

State of the Commonwealth's Drinking Water

October 24, 2012

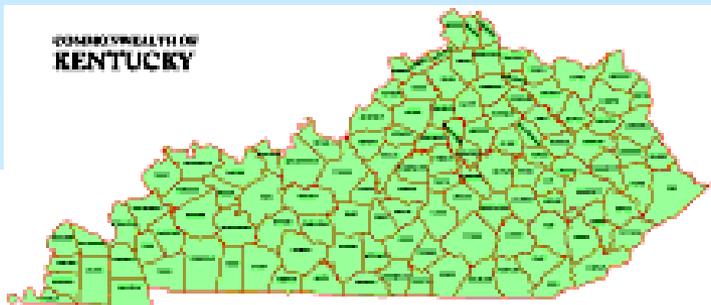


To Protect and Enhance Kentucky's Environment

Kentucky
UNBRIDLED SPIRIT™

Demographics--Population

- 2010 Census (population): 4,339,362
- 120 Counties
 - Largest: Jefferson County 741,096
 - Smallest: Robertson County 2,282
- Municipal Areas
 - Largest City: Louisville Metro 597,337
 - Smallest City: Concord (Mason) 28



Basin Management Units

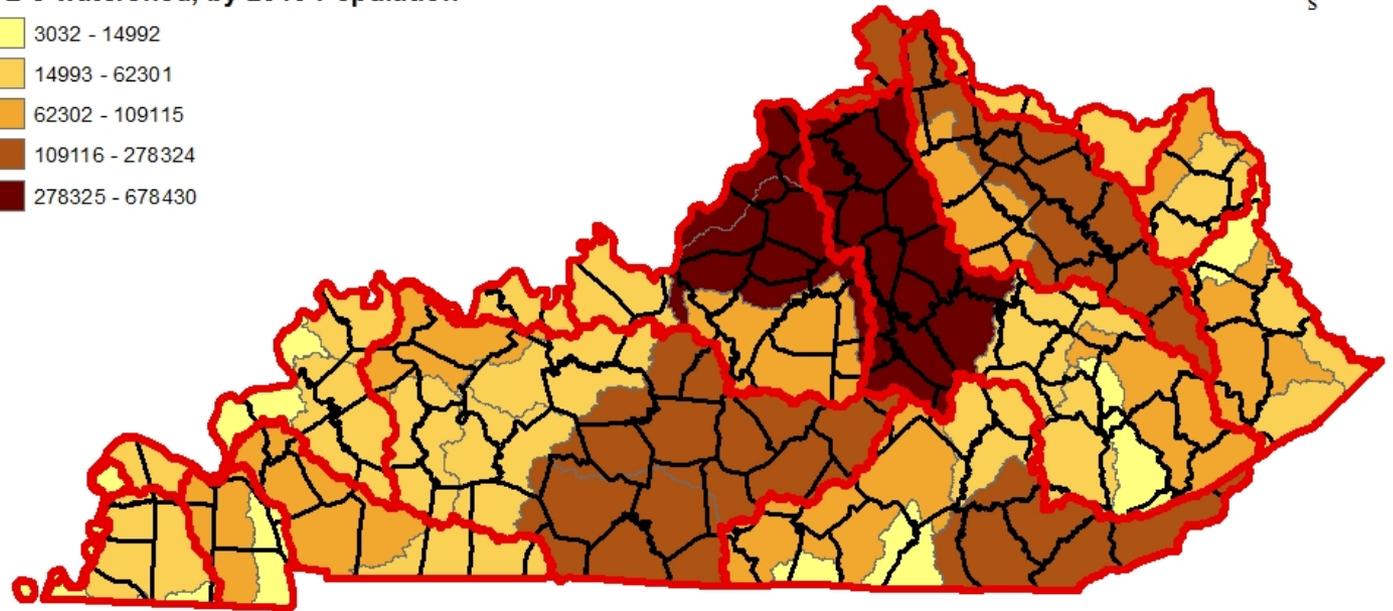
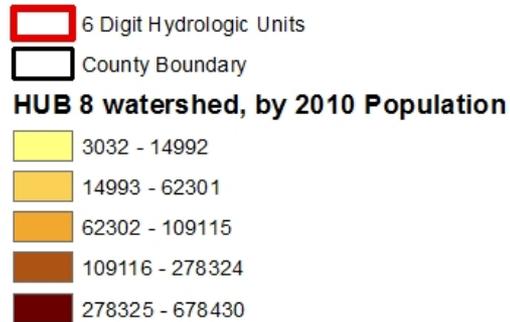
- Basin Management Units (BMU) defined
 - A BMU is a geographic unit within a state in which watershed management and water quality activities occur
 - Those on the map are at Hydrologic Unit Code 6



