

Gabriola Streamkeepers

## **Field notes on creeks and wetlands on Gabriola Island, Fall 2015 / Spring 2016.**

Notes on:

Mallett Creek and Winthuysen Creek are [here](#).

Coats Marsh, Coats Marsh Creek, East Path Creek, and the Stump Farm Streams are [here](#).

Some notes on Dick Brook are [here](#).

Rainfall measurements are [here](#).

All conductivity measurements made in 2015 are on the low side. The sensor was re-calibrated in early 2016. When available, the RDN conductivity readings for Mallett Creek in the fall 2015 are probably more accurate than the GSK readings.

In March 2016, the pH meter was calibrated with 7.0 and 10.0 buffer solution before and after the field trip. Rainwater gave a very similar reading to water in the creeks, slightly alkaline, probably as much a result of the low ion content and lack of buffering than as a measure of the hydrogeology. Calibration using a LaMotte Precision pH Kit (chemical) showed that pH meter readings of approx.8 corresponded to neutral water 7.0; consequently all March 2016 readings have been recalibrated to pH = meter pH – 1.0.

April 2016 pH readings used the PASCO sensor which was calibrated for 7.0 when it read 6.8.

### ***Canary Grass Meadow***

April 4, 2016. Red-listed seaside bitter-cress, *Cardamine angulata*, seen in the meadow. Also Siberian spring-beauty, *Claytonia sibirica*, which is common in places in Coats Marsh.

The wetland dries out very quickly once it stops raining indicating the sandstone bedrock beneath the shallow soil is fractured and readily allows the surface ponds to become groundwater.

### ***Castell Brook***

March 24, 2016. Daniel Way. **WATER QUALITY**

pH ~~8.2~~ 7.2

Specific conductivity: 160  $\mu\text{S}/\text{cm}$  ( measured 86  $\mu\text{S}/\text{cm}$  8.7°C).

DO 10.2 mg/L 88% 9.1°C 101.7 kPa (measured 10.08 mg/L).

Water yellowish, JTU 5.

### ***Chapple Creek***

October 24, 2015. Dry.

November 3, 2015. Pools in creek bed, but no continuous flow through.

November 8, 2015. No flow through the culvert, but extensive pooling and a flow, somewhere in the middle of the 0.1-1.0 L/s range, at its junction with Ferne Road Creek (which is dry).

Must be re-charging the winter marsh at Brickyard Beach. Total precipitation to bring this about around 190 mm.

November 20, 2015. Brickyard culvert flowing at 2.2 L/s.

Tried measuring flow using velocity  $\times$  area [method](#):

Pipe diameter = 0.61 m (24-inch), water depth = 18 mm, water vel = 2.2 ft/s (Brunton); hence,

$R = 0.305$  m,  $d = 0.059$ ,  $V_0 = 0.67$  m/s (actually more like an average as the Brunton propeller diameter is 10 mm),  $\eta = 0.0268$ ,  $\phi = 25.26$ ,  $B = 1.49$ ,  $T = 17.1$ ,  $\lambda_0 = 0.115$ ,  $Q = 0.19$  L/s.

This order of magnitude underestimate is clearly the result of a nonsensical value for  $\lambda_0$  in such shallow water. Substituting  $\lambda_0 = 1$  instead of the formula value gives  $Q = 1.7$  L/s, which is low, but not too bad. Surface velocity measured using a float gave  $V_0 = 0.71$  m/s (2.3 ft/s), which would give the Brunton average velocity with a factor  $\lambda_0$  of  $0.67/0.71 = 0.93$ , which is plausible. More work needed in stronger flows. Bottom line: as a temporary fudge, for  $\lambda_0 V_0$  use  $1.2V_{\text{Brunton}}$ ,  $V_{\text{Brunton}}$  in m/s.

March 22, 2016. **WATER QUALITY**

pH ~~7.9~~ 6.9

Specific conductivity: 177  $\mu\text{S}/\text{cm}$  ( measured 93  $\mu\text{S}/\text{cm}$  8.3°C).

DO 7.3 mg/L 65% 10.1°C 101.6 kPa (in flask: measured 7.37 mg/L).

Water colourless and clear, JTU < 5.

