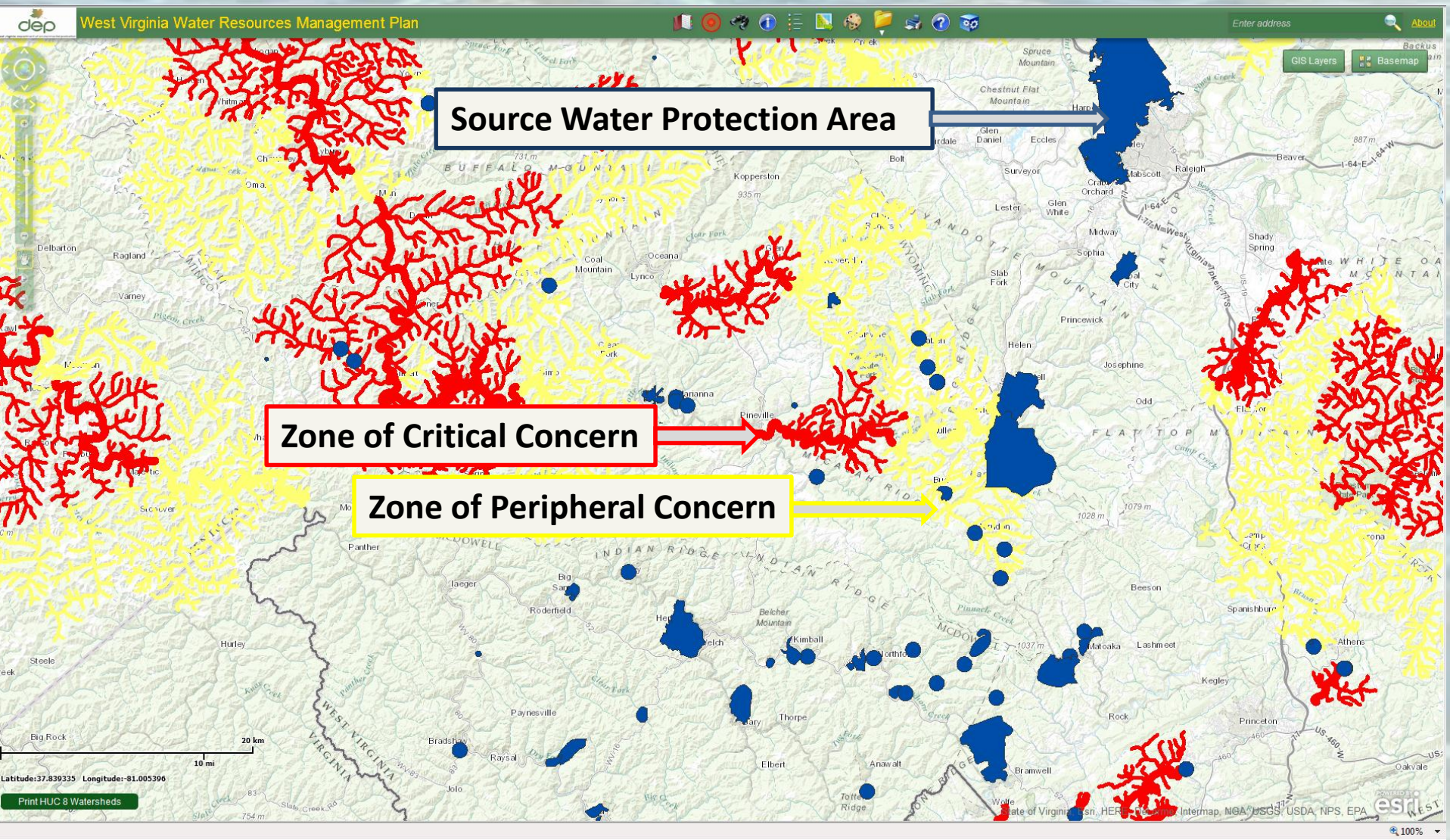
Wetlands
Wetlands.zip
WV_Watersheds

New NHD24 Stream Layer

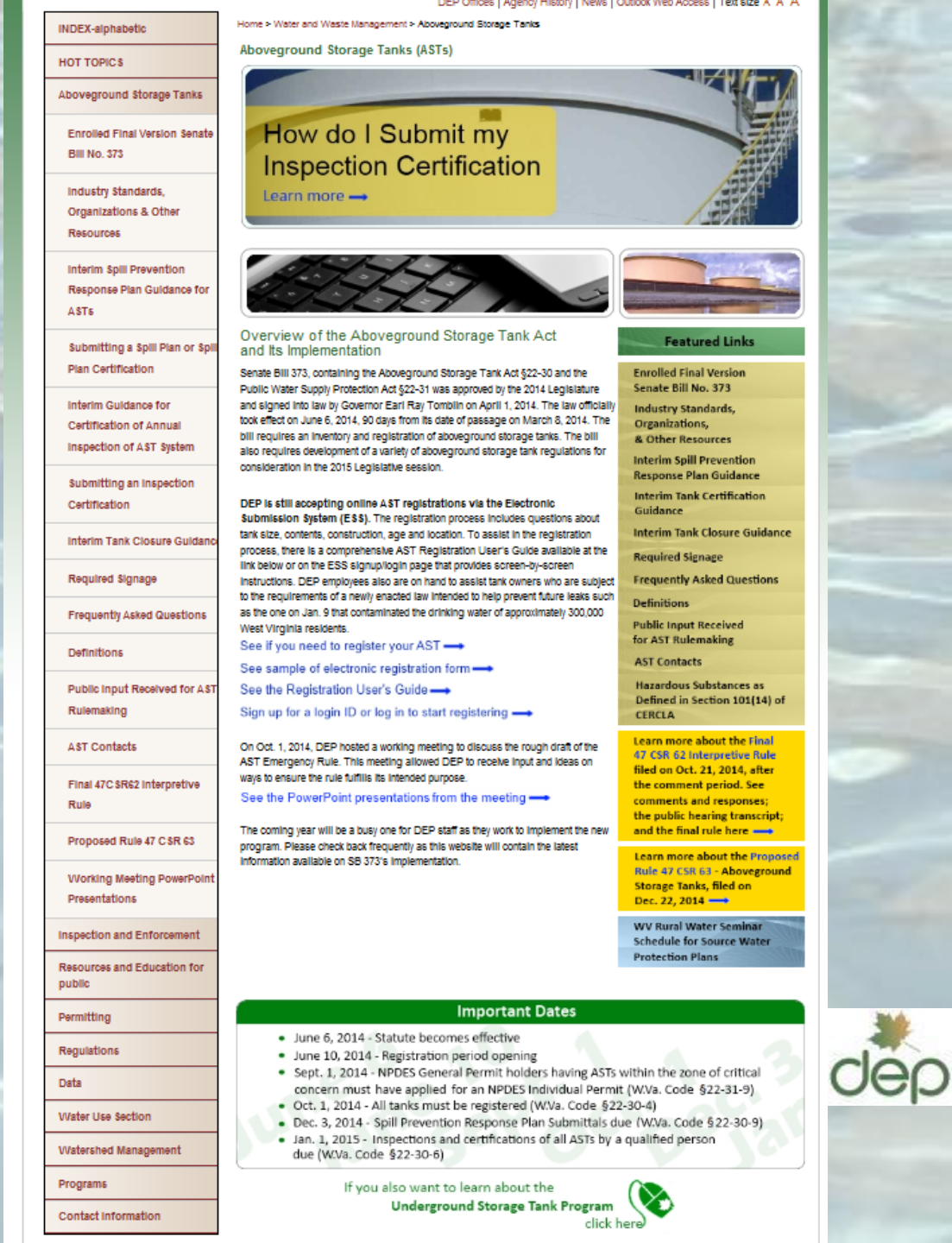


DHHR ZCC, ZPC and SWPA Layer



DEP AST WEB PAGE

Find out more about reporting timelines, forms and the DEP's Final Interpretive Rule



Large Quantity Water User Reporting Requirements for the Horizontal Gas Well Drilling Industry

* Most Oil & Gas operators are already familiar with the LQU reporting requirements and regularly submit data to the DEP's frac-water reporting database.

* *HOWEVER, the frac-water reporting system needs modernized*

    * *we are creating* a new point of entry and database for online submission.

Why a new database?

