

• • • | What do Gollum and Batman have in common?



<http://www.freewebs.com/footballthoughts/gollum.png>



<http://i.livescience.com/images/batcave-companion-02.jpg>



They both live in  
Karst!

# umm... What's a Karst?



Karst is a landscape formed when acidic water dissolves carbonate bedrock, creating unique drainage patterns, caves, and other rock formations.



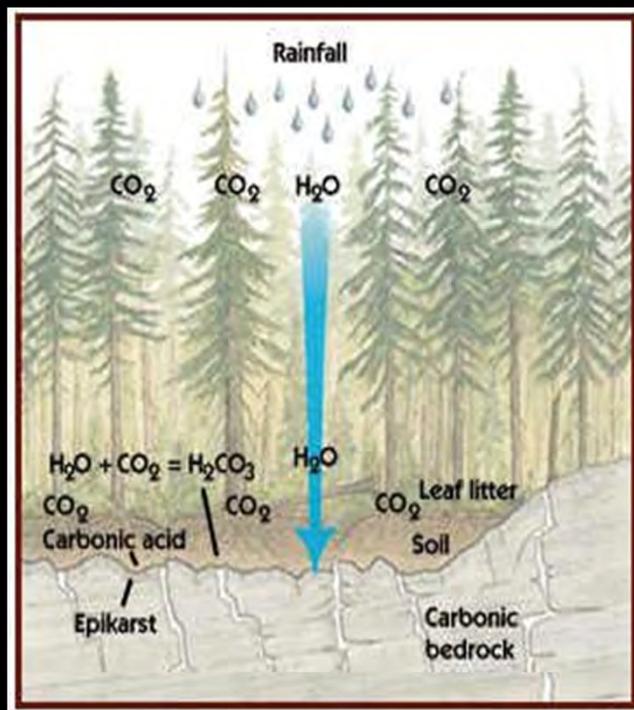
# Global Significance

- Karst covers 20 million Km<sup>2</sup> (12%) of the Earth's land surface
- ¼ of the world's population is supplied by water from karst aquifers

Aquifer: an underground zone of rock or soil that contains and yields water

# ● ● ● | Part 1: Carbonic Acid

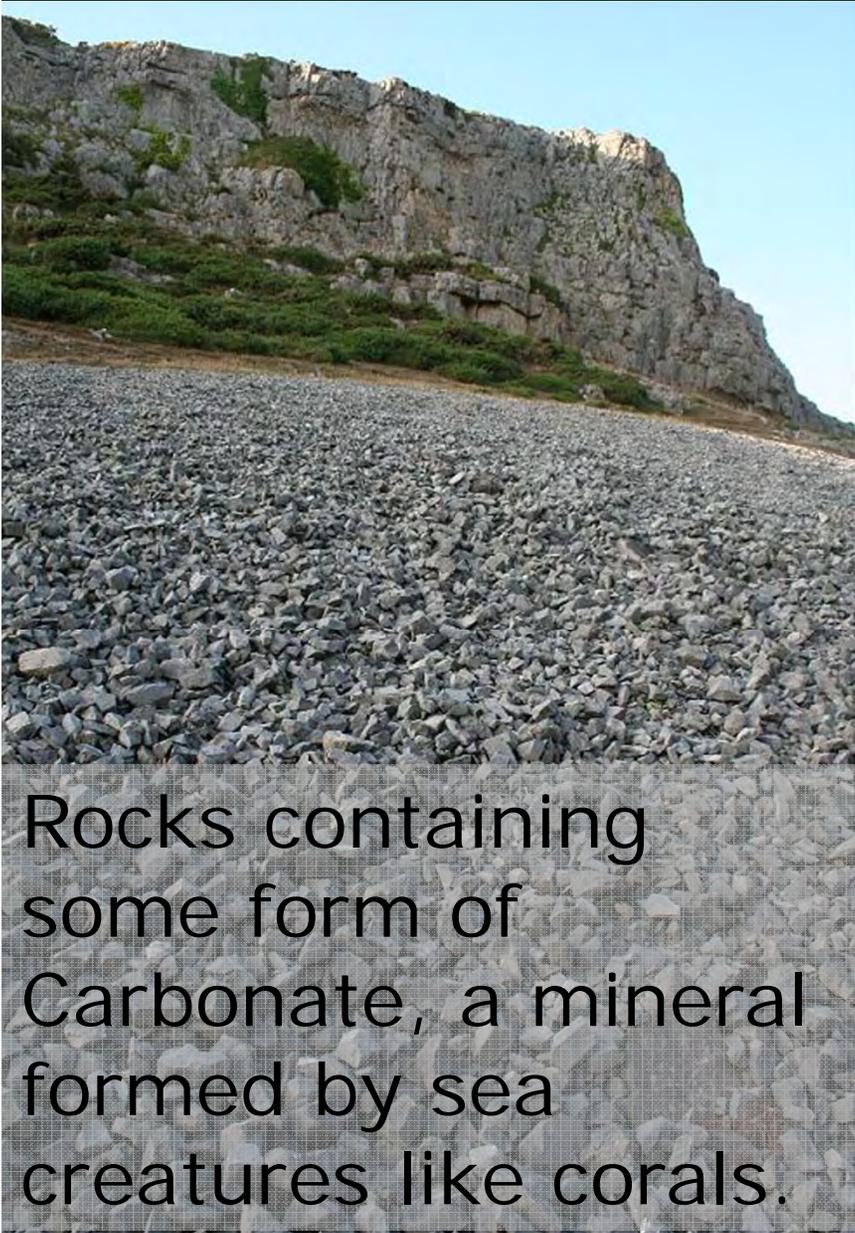
Rain Water + Carbon Dioxide = Carbonic Acid



