

**Real Time Water Quality Monthly Report
Peter's River near Botwood
July– October 2006**

General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.

Maintenance and Calibration of Instrumentation

- The instrument at Peter's River was removed on July 19th, 2006 for cleaning and calibration and then reinstalled on July 20th. The results from comparing the Minisonde values to the Datasonde values during removal and reinstallation on July 19th/20th, 2006 can be seen in **Table 1**.

Table 1: QA/QC Data Comparison Rankings upon removal/reinstallation on July 19th/20th, 2006

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Peter's River near Botwood	July 19 th , 2006	Removal	Fair	Excellent	NA*	Fair
	July 20 th , 2006	Installation	Poor	Excellent	Fair	Poor

* The conductivity probe on the Datasonde was not transmitting data on the day of removal (July 19th, 2006).

- The instrument was deployed until October 23rd (97-day deployment period) at which point it was removed for maintenance and calibration. The long deployment period was due to staff annual leave and workload factors that could not be avoided. The results from comparing the Minisonde values to the Datasonde values during removal on October 23rd, 2006 can be seen in **Table 2**.

Table 2: QA/QC Data Comparison Rankings upon removal on October 23rd, 2006

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Peter's River near Botwood	October 23 rd , 2006	Removal	Excellent	Excellent	Fair	Poor

- A water sample was taken for laboratory analysis as part of QA/QC procedures upon reinstallation.

Data Interpretation

- During the deployment period of July 20th – October 23rd, 2006 the water quality remained relatively stable for most parameters.
- The water temperature (**Figure 1**) fluctuated but showed a general decrease from July to October with a strong diurnal pattern detected in the data throughout the deployment. Water temperature values ranged from 27.9°C in July to 7.2°C in October.

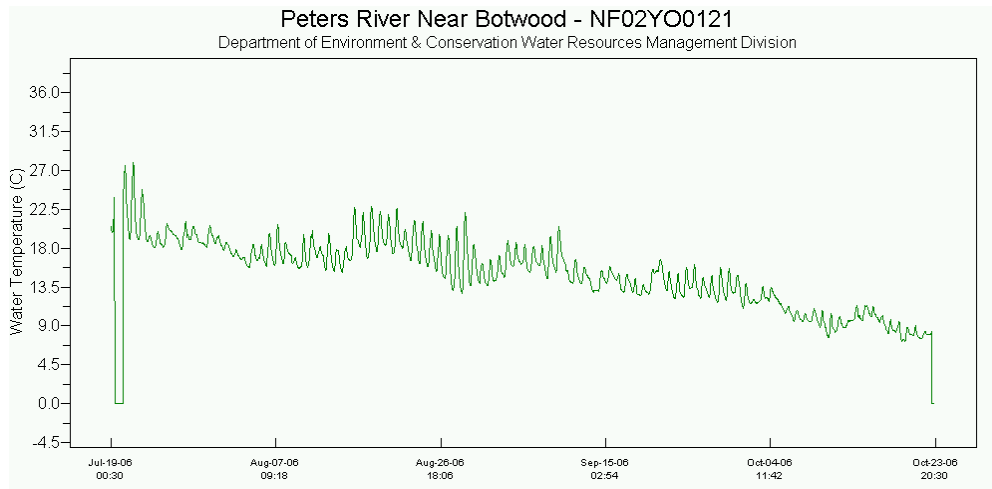


Figure 1

- The dissolved oxygen graph (**Figure 2**) showed a fluctuation but a general increase in dissolved oxygen values over the deployment period. This corresponds to the fluctuation and decrease seen in **Figure 1**. The dissolved oxygen values ranged from 5.68mg/L to 10.15mg/L. These values fall within the recommended CCME Protection of Aquatic Life guidelines for dissolved oxygen in most cases (cold water/other life stages – above 6.5; warm water/other life stages – above 5.5; warm water/early life stages – above 6); however, many values fall below the most conservative limit for cold water/early life stages – 9.5 mg/L.

