

Go Hydrology: A Ten Year Retrospective

Robert V. Sobczak
Big Cypress National Preserve

Opening Confession

“I never set out to
be a blogger.”

Cost = free

Response = Mostly Positive

Still ...

Questions remained

Why is it a
.com and .org?

Mid Life Hydrology Crisis

Gohydrology

Go(ing through the motions)

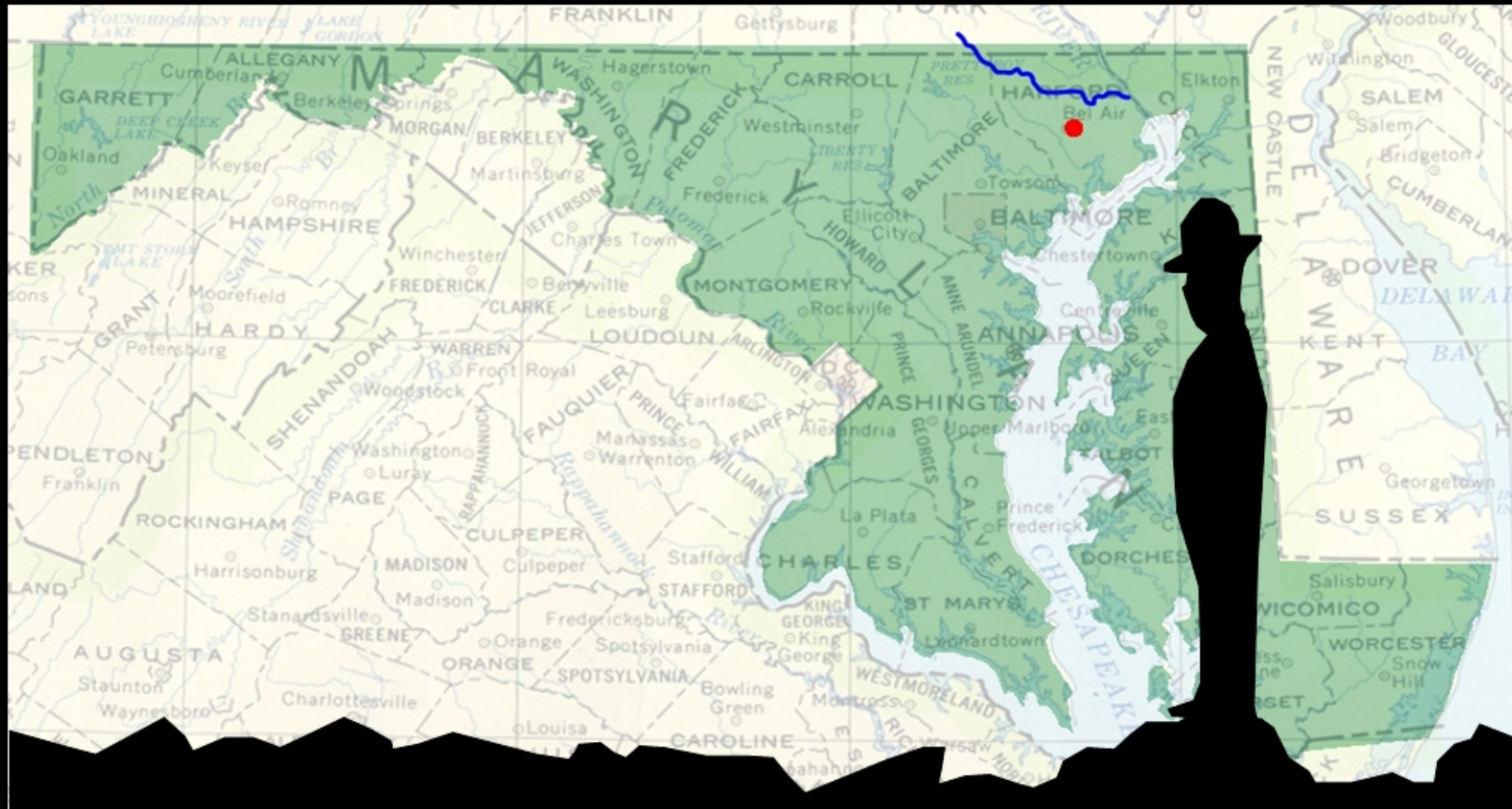








Origin Story

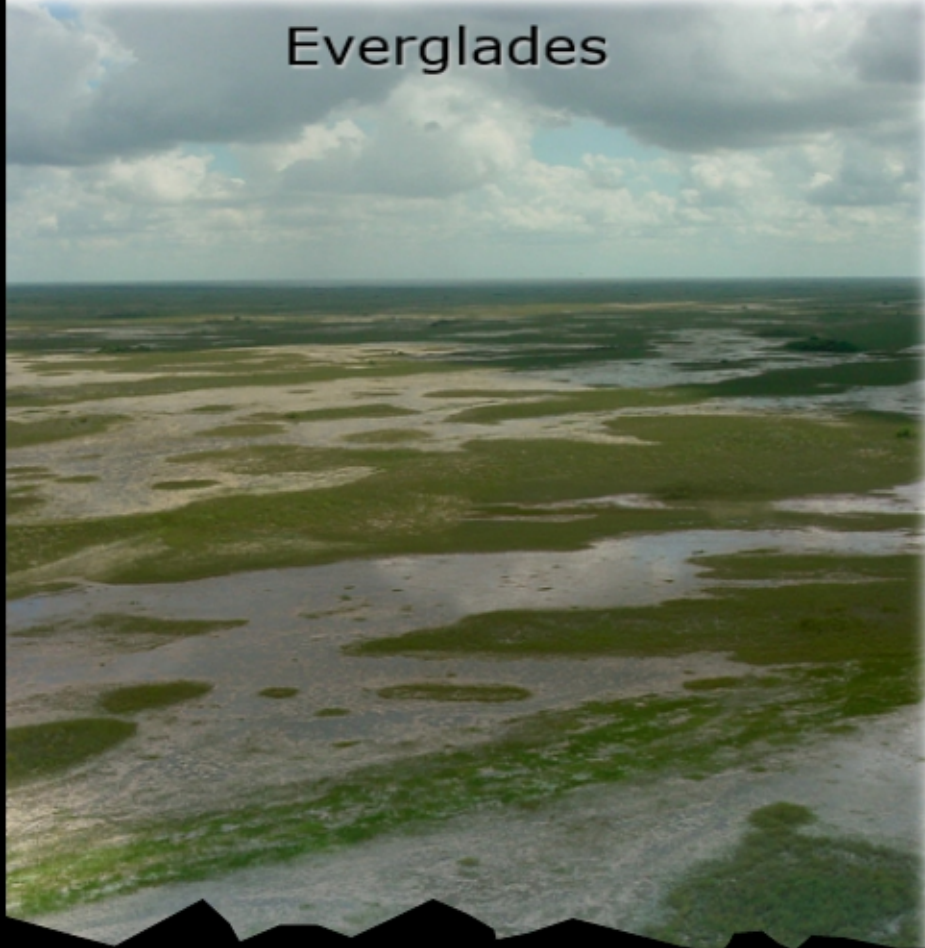




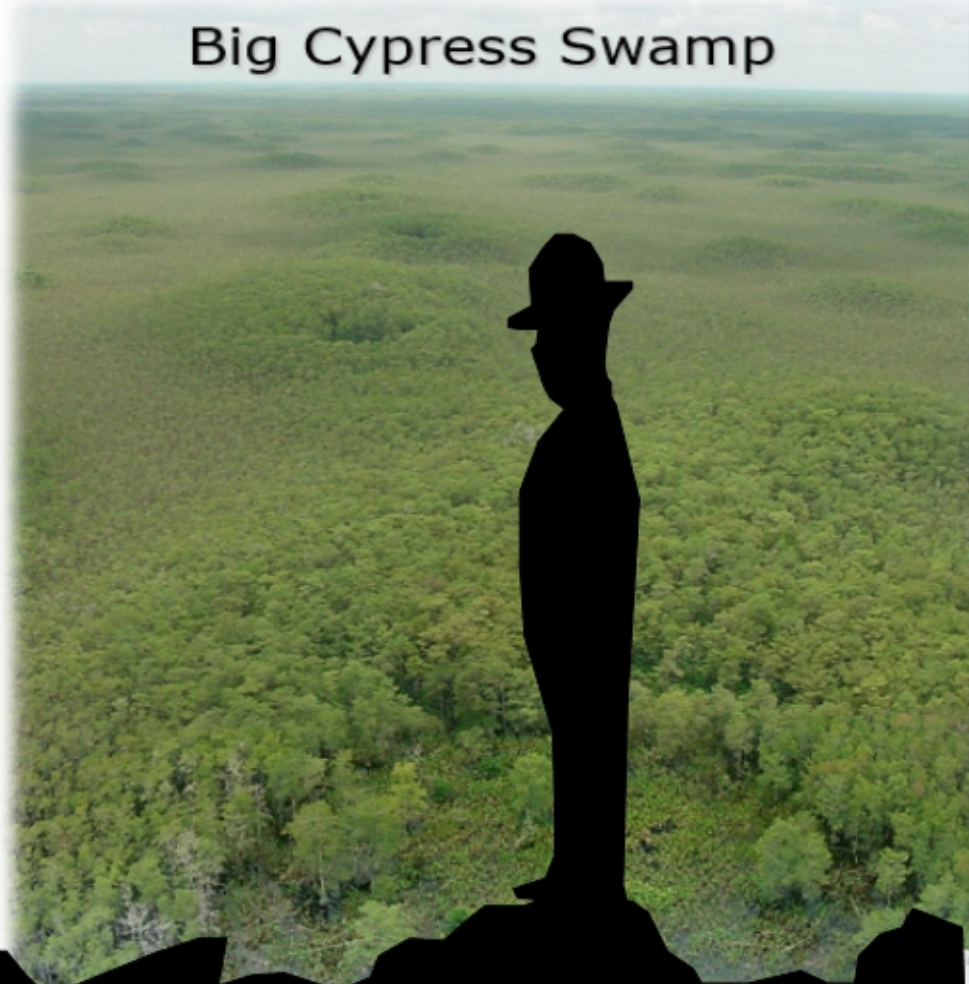




Everglades



Big Cypress Swamp





During the annual **spring drought** ...



everything goes dry!

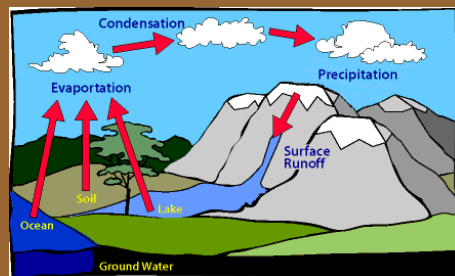
Wrong-way clouds



Moving East to West









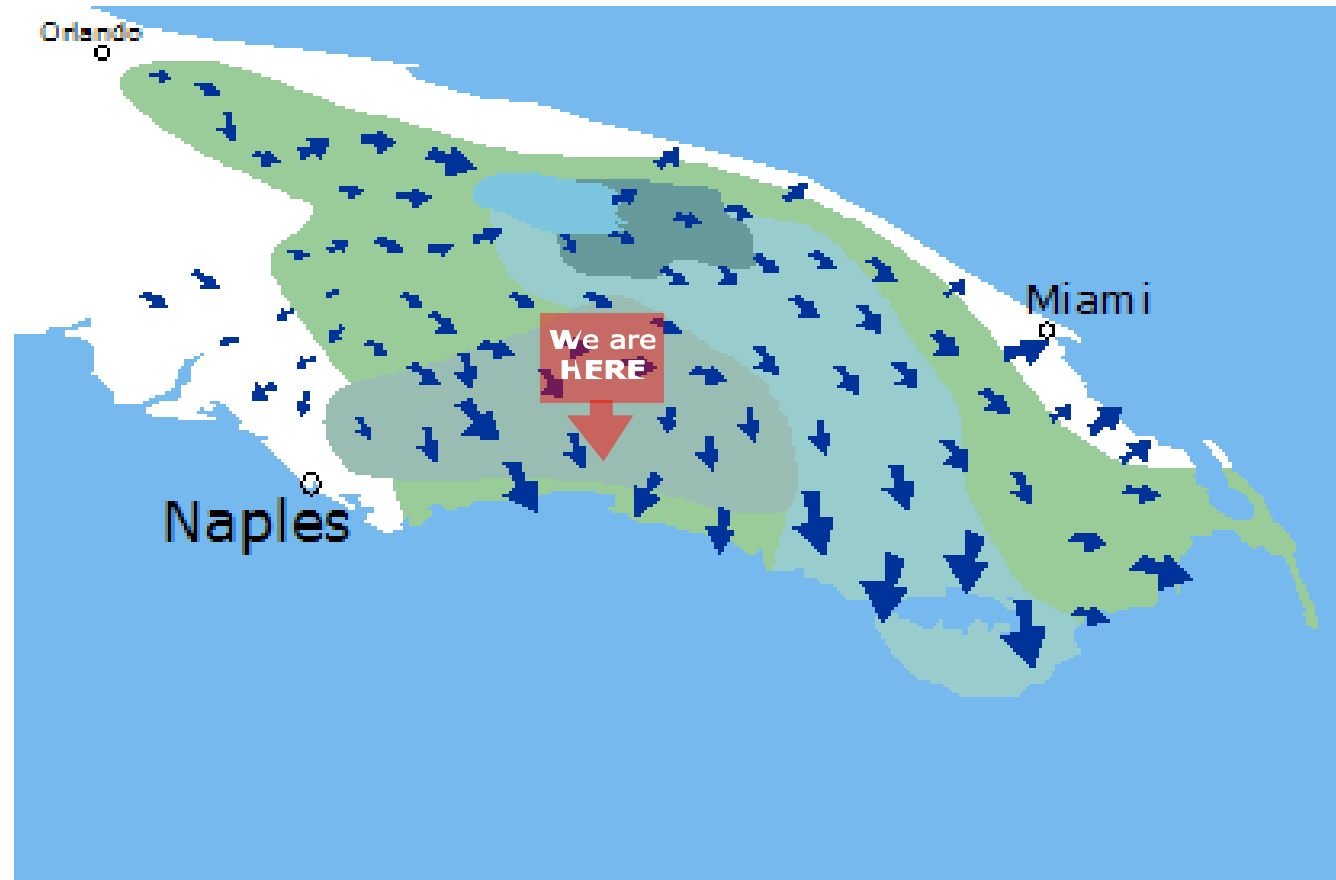
Go Hydrology!







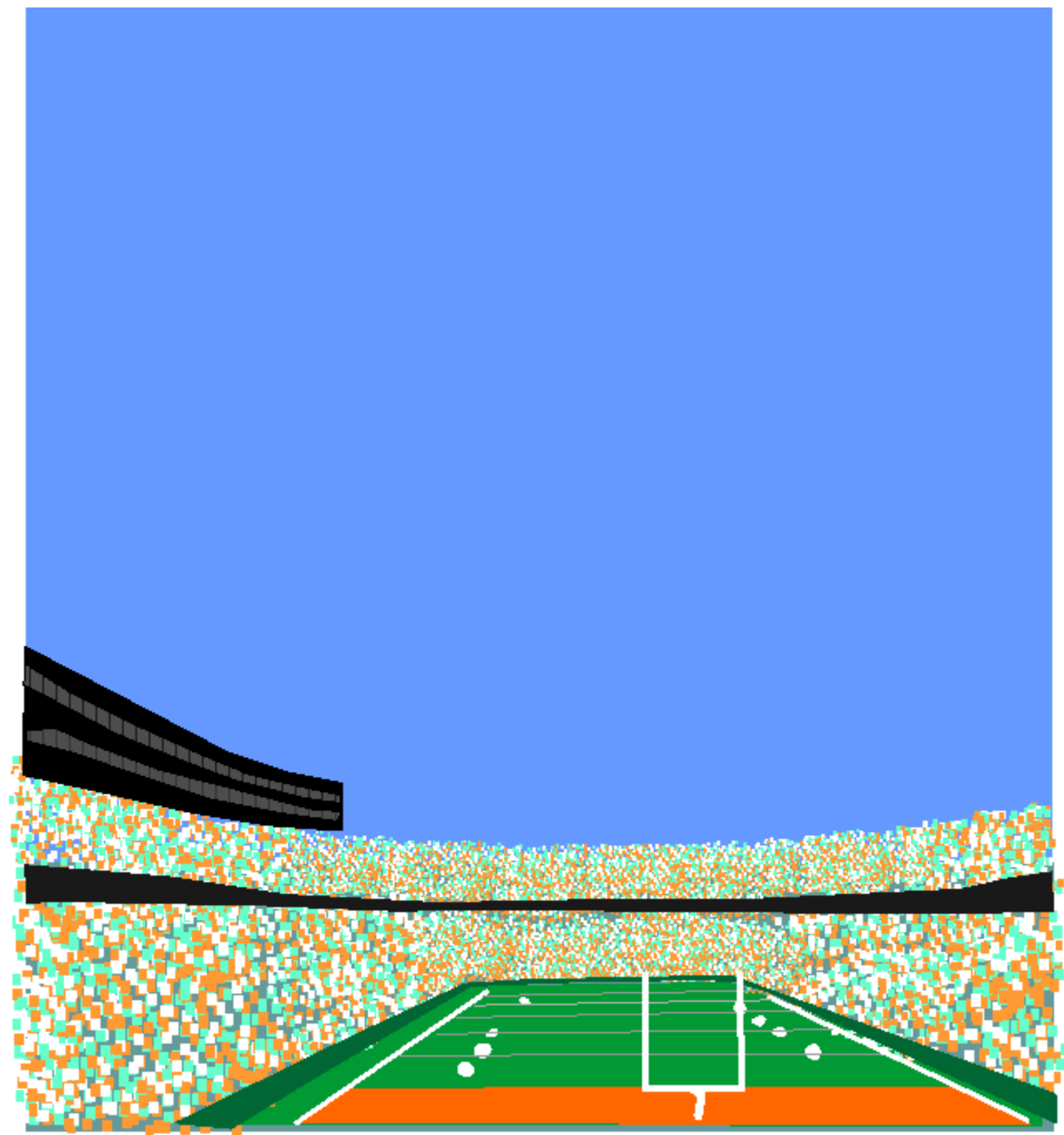




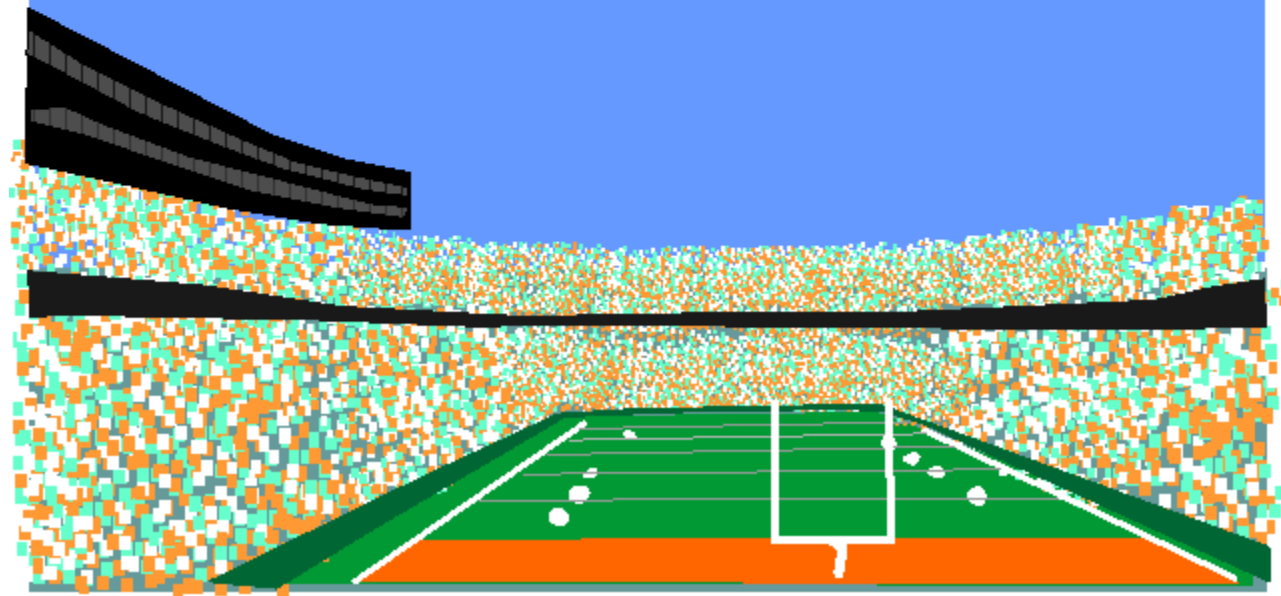
Kissimmee-Okeechobee-Everglades Ecosystem

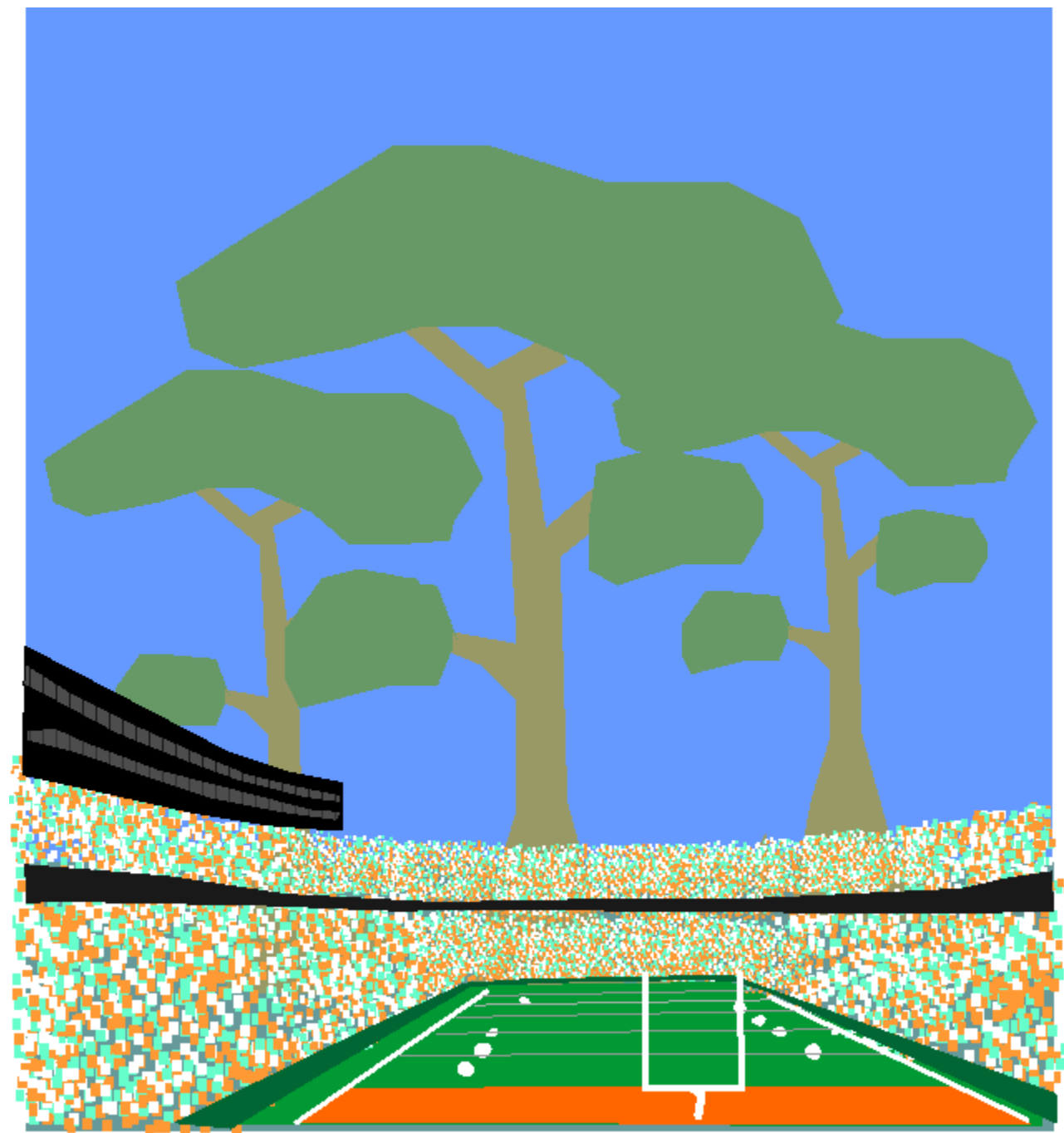


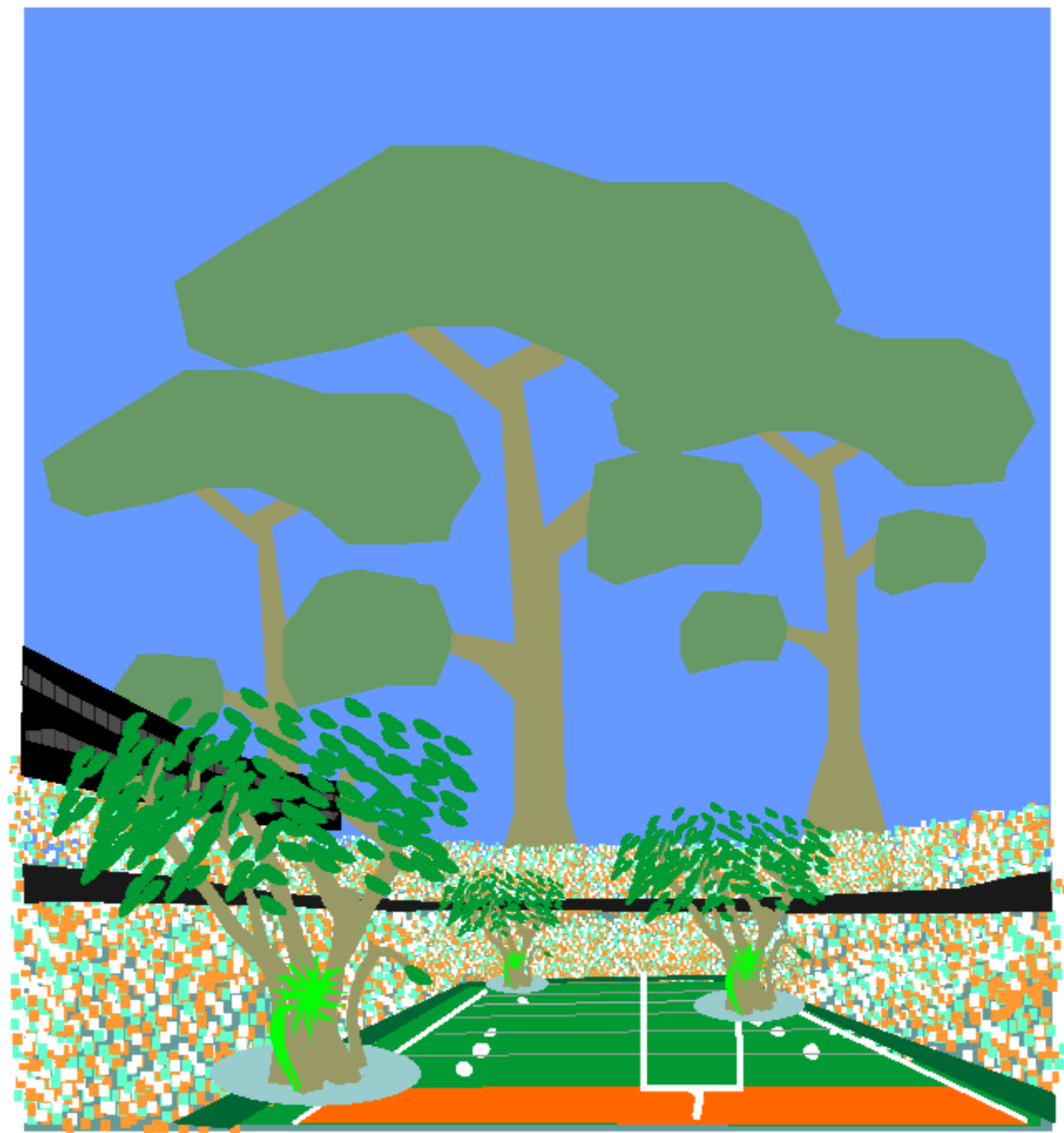
Formed a
Watershed Team



Go Dolphins!















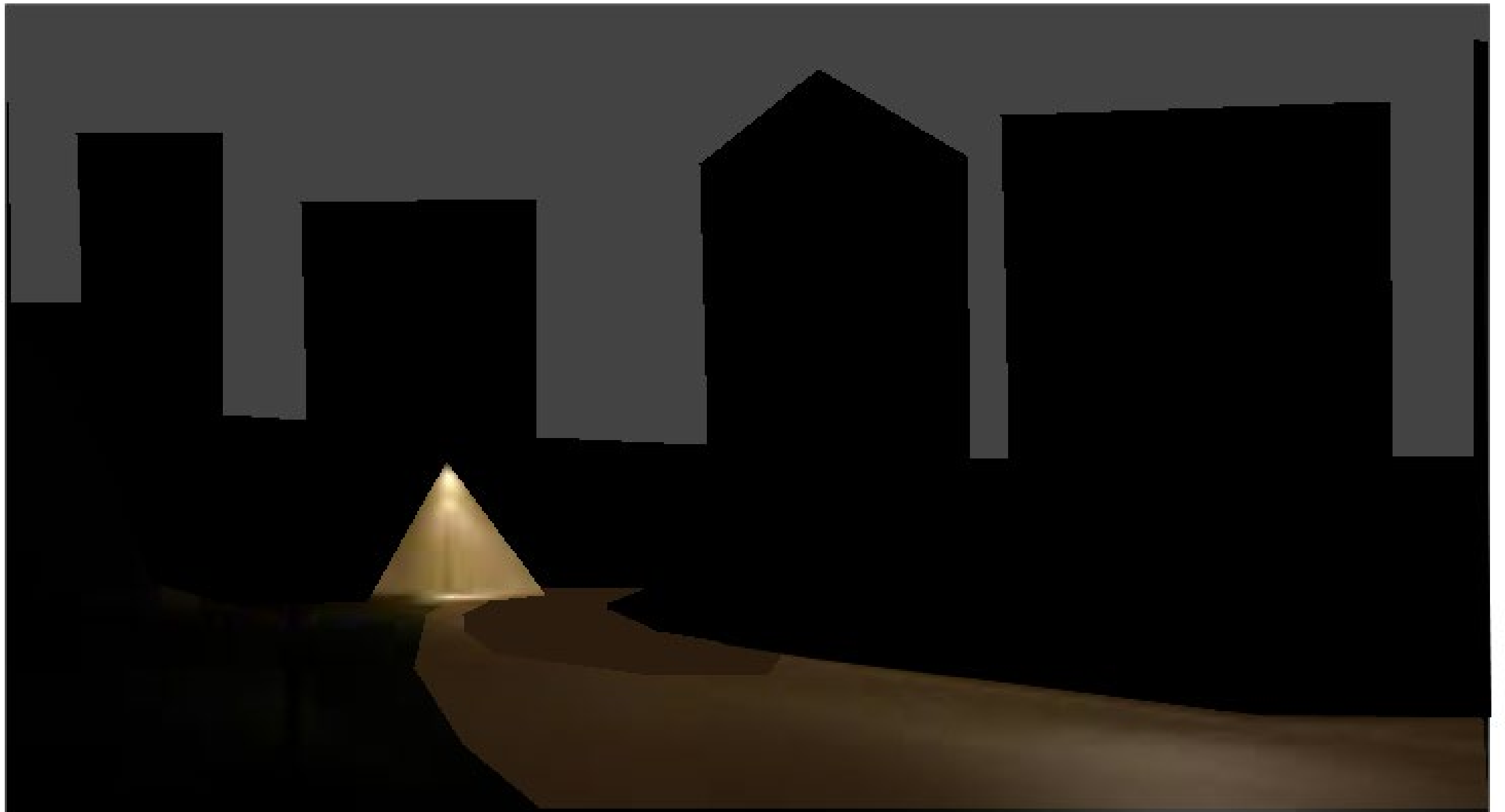




Go Swamp!

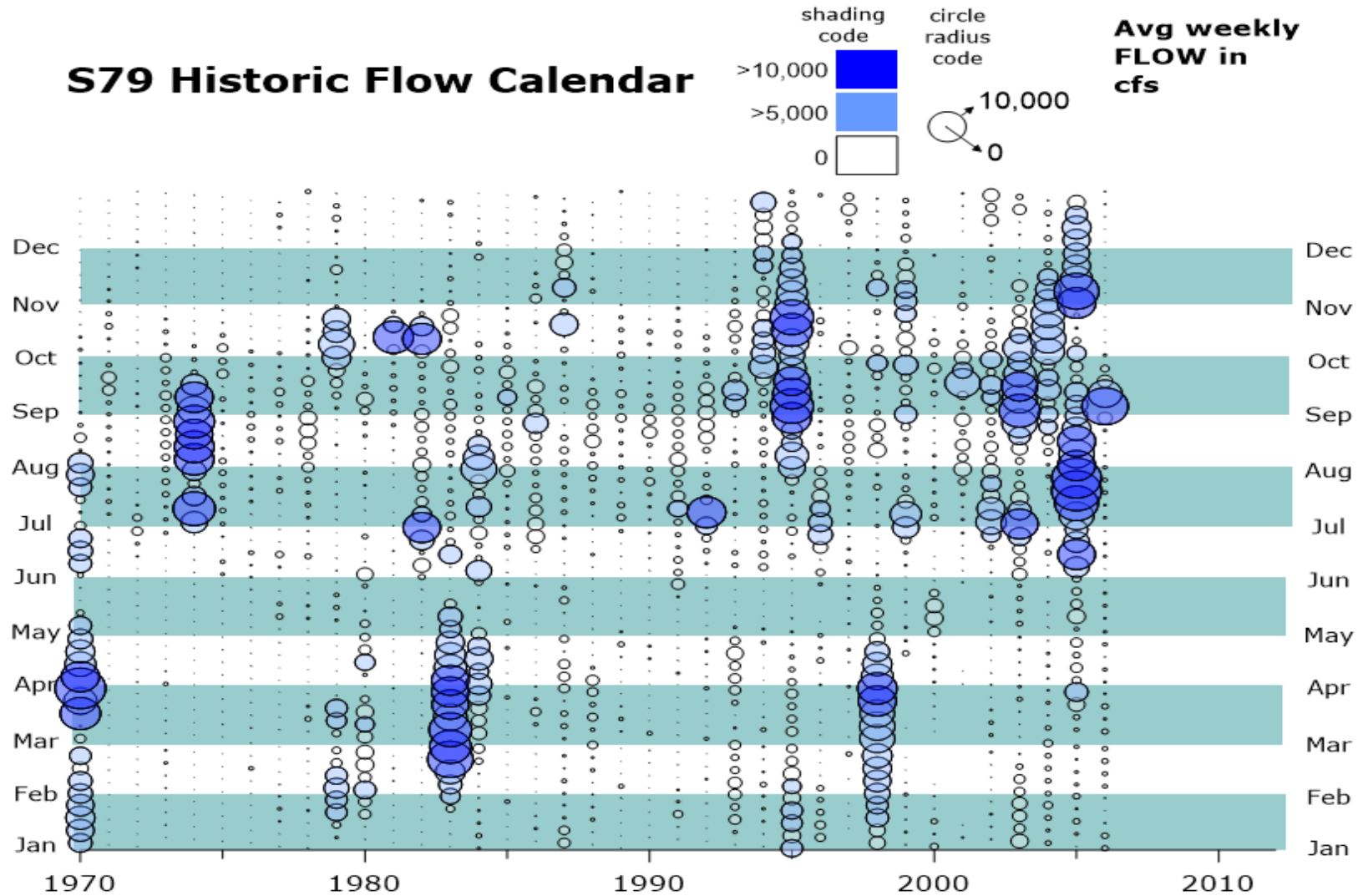


Data Sharing

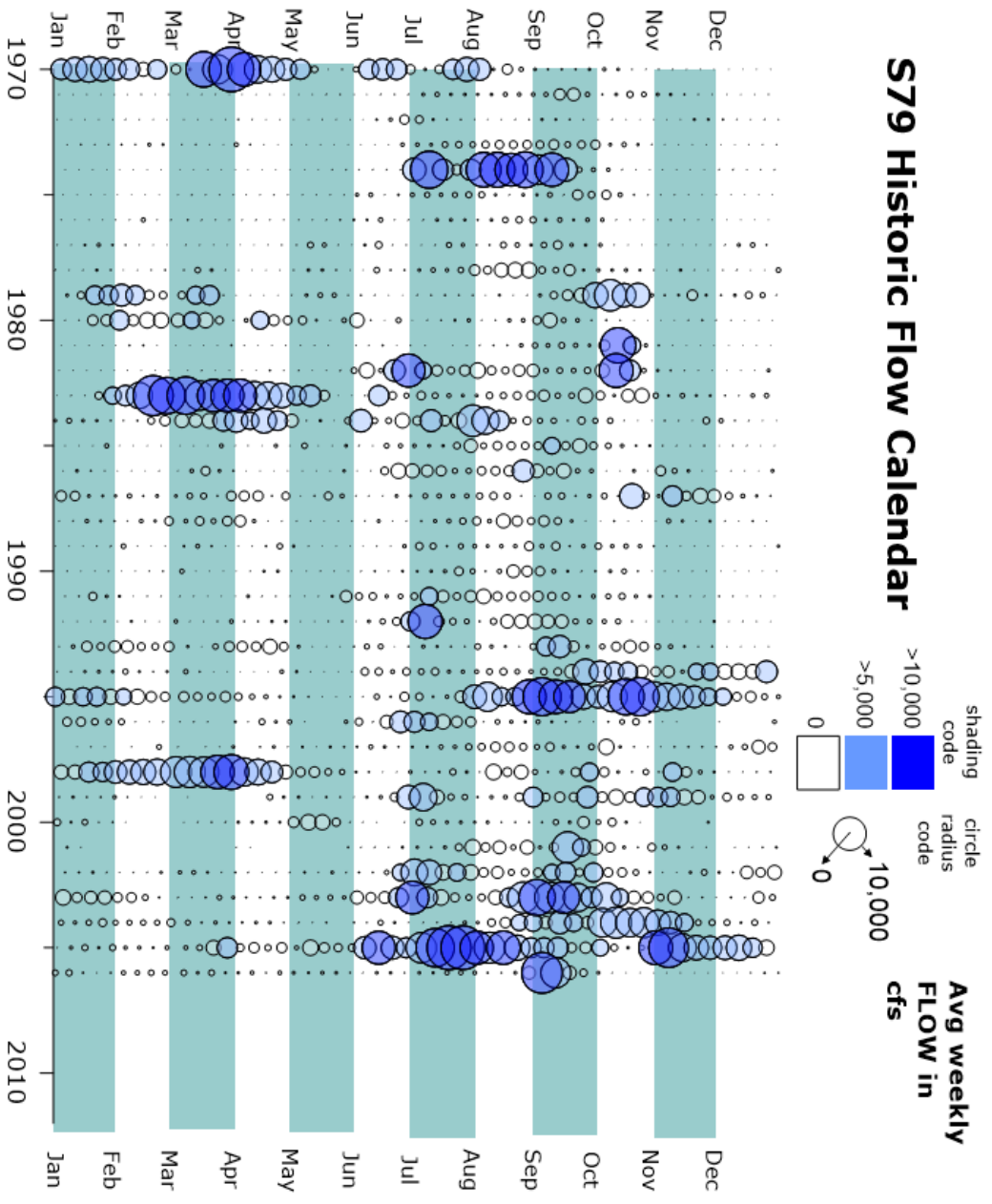


Poor man's data dump

Poor man's data dump



S79 Historic Flow Calendar







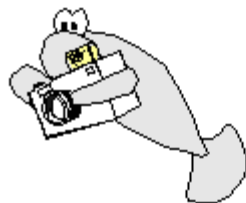
**watershed
rain**



**watershed
budgets**



**watershed
temperatures**



**watershed
photos**



**watershed
news**



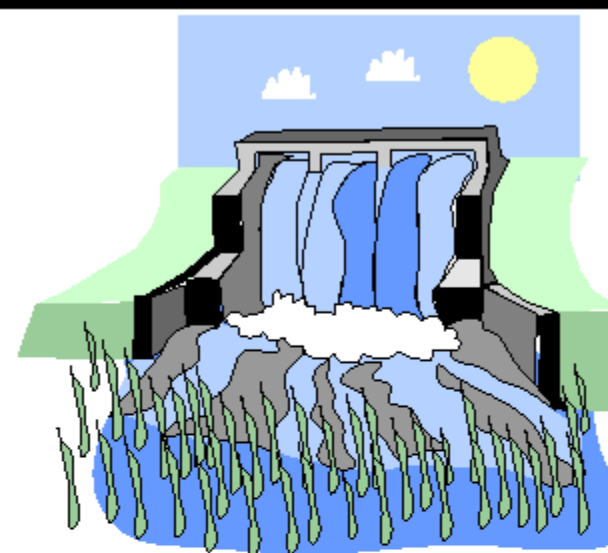
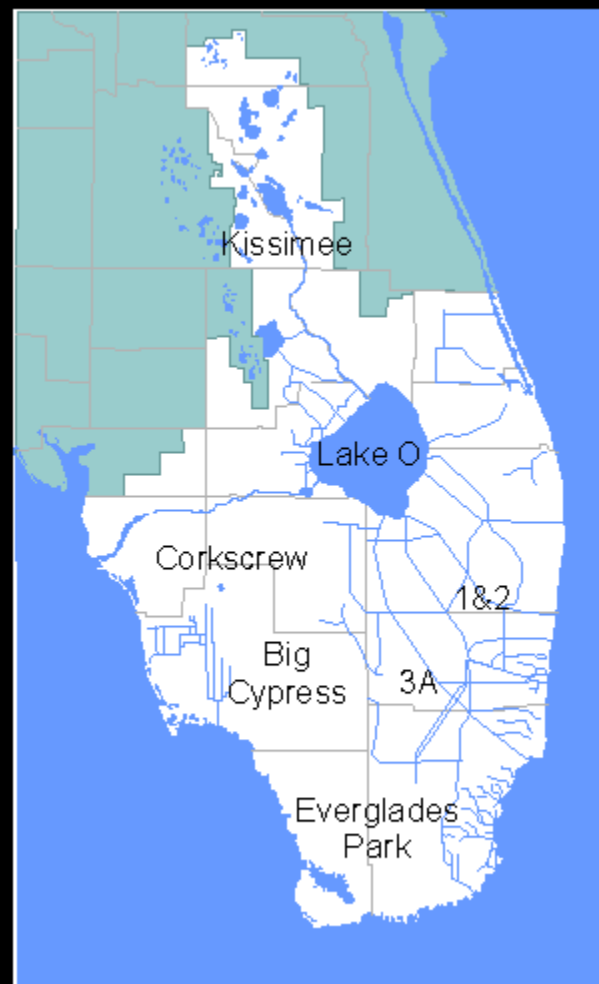
**watershed
restoration**