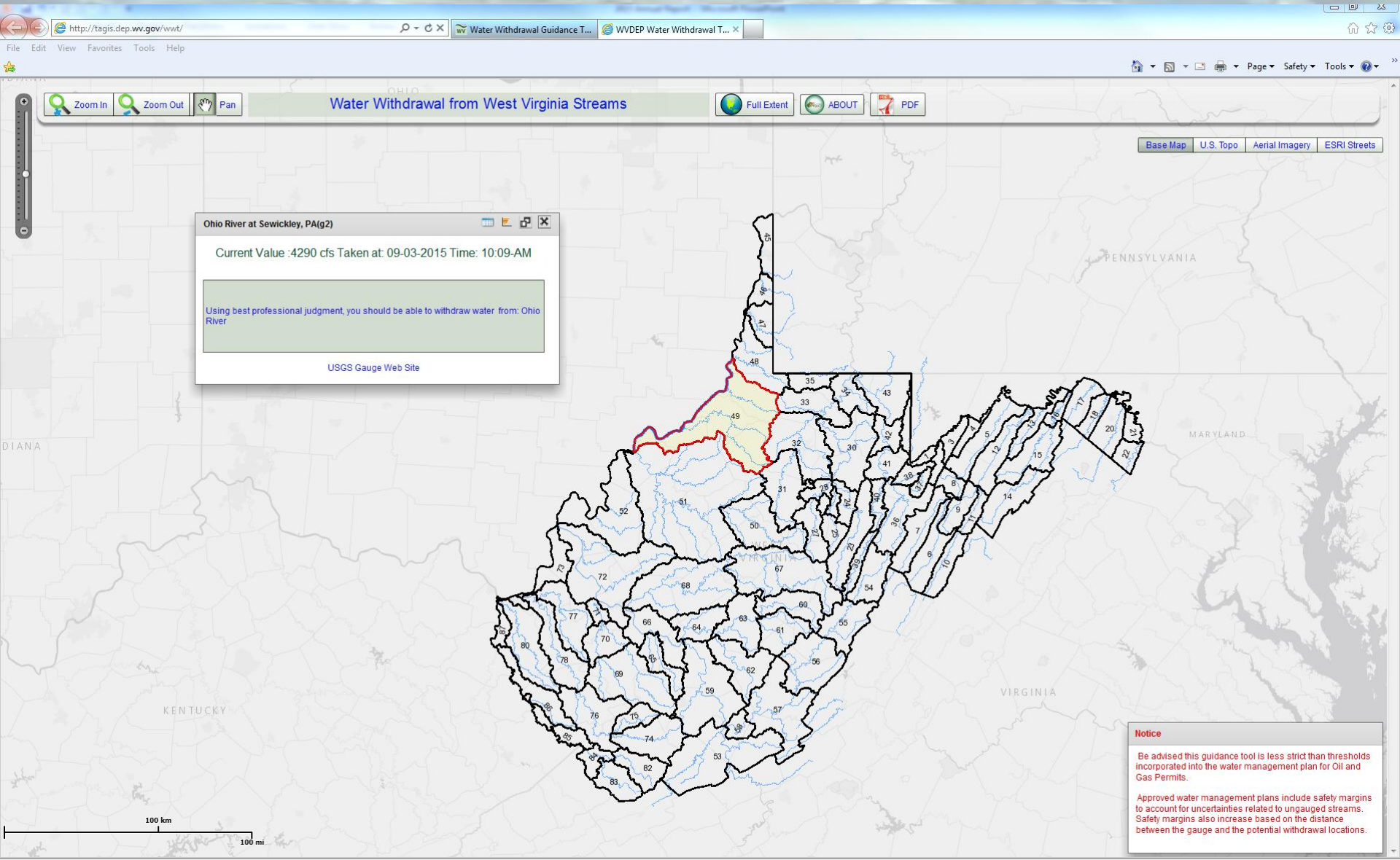
* Capture actual water withdrawal totals from each unique withdrawal location

* Alleviate redundancy to increase reporting compliance. O&G operators are already required to submit a lot of the required data to fracfocus.org

When will the new system take effect?

* We are currently testing a beta version in-house
* Our tentative date to go online is January, 2016
* In the meantime, users will continue to submit water use data to the existing frac water reporting database

Water Withdrawal Tool



Cooperators Contributing to Stream Gage Network Costs

Agency	Support Dollars
DNR	12,500
Independent Cities	25,000
DOH	65,000
WVCA	177,000
DEP	218,000

Plus 110,000 Federal match money by the USGS and additional money from some private investors.

There will likely be a 3 percent increase in 2017

Gas Companies Contributing For Past 5 Years

West Virginia Department of Environmental Protectioin
Division of Waste Water Management
U.S. Geological Survey - West Virginia Water Science Center
Energy Company Flow Monitoring Program
FY 2015

Site Number	Station Name	Collection Type	Cooperator Cost	Other Funding	Annual Cost	Comments
03052120	BUCKHANNON RIVER AT ALTON, WV	Discharge	$16,000	$0	$16,000	CNX Gas
03111955	WHEELING CREEK NEAR MAJORSVILLE, WV	Discharge	$16,000	$0	$16,000	Consol Energy
03188900	LAUREL CREEK NEAR FENWICK, WV	Discharge	$16,000	$0	$16,000	BRC Operating Company LLC
		Total	$48,000	$0	$48,000	

