Draft July 9, 2009

Cypress Creek at Blue Hole Diurnal Sampling Event - June 26-27, 2009

The main purpose of this event was to collect diurnal (24 hour) water quality data to evaluate aquatic life use and contact recreation conditions and improve general knowledge of this site. A secondary objective was to conduct field quality control audits for local volunteer water quality monitoring organizations.

Organizations: Cypress Creek Project, Texas Stream Team, Wimberley Valley Watershed Association and Texas Clean Rivers Program, Wimberley Water Advisory Group, and associated volunteers

Site: Cypress Creek at Blue Hole; one upstream and one downstream site is located on both ends of the park

Contact Recreation - ***E.coli*, and associated measurements**: Two sites were sampled hourly for *E.coli* and Secchi disk transparency. The number of people in the water near each site and types of activities were also documented. An upstream site (located adjacent to the sonde near the bank edge) and a downstream site was established. The downstream site is located 6 meters upstream the park outfall. The total depth at the downstream site is approximately .70 meters. All samples are collected at an average depth of .33 meters.

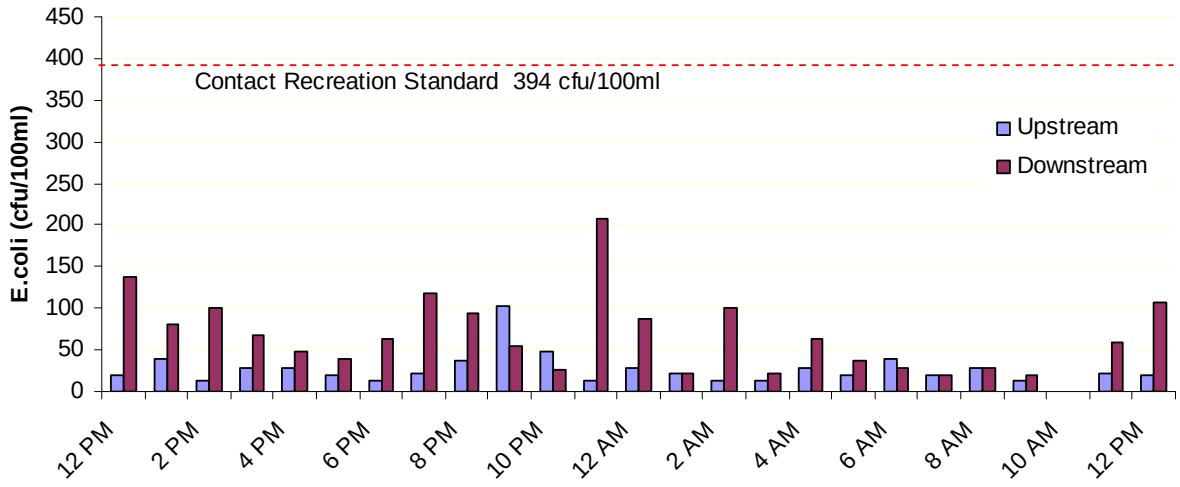
Seven volunteers assisted with diurnal sampling activities. Volunteers and staff received a sample collection and documentation refresher **training** before the event to ensure consistent procedures that adhere to appropriate Texas Stream Team and Surface Water Quality Monitoring requirements are followed. A lead volunteer analyst, Michael Grogan, was responsible for all data sheet documentation and ensured sample collection containers and other materials were correctly processed. Jason Pinchback, Texas Stream Team Director and quality assurance officer, was responsible for overall design and implementation of this activity.