Population by Hydrologic Unit Code 6 Level

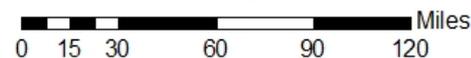
2010 Population of Kentucky, by HUC 8 sub-basin

Red boundaries are the HUC-6 watershed boundaries shown on the previous map



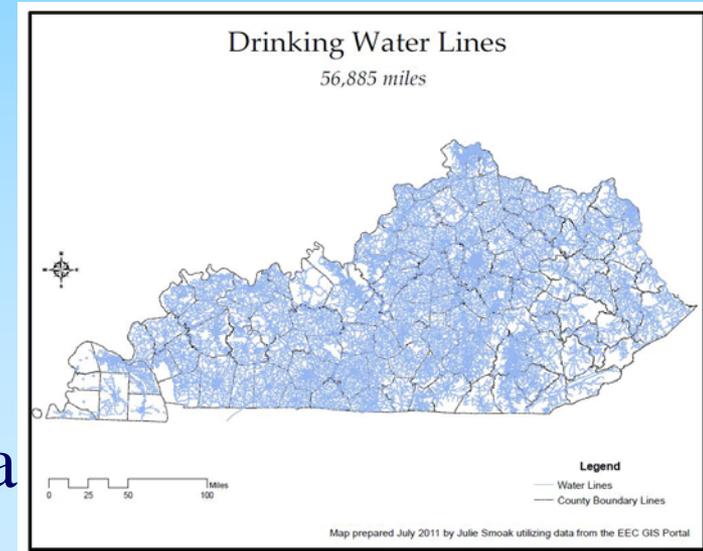
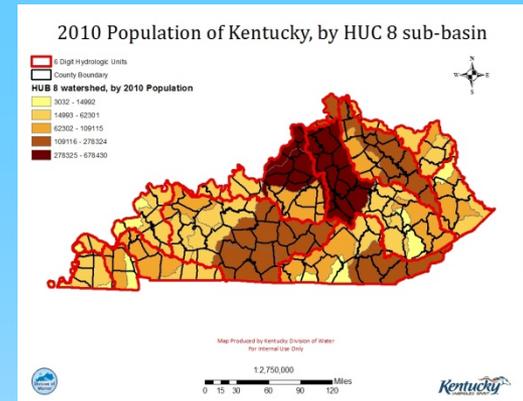
Map Produced by Kentucky Division of Water
For Internal Use Only

1:2,750,000



Public Water Systems

- As of December 31, 2011
 - 461 Public Water Systems
 - 401 are Community Water Systems
 - 60 are Non-community Water Systems
 - 50 Semi-public Water Systems
 - 5 Bottled Water Systems
- KY Infrastructure Authority estimates 95% of Kentuckians have **access** to drinking water from a public water system