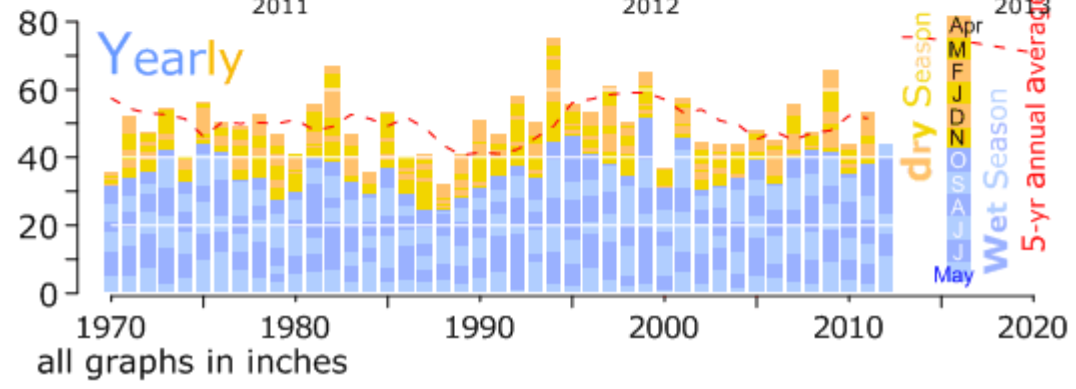
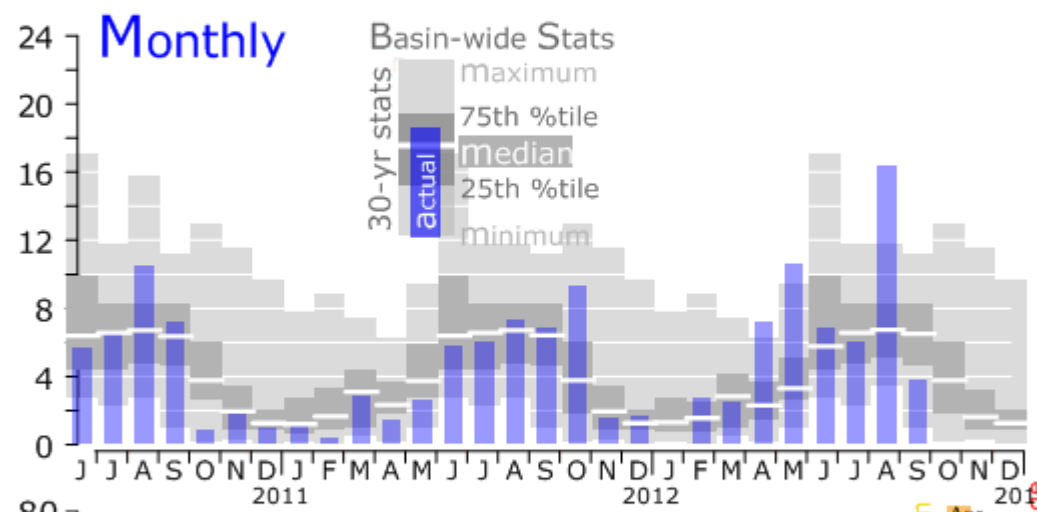
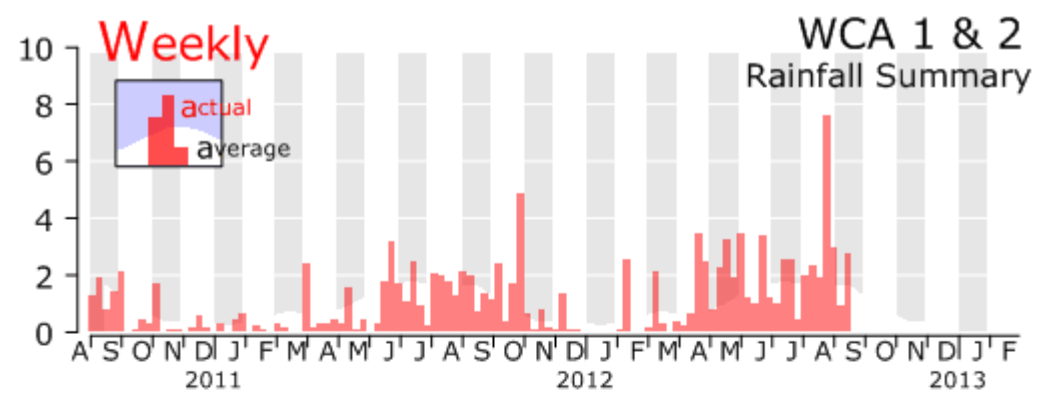
**watershed
timelines**



**watershed
logs**

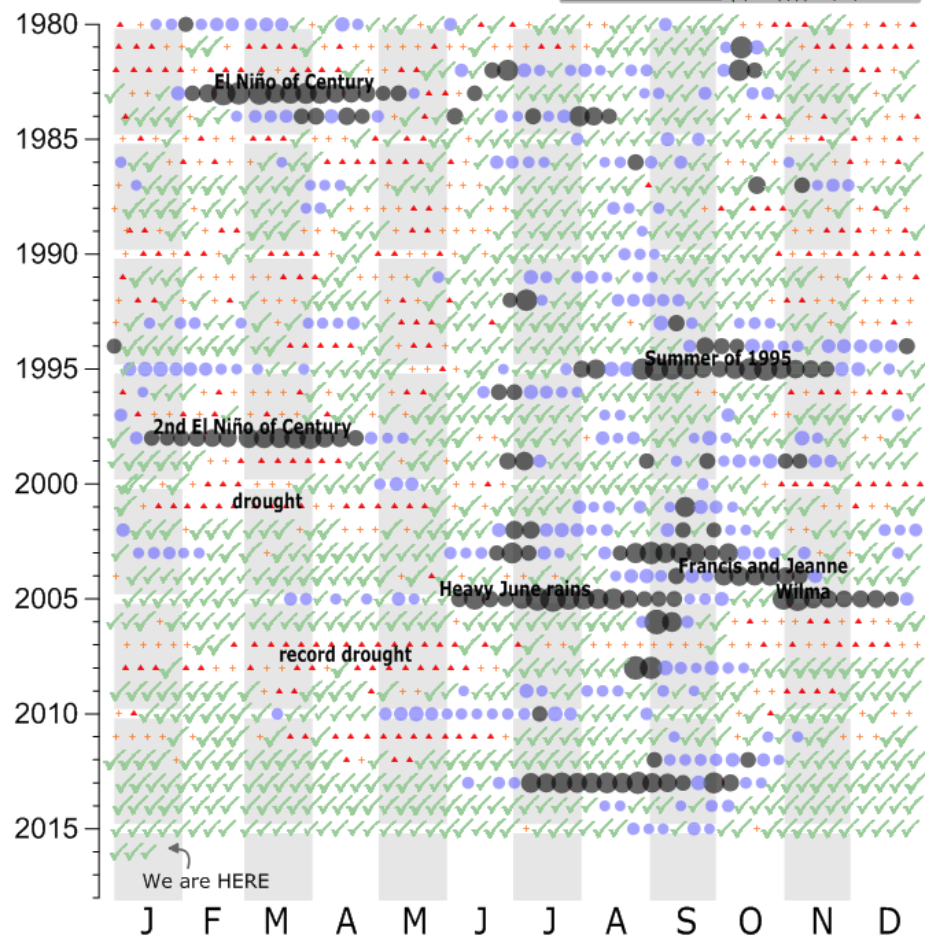
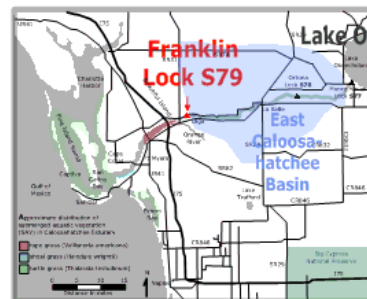
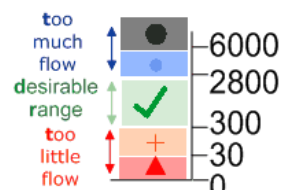


**Watershed
Budgets**
(click on map to view)



History of Caloosahatchee Discharges into the Estuary from the S-79 Structure

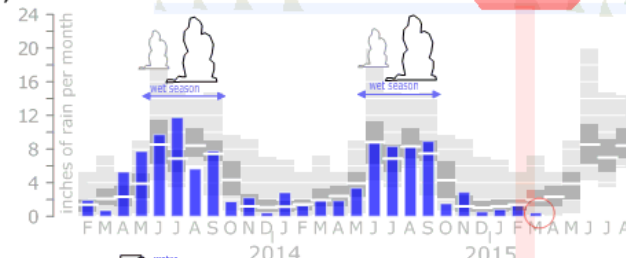
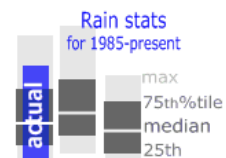
As measured as average weekly discharge at WP Franklin S-79 in cubic feet per second



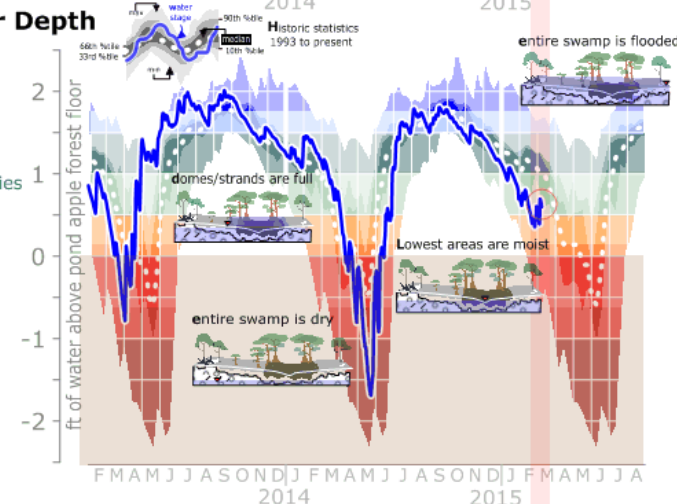
Overview Hydrograph for Big Cypress Nat'l Preserve

We are HERE
03/13/15

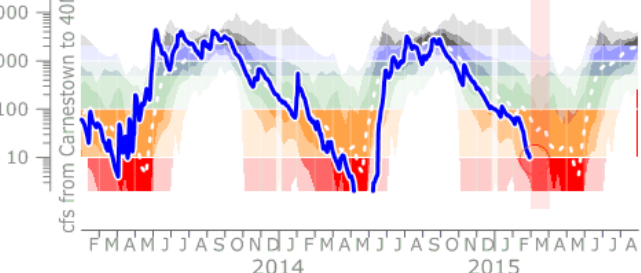
Preserve-wide Monthly Rainfall



Preserve-wide Water Depth

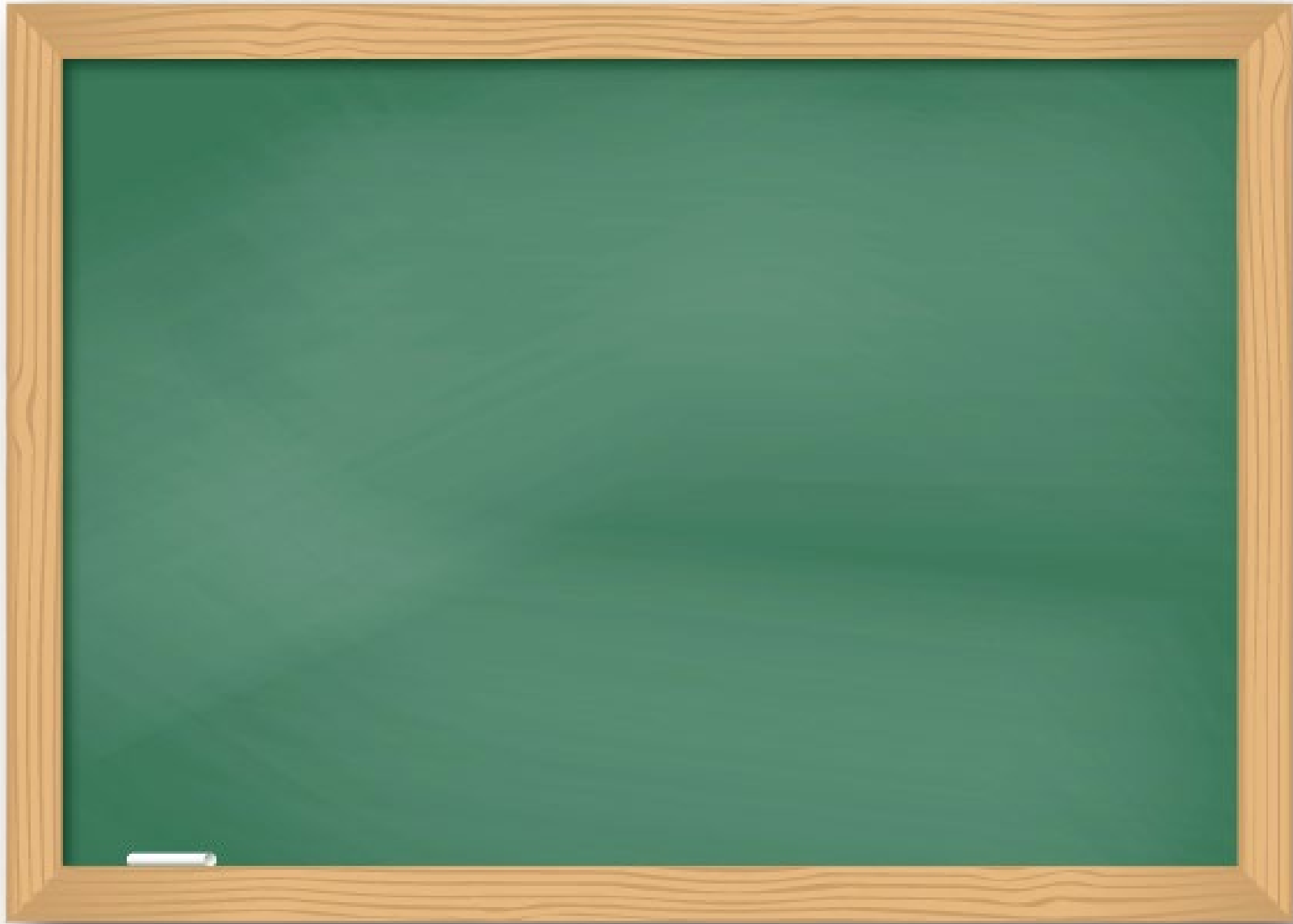


Preserve-wide Sheetflow



Advice:

“You’re right, we
need a war room!”





Weekly Update

Weekly Update

Short
Narrative

Links
to Charts

Weekly Update

Short
Narrative

Short
Narrative

Short
Narrative

Short
Narrative

Short
Narrative

Short
Narrative

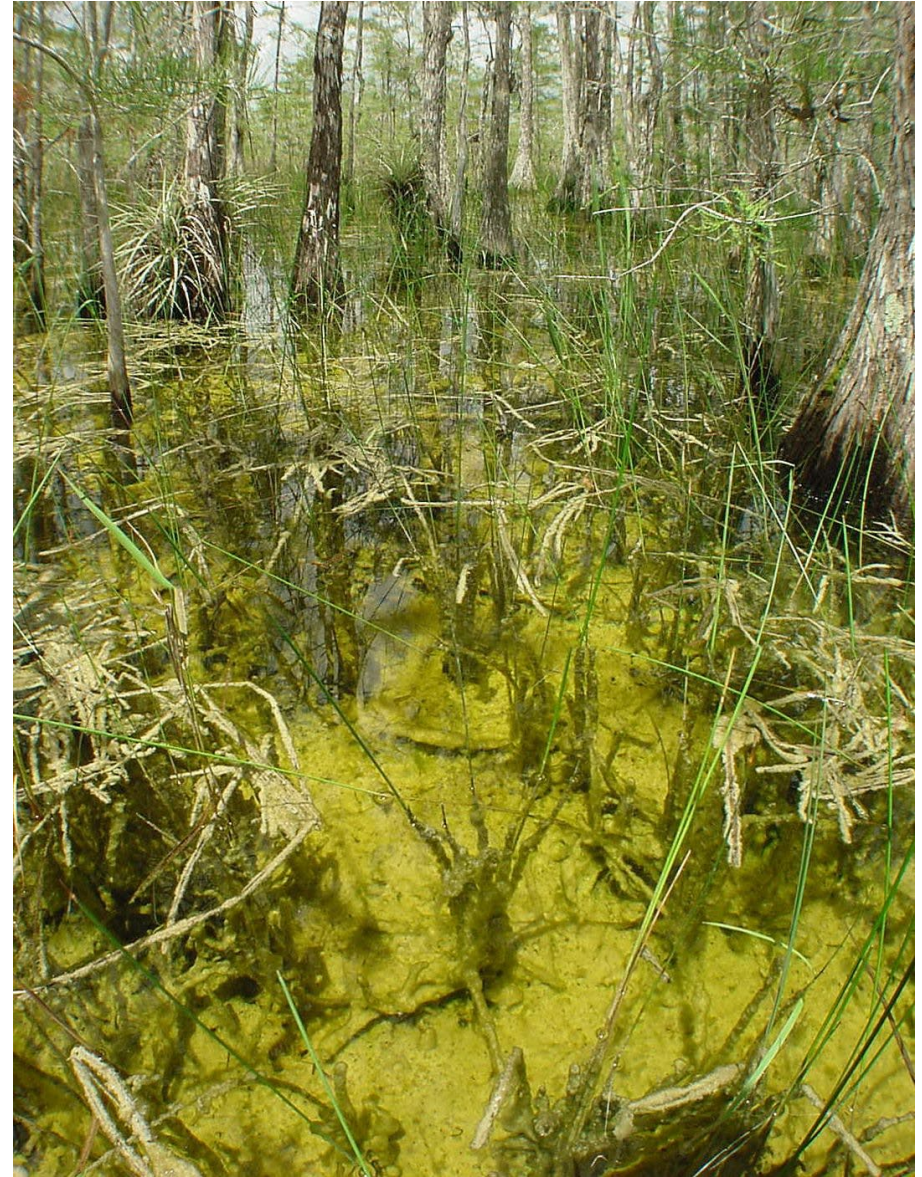
Links
to Charts

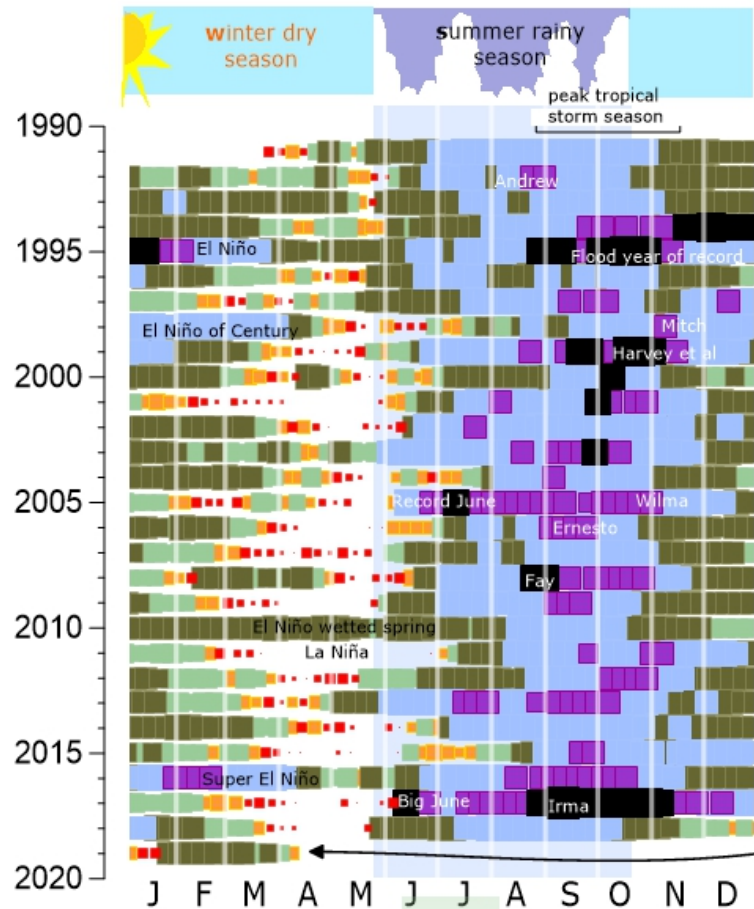


Blogger™



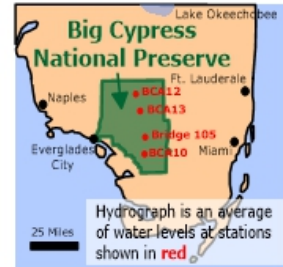




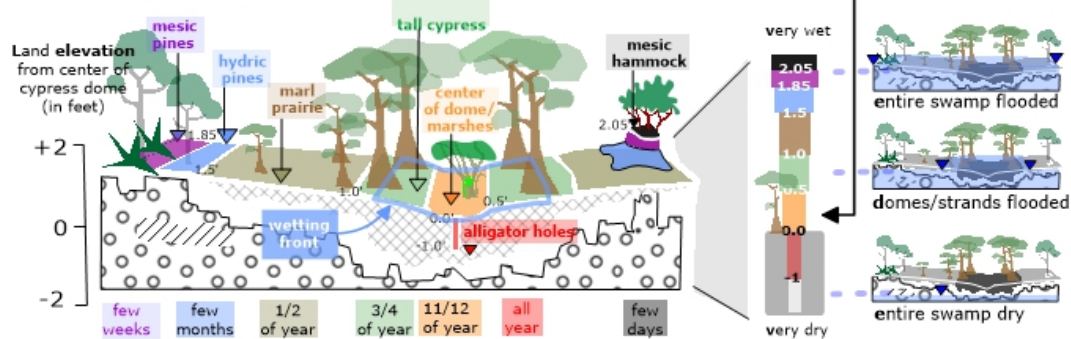


Historical Calendar of water depth in Big Cypress National Preserve

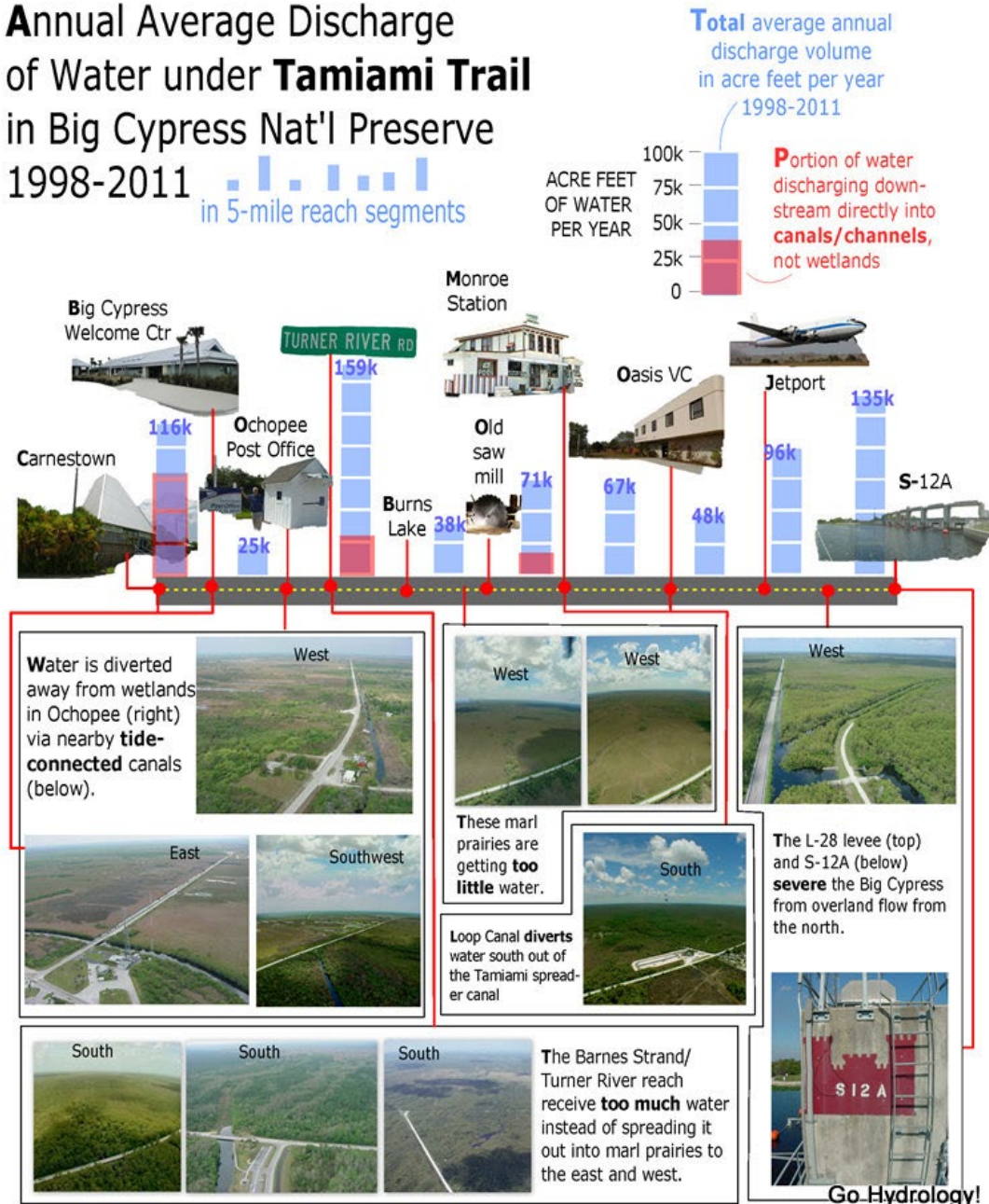
1991 - present



We are HERE
marl prairie

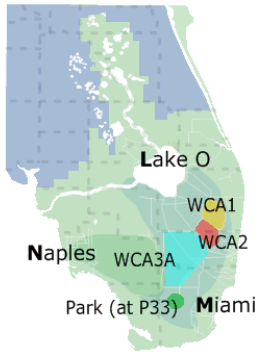


Annual Average Discharge of Water under **Tamiami Trail** in Big Cypress Nat'l Preserve 1998-2011

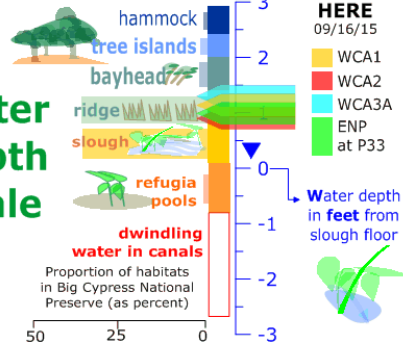


Where's the Wetting Front in the Glades?

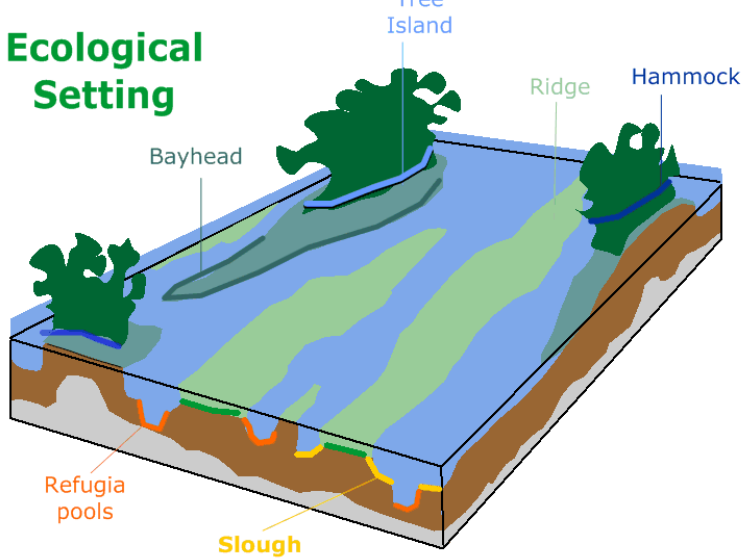
Map



Water Depth Scale

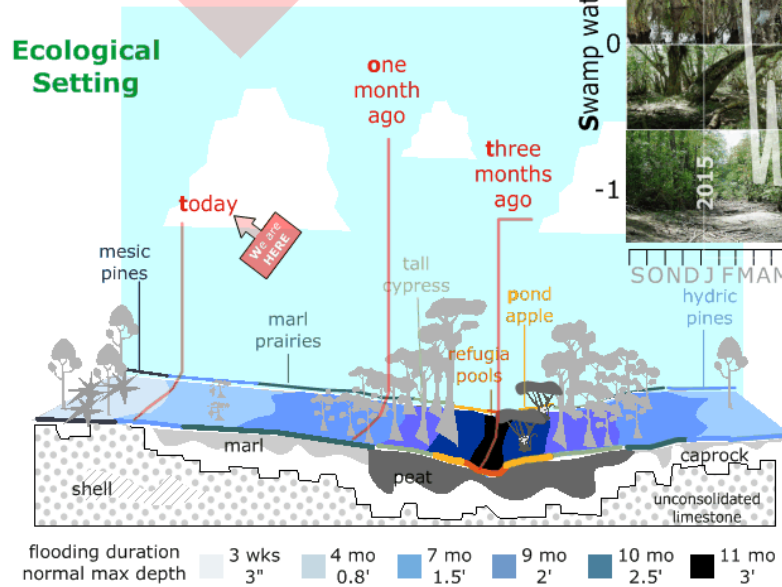


Ecological Setting



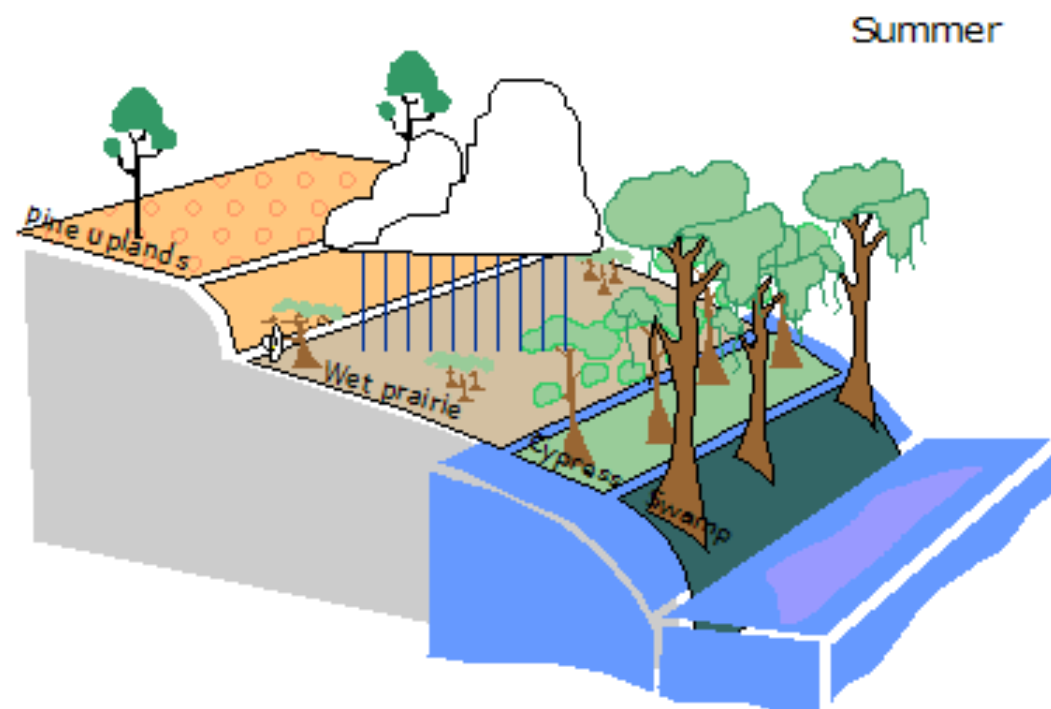
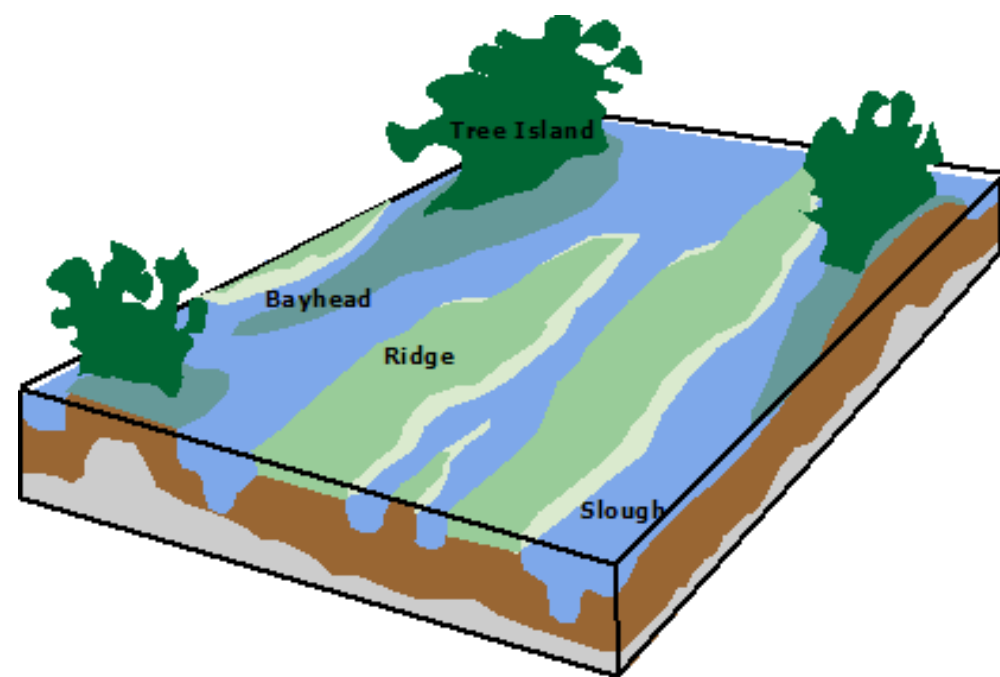
Where's the wetting front?

