

America's Amazon – The Making of an Infographic Worthy of Alabama's World Class Aquatic Biodiversity

Eric Reutebuch and Jennie Powers, AU Water Resources Center, and
Anne Wynn, Geological Survey of Alabama

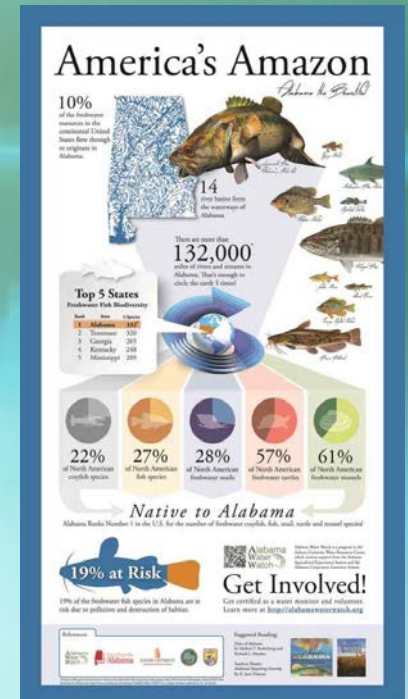
Alabama Water Resources Conference
Friday September 9, 2016
Orange Beach, Alabama

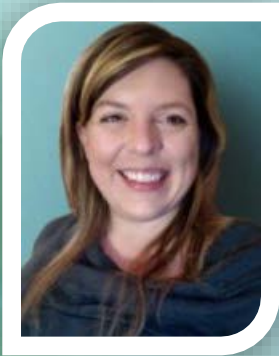


America's Amazon –

The Making of an Infographic Worthy of Alabama's World Class Aquatic Biodiversity

- ❖ How it all started
- ❖ Alabama the Blessed
- ❖ Statewide response
- ❖ What's wrong with this picture?
- ❖ Infographic updates
- ❖ Just another pretty poster?

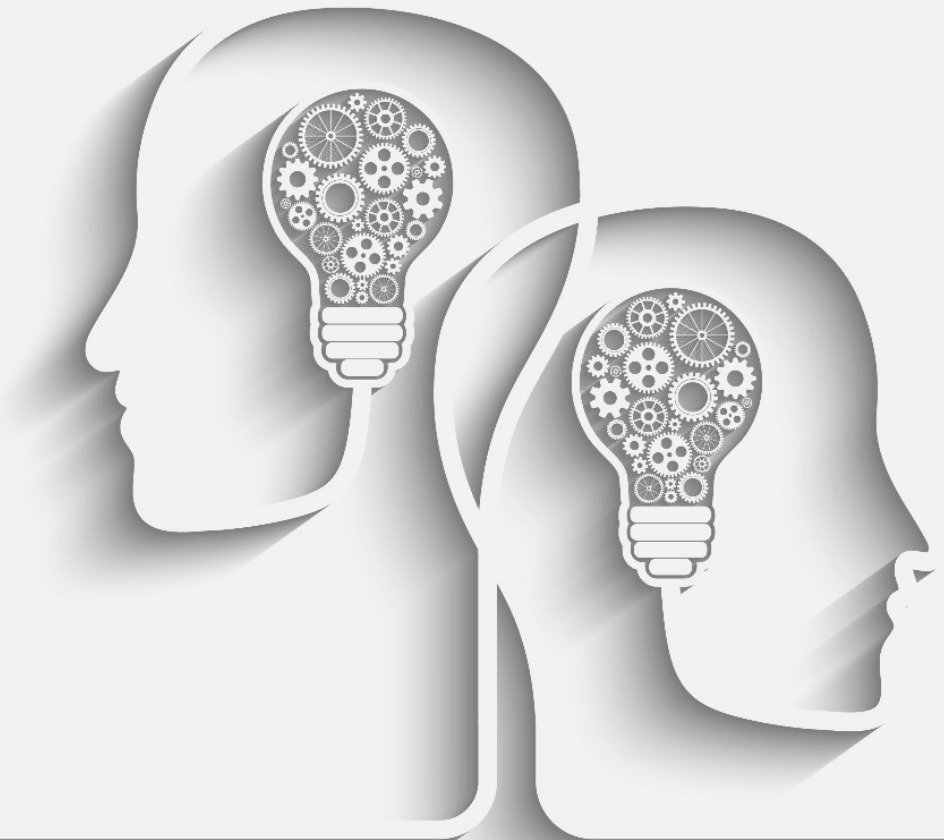




Jennie Powers
Information Technology Specialist IV
Harbert College of Business | College of Agriculture
Auburn University

What is a Technical Communicator?

- Conveys scientific, engineering, or other technical info
- Rewrite and reorganize info to provide new insight
- Create end products in a wide variety of media
- User Advocate
- Information Architect



Infographics 101:

- Functional art that tells a story with charts, maps, diagrams and pictures.
- “Start with a strong focus, do as much research as you can, organize, summarize, and then deliver your conclusions in a structured and visually appealing manner.” (Cairo, 2013)
- “Before you think about style, you must think about structure.” (Cairo, 2013)
- Use best practices in design when considering color, proximity, alignment, repetition, etc.

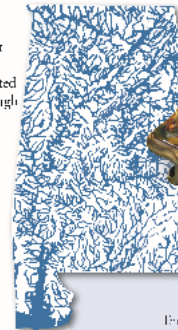
The Super Simplified Story of America's Amazon

Look at Alabama!
It has a lot of water!
And AWWsome fish!
And it's #1 in freshwater fish diversity!
And has so much aquatic diversity!!!
DANGER! We could lose it all!
But...
We can get involved and save it!
Knowledge is power!

America's Amazon

Alabama the Beautiful

10%
of the freshwater
resources in the
continental United
States flow through
or originate in
Alabama.



14
river basins form
the water-ways of
Alabama

There are more than
132,000
miles of rivers and streams in
Alabama. That's enough to
circle the earth 5 times!