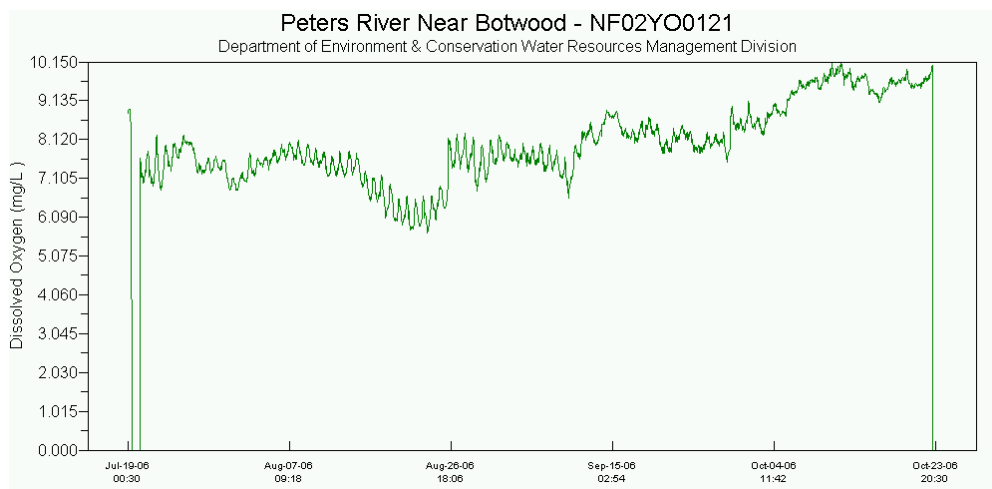


Figure 2

- **Figure 3** shows five time periods where conductivity values significantly drop during the deployment period. These water quality events correspond to increased stage (**Figure 4**) and significant rainfall (**Appendix A**) during that period of time. The remainder of the deployment period remained relatively stable.