Rain water picks up carbon dioxide (CO<sub>2</sub>) from the air and soil, turning into Carbonic Acid.

Carbonic Acid is the same stuff that makes pop fizz

# Part 2: Carbonate Bedrock

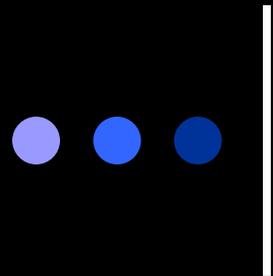


Rocks containing some form of Carbonate, a mineral formed by sea creatures like corals.

- Limestone
  - Calcium Carbonate
  - Dissolves easily in weak acid
  - Forms karst easily
- Dolostone
  - Magnesium Carbonate
  - Dissolves slowly in weak acid
  - Forms karst slowly
  - Most common rock at the Eramosa Karst

Carbonic acid  
SLOWLY dissolves  
carbonate bedrock,  
creating  
underground  
channels for water  
to flow through



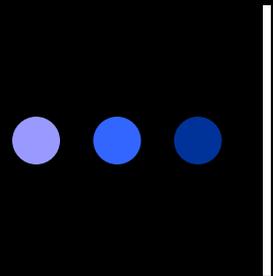


# Try It Yourself!

Part 1: Testing for limestone vs. dolostone

Acetic Acid (vinegar) will bubble on limestone  
but not on dolostone

Dilute hydrochloric acid (HCL) will effervesce  
(spark or glow) on limestone but not on  
dolostone