How KY Compares to Other States

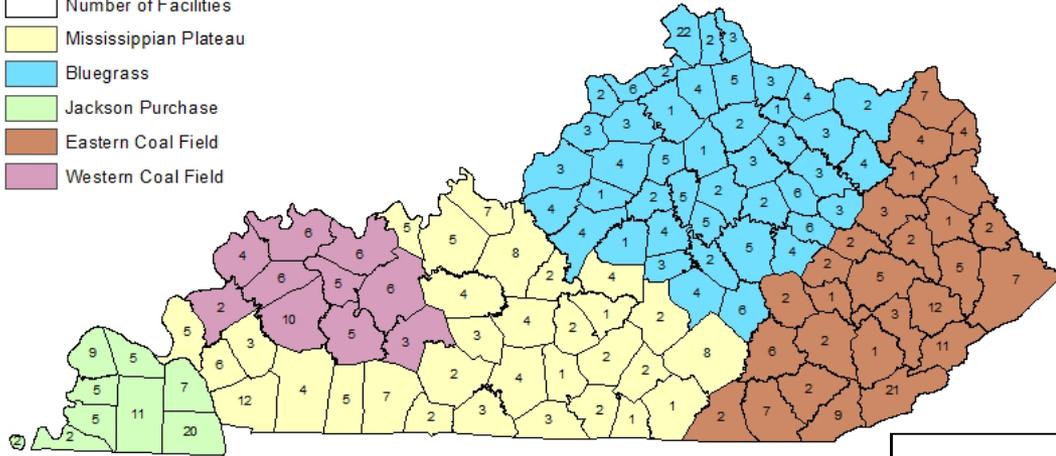
State	Total # PWS	# CWS	# NonCWS	% population served
Border States				
Kentucky	461	401	60	95
Tennessee	910	490	420	90
West Virginia	1027	486	541	84.8
Missouri	2752	1459	1293	88.6
Virginia	2755	1164	1591	83
Indiana	4157	804	3353	83
Ohio	4821	1236	3585	93.6
Illinois	5720	1755	3965	98
EPA R4 States				
Kentucky	461	401	60	95
Alabama	606	527	79	92.5
Tennessee	910	490	420	90
Mississippi	1254	1097	157	90
South Carolina	1435	599	836	82
Georgia	2484	1778	706	87
Florida	5470	1704	3766	
North Carolina	6004	2068	3936	79.4

- CWS—serves primarily a residential customer base
- NonCWS—serves either a transient customer base (i.e., campgrounds, resorts) or the same population base at least 6 months of the year (i.e., schools, industries)

Public Water System Locations

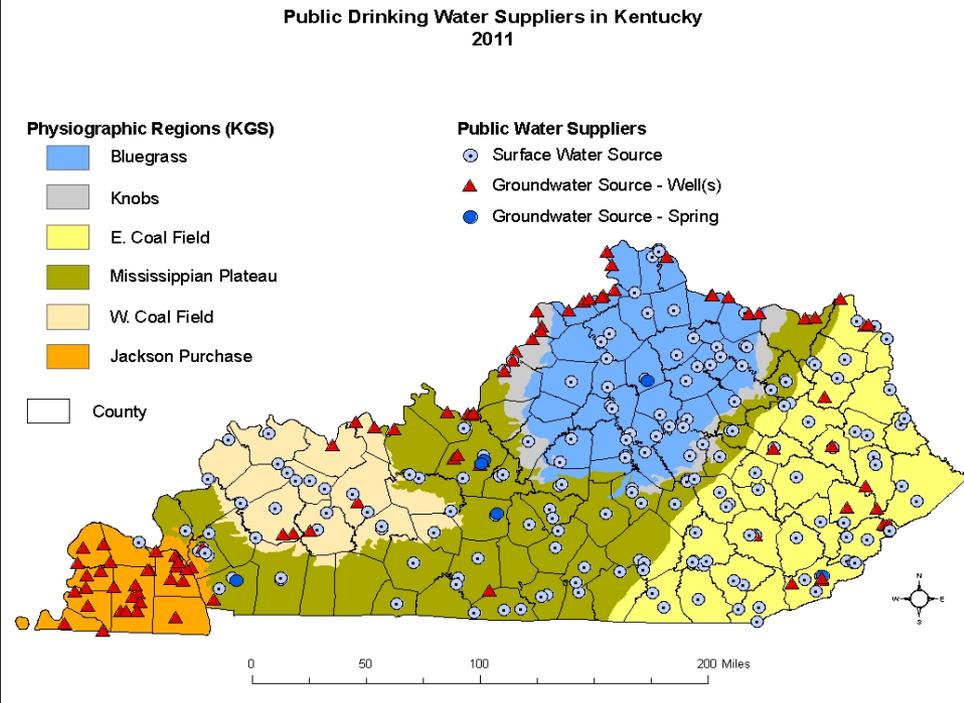
Legend

-  Number of Facilities
-  Mississippian Plateau
-  Bluegrass
-  Jackson Purchase
-  Eastern Coal Field
-  Western Coal Field



