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LEVEL BOOK

#101596

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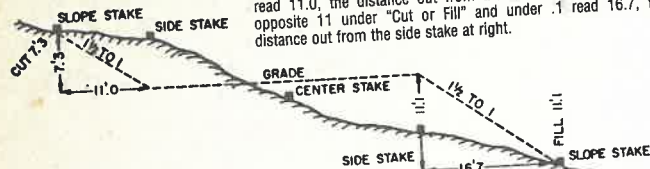
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feet to meters x (.3048)

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

William Shilling

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The paper in this book is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

[illegible]

Sept 25, 01 Wacissa Group
Samplers: TMS, G+M, RPM, RCM
Weather: P/c @ 10:35am
front passing -- almost passed
will be sunny later today.

Spring No 2 (Ancilla Spring)
10:35 am depth - 9'
depression diam.: 25'
vent diam.: 3'
upland description: human features
such as adjacent sandy parking lot
and dive board + rope swing. No
wetland description: multiple buildings,
small vents assoc. with
this spring. We sampled the
vent closest to rope swing --
15' due south. Water is Hydrilla-
choked and thick with algae

Sept. 25, 2001 Wacissa Gr.
Samplers: TMS, GHM, RPM, RCM
Weather: P/c, breezy @ 1:12 pm
front came thru

Big Blue Spring - depth 42 ft
sample time: 30 pm → NNW-SSE: 47 yds
depression diam: → N-NE-SSW: 48 yds
vent diam: 6' diam
upland description: Completely
forested with mixed hardwood-
cabbage palm forest. A rope
swing and a floating raft
platform present. Pristine.
No high ground nearby

wetland descr.: large, ~~shallow~~
round bowl, outpouring 2 runs.
Hydrilla covers 50% of bowl.
Some logs & branches on bottom.
The north spring run flows over
rocky bottom and has been
excavated by footers with scooters.
Spoil holes and scars present.
Water is translucent blue
with large particles suspended.
Can just see to the bottom

- Big Blue (cont)

of the depression. Not quite as
clear as some of the other big
springs like Watulla or Silver.

Sept 26, 2001 Gainer Complex
Spring No. 2

sample time 11:23 am eastern
depression diam: E-W 18 yd; N-S 17 yd
vent diam: ~circular -- 6'
depression depth: 5'

Ownership: Privately owned uplands --
owned by Patronis, Inc. (Panama City)
There are two parallel pipes running
out from spring vent -- 4" diam
yellow pipe and 1 1/2" pipe. Pipes are
sucking out drinking H₂O.

Uplands all forested
Upland description: Spring issues
out of the west bank of the river.
West bank rises to 25' above water
level. Visible outcrop: Suwannee Limestone
(top of Suwannee is irregular); Chipola;
weathered Chipola; undifferentiated
siliciclastics.

Cowart's sample taken from No. 2

Spring No. 2 (cont)

Several cracks in bank wall, all running NE to SW. H_2O issuing from cracks under water level.

Forest type is mixed - hardwood and cabbage palm low, and beech-magnolia forest atop bluff.

Magnolia, white oak, Spruce pine all present. Limestone sidewalls damp and fern-laden.

Wetland description: Water clear greenish-blue issuing forcefully out of sidewall. There is a 50' spring run to the main river channel. E confining creek is tannic and turbid today. Spring run and river confluence marked sharply. Multiple vents out of sidewall (≥ 3). Wetland veg is sparse with patches of dark green algae. Numerous concrete bags forming artificial wall. Numerous Centrarchid fish

Sept. 26 2001 Gainer Group
Samplers: TMS, GHM, RPM, RCM,
Weather: P/C to Partly Sunny
low 54°F, High -- mid 70's
front passed

Gainer No. 3

^{sample} Time eastern: 1:28 pm
depression diam: E-W 93', N-S 39 yds
vent diam: 2' circular
depression depth: 8'
Ownership: Private property --
No Trespass signs.

Uplands: The north shore has a wooden wall constructed to manage sand erosion. Pavillion with picnic tables and open sand and field occupy northern uplands. Beech-Magnolia forest surrounds the rest of the depression. Some Suwannee limestone outcropped sporadically around depression. Some cabbage palms, cypress in and near H_2O , some live oak & loblolly pines atop hill near pavillion.

9-26-01

No 3 (cont)

Wetland: This depression is large and mostly shallow with sandy bottom. Some Suwannee limestone boulders present. There are at least 3 vent complexes. The Western vent issues out of a side well and has a small broadwell nearby. This system boils from at least 3 smaller vents.

The North vent is the largest and deepest, and it is the one sampled for water qual. It boils out of the ground vertically from a circular vent out a cone-shaped depression. Water is greenish-blue and shallow throughout depress. Another vent complex on eastern side of depression with multiple smaller boils.

There is an island in the center of the depression and a 100m spring run to the E confina Cr. Sharp contrast of water clarity at the confluence. Veg is sparse and consists mainly

of dark green algae mats. We observed numerous centrarchid fish and dozens of large, rand tadpoles resting atop the algae @ 5' depth. Possible Bana hectheri or R. gryllis or R. clamitans. Rana sphenoccephala was calling. Tadpoles were very large (160mm TL). Tail fin clear with very distinct dark border. Eyes red.

sample Gainer Spgs No 1C
Time: 2:59 pm Ea. E-W
depression diam. Oval-shape 23 yd x 10 yd
vent diam. 8' x 4' E-W running oval shape
depression depth: 20' vertical vent
Ownership: NWF WMD-owned uplands

Uplands: All surrounding uplands forested. Near water -- some Black gum & cypress; farther up -- Beech-Magnolia - mixed hardwood forest. Dahoon Holly present

Wetland: One single, oval-shaped vent issuing H_2O vertically. Water translucent greenish clear. Much debris blowing out in the water column -- sand, algae, shell frags. Vegetation is sparse, but algae mats present. Centrarchid fish present. Two logs fallen into depression. H_2O flows into Spring No. 1A run. Cypress knees common. No limestone outcropping around perimeter of wetland.

Jackson Blue 9-27-01

Samplers: TMS, GHM, RPM, RCM

Weather: Clear to Fair @ 10am

low 42°F in Crestview 45°F Tally outskirts. High today mid 70's. Front pushed entirely through yesterday evening.

Jackson Blue Spring

^{sample} time (eastern): 11:44 am

depression diam: SW-NE 40'; NW-SE 50'

depression depth: 16.5'

vent diam: ~5', circular

Pool diam: SW-NE 73 yds; NW-SE 71 yds

Ownership: County Park

Uplands: All surrounding uplands are developed into a swimming and recreational park with numerous buildings, concrete terraces, slides, dive board, picnic tables and parking area. North shore is bordered by a 20' high gentle hill or bluff. Some chert flakes and a biface were found on top of hill.

Jackson Blue (cont)

Wetland: Clear, blue, shallow pool with one main circular vent issuing H_2O vertically. Located just off diving board to west. Vent opening has been widened with a backhoe.

Vegetation is sparse in swimming area with some dark green algae mats. Swimming area fenced off by a chain link fence right thru outflow channel. Water boil was not visibly very forceful. Many small to medium size Cypress and black gum trees on the forested southern shore.

Pool bottom has 40% algae coverage, 60% sandy.

October 1, 2001

Wakulla Springs + Natall Rise
Samplers: GHM, RCM, RPM

Weather: Clear, wind light + NE @ 10am. High today near $90^{\circ}F$ Low this a.m. $46^{\circ}F$. This is some of the earliest fall-like weather on record for North FL.

*The NWFWMDC crew graciously sampled Wakulla Spgs vent for H_2O quality and gave us the data. They also filled out the micro land use sheet. Our mission here this a.m. is to get GPS + spring description data. We also are running our second equipment blank and our first field reference sample (FRS) from this site.

WaKulla Spg.:

time: 12:22 east.

vent diam: 70' x 40' horizontal ellipse

pool diam: 96 yd N x 90 yd NW
circular

depression depth: 56 m

Ownership: Florida State Park

(Lee Norris: Park Boat operator/interp
went out w/ us on boat trip)

Uplands: Mixed hard wood and
some Loblolly Pine. West
shore and uplands near spring
are developed into State Park
lodge and full facilities, including
swimming, recreation, and river boat
dock area. North and East shore
and uplands are pristine mixed hard-
wood forest.

Wetland: This is one of the largest
and clearest spring vents in the
state. Today's water clarity was
exceptional. Three weeks ago, during
water sampling training, visibility was
slightly tannic from recent heavy
summer rainfall influence. Very little rain
in Sept. has allowed a clear up.

Hydrilla is areal problem here, but

volunteer divers have pulled much of
it out in recent years. Veg. in the
depression consists of mixed Hydrilla
and native blade grasses. This
spring serves as a recreation
hotspot for riverboat tours and
swimming. Stringently regulated by
State Park officials. Lush swamp
forest of Cypress, Black gum, etc near
shore. This spring and its issuing river
harbor high population densities of
all vertebrates -- fish, amphibians, reptiles, birds +
mammals due in part to protection from

10-1-01 Nutall Rise hunting
& fishing

time: 2:25 EST

pool diam: 66 yd NW-SE; 86 yd NE-SW

vent diam: Not sure -- dark water

depression depth: 50' max @ vent

Ownership: Private Ladson Prop?

Secchi depth: 9' 8" (2.94 m)

Uplands: Mixed hardwoods and
live oak. Entire perimeter of
river rise pool bordered by

trailers, docks, and houses.

To the N, ~1 Km, is an active, large dolostone quarry. Multiple ladders from docks down into H_2O .

Wetland: The H_2O today is relatively clear, as far as how black this river gets. Relative to springs clarity, however, the water here is slightly turbid and tannic-acid stained. Secchi depth measurement an absolute must.

There is a mat of water hyacinth attached to the north shore, just west of vent opening. Bottom not at all visible from surface.

Not much flow apparent. Possibly due to sampling near high tide (3:05 pm high tide, 8:54 am low).

10-2-01 Madison Blue & Troy.
samplers: GHM, RCM, RPM, JRC
Weather: Clear to P/c -- low
this a.m. $42^{\circ}F$ in Munson Sandhills,
 $\sim 80^{\circ}F$ in afternoon.

Madison Blue: Spring

time: 10:40 am

pool diam: 22 yd N-S; 25 yd NE-SW

depression depth: 23' (m)

vent diam: $\sim 6'$, circular

Ownership: Private -- State owned,
county operated park

Uplands: The uplands surrounding the spring are $\leq 25'$ high and sandy with mixed hardwoods and pines. A large gravel parking lot is within 100' on the NW side. Many picnic tables and constructed walkways all around periphery. Also there are a dive platform on south side and scuba dive entry platform on N side.

Wetland: Madison Blue Springs
issues on a 45° slant pointing
eastward toward the nearby
Withlacoochee River. No visible
boil in center of pool today,
but spring run pours swiftly into
the With River. Water was
slightly turbid and greenish blue,
but still clear enough to see
all the way to depression bottom (23.8').
The 150' spring run conflues
with the With. R. and there
was a definitive boundary line
between clear spring and tannic
river H_2O . Almost 100% of
the depression bottom covered
with dark green, slimy algae.
Heavy human swimming and diving
use. There are steep limestone
sidewalls with lush ferns and
mosses on N, W, S periphery.
Suwannee limestone outcropped.
The entire spring run also algae-
laden.

Troy Spring

time: 14:15 pm

pool diam: 42 yd N-S; 36 yd EW

depression depth: 61'

vent diam. estimate 8' diam, circularish

ownership: SRWMD-owned.

Uplands: Spring is surrounded by a
mixed pine and hardwood forest.
One low-impact cabin near
the south side. Sidewalls are
steep -- limestone here has
scalloped appearance. Sand on top of

Wetland: Troy spring is a large,
inundated, steep sided-sink hole
with a circular pool issuing
a short spring run ~ 100 m
to the Suwannee River. Run
flows East. Suwannee R. is
tannic today + there is a
sharp boundary between river and
spring water at their confluence.
Unfortunately this spring basin is

completely algae covered. Almost all surfaces covered by thick, slimy, dark green algae. I remember this place from my last visit in mid 1980's. Very little algae was present and the depression appeared deep blue as the water diffracted sun light against white sand and limestone surfaces. Today, H₂O appears green and has strands and particles of algae suspended. But is clear enough to see to bottom. A few Cypress trees around periphery near shore

NE-SW 35 yd
NW-SE 65 yd
E-W 105 yd

St. Marks Spring

Time 11:00 AM 10/03/01

pool diam. E-W 105 yd NW-SE 65 yd

NE-SW 35 yd

much wider just S of vent up to

140 yds + wide NW-SE

vent diam: approx 30 yds roughly circular

Ownership - Private

uplands - mix of pines/oaks/cabbage

palms. a small "dock" over

spring w/ a short bridge

ts. chunks protecting a short section of bank

mix of upland veg & swamp w/ cypress, maple, willow

Aquatic - area around vent is choked w/ hydrilla, some native veg. further from vent abundant native gr-ASS - *valsneria* (spelling) some water hyacinth mixed in w/ native veg

vent area is not very visible due to dark H₂O (Secchi depth = 6m)
Limestone that can be seen

in a few feet of water is covered
in algae.