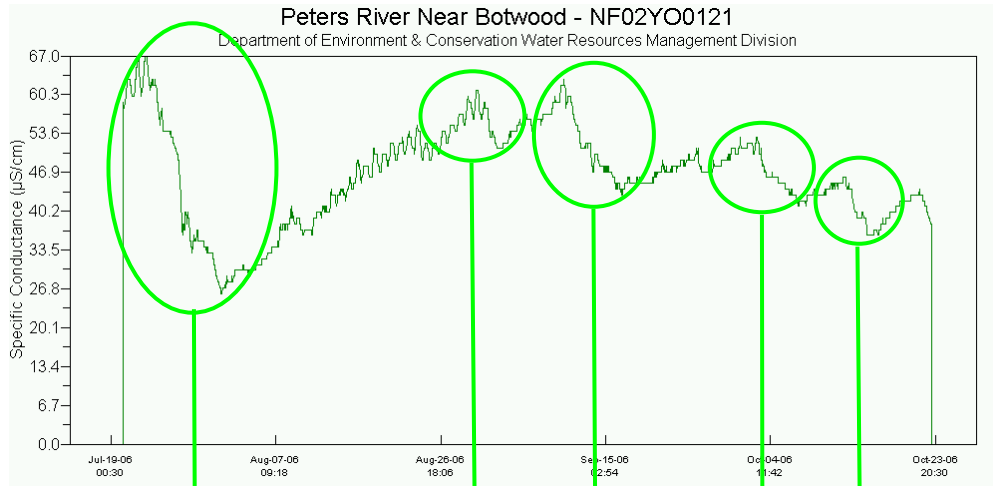


Figure 3

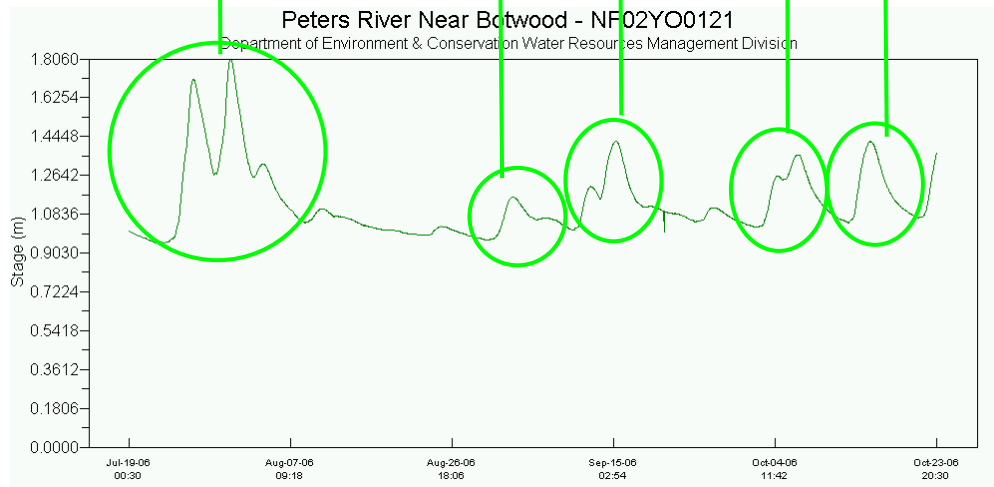


Figure 4

- pH values (**Figure 5**) remained consistent throughout the deployment period with a range of 6.04 – 7.92. Most pH values remain within the recommended range (6.5 – 9.0) for the CCME Protection of Aquatic Life guidelines. The drop in pH which occurred around July 31st corresponds to increased stage (**Figure 4**) and significant rainfall (**Appendix A**) during that period of time.

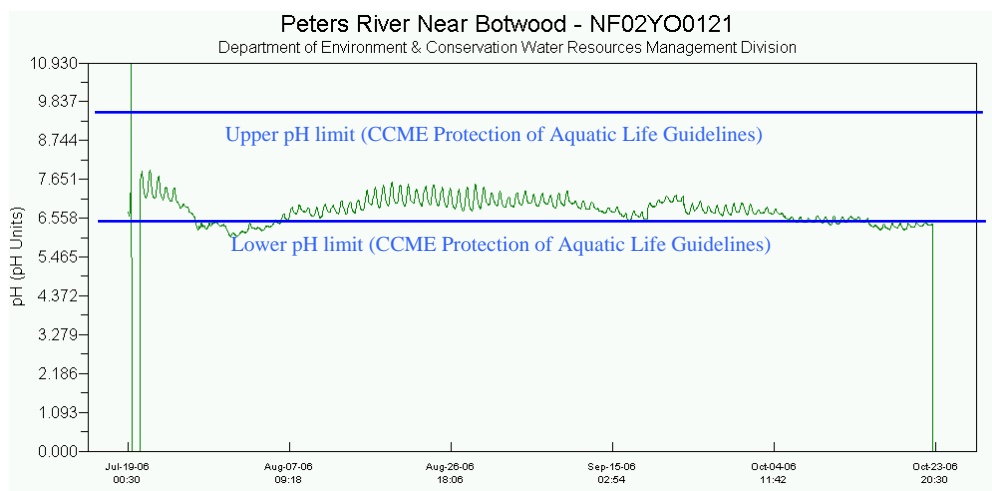


Figure 5

- The turbidity values (**Figure 6**) remained at 0 NTU for the majority of the deployment period. There were a couple of instances where turbidity spikes are seen but all spikes occurred for only one hour duration and dropped immediately back to 0 NTU. One instance in particular occurred on September 12th when the turbidity spiked to its maximum (87 NTU) and dropped back to 0 NTU the next hour. With the exception of the spike of 87 NTU and another of 27 NTU on October 7th all other spikes remained below 8 NTU. These one hour spikes are likely due to a disturbance of the turbidity sensor and not an actual water quality event.