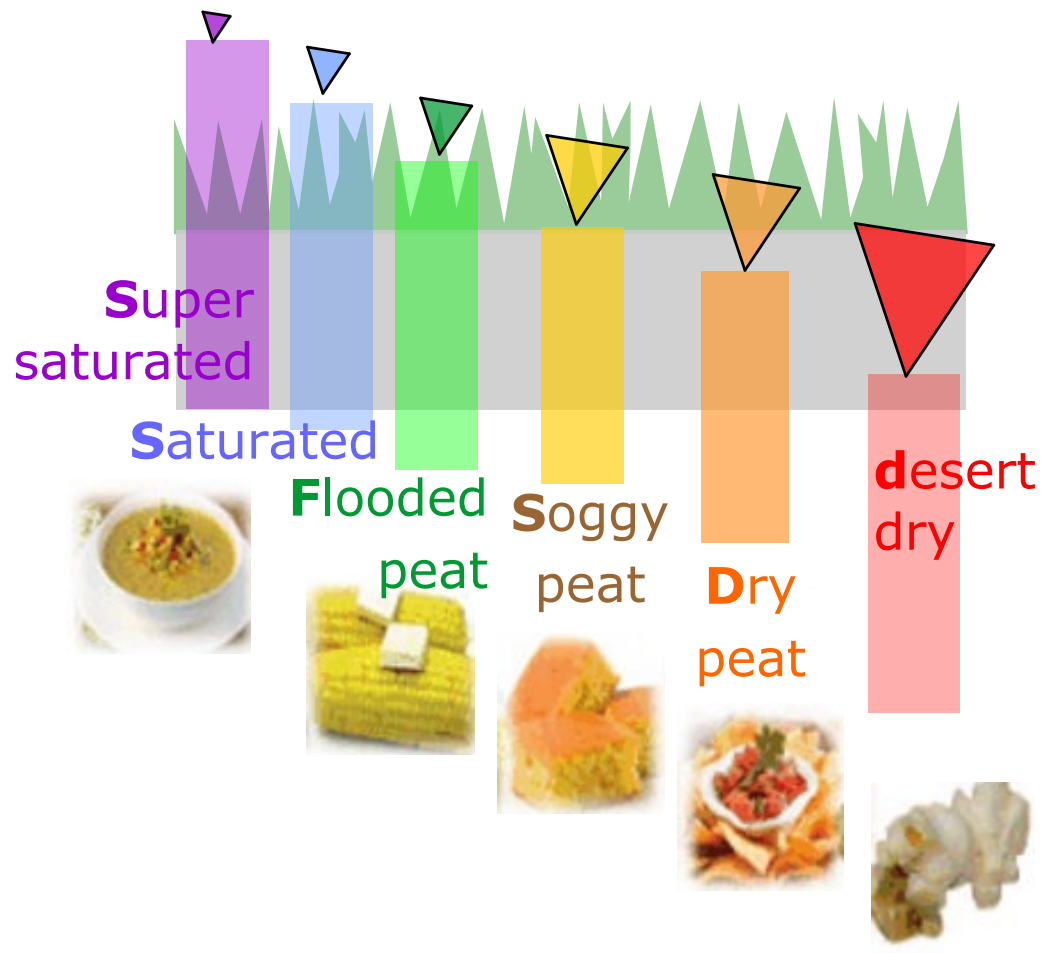
Ecological Setting



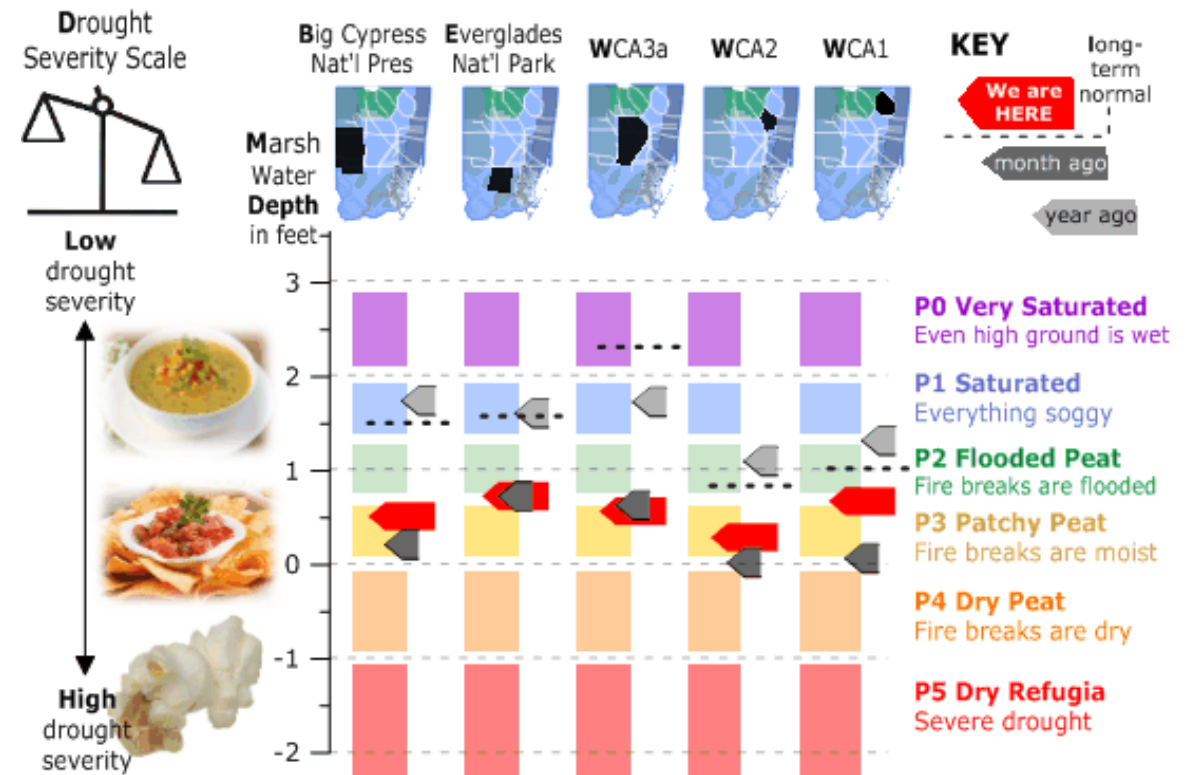
Hydrograph







South Florida **Soup/Popcorn** Scale for 8/13/15







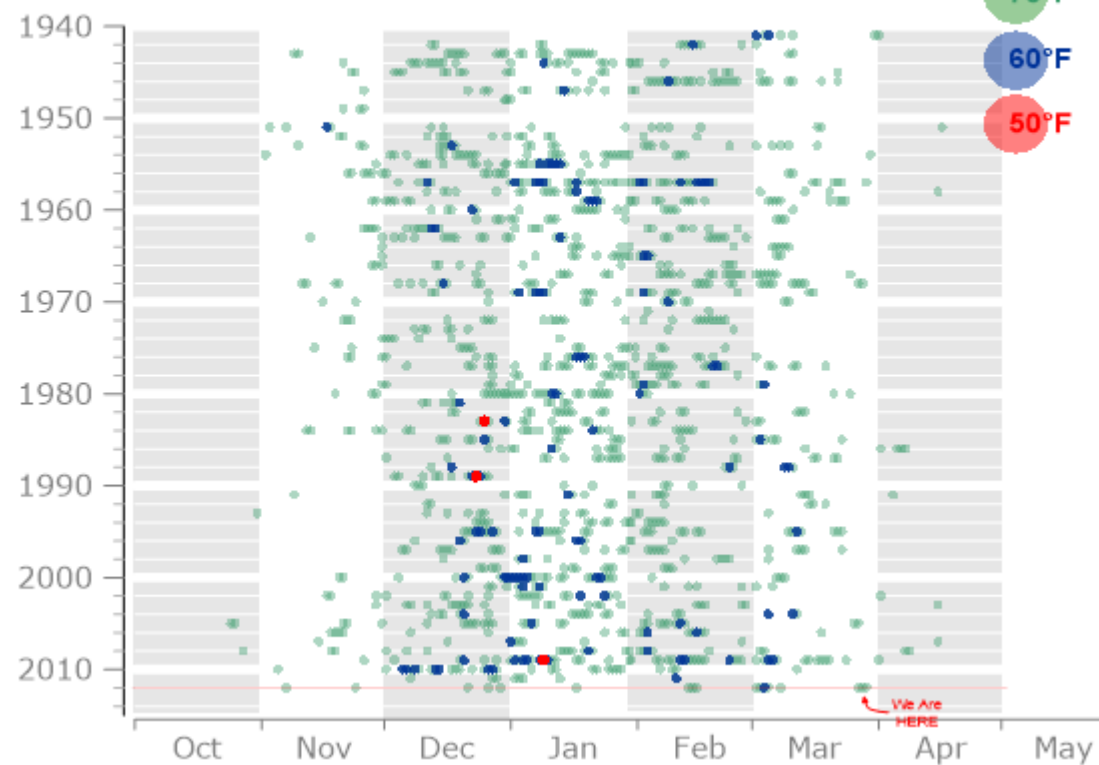
Days of Winter Naples, Florida Style

Data points indicate days when the
Daily High Temperature
Didn't Break Above ...

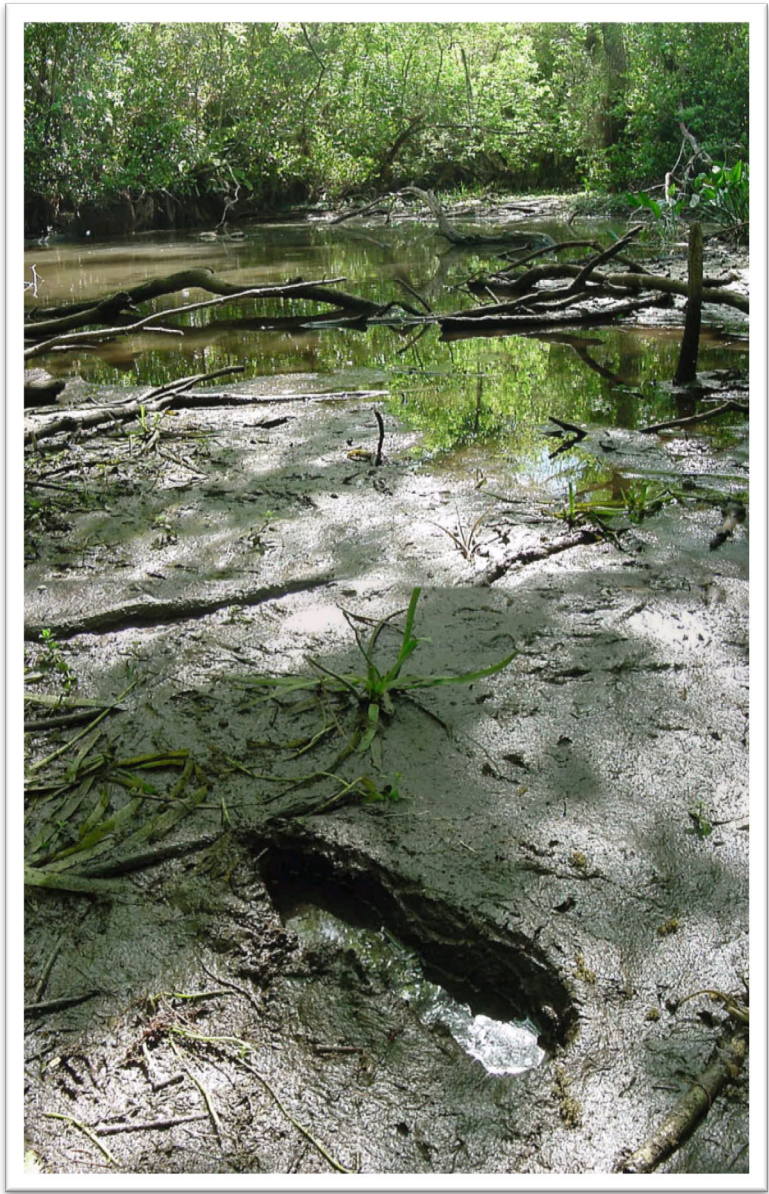
70°F

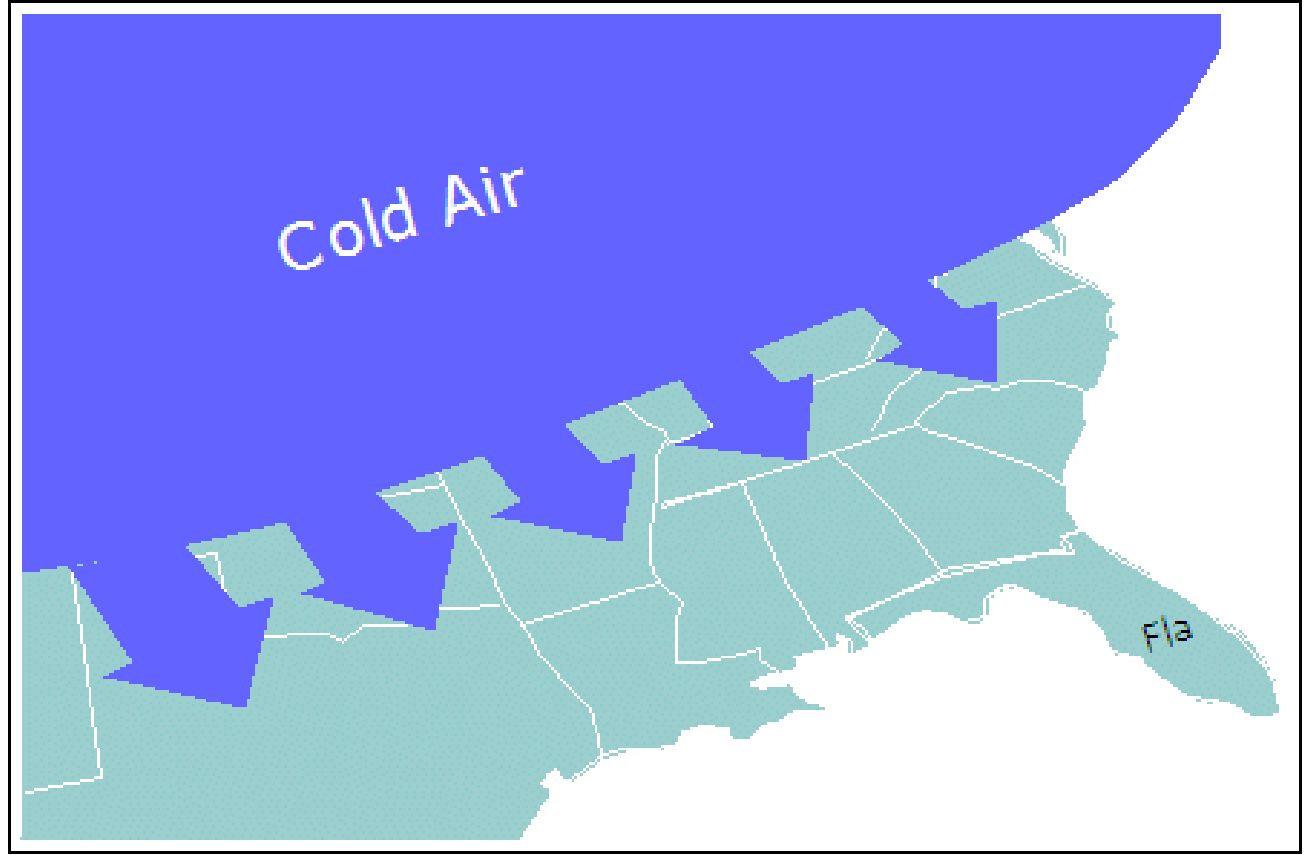
60°F

50°F





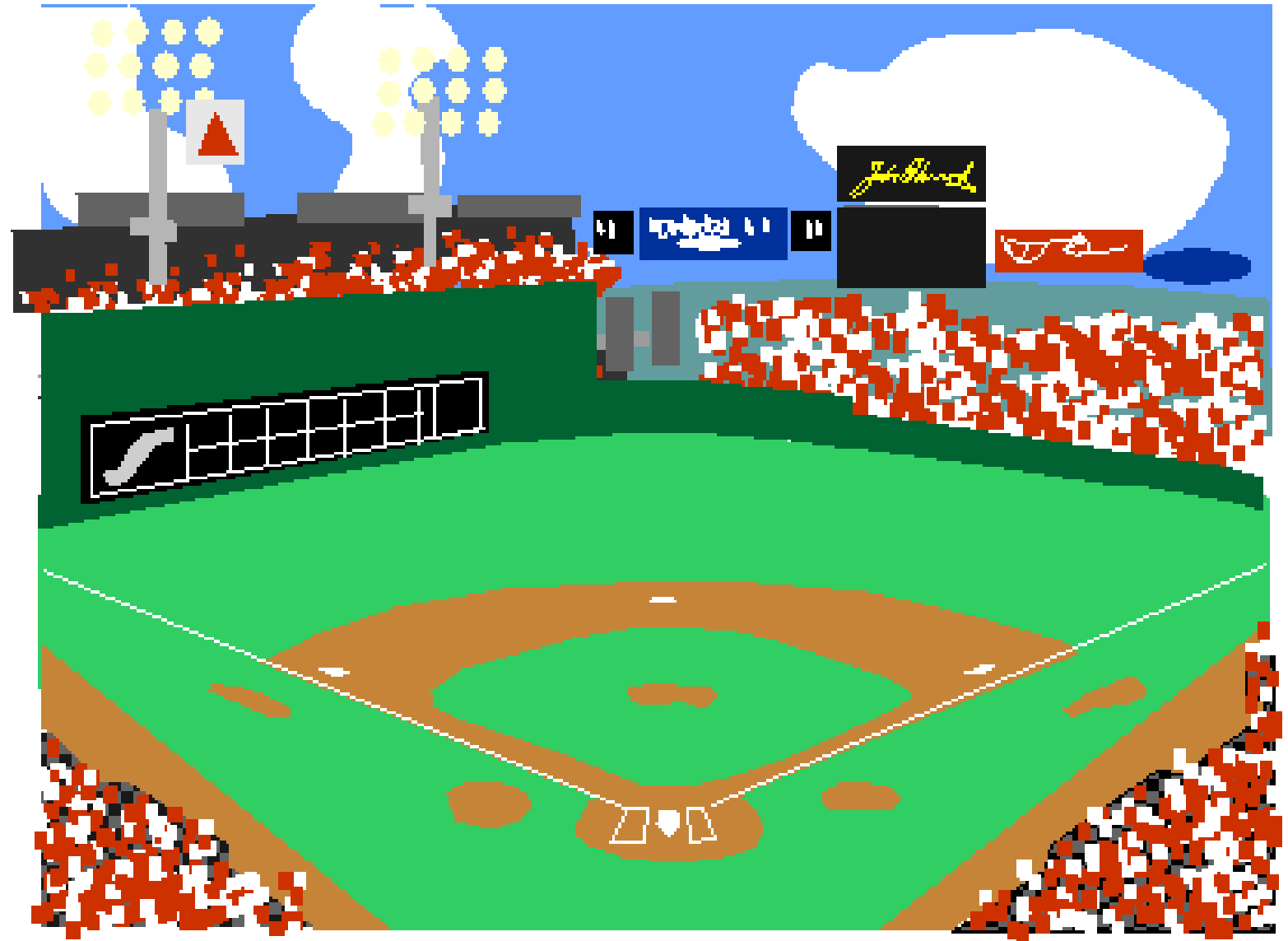
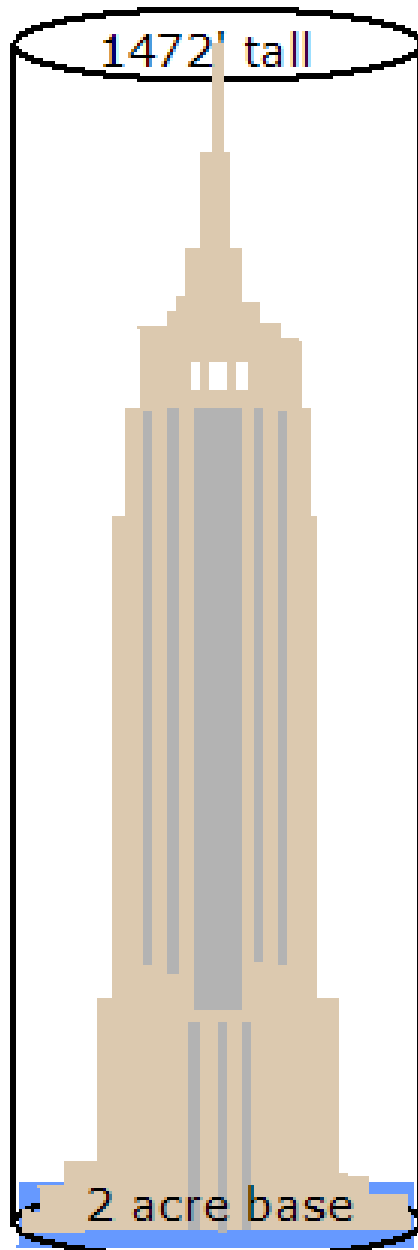


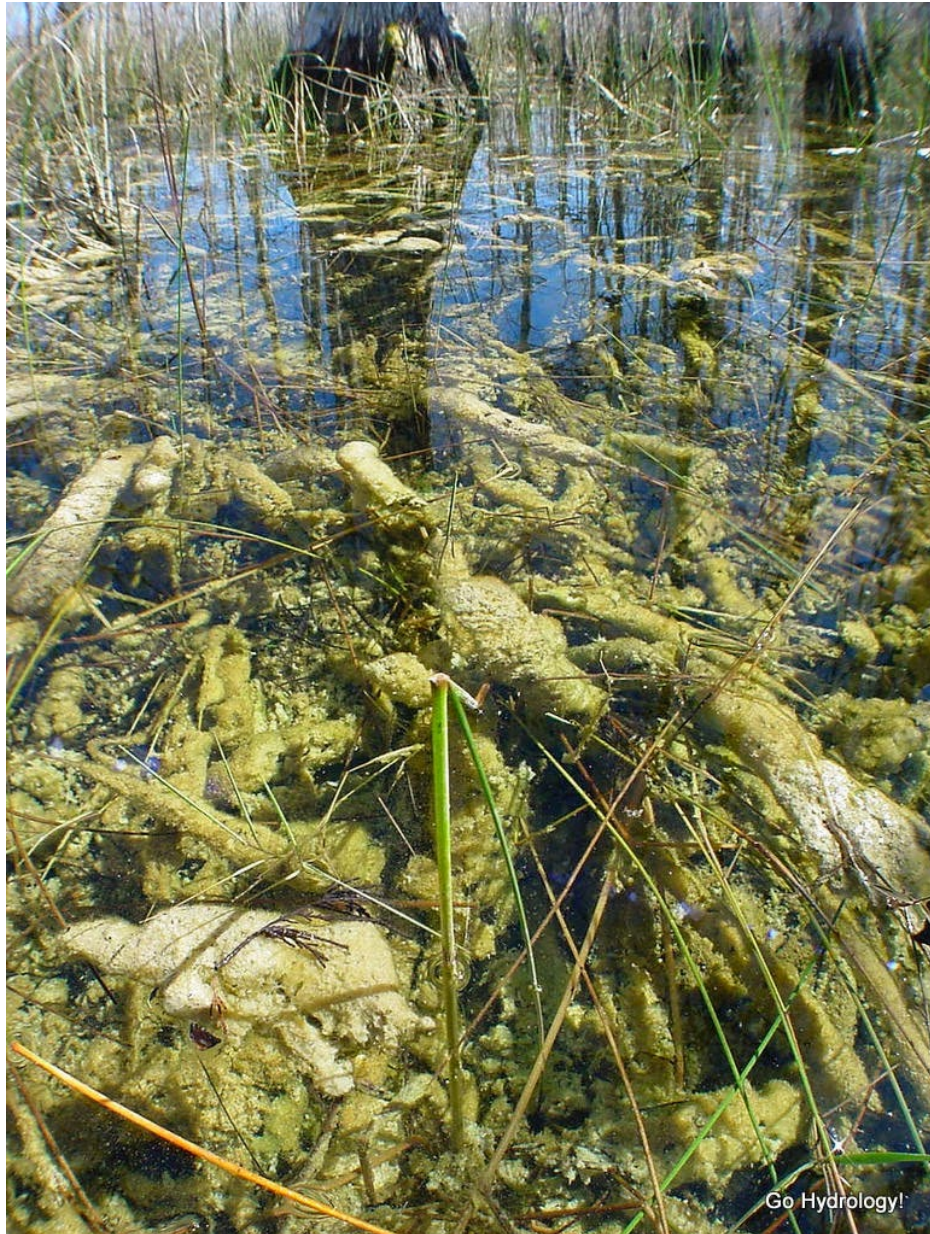


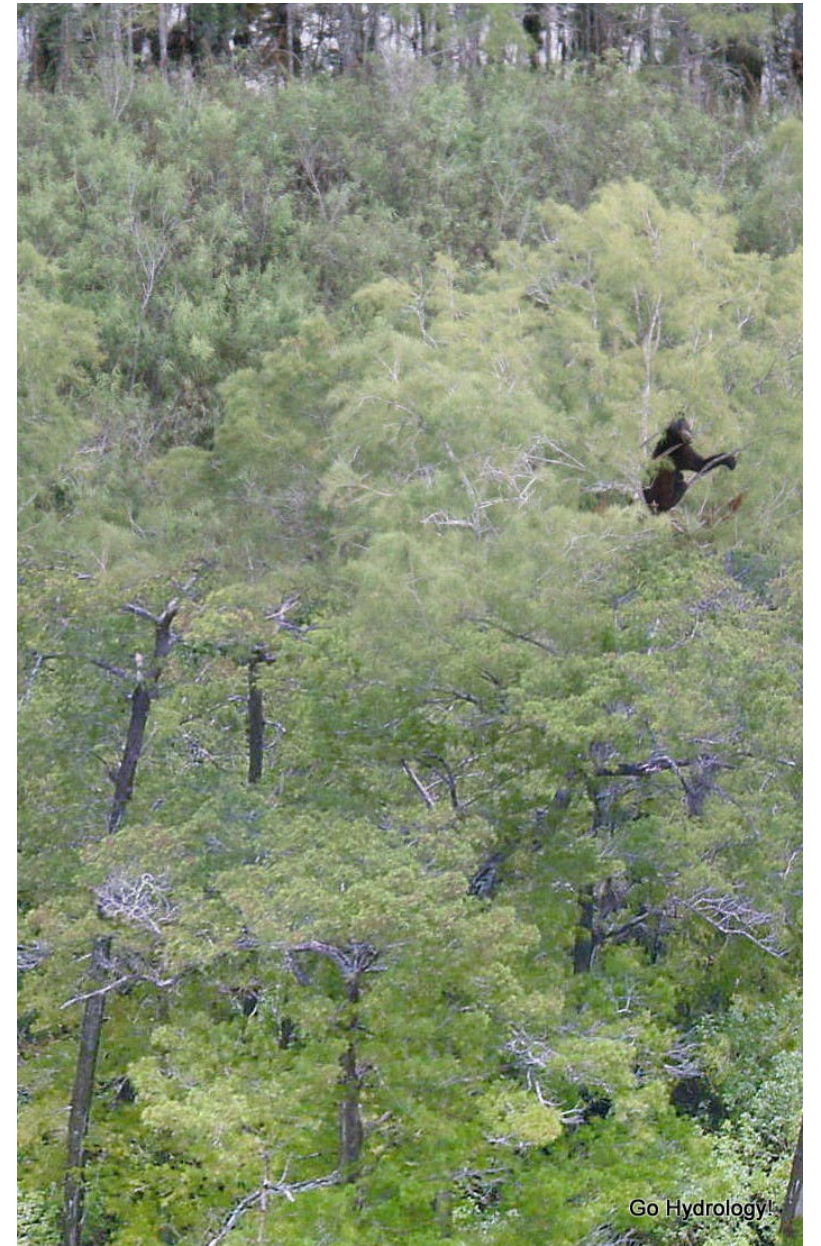






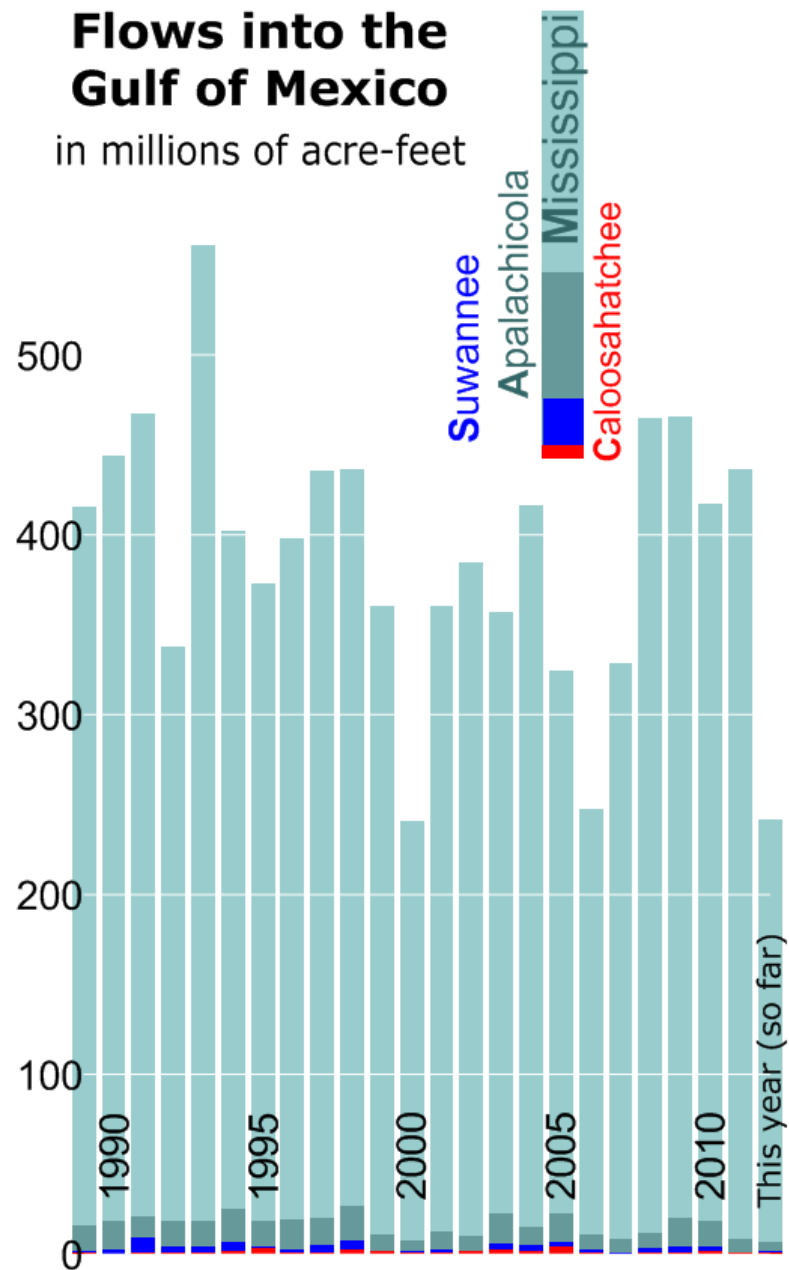






Flows into the Gulf of Mexico

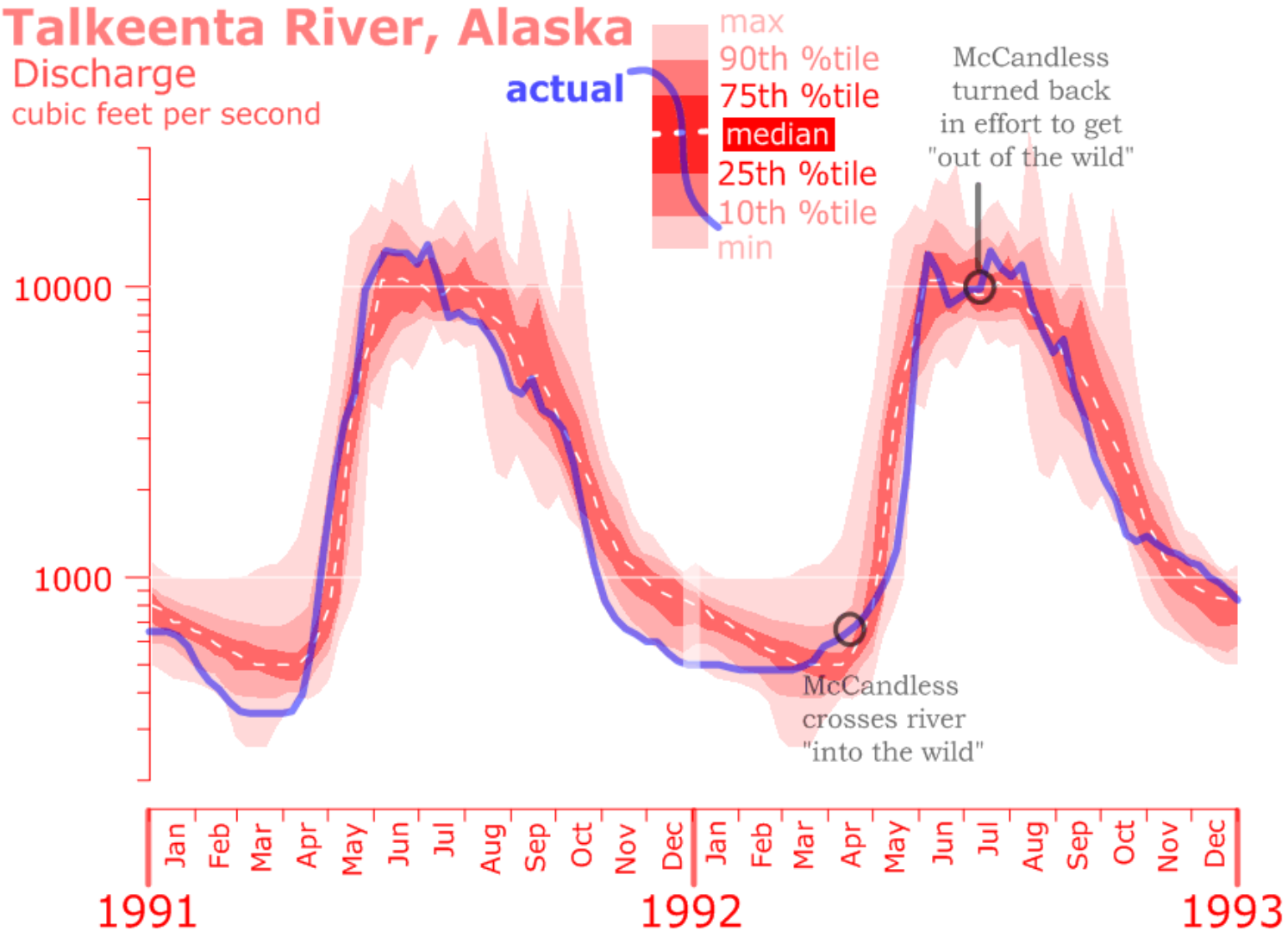
in millions of acre-feet

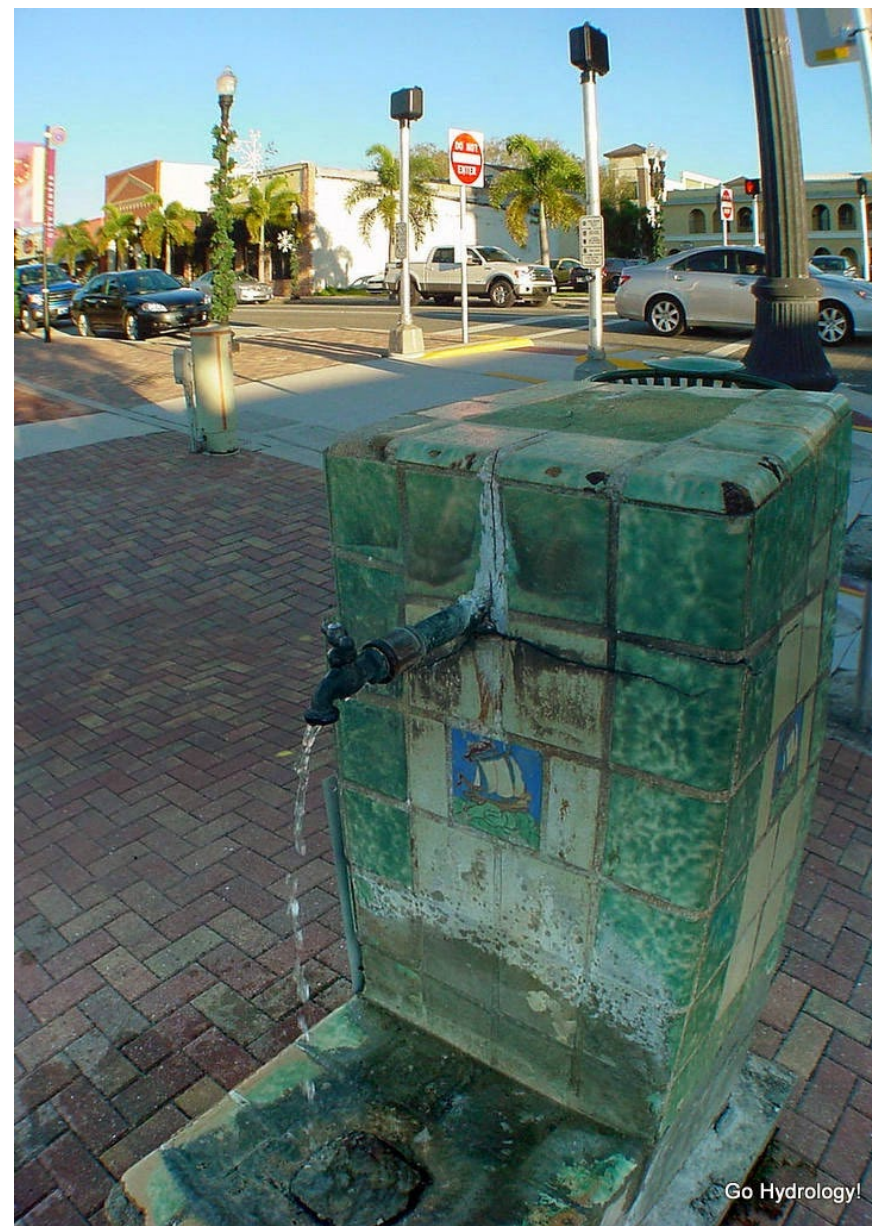


Talkeenta River, Alaska

Discharge

cubic feet per second

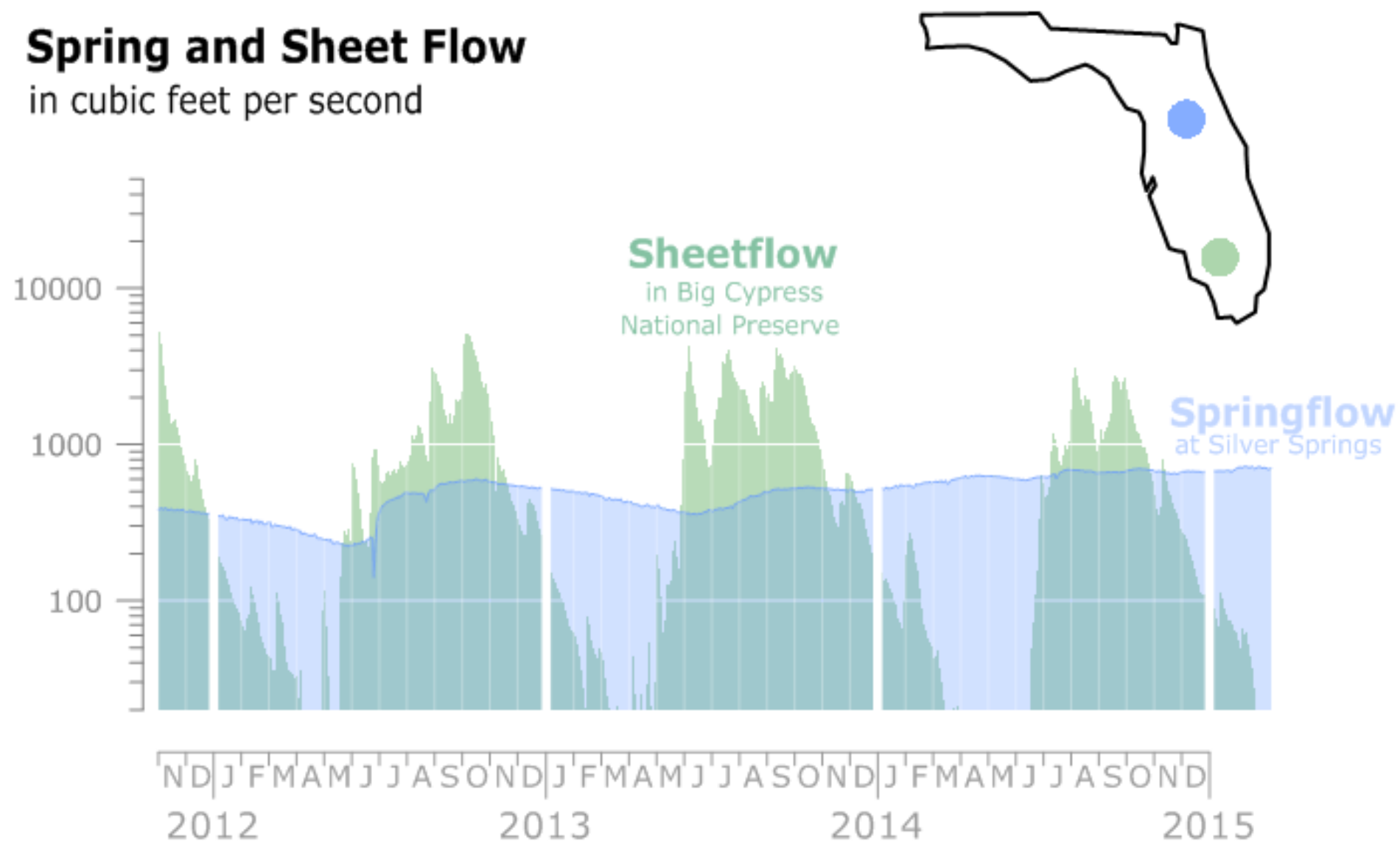






Spring and Sheet Flow

in cubic feet per second





Four horseman of the Florida atmosphere









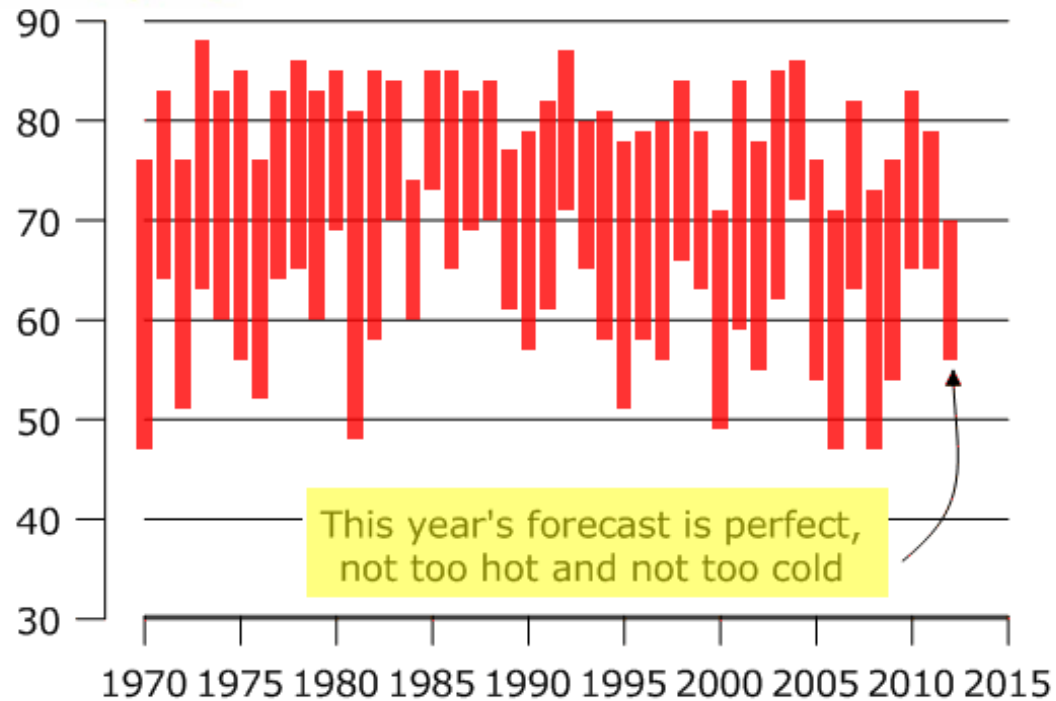


Warm Thanksgiving Wishes

A History of High and Low Temperatures (°F)
on Thanksgiving Day in sunny Naples, Fla

