

# Kentucky Waterways

*Amanda Gumbert, PhD  
Extension Specialist for Water Quality*

# KENTUCKY RIVER BASINS







# KENTUCKY WATER FACTS

- More than 90,000 miles of streams and rivers
- More than 440,000 acres of lakes

# STREAMS IMPAIRED (DO NOT FULLY SUPPORT DESIGNATED USE)

	2014	2016
Aquatic Life	49%	58%
Primary Contact Recreation (swimming)	71%	79%
Secondary Contact Recreation (fishing, boating, wading)	33%	45%
Fish Consumption	62%	60%
Domestic Water Supply	0%	0%
Outstanding State Resource Water	---	16%

## Causes (Pollutants)

1. Pathogens (fecal coliform, E. coli)
2. Sediment
3. Nutrients (N, P)

*Source: 2014 and 2016 Integrated Report to Congress, Kentucky Division of Water.*

*\*Note: Data represent monitoring of approximately 14% of Kentucky's stream miles.*



**If it's on the ground,**  
**it's in your water.**



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# CHALLENGES FOR OUR STREAMS

- Volume
- Sediment
- Pathogens (bacteria)
- Nutrients





# CHALLENGES FOR OUR STREAMS

- Volume
  - Impervious surfaces



# WHAT HAPPENS WHEN IT RAINS?

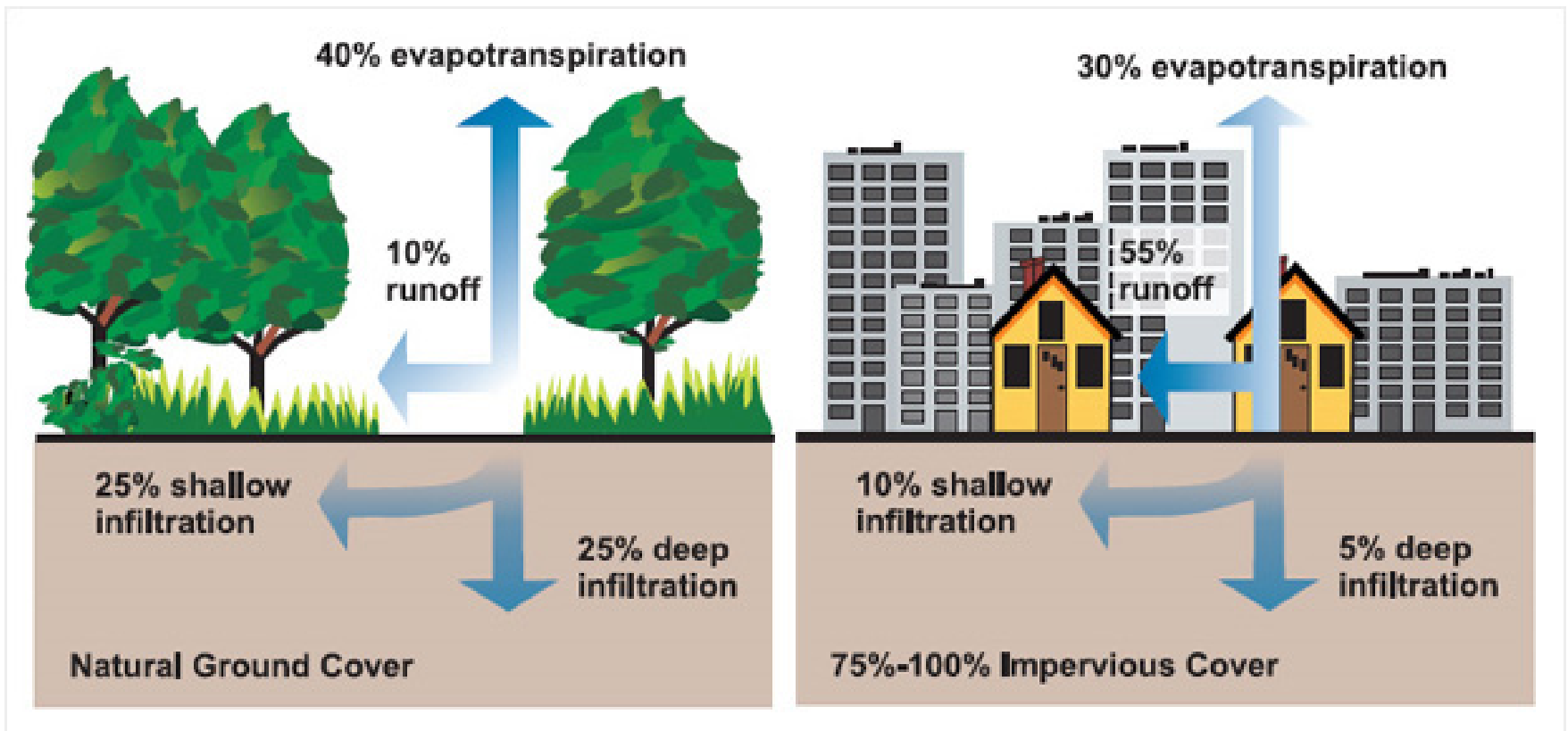


Image: [https://www3.epa.gov/npdes/pubs/nps\\_urban-facts\\_final.pdf](https://www3.epa.gov/npdes/pubs/nps_urban-facts_final.pdf)







# CHALLENGES FOR OUR STREAMS

- Sediment (bare soil)
  - Streambank erosion
  - Construction
  - Tillage













# CHALLENGES FOR OUR STREAMS

- Pathogens (bacteria, viruses)
  - Failing septic/sanitary sewers
  - Livestock
  - Wildlife



# CHALLENGES FOR OUR STREAMS

- Nutrients (N, P)
  - Excess fertilizer
  - Animal manure
  - Human wastewater
  - Wildlife

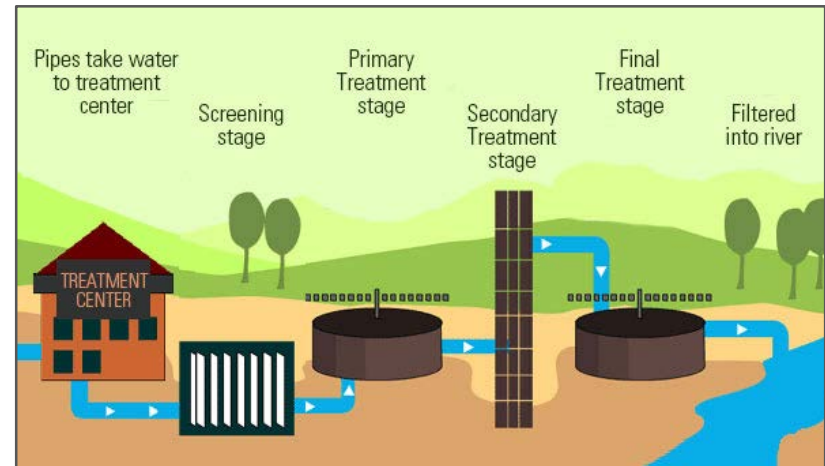


Image: <https://eschooltoday.com/learn/sewage-treatment-process/>



# MISSISSIPPI-ATCHAFALAYA RIVER BASIN

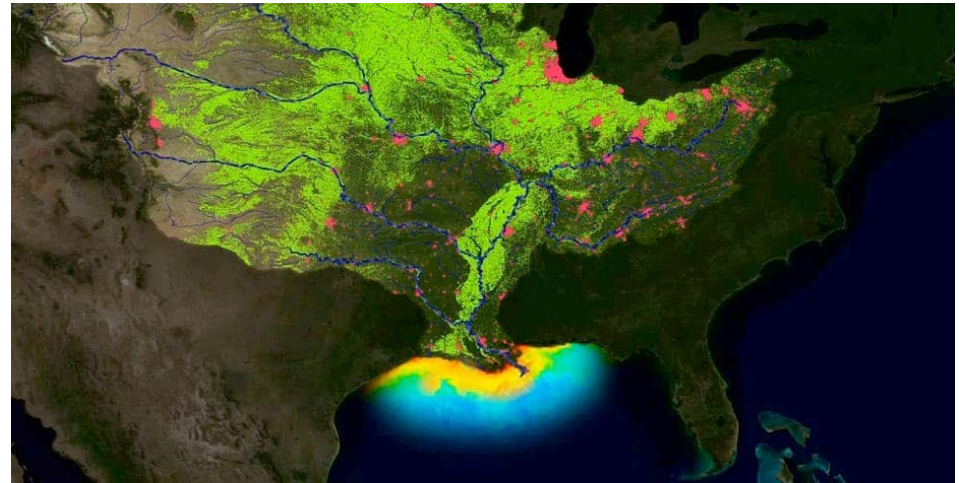


Image: <https://coastalscience.noaa.gov/news/noaa-forecasts-very-large-dead-zone-for-gulf-of-mexico/>

41% of contiguous U.S.  
drains to the Gulf of Mexico.