March 23, 2016. Abundant skunk cabbage, *Lysichiton americanun*, in the wooded reach of the creek.

April 12, 2016. Abundant *Cardamine angulata* in flower in the wooded reach of the creek. This is a red-listed species. Also some trillium.

May 13, 2016. Despite absence of rain, the creek is still flowing, slightly less than 1 L/s.

June 5, 2016. Creek still flowing at a low rate.

June 17, 2016. Creek still flowing,  $\approx 0.5$  L/s.

October 14, 2016. Creek flowing through the culvert again after summer dry.

### ***Columbia Creek***

An ephemeral creek that flows under Taylor Bay Road in a valley between those of Mallett and Winthuysen Creeks, but, unlike the bigger creeks, is without a culvert.

The flow, even at the peak of the rainy season, is less than about 5 L/s, and tails off within a few days without rain in the spring to a barely perceptible trickle.

March 24, 2016. **WATER QUALITY**

pH ~~8.4~~ 7.4

Specific conductivity: 179  $\mu\text{S}/\text{cm}$  ( measured 114  $\mu\text{S}/\text{cm}$  13.6°C).

DO 10.5 mg/L 101% 14.0°C 101.9 kPa (in flask: measured 10.53 mg/L).

Water clear, JTU < 5.

June 5, 2016. Dry. Has been for some time no doubt.

### ***Commons Pond***

November 9, 2015. pH 7.4.

November 24, 2015. **WATER QUALITY**

pH 7.5

Specific conductivity: 128  $\mu\text{S}/\text{cm}$  ( 75  $\mu\text{S}/\text{cm}$  4.4°C) (in flask).

DO 9.3 mg/L 74% 5.3°C 100.6 kPa meter indicated 9.0 mg/L (in flask).

DO may not have been in equilibrium, temperature rising.

April 14, 2016. **WATER QUALITY**

pH ~~6.4~~ 6.6

Specific conductivity: 156  $\mu\text{S}/\text{cm}$  ( 110  $\mu\text{S}/\text{cm}$  16.6°C) (in flask).

DO 10.2 mg/L 107% 17.0°C 100.1 kPa.

### ***Descanso Creek***

April 15, 2016. **WATER QUALITY**

pH ~~6.3~~ 6.5

Specific conductivity: 270  $\mu\text{S}/\text{cm}$  ( 156  $\mu\text{S}/\text{cm}$  11.3°C) (in flask).

DO 8.8 mg/L 82% 12.4°C 102.5 kPa.

Flowing strongly, deep yellowish-brown. JTU>10?

### ***Dick Brook***

September 18, 2015. Dick Brook dry at Locations 2 and 3. Location 1 not visited.

October 24, 2015. Brook dry where it leaves Somerset Pit. The water level in the pit is low.

The “great swamp” as seen from Dorby Way is very green.

March 22, 2016. **WATER QUALITY** Location 1 (pit)

pH ~~8.2~~ 7.2

Specific conductivity: 177  $\mu\text{S}/\text{cm}$  ( measured 97  $\mu\text{S}/\text{cm}$  9.4°C).

DO 10.6 mg/L 95% 10.2°C 101.2 kPa (in flask: measured 10.75 mg/L).

Water colourless, fine silt, JTU=7.

March 22, 2016. **WATER QUALITY** Location 2 (Peterson Rd.)

pH ~~7.9~~ 6.9

Specific conductivity: 218  $\mu\text{S}/\text{cm}$  ( measured 122  $\mu\text{S}/\text{cm}$  10.2°C).

DO 9.2 mg/L 87% 12.6°C 101.3 kPa (in flask: measured 9.14 mg/L).

Water brown, JTU=15.

March 22, 2016. **WATER QUALITY** Location 3 (North Road)

pH ~~8.1~~ 7.1

Specific conductivity: 211  $\mu\text{S}/\text{cm}$  ( measured 113  $\mu\text{S}/\text{cm}$  9.0°C).

DO 10.7 mg/L 94% 10.7°C 101.4 kPa (in flask: measured 10.71 mg/L).

Water brownish-yellow, JTU=15.

June 9, 2016. Location 2. No perceptible flow. Murky.