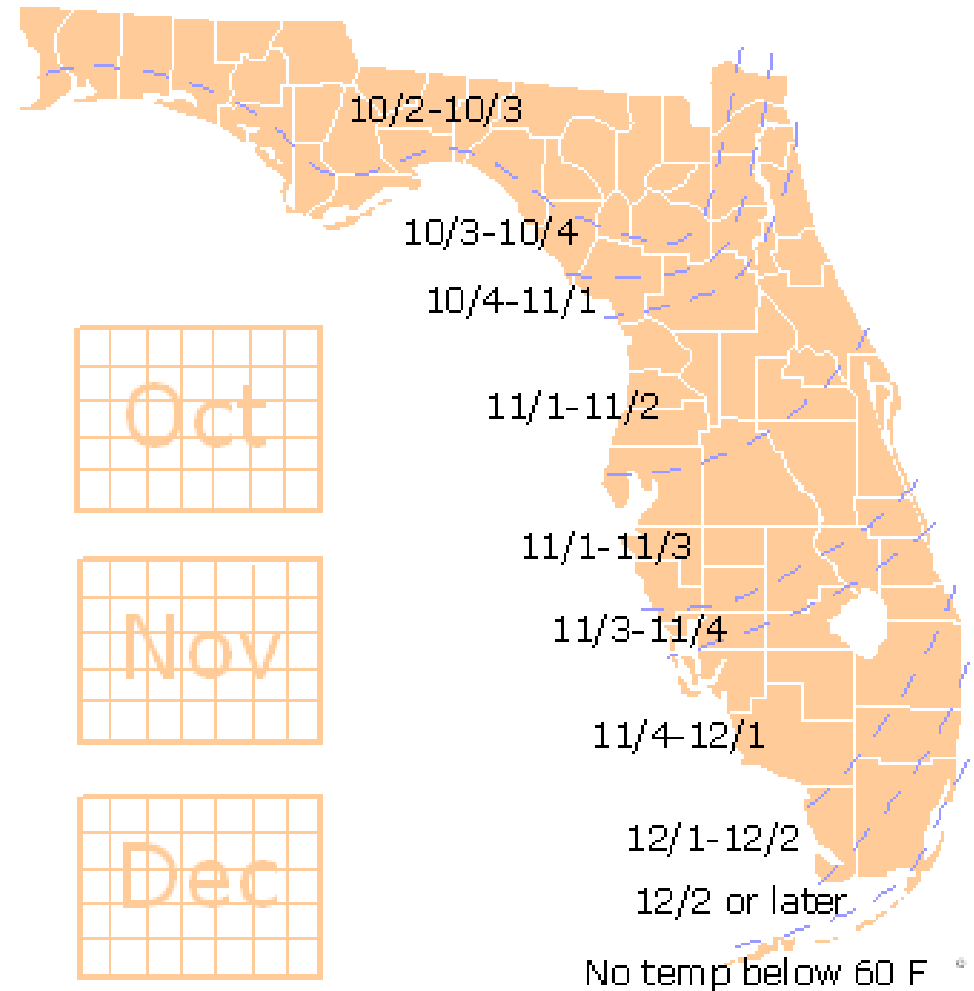
Day
time
high

Night
time
low



When fall arrives in Florida

Adapted from "Florida Weather" (Winsberg, 2003)

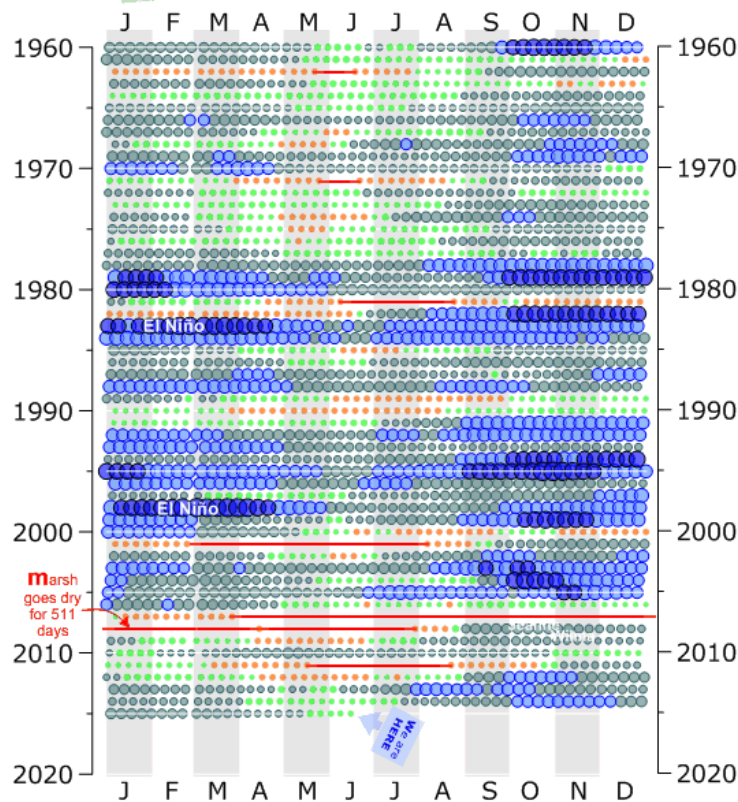




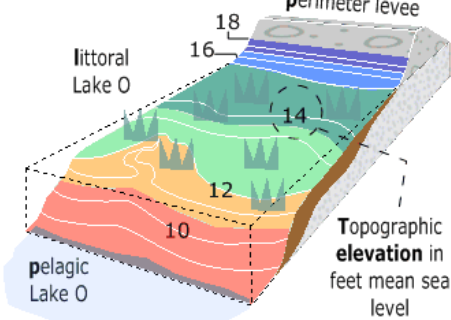


Ecological and Operational Setting of the **Wetting Front** for Lake Okeechobee

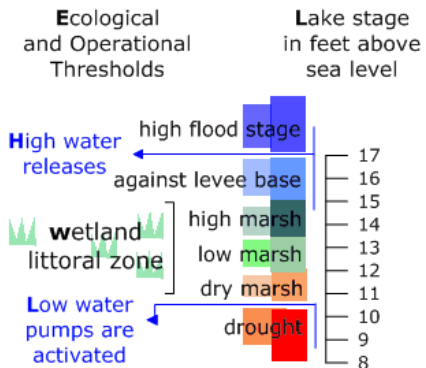
Explanation
Color coding shows lake stage relative to ecological and operational thresholds



Landscape model



Expanded vertical scale

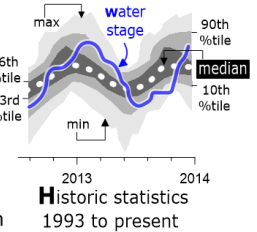


Lake Okeechobee Water Stage

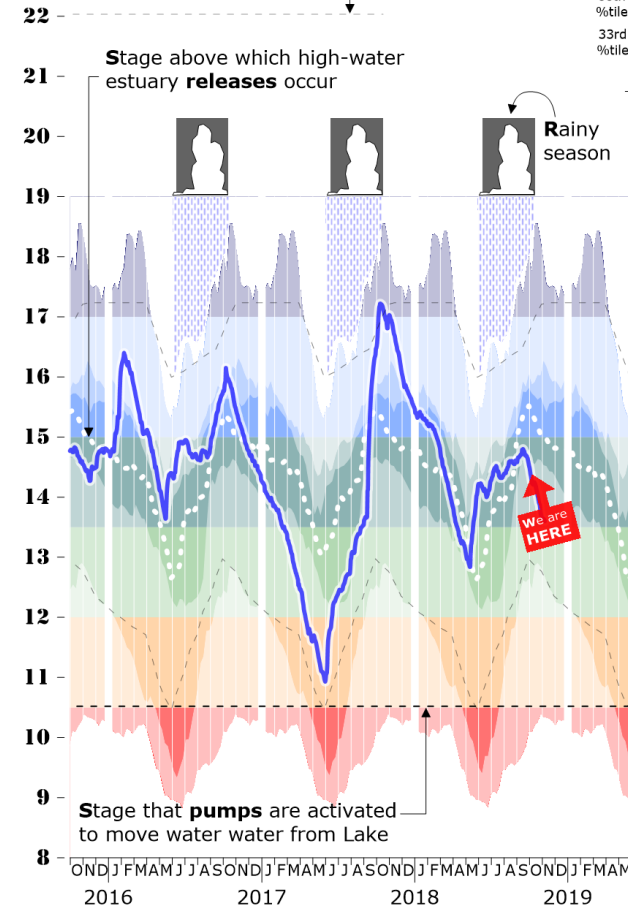
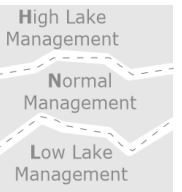


Stage that Lake naturally overflowed into the Everglades **prior** to drainage

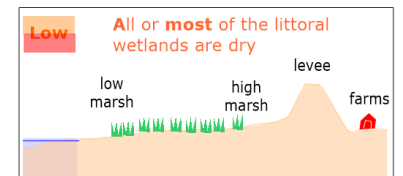
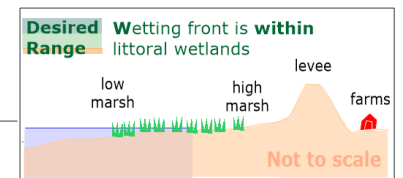
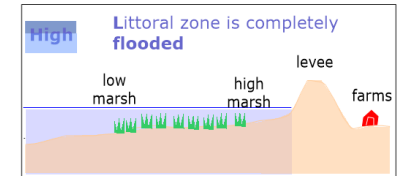
Statistical Framework



Regulation Framework



Ecological Framework

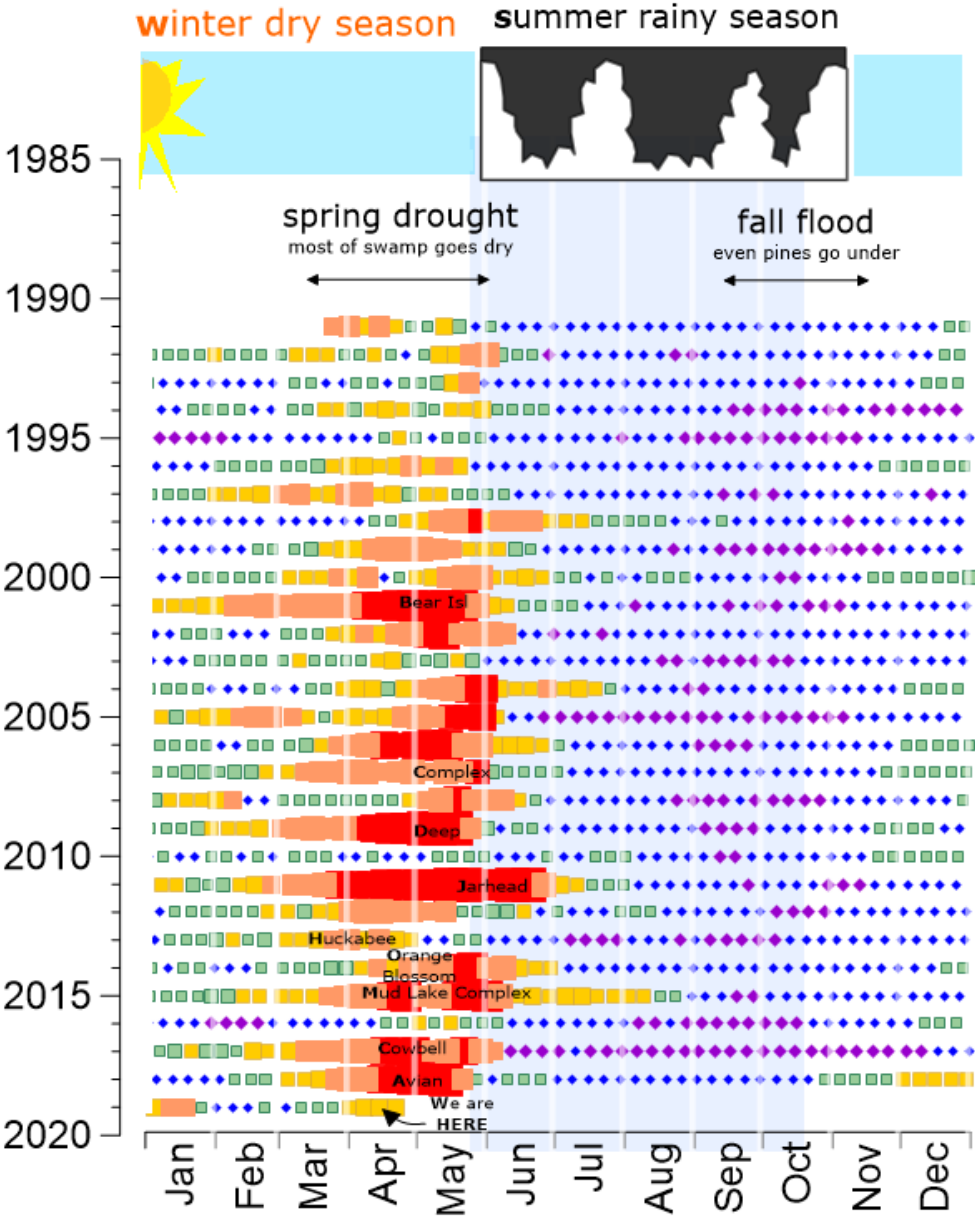


Diagrams depicts Lake stage relative to height of the perimeter levee and the littoral zone/marsh

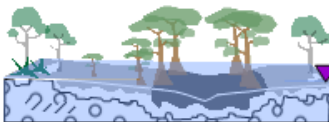


History of Drought Severity in Big Cypress National Preserve

Explanation: The color coding of the chart on the left is based on the hydro-ecological model below



Even high are spongy



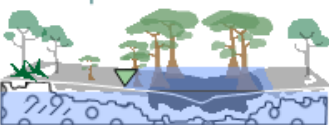
very
saturated
swamp

3

saturated
swamp

2

Low spots are full



fire breaks
are flooded

1

fire breaks
are moist

0

Day-old cornbread



moderate
drought

-1

Tinderbox!



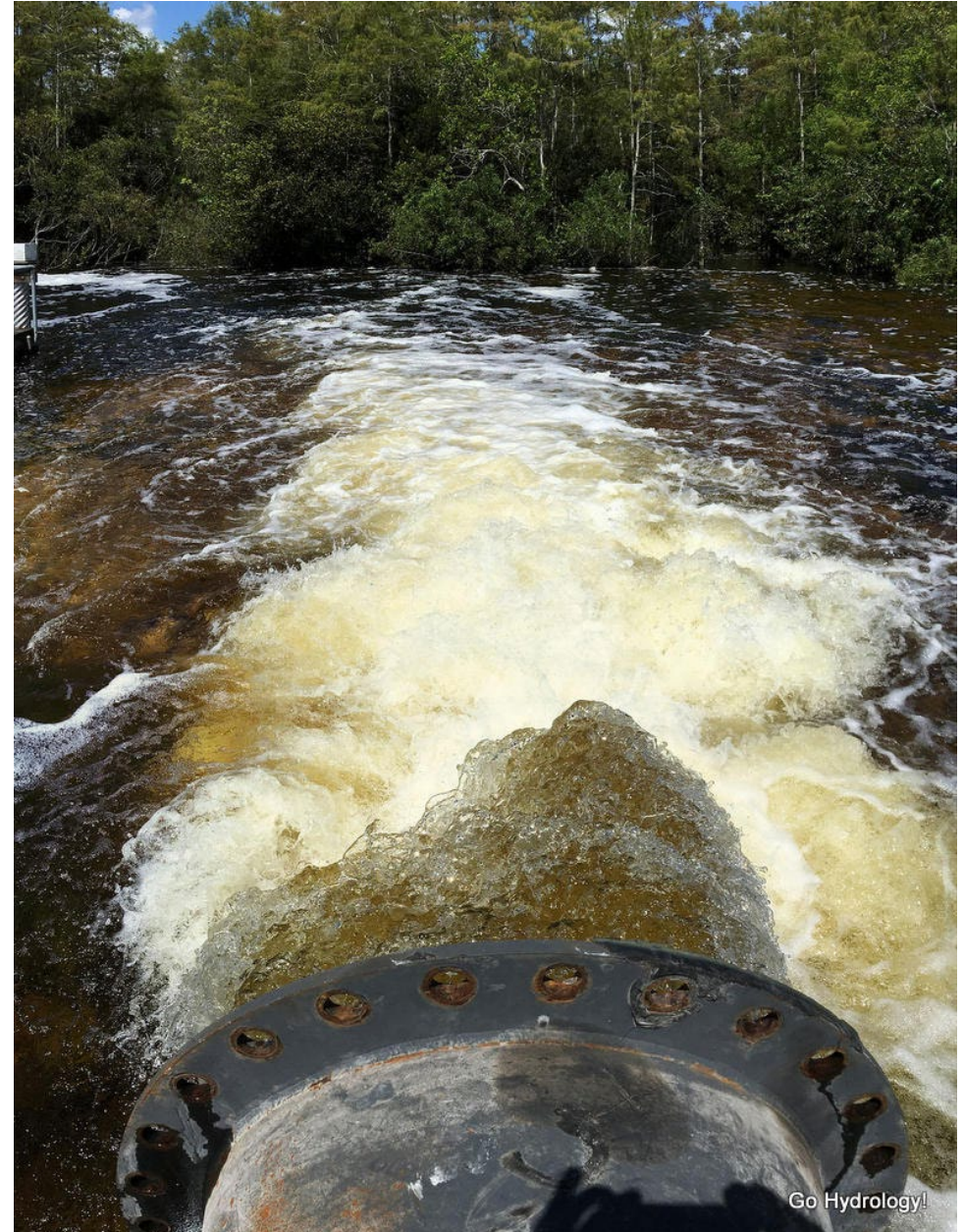
severe
drought

-2

-3

water depth above peat (in feet)





Question: What type of blog is it?

Hydrology
blog



Everglades
blog

Answer:

Hydrology
blog



Everglades
blog

Answer:

Neither



Not a blog



South Florida Watershed Journal
<http://www.sfwj.blogspot.com>

It's about
the water cycle

Water Cycle

Water Cycle

Cycle

Water

Cycle

Water

Cycle

Cycle

Cycle

Cycle

cycle

Cycle

Cycle

Cycle

Cycle

Cycle

Cycle

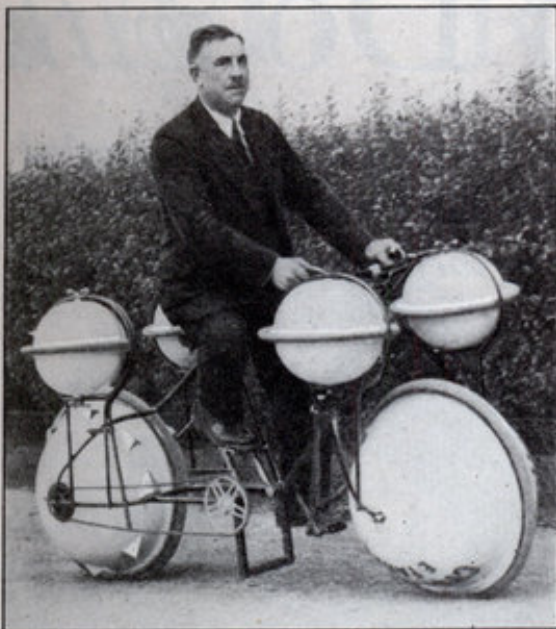
cycle

Cycle

Cycle

Cycle

Amphibian Bicycle Can Travel on Land or Water



The amphibian bicycle, left, ridden by its French inventor, has its supporting outrigger globes raised so it can be used for land travel



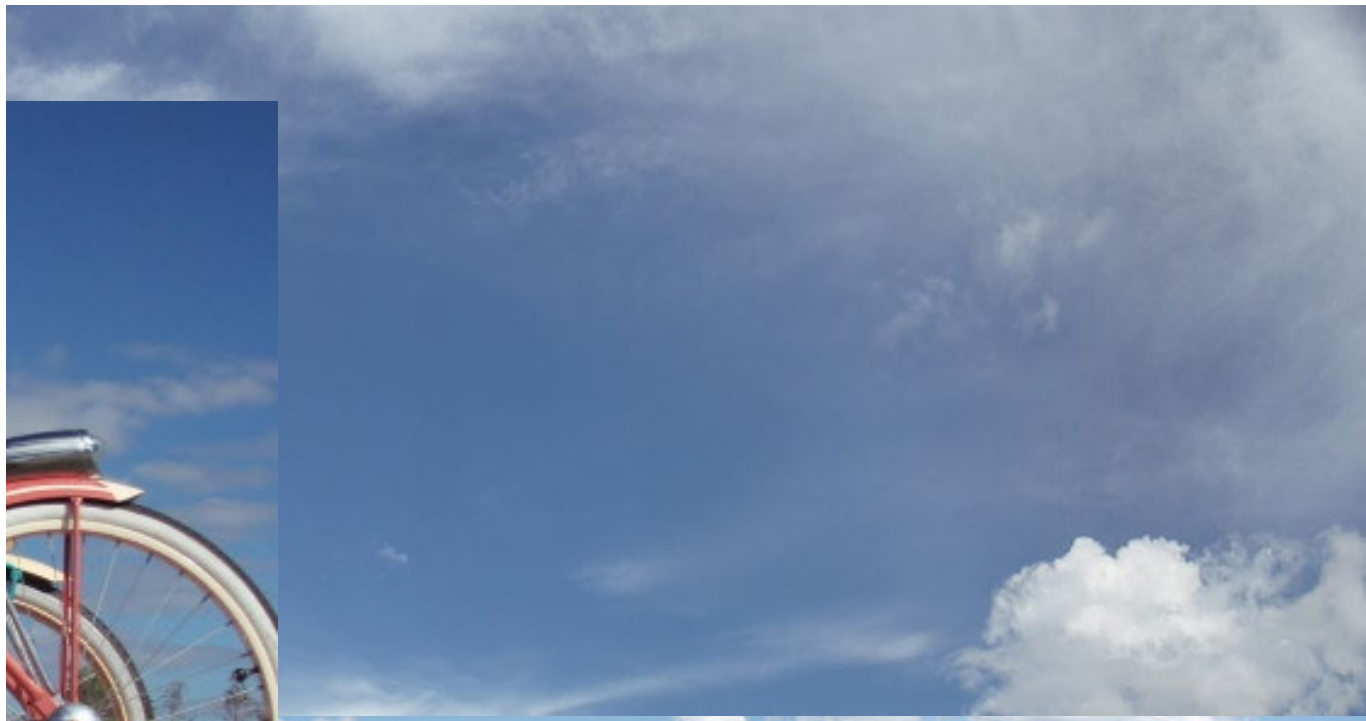
Drawing below, suggests the manner in which the bicycle, pictured at left, would drop the outrigger floats and be supported by them and the wheels in water travel

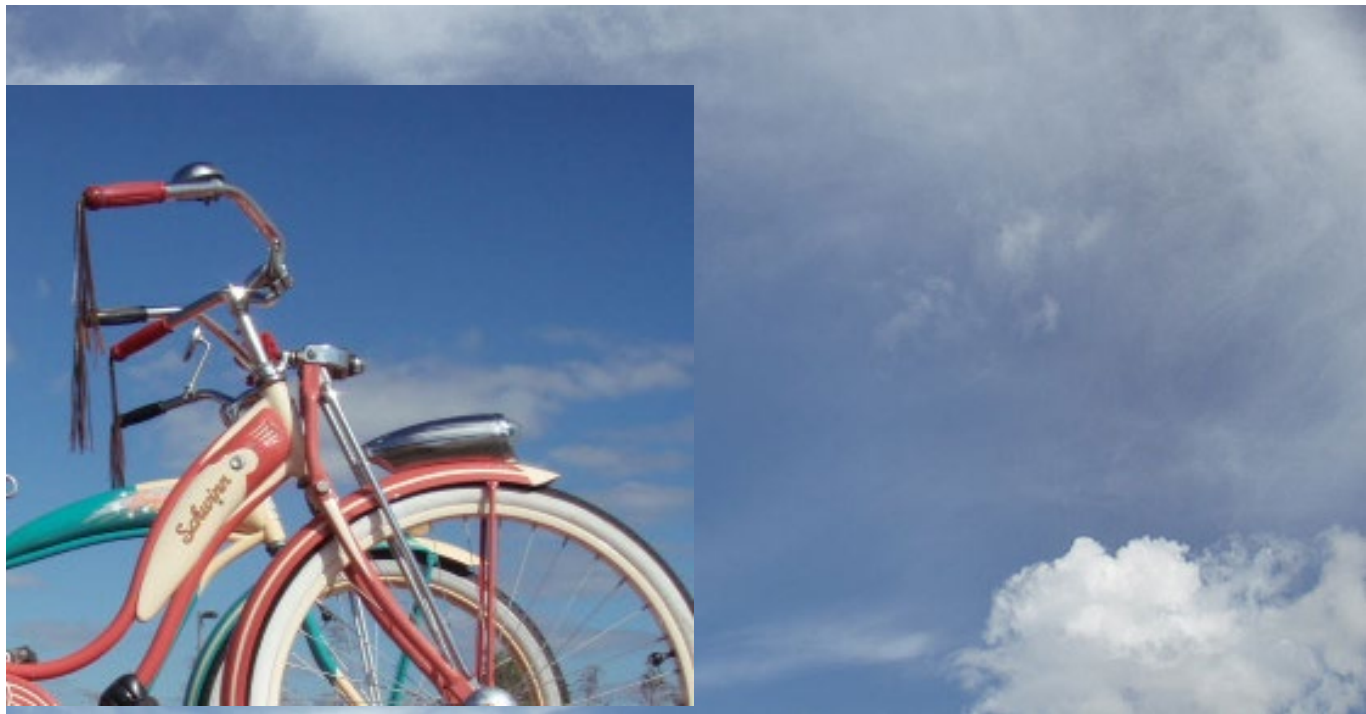
A HYBRID among vehicles, an amphibian bicycle that can travel on land or water, was demonstrated by its French inventor at a recent Paris exposition. Its wheels are hollow, bulbous floats that, with the aid of four smaller globes on outriggers, sustain it in the water. All of the floats revolve freely like wheels, resulting in a minimum of drag. When the rider pedals across the water, fins on the rear wheel

serve as paddles to drive the machine forward. For a ride on dry land, the outriggers supporting the outer floats may be folded up clear of the ground. Proof that

the floats would be sufficiently buoyant to support the rider was given when the inventor navigated his device, without difficulty, across a large swimming pool.





















It's free, fun and ...