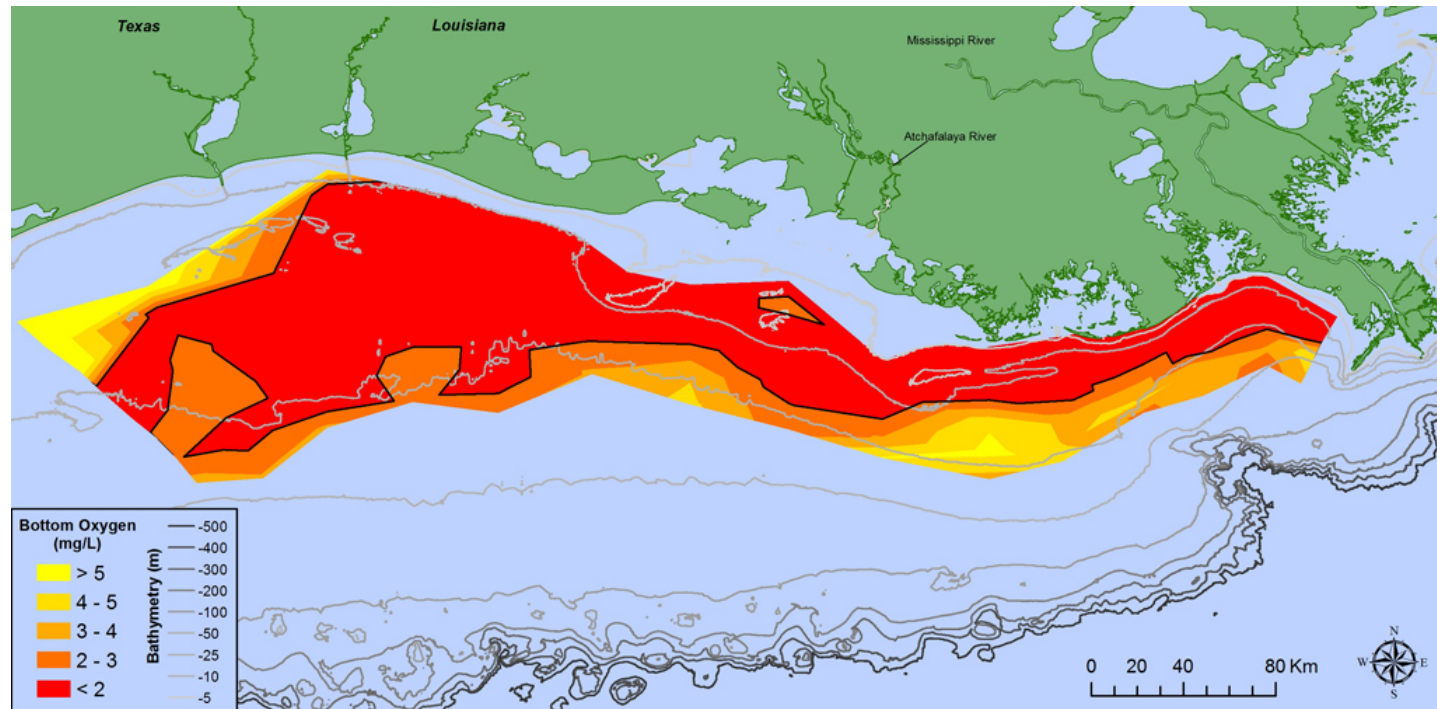
Runoff from farms (green) and  
cities (red) carries nutrient-rich  
water to the Gulf of Mexico. A  
large hypoxic or “dead zone”  
forms during summer each year.