# Try it Yourself!

## Part 2: Dissolve Limestone

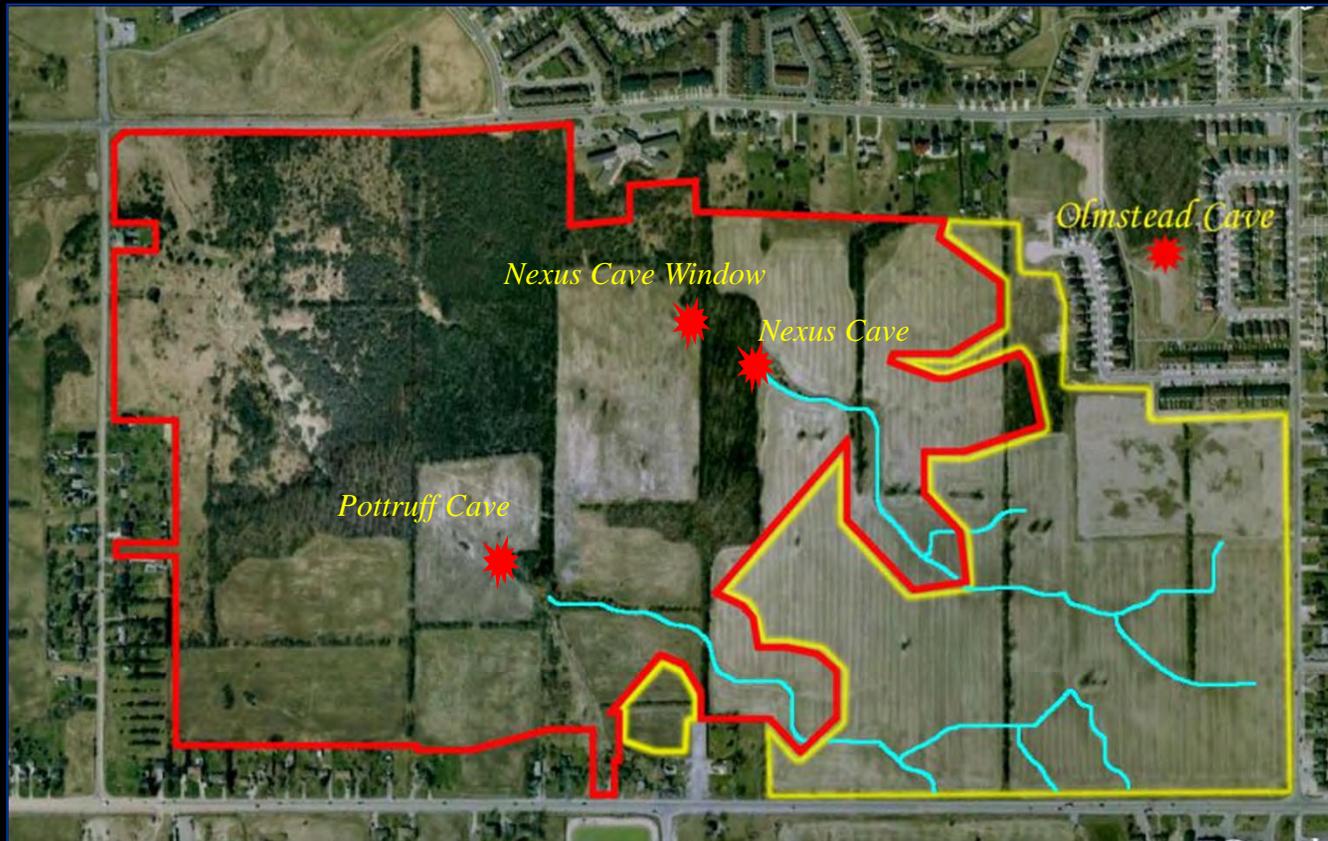
Weigh a small piece of limestone

Place the limestone in a beaker and cover with  
Soda Water or 20% Hydrochloric Acid

Take it out after 1 hour, let dry over night.

Weigh the piece of limestone again. Is it lighter?

# The Eramosa Karst Conservation Area



- Red line: boundary of the Eramosa Karst Conservation Area
- Yellow line: boundary of the feeder lot, where the karst's streams originate