**It's incredibly
dangerous!**



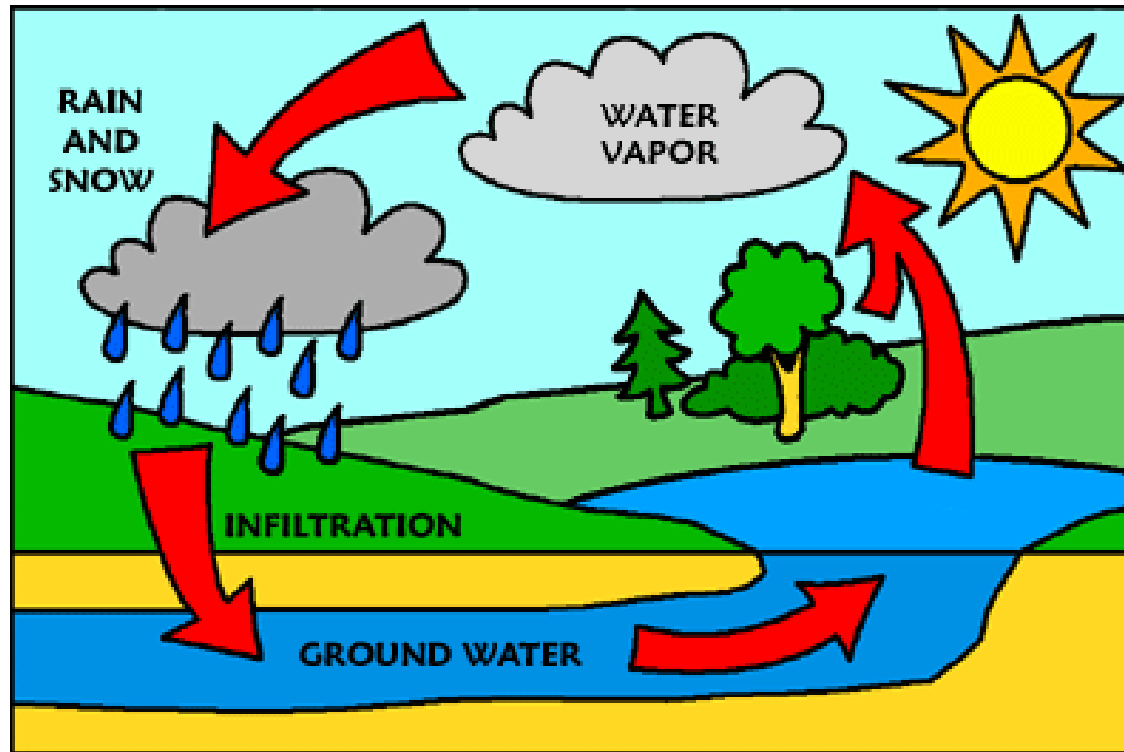
Experts only



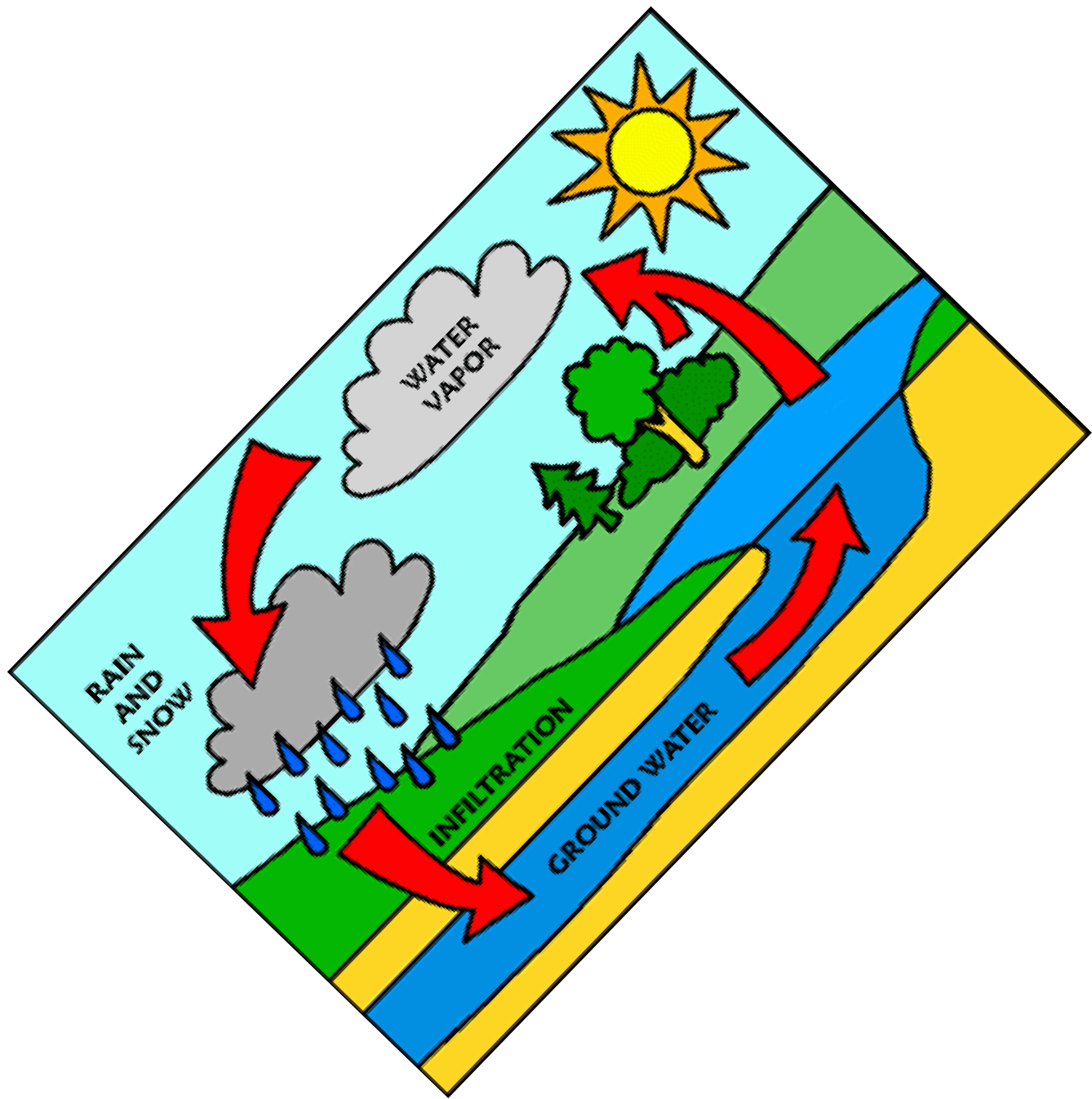
**Everyone's
a winner!**

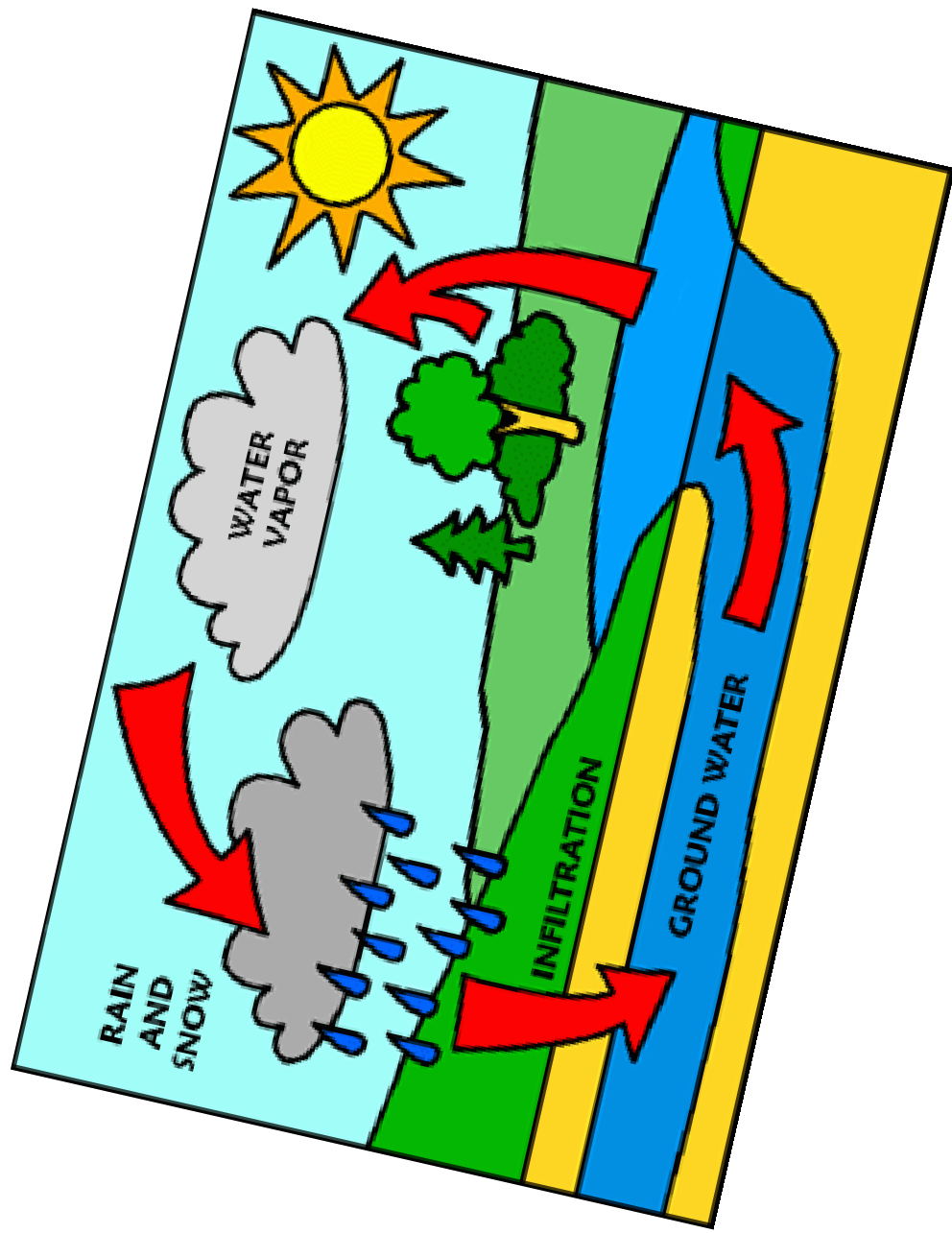


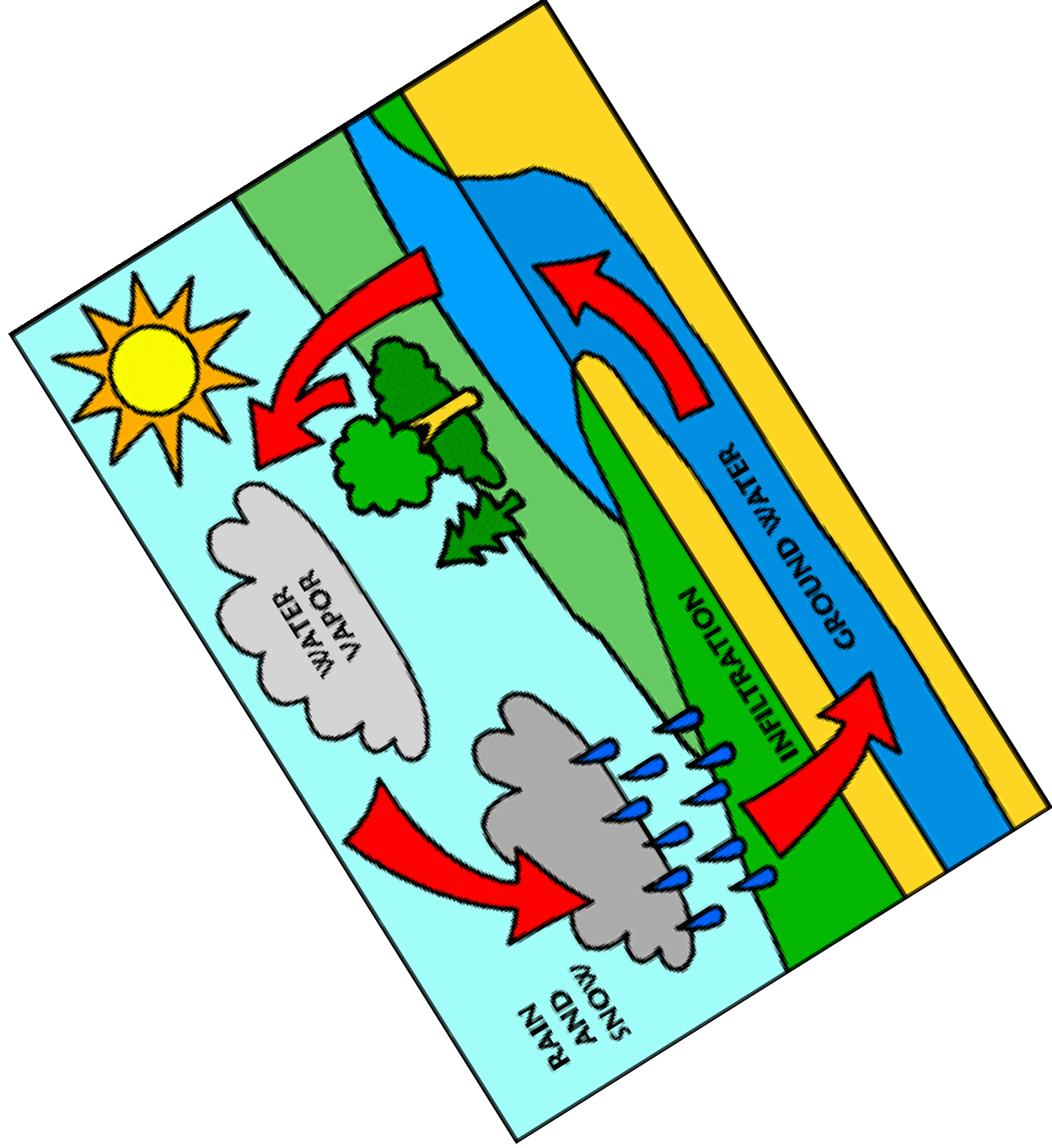
How do we move beyond this **static** diagram?

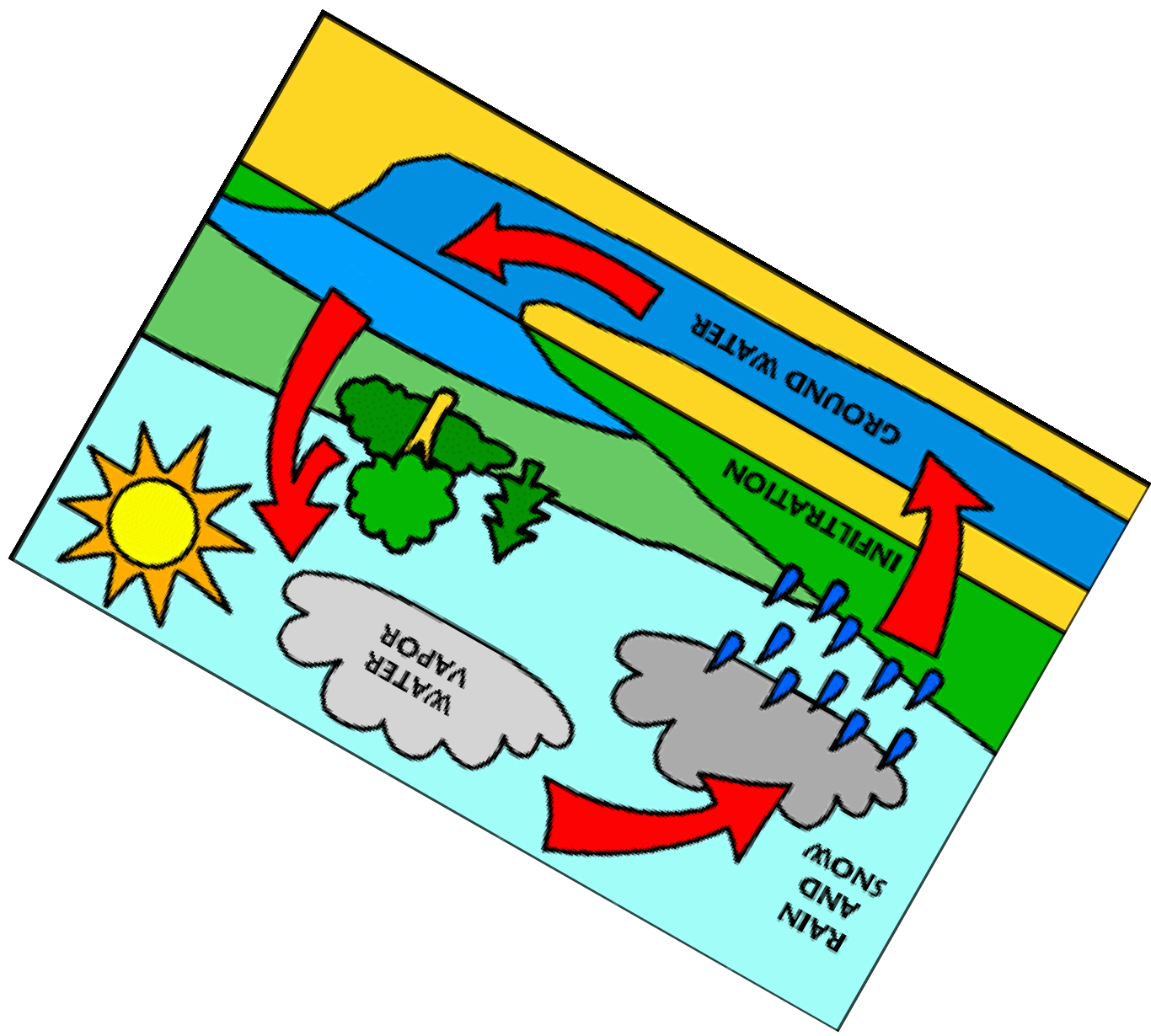


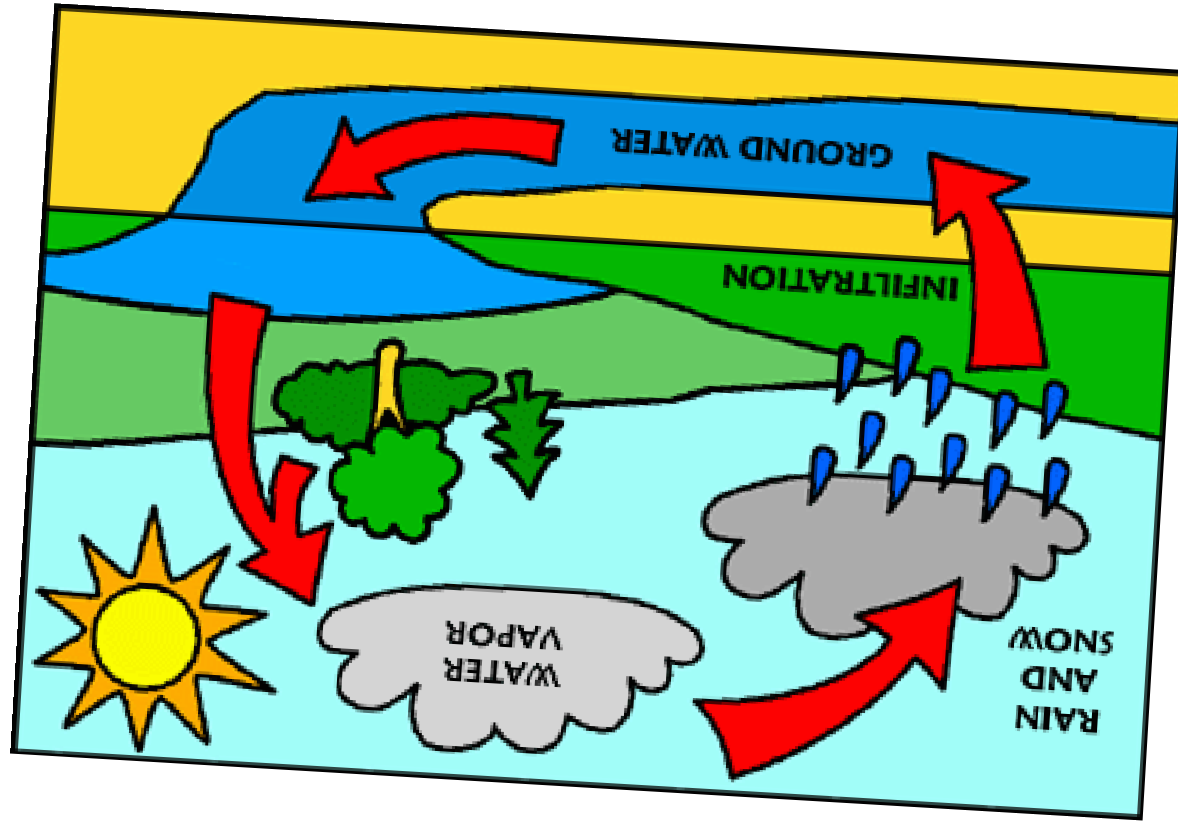
i.e., how do we make the arrows **move**?

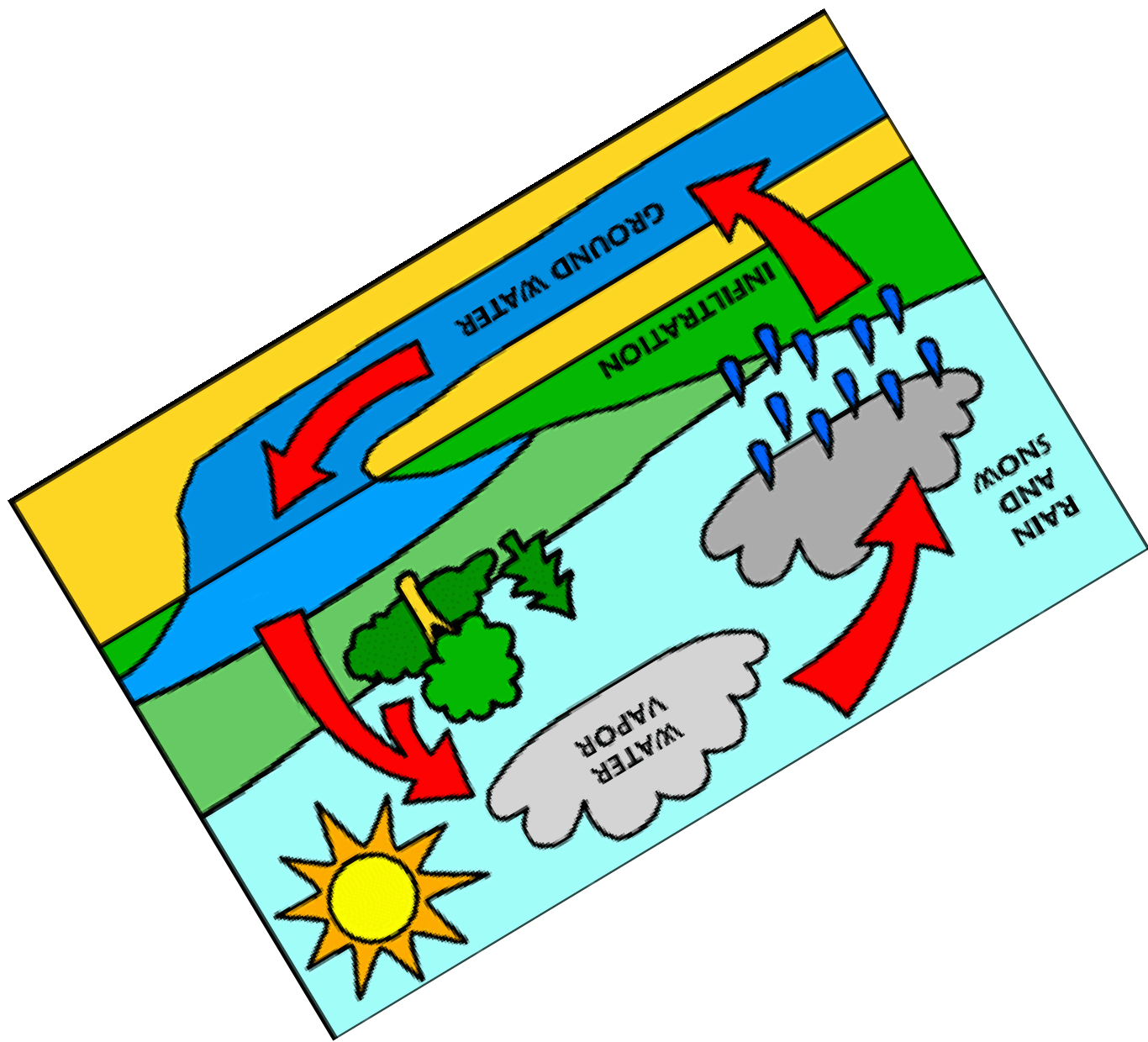


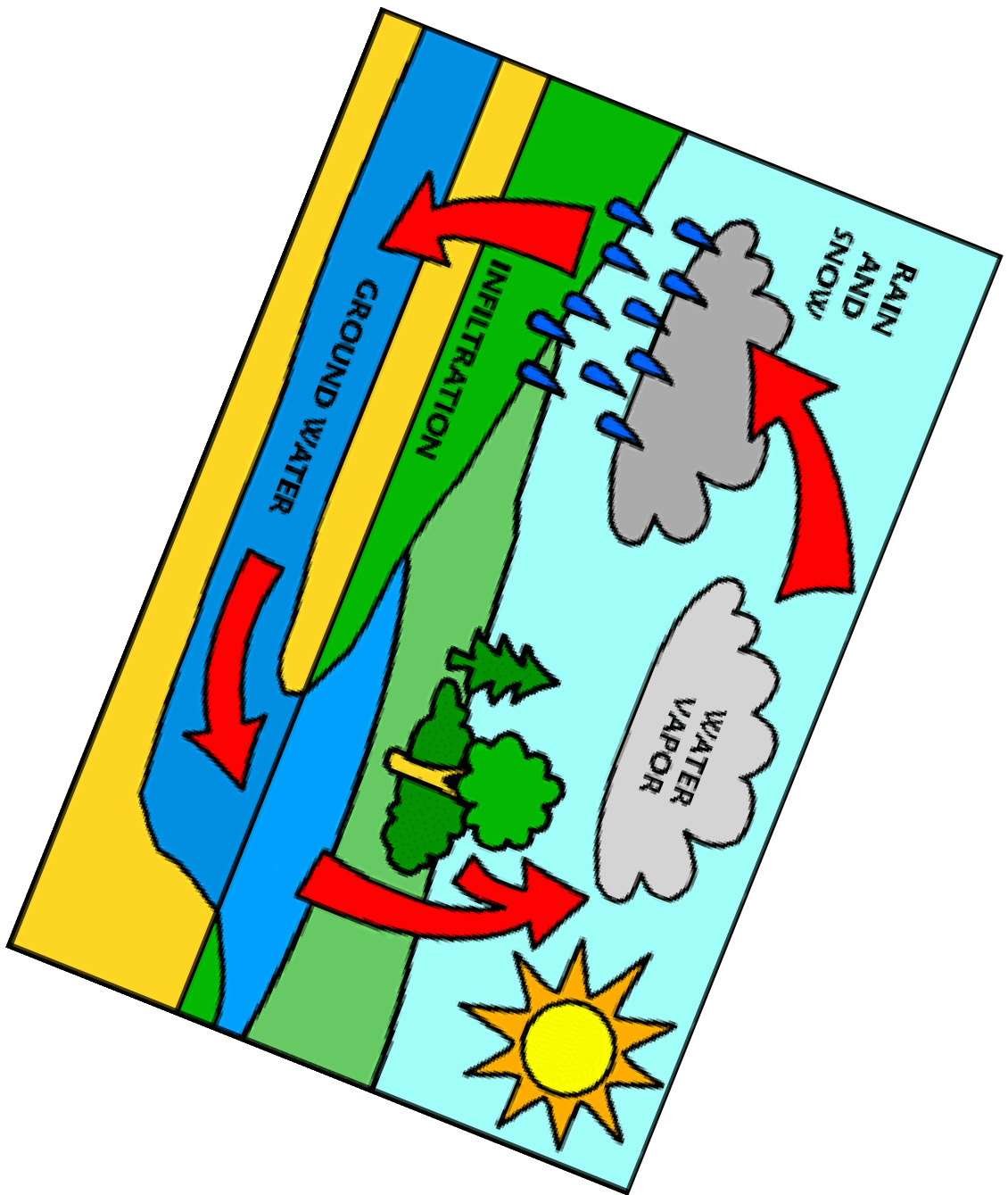


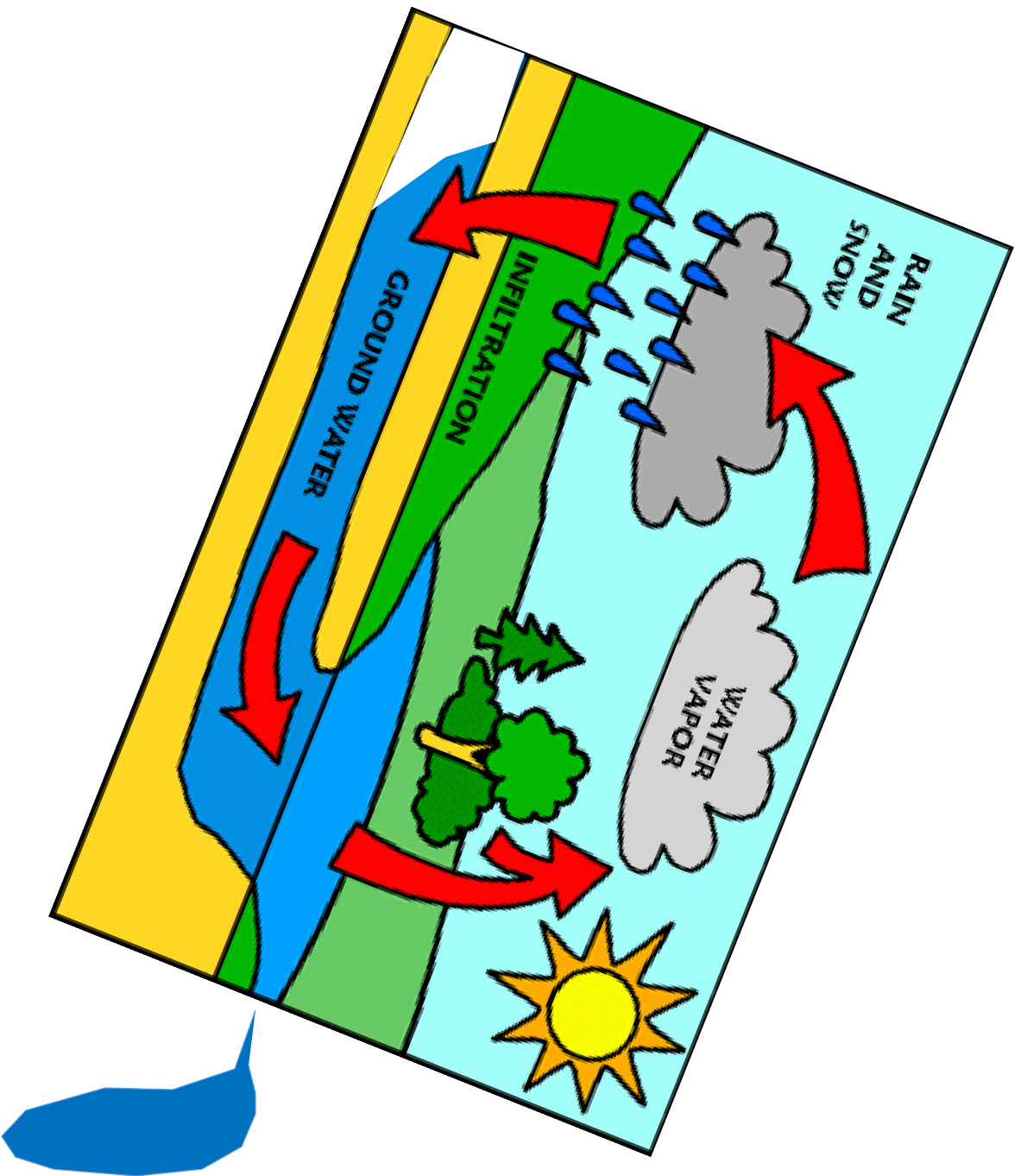


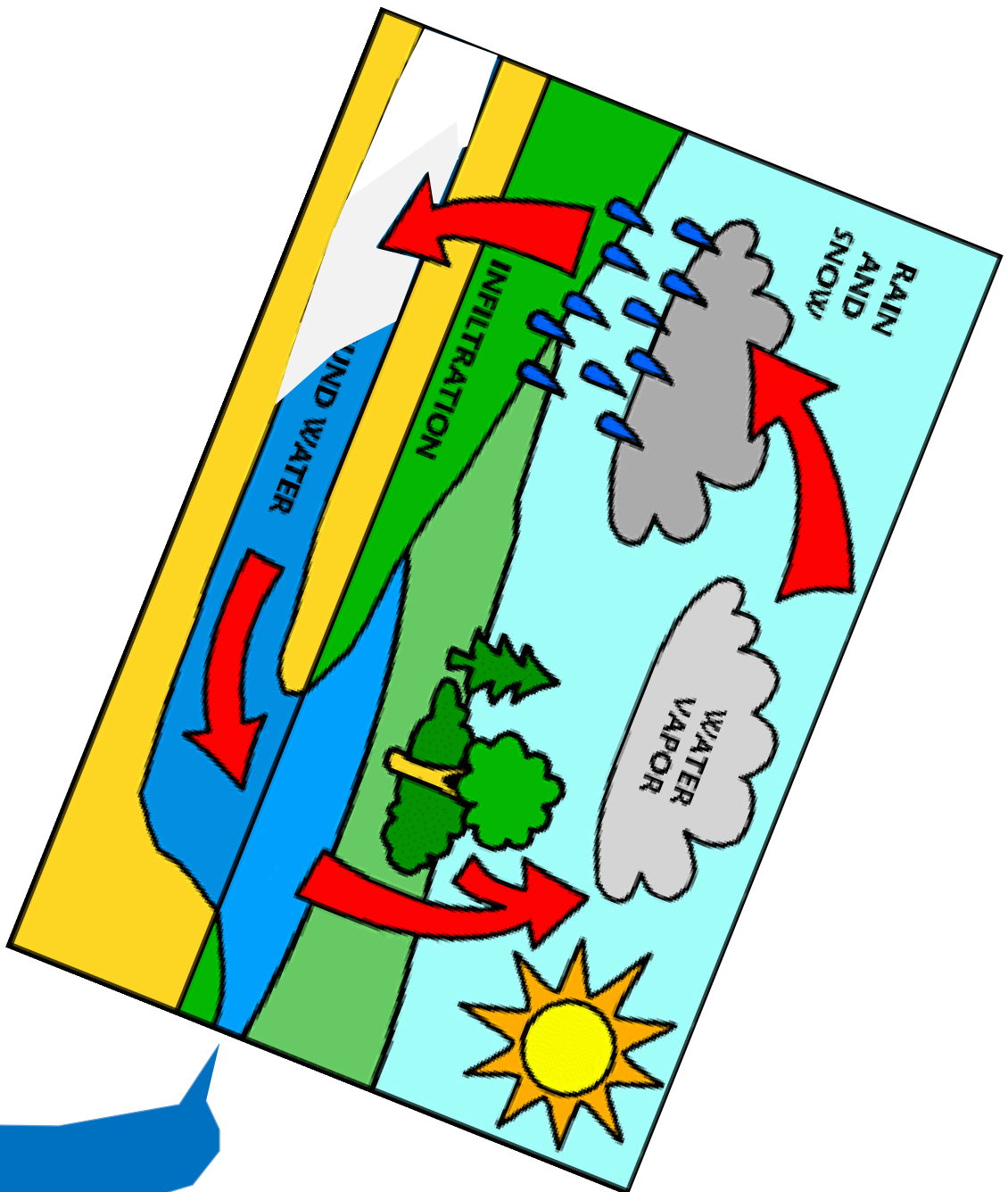


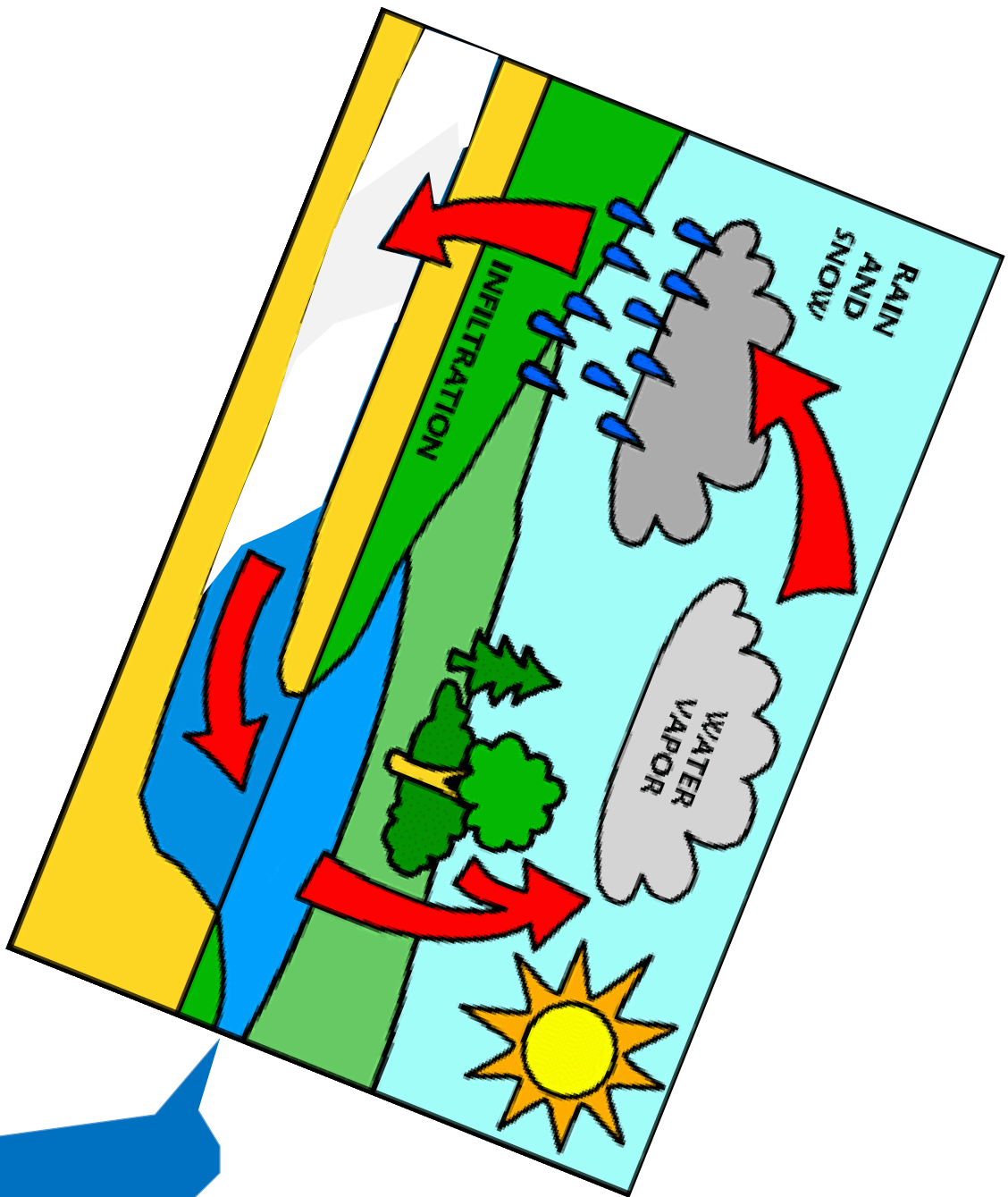


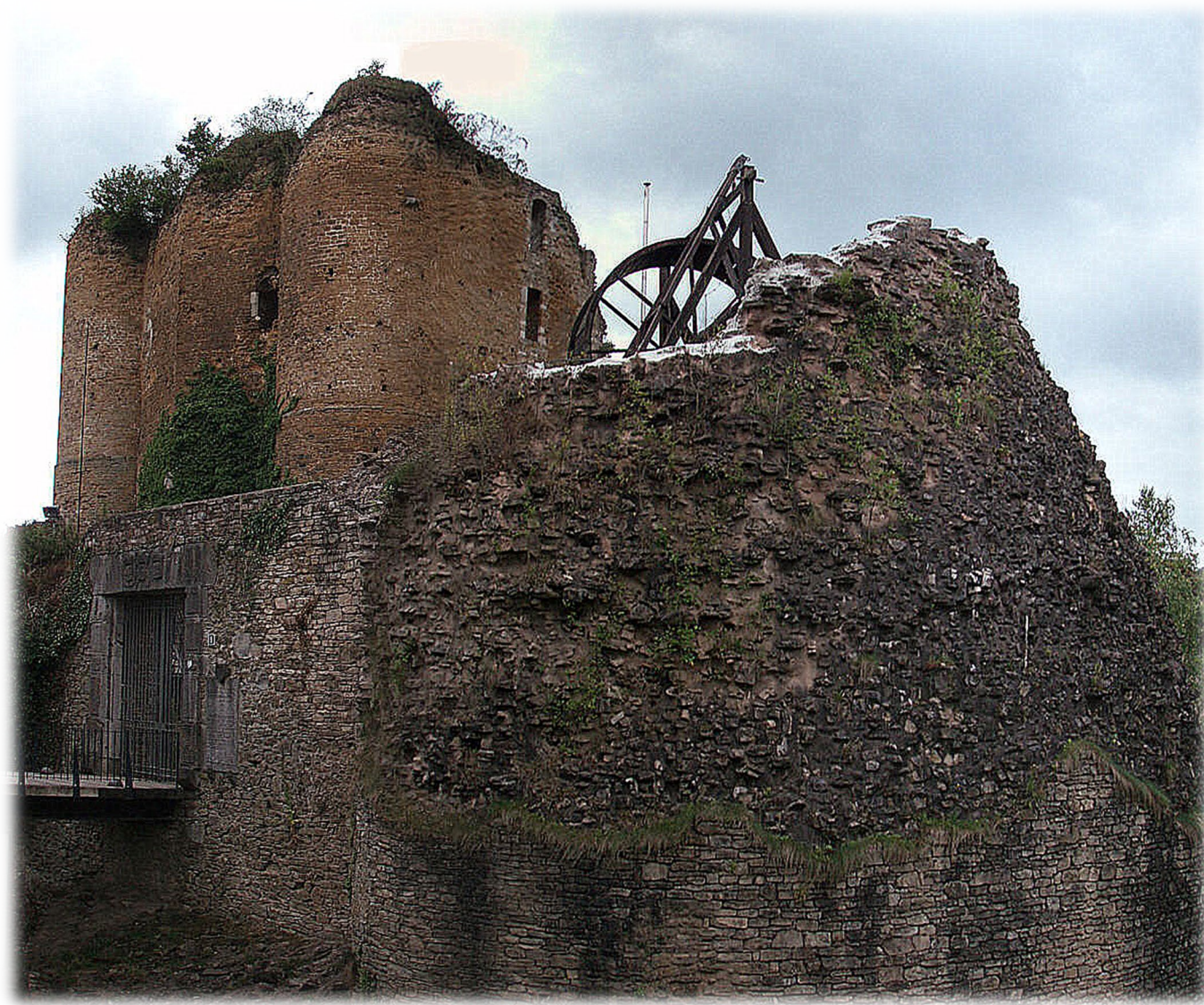












The water cycle is **tough** to follow ...



Because **data walls** are high.

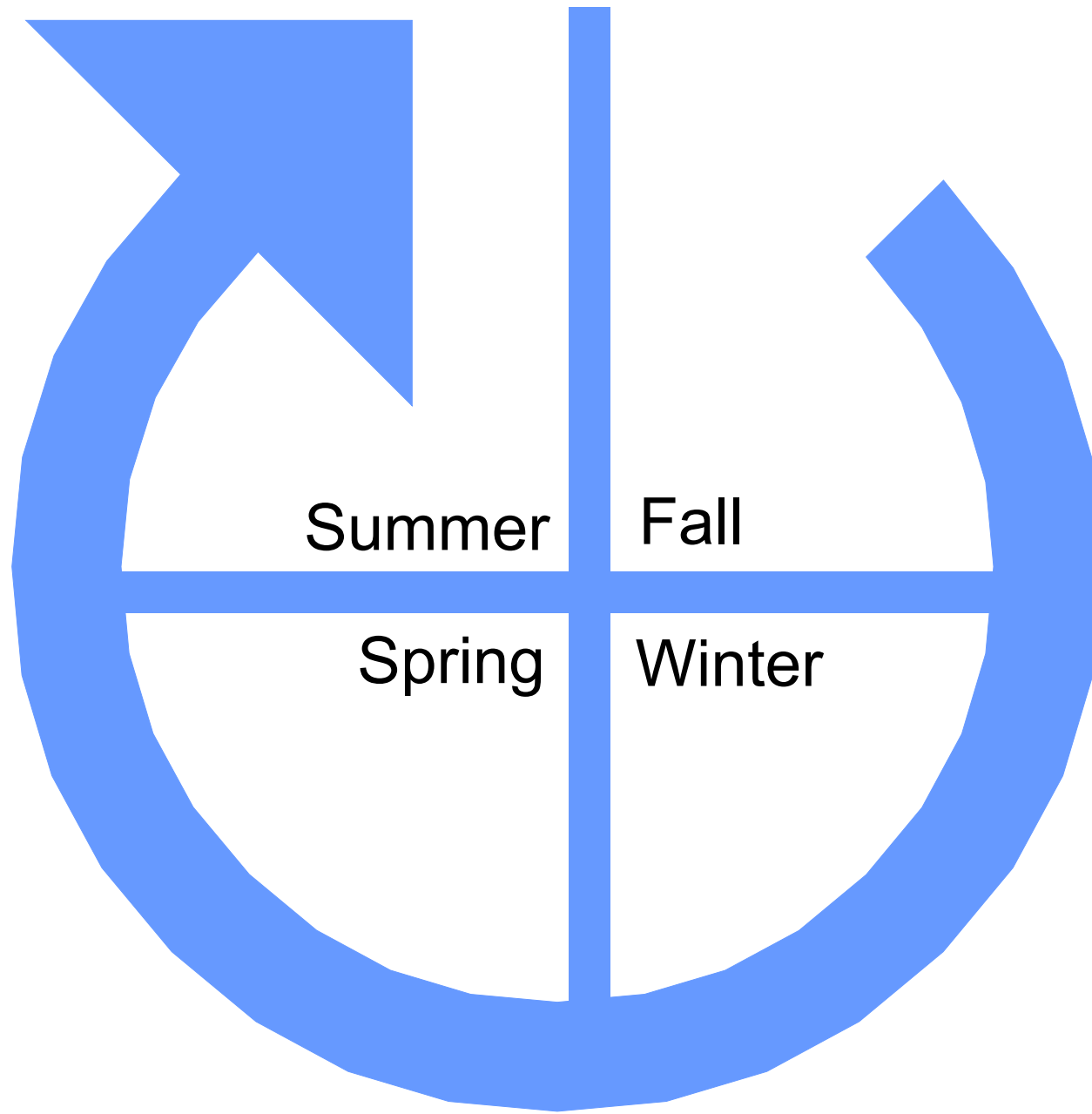
Worth
the **view**
on the
other side!

