



A Comparison of Benthic Macroinvertebrate Fauna
from three Ozarkian Streams Collected by Citizen
Scientists in partnership with the Oklahoma
Conservation Commission

The Data Speaks!
Is it a Language we Understand?





Stream Protection Through Education



Water Chemistry
Fish and
Macroinvertebrates
Habitat



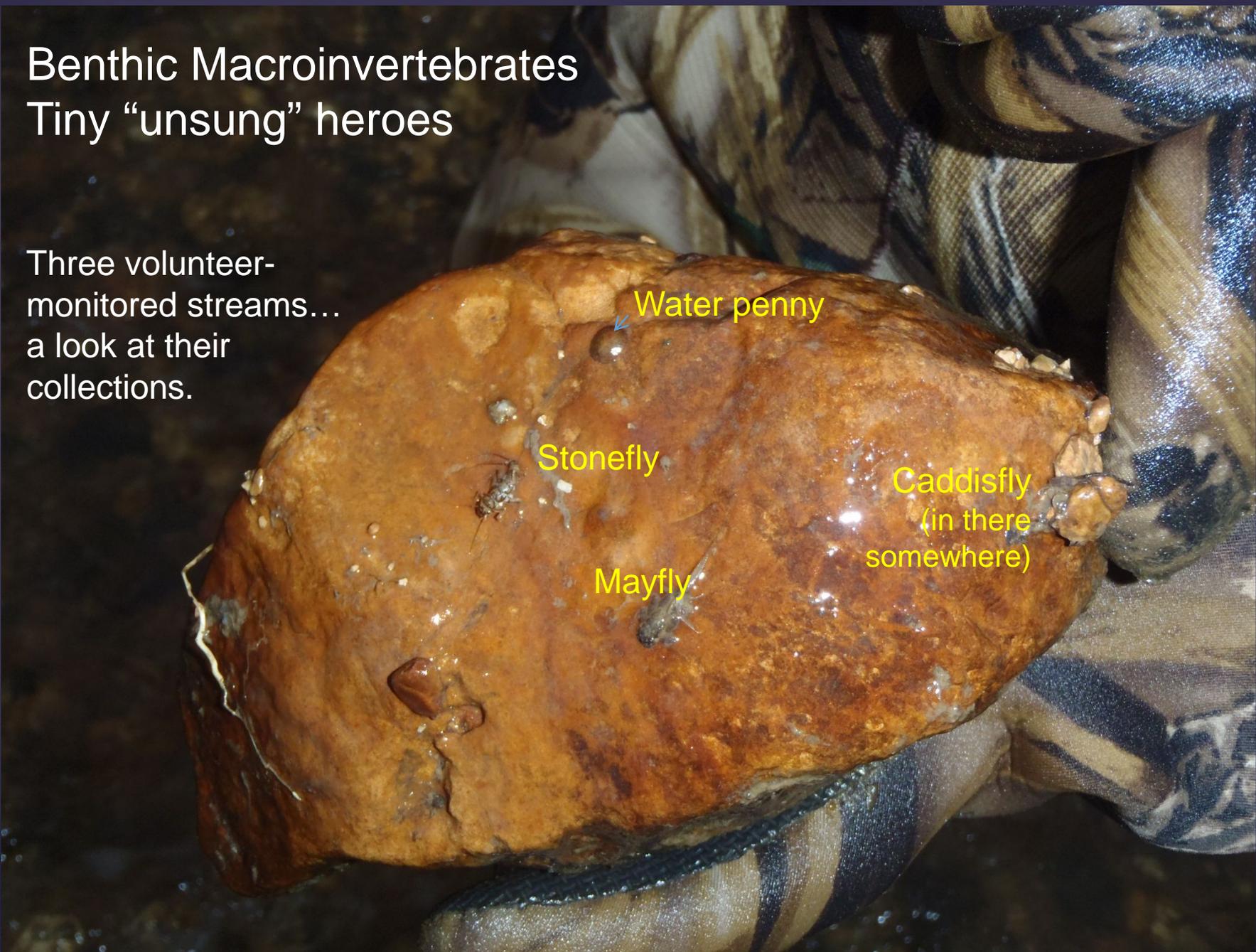


Favorite Thing...
Work with people outside!!!

Benthic Macroinvertebrates

Tiny “unsung” heroes

Three volunteer-monitored streams...
a look at their collections.