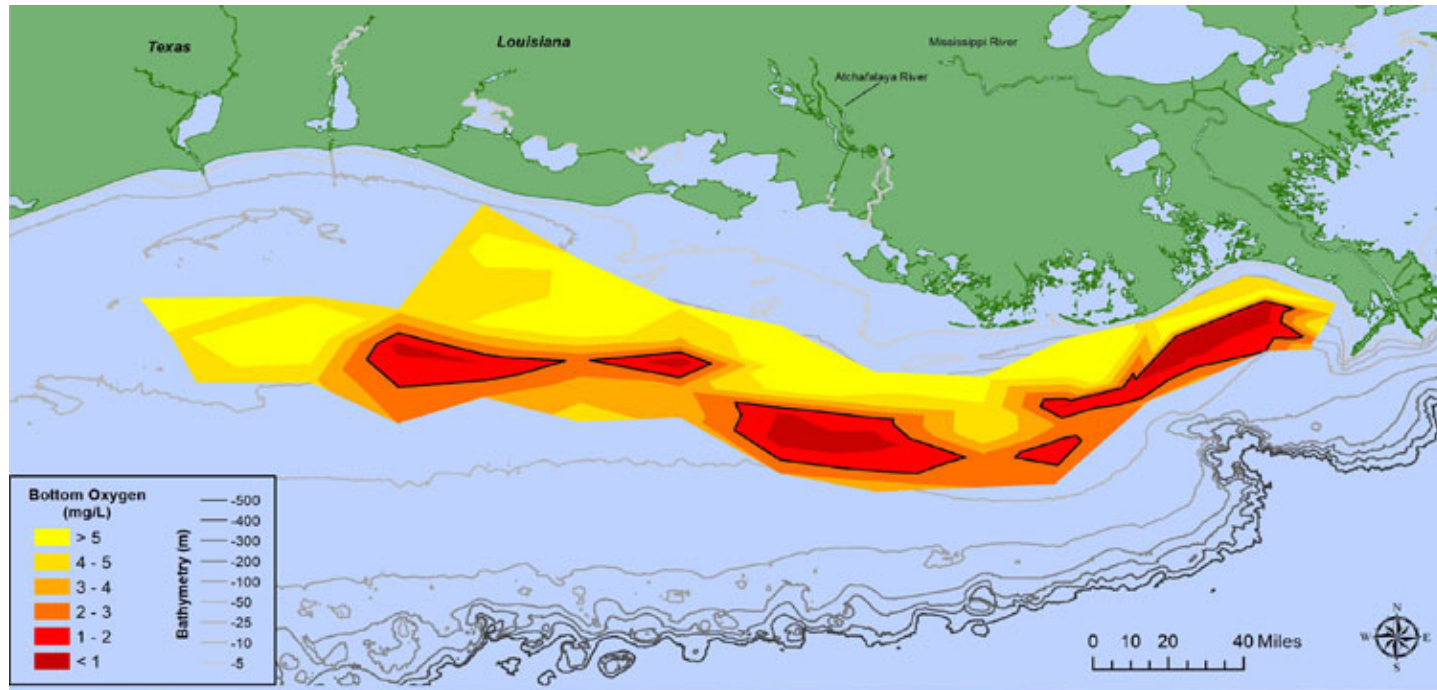
# 2017



Source: <https://gulfhypoxia.net/research/shelfwide-cruise/?y=2017>

2017: 8,776 sq. miles (5.6m acres); largest size measured to date since the standardized mapping cruises began in July 1985.

# 2020



<https://www.noaa.gov/media-release/smaller-than-expected-gulf-of-mexico-dead-zone-measured>

2020: 2,116 sq. miles (1.4m acres); 3<sup>rd</sup> smallest in 34 years of surveys; due to mixing by Hurricane Hanna