Top 5 States Freshwater Fish Biodiversity

Rank	State	# Species
1	Alabama	332
2	Tennessee	320
3	Georgia	265
4	Kentucky	248
5	Mississippi	209



22%
of North American
crayfish species



27%
of North American
fish species



28%
of North American
freshwater snails



57%
of North American
freshwater turtles



61%
of North American
freshwater mussels

Native to Alabama

Alabama Ranks Number 1 in the U.S. for the number of freshwater crayfish, fish, snail, turtle and mussel species!



19% of the freshwater fish species in Alabama are at risk due to pollution and destruction of habitat.



Alabama Water Watch is a program of the Alabama Department of Conservation and Forestry. It is a volunteer-based organization that monitors water quality in Alabama's rivers and streams.

Get Involved!

Get certified as a water monitor and volunteer. Learn more at <http://alabamawaterwatch.org>

References:



Suggested Reading:

Alabama's Water: A Guide to the State's Water Resources by Patricia C. Bohannon and Robert L. Boyd

Alabama's Water: A Guide to the State's Water Resources by Patricia C. Bohannon and Robert L. Boyd





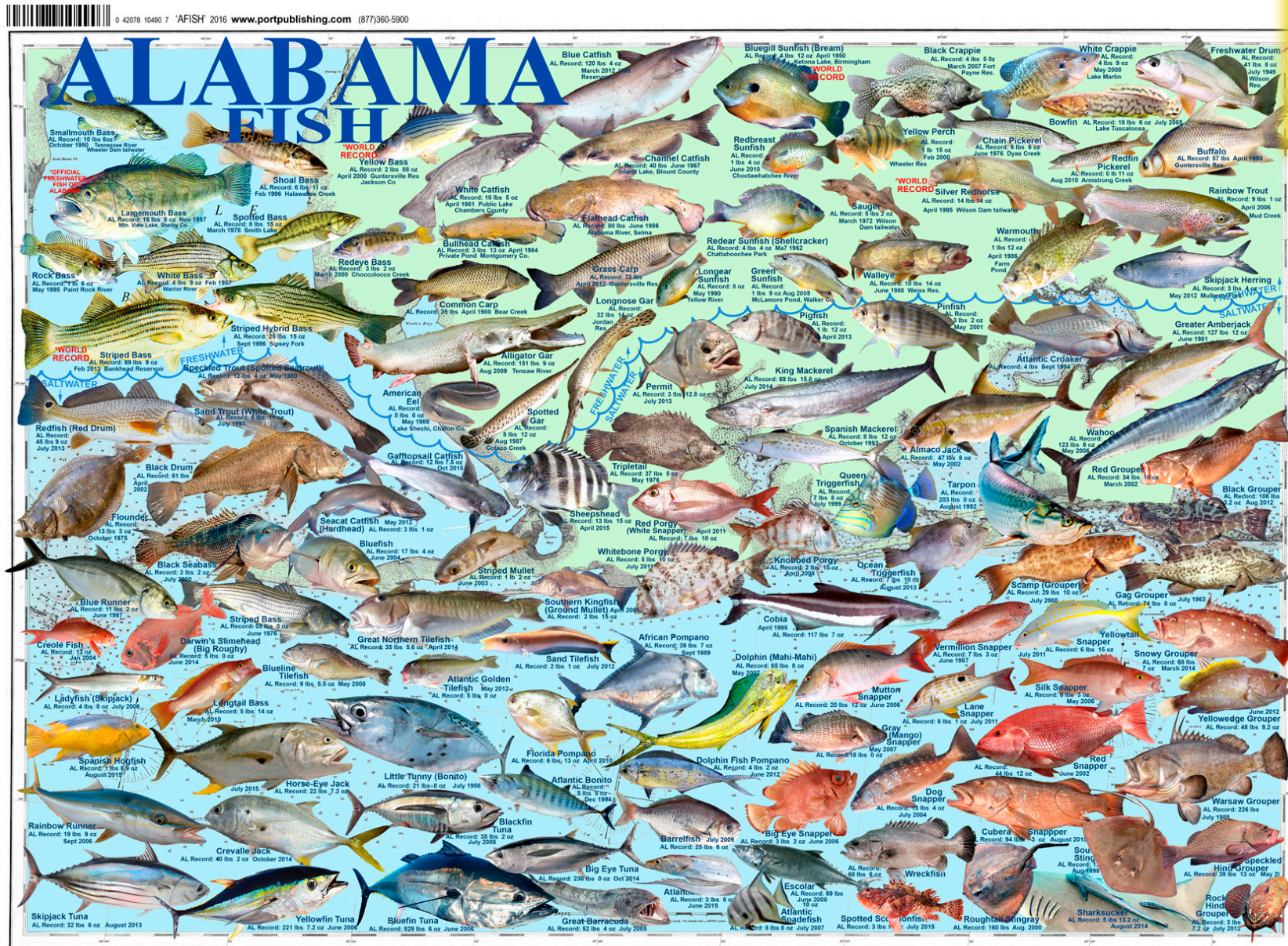
- ❖ This is a great infographic! The Geological Survey of Alabama would be thrilled if you would allow us to use this infographic on the Alabama H2O (SHU) website, if that is OK, www.alh20.org. Great work!! Anne Wynn, Geological Survey of Alabama.
- ❖ Would love a higher resolution version if available to use at the Alabama Museum of Natural History. Thanks! John Friel, Director, Alabama Museum of Natural History.
- ❖ Looks great! I would love to have a larger copy of this for my 4-H programming; Simon Carbone.
- ❖ Excellent resource! Would you like for us to mention this in our next newsletter?; Mark Berte, Executive Director Alabama Coastal Foundation.
- ❖ We love it. We've used it in several presentations including an AWAWG meeting. I'll be using it at the national River Rally this weekend. Mitch Reid, Alabama Rivers Allinace.
- ❖ We have been using everywhere we can and it's in our slide show for the Alabama part! Cindy Lowry, Executive Director, Alabama Rivers Alliance.
- ❖ This would be a great resource for our environmental education programs, like *Creek Kids* at Tannehill. Would it be possible to get an enlarged print? Kasie McKee, AL DCNR.
- ❖ It would be wonderful if we could get a poster or a larger print, We would like to put it in the DeSoto State Park Nature Center. Brittney Hughes, Desoto State Park.
- ❖ Fantastic! I would love to use this in my class! Amy Grilliot, Professor, Troy University.
- ❖ We would love to have Jennie's permission to use this graphic in some of our teaching. We agree that every child in Alabama needs to know how special Alabama is. Tina Miller-Way, Chair, Discovery Hall Programs for Education and Outreach, Dauphin Island Sea Lab.
- ❖ Thanks so much. Dr. Borom will be thrilled. Kathy Hicks, Event Coordinator, Five Rivers – Alabama's Delta Resource Center
- ❖ Great! It gave me a deep sense of pride to know how blessed we are in Alabama, as far as our diversity! It breaks my heart to see how little respect people have for the earth, land, water and wildlife. This is a great teaching tool and I would like to add this to my treasure box to share every opportunity that I can. I also am very interested in being a Water Watch monitor, especially the stream ecology monitoring. Thanks for all your organization and dedicated volunteers have done, are doing and will be doing to save and secure our state and its wonderful biodiversity! God bless America! Beverly Cole.