Ozark Highlands



- Black Hills — Rocky Mountain foothills
- Shortgrass Prairie — Western high plains
- Tallgrass Prairie — Southwestern table lands
- Red Grass Prairie — Central great plains
- Cross Timbers — Central Oklahoma/Texas plains
- Big Rivers — Large, wide sandy rivers
- Arkansas Valley — Prairie bottomland hardwood forest
- Ozark Highlands — Oak-hickory forests
- Quachita Mountains — Pine savanna moist hardwood forest
- Cypress Swamps — South central plains

Dry shortgrass prairies, flooded cypress swamps, hardwood forests, sandy river bottoms — all of these natural communities contribute to the vast variety of living things found in Oklahoma. In other words, we've got lots of critters!

LIFE ZONES OF OKLAHOMA



EXPLORE A LAND OF LIVING THINGS

Oklahoma is bursting with life — second to none in the awe-inspiring diversity of our natural environment. From foothills to forests, wetlands to deserts, Oklahoma is home to 11 distinct ecological regions, or Life Zones, which together support a vast range of living things. (Including you!)

On the Oklahoma Trail, you'll explore 11 of the Life Zones that make Oklahoma such an awesome state full of the coolest animals. Watch a grizzly bear go fishing. Dig up some fossils. Ogle an otter. (Don't believe us? Just wait.)

So get started down the Oklahoma Trail. And remember — things are dependent on each other for survival. When we keep our Life Zones healthy, we stay healthy, too!