Vent is limestone with almost a
sheer drop on NE side from
18ft - 48ft in just a few feet.
Pine sticking out into vent from N
Gently upsloping of vent to SE
425 A straight down on NW
Deepest part 62.3 ft
Elongated fracture

Ichetucknee Group

10-04-01 Blue Hole

time: 12:04 pm

pool diam: 29 yd E-W; 39 yd N-S

vent diam: ~ 6' x 15' elongate NE-SW

depression depth: 37'

ownership: Ich State park

Samplers: TMS, GHM, ALAN, Jim, Beck, RCM

Uplands: Mixed hardwood forest

Spring located in a lowland with
a nearby bluff to the east with
mixed hardwood - pines. Several
cypress and maples around
periphery.

Weather: P/C, warm. Highs 80's
low's 50's. Almost no wind.

Wetland: Water today is
quite clear with bluish tint. Aquatic
vegetation is mostly native
species and no hydrilla to
be found within Park boundary
(say, Park officials). Native
blade grasses cover 90% of
depression except for vent
opening and adjacent scours.
Nice visible vertical boil.
Spring water issues up out
of a vertical limestone vent
(Sawannee limestone). H_2O ~ 6'
deep at vent edge.
Run flows south and the pool
is fenced off at South end.
At the NW side of pool enters
the gentle spring run issued by
Cedar spring to the North.

Ichetucknee Main

pool diam: 34 yd EW; 29 yd N/S

vent diam: ~~single~~

depression depth: 17' in vent crack

time: 12:30 pm

ownership - State Park

Upland: Mixed hardwood, Pine, Oak.
Limestone wall and walkway
bordering the West side of pool.
A gravel parking lot atop NW
side bluff. Highest point ~ 15"
above H₂O level.

Wetland: Water is clear blue
and issues out of a NE-SW
running crack in Suwannee limestone.
Limestone bedrock outcropped covered
in some areas by sand. A thin
veneer of light green algae
carpets 90% of pool. But it is
so thin that it can be seen
through. No other aquatic veg
at this time. Pool perimeter

bordered by lush wetland vegetation
-- grasses and shrubs.

Ichetucknee Cedar Head

pool diam $\approx$ 20 ft

vent " $\approx$ 2 ft

depression depth - 6 ft

Time = 14:27

ownership - State

Upland - mixed hardwood pine/oak
Entirely forested surroundings
High ground on the West
side of spring touches pool.
15' highest point. High ground
also on east side, but is
farther away across a lowland
flood plain. Much Virginia
Chain fern in surrounding uplands.
Some Suwannee limestone in West
Side Bluff.

Wetland: Spring issues up vertically, with almost no flow, much particulate deposition in pool. One small area of flow where white sand remains cleared marks vent opening. Algae and particle matter carpet pool bottom. Water flows South out a small run which flows into Blue hole ~ 200m downstream. Some Sawannee limestone boulders in pool bottom. Many downed logs in pool. Water clear blue.

Mission Spring
depression depth 3'
vent diam - ~ 6'
pool diam - 10' x 15'
State Park

Upland -- Mixed hardwood & Pine. Old Spanish Mission Site to the E of spring. Completely forested uplands. High ground all around -- 15-20' above water.

Wetland: Spring issues laterally out of a cavern in a high bank (12'), flows North to the nearby Ich. River. All native aquatic blade grasses. Sawannee Limestone bank and boulders. Water clear blue. Thin sheen of algae -- see thru. Grass blades in spring run were cloaked in algae -- upper 1/3 of blades were covered, where sunlight had easy penetration.

10-8-01 → 10-11-01

Santa Fe River Vents, etc
sampled with Dave Hornsby

Camping this week on Santa Fe
from 10-8 → 10-11

Equipment blank + FRS
on 10-8.

Samplers this week: TMS, GHM,
RPM, RCM, Dave Hornsby

10-8-01 Santa Fe Springs

weather: Clear by noon, brisk N wind

pool diam. 64 yds N-S; 72 yds NE-SW

vent diam. unknown

depth: 75-83' (80')

Ownership: Private.

1.47 secchi

Uplands: A mixture of hardwoods
and some pines. Live oak
common. All surrounding uplands
are 15-20' ^{high} and steeply above
the circular pool. Other words,
pool entirely surrounded by steep-
sided sandy banks. 5 houses
are evenly distributed around
periphery.

Wetland: Large circular
pool, very deep conical sink hole,
steep-sided. Cypress abundant
at and near H₂O line. No
visible boil. Water tannic today.
D. Hornsby said he'd never seen
it tannic before (it's usually
clear). No non-native veg
visible. Some Hydrocotyl mats
near edge. Short spring run to
the Santa Fe flowing SE.

10-8-01 Treehouse Spring

pool diam: 42 yds NS 58' EW

vent diam: Unknown (tannic H₂O)

depth: 9.44

Ownership: Private.

Weather: Cloudy at 14:30

The front that passed yesterday
in Tally is stalled over NGFLA

Uplands: Spring pool is surrounded
immediately by lowland swamp
forest with abundant cypress
maple and laurel oak.

50 yd from E shore is a high ground bluff that rises ~ 10-12' higher than flood plain. Mixed hardwoods up there. No houses, pristine.

Wetland: Circular pool, tannic H₂O, no visible boil. Some hyacinth mats (small). Flows west into adjacent Santa Fe R. No visible non native veg other than Hyacinth. One small rope swing. Secchi 1.0m

10-8-01 Columbia Spring
pool diam. 25 yd NS x 50 yd EW
vent diam: 12'
depth: 25'
Ownership: Private
weather: Cloudy @ 17:00

Uplands: Surrounding forest is lowland swamp forest that gradually rises to mixed hardwood uplands toward the E and N. One house 200m to E.

Wetlands: Spring issues out of a circular vent and pool and flows copiously West into the nearby Santa Fe R. Water very tannic today. Algae growing on Suwannee limestone boulders. Native blade grasses, long and thin, present. No non natives. At the bottom side (West) of pool, spring H₂O flows over a man made wall of Suwannee limestone boulders.

10-9-01 Santa Fe Rise

weather: Clear, E-SE wind.

pool diam: E-W 58 NS 55 open to SE

vent diam: ?

depth ~~44~~ 50.5'

ownership: State

Uplands - Pine/oak floodplain

w/ numerous sink holes. Land

quickly rises to ~8' above rise + levels

Wetlands - narrow band of ^{off}

of cypress around pool varies

from < 1 ft to > 10 ft wide

no bog seen. Check springs

report card for veg.

The large ditch ^{and} present ground
edges. H₂O very tannic today.

10-9-01 Hornsby Spring

At Camp KalanKua

weather: Clear to PC @ 12:53

pool diam: 52 NS x 49 E-W yds

vent diam: ?

depth: 34' (Note, we were not
allowed in the spring, but a
sign said there were depths
up to 50')

Ownership: Private, Camp
KalanKua Bible camp.

Uplands: All landscaped and
developed into lawns, walk
ways and residences. A
recreation development. Some
Live Oaks remaining. Uplands
start at 6' above water level
and rise up to ~15'.

Wetland: Pool periphery is totally
developed into boardwalks, slides,
and swimming facilities. A floating
walkway extends across pool from
NW-SE. H₂O is greenish, very

slightly tannic. Secchi depth
8.5m. H₂O run flows WNW to
the Santa Fe no more than
1/4 mi. Algae is growing on
rocks inside the spring. A Hyacinth
mat also present.

10-9-01 Devil's Ear Spring
pool diam: 35' x EW, 20' x NS
vent diam: 25' x 15' oval shaped
depth: 34'

Ownership: Private -- Ginnie Spgs
weather: @ 16:00. PC to Cloudy
Equipment blank done before -
hand (#4)

Uplands: Developed recreational
swimming and picnic area.
Some mixed hardwoods and pines.
Adjacent high ground just 3' above H₂O.

Wetlands: Lots of Hydrilla
in spring pool (75% coverage)
Some algae on hydrilla and
native blade grasses. Clear blue

H₂O today. Large forceful
bail. Santa Fe river is
adjacent to spring pool,
and there is a sharp
boundary between tannic
river H₂O and clear spring
H₂O.

10/10/01

Holton Creek Rise

pool diameter: SE-NW 75', SW-NE 59',
vent "100"?

depth 95' - highly variable - very irregular
bottom

Upland: banks 20-25' high

upland veg almost to water
palmetto, oak pine sweet gum, hickory
Sawtooths exposed in banks

Wetland: bottom covered w/ algae
very little other veg can be seen.
numerous logs. Very Tannic H₂O

Holton Creek runs southward
from pool

10-10-01

Alapaha River Rise

pool diam: 25 yd ESE-WNW; 36 yd N-S

vent diam: ?

depth: 72' max

Ownership: Private?

Weather: Overcast, low 80's

1.5 m secchi

Uplands: Mixed hardwoods + loblolly pine. Very steep vertical sidewalls. Suwannee limestone, scalloped, rising to 25' above water. Walls moist and moss-laden. Overhanging live oaks.

Wetlands: Tannic, but clear H₂O. Some algae on limestone walls. Outflow run goes south 1/4 mile to Suwannee R. Vertical limestone walls. Water volume issuing out today clearly mag. 1.

10-11-01

Siphon Creek Rise

pool diam: 15 yd N-S; 30 yds E-W

vent diam 25' long

depth 11'

Ownership: SRWMD

weather: Clear to PC @ 10:45 am

Uplands: No nearby uplands - all surrounding forest is lowland river floodplain forest, dominated by black gum and cypress.

Wetland: Some *Volcineria* in pool; also some long, narrow blade grass. Some duckweed near banks. Voluminous visible boil today, issuing vertically out of vent adjacent to Santa Fe River. Beaver foraging scars on nearby trees. Adjacent ground is 2' higher than H₂O level, with *Viviparus* shell marl outcropped. H₂O is clear, but moderately tannic. Santa Fe River also tannic.

10-11-01

Lafayette Blue Sink

pool diam: 19 yds N-S; 34 E-W

vent diam: 20' x 12' oval

shape cavern entrance

depth: max 22' max

Ownership: County Park

Weather: PC to MC @ 13:30

Uplands: Developed county swimming and recreation park. Some boardwalks and walk ways. A few pines live oaks and other hardwoods. Upper Ocala limestone outcropped. Adjacent high ground is 20' above H₂O.

Wetlands: Bluish-green, slightly turbid H₂O flows out of a horizontal vent.

Outflow goes East into nearby Suwannee R. nearly 100 m to East. H₂O has suspended algae particles and very thick algae all over limestone banks.

There is a 20' wide land bridge spanning N to S over the outflow channel midway down to the Suwannee R. A couple Cypress near H₂O level.

10-15-01 thru 10-18-01

Chassahowitzka, Kings Bay, Homosassa, Weeki Wachee, with SWFWMD folks

10-15-01 Chassahowitzka group
samplers: RCM, RPM, SWFWMD
weather: front passed yesterday clear to P/C today. Brist NW wind. @ 10:45 am

Chassahowitzka main:

samplers from SWFWMD: Rob Degraff, Joe Haber; RCM, RPM
pool diam: 49 yds N-S; 45 yds
EW (from vent to boat ramp)
vent diam: 1' x 1' circular
depth: 13.5'
Ownership: USFWS

Uplands: No nearby uplands.

Wetland: Spring pool and run all surrounded by lowland river hardwood swamp forest with abundant cabbage palm, cypress and hardwoods. H_2O clear greenish. The vent is at the head of a long open H_2O (133 yds). To the ENE, spring run with surface influence (clear today) comes in, and it flows over the vent. Boat ramp with facilities to the WSW of pool. Aquatic veg is common. 50% Hydrilla coverage. Some Hyacinth mats. Some algae on Hydrilla. No limestone outcropped. Boil visible

Chass.

10-15-01 Spring No. 1
weather -- clear, NW wind @ 11:55 am
pool diam: 23 yd NS X 27 yd E-W
vent diam: 6', circular
depth: 8.3'
ownership: US FWS

Uplands: No nearby uplands.