Procedure:	Label data form and container with time and sample number;
(once per hour)	Collect E.coli samples first and place on ice;
	Collect Secchi Disk Depth measurements;
	Document on-site conditions on data sheets
	Take photos and video
	E.coli samples are processed for incubation every six hours

Start Time: 12:05pm, June 26, 2009
End Time: 12:05pm, June 27, 2009

The preparation of this report was financed through grants from the Texas Commission on Environmental Quality, River Systems Institute, and local partners

Cypress Creek at Blue Hole Upstream and Downstream *E.coli* – June 26-27, 2009



DRAFT RESULTS: All collected *E.coli* data are below the TCEQ contact recreation single sample criteria of 394 cfu/100ml and geometric mean criteria of 126 cfu/100ml. Downstream *E.coli* data are higher than upstream data. These results are consistent with historical data.

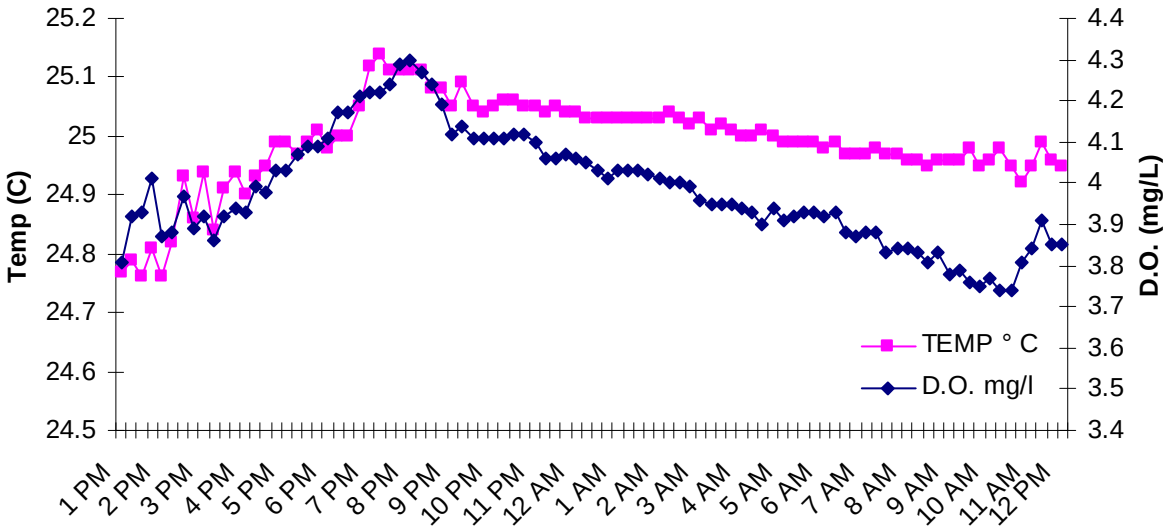
E.coli (cfu/100ml)		
	Upstream	**Downstream**
Min	14	19
Max	103	207
Mean	27	66
GeoMean	24	53
Std Dev	18.4	45.4
N	25	25

It did not appear that the Blue Hole site received surface **flow** upstream of the immediate area. The USGS gauge station at Jacob's Well shows 0.00 cfs flow since June 24, 2009. The downstream flow at Blue Hole is estimated at less than .6 cfs. Land owner comments and anecdotal experience suggest several springs are located in the immediate vicinity of Blue Hole. No substantial rain has fallen in the last fourteen days.