Flint Creek



Tahlequah Creek: Town Branch

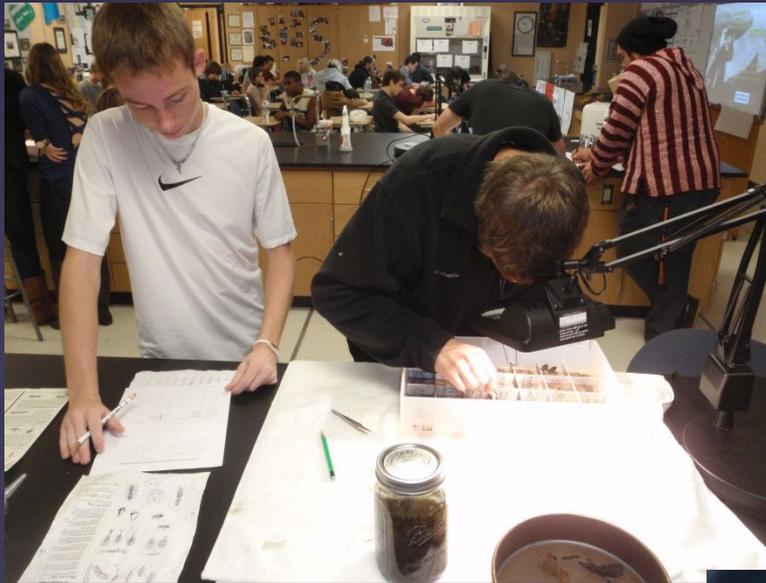


Spring Creek





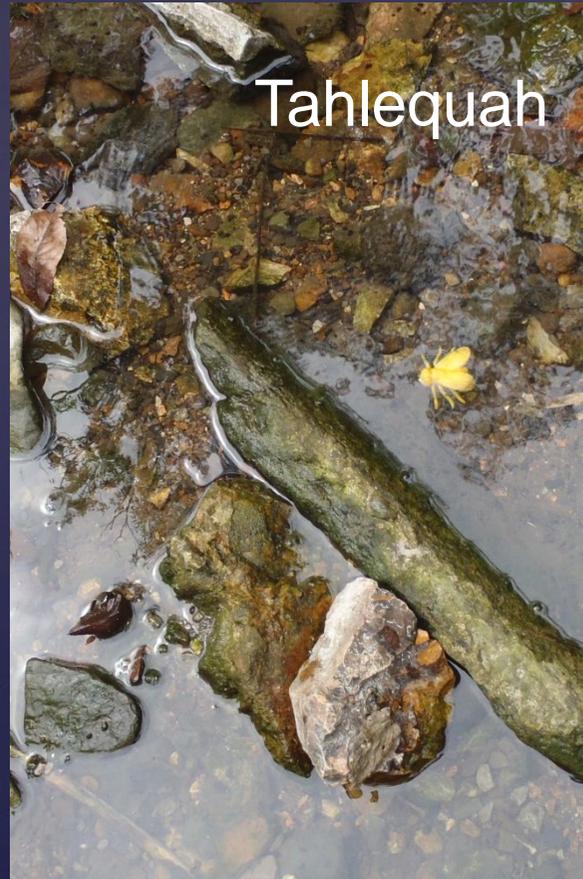


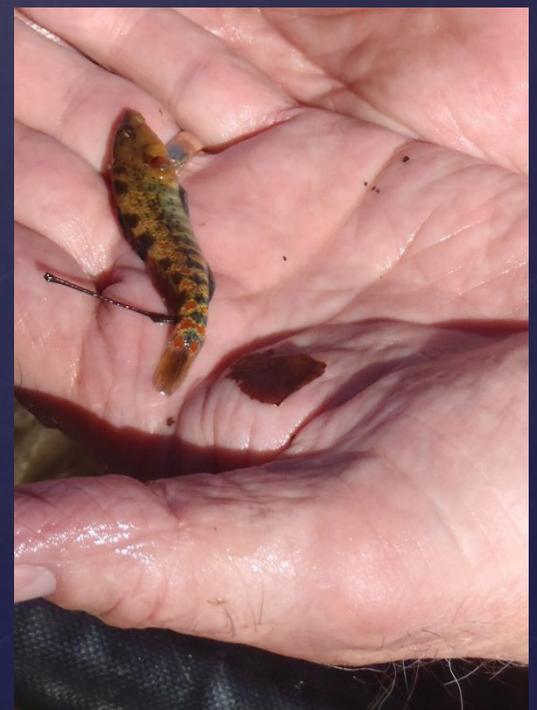


Goal is to remove a
statistically relevant portion
that is sent to our taxonomist



We get back a report on what was in the sample, so rest of presentation is “What was living in the Creeks?”





Epiphany:

I did not find historic bug data for the streams of interest.

Blue Thumb data is all I have.

Spring Creek: 2000

Tahlequah Creek: 2001

Flint Creek: 2005

**Volunteer
Data
Rules!!!**



A Glance at Spring Creek

Long time site

Loyal, scientific volunteer

Have been four different sites monitored on
Spring Creek

Earliest collection – Winter, 2000 (Fram Site)

Isopods – 45 (8)

Mayflies (small minnow) -17 (4)

Water beetles – 6 (4)

Mayflies (stream) – 9 (4)

Midges – 9 (6)

Mayflies (spiny crawler) – 6 (1)

Caddisflies (common netspinner) – 7 (4)

Caddisflies (fingernet) – 3 (3)

Stoneflies (green) – 2 (1)

Stoneflies (green-winged) – 1 (2)

Isopods – 45 (8) Mayflies (small minnow) -17 (4)
Water beetles – 6 (4) Mayflies (stream) – 9 (4)
Midges – 9 (6) Mayflies (spiny crawler) – 6 (1)
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Caddisflies (fingernet) – 3 (3)
Stoneflies (green) – 2 (1) Stoneflies (green-winged) – 1 (2)

42% of sample very tolerant (8)
45% of sample in the middle (4 – 6)
13% of sample very sensitive (1 – 3)

Spring Creek is also a reference stream for the Ozark Highlands Ecoregion.

Summer collection, same year...

35% water beetles

19% mayflies (mid-range)

19% caddisflies (mid-range)

(ONE chimarra caddisfly with sensitivity of 3)

7% midges

NO stoneflies



Spring Creek Winter collection, 2004

61% Isopods

10 % Midge

13% Mayflies

12% Caddisflies so 25% of sample is VERY sensitive

Epiphany – This sample had probably the greatest percent of very sensitive species, and it was one of the least diverse.



Spring Creek Thoughts...

Stoneflies, very sensitive, rarely appear in summer collections

Winter of 2007 collection – 9% stoneflies, 45% mayflies, 5% caddisflies

Possible trend toward fewer of most sensitive mayflies. Need to see most recent collections.