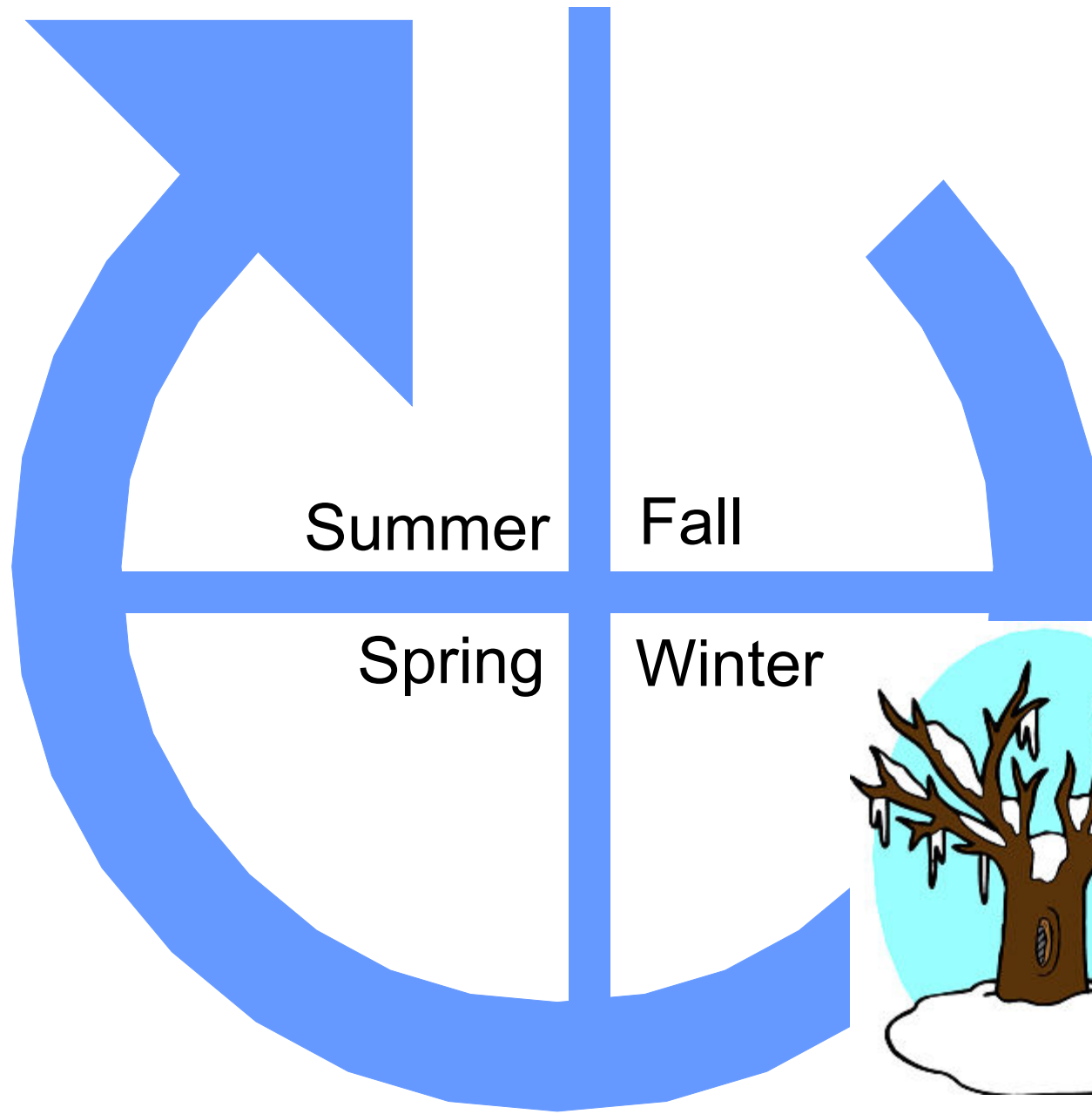


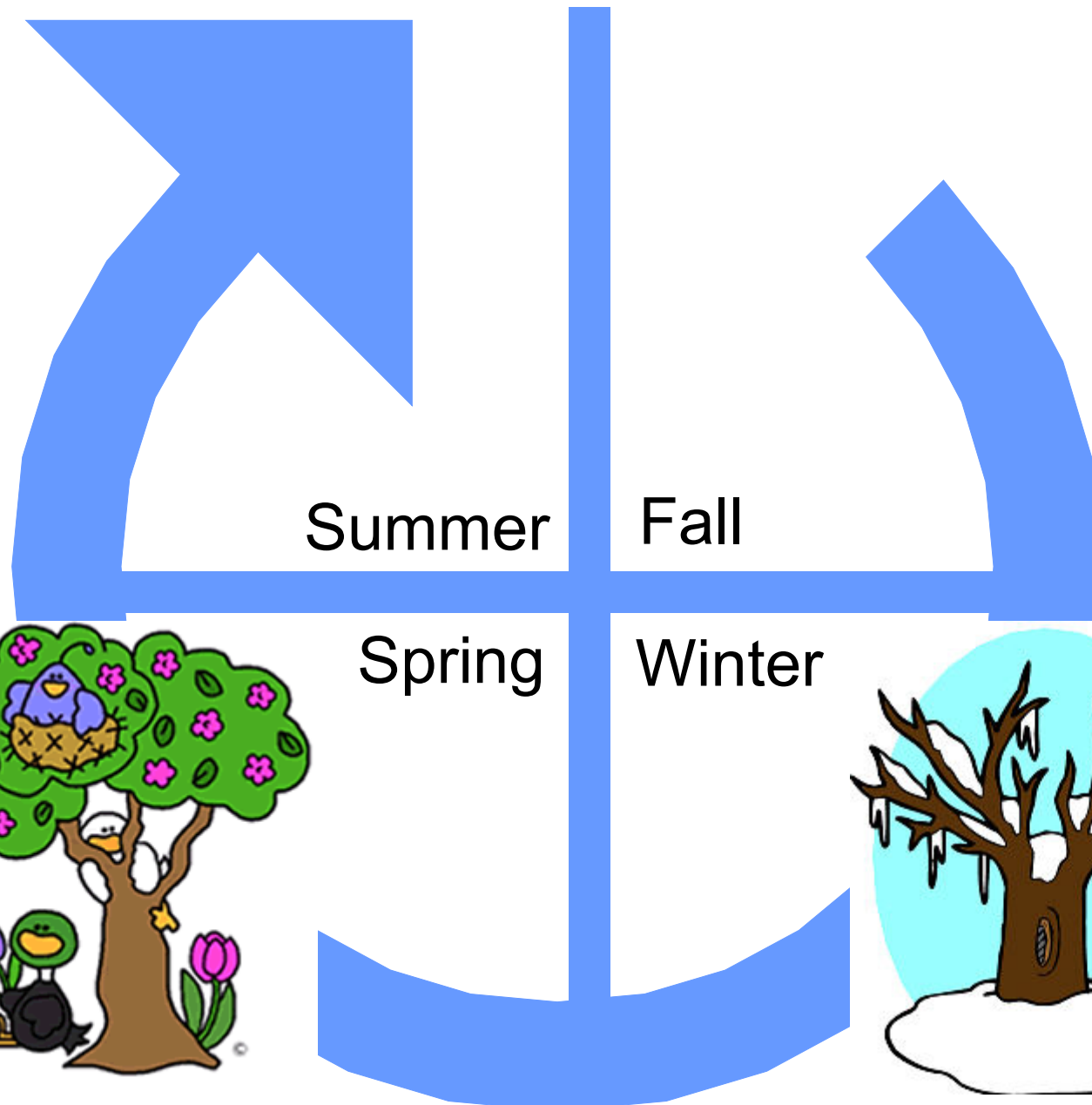
Water
cycle

=

Perfect topic
for a blog
in south Florida







Summer

Fall

Spring

Winter





Summer

Fall



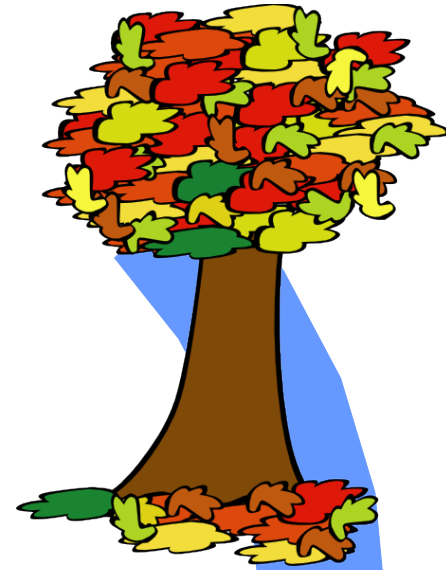
Spring

Winter





Summer



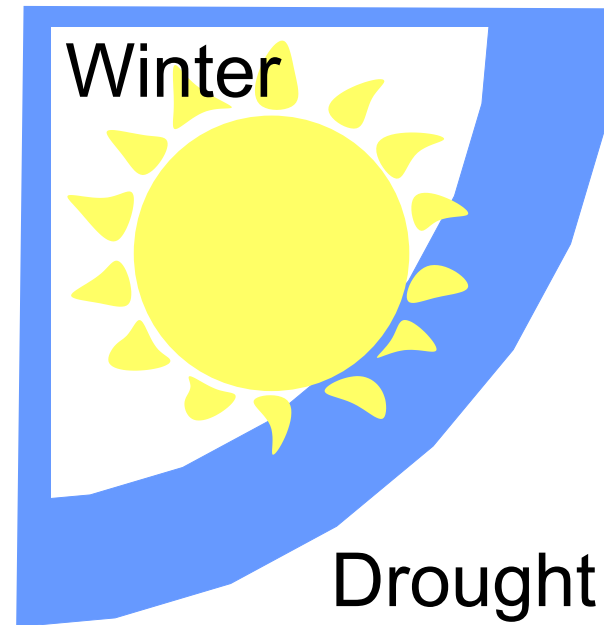
Fall

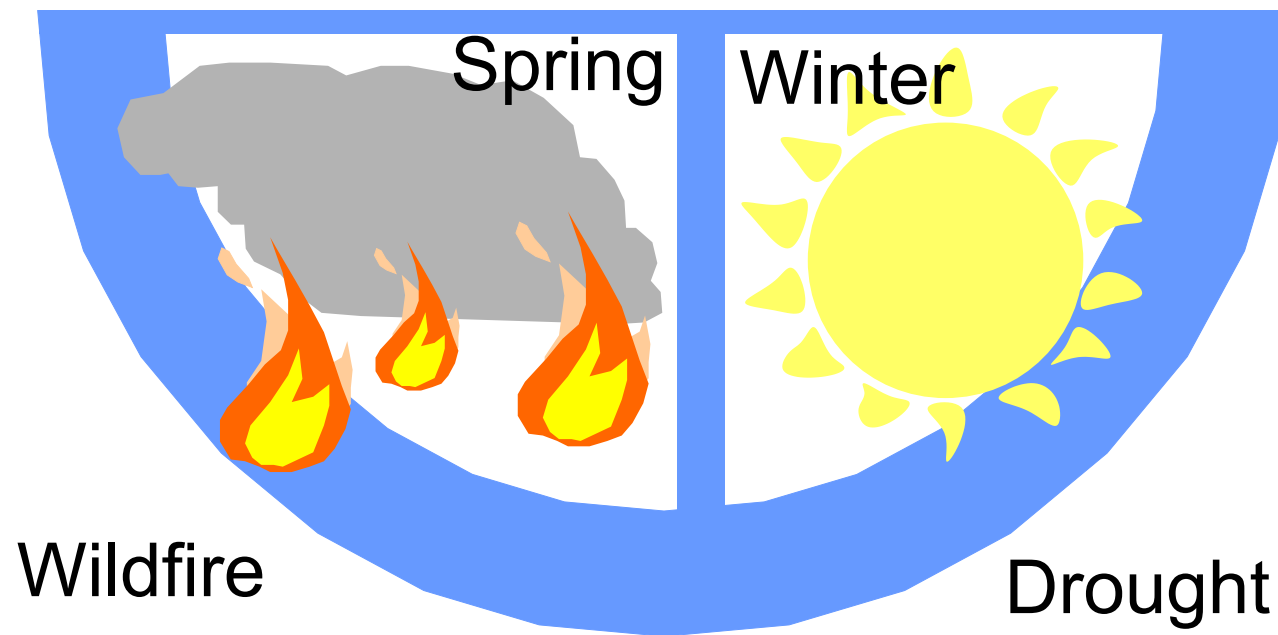


Spring

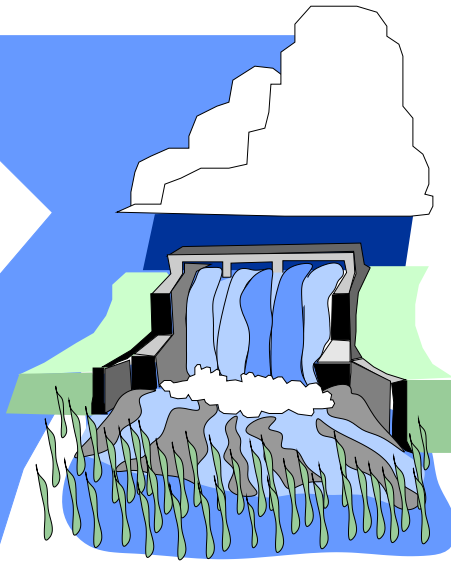


Winter



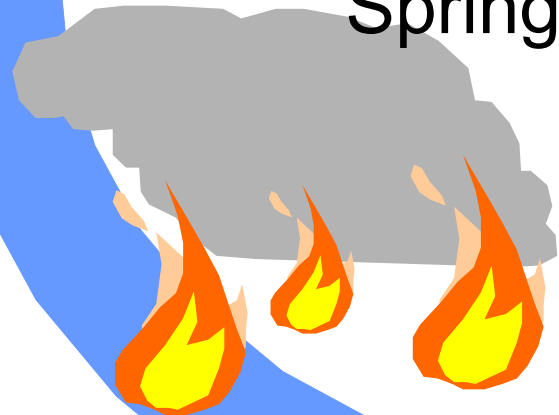


Flood



Summer

Spring



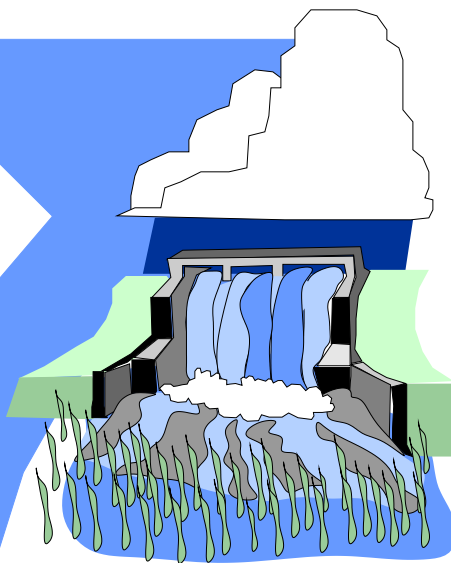
Wildfire

Winter



Drought

Flood



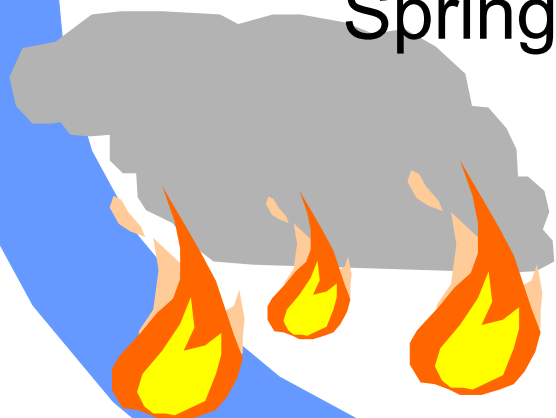
Summer

Hurricane



Fall

Spring

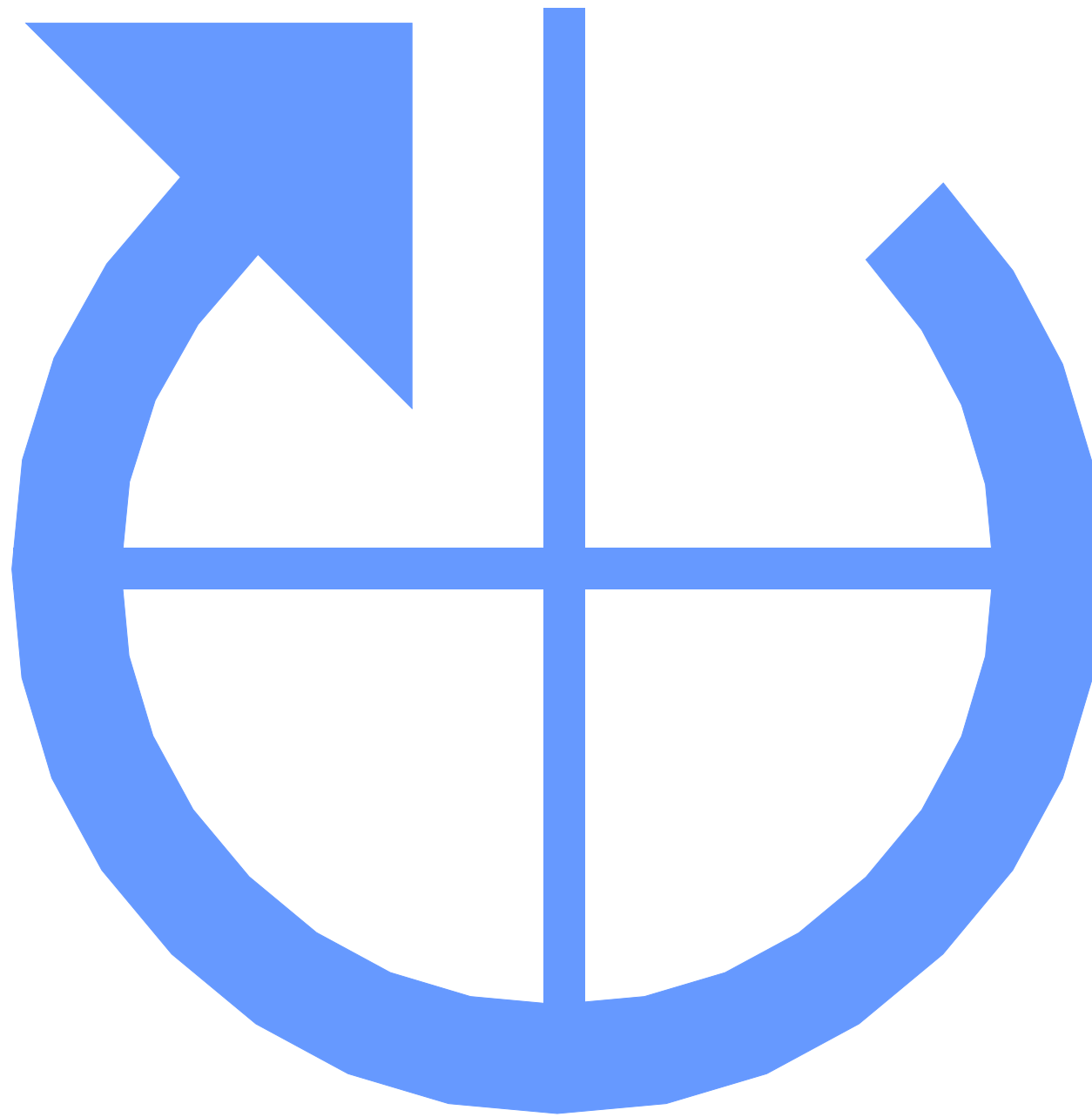


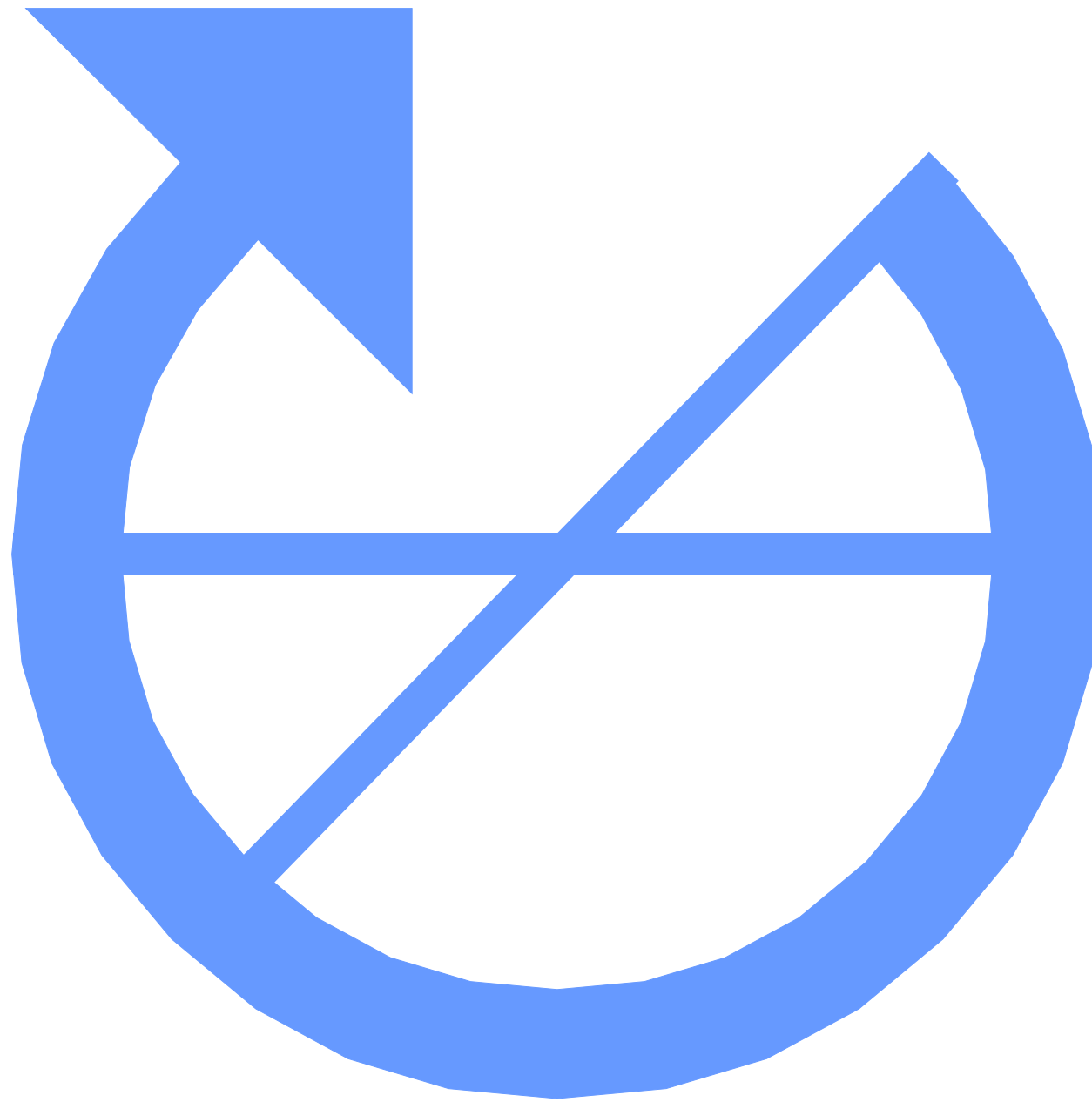
Wildfire

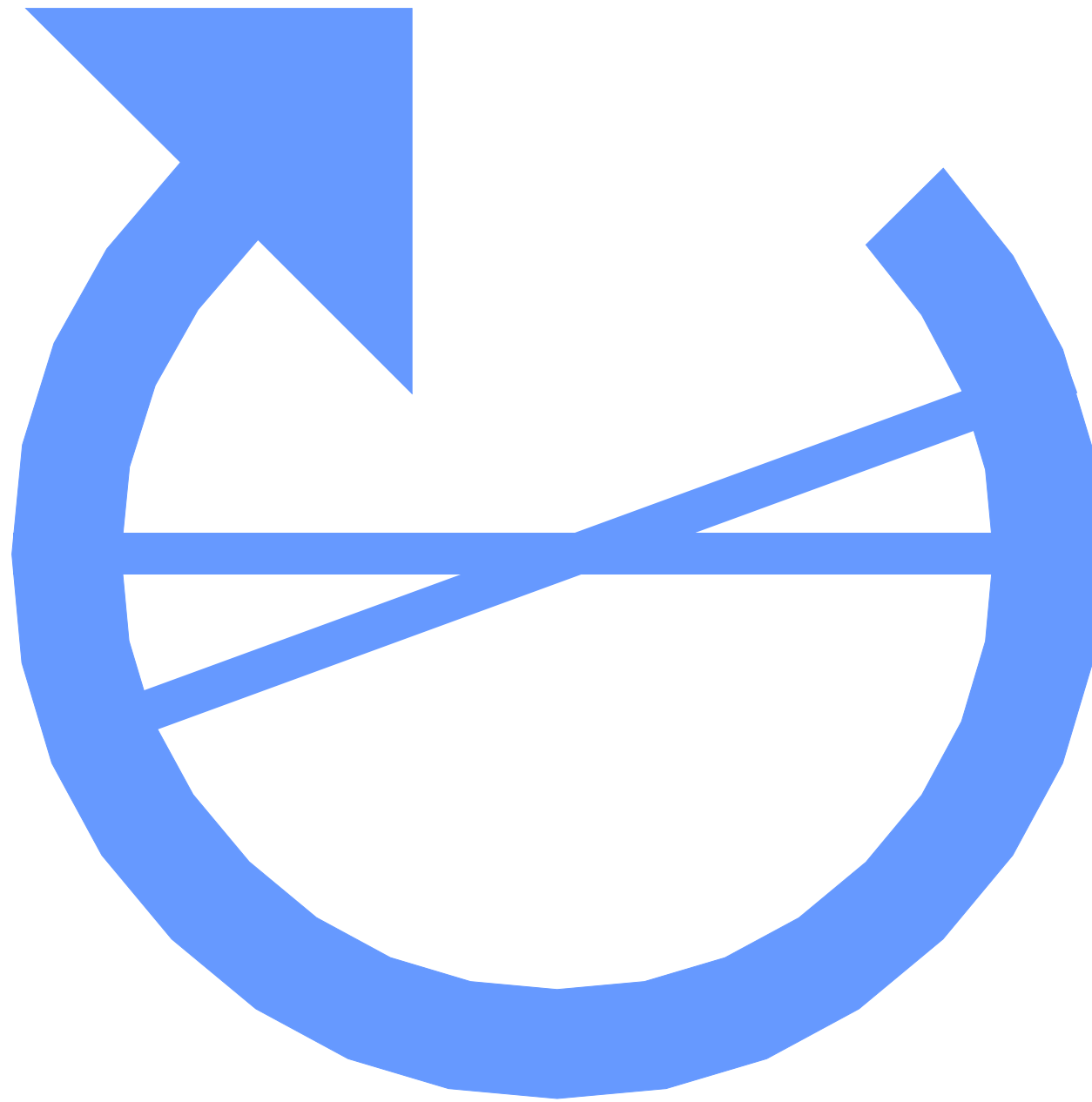
Winter

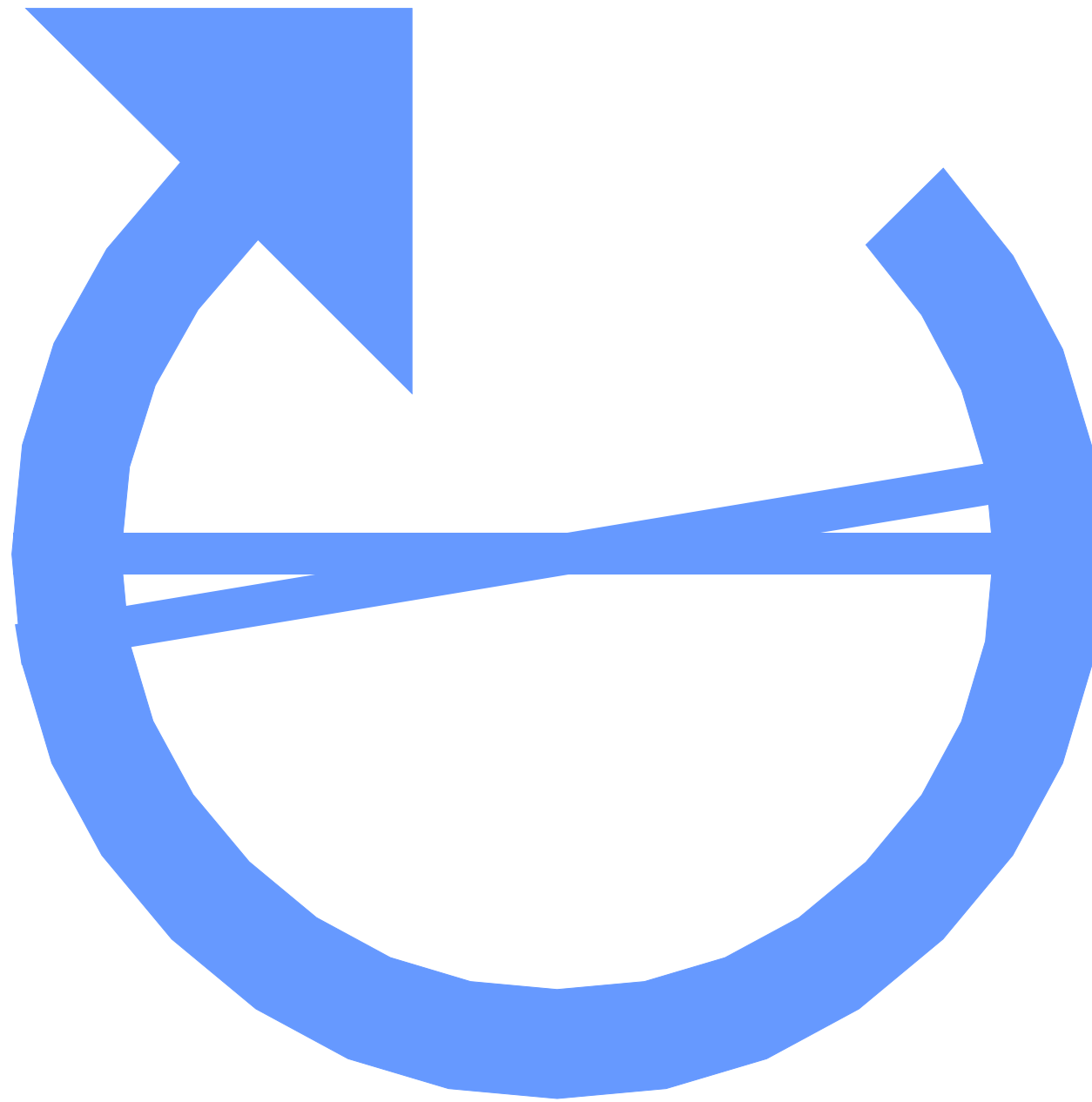


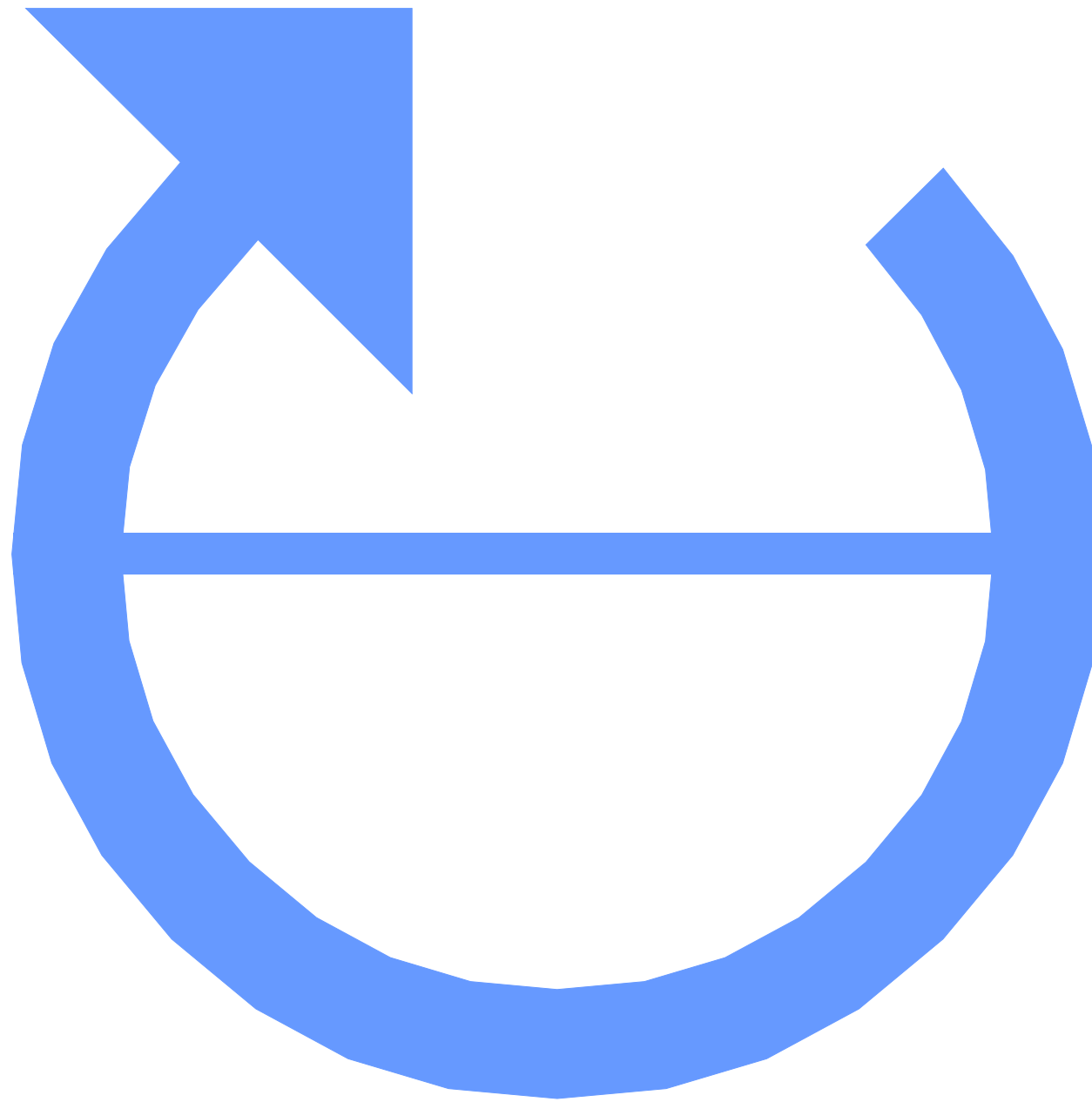
Drought













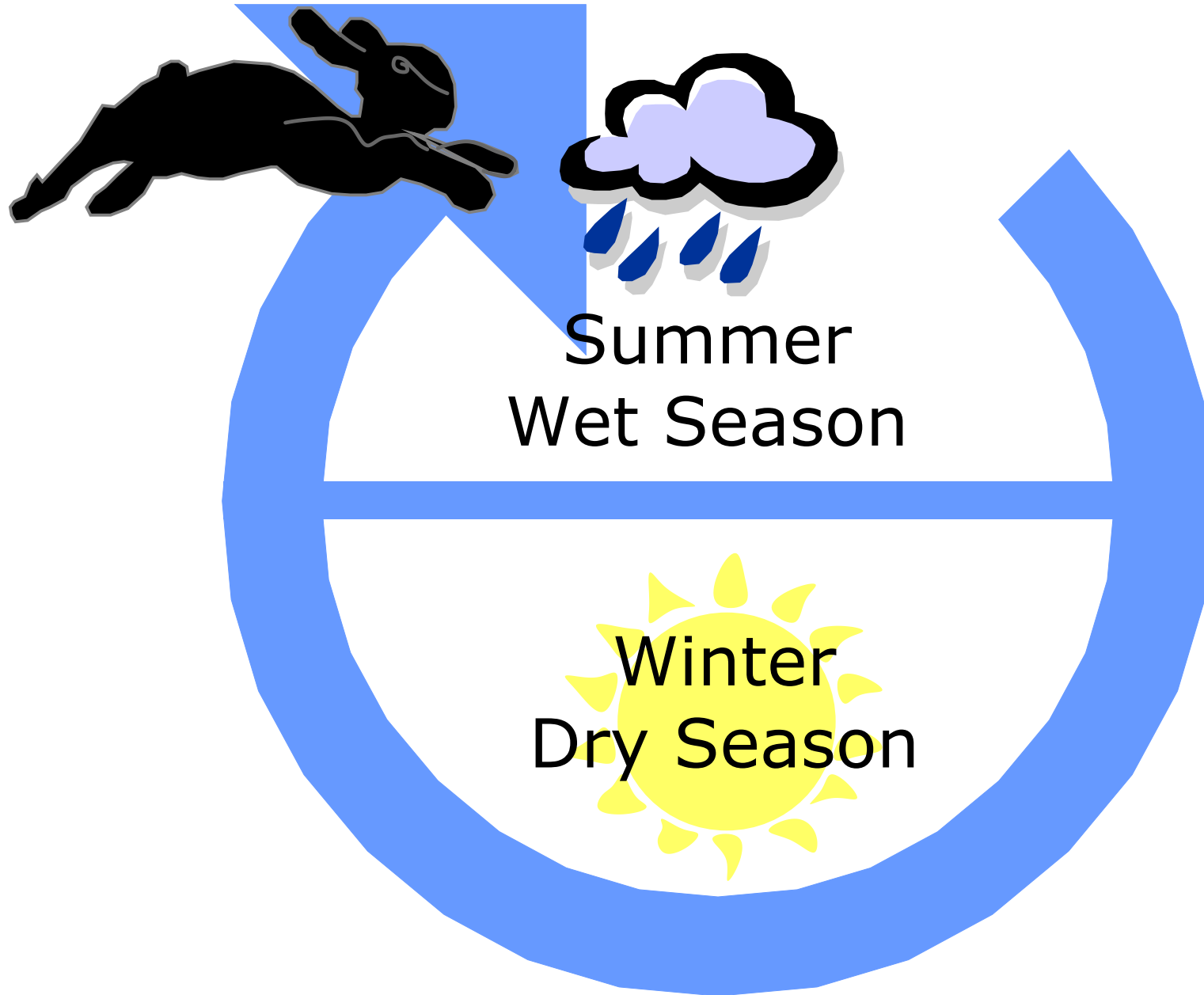
Summer
Wet Season

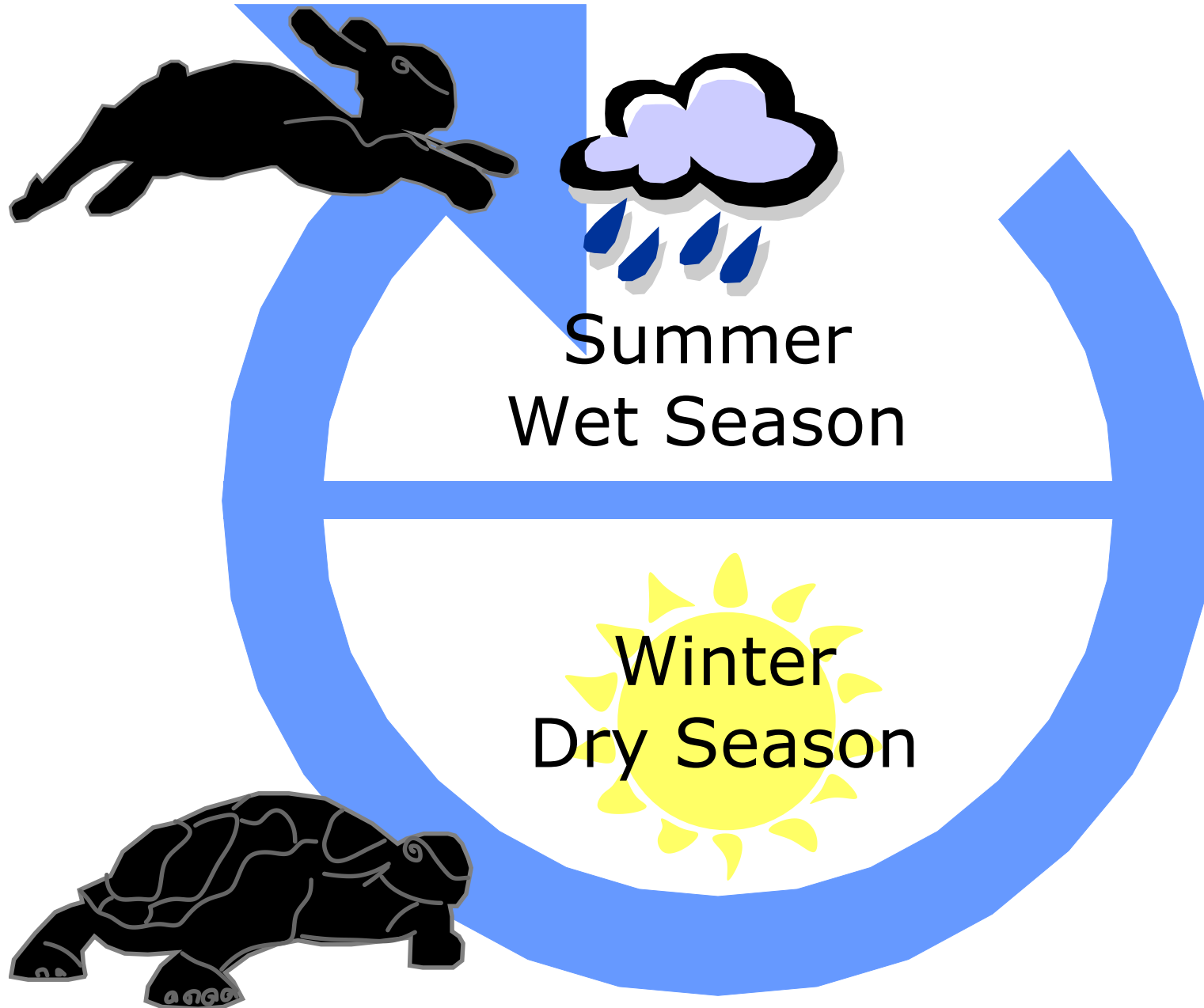


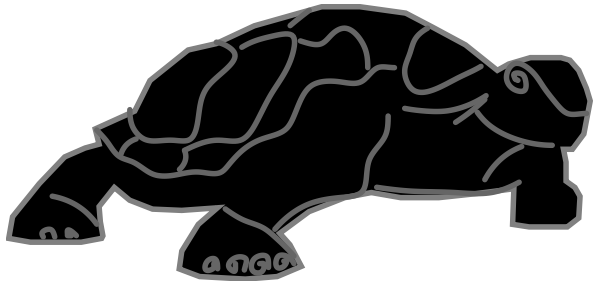
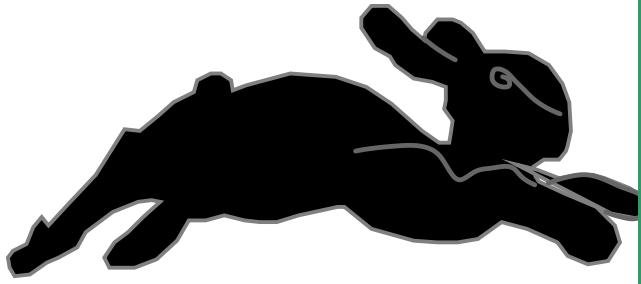
Summer
Wet Season

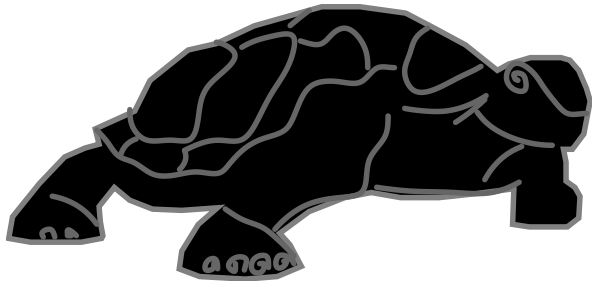
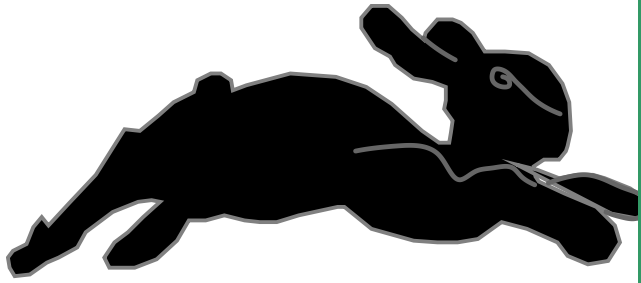


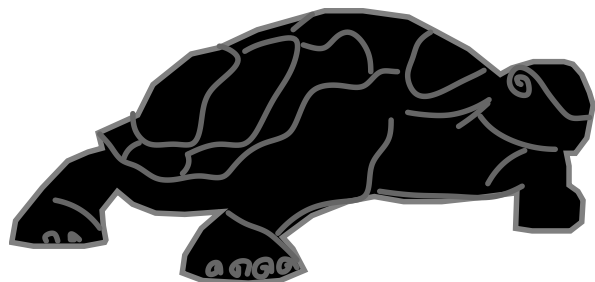
Winter
Dry Season

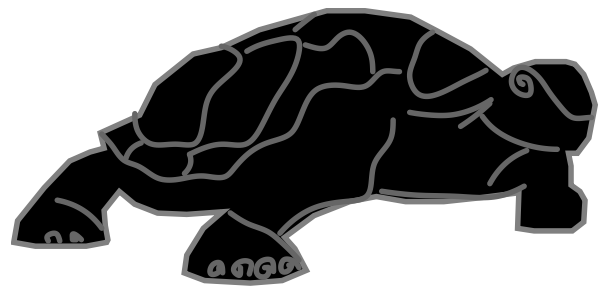
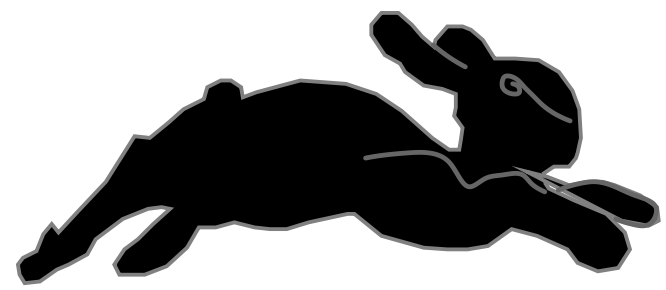


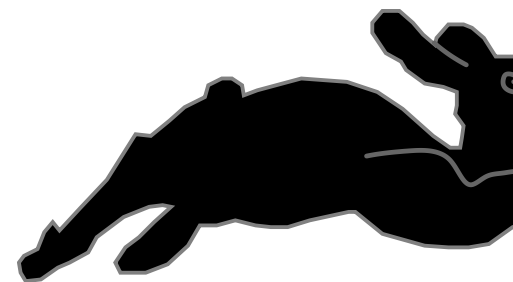


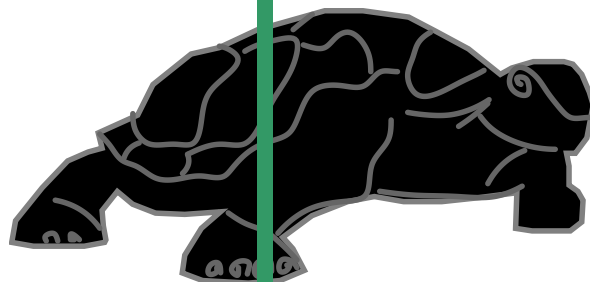


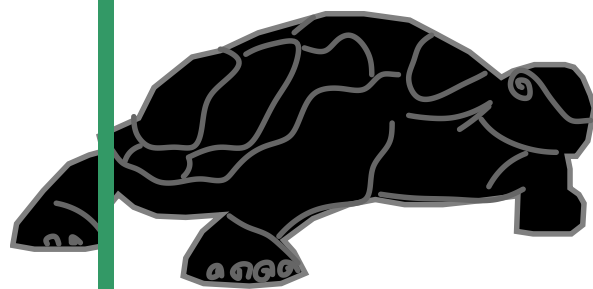


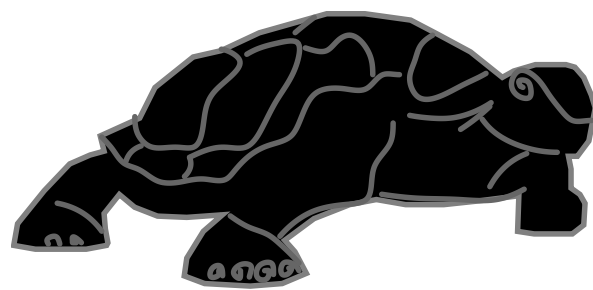


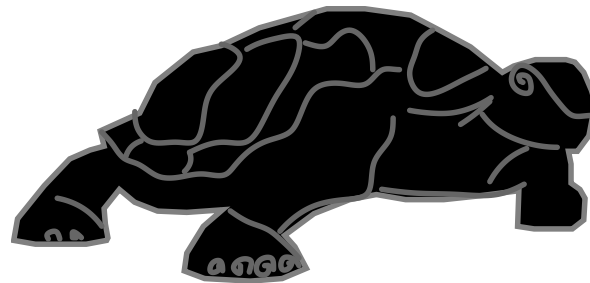