Infographic Resources

- Cairo, Alberto. 2013. *The functional art, an introduction to information graphics and visualization*. Berkley, CA: New Riders.
- <https://piktochart.com/>
- <https://www.canva.com/create/infographics/>
- <https://venngage.com/>
- <http://vizualize.me/>
- <https://developers.google.com/chart/>
- <https://www.easel.ly/>

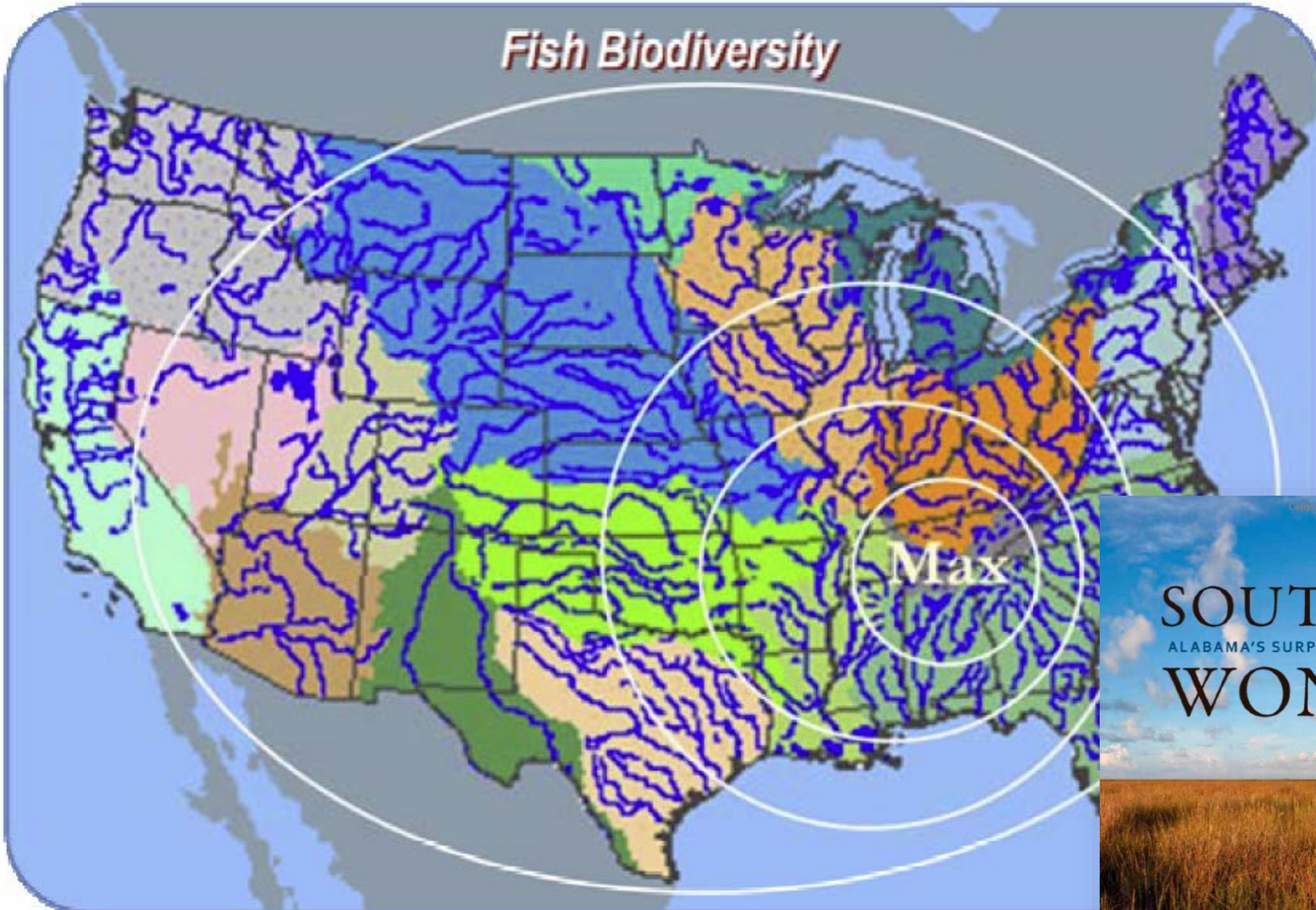
Alabama the Blessed

Son, we're
in Heaven!



Source: portpublishing.com

Fish Biodiversity



SOUTHERN ALABAMA'S SURPRISING BIODIVERSITY WONDER

R. SCOT DUNCAN
FOREWORD BY EDWARD O. WILSON
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[Edit](#)

AWWsome Infographic!

AWW has been blessed with some fabulous folks over the years who have given of their time, talent and treasure to the betterment of the Program. Here is a recent example.