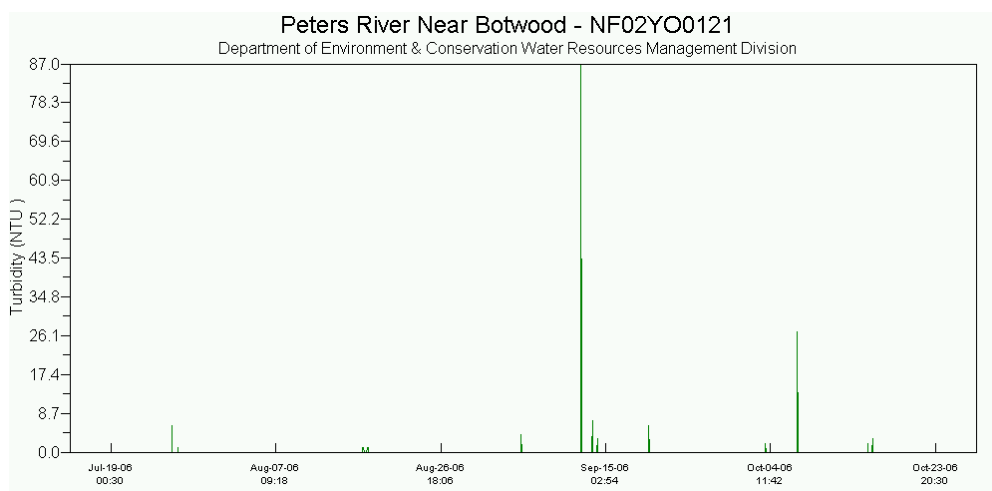


Figure 6

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Appendix A – Climate Data for Gander (July, August, September & October 2006)

Daily Data Report for July 2006											
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days C	Cool Deg Days C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
01	25.4	13.4	19.4	0.0	1.4	1.0	0.0	1.0	0	23E	54E
02	20.7	12.1	16.4	1.6	0.0	3.2	0.0	3.2	0	21E	63E
03	19.3	10.9	15.1	2.9	0.0	1.4	0.0	1.4	0	32E	44E
04	21.2	9.8	15.5	2.5	0.0	1.2	0.0	1.2	0	28E	41E
05	24.1	12.0	18.1	0.0	0.1	T	0.0	T	0	17E	32E
06	25.8	16.3	21.1	0.0	3.1	0.6	0.0	0.6	0	22E	32E
07	25.0	10.4	17.7	0.3	0.0	0.0	0.0	0.0	0	30E	44E
08	24.2	9.7	17.0	1.0	0.0	T	0.0	T	0	25E	43E
09	29.8	17.1	23.5	0.0	5.5	0.0	0.0	0.0	0	22E	57E
10	24.6	11.5	18.1	0.0	0.1	0.6	0.0	0.6	0	23E	33E
11	25.8	11.9	18.9	0.0	0.9	2.2	0.0	2.2	0	<31	
12	21.0	5.5	13.3	4.7	0.0	15.0	0.0	15.0	0	27E	44E
13	20.6	6.1	13.4	4.6	0.0	0.0	0.0	0.0	0	<31	
14	17.9	7.1	12.5	5.5	0.0	0.2	0.0	0.2	0	<31	
15	14.2	10.4	12.3	5.7	0.0	13.0	0.0	13.0	0	<31	
16	21.5	11.4	16.5	1.5	0.0	0.4	0.0	0.4	0	22E	37E
17	24.2	13.5	18.9	0.0	0.9	0.2	0.0	0.2	0	20E	33E
18	27.0	17.3	22.2	0.0	4.2	0.2	0.0	0.2	0	18E	44E
19	28.7	14.2	21.5	0.0	3.5	0.0	0.0	0.0	0	23E	35E
20	26.4	12.8	19.6	0.0	1.6	0.0	0.0	0.0	0	35E	39E
21	28.1	14.0	21.1	0.0	3.1	T	0.0	T	0	21E	39E
22	22.3	15.1	18.7	0.0	0.7	8.6	0.0	8.6	0	29E	44E
23	18.5	12.9	15.7	2.3	0.0	7.2	0.0	7.2	0	<31	
24	18.6	12.4	15.5	2.5	0.0	25.4	0.0	25.4	0	<31	
25	19.6	12.0	15.8	2.2	0.0	29.8	0.0	29.8	0	35E	44E
26	17.3	14.5	15.9	2.1	0.0	5.2	0.0	5.2	0	25E	32E
27	23.1	12.7	17.9	0.1	0.0	T	0.0	T	0	<31	
28	20.3	13.9	17.1	0.9	0.0	T	0.0	T	0	<31	
29	18.4	15.0	16.7	1.3	0.0	31.6	0.0	31.6	0	17E	35E
30	26.3	12.9	19.6	0.0	1.6	0.0	0.0	0.0	0	32E	37E
31	22.1	10.8	16.5	1.5	0.0	1.8	0.0	1.8	0	29E	48E
Sum				43.2	26.7	148.8	0.0	148.8			
Avg	22.6	12.2	17.5								
Xtbn	29.8	5.5								21E	63E