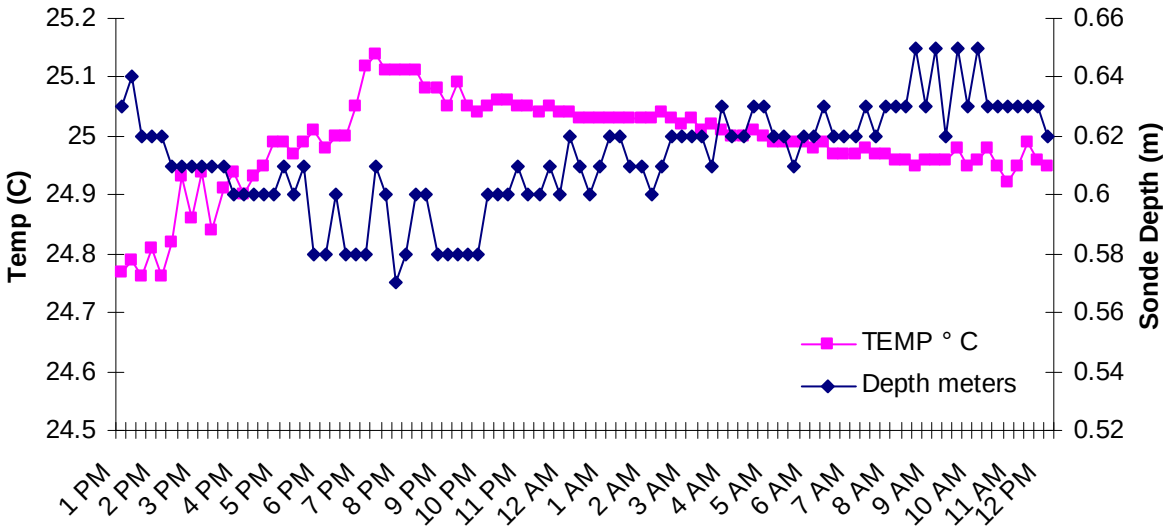
Aquatic Life Use - Field core water chemistry: MS5 sonde was deployed immediately upstream of the Blue Hole property and was suspended by a wire that crosses the creek. The sonde was located midstream at a depth of approximately .57-.65 meters, depending on flow conditions. The sonde measures dissolved oxygen, specific conductivity, pH, water temperature, and sample depth at fifteen minute intervals. This location is the most representative location at this site and the area is least likely to be disturbed by park users. The total depth at the deployment location is 2.55 meters.

Start Time: 1:15pm, June 26, 2009
End Time: 12:45pm, June 27, 2009

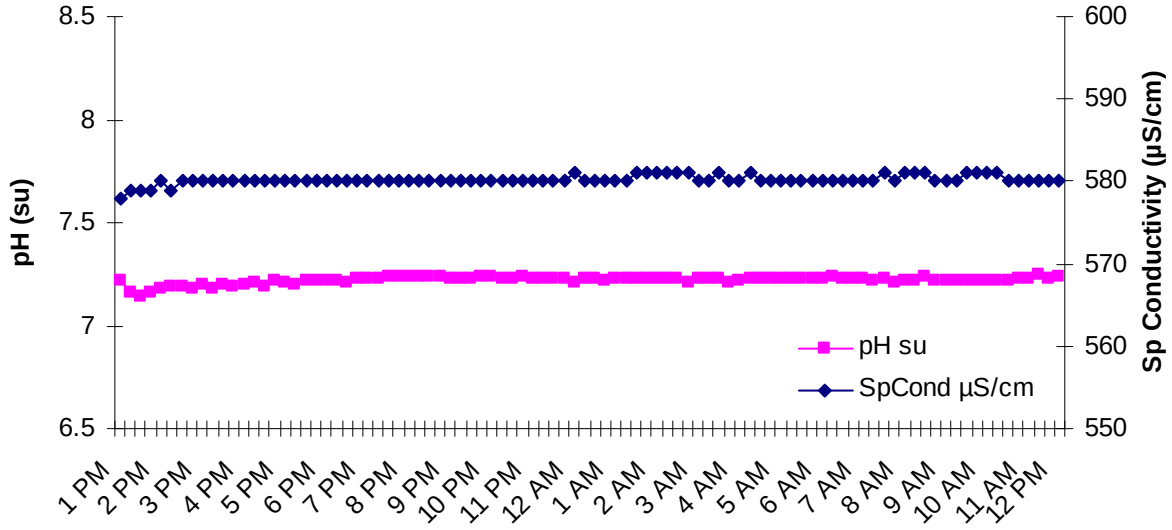
Cypress Creek at Blue Hole Dissolved Oxygen and Water Temperature – June 26-27, 2009