Wetland: Pool surrounded by lowland swamp forest with cabbage palm and mixed hardwoods. Residences to the south through forest. H_2O issues vertically from a circular hole in bedrock limestone (Ocala?). Another vent just 10' south of main vent. Again, a surface influenced stream, clear today, flows into spring pool from West. Spring run flows eastward toward Chass. Main. Some backhoe scars on bedrock limestone in spring pool. H_2O clear bluish.

Nice visible boil. Algae all over limestone. Some Valoniopsis blades in West end of pool.

10-16-01 Homosassa No
1, 2, 3. (3 vents)

Samplers same as yesterday.

Weather @ 10:30am Overcast
mid 70's.

Homosassa vents 1, 2, 3 inhabit
the same spring pool: 63 yd N-S
95 yds E-W.

max depth: #1 67'; #2 65'; #3 62'
Ownership: State Wildlife Park

Uplands: no nearby true uplands

Wetlands: Periphery of spring pool
is developed into an interpretive park,
with walk ways, benches, and
interpretive signs. Manatees are

captive in spring pool. Inter-
pretive talks given on them
while being fed. Feeding tank
in spring pool. Floating pavilion
in spring pool. Extends down
into water with see-thru
glass into H₂O for wildlife
viewing. Pool is teeming w/
fish, like snook, sheeps head
tarpon, jack crevalle, snapper,
and gar. Pool surrounded addi-
tionally by lowland hardwood-
cabbage Palm forest.
H₂O clear blue, slightly turbid.

Sampling order: 2, then 1,
then 3.

Spring run flows Westward. ~1/3 mi
downstream is a fence across
river to keep out boats and
keep in manatees.

Some algae in pool, most
rocks thinly covered.

Sampling method:

Pipe with 3 tubes for each vent runs into pool with outlet box @ 10ft from spring pool. 3 valves in box for each vent (#1, #2, #3).

Each vent is purged for 10 min as there are gallons of water remaining in tubes from last sampling effort. Use a tripod filter instead of inline like ours. Again 3 readings, 5 min apart, are taken to ensure stability. Last reading is officially recorded.

Raw Eh is additionally taken which is then converted into a redox potential value.

Not allowed to swim here

10-17-01 Kings Bay Spgs.
Tarpon Springs
Hunter Springs

Samplers: RCM, RPM and SWFWMD crew: Eric Dehaven, Cathryn Wolden, Dave Dewitt

Weather: @ 10:30 am: MC with high cirrus clouds. Front just passed last night, gusty winds, cold -- mid 50's. No rain chance.

Tarpon Hole → 158' NS, 185' EW
pool diam (100' circular opening)
vent diam: on eastern wall, there is a triangular vent fracture inside which is a 4' x 1' depth: 58' where sampled (60' max) horizontal vent

Uplands: Some islands of Palm-Cedar coastal hammock to north, houses to the east and south.

Ownership: Crystal River NWR for Islands, Private on mainland to E and S.

Wetland: A large circular hole
in Ocala limestone below open
brackish bay water. Visible
boil at (low tide). At least
one Manatee present in
spring today. Much algae
all over rock walls, Grasses and
rushes present around pool
perimeter - - brackish marsh
with islands of palm-cedar-
hardwood coastal hammock.
H₂O is greenish with particles
suspended. (3.9 m Secchi depth)

Wood Storks, grackles, sawanee cove
manatees, ibis, great american white
egret, big blue heron, mallards

OVER

Hunter Spring

pool diam 70 yd circular
vent diam ~ 2' circular
depth 13.2'
ownership: Private to the south
County Park on the North

Uplands: County Park on the North shore is 3-4' above mean sea level, developed for swimming and recreation.

To the south, east & west, the uplands (5-6' high) are extensively developed with apartments and residences. A concrete sea wall entirely surrounds pool (except outflow & inflow).

Wetland: Clear H₂O boiling up from vent 13' off the bottom at a side creek leading into Kings Bay.

Bottom choked with thick, green filamentous algae (Lingbya). Floating swimming dock. Sandy bottom with some limestone near vent. This area closed to swimming this summer due to bacterial presence. Some Hydrilla

Used a Keck Submersible pump at both Hunter & Tarpon Hole Springs

10-18-01 Week: Watchee
weather @ 11 am Blue Skies & N wind
pool diam: 55 yd E-W; 70 yd N-S.
vent diam: (SWFWMD pub)
depth: 45' max
ownership: SWFWMD just acquired all property including private park.

Uplands: almost completely comprised of Week Watchee

Spring water park structures
Picnic table pavilion & underwater
viewing area. Water slides going
into shallower pool adjacent to
main vent. There are scattered
shade trees - Sweet gum, magnolia
& more trees along Spring run
100-200 yds NW of vent.
US 19 runs parallel to vent on
east side. Nearest high ground to East

Wet. slopes up to 15' above H_2O level
Bright green & duller filamentous
algae within vent pool. Also,
man-made structures for mermaid
show such as a castle & pla forms
Max depth of pool is 4 ft though
vent itself is much deeper -
150 ft down into cavern system.
Saw only peninsula cooters (no
Swanee cooters). Also softshell
turtle (*Apalone ferox*), needle fish
& smaller fish. Vent issues from a
NW to SE - running fracture in Ocala ^{lime} stone
Spring run is 4-5 miles to
gulf. Large visible boil.

10-22 - 10-25 week

10-22 Fanning Springs
samplers: GHM, RCM, RCM
weather: MC -- tropical moisture
rising up from South FLA.

pool diam 69 yd N-S; 48 yd E-W
vent diam -- 1' circular
depth - 12.2'
ownership: State Rec Area

Uplands: Uplands to E and
S of pool rise sharply to
20' above H_2O level. Mixed
hard woods & live oak atop
high ground. Most slopes & high
ground developed into swimming
& rec. area. Numerous walkways
and a bath room & Visitor center
nearby. Slopes lush with veg
and ferns

Wetlands: H_2O clear and bluish, issues both horizontally and vertically from spring pool -- multiple small boils in sandy bottom. Main vent discharges from Ocala limestone wall on S side. Nice visible boil. Moderate algae in patches. Main pool thinly covered. Bottom mostly sandy. Some aquatic veg -- all native. Swimming ropes and floating walkways present. Spring run flows North for 40 yds then turns sharply west and flows 150 yd to the tannic Suwannee. Many cypress near H_2O . Boat traffic is not allowed due to a wooden barrier -- walkway across run. Ocala limestone outcropped. Also, there are numerous springs flowing out of limestone walls as little run-lets into main pool.

10-22-01 Manatee Springs
pool diam 32 yd N-S; 48 yd E-W
vent diam 4' x 8'
depth: 25.2'
ownership: State Park

Uplands: Surrounding uplands developed into swimming and rec. area.
South shore heavily built up with walkways and rock walls. North shore pristine.
South shore uplands rise to 12-15' above H_2O . Some mixed hardwoods and large live oaks. Slopes have thick chain fern and outcropped Ocala limestone.

Wetland: H_2O issues
forcefully, vertically out
of pool bottom, actually
out of the south side of
conical depression. Water
flows out of a horizontal
oval-shaped vent, so
strong that it will blow
your mask off. Limestone
ledge 1' under H_2O surface
on south side. Thick algae
covering 75% of rock wall.
Bottom of depression
is also sandy with several
large logs. Many cypress with
large knees along N & E shores.
Big blobs of algae are suspended
in H_2O . Water sky blue.
Some native aquatic veg. H_2O
level seems to have lowered by
1 foot very recently. 50%
fall color in cypress needles

10-23-01 Rainbow Group
weather: very thick fog and
low clouds/mist @ 9am.
samplers: RCM, RPM, SWFWMD
Personnel, Joe Haber &
Chris Tomlinson

Rainbow #6

pool diam N-S 20 yd; E-W 25 yd

vent diam 1' x 2'

depth: 16.9'

ownership private, on both
N & S shore of river.

weather - Cloudy

Uplands: Uplands to the south
gently rise to a sandhill
up to 20'. Houses near river
Some longleaf pine - turkey
oak on sandhill and mixed
hardwoods nearby on gentle
slopes. To the N there are
no visible uplands.

Wetland: This spring ^{lies} at the bottom of the Rainbow River closer to the S side. conical depression down to vent at bottom. H₂O blowing out to a boil on river, clear and lightly blue. Very thin algae. Patches of native Valcinereg blade grass all around depression. 45° rock walls leading down to vent. Whole river crystal clear. Many other grasses and sedges near shore on N & S sides. Ocala limestone outcropped in sheets all over river bottom and in spring. Some low-lying Hydrilla on S side of River.

Rainbow #1 (Head of River
pool diam. ^{N-S} 110 yd x 120 yd E-W
vent diam. - 8" x 1"
depth 9.9'
ownership: State Park

Uplands: Surrounding uplands on all sides (W, N & E) rise sharply to 20'-25' above H₂O level. Mixed hardwoods and some remnant longleaf pines along with developed walkways and State Park facilities all around. Some limestone boulders Big live oaks w some strangler Fig on them...

Wetland: Large spring pool with multiple vents and roped-off swimming area. H₂O clear sky blue. Aquatic veg present in patches dominated by native plants, blade grass, and some Hydrilla. Mostly sandy bottom with Ocala

limestone rubble near vents on
N side of pool.

No boats (motor) allowed
within $\frac{1}{4}$ mi of head
spring. Some algae < 50%
coverage. Visible boil

Rainbow #4

pool diam 25 N-S x 25 E-W yds
vent diam 1' x 2'
depth 10.9
State Park

Uplands: Same as description
for spring #1

Wetland: Clear, sky blue H₂O.
Shallow spring depression
on the bottom of river just
120 yds downstream of spring #1
Nice patches of aquatic veg
some Hydrilla. Some algae
< 50% coverage, thin layer.

Vent angle $\sim 45^\circ$. Visible
boil. Ocala limestone at
vent. Sandy otherwise.
Aquatic veg rich, with 75%
coverage. Less than 25%
Hydrilla. Within State Park
no motor boat zone

Rainbow - Bulbline Spring

pool diam 15 yd N-S x 25 yd E-W
vent diam 8" w/c boulder fell nt is blocking
depth 2.8' Still in S.P.
"resource protection area"

Uplands: Much more natural - no structure
mixed hardwoods - brazilian pepper, oak, cabbage
palm. Rise sharply to 15'

Wetland: Apple snail eggs on veg
Spider lily's flowering, lots of
different native aquatic plants
opens into sandy pools. See
grass (thick + thin bladed). Some
algae (< 50%) filamentous

Large bubbling boil. Flowing
big time! Downed trees surrounding
vent. Spring run flows WSW
~200 yds to Rainbow River
Vent flows vertically with
enough force that the boil
rises 4'-6" higher than
surrounding H₂O level.

10-24-01 Blue Spring
pool diam 45' x 35' x 30' deep
vent diam 10' x 15' @ weather @
depth 20' 10am heavy
State Park fog burning off
Tom Scott, GHN, RPM, RCM 76°F

Uplands: A mixture of
Live Oak, Cabbage Palm
and saw palmetto. Rise
sharply to 15-20'. Steep
side walls of Nashua
marl limestone and sand
on top. Other hardwoods
Sidewalls well vegetated with
ferns and palmetto.

Wetland: Gorgeous steep-
walled spring depression
with greenish clear H₂O.
Very forceful vertical boil
issuing from a vertical
crack, vent. Patchy algae
throughout depression >50%
coverage. Ocala & Avon Park
limestone down near vent.
Sand and limestone rubble bottom.
Spring run flows SSE 1/3 mi
to the St. John's river.
Very abundant Pseudemys floridana
No P. concinna. A. mississippiensis.
SJR very tannic today.
Logs across vent.
Some Button bushes near shore
on S side. Spring run
teeming w/ large Gar.
Some additional small boils
in North Sidewalls.

10-25-01 Alexander Spgs
Pool diam: 100yd N-S; 86yd EW
vent diam 1'
depth 25'
USDA Forest Service

GH/M, Tom Scott, RPM, RCM

Uplands: High Ground on the
south side rises to ~12'
gently. Swimming and camping
facilities there. Rock wall, Cabbage
Palms, Live Oaks & mixed hard-
woods.

Wetland: Large pool and
conical depression with
forceful vertical spring boil.
Clear, bluish green, turbid. Sand
and limestone cobbles blowing
upward. Native aquatic veg
dominated by Valcinerea, some
Lillies on North side. Pool
mostly sandy bottom. Native

grasses and plants all
around edge. No motorboats
allowed in spring pool.
Ocala limestone outcropped
near vent, Rock ledge
running N-S along bottom near
vent. Multiple smaller vents.
Apple snail eggs present.
Thin algae in patches. Smallest
amount seen in any spring yet.