We here at the AWW office were asked recently about what we'd like to have done in the form of an infographic by our IT assistant, Jennie Powers. She needed to develop an infographic for a class she is taking here at AU. I thought for about half a second and said ALABAMA'S AWESOME AQUATIC BIODIVERSITY! In my unbiased opinion, I believe that every child (and adult) in Alabama should know that this state ranks **NUMBER ONE** among all 50 states in aquatic biodiversity (including freshwater fish, snails, mollusks, crayfish and turtles!; see [Biodiversity in Alabama](#) and [Fishes of Alabama](#))! The hundreds of beautiful fish species that inhabit our waters (**325** native freshwater species and **100** or more marine species – wow!) are true treasures that every Alabamian should be proud of, and cherish! Several rival tropical reef fishes in their colorful beauty! Here are a few of my favorites:



— Rainbow darter (*Etheostoma caeruleum*)



— Speckled darter (*Etheostoma stigmaeum*)



— Banded darter (*Etheostoma zonale*)

What's wrong
with this picture?

America's Amazon

Alabama the Beautiful

10%

of the freshwater
resources in
the continental
United States
flow through
or originate
in Alabama



14

river basins form
the waterways of
Alabama

There are
77,242
miles of river in Alabama.
That's enough to circle the
earth 3 times!

Top 5 States Freshwater Fish Biodiversity

Rank	State	# Species
1	Alabama	325
2	Tennessee	320
3	Georgia	265
4	Kentucky	248
5	Mississippi	209



38%

of North American
fish species



43%

of North American
freshwater snails



51%

of North American
freshwater turtles



60%

of North American
freshwater mussels

Native to Alabama



19% of the freshwater fish species in Alabama are at
risk due to pollution and destruction of habitat.



Get Involved!

Get certified as a water monitor and volunteer.
Learn more at <http://alabamawaterwatch.org>

References:



Suggested Reading:



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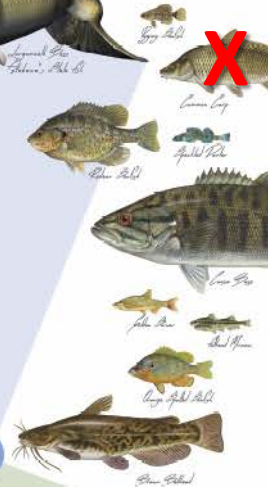


14
river basins form
the waterways of
Alabama

There are ~~77~~ 242
miles of rivers in Alabama.
That's enough to circle the
earth 3 times!

Top 5 States Freshwater Fish Biodiversity

Rank	State	# of Species
1	Alabama	260
2	Tennessee	260
3	Georgia	265
4	Kentucky	248
5	Mississippi	209



Native to Alabama



19% at Risk

19% of the freshwater fish species in Alabama are at
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References:



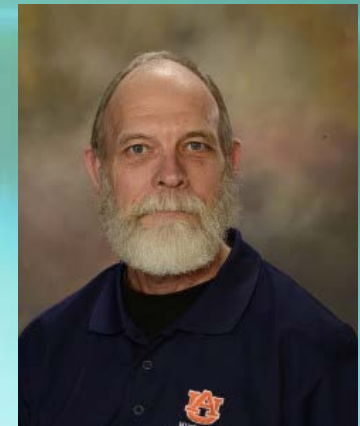
Suggested Reading:





The Mussel Whisperer

www.outdooralabama.com/aquatic-biodiversity-center




Alabama Natural Heritage Program

www.aumnh.org

www.gsa.state.al.us/gsa/eco

Update of Alabama stream miles - 77,000 to 132,419 miles

- ❖ The USGS National Hydrography Dataset (NHD) Best Resolution for Alabama, which is at the **1:24,000** scale, was clipped to the state of Alabama in ArcMap GIS.
- ❖ The length of all the flowlines (there were 352,473 segments!) was then determined from the GIS attribute table.



science for a changing world

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Communities → National Geospatial Program → The National Map → National Hydrography Datas... → National Hydrography Datas... → USGS National Hydrography...

USGS National Hydrography Dataset (NHD) Best Resolution for Alabama 20160411 State or Territory FileGDB 10.1

Go to ▾ View ▾

Dates

Publication Date :	2016-04-11
Start Date :	1901-01-01
End Date :	2919-10-05
File Modification Dat...	2016-04-13 07:35:00

Citation

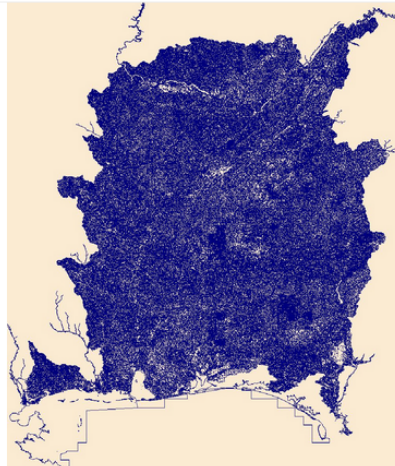
U.S. Geological Survey, National Geospatial Program, 20160411, USGS National Hydrography Dataset (NHD) Best Resolution for Alabama 20160411 State or Territory FileGDB 10.1: U.S. Geological Survey: Reston, VA, https://prd-tnm.s3.amazonaws.com/StagedProducts/Hydrography/NHD/State/HighResolution/GDB/NHD_H_01_GDB.zip.

Summary

The National Hydrography Dataset (NHD) is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD data was originally developed at 1:100,000-scale and exists at that scale for the whole country. This high-resolution NHD, generally developed at 1:24,000/1:12,000 scale, adds detail to the original 1:100,000-scale NHD. (Data for Alaska, Puerto Rico and the Virgin Islands was developed at high-resolution, not 1:100,000 scale.) Local resolution NHD is being developed where partners and data exist. The NHD contains reach codes for networked features, flow direction, names, and centerline representations for areal water bodies. Reaches are also defined on waterbodies and the approximate shorelines of the Great Lakes, the Atlantic and Pacific Oceans and the Gulf of Mexico. The NHD also incorporates the National Spatial Data Infrastructure framework criteria established by the Federal Geographic Data Committee.


