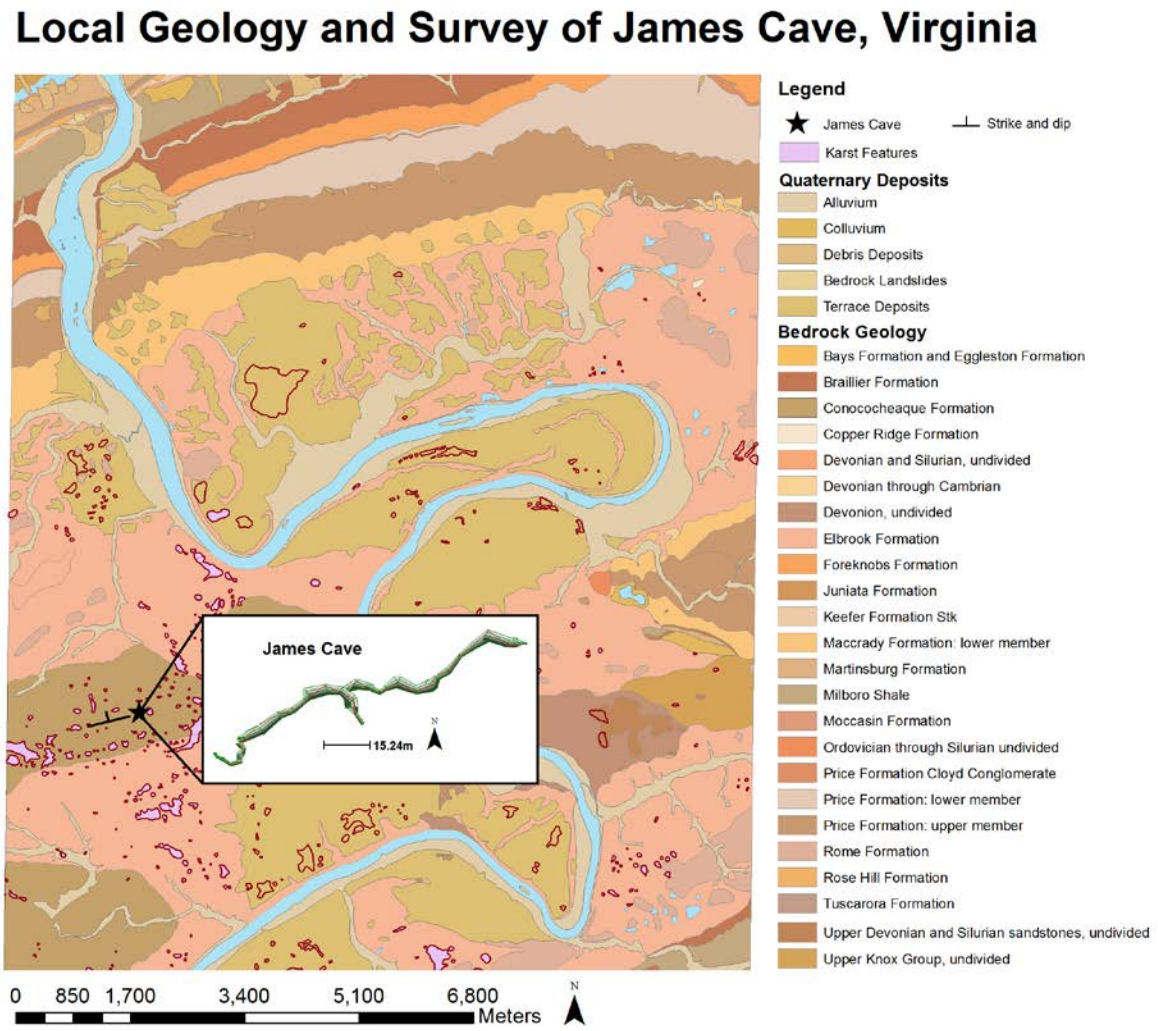
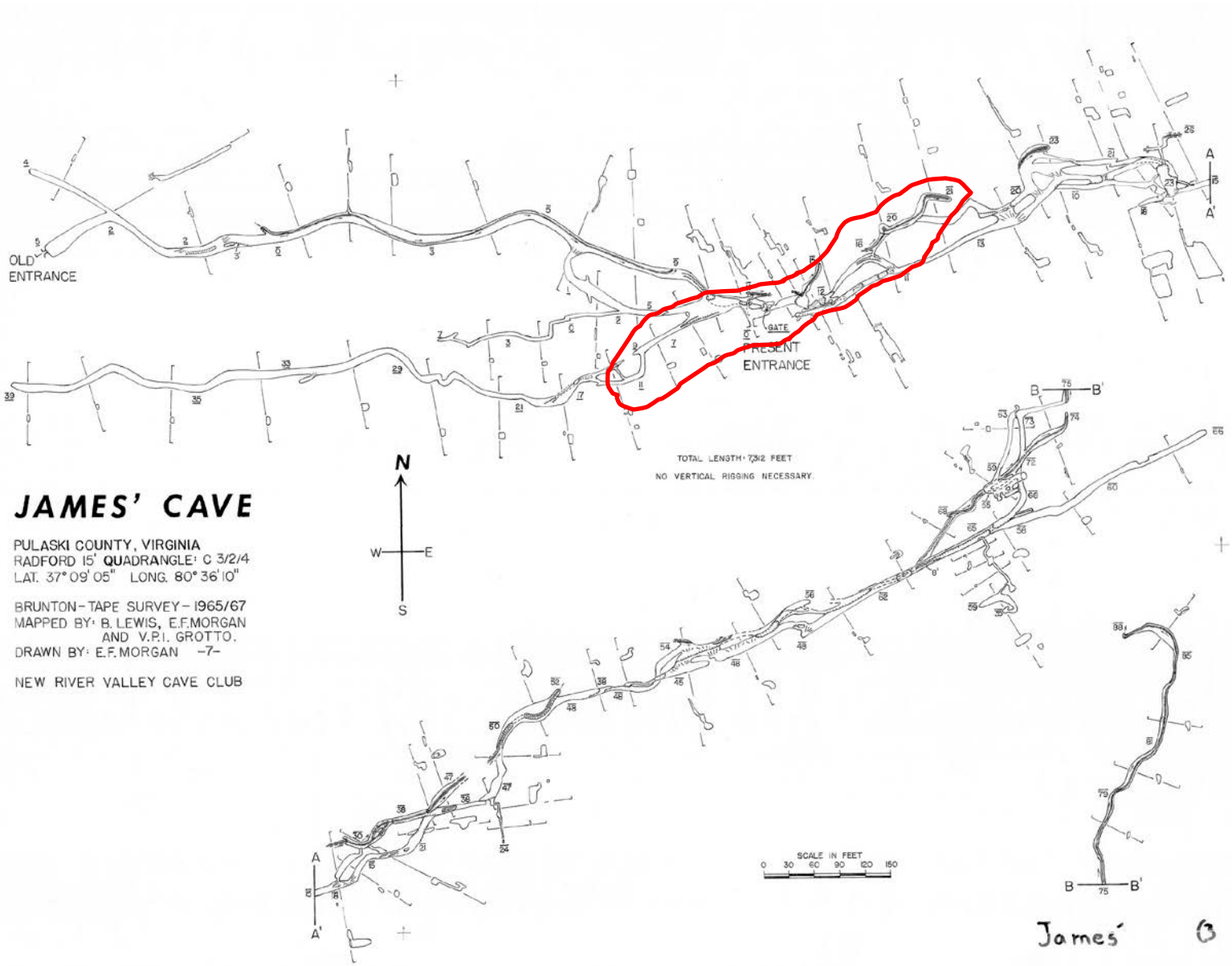
READ ME File for Epikarst Monitoring of Air and Water Temperature and Specific Conductance