Daily Data Report for August 2006											
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days C	Cool Deg Days C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
01	17.4	10.3	13.9	4.1	0.0	0.2	0.0	0.2	0	25E	33E
02	20.4	10.9	15.7	2.3	0.0	16.2	0.0	16.2	0	18E	41E
03	13.6	8.4	11.0	7.0	0.0	T	0.0	T	0	33E	32E
04	16.6	7.3	12.0	6.0	0.0	0.0	0.0	0.0	0	<31	
05	19.0	10.8	14.9	3.1	0.0	5.4	0.0	5.4	0		
06	21.9	12.4	17.2	0.8	0.0	1.0	0.0	1.0	0	29E	44E
07	25.3	12.5	18.9	0.0	0.9	0.0	0.0	0.0	0	22E	56E
08	23.4	15.3	19.4	0.0	1.4	0.2	0.0	0.2	0	20E	54E
09	18.0	11.3	14.7	3.3	0.0	32.0	0.0	32.0	0	<31	
10	17.8	10.8	14.3	3.7	0.0	0.4	0.0	0.4	0	33E	35E
11	23.2	13.2	18.2	0.0	0.2	0.0	0.0	0.0	0	20E	48E
12	18.6	11.8	15.2	2.8	0.0	12.4	0.0	12.4	0	12E	32E
13	19.6	10.6	15.1	2.9	0.0	1.6	0.0	1.6	0	22E	44E
14	19.3	10.3	14.8	3.2	0.0	0.8	0.0	0.8	0	24E	48E
15	21.1	11.7	16.4	1.6	0.0	T	0.0	T	0	20E	46E
16	25.5	15.3	20.4	0.0	2.4	2.4	0.0	2.4	0	18E	41E
17	22.2	14.5	18.4	0.0	0.4	0.0	0.0	0.0	0	<31	
18	23.7	14.2	19.0	0.0	1.0	0.0	0.0	0.0	0	<31	
19	24.0	13.4	18.7	0.0	0.7	0.0	0.0	0.0	0	23E	35E
20	22.5	12.8	17.7	0.3	0.0	8.0	0.0	8.0	0	34E	35E
21	22.5	12.0	17.3	0.7	0.0	7.8	0.0	7.8	0	<31	
22	18.9	13.6	16.3	1.7	0.0	5.0	0.0	5.0	0	<31	
23	23.0	8.4	15.7	2.3	0.0	4.2	0.0	4.2	0	24E	35E
24	19.3	10.4	14.9	3.1	0.0	T	0.0	T	0	23E	41E
25	18.6	10.0	14.3	3.7	0.0	6.2	0.0	6.2	0	24E	33E
26	14.4	5.7	10.1	7.9	0.0	3.0	0.0	3.0	0	1E	32E
27	14.1	4.4	9.3	8.7	0.0	0.0	0.0	0.0	0	<31	
28	14.5	5.7	10.1	7.9	0.0	0.0	0.0	0.0	0	<31	
29	20.5	5.7	13.1	4.9	0.0	0.0	0.0	0.0	0	22E	41E
30	16.0	7.3	11.7	6.3	0.0	0.6	0.0	0.6	0	<31	
31	13.0	9.8	11.4	6.6	0.0	34.6	0.0	34.6	0	3E	44E
Sum				94.9	7.0	142.0	0.0	142.0			
Avg	19.6	10.7	15.2								
Xtbn	25.5	4.4								22E	56E