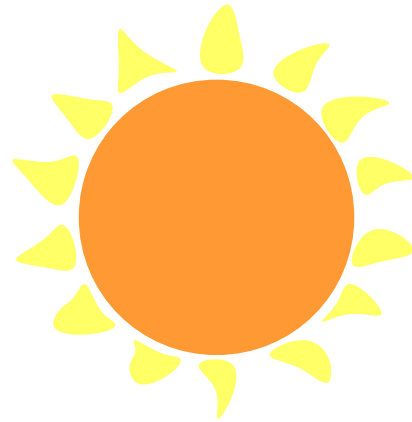


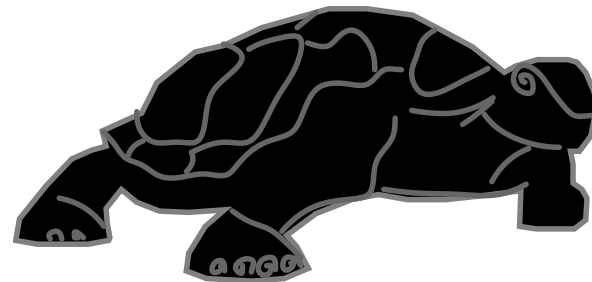
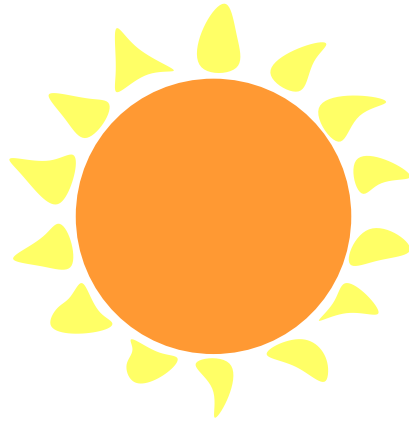


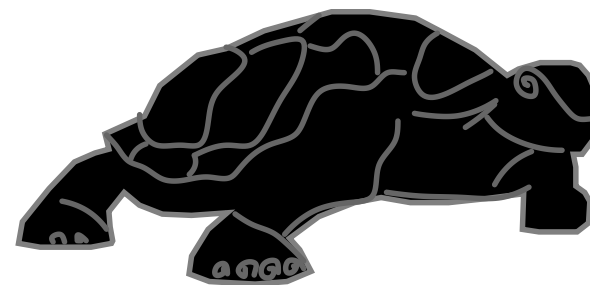
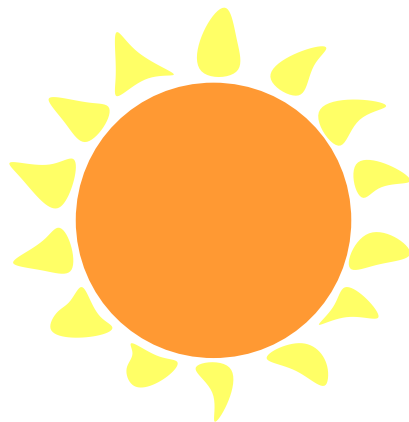


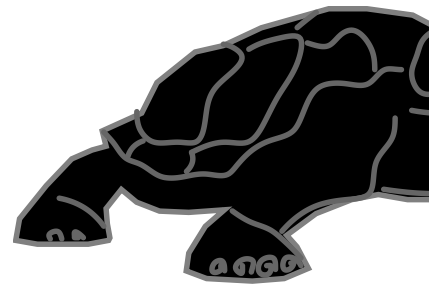
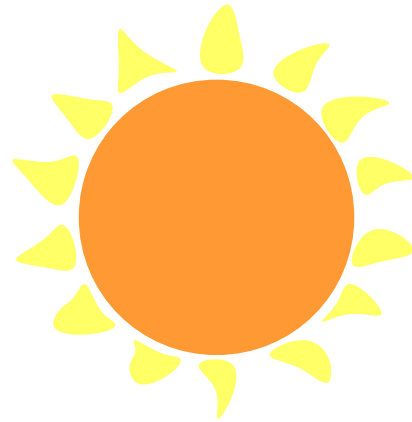


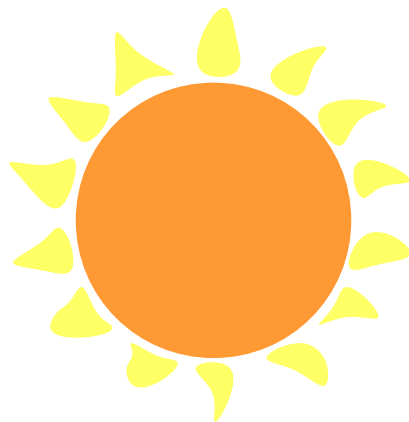
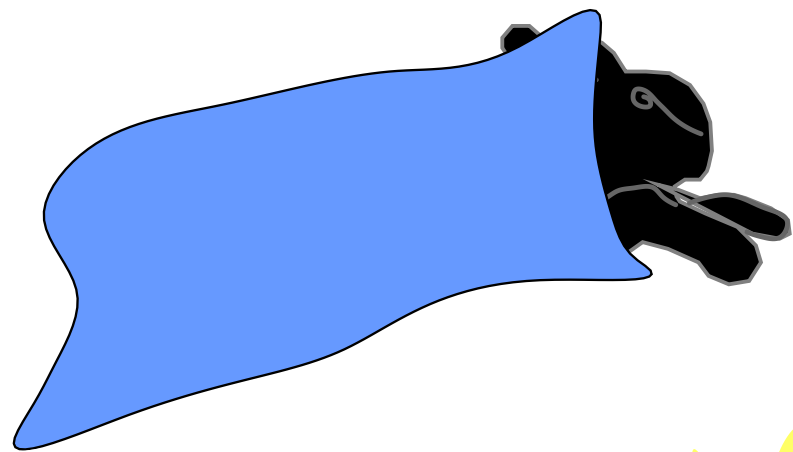


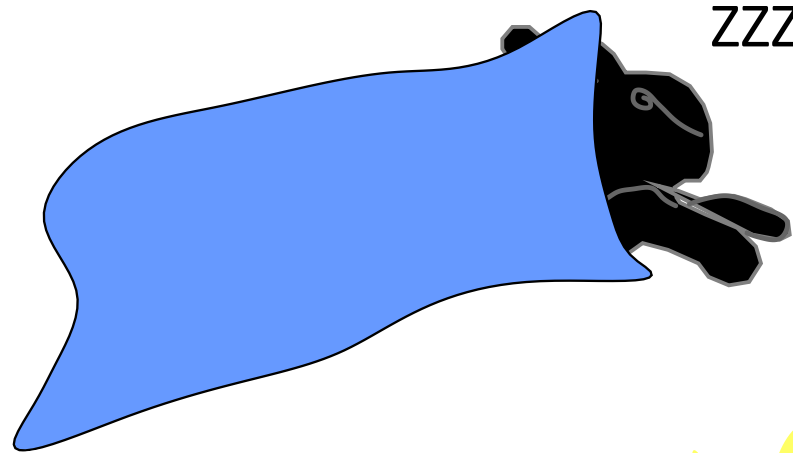




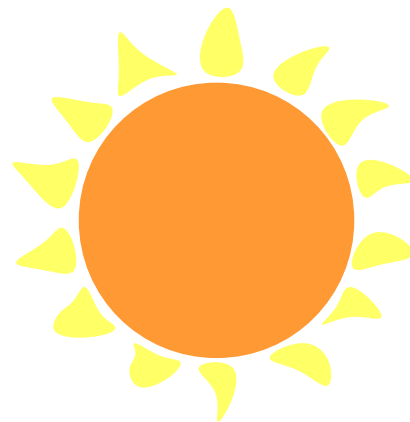


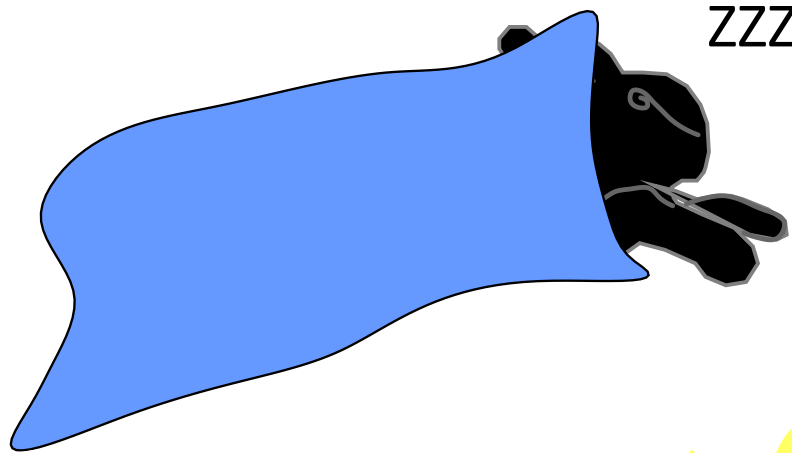




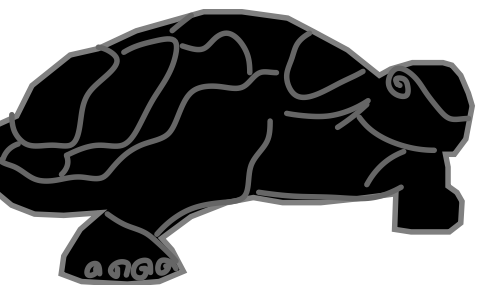
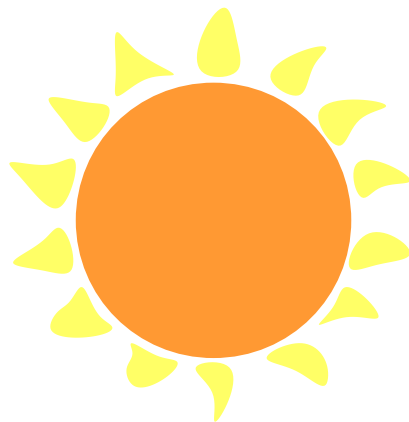


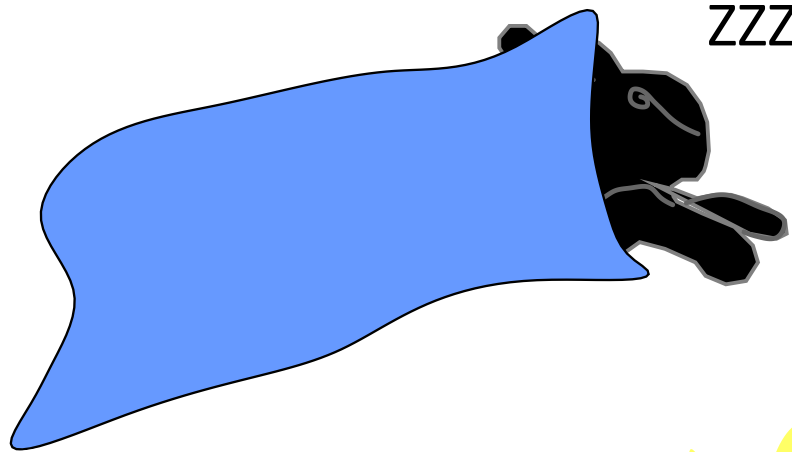
zzzzzzzzzzzz



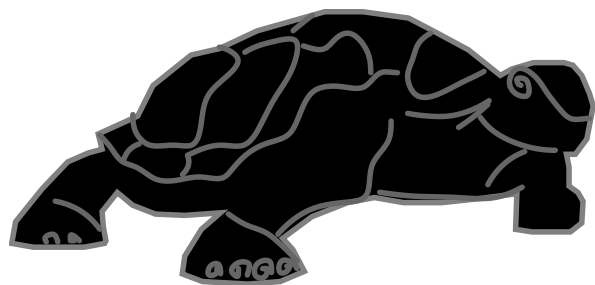
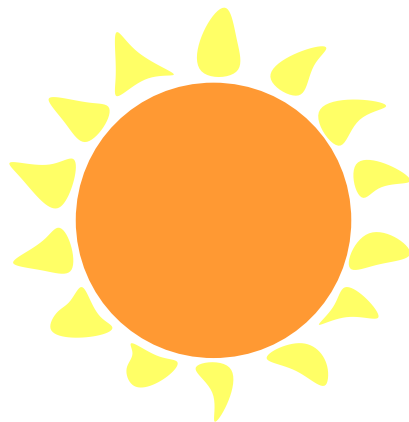


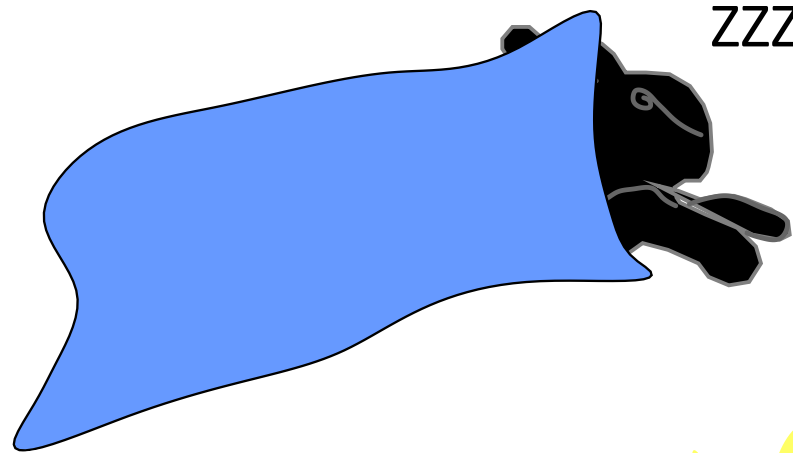
zzzzzzzzzzzz



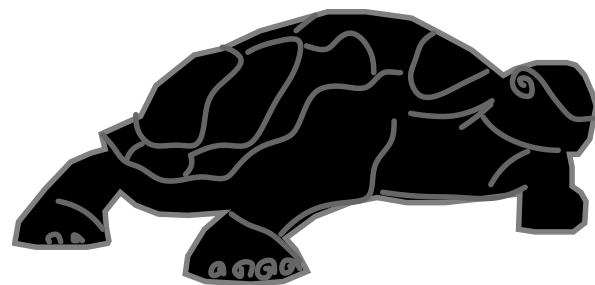
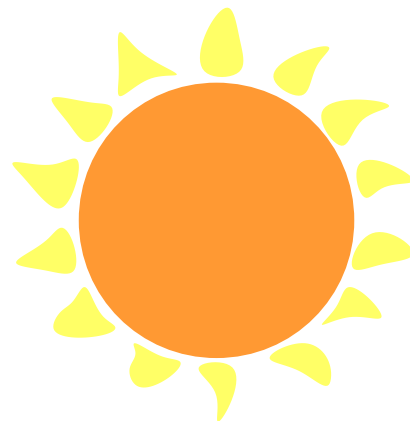


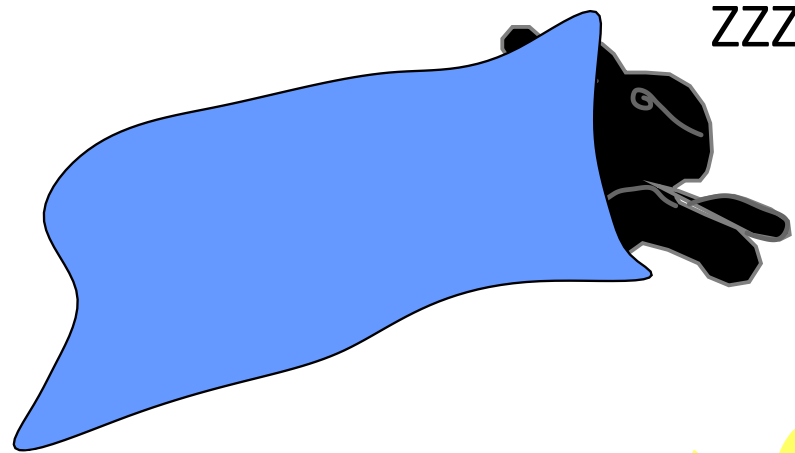
zzzzzzzzzzzz



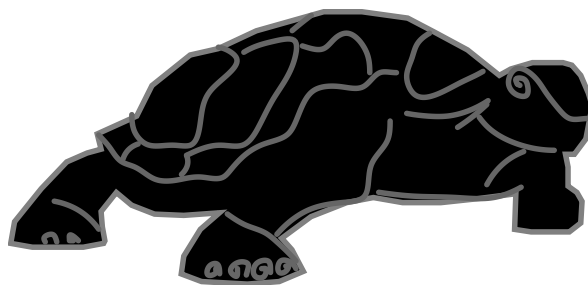
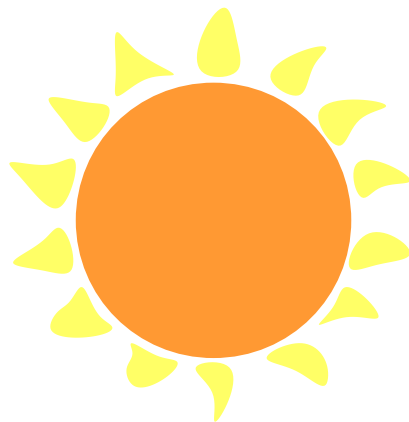


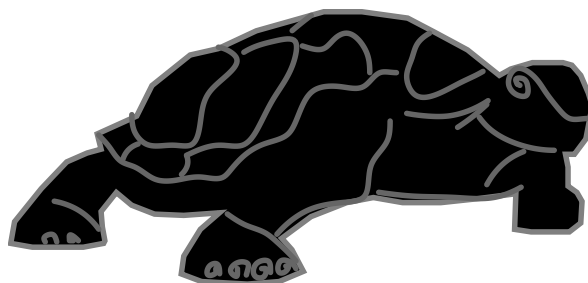
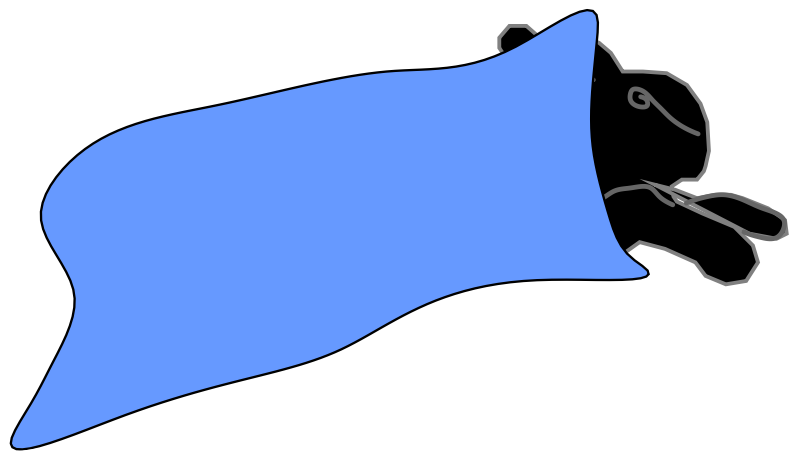
zzzzzzzzzzzz

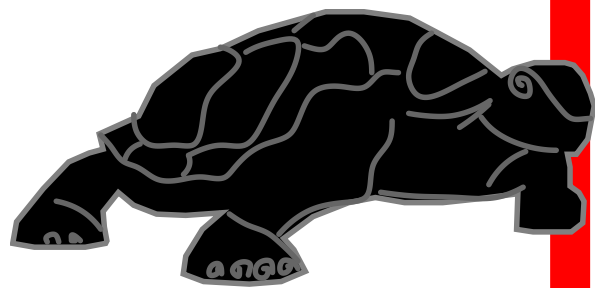
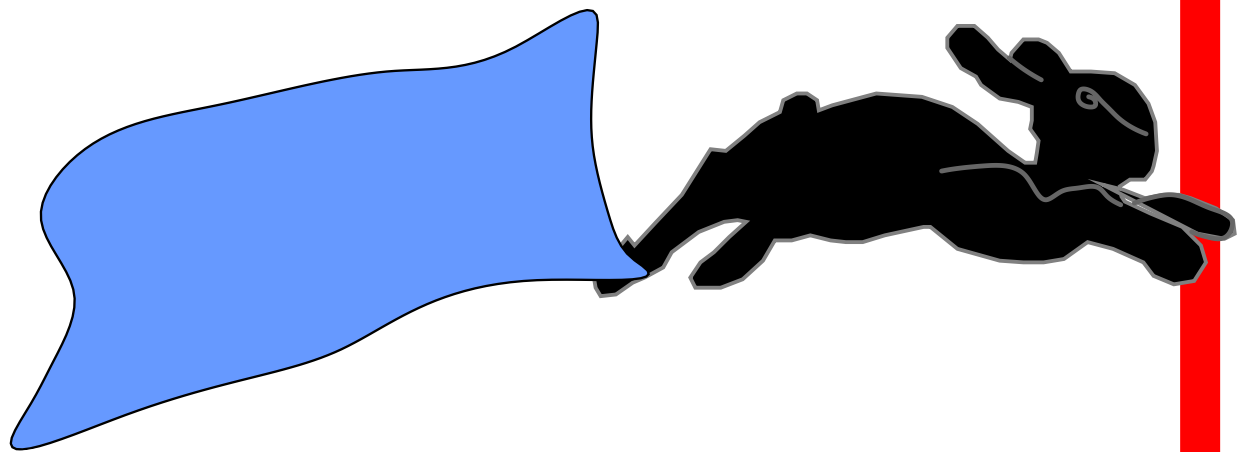


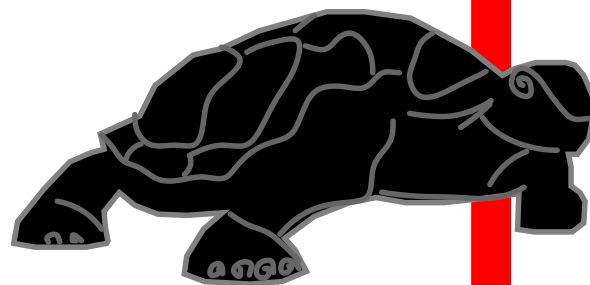
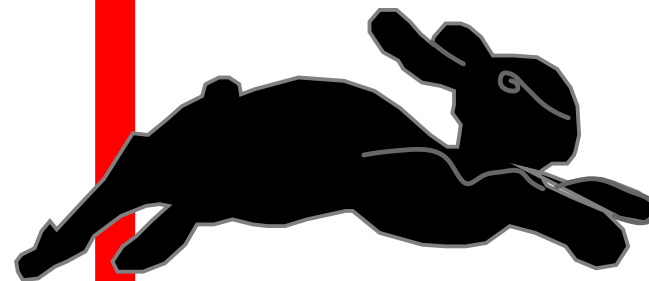
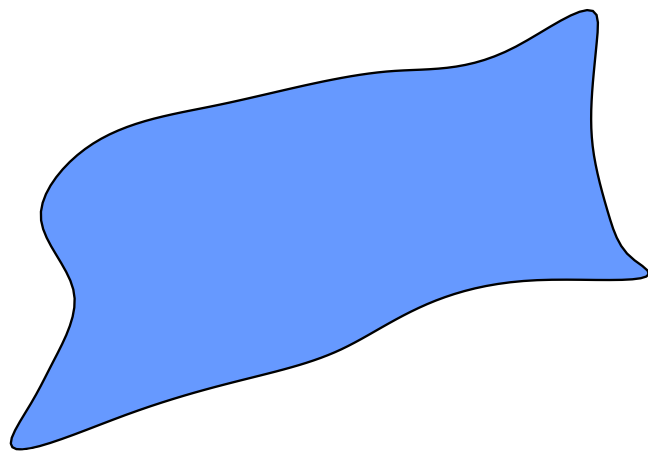


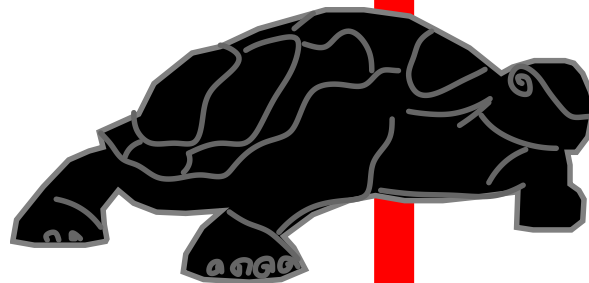
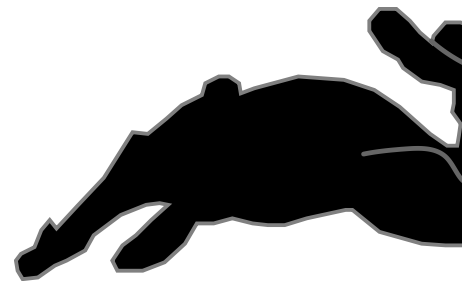
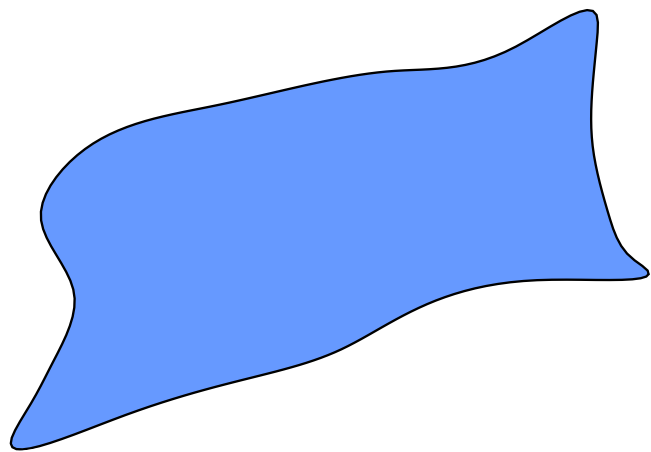
zzzzzzzzzzzzzzzz

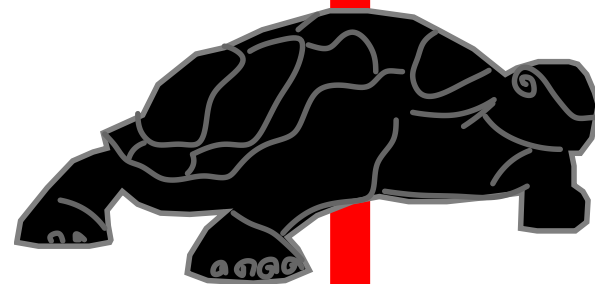
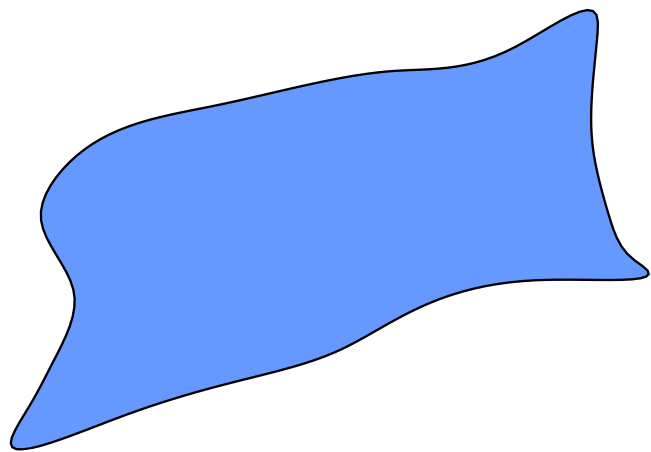