Number of
PWSs by
County

Location and
Type of Drinking
Water Treatment
Plants



Public Water Systems

- 25% of KY's public water systems have treatment plants
 - The other 75% purchased treated drinking water from systems that have treatment plants
 - All are regulated by KY and EPA
- 70% of KY citizens receive drinking water from plants that treat surface water rather than groundwater
- 70% of the public water systems serve less than 10,000 in population

Therefore--KY is a small system state that relies on surface water

Public Water System Regulation

- PWSs are regulated by the Safe Drinking Water Act and 40 CFR Parts 136 and 141-143
 - These regulations are referred to in 401 KAR Chapters 8 and 11
 - Chapter 8 Public Water Supply
 - Chapter 11 Operator Certification
- KY EEC has the primary enforcement authority to administer the SDWA
 - Department for Environmental Protection

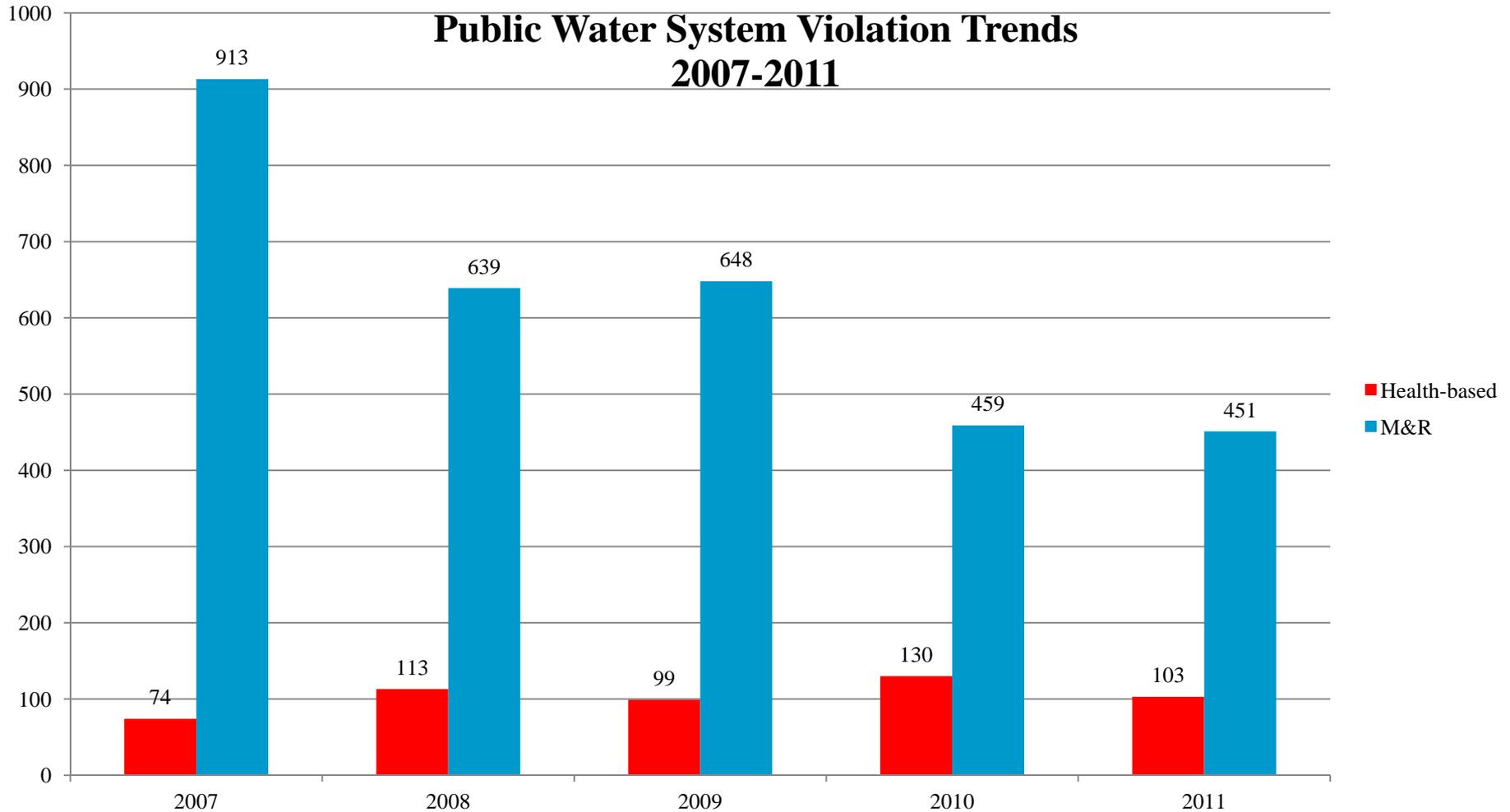


Public Water System Regulation

- Regulatory authority applies to:
 - Source water protection
 - Engineering design and construction
 - Finished water monitoring and compliance
 - Certified laboratory results
 - Reporting of monitoring results
 - Public notification
 - Inspections and surveys
 - Operator certification
 - Maintenance of technical, managerial and financial capacity