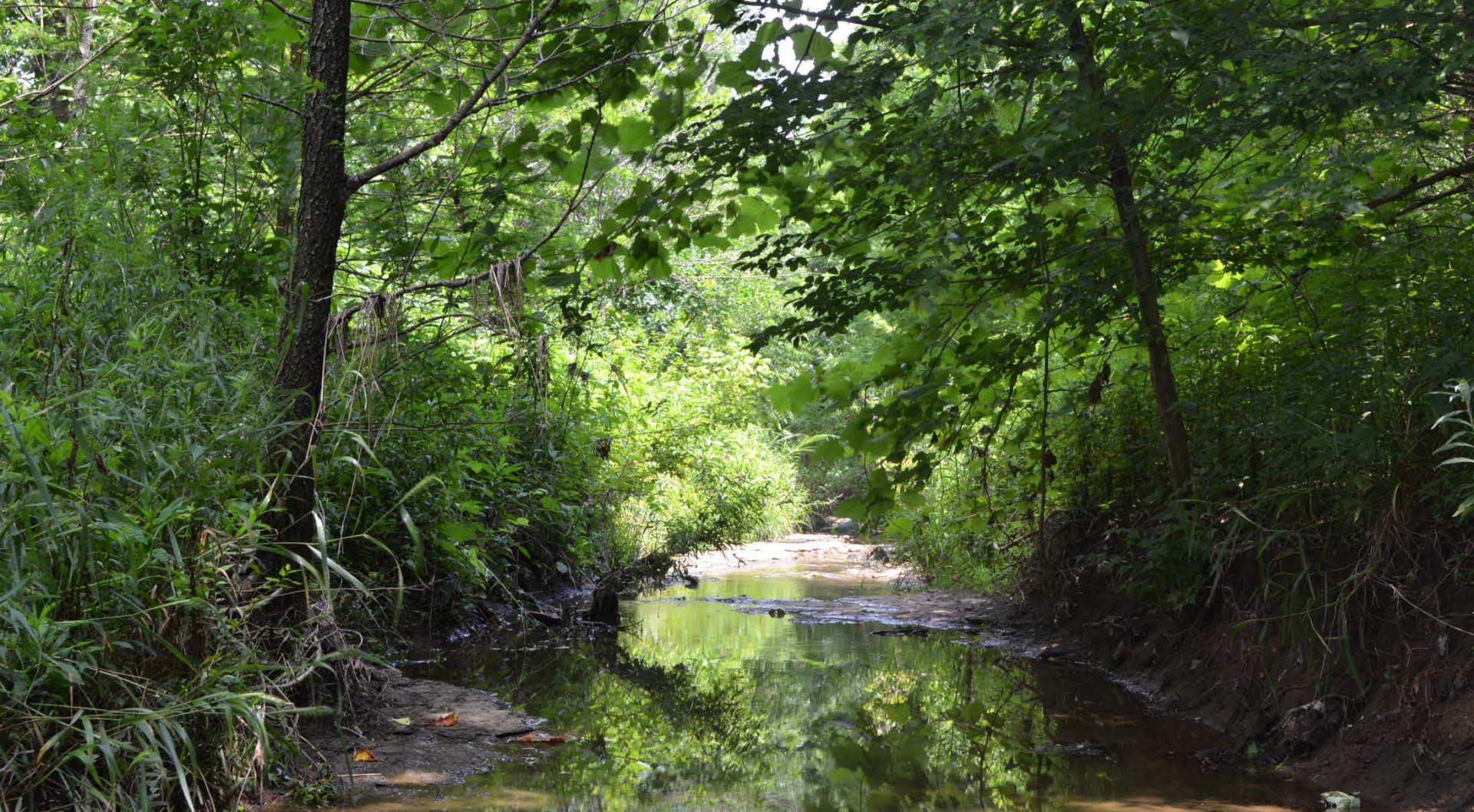
LIFE  
is better  
ON THE  
WATER



**When you're fertilizing  
the lawn, you're not just  
fertilizing the lawn.**







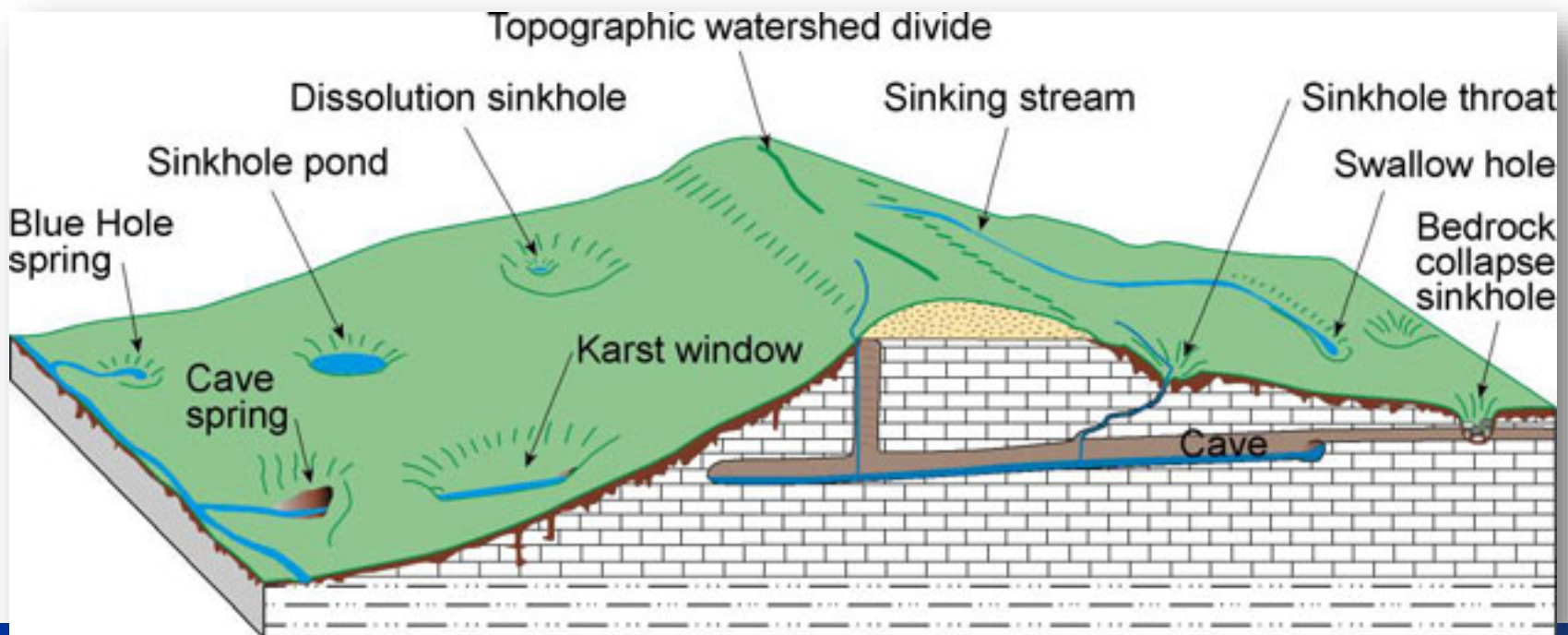
# Kentucky Waterways

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Extension Specialist for Water Quality*