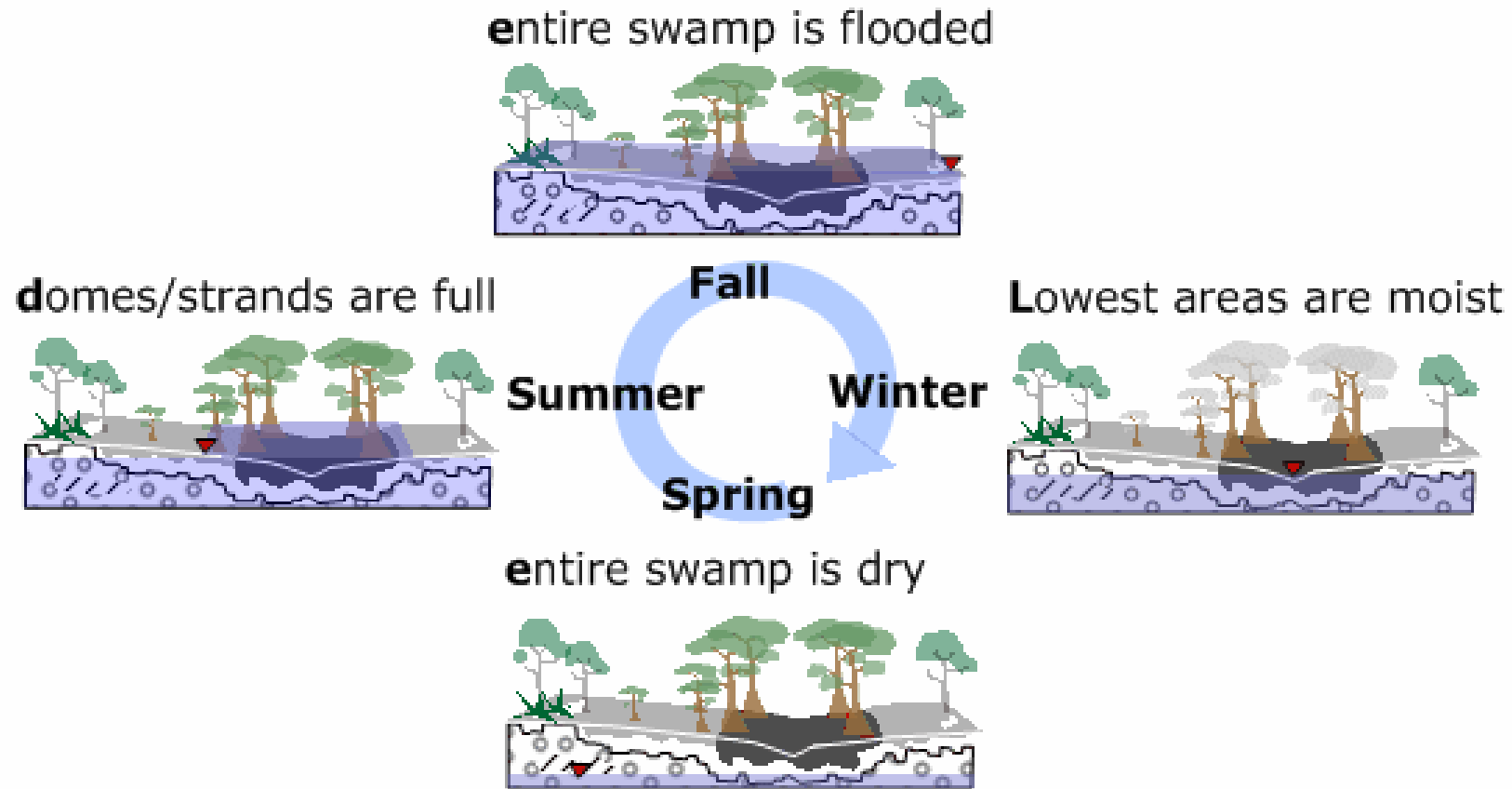








Swamp Water Cycle



Hydrogeologica

Hydrology
That Nobody
Understands or
Reads

Three Perceptions of Fundamental Banality
in Eigen Flow Dymanics of a Anisotropic
Wetland of Large Spatial Scale

Bob Sobczak, Sobczak, R.V., and Angel, B.

$$\lim_{x \rightarrow \infty} \frac{\pi(x)}{x / \ln(x)} = 1$$

$$\sum_{k=0}^n \binom{n}{k} = 2^n$$

$$\oint_C \frac{f'(z)}{f(z)} dz = 2 \pi i (N - P)$$

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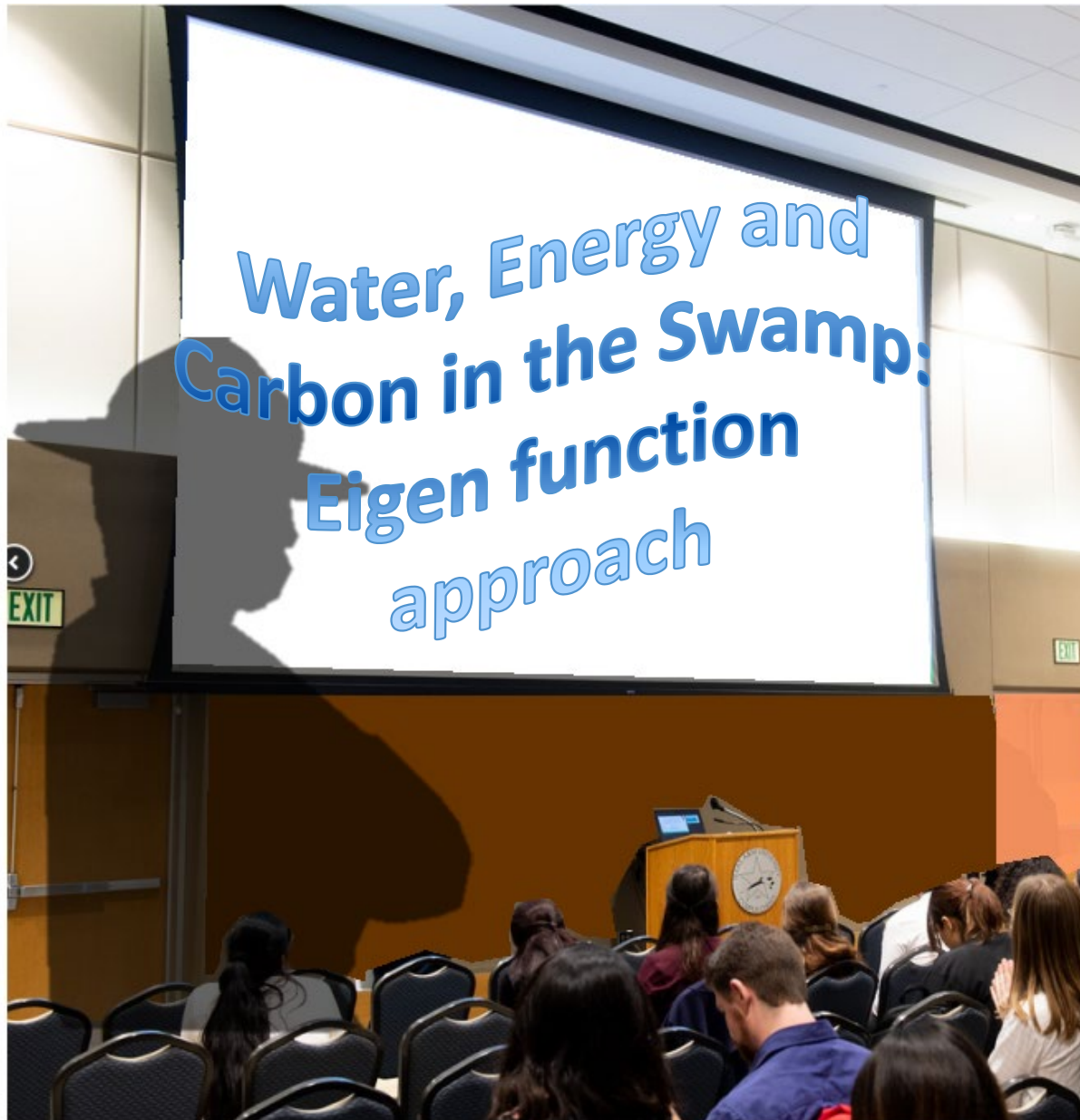
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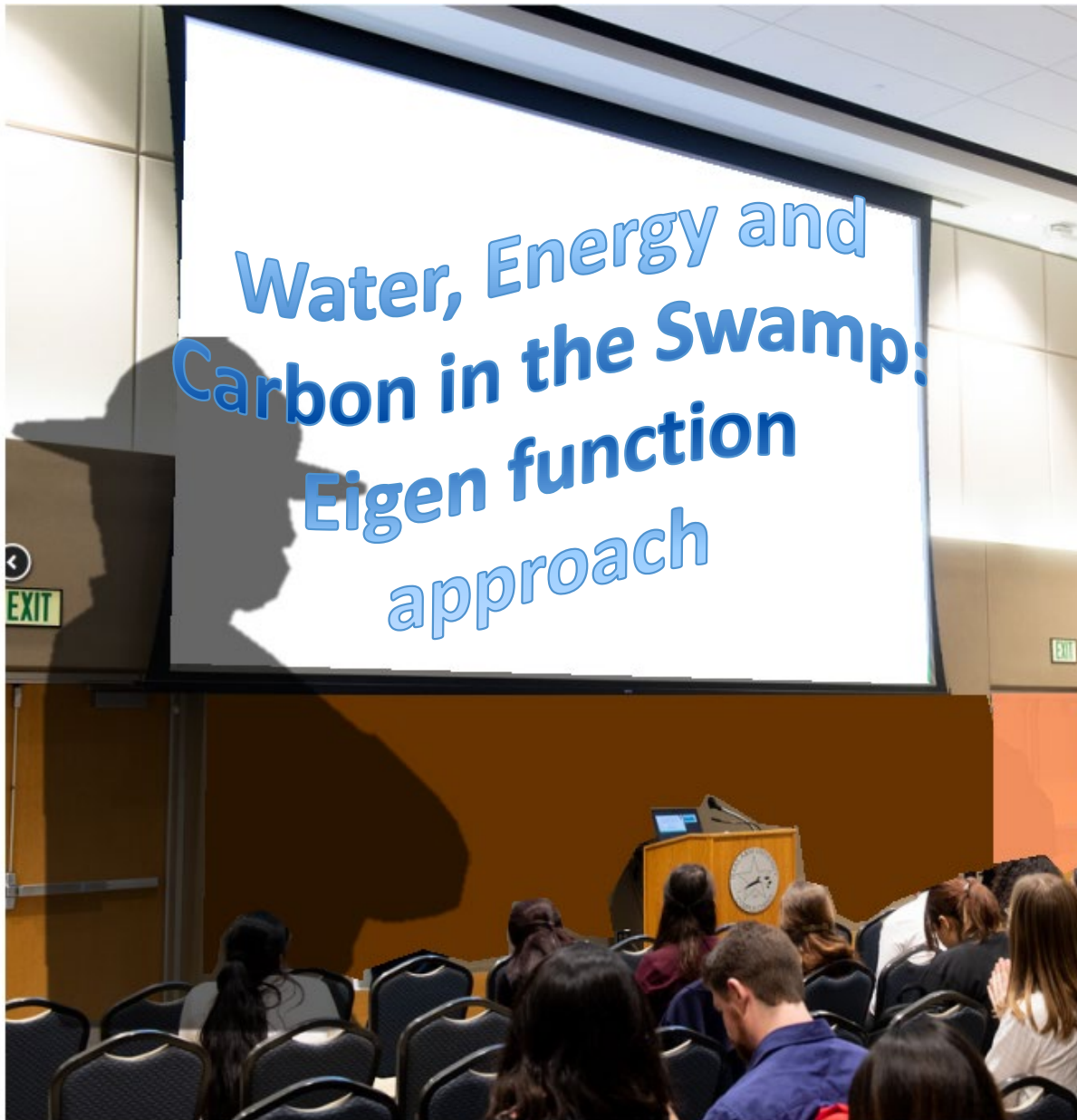
$$\oint_C \frac{f'(z)}{f(z)} dz = 2 \pi i (N - P)$$

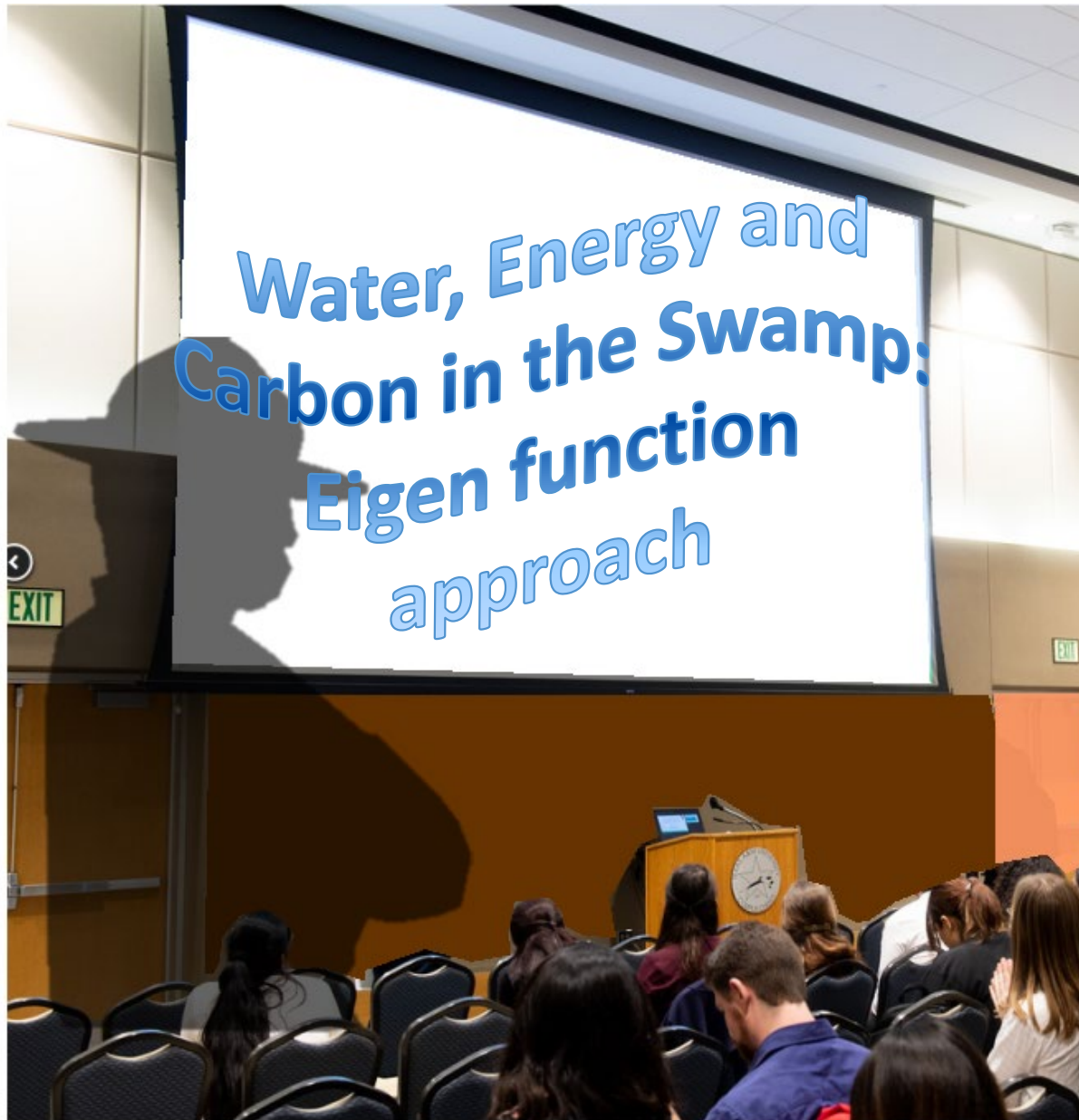
Once Upon A Water Cycle

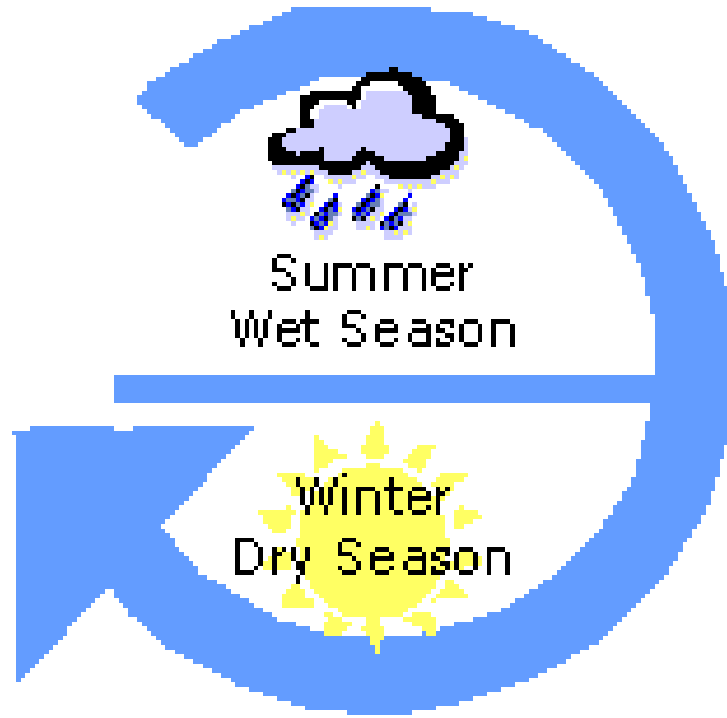
Hydrology
That Everyone
Can Enjoy

$$1 + 1 + 1 + 1 \dots$$









Go Hydrology!
<http://www.gohydrology.org>

Favorable
initial conditions



Historical data

Real-time data

Internet

Free Software



Ranger/hydrologist

Quick turn around

Some sense of humor

Semi-smart (not too smart)

Discipline



Swamp mystique

Watershed myth

Scenic beauty

Water cycle approach



Remote outpost

Small staff

In-house trust

Aquatic outreach



*"I see that, in college, you got along equally well
with the jocks and the stoners."*

People's
hydrologist

Speaks to both lay
and technical
experts

Unintended Consequences

MOBILE FIDELITY SOUND LAB

BOB DYLAN HIGHWAY 61 REVISITED



MONAURAL

MOBILE FIDELITY SOUND LAB

BOB DYLAN HIGHWAY 41 Revisited



MONAURAL



Made me better

Weighed me down

Kept me grounded

Blurred lines between ...



- Work and play
- Office and home
- Being serious and joking

Reoccurring Question:

“Bob, when are you
going to get a **real** job?”



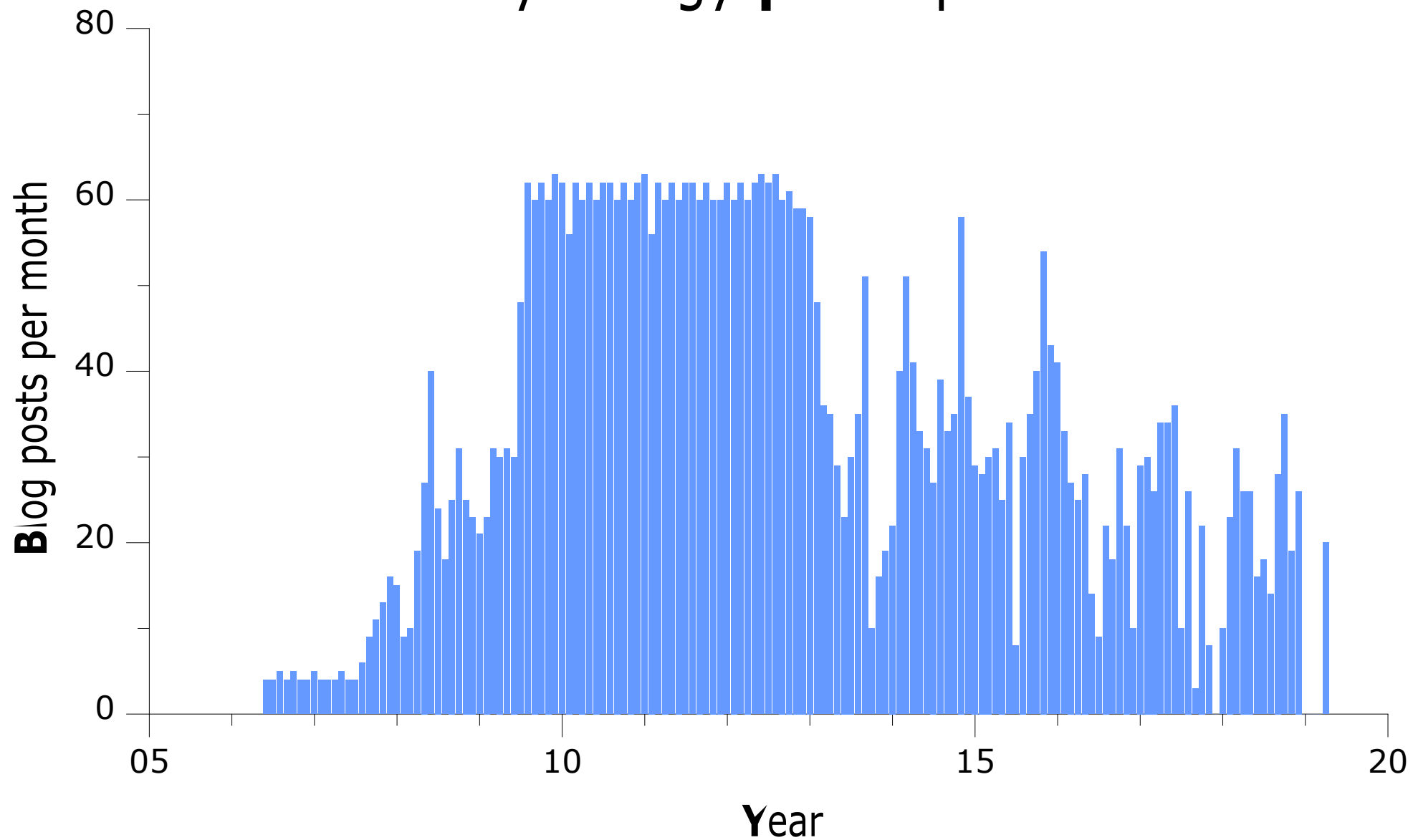
Had fun

Gave me a
voice

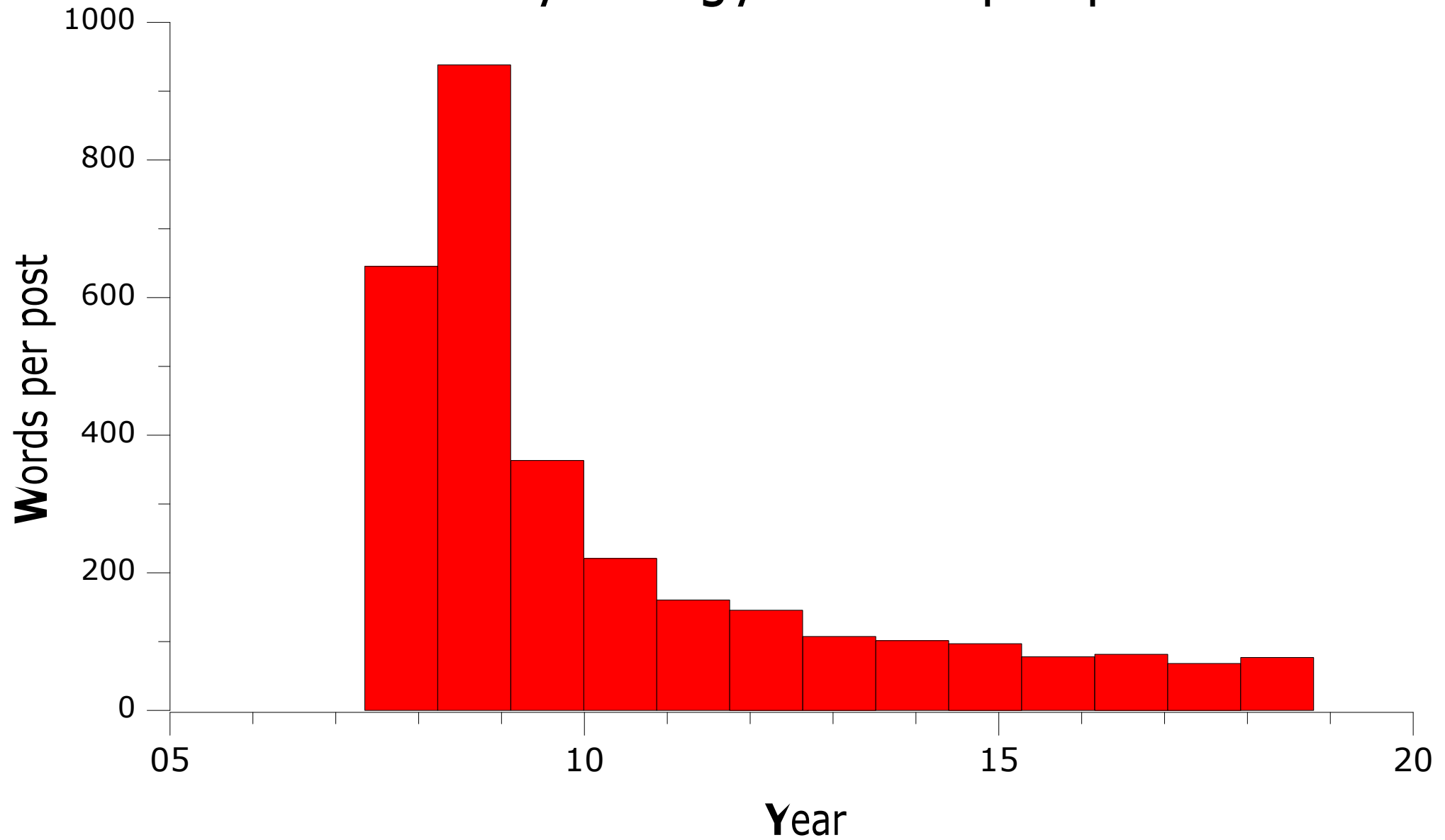
Suffered for
my art

Trends

Go Hydrology **posts** per month



Go Hydrology **words** per post



Positive Outcomes



Shared
Lexicon

Fostered
collaboration

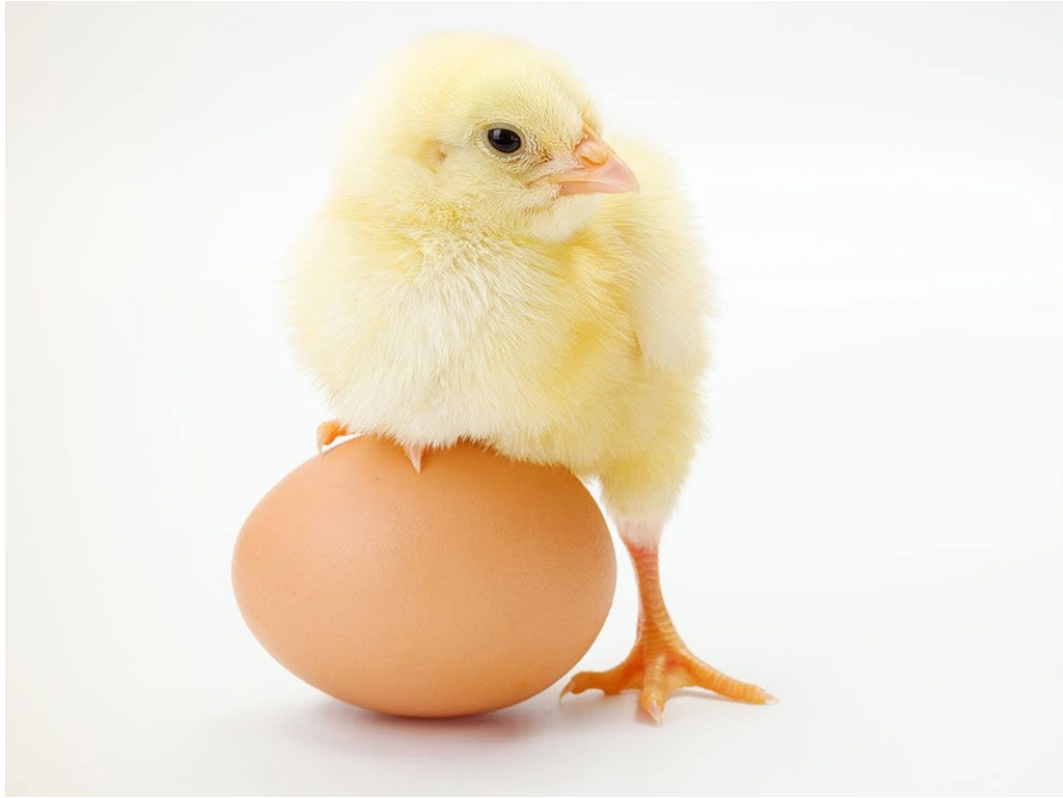
Multi-agency



Decoded hydrology

Unlocked past

Improved memory



Idea mill

Kept saw sharp

Multidisciplinary



Had fun together

People love water

People want to be
connected to nature

**“Nobody owns the
water, man”**

Unknown citizen

Not without perils



Gray
Area



Gray
Area

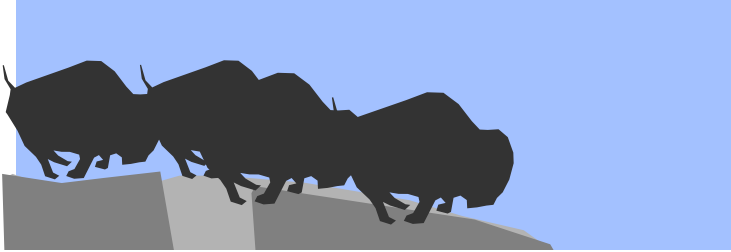


“illuminated,
celebrate, share”

“You tell me it’s the
institution, you better
free your mind instead”

John Lennon, Revolution

Success by failure



Ahead Of Pack



Ahead Of Pack



Antiquated in
modern social
media world

Webmaster
failure

Database failure

weather clouds Preserve swamp level diagram
Hydrology made easy wacky
current Water I don't know
exciting restore it
blog Staff enjoys it cool graphs
Sobczak SUPPORT WATER RESOURCES Bob
Water flows down gradient Get your feet wet

Lessons Learned



Less is more
Keep it light
Keep posting
Rule of the Ninja

Future Directions

Bring it back to
some semblance of
its **former** glory

I don't know





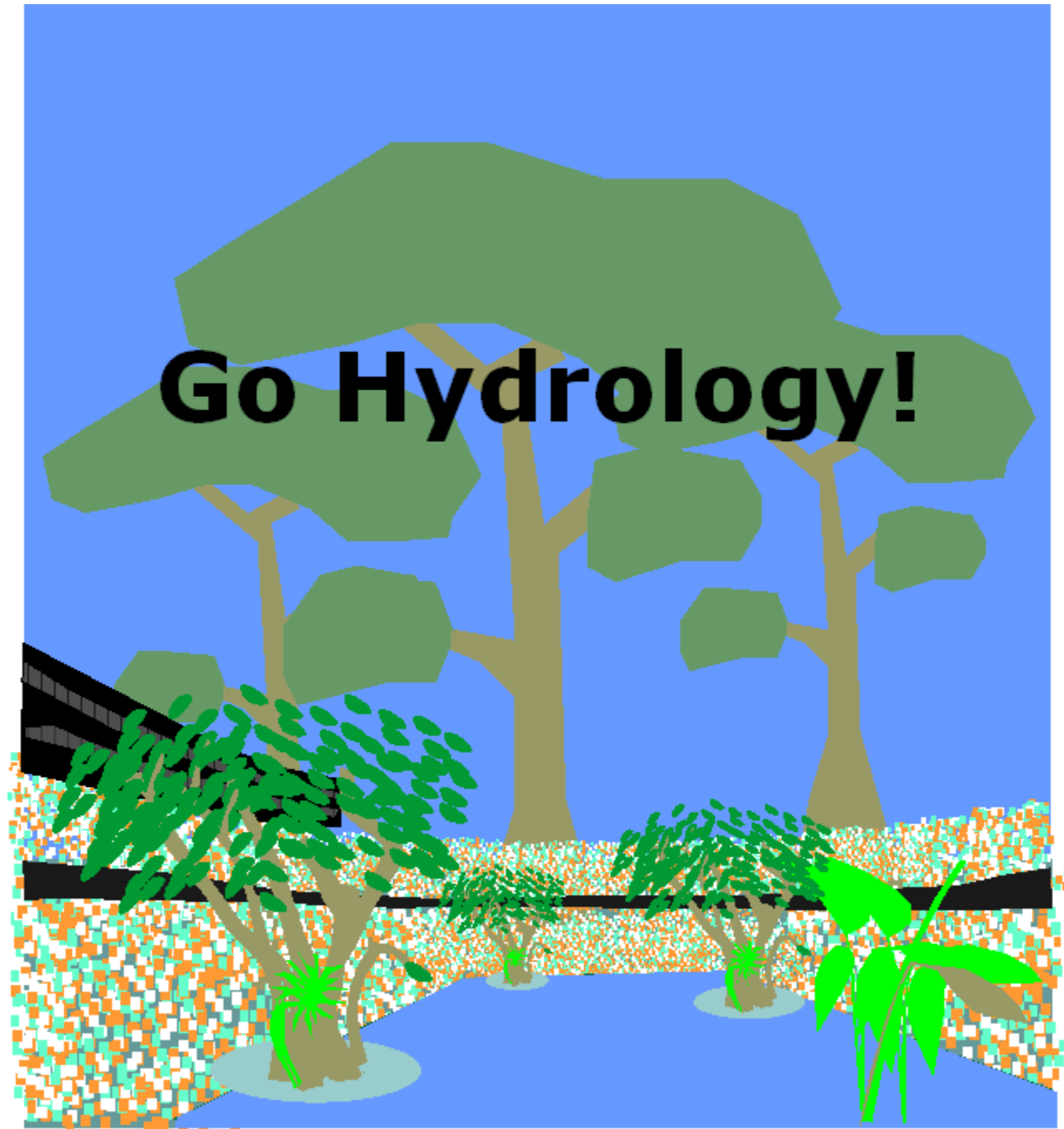


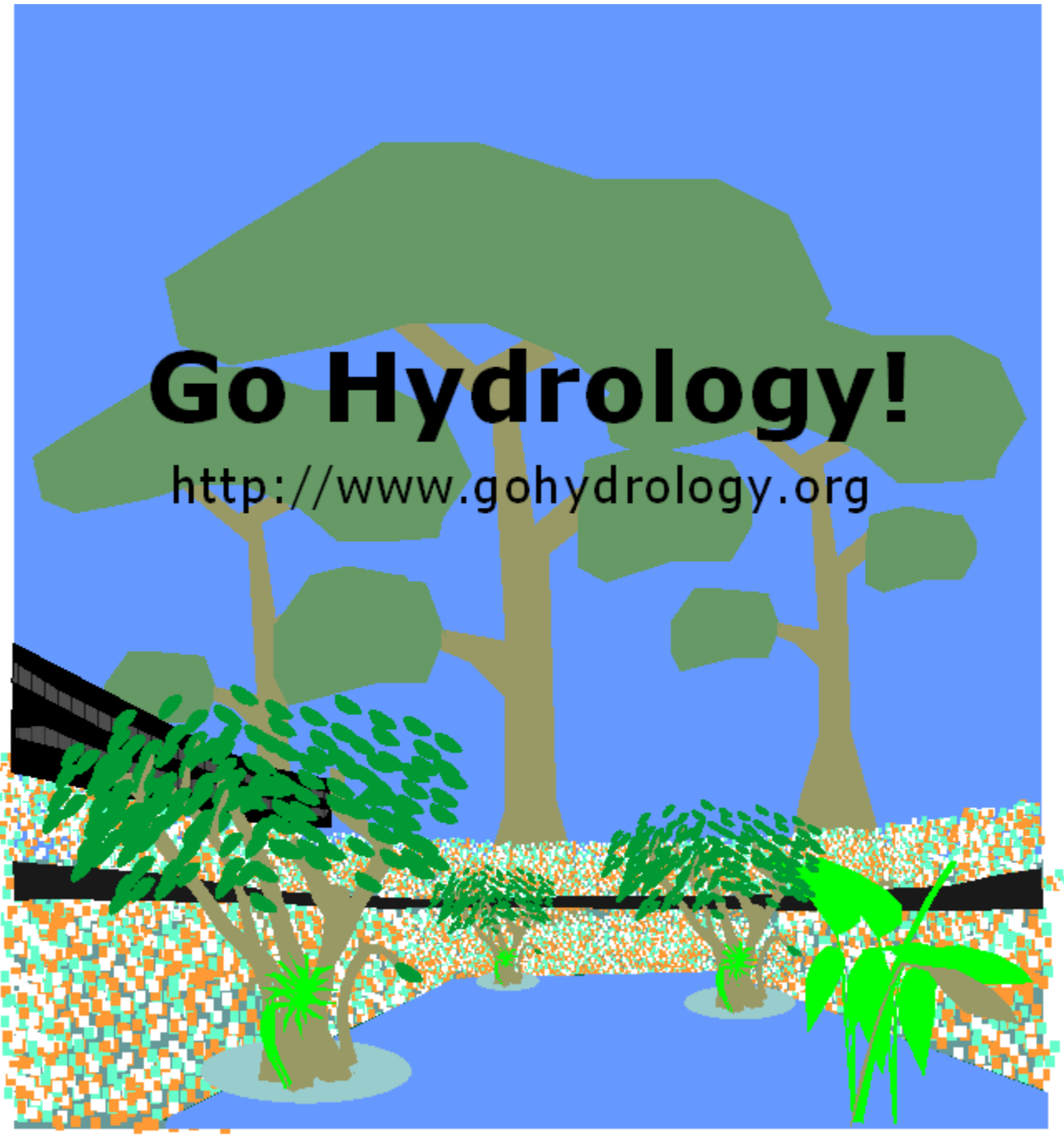






Go Hydrology!



A stylized landscape illustration. The background is a solid blue sky. In the middle ground, there are several large, green, rounded trees with brown trunks. To the left, a black building with a grey roof is partially visible. The foreground features a body of water, represented by a blue area, with several smaller green trees and plants growing along its edge. The ground is depicted with a pattern of small, colorful squares in orange, green, and white.

Go Hydrology!

<http://www.gohydrology.org>