Public Water System Violation Trends



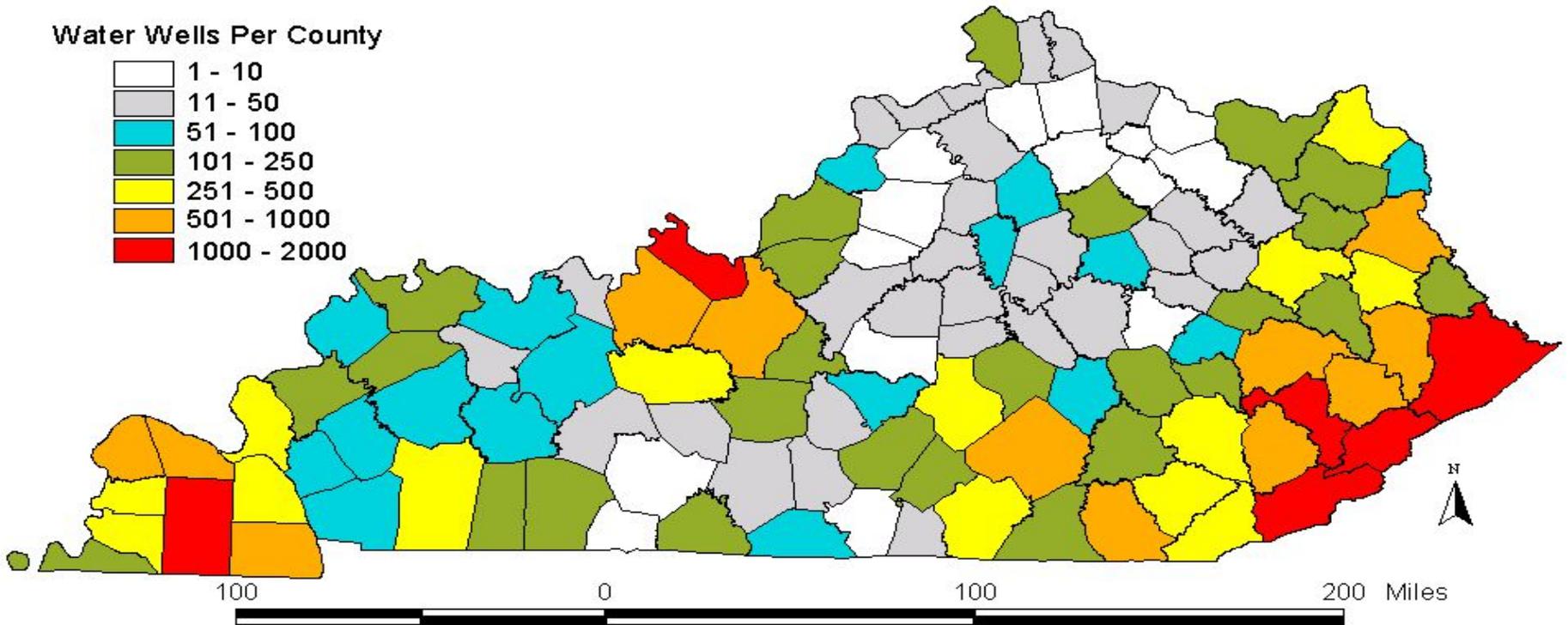
Public Water System Violation Trends

- Overall, the number of drinking water violations has decreased over the past 5 year
 - On average, only 15% of the violations are due to a health-based contaminant
 - This means 85% of the violations, on average, are related to monitoring and reporting violations
- The majority of health-based violations are for exceeding the disinfection by-product contaminant levels

Private Drinking Water Supplies

- Private drinking water supplies are defined as those that provide drinking water to fewer than 3 residences
 - Over 29,000 private drinking water wells are in the Groundwater Database
 - These wells serve approximately 444,000 people
 - Sometimes citizens opt to remain on their private well rather than connect to the public water system
 - Not all have been tested
 - Both KY Geological Survey and DOW house the data
- Private supplies are not regulated by the Safe Drinking Water Act or KY's drinking water regulations
 - Well drilling and construction (401 KAR Chapter 6)