Site Setting:



James Cave is located within Pulaski County, Virginia and is formed within the Cambro-Ordovician Conococheague formation.

The section of study is a small portion James Cave. This section of study is outlined in the figure below.



JAMES' CAVE

PULASKI COUNTY, VIRGINIA
RADFORD 15' QUADRANGLE: C 3/2/4
LAT. 37° 09' 05" LONG. 80° 36' 10"

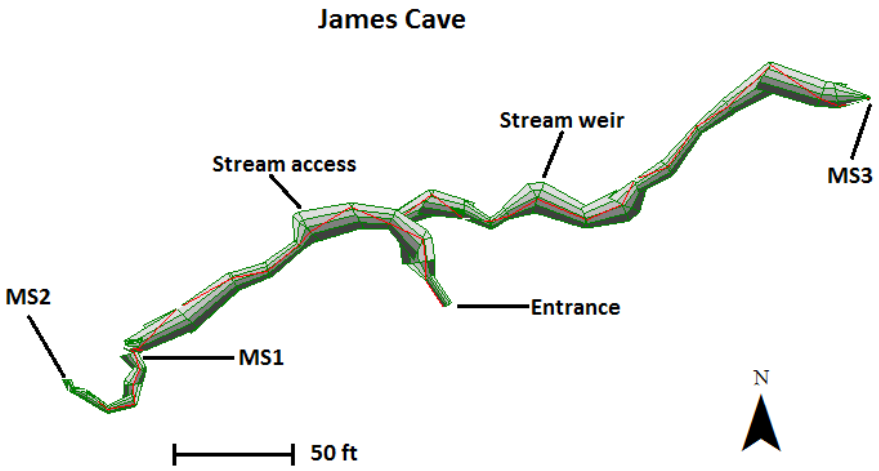
BRUNTON-TAPE SURVEY-1965/67
MAPPED BY: B. LEWIS, E.F.MORGAN
AND V.P.I. GROTTO.
DRAWN BY: E.F.MORGAN -7-