Calibration 10-24-01 - 6:50pm

DO	Ph 7	Ph 4	pH 10	SpCon					
100.1	100	7.0	7.0	4.09	4.0	0.8	0.0	156	257

10-25-01 Alexander Spgs
pool diam: 100yd N-S; 86yd EW
vent diam 1'
depth 25'
USDA Forest Service

GHM, Tom Scott, RPM, RCM

Uplands: High Ground on the south side rises to ~12' gently. Swimming and camping facilities there. Rock wall. Cabbage Palms, Live Oaks & mixed hardwoods.

Wetland: large pool and conical depression with forceful vertical spring boil. Clear, bluish green H₂O. Sand and 'limestone' cobbles blowing upward. Native aquatic veg dominated by *Valcinerea*; some Lillies on North side. Pool mostly sandy bottom. Native

grasses and plants all around edge. No motorboats allowed in spring pool. Ocala limestone outcropped near vent, Rock ledge running N-S along bottom near vent. Multiple smaller vents. Apple snail eggs present. Thin algae in patches. Smallest amount seen in any spring yet.

Calibration 10-24-01 - 6:50pm

DO	Ph 7	Ph 4	pH 10	SpCon					
100.1	100	7.0	7.0	4.09	4.0	0.8	10.0	156	257

10-25-01

Silver Glenn Spgs.

pool diam: 66 yd N-S x 59 E-W
vent diam: horizontal slit 12' x 1'
depth: (see sheets)
ownership: Private

Uplands: Developed into swimming and rec area with walkways and burns and benches all around. Viviparid shell marl and midden material outcropped in areas. Gentle rise in slope to about 12' to West and all around. Live oaks and red cedars. Wax myrtle around edges.

Wetland: Very few wetland plants around pool edge. Some aquatic veg. dominated by Valisneria and Linbya algae patches.

Blade grass has algae. a little Hydrilla. Conical depression. Horizontal elongate vent with two larger openings at each end. Bottom a mix of Viviparous and sand. Upper Ocala limestone outcropped at vent. Some consolidated Vivip. marl as well. Human artifacts like pottery, chert, and animal bones present. A mixture of natural marl and Human midden. Mullet and Red-bellied sunfish. Two vents in pool, on W & E side. We sampled the E vent. Two ropes closing off spring pool to boats. Big house boats anchored outside it. Wide spring run flows Eastward to Lake George. Large boil. Collected Ocala limestone boulder from vent with large Lep fossils. The Spring run is

heavy with boat traffic on the weekends. Will Ebaugh (USFS) estimated almost 1000 boats so you could walk from one to another within the $\frac{1}{3}$ - $\frac{1}{2}$ mile run from Lake George to the spring vent. During our visit, 5 or 6 large houseboats were present. Area is roped off to motorized vehicles about 200 ft from vent but heavy swim traffic -- may be the cause of sparse vegetation. To the west of main vent is a small inlet with another smaller vent -- a large hole about 25 ft thick with mullet. This area is roped off + rich with native grass + algae.

10-30-01 Steinhatchee

pool diam: 24 yd N-S ^{Rise} x 10 yd E-W

depth: 12'

vent diam: ?

secchi depth: 1.87m

ownership: SRWMD

weather: crystal clear and cool. N wind 5-10 lows up. 30's highs in 70's

samplers: GHM, RPM, RCM

Uplands: Surrounding uplands are planted slash pine (ca. 12-15 yrs) with some hardwoods and live oaks near pool. Highest elevation to the south is ca. 10' above H₂O; to N is ca. 12' " " " Very Karstic with numerous fissures and sinkholes near pool. A few cabbage palms. Steep side walls up to 3' high of Ocala limestone.

Wetland: H_2O emerges out of ground from small pool.

*Note: there is an island in the middle of the depression covered in Cypress & Knees.

Whole pool with island in it measures 35 yd E-W x 50 yd N-S

Very little flow today. Tannic.

Some thin algae coupled with particle deposition, where you can see to bottom.

Maidenhair fern on sidewalls & dripping. Very little aquatic veg seen thru tannic H_2O .

Potamogeton present.

10-31-01 Falmouth Spring

pool diam 29 yd N-S; 27 yd E-W
depth 39'

vent diam ~5'

ownership: SR WMD

secchi depth 8 meters

Uplands: Steep sided walls rise to 25-30' above H_2O all around pool and run. Slopes and hill top

covered in mixed hardwood / loblolly pine forest. Limestone (Suwannee) outcropped near pool edge and along run. East side of pool and run has a raised boardwalk leading from uplands to pool.

Wetland: H_2O in pool and run turbid with algae particles, otherwise clear. Bottom & sides covered with thick filamentous algae. This spring is a karst window with an exposed run 152 yd long running N-S. Flow is from S to N. No visible boil. Entire pool and run steep-sided. Suwannee limestone outcropped in run & pool. Ferns on limestone boulders. Very little flow in run toward siphon.

11-5-01 Spring Creek

RCM, RPM, GHM
weather Clear blue skies,
breezy, lows mid 40's,
highs mid 70's

Spring Creek Rise #2

pool diam 50 yd N-S, 40 yd E-W
vent diam
depth 75' max

Uplands: Coastal Cabbage Palm-
Red Cedar-Hardwood hammock
Town of Spring Creek borders
the S edge of pool

Wetland: Coastal brackish marsh
with saw grass all ground
edge of pool. Exposed peat
banks at low tide. - St Marks
limestone ledge on N side

of sink under 5' H₂O.

This spring is a very
deep hole with a huge
forceful boil. H₂O slightly
tanning. Sampled at 10:30 am
low tide. Huge amount of
fresh water pouring out the
short 100 m long run to
the estuary or open H₂O.

Fisherman fishing in
vent. Conical, steel sink
depressor. Algae-- probably normal
for these brackish conditions.

Spring Creek Rise (#1)

pool diam: 51 yd N-S 50 yd E-W
vent diam:
depth 43' max

Uplands: 5-10' above H₂O, flat.
All the town of Spring Creek.
There is a drainage pipe
leading into spring pool from
town. All the N shore is a
concrete sea wall. Floating
docks on S side of pool.
Old boat ram on E side of pool.

Wetland: Tidal brackish marsh
around pool. Boil is huge with
tremendous outflow into
estuary. Some floating docks
South. Drainage pipe into
wetland (pool). St. Marks
limestone. Conical depression.
Lots of algae -- not
filamentous -- possibly due to
normal brackish conditions.

11-8-01 Field trip w/
Russ Fridenborg & Jim Stevenson

Blue Spring Volusia:

- Choked w/ filamentous algae
& don't know why -- NO_3 is
fairly low, too.

DO low -- possibly due to
algae respiration.
this also isn't good for inverts.

Very High conductivity today

780% algae coverage. No
aquatic plants (vascular)
Very rare to see no vascular
plants in a spring.

Silver Glenn): Lowest Nitrate
Gainer + } 2 ppm
Alexander }
Juniper } low NO_3 Fanning highest
40 ppm

11-15-01 Silver Springs

Main, ^(Abyss) Reception Hall, Blue
Grotto.

Weather: Thick cloud cover,
intermittent light rain, breezy.
Borderline sampling conditions.

Samplers: RCM, GHM, RPM.
accompanied by Tim Curran
from USGS. We're filling a
few bottles for him. Alamonte
Springs

Main Spr.

pool diam: 100 yd N-S, 65 yd E-W
depth: 33'
vent diam -- 20' long, horizontal
vent. 12' high.

Uplands: Surrounding lands
rise to about 12' above
H₂O; Everything is developed
into an adventure theme park.
Live oaks & Palm trees present.

Wetland: Pool edge built up
with rock and wooden
walls on N & W sides.
Glass-bottom boat docks
on W side. Rich aquatic
vegetation -- *Valisneria*
& small blade grass. Algae
thick on blades and on
rocky substrate. The
depression is large and
deep, steep-walled. Many
fish -- bass, sunfish, Florida
cooters & Apalone.

No visible boil, but there
is flow out of the vent
at the bottom. Horizontal
vent at bottom of pool
on NE side, rock cliff.
H₂O blue -- suspended algae.
Many glass-bottom tours.

Reception Hall. (Now called Abyss)
deep Crack, vertical

depth: (81' max)

pool diam: 30' N-S, circular

vent diam: 2' crack

Upland: Uplands to South
rise to nearly 6' above H_2O
Forested w/ mixed hardwoods.
All river to North, then
recreation park,

Wetland: This side spring,
is on South side of
Silver river $\frac{1}{4}$ mi down
river from main spring.
It is one of 3 side
springs here. *Valcinerea*
grass around side slopes
of depression. Rich
veg. Cypress and black
gum along shore. Apple
snail eggs present.

This spring is a vertical
crack in Ocala limestone
small vent, H_2O blue, many
fresh water mollusc shells
boiling up in vent. Some
algae, less than main
spring. An ^{old} boat is wrecked
and grown over w/ grass
in algae on N. side of
depression. H_2O Blue
Many glass-bottom tours
No visible boil.

Blue Grotto

pool diam: Circular side
spring -- 35 yd diam.

pool depth -- 21.6'

vent diam -- 1.5'

uplands: High ground to the
south -- rises about 15'
above H_2O . There is an
animal zoo here with
Barbours sheep, Rhesus
monkeys. Fort King water-

way, in between spring pool
and high ground. ^{is a} Man-dug
channel for passage of zoo
boat tours.

Wetland: Some blade grasses
depression bottom mainly
sand/shell grains. A 10-12'
gator clinging to bottom
near vent. Shell debris
blowing up in vent, visible
boil here. Blue th₂O. Cypress,
Maple, and Black gum
on South shore.

Again, this is a side
spring along Silver river
channel on the South side.
Cypress trees in 50% fall
color.

1-30-02

Magnitude Two's

1-30-02

Ponce de Leon Spring
Volusia Co. RCM, GCM, RPM

spring pool dimensions: 56 yd EW, 63 yd N-S
pool depth: 28.0

water color: light green

aquatic veg: none but algae patches

algae: patchy, suspended filaments

High ground: Slopes gently to east ^{South} to 6-8'
above H₂O level

Surrounding environment: To North &
west is swampy lowlands of St Johns Riv.
system and Lake Woodruff. Dense swamp
forest. Immediate surroundings is heavily
landscaped & built-up State Rec area.

Utilization: State Rec area full
facilities

description: Photos by RPM.

The spring pool is in a steeply sloping conical depression. One vent issues water vertically in center of pool. Nice visible boil in January 2002. 100% of spring pool edges are concrete wall with occasional ladders for swimming access. Concrete weir built over outflow acting to catch H_2O . Pool H_2O is perched 3' higher than issuing spring run. Run flows westward into nearby Lake Wood ruff. Both sides of run densely forested w/ cypress & mixed hardwoods. Bottom is sandy, except for the vent opening in center. Vertical cave opening. One Spring.

Tony Russell, Park Ranger said they had a copy of an Audubon pub. describing spring & flow

1-30-02

GHM
RCM, RPM
Juniper Springs

pool dimensions: 40 yd E-W, 30 yd N-S
" depth: 11.7' (3.6 m)

water color: sky blue

aquatic veg. > 50% *Valoniopsis*

algae: thin, sparse

high ground: to the south & west, high ground rises to ~ 8' above H_2O

Surrounding environment: Mixed pine, palm & Live oak.

Utilization: owned by USFS, operated by concessionaires. Full facilities. Canoeing, camping, etc.

Description: This spring has an oval pool. Extensively landscaped & developed. Limestone boulder wall entirely surrounding pool. 3-level terracing around pool. Multiple swimming ladders

Shade oaks all ground. Picnic facilities all around. Run flows generally eastward (+north) about 10 mi to the S.J.R. (Lake George). Rec area + upper $\frac{2}{3}$ of spring run is within the Juniper Prairie Wilderness Area. 20' downstream from pool is a mill with a waterwheel on south side of spring run. Juniper run is a wilderness canoe trail from head springs to US 19 wayside. Also, there are an east and west vent in spring pool. We sampled east vent (larger, deeper.)

1-30-02

Fern Hammock Spring

52 yd E-W, 25 yd N-S
depth: 5'

color: light greenish blue

aquatic veg: almost none

algae: 75% covering on bottom except in the vicinity of scoured boils.

high ground: none adjacent. Land surrounding spring is swampy lowlands with dense pine, palm, and mixed hardwoods.