# SENSITIVE AREAS

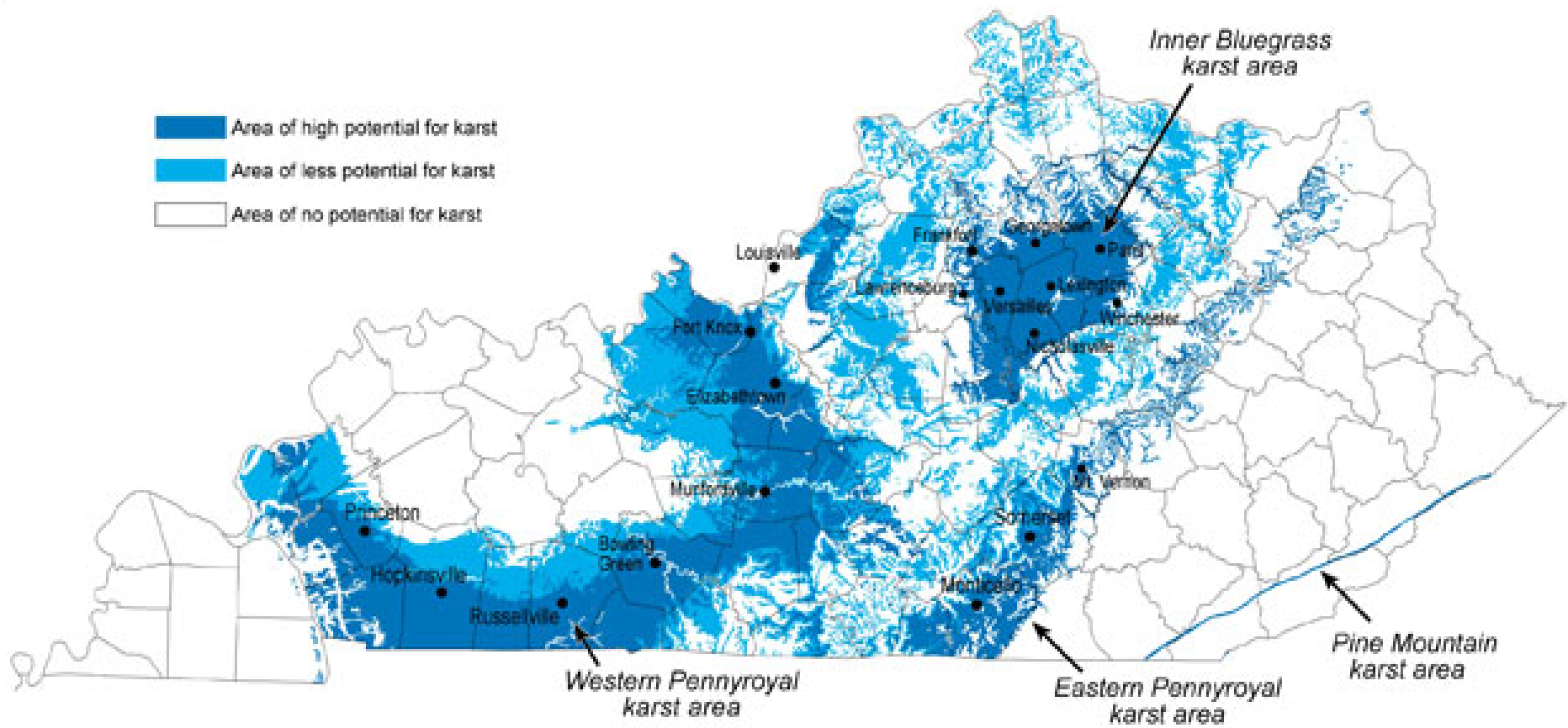
- Where ground water is near the surface or easily accessed (wells, sinkholes, porous soil, etc.)
- In karst regions, there may be little infiltration into the soil before contaminants reach ground water