DEP Water Use Sole Supporter for the GW Monitoring Network

West Virginia Department of Environmental Protectioin
Division of Waste Water Management
U.S. Geological Survey - West Virginia Water Science Center
Groundwater Monitoring Program
FY 2015

Site Number	Station Name	Collection Type	Cooperator Cost	USGS Matching Cost	Other Funding	Annual Cost	
372322081241501	Mcd-0204	Water Level	$2,970	$1,900	$0	$4,870	
373839081255201	Wyo-0148	Water Level	$1,434	$1,100	$2,336	$4,870	*
380653080155301	Poc-0256	Water Level	$1,434	$1,100	$2,336	$4,870	*
381447081393101	Kan-0946	Water Level	$2,970	$1,900	$0	$4,870	
382008080292801	Web-0167	Water Level	$2,970	$1,900	$0	$4,870	
382205082304501	Way-0144	Water Level	$2,970	$1,900	$0	$4,870	
385849079563901	Bar-0136	Water Level	$2,970	$1,900	$0	$4,870	
390333078370801	Hrd-0301	Water Level	$2,970	$1,900	$0	$4,870	
391020080244101	Har-0165	Water Level	$2,970	$1,900	$0	$4,870	
391308081064201	Rit-0116	Water Level	$2,970	$1,900	$0	$4,870	
391920078032201	Ber-0840	Water Level	$2,970	$1,900	$0	$4,870	
392200078532001	Min-0173	Water Level	$2,970	$1,900	$0	$4,870	
392725077582401	Ber-0445	Water Level	$2,970	$1,900	$0	$4,870	
392757077501001	Jef-0797	Water Level	$2,970	$1,900	$0	$4,870	
393814079484601	Mng-0585	Water Level	$2,970	$1,900	$0	$4,870	
401216080362703	Brk-0066	Water Level	$1,013	$0	$3,857	$4,870	*
		Total	$42,491	$26,900	$8,529	$77,920	

* Other funding all or partially provided by the USGS National groundwater monitoring program

Stream Gage Funding

- **All of our water resource science and web tools are dependent on the USGS Stream Gaging network.**

- **It costs about 1.3 million per year to fully fund our states stream gage, groundwater and water quality network.**

- **The cost is currently supported by five state agencies, the ACoE, the USGS and some private industries.**

- **The WRPMA requires any state agency to notify this Commission if they are reducing their supporting funds:**
  - **§22-26-3(p)** *Should a cooperating state agency become unable to maintain its contribution level, it should notify the USGS and the commission of its inability to continue funding for the subsequent federal fiscal year by July 1 in order to allow for the possible identification of alternative funding resources.*

Other Projects and Studies Underway

- **Geophysical Well Logging - Groundwater Aquifer Study**
- **Mine Pool Study – Location, Quantity, Quality and Sustainability**
- **Source Water Protection and Stream Time of Travel Study**
- **Aboveground Storage Tanks ZCC, ZPC and SWPA's**
- **Water Conservation Award in 2016**

2015 WV Annual Water Conference

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

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Water Use Section

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West Virginia Water Resources Conference

In conjunction with
The WVRWA 30th Annual Training and Technical Conference

Meet the Water Use Section

The West Virginia Water Resources Protection and Management Act identifies the need for the protection and conservation of our state's water resources. It recognizes that a comprehensive assessment and statewide management plan for water resources will benefit the citizens of West Virginia: West Virginia Code Chapter 22, Article 26.

In support of this, the Water Use Section of the DEP's Division of Water and Waste Management was formed. We have many responsibilities. This meeting focuses on the Statewide Water Management Plan for West Virginia, Legislation, Resource Mapping, Large Quantity Users, Flood and Drought, and Marcellus Shale.

Here are the group members:

Brian A. Carr, P.G., Program Manager
Mark Collins, Env. Resources Analyst
Carson Wright, Hydrologist
Robert. D. Biller, LQU Coordinator
Fini Bya, GIS Coordinator

Water Resources Management Plan

§22-26-8. State Water Resources Management Plan; powers and duty of secretary.

(a) The Secretary of the Department of Environmental Protection shall oversee the development of a State Water Resources Management Plan to be completed no later than the thirtieth day of November, two thousand thirteen. The plan shall be reviewed and revised as needed after its initial adoption. The plan was developed with the cooperation and involvement of local and state agencies with regulatory, research or other functions relating to water resources.

To view the "West Virginia Water Resources Management Plan", the "West Virginia Watershed Atlas", or the "West Virginia Watersheds: A Closer Look" please go to the following website:

http://dep.wv.gov/WVWaterPlan

QUESTIONS ?

WV department of environmental protection

-Promoting a healthy environment