Contacts

Distributor :	U.S. Geological Survey, National Geospatial Technical Operations Center
Metadata Contact :	U.S. Geological Survey, National Geospatial Technical Operations Center
Originator :	U.S. Geological Survey, National Geospatial Program
Publisher :	U.S. Geological Survey



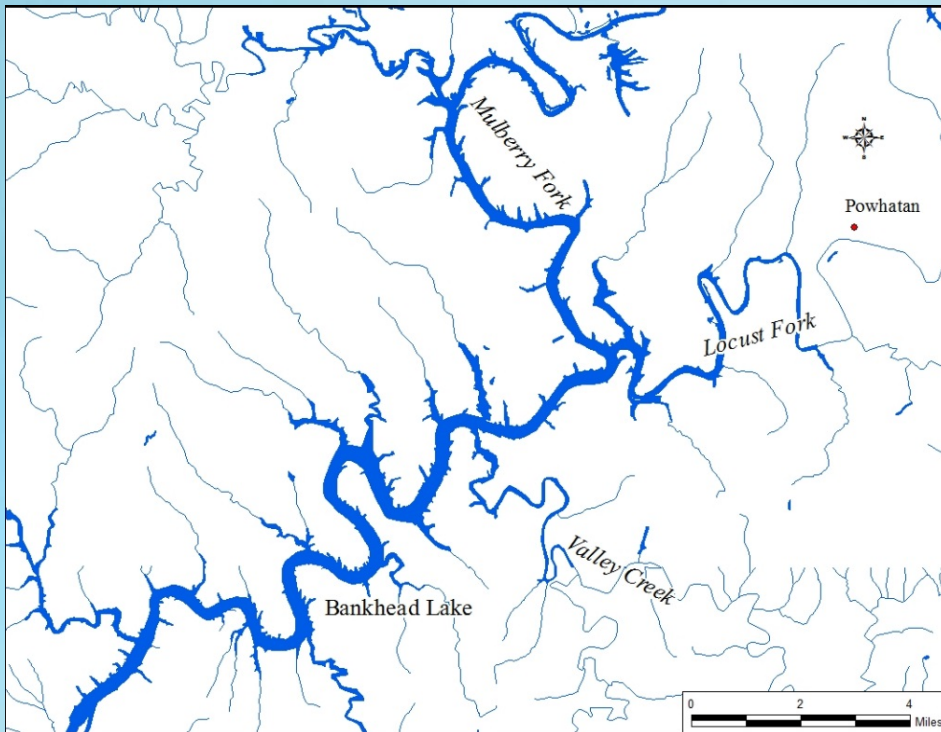
Thumbnail JPG image

Map »

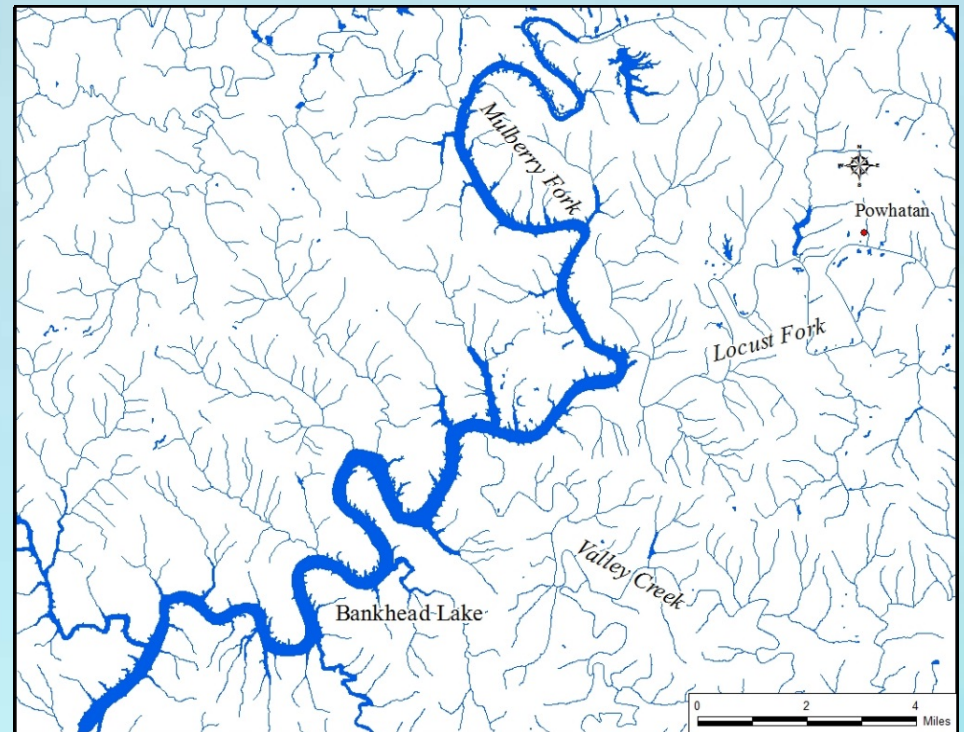


Why the 55,000⁺ mile increase?

Original 1:100,000 scale NHD

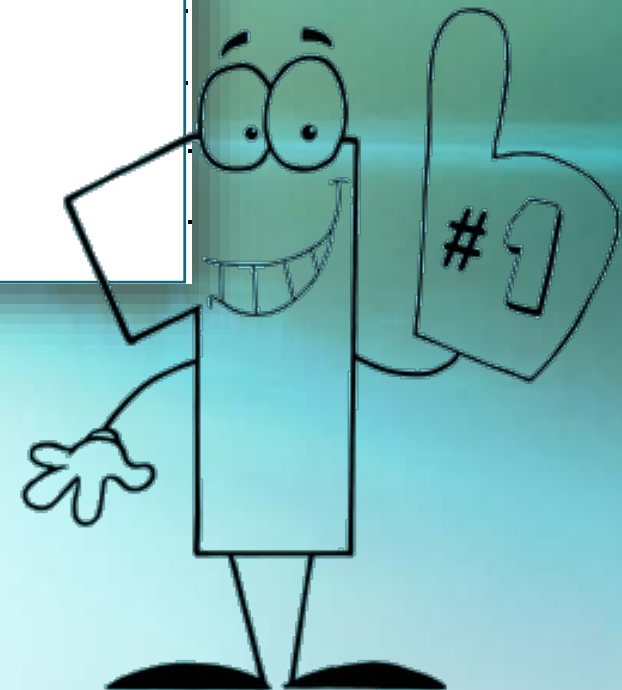


Higher resolution 1:24,000 scale NHD



So, who's Number One?