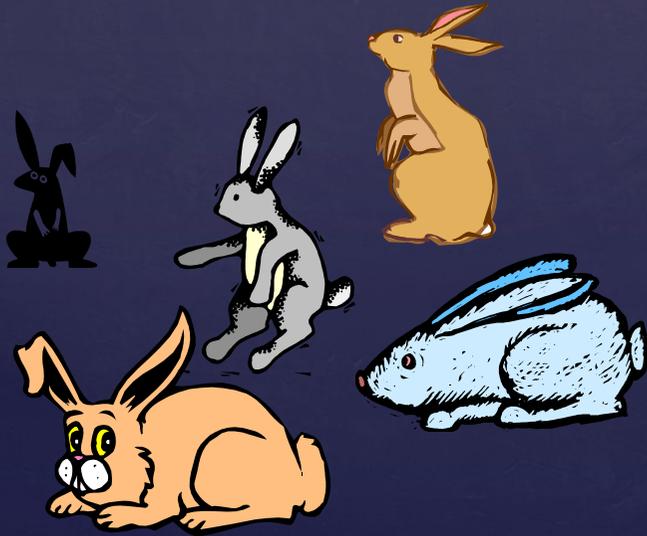
A good diversity may not necessarily have the most sensitive little fellows.

NW Arkansas and NE Oklahoma - growth, new development, poultry production.

Maybe the percent of the critters makes more sense if you know a little more about life histories....



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Flint Creek



Flint Creek is a
Scenic River.

**Always has good flow – almost always
shows a phosphorous level above 0.037.**

First collection on Flint
Creek: summer of 2004
3.51 SW Diversity
Dipterans: 35%
Mayflies: 47%
Caddisflies: 6%
Stoneflies: 2%
Beetles: 7%



Summer of 2006

Beetles: 20%

Dipterans: 22%

Mayflies: 45%

Stoneflies: 1%

Caddisflies: 10%

Most sensitive
bug: mortarjoint
casemaker
caddisfly (2nd
place – common
stonefly)





17% of population
was VERY sensitive
common stonefly,
spiny crawler mayfly,
stream mayfly

Winter of 2008 Collection

Isopods: 11%

Mayflies: 63%

Caddisflies: 6%

Dipterans: 7%

Stoneflies: 9%



First collection on Flint Creek:
summer of 2004
3.51 SW Diversity
Dipterans: 35%
Mayflies: 47%
Caddisflies: 6%
Stoneflies: 2%
Beetles: 7%

Collection on Flint Creek:
summer of 2009
3.05 SW Diversity
Dipterans: 6%
Mayflies: 26%
Caddisflies: 56%
Stoneflies: 2%
Beetles: 11%