NEW RIVER VALLEY CAVE CLUB

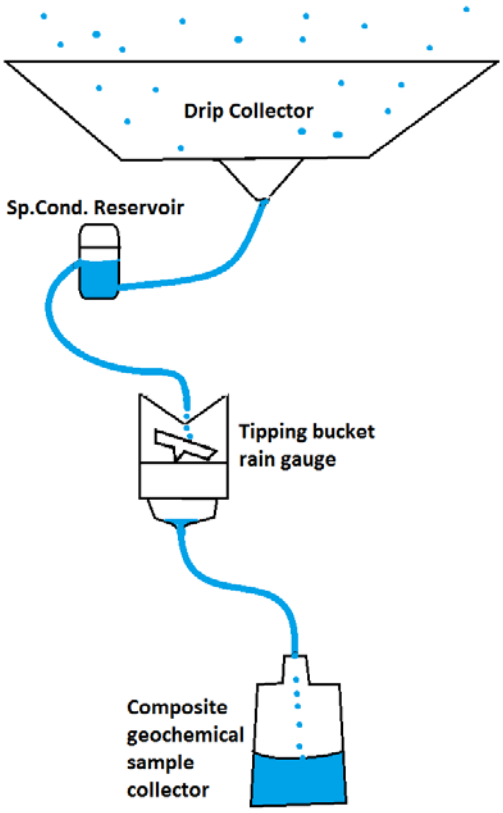
James' 6

Instrumentation and monitoring locations

James Cave is instrumented at several sites. There are three drip sites (MS1, MS2, and MS3) shown in the figure below. At the surface projection MS2 and MS3 and near the cave entrance there are soil lysimeters. There is cave stream access at two locations, with a v-notch weir at one location. Additionally, near the cave entrance there is a precipitation monitoring station.



Drip monitoring set-up and instrumentation as of January 2011 is shown in the schematic below.



Previous instrumentation chronology and instrumentation specifics

In the tables below the instrumentation changes are detailed through time and the specifics of instrumentation are outlined.

Date	Site(s) Impacted	Description
09/2007	Surface	Rain gauge with temperature, relative humidity sensor installed
09/2007	MS1, MS2	Suspended tarps and rain gauges installed; HANNA multiparameter sondes installed.
02/2008	MS3	Suspended tarp and rain gauge installed; HANNA multiparameter sonde installed.
08/2008	Surface	Precipitation collector installed
03/2009	Stream weir	Stream weir installed
03/2009	Stream weir	Solinst pressure transducers (level and barometric loggers) installed
06-07/2009	Soil2, Soil3, Soil Entrance	Tension lysimeters installed at 3ft depth
04/2010	Stream	HANNA multiparameter sonde installed
01/2011	Stream	HANNA moved upstream from weir to near entrance
01/2011	MS1, MS2, MS3	Sondes removed; specific conductance loggers installed
01/2011	Stream weir	Stream weir replaced with concrete V-notch weir
06/2011	Stream	Sonde removed; specific conductance logger installed
02/2012	All sites	Cease composite geochemical sampling
05/2012	MS1, MS2, MS3	Replaced microstation and smart sensor rain gauge with reed switch and pendant logger combination
05/2012	Stream weir	Replaced Solinst level and baro loggers with Onset
06/2012	Surface	Replace smart sensor rain gauge with reed switch and pendant logger combination
07/2012	MS1, MS2, MS3	Replaced pendant logger with pulse adaptor and microstation combination

Item	Manufacturer	Part/Model Number
HANNA multiparameter sonde	HANNA Instruments	HI9828
Smart sensor rain gauge	Onset	RGB-M002
Microstation data logger	Onset HOBO	H21-002
Level logger	Solinst	3001
Barometric pressure logger	Solinst	3001
Water level logger	Onset HOBO	U20-001-01
Barometric pressure logger	Onset HOBO	U20-001-01
Specific conductance logger	Onset HOBO	U24-001
Reed switch	Texas Electronics	120-0018
Terminal Block	Texas Electronics	009-0059
Pendant logger	Onset HOBO	UA-003-64
Pulse adaptor	Onset HOBO	S-UCD-M001

Data Collection and Management

Continuous time series data were offloaded from sites on a monthly or bimonthly basis. These data were stored on a variety of hard and virtual data storage locations and were aggregated for this project starting in fall of 2011. Temperature compensation for conductivity was conducted via a linear equation:

$$C_{25} = \frac{C_T}{1+\alpha(t-25)}$$

Where alpha is 0.021, C_T is the measured conductivity, and C_{25} is the specific conductance at 25C

Units for temperature and conductivity are degrees Celsius and uS/cm, respectively. Multi-point drift correction of the specific conductance was done via a linear adjustment in AQUARIUS Workstation (Aquatic Informatics 2011) and were based on field measurements conducted with an Oakton conductivity meter.