State	Stream Length (mi)	Area (sq mi)	Stream mi/sq mi
Alaska			
California			
Texas			
Montana			
Nevada			
Kansas			
Alabama			
Idaho			
Oregon			
New Mexico			



[Edit](#)

AWW Infographic 2.0

You may recall our previous AWWareness blog article, *AWWsome Infographic!* . We were thrilled to receive an all-time record number of responses to the post, requesting use of the beautiful infographic that Miss Jennie Powers created as an AU class project. Folks from all over the state asked if they could use the new infographic in their education and outreach efforts. Our answer – DEFINITELY, PLEASE DO! Jennie, in all of her kindness, gifted her work to AWW, and would be thrilled if you/your group/your school/your agency would utilize her work to increase awareness of our bountiful aquatic biodiversity here in Alabama.

We also received numerous excellent comments/edits/suggestions from many keen-eyed and highly knowledgeable individuals. In fact, the infographic initiated a greatly-needed exchange among state agency folks, university folks and others about the estimates of our aquatic resources here in Alabama. We here at AWW have been using the '*greater than 77,000 miles of streams and rivers in AL*' since we printed our first brochures and manuals back in the early 1990s. As a result of the infographic and ensuing communications, the good folks at the Geological Survey of Alabama (GSA) conducted an updated GIS analysis of Alabama streams using much-improved digital stream data (USGS NHD*, which was not available in the early 1990s and contains much more detail than the previously-used 1:100,000 scale data). The number came out to be a whopping **132,419 miles of streams and rivers** – now that is truly AWWsome! Thus, Alabama is a very, very rich state relative to water resources!

Not only that, but the state's aquatic biological richness estimates have been updated too. The good folks at GSA recently conducted a freshwater fish species inventory for the state, and bumped the previous count of 325 up to **332** (not counting the ~ 15 introduced, nonnative freshwater fish species in AL), and we're **STILL No. 1 in the U.S.!**

I cannot absolutely guarantee that the values presented here will not be tweaked further, but after vetting the infographic with biological experts at the [GSA \(Ecosystems Investigations Program\)](#), [Alabama Natural Heritage Program](#), [Alabama Aquatic Biodiversity Center](#) and the [AU Department of Biological Sciences](#), we think we've got the most up-to-date information currently available. So, after numerous edits/updates/additions, here is the new, improved AWWsome Infographic 2.0; we hope that it proves valuable in increasing awareness of our aquatic treasures:



Infographic 2.0

America's Amazon

Alabama the Beautiful

10%

of the freshwater resources in the continental United States flow through or originate in Alabama.



14

river basins form the waterways of Alabama

There are more than
132,000*
miles of rivers and streams in Alabama. That's enough to circle the earth 5 times!

Top 5 States Freshwater Fish Biodiversity

Rank	State	# Species
1	Alabama	332*
2	Tennessee	320
3	Georgia	265
4	Kentucky	248
5	Mississippi	209



Native to Alabama

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19% of the freshwater fish species in Alabama are at risk due to pollution and destruction of habitat.



Alabama Water Watch is a program in the Auburn University Water Resources Center, which receives support from the Alabama Agricultural Experiment Station and the Alabama Cooperative Extension System.

Get Involved!

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References:



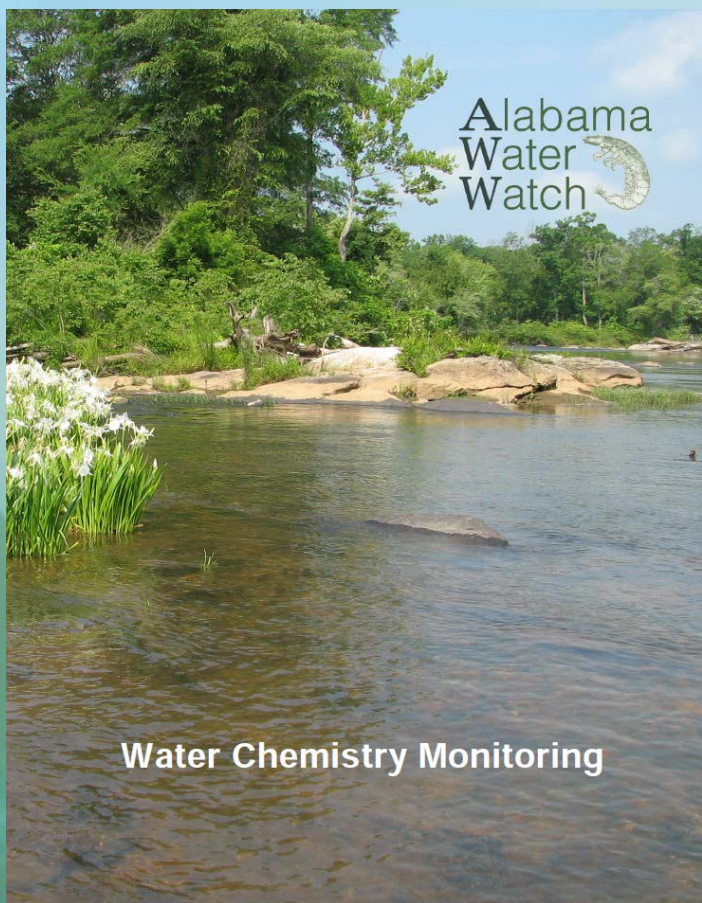
Suggested Reading:

Fishes of Alabama
by Herbert T. Baskich and
Richard L. Mayden

*Southern Wonder:
Alabama's Surprising Diversity*
By B. Scott Duncan



*Number of fish species and their basins and is greatly updated by USGS, American ichthyologists, along USGS National Hydrographic Dataset (NHD) data. Downloaded by Alabama, and <http://www.alabamawaterwatch.org> using ArcMap/Python script (08/07/2012) to all groups. Last time updated by USGS, see details.