Utilization: USFS, operated by concession. This spring is maintained in a more pristine condition with forest surrounding

Description: This spring is in a pool along a side braid of upper Juniper Run down from ~~where~~ Juniper springs. There are at least 20 vertical sandy

boils in the entirely sandy bottom. A wooden bridge arches over the center of the elongated pool. A clear stream flows into pool from S side, then H_2O flows out of pool on NW side. Much of the pool is under a hardwood canopy. Banks are pristine and rise to 3' above H_2O . No swimming allowed. 2 effluent pipes drain into pool, probably from an interpretive pavilion on the NE side. Pipe made of ceramic, probably sewer. They appear abandoned.

1-31-02

Salt Springs (ONF)

pool dimensions: 43' NE-SW, 63' NW-SE
" depth: average depth = 2', overboil = 8'

water color: clear, light blue

aquatic veg: abundant native grass + hydrilla
algae: thin patchy coating

high ground: to the N, S + W, it rises to
x 15-18' steeply to the top of sand
hills.

surrounding environment: Sandhills surround;
harbor landscaping, live oaks and palms
and sidewalks.

Utilization: Rec. Area. Full facilities
picnic, swimming. Nature obs.

Description: This spring has multiple
boils. There are 4 large, noticeable
ones. We sampled the boil in the
north corner of spring pool nearest
the concrete wall. Shallow pool
on average except over a boil.

Spring run flows south several hundred yards to Econf. Cr.
Large boil today. Crystal Clear H₂O.
North shore is erosion-controlled with concrete bags.

Cypress Springs 2-5-02

RCM, RPM, GHM cloudy, cold
40's

Pool dimensions: 38 yds N-S; 44 yds E-W

" depth: 26' cavern goes to 65'

water color: light blue

aquatic veg: small patches of native grass

algae: thin patches

high ground: nearest high ground

is 150 yd west and rises to about 20-30'

above H₂O. Shops & facilities here.

surrounding environment: Cypress springs

is located within Holmes Creek

lowland flood plain. Dense gum-cypress forest.

Utilization: Owned by Harold Vickers. Developed into recreation park. Swimming, SCUBA, picnicking allowed. About to change ownership to bottling company... Bill Cobb, consultant, Panther Creek, Inc. 850-643-3061 Telogia, FL

Description: Cypress Springs is probably a first magnitude spring (USGS & others). It occupies a conical depression, sandy & limestone bottom. (USGS 138th Loxleir) (Willis 102). Large, voluminous, vertical ^{state} boil in pool center. Limestone outcropped all over pool. Spring run flows south ~ 1/4 mi to Holmes Creek. Harold built a dam around the north side of the spring to block flow of an incoming tannic stream. Its flow was diverted to below the spring pool on the west side. Aesthetic purposes. On NW side of pool, there are wooden entry platforms & ladders. Nice river swamp forest all around spring.

circular spring pool

cloudy, cold, highs in 40's

Beckton Spring 2-5-02

RCM, RPM, GHM

pool dimensions: 53 yd E-W; 60 yd N-S

" depth: 19.6'

water color: blue-greenish

aquatic veg: sparse, some Hydrilla in run
algae: thin patches

high ground: High ground along west
bank steeply rises to 12'-15'
above H₂O, then continues to >20'

surrounding environment: Lowland river
swamp floodplain on east side,
high ground w/ mixed hard wood & pine
on west side.

Utilization: Owned by Harold Vickers.
He wants it is awaiting permission
to commercialize it into recreation
park like Cypress.

Description: Circular spring pool
in a conical depression. Sandy
bottom with some limestone
boulders near vent. On east side

of vent, a finger channel of
Holmes creek enters into pool.
All H₂O outflows down a
straight spring run due south,
1/4 mile, to Holmes Creek.
Run is clear and averages 1.5'
deep. Pool and run bordered
by Gum & cypress. On high
ground is a house & future
camp sites. Boat ramp on
NW side. Small, but noticeable
boil.

2-11-02

Blue Hole (Jackson)

pool dimensions: 53 yd E-W, SE-NW long axis =
86 yds.

water color: dull green and murky
secchi depth: 2 meter

aquatic veg: thick water lettuce under bridge
algae: thick, large patches of filamentous
green algae ubiquitous >50%.

pool depth: 4'-26' (Rosenau, et al)

high ground: West side of pool gently rises to 8-10' above H₂O.

surrounding environment: West side of pool is grassy and developed into a swimming park. It harbors tall loblolly pines + a few hardwoods. To SE, along run, land is low and swampy. On E side are mixed hardwoods

Description: Elongated spring pool. All shores of the pool are sculpted by humans. W side of pool has a limestone boulder wall with stairs leading down to a sandy swimming shore. S side has a wooden bridge over outflow run. E side has a limestone boulder wall and a wooden dock. N side also has a wooden walkway. This walkway

runs over a small land bridge that separates a small side pool of clearer, bluer water (on NW side. On W side are full facilities. Spring run flows SE toward the Chipola River (1.6 mi). No boil visible on pool surface. Sample taken off E-side dock. *Note: I sighted two adult (♂ + ♀) Trachemys scripta elegans in the spring pool. Must have been introduced into Chipola River system. Also, I spotted at least 5 T. scripta scripta mixed in.

Hypothesis: We believe that this "spring" is really a stream or creek rise of an underground finger of the Chipola River. Very high DO, low temp., and similar murky color to the Chip. Riv. all support this hypothesis...

utilization: Owned by Florida Caverns State Park...

This springs is aptly named due to the salt content in the spring water. Pool is teeming with schools of mullet and centrarchid fish. N, S, & W sides of pool are built up with a steep, 5' concrete wall, with an accompanying sidewalk. Salt Springs run flows generally eastward (— mi) into Lake George. Boats are not allowed in pool but frequent the run. An old house from ca. late 1800's sits up top of the hill to the SW.

2-4-02

RCM, RPM, GHM

Washington Blue Spring (Econfina Cr) ✓

pool dimensions: 19 yd N-S; 35 yd E-W
" depth: 2' in center away from vents
water color: clear, greenish tinge
aquatic veg: ~ 25% native grass covering
algae: patchy < 50%
high ground: to the North, ground rises steeply to 15' above H₂O. Picnic area there.

Surrounding environment: To the N+E, is mixed hardwood ^{pine} forest (high). Toward Econ Cr is mixed hardwood & cypress swamp.

Utilization: NWFWM D gated swimming recreation park. Permitted camping allowed. Pavillion present.

Description: Blue springs flows ^(sandy bottom) generally from NE to SW approx 150 yd to Econfina Creek. On the north side of its short run) another wild spring run flows in. The wild spring flows 69 yds

N to S into Blue Spr. run. It flows horizontally out of a small cave in a limestone bank that rises ~ 15'.

Blue Springs run appears to flow ~ 160 yd to Econ. Cr.

Blue springs pool is oval shaped E-W. North half is built up with concrete wall & steps. An old fenced off well is up top to north.

There are 2 vents where H_2O flows sparingly out of horizontal caves, on north side at bank's bottom.

Williford Spring 2-4-02

pool dimensions: 19 yd N-S; 20 yd E-W
" depth: 10.1'

water color: blue-greenish

aquatic veg: none

algae: patches < 50% and swaying long in high ground; to N & W high ground rises to 15' above H_2O . Sand hill uplands.

surrounding environment: Mixed hardwood & pine uplands. Except at park on N side of pool, all surroundings are pristine. Myriad other small springs nearby to west.

utilization: NWFWMD swimming and recreation park.

Description: Circular pool with sandy bottom. Limestone outcropped at vent. Conical depression. Northern half of banks are cleared for park, wooden fencing & entry stairway. Port-a-potties present w/ picnic tables. Cabbage palms present. Chipola limestone and Marianna Vent in center of pool.

2-12-02

Ponce de Leon (Holmes Co)

pool dimensions: 35' N-S X 37' E-W

pool depth:

water color: greenish blue

aquatic veg: a few stemmed plants, sparse

algae: 75-80% coverage by thick filamentous mats.

Some algae suspended in H_2O

high ground: To E, ground rises gently to 6-8' above H_2O . To W, ground is low-lying bottom associated w/ Sandy Cr.

surrounding environment: Entire east half is a highly developed State Rec area.

To the west, is Sandy Creek and associated bottom forest. Numerous hiking trails through out.

Description: Spring pool horseshoe-shaped & almost entirely built up around by a rock wall with swim access points. Boardwalk over out-flow creek and over a concrete weir. Sandy bottom, shallow pool. Vent is vertical near north side and a

very small boil on surface.

2 Cypress trees growing in spring pool N + W of vent.

Utilization: Ponce de Leon State Rec. Area.

Notes: Morrison Spring is flooded on 2-12-02
Watch: Caryville - 4' for spring to clear up.

2-19-02

Cray's Rise day trip.

low tide 12:06

No go because of
Control burn (STMNWR)

Horn Spring 2-20-02

pool dimensions: 34 yds N-S, 30 yd FW
depth: 22'

color: greenish

aquatic veg: choked w/ Hydrilla
some sandy patches @ bottom

algae: no large mats, but water
column has suspended particles

highground: highest ground is to SE
and rises very gently to ~ 6'
above H₂O. Flatwoods to S &
St. Marks River to north.

surrounding environment:

Flatwoods to S, river
bottom to N. Flatwoods
are being logged (thinned).

St. Joe prop leased to
hunt club

Description: Circular spring
pool with an outflow channel
leading to the WNW ~ 150m
to the St. Marks River.

A hunt camp is situated on the
S side of pool. Rest of pool
edge forested. Wooden dive
platform on S side. Conical
bowl shape depression. Tiny
boil on surface. Along the
S side of Horn Run, another
spring run, come in from a
small pool covered w/
duckweed, but with 2nd
mag flow! No conspicuous
single boil on bottom of
Horn. Sandy boils. Logs
all over bottom. Horn Run is
flowing swiftly and is ~ 15-
20' wide. Abundant veg
& Hydrilla.

2-20-02
Natural Bridge Spring

dimensions 22 yd N-S, 25 yd E-W
depth: 33'

color: clear, greenish
aquatic veg. much algae on limestone
substrate some aquatic plants.
algae: much covering on lime-
stone & logs.

sechi: 4 m

high ground: to N-NE rises to
6-8' above H₂O, but isn't
adjacent to H₂O. It's
about 250' to N-NE

surrounding environment: lowland
hardwood swamp forest.

Description: Natural Bridge
spring is a Karst window that
flows (volaminously for a 2nd mag.
spring) about 1/2 mile southward.
It disappears again and
presumably enters the St.

Marks somehow (?)
The spring pool is semi-
circular and its run is
as wide as the pool,
giving the appearance of
a river rise. Pool is in
a deep sink hole depression,
and the vent is on the
north side. Bottom is sandy
and bouldery with abundant
logs. The run is shallow
averaging 4' deep and is
swift-flowing. Bottom is
limestone bedrock with
rubble - including much
fossil vertebrate material and
chert debris. No boil
on pool surface, flow is all
horizontal.

utilization: St. Joe prop.

Rhodes Spring #2 2-21-02

pool dimensions: 15 yd E-W x 16 N-S

pool depth: 12'

color: clear

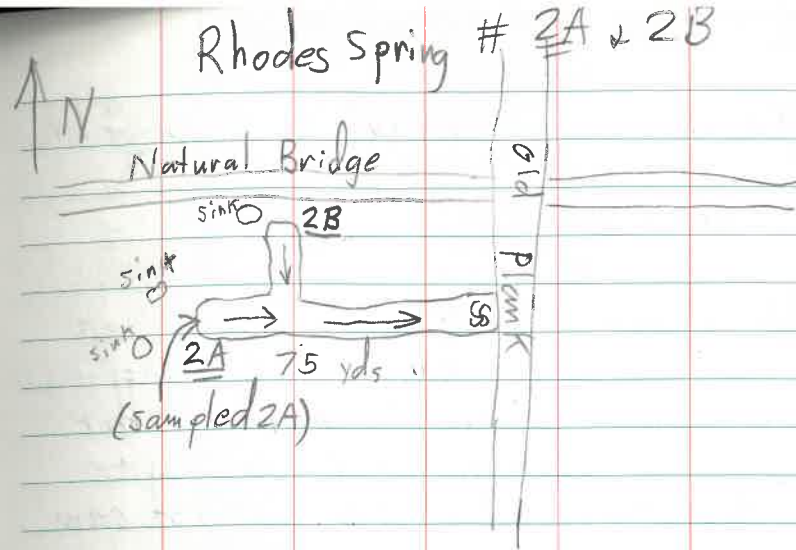
aquatic veg: a few plants, ^{pool 1/2 covered} by duckweed

algae: thin even layer mixed with fine dark silt

high ground: to NW, ground rises gently to ~6' above H₂O

Rest of ground is low, surroundings: ^{planted} pine flatwoods to NW, Rest of area is low lying, mixed hardwood swamp, mesic & hydric.