What you'll see at  
the Eramosa Karst

# Sinkholes



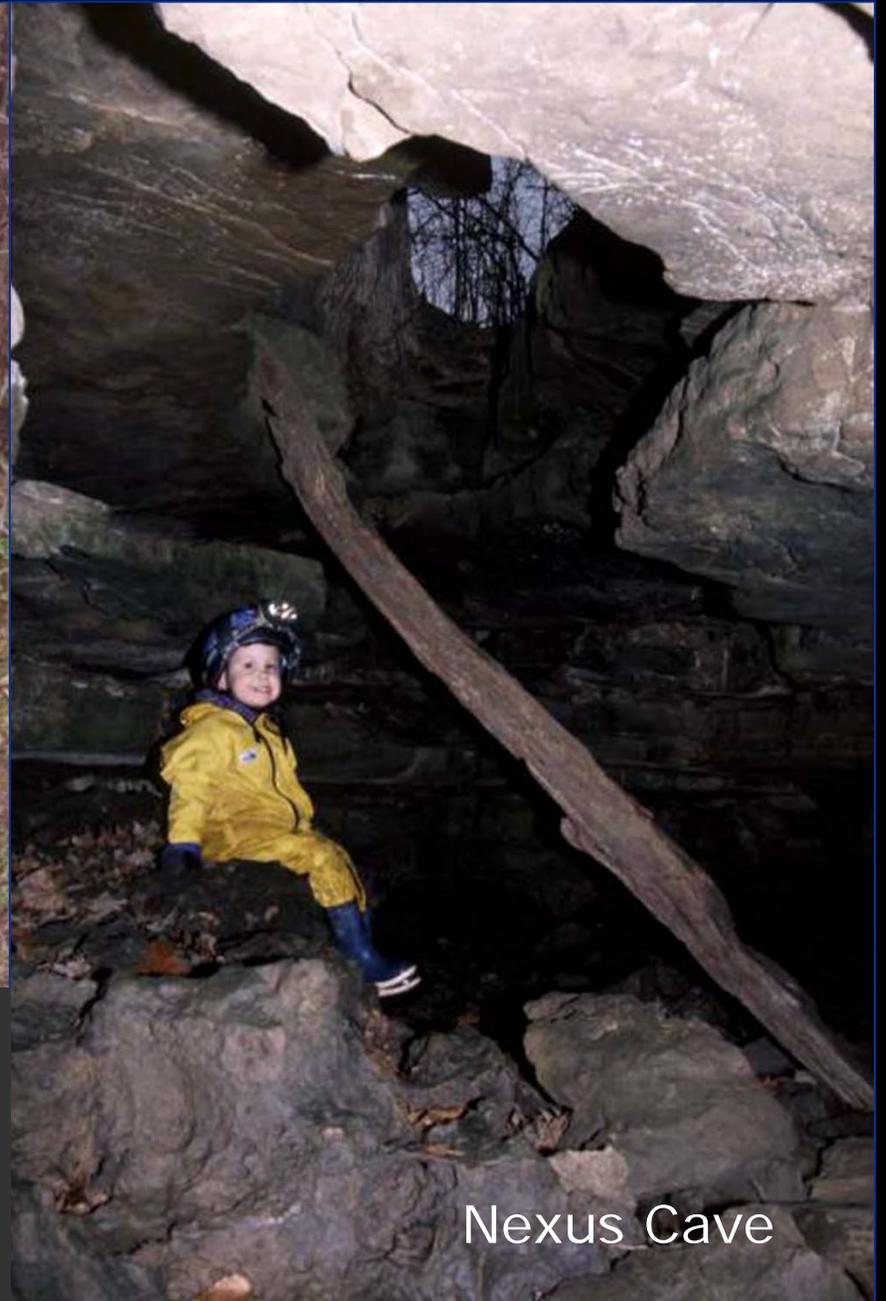
Circular or oval depressions, caused when surface sediments sink into gaps in the bedrock

# Caves





Caves: Natural cavities dissolved into bedrock by water. Large enough for human passage