Alabama
Water
Watch

Water Chemistry Monitoring



What is a Watershed

A **watershed** is the total land area that drains to a common point. Such a point may be a larger stream, a lake or the ocean. Watersheds come in many sizes, and small watersheds are contained within larger watersheds.

Very large watersheds are also called **basins**. The Alabama, Black Warrior, Cahaba, Coosa, Tallapoosa and Tombigbee basins are all part of the greater Mobile Basin. We all live in a watershed, no matter how far we are from a river or lake.

Alabama's Rich Water Resources

- Alabama contains more than **77,000** miles of streams, 3.6 million acres of wetlands and 560,000 acres of lakes, ponds and reservoirs.
- About 8% of the freshwater in the continental U.S. originates in or flows through Alabama. The state has more miles of navigable rivers (1,438 miles) than any other state.
- The Mobile River system drains 44,000 square miles. It is the sixth largest drainage basin in the U.S. in area and the fourth largest in mean flow, averaging 64,000 cubic feet per second. (USGS, 1998).
- The Tennessee River is a tributary of the Mississippi River. The Mississippi Basin is the third largest drainage basin in the world (1.24 million square miles). Only the Amazon and Congo Rivers have larger drainage areas.



Alabama Water Watch



Community-Based Watershed Stewardship
through Citizen Volunteer Monitoring of
Alabama's Lakes, Streams and Coasts

Why Should You Monitor Water?

Alabama is blessed with an amazing **77,000** miles of rivers and streams, teeming with some of the highest biodiversity in the world. At the same time, Alabama has a high number of endangered and threatened aquatic species.

To be good stewards of this rich endowment means taking responsibility and caring for our water resources. This requires vigilant and ongoing monitoring of the conditions and trends of our waterbodies. It means taking steps to protect what is healthy, and restore what is not.



Citizens have a key role to play in monitoring and caring for our waters.

Water Quality in Alabama

- 77,000 miles of rivers and streams
- 3.6 million acres of wetlands
- 560,000 acres of lakes, ponds, and reservoirs
- More navigable rivers than any other state
- 5th in the nation in plant and animal diversity
- 1st in freshwater species diversity!


Alabama
Water
Watch



Biodiversity in Alabama | Encyclopedia of Alabama - Internet Explorer

http://www.encyclopediaofalab... Biodiversity in Alabama | Enc...

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Biodiversity in Alabama


R. Scot Duncan, Birmingham-Southern College

Alabama is one of the most biologically diverse states in the United States, and with regard to some [plants](#) and [animals](#), in the world. This diversity is a product of [Alabama's](#) warm, moist [climate](#), its great [geologic](#) diversity, and its rich evolutionary past. With more than 4,533 documented species, Alabama ranks fifth among states in terms of overall species diversity, and is first among states east of the Mississippi River. The large western states of California, Texas, Arizona, and New Mexico lead the nation, and fellow southeastern states Georgia (sixth) and Florida (seventh) trail Alabama. Alabama harbors 64 types of terrestrial ecosystems, including 25 forests and woodlands, 11 wetlands, and 7 glades and prairies. The state also supports more than 132,000 miles of [rivers](#) and [streams](#) and several dozen marine ecosystems.

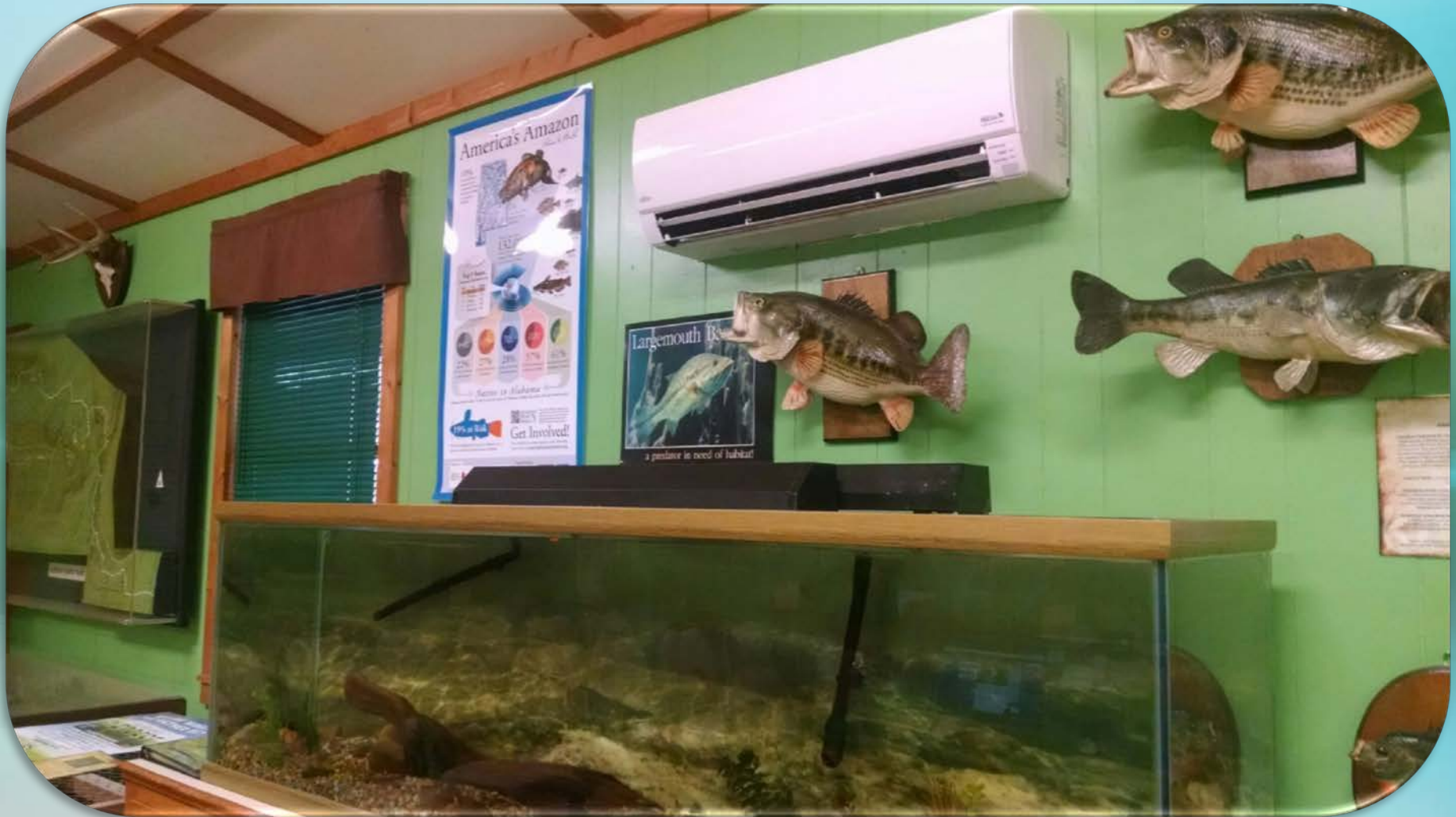
Alabama ranks first among states or is at or near the top for several types of animals and plants. It is number one for diversity of [freshwater mussels](#), freshwater [fishes](#) (Tennessee is a close second), freshwater snails, crayfish, and freshwater turtles. It is third for combined diversity of [amphibians](#) and [reptiles](#) and seventh for number of species endemic to the state, that is, species found only within Alabama. Some of the state's most famous endemic species include the [Red Hills salamander](#), Alabama sturgeon, and the Alabama beach mouse. Alabama is also first in carnivorous plant biodiversity and is one of the world's hotspots for these unusual organisms. The extensive [cave](#) system in the northeastern part of the state harbors the third most biodiverse cave fauna in the temperate world. Considering that only 10 percent of these caverns have been explored,