Daily Data Report for September 2006											
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days C	Cool Deg Days C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
01	12.2	7.2	9.7	8.3	0.0	9.4	0.0	9.4	0	3E	44E
02	16.4	6.7	11.6	6.4	0.0	0.4	0.0	0.4	0	31E	37E
03	25.5	9.7	17.6	0.4	0.0	0.0	0.0	0.0	0	<31	
04	21.2	13.0	17.1	0.9	0.0	2.8	0.0	2.8	0	23E	33E
05	19.1	11.7	15.4	2.6	0.0	15.6	0.0	15.6	0	<31	
06	19.1	10.7	14.9	3.1	0.0	0.2	0.0	0.2	0	<31	
07	15.5	10.2	12.9	5.1	0.0	T	0.0	T	0	<31	
08	21.3	9.4	15.4	2.6	0.0	0.0	0.0	0.0	0	22E	32E
09	22.8	12.8	17.8	0.2	0.0	0.0	0.0	0.0	0	22E	37E
10	15.3	7.4	11.4	6.6	0.0	21.2	0.0	21.2	0	2E	33E
11	13.5	6.1	9.8	8.2	0.0	2.2	0.0	2.2	0	33E	41E
12	16.2	6.4	11.3	6.7	0.0	0.0	0.0	0.0	0	<31	
13	11.0	7.6	9.3	8.7	0.0	58.8	0.0	58.8	0	3E	74E
14	21.5	10.7	16.1	1.9	0.0	0.0	0.0	0.0	0	32E	48E
15	22.0	12.3	17.2	0.8	0.0	0.0	0.0	0.0	0	26E	32E
16	16.1	5.9	11.0	7.0	0.0	4.8	0.0	4.8	0	36E	33E
17	17.1	5.6	11.4	6.6	0.0	7.0	0.0	7.0	0	36E	32E
18	10.5	5.2	7.9	10.1	0.0	3.4	0.0	3.4	0	36E	33E
19	10.1	6.1	8.1	9.9	0.0	T	0.0	T	0	16E	35E
20	21.2	9.9	15.6	2.4	0.0	4.4	0.0	4.4	0	18E	41E
21	19.2	10.3	14.8	3.2	0.0	3.4	0.0	3.4	0	21E	48E
22	14.4	6.2	10.3	7.7	0.0	T	0.0	T	0	26E	33E
23	15.0	5.9	10.5	7.5	0.0	0.0	0.0	0.0	0	28E	33E
24	17.3	7.3	12.3	5.7	0.0	6.4	0.0	6.4	0	16E	44E
25	19.0	7.3	13.2	4.8	0.0	2.8	0.0	2.8	0	16E	59E
26	14.9	7.0	11.0	7.0	0.0	T	0.0	T	0	<31	
27	15.4	5.3	10.4	7.6	0.0	0.0	0.0	0.0	0	<31	
28	16.8	5.1	11.0	7.0	0.0	0.0	0.0	0.0	0	<31	
29	16.7	5.6	11.2	6.8	0.0	0.0	0.0	0.0	0	16E	35E
30	16.8	8.5	12.7	5.3	0.0	2.2	0.0	2.2	0	16E	46E
Sum				161.1	0.0	145.0	0.0	145.0			
Avg	17.1	8.1	12.6								
Xtbn	25.5	5.1								3E	74E

Daily Data Report for October 2006											
Day	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days C	Cool Deg Days C	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's Deg	Spd of Max Gust km/h
01	12.0	6.1	9.1	8.9	0.0	0.0	0.0	0.0	0		
02	10.0	8.5	9.3	8.7	0.0	13.8	0.0	13.8	0		
03	14.2	9.7	12.0	6.0	0.0	4.4	0.0	4.4	0		
04	15.9	7.8	11.9	6.1	0.0	0.2	0.0	0.2	0		
05	11.5	3.5	7.5	10.5	0.0	24.4	0.0	24.4	0		
06	7.7	2.9	5.3	12.7	0.0	0.0	0.0	0.0	0		
07	12.9	2.7	7.8	10.2	0.0	0.0	0.0	0.0	0		
08	12.6	4.9	8.8	9.2	0.0	T	0.0	T	0		
09	14.4	5.1	9.8	8.2	0.0	0.0	0.0	0.0	0		
10	12.2	3.0	7.6	10.4	0.0	0.0	0.0	0.0	0		
11	9.5	1.8	5.7	12.3	0.0	T	0.0	T	0		
12	8.4	4.4	6.4	11.6	0.0	T	0.0	T	0		
13	13.4	6.6	10.0	8.0	0.0	20.4	0.0	20.4	0		
14	18.5	10.7	14.6	3.4	0.0	4.0	0.0	4.0	0		
15	16.8	6.0	11.4	6.6	0.0	T	0.0	T	0		
16	11.5	3.0	7.3	10.7	0.0	0.0	0.0	0.0	0		
17	9.8	1.2	5.5	12.5	0.0	0.0	0.0	0.0	0		
18	8.2	0.1	4.2	13.8	0.0	0.0	0.0	0.0	0		
19	8.0	0.3	4.2	13.8	0.0	0.0	0.0	0.0	0		