# KARST REGIONS OF KENTUCKY

- Area of high potential for karst
- Area of less potential for karst
- Area of no potential for karst









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**it's in your water.**



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# SOLUTIONS FOR A HEALTHY STREAM

- 1) Plant in the buffer zone



# BENEFITS OF HEALTHY STREAM BUFFERS

- Filter runoff water
  - Slows down water, increases infiltration
  - Dissolved pesticides can be filtered
- Uptake excess N-P-K from adjacent areas
- Protect streambanks from erosion
- Reduce flood damage
- Provide shade to streams
- Provide wildlife habitat
- Improve aesthetics



# SOLUTIONS FOR HEALTHY STREAMS

- 1) Plant in the buffer zone
- 2) Don't mow in the buffer zone (see #1)







# SOLUTIONS FOR HEALTHY STREAMS

- 1) Plant in the buffer zone
- 2) Don't mow in the buffer zone
- 3) Keep your septic system in good condition AND watch what you flush





# SOLUTIONS FOR HEALTHY STREAMS

- 1) Plant in the buffer zone
- 2) Don't mow in the buffer zone
- 3) Keep your septic system in good condition AND watch what you flush
- 4) Pick up litter and don't dump anything down storm drains



- Educate family members not to litter.
- Be part of a community clean-up or organize one yourself.



# SOLUTIONS FOR HEALTHY STREAMS

- 1) Plant in the buffer zone
- 2) Don't mow in the buffer zone
- 3) Keep your septic system in good condition AND watch what you flush
- 4) Pick up litter
- 5) Don't change the path of streams







# SOLUTIONS FOR HEALTHY STREAMS

- 1) Plant in the buffer zone
- 2) Don't mow in the buffer zone
- 3) Keep your septic system in good condition AND watch what you flush
- 4) Pick up litter
- 5) Don't change the path streams
- 6) Get outside and enjoy Kentucky's water resources!



“Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land.”

*Luna Leopold*



# [WWW.UKY.EDU/BAE/BACKYARDSTREAMS](http://WWW.UKY.EDU/BAE/BACKYARDSTREAMS)

**Biosystems & Agricultural Engineering**  
Division of Engineering  
College of Agriculture, Food and Environment

myUK

## Biosystems & Agricultural Engineering

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### Backyard Streams

Image created by Chris Sias

Many urban homeowners are not sure what to do about the stream in their backyard. Who owns it? How can I take care of it? What plants are good for my streambanks? These common questions lead to some confusing answers. This website is designed to help homeowners to backyard streams appreciate this resource, protect personal property, and improve water quality and habitat.

Backyard Streams - Glacierside Park

Backyard Streams - Colony Neighborhood

Backyard Streams - Landsdowne Branch

Publications

Webinars

Interested in becoming a Certified Backyard Stream Steward? This online course is comprised on 12 modules designed to help homeowners understand how to protect and manage their backyard streams. Learn how fundamental stream processes are related to channel shape, how stormwater impacts stream ecosystems, why stream beds and banks erode, what methods can protect and restore stream ecosystems, what permits are required to restore streams, how karst landscapes influence streams, and how to begin a watershed assessment.

**Interested? Register to Become a Certified Backyard Stream Steward!**

Interested in learning more but not ready for the online course? Use the links below to access relevant publications and webinars.