Alabama Beach Mouse



DeSoto State Park Nature Center



Dauphin Island Sea Lab

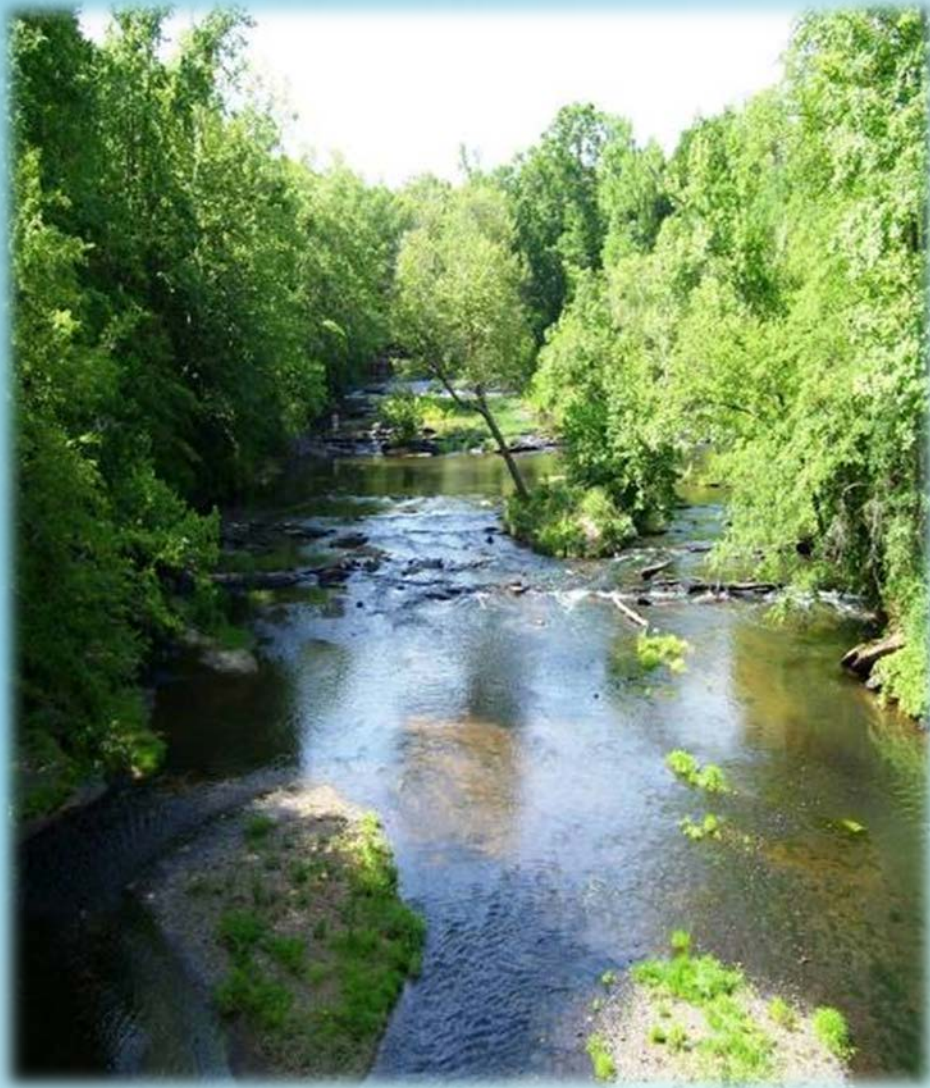


Ms. Cook teaching students from Leinkauf Elementary in Mobile

The Alabama Museum of Natural History



Come see us!



Saugahatchee at Lee CR 65 Bridge



Alabama Water Watch

AU Water Resources Center

559 Devall Drive

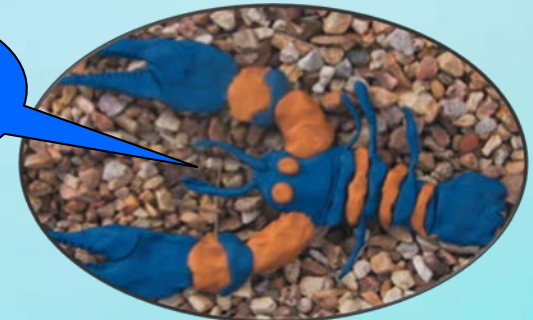
Auburn, AL 36849

www.alabamawaterwatch.org

Toll Free: 1-888-844-4785

email: info@alabamawaterwatch.org

**War
Eagle!**



*The Auburn University crayfish, found only
in the waters flowing through AU campus!*