Description: Rhodes Spring #2 is a karst windglw that flows due East 75 yds into a siphon on the roadside (old plank). 15 yds downstream, another equal-sized run comes in from the N. See drawing →



Each vent appears to be 2nd mag. Boils on both vents. Sandy, silty, loggy bottoms.
Utilization: St. Joe prop.

Rhodes #4

pool dimensions: 15 yd E-W x 15 yd N-S
depth: 17'

color: clear, ^{light} greenish tinge

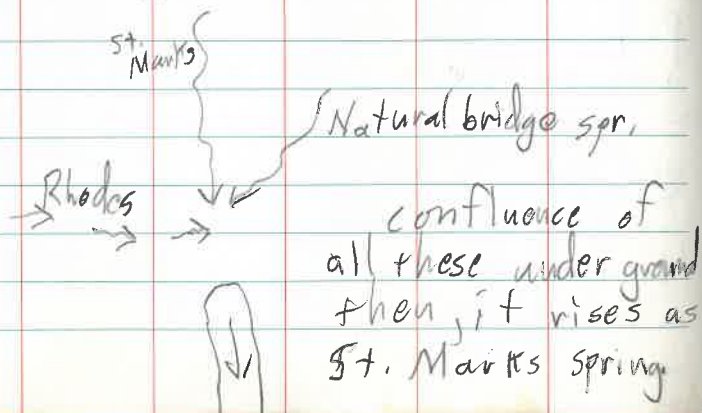
aquatic veg: some emergent agnatics + duckweed

algae: thin layer

high ground: banks rise steeply to 6' > H₂O then it flattens

surroundings: Planted pine flatwoods
to N, swampy lowland
drainage to S.

Descriptions: Rhodes # 4 is
a Karst window flowing
63 yds SE. I believe that
it is another window into
the same subterranean stream
system that Rhodes # 2
is assoc. with. See aerial photo
for complete descr. The whole
stream trends east & south
toward the natural bridge
area. Natural Bridge spring
is another underground river
flowing towards the St. Marks
from the NE



Good flow in stream, sandy
mucky bottom. Conical
sink depression. Run is
as wide as pool.

Util: St. Joe Prop.
(Hunt Club)

Rhodes # 1

pool dimensions: 27 yd E-W x 25 yd N-S
" depth:

color: clear
aquat veg: common including Hydrilla

algae: thin layer on substrates,
some long filament clusters
high ground: To W, ground
rises gently to 6'

surrounding: To W slopes up into
planted pine flatwoods. Rest
of surrounding is lowland
swamp with mixed hardwoods

and cypress. Completely
forested surroundings.

Description: Rhodes #1 is
also a Karst window. It flows
eastward 80 yds. Much
duckweed covers spring and
siphon. Spring is on W side,
siphon E. Again, this window
looks into the same under ground
river as Rhodes 2, 4. Run is
crescent shaped. Run is shallow
& has sandy, organic substrate.
A wild place. No boils, but
good flow in run toward
siphon

util. St. Joe & hunt club leased

2-25-02

Washington Blue on Choctaw-
hatchee

pool dimensions: 37 yd N-S X 33 yd ^{E-W}
" depth: 22'
H₂O color: clear - greenish blue
aq. veg. native Elodea ~ 60%, Hydrilla ^{in Run}
algae: patches, inch-long fibers,
pinkish color, on rock ledge
near vent,

high ground: adjacent on
S side of pool rises
steeply to 15-18' above H₂O.

surrounding environment: All
intact forest. Mixed hardwood-
Pine atop high ground.
Gorgeous gum-cypress
swamp forest along spring
run. Some old cypress.

Description: Magnificent wild spring in a conical, circular depression. Considerable vertical boil on H_2O surface. Vent on bottom located in a limestone fissure. Rock outcropped on S side of pool. Very chalky limestone. S side of the vent has ^{10'} vertical limestone wall with well visible bedding planes. Many Elinia & Pomacea in spring/run.

Blue spring gives rise to Spring Run, which flows N for 100 yds, then turns [?] W and flows another ($\frac{1}{2}$ mi) to the Choctaw hatchee R.

Old map says is Boynton cutoff becoming Holmes Cr. But Boynton cutoff is really the Choctaw R. now. Blue Spring, therefore, doesn't flow into Holmes Cr, but rather directly into the Choctaw R.

below the confluence w/ Holmes Cr.

Utilization: Private prop.
Local swimming spot.
Some trash. One old bottle (Late 1800's found)

2-25-02 Morrison Spring
pool dimensions: 100 yd E-W, x 110 N-S
pool depth: 46'
aq. veg. -- lots of water lettuce
algae: thin.
water color: greenish, turbid.
secchi: 6.3 meters

high ground: To the S about 100 yds down the wide spring run, high ground meets the side of the run and rises steeply to about 15' above

surrounding environment:

All surroundings forested. Immediate surroundings harbor a dense gum-cypress forest.

Description: Large spring pool, circular, noticeable pool in center. Conical, bowl shaped depression. Sandy bottom, except near vent - rocky. Deep center. A boat ramp on W side. Diver in the cave during sampling. Run flows slowly and wide to the Choctaw R. about $\frac{1}{2}$ mi SE. when the river rises, it backs up into Morrison & clouds it up.

Util: Private owned concession for cave diving.

Holmes Creek Spring exploration

2-26-02

William Shirling

not done

Mullet Spring is the confluence of several sandy seepage pools along the E side of Holmes Creek. The seep pools are 1" shallow, hard and soft sand, Moss and leaf detritus abundant. Pools up to 50 yds across! Algae mats present. Wonderful variety of molluscs -- Viviparids, Elimia, etc, Corbicula here Eurycea cirrigera, Pomacea used to have abundant mullet but were killed owned by WMD recently. Vernon an old steamboat landing Holmes Creek steamboat water way

former Sapp property 1082 acres

2-26 - Shell Cracker Spr.

This is another seepage spring where the confluence of multiple seeps pools up -- confluence pool is the spring. Not Floridan aquifer. WMD property. Former Sapp property.

Digital image #1

These seeps never dry even during the recent drought.

Main spring pool is 50 yd long.

There is a larger sandy bail here on N side of pool where a outflow channel is. All within deep gum-cypress swamp.

Rock Samples Holmes Cr.

#1	30° 39	08.5	N
	85° 41	21.7	W

Limerock outcrop in River bed. Very coarse gravel in a white/gray clay matrix. Limestone (grainstone) is friable & sparsely outcropped along this stretch of river. About 1 foot of clay exposed on W bank.

Clemmons Spring (below Beckton)

another seepage spring pool w/ $\frac{1}{4}$ - $\frac{1}{2}$ mi long spring run w. high ground along E bank.

2 dig. fotos after several crayfish fotos.

Crayfish from Holmes Creek betw. Cypress & Beckton.

Mouth of Clemmons -

A small spring pool, circular, 15' wide, clear, sandy boils in bottom.

Head of Clemmons is a deep pool, murky, blue H₂O. Owner Clarence Moore dense cypress - Gum forest.

Citizen Preservation Council of Washington County.

Main reason: Tired of Harold Vickers & what he did to Cypress.

Came to a head when he bought Beckton & wanted to do the same to it.

One thing led to another - thrust of group went away from Vickers toward conservation of Holmes Cr.

• Two Creek Blvd. on 79 south of Vernon Rt. on Keen Kutter Blvd.

2-26-02

Jack Paul Springs up from
Two Creek Landing, on
Holmes Creek below Vernon
off Hwy 79.

On E side of Creek
~ 1 mi. upstream of Landing.
Spring run mouth on E
side of Cr. Run is
30' wide averages 3'
deep. Clear H₂O. An access
burn is along the upper
1/2 of run on E side. Built
up 4' high. Very nice
boil up from middle of
run call it Jack Paul
#3 30° 36 44.3 N est.
85 44 01.8 SW

Burn runs up around head
of run to keep river
water out?

Jack Paul #1 and 2:
30° 36 46.5 N
85° 44 01.6 W

Vents #1 and 2 occupy
same small spring
pool at the very head
of the spring run. pool
diam = 40'. Vent #1 is
on W side and blowing
considerably. Vent #2
is on E side and is
barely blowing, has detritus
in it. All vertical boils.

Summary: Jack Paul Springs
#1 and 2 are at the
head of run. #3 is
about 100 yds downstream.
Limestone is outcropped
at vent. All aquifer
springs. Owned by Jack
Paul -- running cattle
nearby, owner of Vernon
drugstore. Run flows 400 yds
NNE - SSW. Holmes Creek
finger is diverted by the
E side burn and allowed
to re-enter the run downstream.

200 yds from head through
a culvert. Flow in culvert
today barely a trickle.

Input several points into the GPS
Snellcrak ← also contains line-generic
Mullet for Jack Paul Spring Run
from the head Spring to
Holmes Creek.

2-26

Hightower Springs
off 79 (S) at
Vernon.

Now is a NWF boat
ramp on E side of
Pool. Pool diam is
45 yd N-S, 25 EW. Shallow
averages ~ 5' deep. Flows
into E side of Holmes Cr.
Run small, shallow, 70 yds
long. Pool bottom has

numerous sandy boils.
Algae. High ground on SE
side. Dense gum-cyp.
forest. Looks like mag.
3 (est 5 cfs)
(Dig foto # 15)

2-27-02

Brunson Landing
S of Vernon on W side
of Holmes Creek
Walk S (downstream) along
foottrail to spring run,
go up run.
A beautiful, deep circular
pool, limestone near vent,
conical depression. Gives
rise to 2 spring runs. Large
3rd mag. Clear blue H₂O.
Long filamentous algae in
run. Spring & run entirely
within W side floodplain
forest. Entirely pristine
surroundings. Multiple seep

springs along run. Main
vent at head is 15' deep
Private owned (Galloway)
dig photos 16, 17

Piney Wood Spring

in FGS bulletin
Murky green-brown H₂O.
No flow today. Vent
at bottom not blowing.
Seepage in from surrounding
banks. Construction
debris in spring pool.
Circular pool, 25' diam.
Small sink to S nearby.
Uplands planted slash pine.
Located off road to Cypress
Spring. Spring run .05 mi
long, at one time it
flowed into Cypress spring,
but Vickers diverted the
flow, and dumped debris
in the H₂O to plug up

flow to increase Cypress
flow. This used to look
as magnificent as
Brunson, and have a boil.
not any more.

Run flows due west.
Vickers dug ditch in
floodplain also to divert
flow from Cypress. Run is 20-30'
wide

A very damaged spring
system due to
① Debris plug
② Channel diversion in
flood plain
③ Murky H₂O

Bill Saunders Owner
Sympathetic w/ CPC

dig foto # 18

Miller's Ferry Spring (Blue Spring)

Large deep hole in limestone
on creek side up ~300 yd
from Miller's Ferry bridge
33.4' max depth. No
visible boil on creek
surface, but deep limestone
hole. High ground adjacent
to creek and spring
on E side. 40' high bluff
Water lettuce & lilies
nearby. Dense gum-cypress
both sides. 35 yd diam pool
dig foto #19

Skipper Spring:

An old fallen oak
on N side of pool.
Pool & run are entirely
within flood plain. High
ground on S side. 17'
deep. Always is milky

blue and green. Never
seen bottom. Dense
gum-cypress all around
No boil. Circular 40 yds
diam. Trees cut in H₂O
around all perimeter.
Bowl shaped depression.
H₂O looks like that of
Holmes Creek. Regular
bottom.

Up from Miller's Ferry Spr.
about 300 yds on W side
of Creek. OHL 6-7'
above H₂O on trees

← ~~Miller's Ferry Spring~~ 7/19/2003
No name Spring up from
Skipper Spring; down
200 yds from a bluff,
visible on the E side
of Holmes Cr.
dig foto #19. 40' diam
pool, 150 yd run on E
side of Creek. Entirely
within dense flood plain

gum-cypress forest.

Murky greenish H_2O . No bar.
OHWL is 6' above H_2O . High
ground to S about 50 yds
Precipitous ledge on
N side of pool.

High Ground up from Millers Ferry (upstream
from 2nd unnamed spring (low))
Lat: $30^{\circ} 34' 45.9$
Lon: $85^{\circ} 50' 16.0$

~10' bluff on east bank of Holmes Creek.
White-reddish mottled clayey sand with
about 1-2% coarse sand and gravel. Gravel
clasts are large - almost cobble size.
8' deep scour out from bluff
in Creek.