Have questions or comments about backyard streams? Please reach out to Amanda Gumbert, Ph.D. ([amanda.gumbert@uky.edu](mailto:amanda.gumbert@uky.edu)) and Carmen Agouridis, Ph.D., P.E., M.P.P. ([carmen.agouridis@uky.edu](mailto:carmen.agouridis@uky.edu)).

ID-242

University of Kentucky  
College of Agriculture,  
Food and Environment  
Cooperative Extension Service

## Central Kentucky Backyard Stream Guide


Amanda Gumbert, Agricultural Programs, Carmen Agouridis, Biosystems and Agricultural Engineering, and Chris Sias, Landscape Architecture



Cooperative Extension Service | Agriculture and Natural Resources | Family and Consumer Sciences | 4-H Youth Development | Community and Economic Development

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IP-75



### LIVING ALONG A KENTUCKY STREAM

Cooperative Extension Service | Agriculture and Natural Resources | Family and Consumer Sciences | 4-H Youth Development | Community and Economic Development



# Online Course - Canvas

File Edit View History Bookmarks Tools Help

Backyard Streams Program

https://canvas.instructure.com/courses/1340900

80%

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CANVAS-NA

Home

## Backyard Streams Program

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Help

Many urban homeowners are not sure what to do about the stream in their backyard. Who owns it? How can I take care of it? What plants are good for my streambanks? These common questions can lead to some confusing answers. This course is designed to help homeowners with backyard streams appreciate this resource, protect personal property, and improve water quality and habitat.



Backyard Streams

Image created by Chris Sass

### Welcome to the Backyard Streams Program!

Welcome to the University of Kentucky Cooperative Extension Service's Backyard Streams program. This program is comprised of 12 online modules that are designed to help homeowners understand how to protect and manage their backyard streams. After successfully completing each module, you will become a Certified Backyard Stream Steward.

To learn more about our Backyard Stream program, visit [www.uky.edu/bae/backyardstreams](http://www.uky.edu/bae/backyardstreams).



## Course Topics

- Backyard Stream Basics
- Challenges for Urban Streams
- Fluvial Geomorphology 101
- Ecosystem Services 101
- Streambank Erosion 101
- Riparian Buffer Vegetation 101
- Stream Restoration 101
- Stormwater 101
- Low Impact Development 101
- Permitting 101
- Karst 101
- Watershed Assessment 101



# Certificate of Completion

presented to

*Tammy Barnes*

for completing stream science learning modules as part of the  
University of Kentucky Cooperative Extension Service  
Backyard Streams Program

August 27, 2018



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Extension Water Quality Liaison

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Carmen T. Agouridis, Ph.D., P.E., M.P.P.  
Extension Associate Professor

 College of Agriculture,  
Food and Environment  
BioSystems and Agricultural Engineering Extension

## Virtual Farmer Shop Talks (Archived)

<https://bit.ly/virtualshoptalks>



**Virtual Shop Talks for Farmers**  
"Resource Stewardship in Hard Times"

Free and open to all farmers

**Dates and Line-Up**  
All are 9am-10:30am CT / 10am-11:30am ET

Wednesday, February 3rd  
**Making Conservation Make Cents**

Wednesday, February 17th  
**Re-Thinking How We Manage On-Farm Nutrients**

Wednesday, March 3rd  
**Making Progress through On-Farm Trials**

Wednesday, March 17th  
**Farmer-to-Farmer Perspectives to Help You Nail Down Your Next Steps**

Learn more & register:  
<http://bit.ly/virtualshoptalks>

ORGANIZED BY MISSISSIPPI STATE UNIVERSITY EXTENSION, UNIVERSITY OF KENTUCKY EXTENSION, UNIVERSITY OF WISCONSIN-MADISON EXTENSION, UWI DISCOVERY FARMS, ARKANSAS DISCOVERY FARMS, AND UNIVERSITY OF ILLINOIS

## KYH2O Podcast

- Available on iTunes and Podbean

## YouTube channels

- UK Watershed Protection and Restoration
- UK Turfgrass Science





# CONTACT INFO



University of Kentucky  
College of Agriculture,  
Food and Environment  
*Cooperative Extension Service*

Find your local Cooperative  
Extension Service Office:

<http://extension.ca.uky.edu/county>



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<https://anr.ca.uky.edu/person/amanda-gumbert-phd>