Tahlequah Creek: Town Branch Monitored at two sites, off and on

Spring Street Site



GHOST volunteer

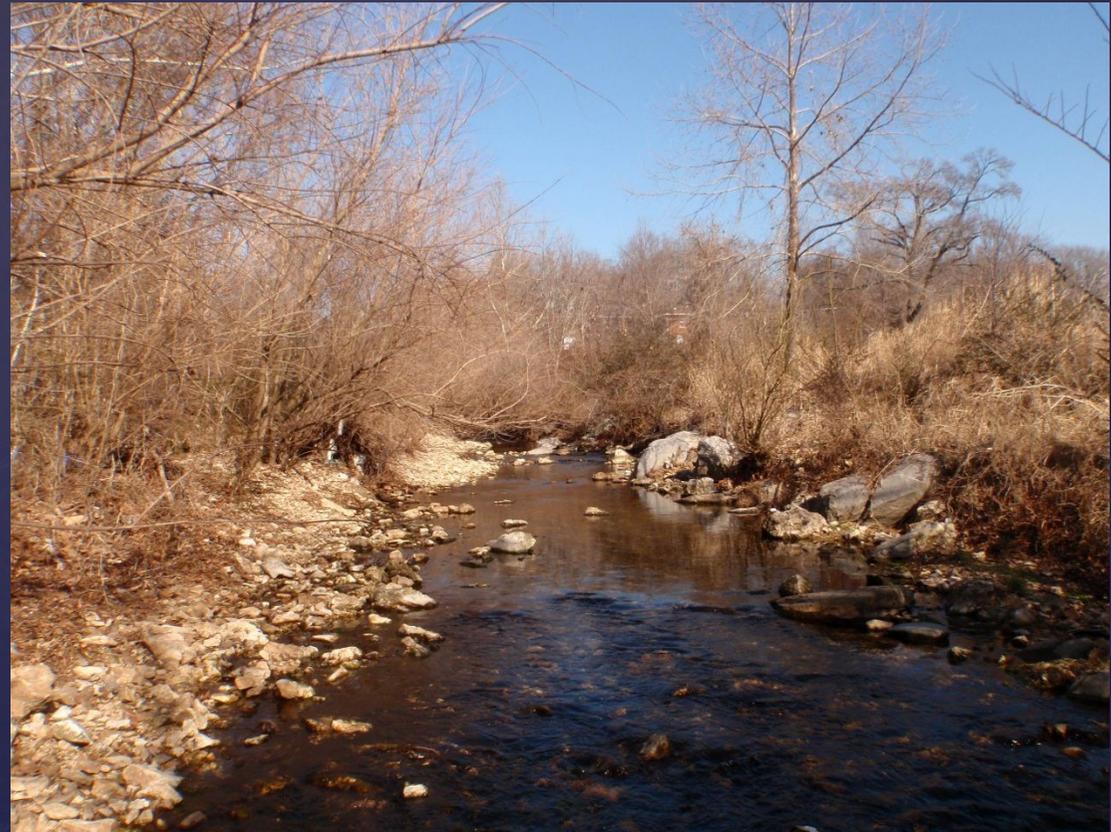
GHOST volunteer



Tahlequah Town Branch: Basin Street



Tahlequah Creek is urban.



First Macro Collection from
Tahlequah Creek, Town Branch,
Basin Street:

Isopods: 6%

Beetles: 7%

Dipterans: 38%

Mayflies: 21%

Caddisflies: 20%



Most sensitive: Chimarra
(fingernet caddisfly, little black)
was 18% of the sample (3)

Orthocladinae (midges) was 37%
of the sample (6)



Summer Collection of 2004:

Isopods: 11%	13%
Beetles: 2%	3%
Dipterans: 34%	23%
Mayflies: 24%	28%
Caddisflies: 24%	28%



Green numbers reflect removal
of black flies. (19 in sample)

What if isopods are ALSO removed?
Bell curve becomes healthy.

Winter collection 2009:

Isopods: 7%

Beetles: 28%

Dipterans: 9%

Mayflies: 31%

Caddisflies: 17%

(one of several others, but this has been the case often,
all samples)





Thoughts on Tahlequah Town Branch...

Where are our stoneflies?

Most sensitive creature found – Agapetus, little black caddisfly
one individual, one collection BUT lots of Chimarra, also very
sensitive, often MOST abundant caddisfly!

No Ephemerella or Eurylophella, very sensitive mayflies.

Megaloptera Corydalus found in several collections.

This creature really knows how to work the crowds!



Hellgramite



Three streams in the Ozark Highlands Eco-region.
My thoughts about macroinvertebrate data.

Bigger picture: Because of volunteer monitoring, we have this data.

Volunteer data reports are available at:
www.conservation.ok.gov, click Blue Thumb in upper left corner.

Some copies are with me today.

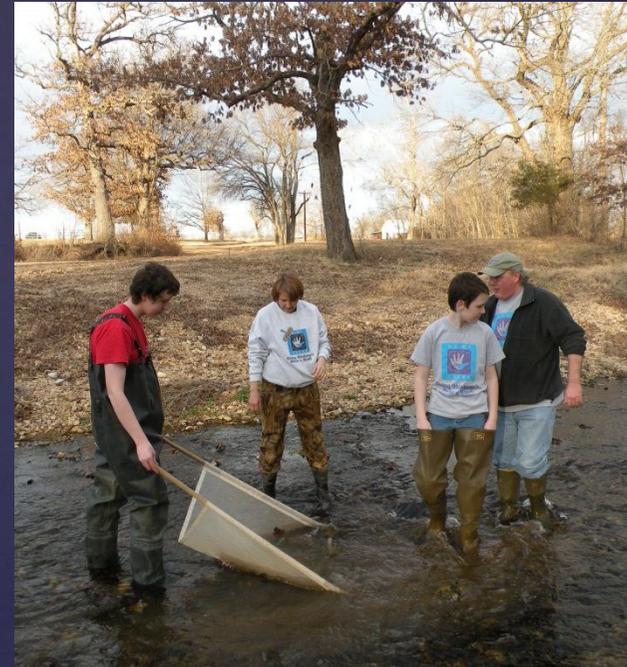






The even bigger picture....

People involved. Learning life histories. Realizing that their own actions make a difference.





Take a child
outside!