2nd High Ground - 15'-18' bluff

Lat: $30^{\circ} 35' 28.5$

Long: $85^{\circ} 50' 17.2$

About at water level to ~3' above
is a ~~thin~~ finely laminated, blocky
gray-reddish clay interbedded with

silt and sand. Mollusk molds
present. Ripple marks and other
sed structures present.

Galloway Spring - Spring run ^{photo # 20}
enters Holmes Creek in a large bend.
Run is 400 yds long, flows
S then E into Holmes Cr.
Entirely within Floodplain
on W side of Cr. Higher
ground just to W rises to
10'. H_2O is greenish blue.
Deep, circular, conical
depression. Precipitous drop
into depths on W side. Est.
15'-20' deep. Water lechase
in run. Magnificent &
totally wild. Small floating
wooden platform. Obscure
dirt track leading in on
W side. Private owner
Baby Sternotherus minor

* High Bluff with outcrop of white,
carbonate-clay mixture with some
mollusk material embedded. Took
sample of white clay material

30 36 21.8 N
85 49 37.6 W

Sample #3

Bluff ~ 60-70 m long. Clayey, carbonate
overlain by reddish clayey sand/sandy
clay. **FIRST CARBONATE**

OUTCROP. Upper clayey sand
unit contains quartz gravel

Drinking Spring:

Photo # 21

Tiny little pool + boil
on W side of creek
up a short stream run
40 yds long. Pool diam 5'
sand & mud outcropped.
Mag with me 3-4. About
1.5' deep tiny depression.
Some seepage streams coming
in

Cray's Rise 3-5-02

REM, RPM, JAM

pool dimensions: 75 yd N-S
111 yd E-W

pool depth: 39'

aquatic veg: very little in H₂O -- Black
algae: can't see ^{needle rush}
around perim.

water color: tannic, but clear
secchi depth: 1.7 m

high ground: None nearby.
All Flatwoods nearby.

surrounding environment:

Slash and Longleaf pine

Flatwoods. Just burned
about 2 weeks ago (check notes).
Pool ringed by a thin tier of Black needle
rush

Description:

Cray's Rise is a tidal spring
run entering into Ochlockonee
Bay on the N side about 1 mile
downstream of the mouth of the
Sopchoppy R.

It typically is tannic or murky brown color. Today, a sizeable boil is present. Spring pool is at the head of the 600 yd long run and is oval shaped E to W. Many downed logs are littered around perimeter. Tidally influenced. Depression profile beneath the water surface is steep-sided and deep. Some ^{lime} rock is outcropped near vent (felt with anchor). Tarpon are

Utilization: Owned by St. Marks NWR. Restricted land access.

→ common at the surface of the water. Low tide @ 11:31 am today. Big Bend got 8" of rain 2-3 days ago and the Ocklocknee and 500 choppy are flooded. But it doesn't seem to have affected water level here at Cray's. In fact, this low tide event is lower than when we were here last time.

Today, NNE wind. Small seep streams are flowing into the rise pool from off the flatwoods on the E side.

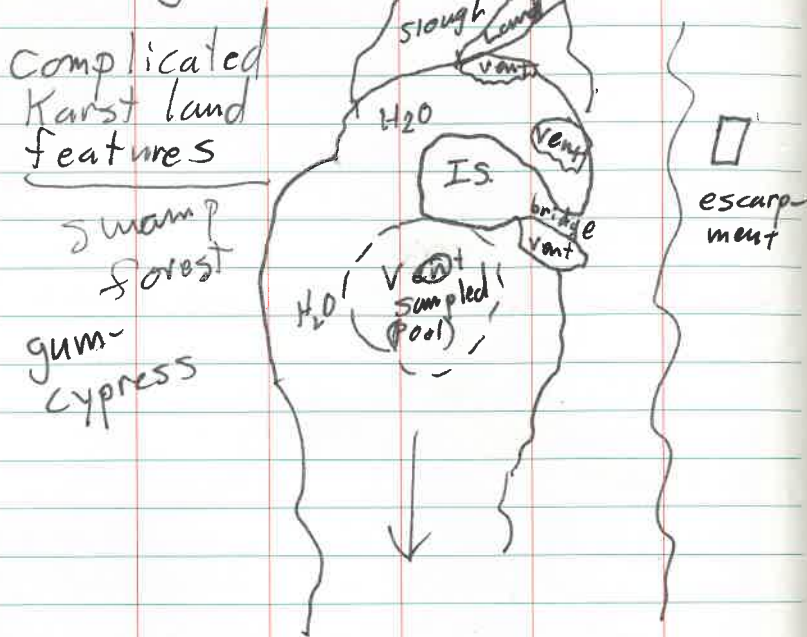
Bosel Spring 3-6-02
RCM, RPM, TAM, Mark
Ludlow -- Park Biologist

pool dimensions: 25 yd N-S x 18 yd E-W
pool depth: 14'
aquatic veg: very abundant: variable leaf
algae nuphar luteum chipolaensis Elodea
water color: murky green little algae
sechi depth: 14' No hydrilla (yet)

high ground: to the E, ground rises gently to 10'-12'

surrounding: To W, swampy flood plain forest. To E, private owned pasture w/ one house.

Description: Bosel spring is in a bowl shaped depression along the E side of the Flood plain up along the escarpment. An old swimming dock caved in on E side. Right now, a flood slough of the risen Chipola R. is flowing over the vent.



The Karstic features nearby include sinks and Islands between sloughs & sink runs.

Small boil present on vent sampled. Murky green water looks like it has Chipola R. influence. High DO and lower temp. No leaves on trees yet -- one of the latest springs in my memory. Recent very cold temps (teens) & frost. Escarpment on the E side. Limestone near vent. ~~Near~~ ice cave

3-13-02
Mill Pond Spring
Land owner: Lamb
RCM, RCM, James Mac.

pool dimen: 42 yd N-S x 50 EW
pool depth: 16.8'
aq. veg. ~ 90% Hydrilla cover
water color: blue sky blue

high ground: to the NW, ground
rises to about 6'-8', gently.
House atop,

surrounding: Mixed hardwood
swamp forest except for
house & lawn.

Description: This spring has
a circular pool with a conical
depression. Vent in bottom
center. Horizontal cage.
No bail visible on surface.
Sandy bottom, limestone outcropped
at vent. Lamb's house &
lawn on NW side of pool.
Dock out into pool on W side.
Wide, shallow spring run flows
ENE into Spring Lake. More
high ground on S side of run
200 yds downstream. Run averages
1' deep. Flint flakes

Private owned

Springboard 3-13-02

(cotton spring)

pool dimensions: 26 NW x 20 FE

pool depth: 18.4'

veg: eodea, variable leaf milfoil, lilies

water color: sky blue, clear

→ all plants in wide shallow
run. Very rich veg. And
tons of *Valcinerea*

surrounding: All forested by
lowland mixed hardwood swamp
forest.

very little algae

high ground: none nearby

Description: Springboard is
a deep crack that issues
from the N side of a long
open, shallow run that
flows E toward the W end
of Spring Lake (see aerial)
No bail on surface. Very
rich veg in wide shallow
run. Run is twice as wide

as the spring pool. Tons
of snails including *Elmia*, *Viviparus*
and *Fornacea*. Fete-let surroundings
Sandy run bottom. Limestone
near vent. Run flows 500 yd E and
into a siphon covered in duckweed
Utilization: private owned
Lamb's land

Double Spring:

3-13-02

pool dimensions: 29 yd EW x 27 N/S
Circular

depth: 18.0

aq veg: *Elodea*, water lettuce

algae: large + thick mats

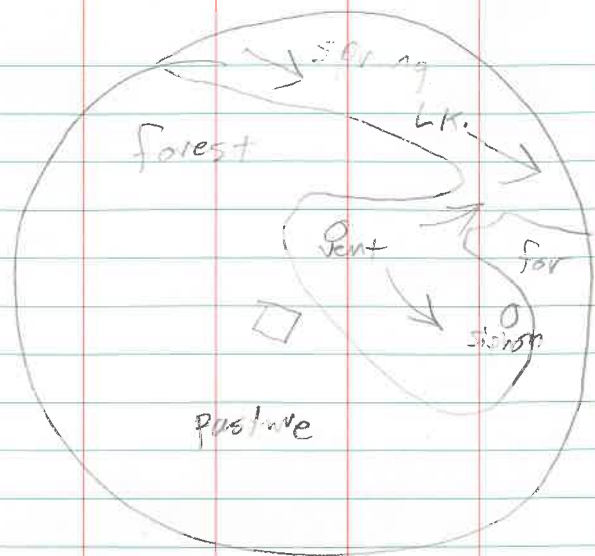
water color: murky blue

surrounding: house on the
SW side. Low Hardwood
Swamp forest all around.

High ground: To the SW
ground rises gently to
8' above ± 0 .

Description: Double spring
is actually a spring
and a siphon combined.
The spring is on the W side
of the pool/run. Boil on
spring. Run flows E for 92
yds. as wide as spring, then
flows into siphon. However,
the run splits in two, and
a small part of the flow enters
the lake on the S side. Split
run flows N. about 30 yds.
Sandy bottom. Limestone near
vent. Private dock on
S side of pool, house. Siphon
15' deep.

Utiliz: Private: Owned by
sister of Dr. Lamb -- owner
of Mill Pond spr.



RUN, RCM
JAM, Harold

3-21-02

Gadsden Spring

pool diam: 40 yd N-S, 47 yd EW

pool depth: 43'

algae: very rich, 6+ species no *Hydrilla*

algae: some thick mats - filamentous

color: murky and sky blue

secchi: 11.9

High Ground: to north,
ground gently slopes
up to 10' above. Mixed
pine-hardwood leading ultimately
up to an ag. field.

Surrounding: All forested.
Mixed pine-hardwood to
N, lowland hardwood-cypress
swamp. Deep stand near
the N side of pool up a
narrow, mowed grass path.

Description: Gadsden spring
is in a very deep circular,
conical depression. No
bail visible on surface. Gorgeous
spring run flows south
400 yds into Spring Lake.
Two projectile points found
in run last week on
first sampling attempt. Silty
still bottom. Plants all
around perimeter.

Limestone ledge on N side
about 20' below. 3 wooden
planks along N shore for
erosion control. At least
one small sink to the N,
15' diam, with H_2O . Large
vent below the ledge on N
side of pool

Black Spring

3-21-02

RCM, RPM, JAM

pool diam: 50 yd N-S x 47 E-W

pool depth: 49.1'

aq. veg: very rich around

edges: 5+ species including
lettuce, elodea, no Hydrilla

algae: thin layer, some mts.

color: slightly tannic, clear,

but pool appears all dark

from above because it is

so deep & dark-bottomed. Not

marked Aptly called Black Spring

secchi: 4.2 m

High Ground: to the S,
land rises very slow at first
100', then up to 10'-12' above
 H_2O .

Surrounding: All forest gl
with low mixed hardwood
forest.

Description:

Black spring derives
its name from its tendency
to issue slightly to moderately
tannic H_2O . This gives
the spring pool a dark
appearance. This spring is
circular and occupies
a very deep and steep-
sided conical depression.
A vertical limestone ledge
exists 20' below the surface
on N side of pool. Wall

erlands at least 25 more
feet to pool bottom. A very
similar situation in these respects
to Gasden Spring. No boil
on surface. This spring has
3 runs. One flows N - about
100 yds into Spring Lake, the
other flows E and conflues
with the lake about 300 yds
down stream. A very small
3rd run meanders through the
low forest between the first
2 runs and meets the lake.
This spring has surface inflow
and may be a creek rise.

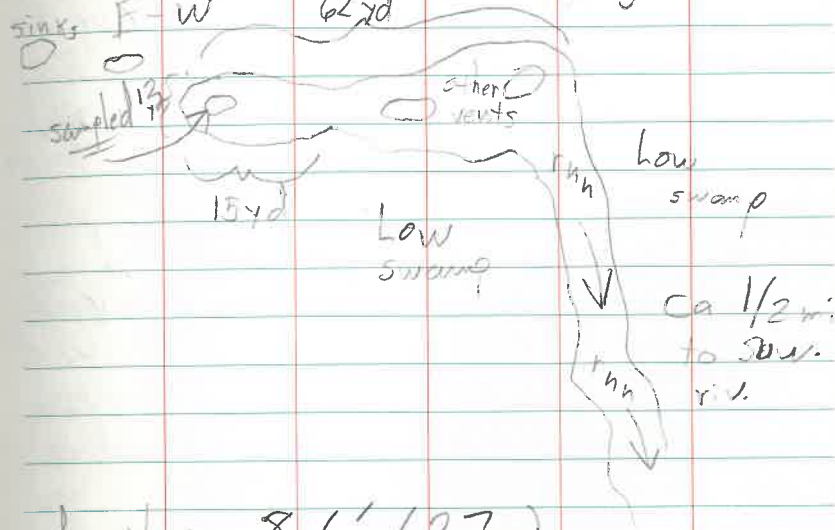
private land around

Allen Mill Pond Springs

3-25-02

RPN, RCM

pool diam: 12 yd N-S x 15 E-W
w/ connected pools spanning
E from sampled head spring = 62 yd
F-W 62 yd



depth: 8.6' (2.7m)
aquatic veg: some small lilies, large duct-
weed, hydrilla in run very thick
algae: entire pool surface covered by 1"
thick layer green filament. algae
color: clear H₂O, dark bottom

high ground: to the W, ground rises steeply to 15' above H_2O level. High ground touches spring bank.