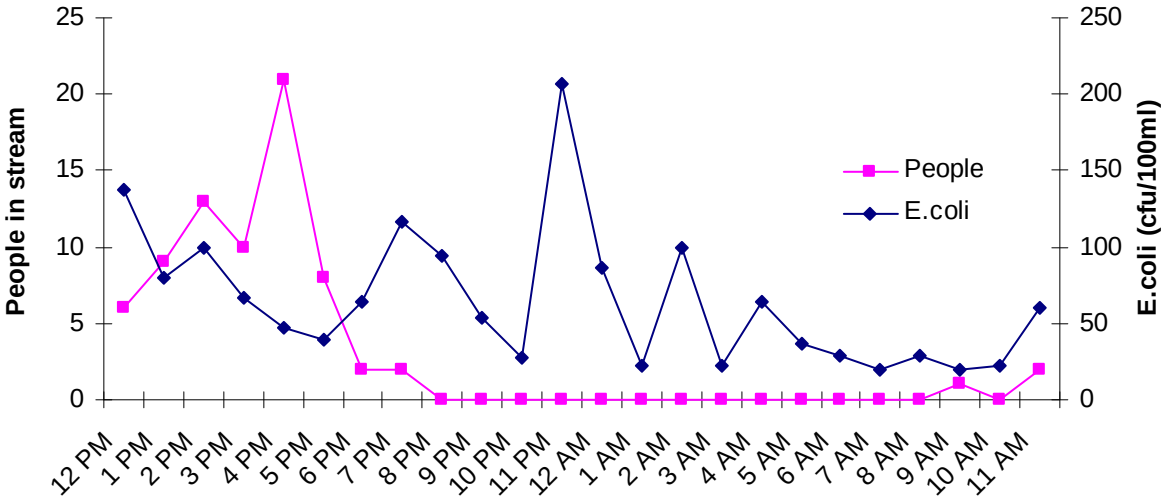
Cypress Creek at Blue Hole Sonde Depth and Water Temperature – June 26-27, 2009



Cypress Creek at Blue Hole Sonde Specific Conductivity and pH – June 26-27, 2009



Cypress Creek at Blue Hole Contact Recreation and *E.coli* – June 26-27, 2009



DRAFT RESULTS: All dissolved oxygen data are below expected values for Cypress Creek. Depressed dissolved oxygen values may be related to low flow and elevated temperatures. Specific conductivity and pH remains steady and is within expected range. Water level appears to decrease .07 meters. This may be related to evapotranspiration or hydrogeologic conditions . Additional data is needed to better understand these diurnal cycles. Water temperature fluctuation is less than expected. This is probably a result of limited upstream flows and consistent groundwater input near the monitoring site.

Quality Control Audits: An in-field quality assurance audit was completed for the volunteer Wimberley Water Advisory Group. This group has collected bacteria indicator data on Cypress Creek and Blanco River for 20 years. Fecal contamination concerns continue to be a prevalent issue and this group and other members of the community expressed interests in increased use of the information they collect at eleven sites. The audit was also performed for the Cypress Creek Project and other potential data users in order to determine the level of quality associated with this in-depth data set. This quality assurance audit occurred at Blue Hole 4:30-6pm on June 26 2009. Details and event results are included in a separate report.

A Texas Stream Team San Marcos River Ranger citizen monitor also received a quality control site visit during a separate activity.

Ten volunteers participated in these quality assurance activities.

Thanks to Michael Grogan, Matt Gommert, City of Woodcreek, Texas Stream Team volunteers, The Johnson Family, Wimberley Water Advisory Group, Adrian Vogl, Watershed Sciences Laboratory, Mary Waters, Wimberley Valley Watershed Association, David Procyk and Hydrolab, Abigail Wetzel, David Baker, Guadalupe-Blanco River Authority, Jeff Mitchell, and the San Marcos River Rangers.