### ***Fiddlehead Creek***

April 15, 2016. **WATER QUALITY**

pH ~~6.4~~ 6.6

Specific conductivity: 208  $\mu\text{S}/\text{cm}$  ( 112  $\mu\text{S}/\text{cm}$  9.1°C) (in flask).

DO 10.4 mg/L 92% 10.3°C 102.5 kPa.

Flowing, very clear. JTU=0–5

### ***Goodhue Creek***

November 24, 2015. Upstream of Commons Pond near boardwalk

**WATER QUALITY**

pH 7.4

Specific conductivity: 179  $\mu\text{S}/\text{cm}$  ( 112  $\mu\text{S}/\text{cm}$  6.3°C) (in flask).

DO 9.0 mg/L 74% 6.7°C 100.7 kPa meter indicated 8.9 mg/L (in flask).  
Rain - shallow groundwater mix?

April 14, 2016. Golf Course Club House

**WATER QUALITY**

pH ~~6.1~~ 6.3

Specific conductivity: 171  $\mu\text{S}/\text{cm}$  ( 97  $\mu\text{S}/\text{cm}$  10.2°C) (in flask).

DO 8.4 mg/L 78% 11.6°C 100.1 kPa.

Water yellowish, JTU=5–10.

***Maples Bay Spring***

April 15, 2016. Seepage on the beach.

**WATER QUALITY**

pH ~~6.5~~ 6.7

Specific conductivity: 213  $\mu\text{S}/\text{cm}$  ( measured 120  $\mu\text{S}/\text{cm}$  10.3°C).

DO 9.7 mg/L 90% 12.6°C 102.4 kPa.

Water crystal clear, JTU=0.

***River Place Creek***

March 24, 2016. **WATER QUALITY**

pH ~~8.3~~ 7.3

Specific conductivity: 176  $\mu\text{S}/\text{cm}$  ( measured 95  $\mu\text{S}/\text{cm}$  9.0°C).

DO 10.1 mg/L 89% 9.7°C 101.1 kPa (in flask: measured 10.02 mg/L).

Water yellow-brown, JTU=5–10.

April 10, 2016. Just a barely perceptible trickle at the bridge. Ponding along most of its length.

June 12, 2016. Dry at the lake.

***Stoney Creek***

March 22, 2016. **WATER QUALITY**

pH ~~8.2~~ 7.2

Specific conductivity: 106  $\mu\text{S}/\text{cm}$  ( measured 57  $\mu\text{S}/\text{cm}$  8.1°C).

DO 9.8 mg/L 87% 9.7°C 100.7 kPa (in flask: measured 9.76 mg/L).

Water very pale yellow, JTU<5.

June 12, 2016. Dry at Tait Road.

***Upper Jenkins Creek***

October 25, 2015. Flowing through the Tait Road culvert just east of the Ferne Road junction.

About 0.1 L/s. How long it has been flowing not known. There is a geological report of the site (Site 4) just upstream of this location [here](#).

**WATER QUALITY**

pH: 7.7

Specific conductivity: 301  $\mu\text{S}/\text{cm}$  ( 215  $\mu\text{S}/\text{cm}$  10.77°C) (in flask) [likely 383  $\mu\text{S}/\text{cm}$ ].

DO 6.8 mg/L 64% 11.4°C 99.4 kPa (in flask).

*GSK DO sensor cross-check with Winkler titration was perfect.*

March 24, 2016. **WATER QUALITY**

pH ~~8.5~~ 7.5

Specific conductivity: 236  $\mu\text{S}/\text{cm}$  ( measured 125  $\mu\text{S}/\text{cm}$  8.7°C).

DO 10.2 mg/L 90% 10.2°C 100.8 kPa (measured 10.23 mg/L).

Water clear, JTU<5.

***Wagg Brook***

March 22, 2016. **WATER QUALITY**

pH ~~8.2~~ 7.2

Specific conductivity: 98  $\mu\text{S}/\text{cm}$  ( measured 55  $\mu\text{S}/\text{cm}$  9.1°C).

DO 10.8 mg/L 96% 10.3°C 101.6 kPa (in flask: measured 11.11 mg/L).

Water yellowish, JTU=8.  $\diamond$