Surrounding: Immediate surrounding are low cypress/hardwood swamp forest. Uplands to W are forested w/ mixed pine + hardwoods.

→ occupies an elongated fissure

Description: Allen Mill Pond springs is at the head of a $\frac{1}{2}$ mile run flowing southward into the Suwannee River. At the head of the run, there is a 62 yd stretch of connected spring pools oriented West to East. At least 3 vents here. The vent sampled is at the West most end of the string of vents, adjoining the Western high ground. No boil on any of the spring

pools today. Very low water level today. A thick algal mat covers the entire pool stretch. Limestone is exposed along spring sidewalls. Hydrilla choked run. Gated access flow line to head spring.

Owned by SRWMD, who maintains an access to the Spring (W) with small parking lot

Owens Spring 3-25-02

pool diam: 38 yd N-S, 29 yd EW
depth: 31.3'

aq. veg: Little

algae: dark green algae layer all over bottom + substrate.

color: clear -- slightly tannic

high ground: pool has steep banks all the way around. ground is 15-20' higher than here

Surrounding: All surrounding area is forested with oaks, pines, & other hardwoods;

Owned by SRWMD, gated off

Description: Owens Spring is in a steep-sided, conical depression, vent at bottom below a vertical limestone ledge on SW side. Limestone borders along sidewalls. Small spring run flows E-trending (? mi) to the Suwannee River. No boil.

Very low flow from spring. Suwannee R. just rose 2 weeks ago following a large 8" rain & spilled tannic H₂O into spring. Today, the spring H₂O is slightly tannic.

Sandy bottom w some rock. A dirt road (track) accesses the spring from the S. On S bank, there is a gravel parking area. One rope swing.

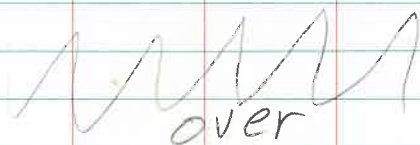
Gated access.

Running Springs

pool diam: 26 yd N-S; 18 E-W
depth: 6' max
aquatic veg: little or none

algae: thin layer, patchy, may be trampled by frequent swimming.
color: crystal clear, bluish

high ground:



Surrounding: Owned by Celeste and Hoch Shitama Gainesville, FL. Land surrounding the springs is partially forested with mixed hardwoods. Land to N of spring sampled (between both running springs) is grassy -- A restoration project underway to control erosion

and bring back plant cover.

High ground: All land adjacent to both Running Springs is much higher than springs -- 20' higher.

Description: Running Springs is a pair of short spring runs boiling out of high banks along the E side of the Suwannee River. The springs are not connected, high ground separates them. The N run has less flow and is ~ 50 yd long, flowing E to W into the River. The South run has multiple boils out of high banks and flows more N to S. It has a natural limestone dam just above where the pool meets river, creating a nice



backed up pool. Spring water cascades down over the dam and into the river.

We sampled the boil at the N end of the pool near the steep sidewall. Pool banks are steep to 20' high. Limestone boulders and sand and gravel bottom. All boils in pool come up forcefully. We sampled the South Run because it had more flow today. Frequent swimming here, but the place is free of litter since the Shitan's gained ownership. Suwannee very tannic and swift today.

Peacock Spring 3-26-02
not flowing *spring
caving hot spot, run
filled with divers, dried
not sampleable

Telford Spring

3-26-02

Choked with people

Must sample this at
dawn. Will return

Charles Spring

3-25-02

attempted, but unsuccessful.
Suwannee river tannic
water filled, no flow.
Will Return

Suwannee Springs:

3-26-02

Flowing, boiling tannic
water. Did not
sample. Will return

White Springs

3-26-02

Not flowing. Backfilled
with tannic Suwannee
River H₂O. Hasn't flowed
for 3-4 years, says
a Park Ranger at the
State Culture center.
Will not be sampled. "

3-28-02

Branford Springs

RCM, RPM

pool diam: 28 yd E-W; 30 yd N-S

pool depth: 12.5'

aquatic veg: some floating mats of Hydrocotyl. Little else.

algae: covering 75%, thin layer and thick blobs & mats.

color: slightly tannic and greenish.

High Ground: Spring and short run entirely surrounded by 18'-20' high ground

Surroundings: This spring is within the Branford city limits and heavily littered and used. A Dive shop is on the South banks, and a county parking lot is on the West banks. The SW is to the E, US 27 is N

Located in Ivey Memorial Park.

Description: Branford spring is situated in a steep-sided bowl shaped depression located adjacent to and just S of the US 27 bridge on the E side of the river. Its banks are nearly vertical and limestone is outcropped in and around spring. A small boil is present on the E side of the pool, coming out from under a rock ledge. The short spring run flows N for 30 yds then sharply W 30 more yds into the tannic Suwannee River. A big rain about 3 weeks ago has flushed many springs with tannic water including this. An algal bloom is occurring in the water turning it greenish. Tons of littered trash items are in the H₂O & banks. A large wooden platform and stairs are built along the S and E banks.

Ruth Spring (Sulphur Springs)

3-28-02

RCM, RPM

pool diam: 27' d F-W; 25' N-S
pool depth: 5.9' 1.8 m

aquatic veg: little or none

algae: patchy, thin layers

color: slightly tannic, clear.

High ground: To S & W, ground
rises steeply to ~20'

Surroundings: All forested with
mixed hardwoods and oaks
to S & W, with lower
swamp forest along run.

Description: Ruth Spring
is located in Troy Spring
Conservation Area (SRWMD)
within a large forested
area along the W side of
the Suwannee River. Water
levels here are very low
about 5' lower than before
the 4 yr drought. A small
boil is located on the W
side of the pool, coming
from under a limestone
ledge. Limestone outcropped
around pool edge. Wooden
erosion control wall built on
W side at where former
water level was. Swimming
hole, public access. Spring
run about 1/4 mi long to
E in Suwannee River.
Swimmers here earlier, bathing
with soap.

Suwanacoochee Spring

April 1. RCM, RPM

On the W side of lowest
Suwanacoochee R.

Flowing well, but is lightly
tannic. We decided not
to sample. Larry Arrant
is our contact from the
Suwannee River State Park.

Ellaville spring. 4-1-02
RCM, RPM

Spring is located just S or
downstream (1-200') from SP. boundary
on same side as overlook
(E side). Flowing very
tannic, same color as river.
It is S of the RR tracks (bridge)

Little River Spring

4-1-02

RCM, RPM

pool diam: 31 yd EW x 36 N-S
50 yd run NE → SW into Riv.
algae: thick mats on sand & rocks
50% - Kept batted down by swimmers
depth: 11'

color: greenish blue & clear

high ground: entirely surrounded by
15'-18' high flat ground--

surroundings: County Park parking
and mixed Pine & hardwood
forest.

Description: This gorgeous
spring discharges into the
E side of the Suwannee
R. with a run of about
50 yd SW into the tannic
Suwannee River.

The sizeable boil issues vertically from a deep cavern system frequented by cave divers. Limestone is outcropped all along the pool bottom, areas of sand. A wooden walkway stretches down the NE bank into the sandy shores around H₂O edge. Spring is typically 3'-4' higher as evidenced by exposed sandy banks. Favorite swim spot. Being renovated by county.

Hart Springs

4-4-02

RCM, RPA, Alan & Chicken

pool diam: ~17 yd N-S; x ~15 yd E-W
pool depth: 19.9'

algae: greater than 80% - thick
aquatic veg: much Hydrilla
some floating lilies

color: greenish, clear

High Ground: Surrounding land is
8' above H₂O and all flat.
No real high ground.

Surroundings: All a highly developed county recreation park. Numerous boardwalks & pavillions, grassy lawns, facilities, etc

Description: Hart Springs is a highly landscaped spring county park. Spring pool has been shaped roughly rectangular by a 4' high metal wall. A nice big vertical boil was present on the main spring. The upper area of the spring run has three fingers. At the head of the middle finger is the largest and

currently the only flowing
spring, and the one sampled.
The other two side runs
are low and not flowing.
All the upper area has the
4' wall along banks.

The main boil is vertical, vent
situated in the bottom of a
limestone fissure. Crack opening
has 15' vertical walls.

Spring run flows 2 feet NW
into the Suwannee river.
It is on the E side of river

Sun Springs

4-4-02

4 samplers (previous)

pool diam: N-S 33 yds
E-W 44 yds

pool depth: 14.2'

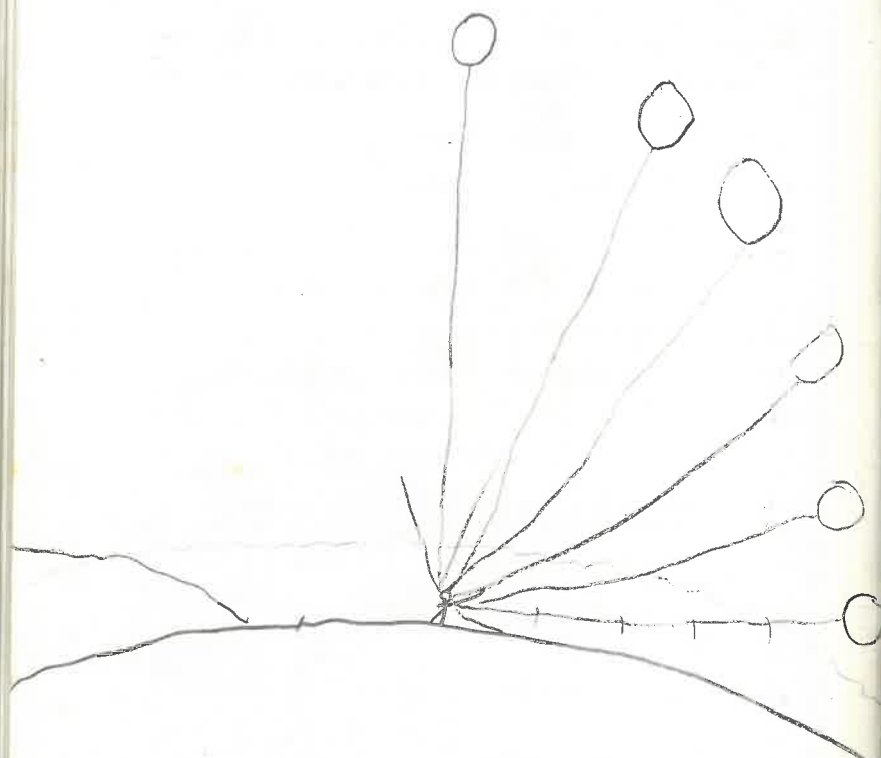
Algae: > 50% and silt laden
w/ particulates
Aq veg: little, some lily or hyacinth
color: greenish and clear

High ground: In all directions
ground rises to 15'-18' above
water surface, then flattens.

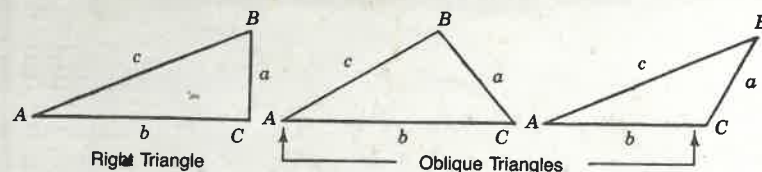
Surroundings: Mixed hardwoods
and homes, particularly along
the north banks of foot
creek run.

Description: Sun spring
is located in a single conical
depression, circularish. Bottom
is sandy, some limestone
at vent in center. Bottom
particle-laden. No pool,
but there is gentle flow
out the narrow run. Run
flows N and W to the
Suwannee R. (5-600 yds)

There are concrete terraces
along the E shore of pool
Some cypress. Fenced
off private prop.



TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given a, b	Required A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given A, B, a	Required b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$, $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$, $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft.

Horizontal distance also = Slope distance minus slope distance times $(1 - \cos \text{ of vertical angle})$. With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately: - the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.