 - Ambient monitoring network
 - Complaint investigation
 - Some local health department oversight

Number of Private Wells per County



Drinking Water Projects



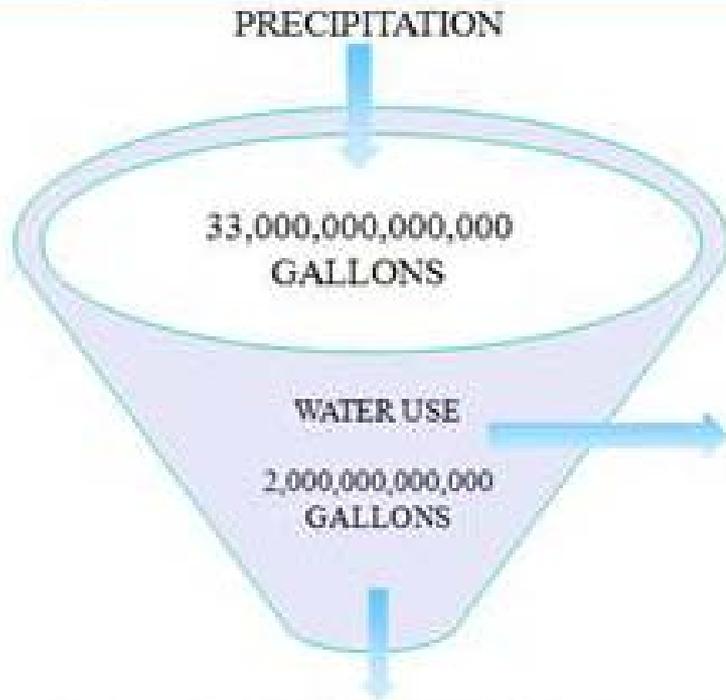
On-going Drinking Water Projects

- Area-Wide Optimization Program (AWOP)
Technical Assistance
 - Focusing on optimizing existing drinking water treatment and distribution to meet more stringent regulatory requirements
 - Microbial (turbidity) removal
 - Disinfection by-product control and reduction

On-going Drinking Water Projects

- Capacity Development Assistance Program
 - Providing grant funds to small drinking water systems to correct deficiencies noted during inspections
- 5-year Wellhead Protection Plan updates
- Groundwater study on bacterial levels in private drinking water wells
- Source water quality monitoring projects

Source Water Quantity



Of the 2 trillion gallons available, approximately 1.8 trillion gallons is withdrawn and used

Total annual rainfall in KY results in 33 trillion gallons

31 trillion gallons is not available due to:

- Discharge to rivers and streams to the Ohio, TN and MS Rivers
- Recharge of groundwater
- Evapotranspiration
- Stored soil moisture
- Storage in lakes and reservoirs (over 1 trillion gallons)

Source Water Quality

- Source Water Protection
 - Sediment, bacterial loading and natural organic matter are the primary source water challenges that lead to drinking water violations and public health issues
 - Point source (“end of the pipe”) discharges (i.e., wastewater treatment plants, industries)
 - Non-point source (not piped) contamination (i.e., storm water, agricultural)

Source Water Quality and Protection

- Both drinking water utilities and dischargers are responsible for protecting KY sources of drinking water
- Drinking water systems need to plan to protect
 - Source waters
 - Wellhead areas
 - Groundwater

Conclusions and Challenges

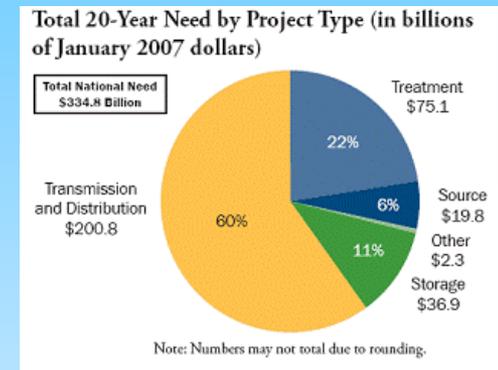


KY's Drinking Water Challenges

- Maintaining technical, managerial and financial abilities
 - Decreasing water system revenues
 - Competing priorities
 - Political environment
 - Federal and state regulations
 - Water system staffing
 - Managing water (source, water loss, conservation)
- New regulatory requirements
 - Stricter disinfection by-product compliance

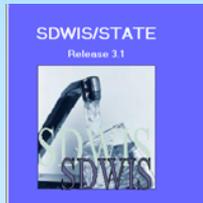
KY's Drinking Water Challenges

- Aging infrastructure
 - There is a \$1 Trillion need across the US
 - 2007 Drinking Water Needs Survey indicated that KY needs \$4.978 billion dollars for infrastructure
 - Water loss
 - Pressure fluctuations
- Source Water Protection
 - Ever-emerging new source water contaminants
 - Clean Water Act versus the Safe Drinking Water Act
- Simultaneous Compliance
 - Actions taken by a water system to comply with one regulation may cause them to violate another



Data Gaps

- Drinking water contaminants are monitored on different schedules
 - From every 4 hours for turbidity to once every 9 years for asbestos
 - Drinking water plants do monitor as frequently as every 2 hours for operational purposes
 - But only those tests that can be quickly and readily done—turbidity, pH, chlorine residual
- Multiple databases
 - “Mining” or extracting needed information



Data Gaps

- Emerging Contaminants
 - EPA has a process for evaluating new contaminants and their potential presence in drinking water
 - Contaminant Candidate List
 - Unregulated Contaminant Monitoring Rules
- Private Residential Systems
 - Educating the private well users
 - Number in use
 - Identifying potential sources of contamination and the link to surface waters
 - Treatment

Is KY's Drinking Water "Safe to Drink"?

- For the **regulated public water systems** the answer is **YES!**
 - The quality of the finished water produced and distributed by public water systems is good
 - The overall number of violations is decreasing
 - For the past 5 years, an average of 15% of the violations are health-based
 - Only 25 systems (5.4%) are in formal enforcement actions
 - But, home plumbing and its maintenance can affect the quality of drinking water in residences

Is KY's Drinking Water "Safe to Drink"?

- KDOW's groundwater database indicates that most **private residential wells** in KY provide safe drinking water
 - As noted earlier, private drinking water wells are not regulated by KDOW
 - Private citizens using wells have the sole responsibility for ensuring the purity and safety of the water they drink
 - Such wells can be impacted by bacteria, iron, manganese and sulfide
 - Water contamination issues identified by KDOW can be controlled with filtration or disinfection
 - Residential wells are typically disinfected; however most wells do not have any further treatment

Questions?? Comments??

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