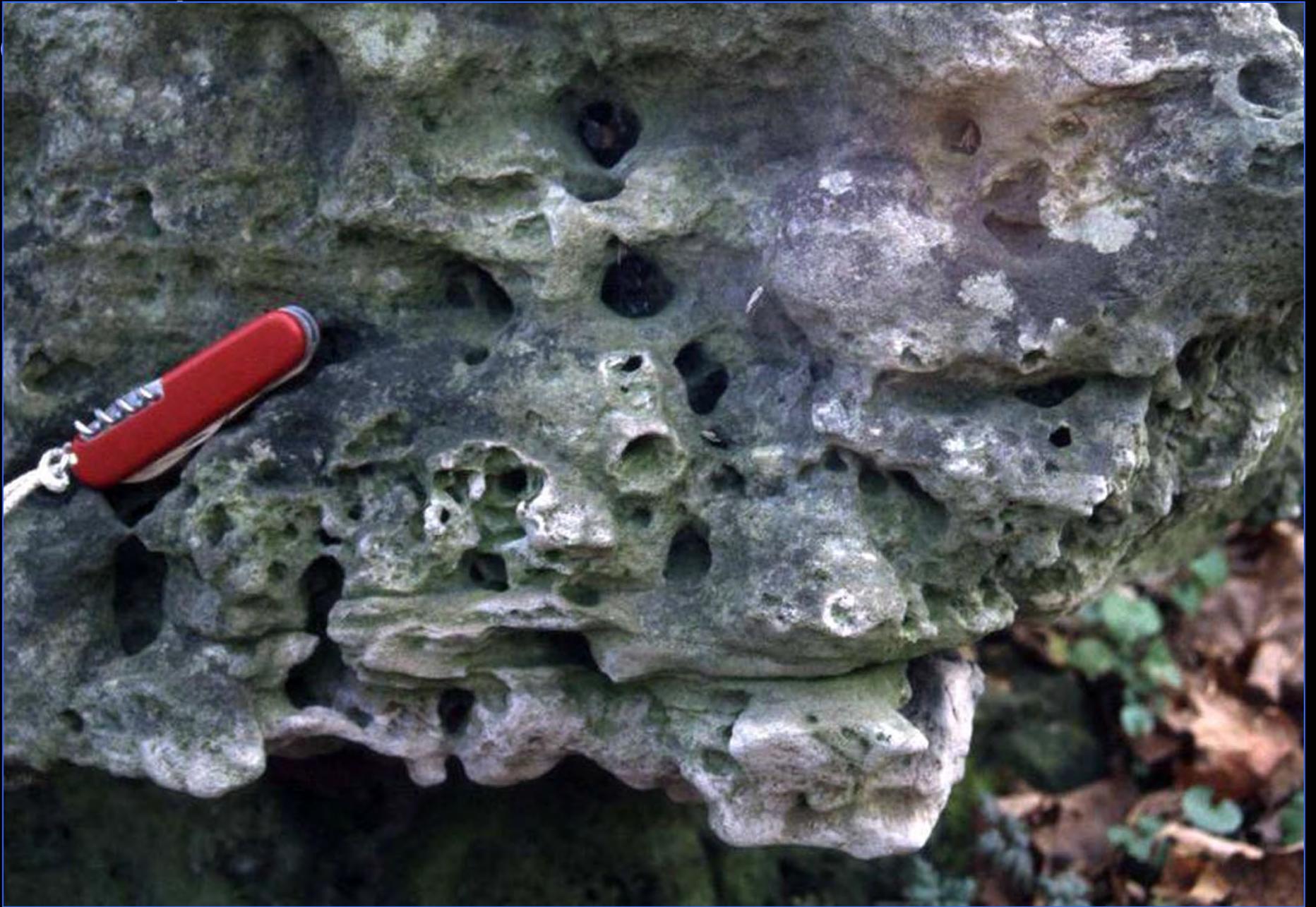


Nexus Cave



Potruff Cave

# Karren





Decantation  
Runnels: formed  
when water slowly  
trickles over the  
rock

Karren: Swiss cheese like  
features on rocks, formed  
when acidic water  
dissolves rock surfaces

# Sinking Streams



Streams that run along the surface before disappearing into an underground channel

# Springs and Seeps



An area where underground streams resurface

# Dye Tracing: Tracking a Sinking Stream

1. Fluorescent dyes are poured into the sinking stream
2. Nearby streams are monitored for the presence of the dye
3. Scientists guess where water flows underground based on where dyes appear



Dye Tracing is the easiest and safest way to study where ground water flows.

Why?

- Dyes can be detected at very low levels
- Dyes have very low toxicity and do not harm the environment





# Changing Water Courses

- One Key Feature of Karst is Underground Drainage
- When underground channels fill up, the excess flows over ground, creating streams that weren't there before



# Pottruff Cave- Winter



Outside



Inside –frozen stream



# Pottruff Cave - Spring





# Water Cress Sink – Late Fall



Sink

Dry  
Stream  
Bed



# Water Cress Sink- Early Spring



Sink

Formerly  
Dry  
Stream  
Bed



# Why does Karst Matter?



# 1. Water is NOT purified as it moves through karst aquifers

Surface water is not filtered through soil but flows directly into underground streams



Spring snow melt trickles into Nexus Cave Window

## 2. Water can carry contaminants very far, very quickly

Water moves very quickly through underground caves and channels, bringing any contaminants with it



Water flowing in underground portion of Nexus Cave Entrance

● ● ● | Would you drink water that flowed through this?



# Or this?



© Greg Middleton



○ 25% of people on earth drink water from karst aquifers

○ Many ecosystems (including the Eramosa Karst Conservation Area) depend on the water in karst springs



Karst areas need to be kept clean to ensure water quality remains high and human and environmental health is preserved

So, when you're at a karst, remember:

