

# Real Time Water Quality (RTWQ) Deployment Report NF02YL0012 – Humber River at Humber Village Bridge November 2009 – January 2010

## General

- The Water Resources Management Division staff monitors the real-time web page on a daily basis.
- This monthly report interprets the data from the Humber River at Humber Village Bridge RTWQ station for the period of November 9<sup>th</sup>, 2009 to January 6<sup>th</sup>, 2010.

## Maintenance and Calibration of Instrumentation

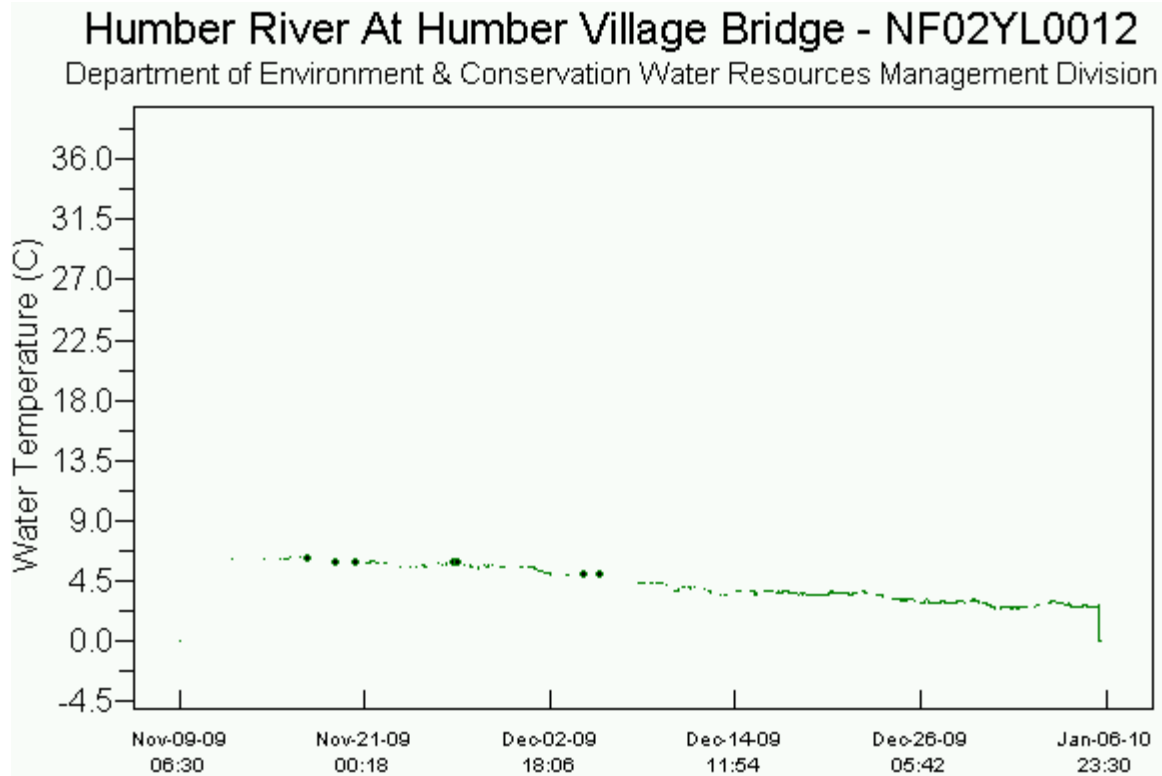
- The instrument was deployed from November 9<sup>th</sup>, 2009 to January 6<sup>th</sup>, 2010. (58 day deployment period) at which point it was removed for maintenance and calibration. This was a typical deployment period for this station at this time of the year and the instrument appears to have kept its calibration reasonably well for the duration of the deployment period.
- The results from comparing the Minisonde values to the Datasonde values can be seen in **Table 1**. Collection of QA/QC readings involves a second set of data readings being collected at the time of removal & installation, using a similar, freshly calibrated instrument. Data readings from both instruments were compared and their variability was ranked, as part of the QA/QC protocol.
- For installation a ranking of excellent was achieved for dissolved oxygen and conductivity, while pH had a fair rating and temperature was good. For removal a ranking of excellent was achieved for temperature, conductivity and dissolved oxygen, while pH was fair.

**Table 1: QA/QC Data Comparison Rankings for installation – Nov. 9<sup>th</sup> & removal – Jan. 6<sup>th</sup>, 2010**

Station	Date	Action	Minisonde vs. Datasonde Comparison Ranking			
			Temperature	pH	Conductivity	Dissolved Oxygen
Humber River at Humber Village Bridge	Nov 9 <sup>th</sup> , 2009	Installation	Good	Fair	Excellent	Excellent
	Jan 6 <sup>th</sup> , 2009	Removal	Excellent	Fair	Excellent	Excellent

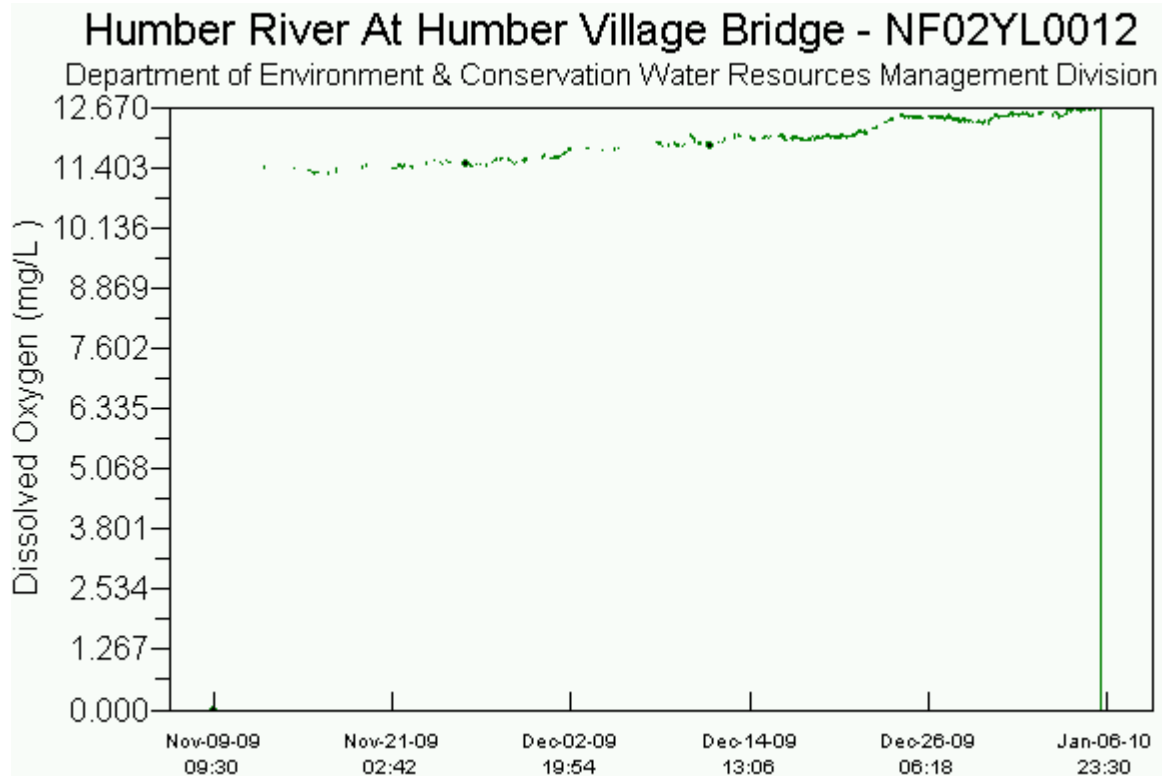
## Data Interpretation

- During the deployment period of November 9<sup>th</sup>, 2009 to January 6<sup>th</sup>, 2010 the water quality was relatively stable for all water quality parameters with a typical late fall seasonal trend and gentle variations throughout the deployment period.
- Water temperature values (**Figure 1**) for the deployment period ranged from a high of 6.4 °c to a low of 2.4 °c with a gradual cooling trend.



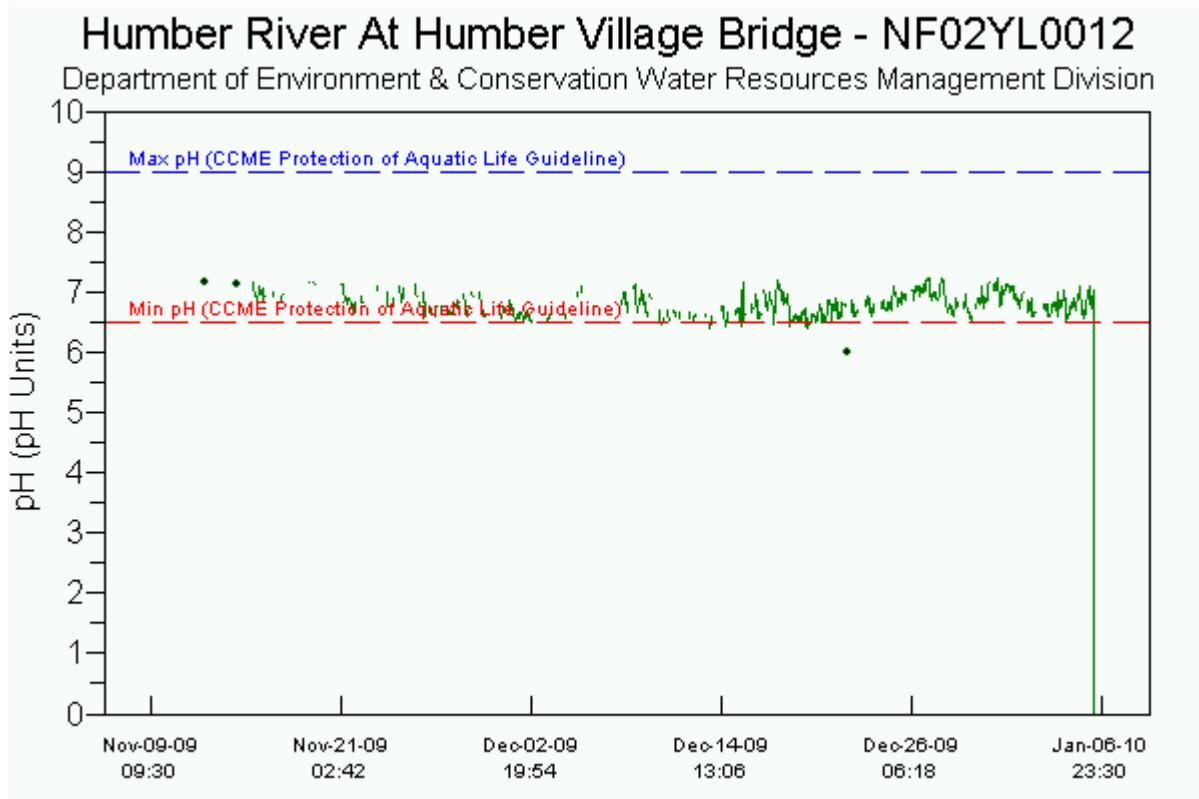
**Figure 1**

- Dissolved oxygen (DO) values (**Figure 2**) for the deployment period showed a gently rising trend in relation to falling temperature. During the deployment period oxygen ranged from a low of 11.26 mg/l to a high of 12.7 mg/l, which is typical of this period at this station.



**Figure 2**

- There are 4 different guidelines for DO depending on the life cycle stage and water temperature (cold water/other life stages – above 6.5 mg/L; warm water/other life stages – above 5.5 mg/L; warm water/early life stages – above 6 mg/L; cold water/early life stages – 9.5 mg/L). All guidelines were met during this deployment period.
- pH values (**Figure 3**) ranged from 6 to 7.23 over the deployment period which is a typical range of values for this station. The CCME Guidelines for the Protection of Freshwater Aquatic Life for pH is a range of 6.5 – 9.0 and only a small percentage of the readings were below 6.5. Due to the underlying geology and ecosystem characteristics it is quite common for Newfoundland surface waters to have a pH lower than the range recommended by the CCME Guidelines.



**Figure 3**

- Specific conductance values (**Figure 4**) were relatively consistent over the deployment period with some day to day variation. Values ranged from 38.3  $\mu\text{S}/\text{cm}$  to 41.8  $\mu\text{S}/\text{cm}$ , which is typical for this station.
- Turbidity values were zero for the duration of the deployment period and therefore are not graphed in this report.

## Humber River At Humber Village Bridge - NF02YL0012

Department of Environment & Conservation Water Resources Management Division

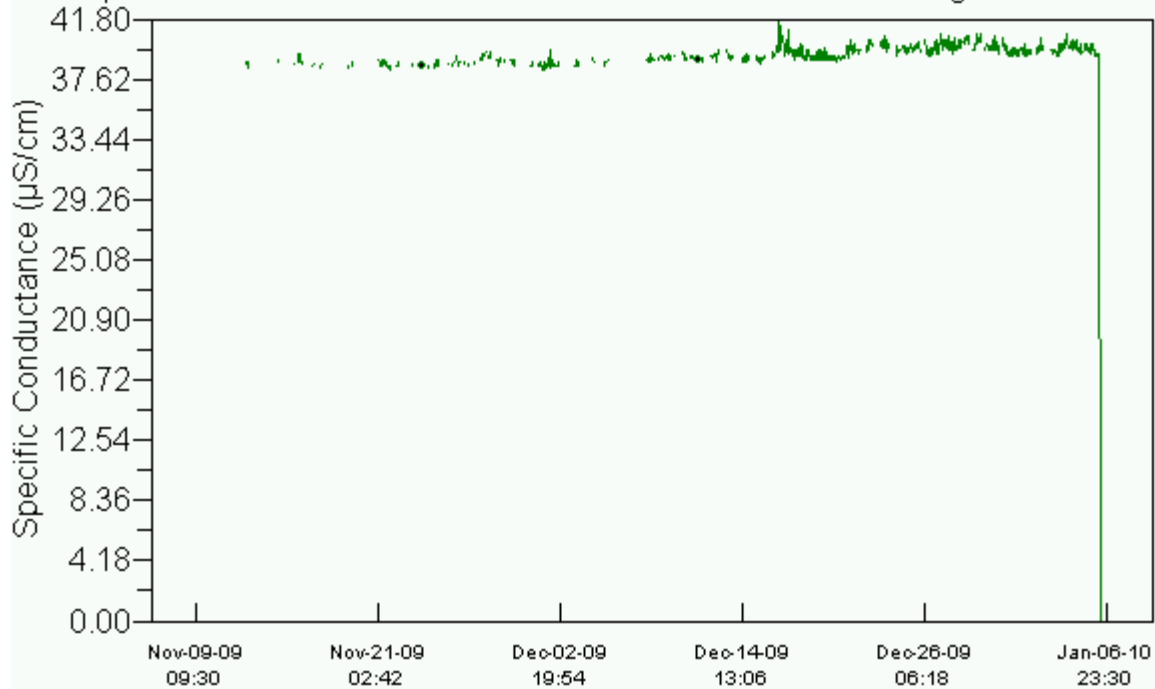


Figure 4

## Humber River At Humber Village Bridge - 02YL003

Department of Environment & Conservation Water Resources Management Division

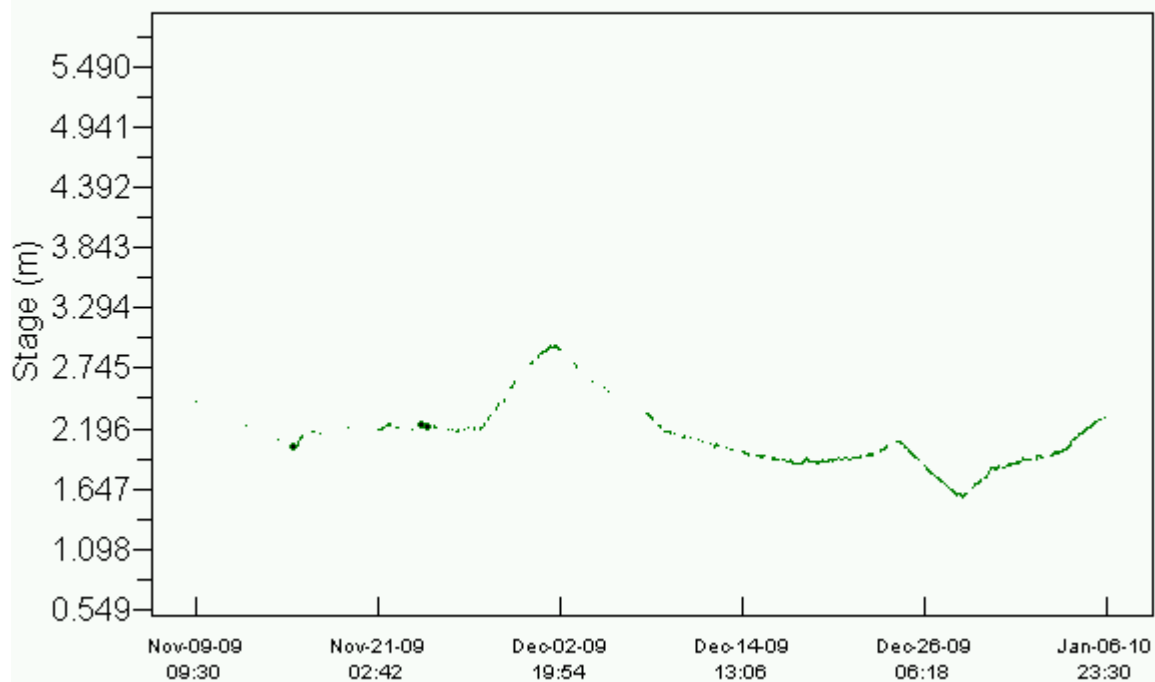


Figure 5

- Stage height readings (**Figure 5**) showed relatively stable levels through the deployment period with some gentle undulations. During the deployment period the height of the river ranged from 1.576 m to 2.953 m, which translates to a range of 154 m<sup>3</sup>/s to 399 m<sup>3</sup>/s.
- Climate data for the months of November and December is appended to the end of this report.

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# Climate Data

Daily Data Report for November 2009

<u>Day</u>	<u>Max Temp</u> °C	<u>Min Temp</u> °C	<u>Mean Temp</u> °C	<u>Heat Deg Days</u> °C	<u>Cool Deg Days</u> °C	<u>Total Rain</u> mm	<u>Total Snow</u> cm	<u>Total Precip</u> mm	<u>Snow on Grnd</u> cm	<u>Dir of Max Gust</u> 10's Deg	<u>Spd of Max Gust</u> km/h
<a href="#">01</a> †	14.5	3.0	8.8	9.2	0.0	M	M	17.9		25	72
<a href="#">02</a> †	6.7	-2.3	2.2	15.8	0.0	M	M	0.0			<31
<a href="#">03</a> †	3.3	-0.8	1.3	16.7	0.0	M	M	21.1		8	39
<a href="#">04</a> †	5.2	-0.3	2.5	15.5	0.0	M	M	2.1		26	46
<a href="#">05</a> †	3.4	-4.2	-0.4	18.4	0.0	M	M	0.7		27	50
<a href="#">06</a> †	0.7	-3.3	-1.3	19.3	0.0	M	M	12.7		8	52
<a href="#">07</a> †	0.7	-3.4	-1.4	19.4	0.0	M	M	0.0		31	39
<a href="#">08</a> †	3.9	-3.9	0.0	18.0	0.0	M	M	3.1		21	44
<a href="#">09</a> †	5.7	2.3	4.0	14.0	0.0	M	M	0.0		27	54
<a href="#">10</a> †	4.1	-2.2	1.0	17.0	0.0	M	M	0.0			<31
<a href="#">11</a> †	3.2	-2.8	0.2	17.8	0.0	M	M	0.8		28	39
<a href="#">12</a> †	5.2	-4.2	0.5	17.5	0.0	M	M	0.6		22	35
<a href="#">13</a> †	5.1	-1.1	2.0	16.0	0.0	M	M	0.0		29	35
<a href="#">14</a> †	10.8	-0.5	5.2	12.8	0.0	M	M	0.0		24	32
<a href="#">15</a> †	10.1	5.1	7.6	10.4	0.0	M	M	16.4			<31
<a href="#">16</a> †	11.0	1.6	6.3	11.7	0.0	M	M	1.3		26	54
<a href="#">17</a> †	2.2	-1.9	0.2	17.8	0.0	M	M	0.6		29	37
<a href="#">18</a> †	3.3	-2.3	0.5	17.5	0.0	M	M	0.0		31	33
<a href="#">19</a> †	4.0	-3.3	0.4	17.6	0.0	M	M	0.0		29	35
<a href="#">20</a> †	9.1	-1.7	3.7	14.3	0.0	M	M	0.0		23	33
<a href="#">21</a> †	9.6	0.4	5.0	13.0	0.0	M	M	9.6		23	50
<a href="#">22</a> †	2.1	-4.2	-1.1	19.1	0.0	M	M	0.0		30	32
<a href="#">23</a> †	3.9	-4.8	-0.5	18.5	0.0	M	M	M			<31
<a href="#">24</a> †	4.4	-0.9	1.8	16.2	0.0	M	M	0.0		19	33
<a href="#">25</a> †	7.9	0.1	4.0	14.0	0.0	M	M	0.0			<31
<a href="#">26</a> †	11.1	3.3	7.2	10.8	0.0	M	M	6.0		21	48
<a href="#">27</a> †	3.9	1.6	2.8	15.2	0.0	M	M	28.0		9	43
<a href="#">28</a> †	14.8	1.7	8.3	9.7	0.0	M	M	3.9		8	50
<a href="#">29</a> †	7.6	-0.5	3.6	14.4	0.0	M	M	3.7		26	57
<a href="#">30</a> †	2.8	0.6	1.7	16.3	0.0	M	M	3.0		26	61
Sum				<b>463.9</b>	<b>0.0</b>	<b>M</b>	<b>M</b>	<b>131.5*</b>			
Avg	<b>6</b>	<b>-1</b>	<b>2.52</b>								
Xtrm	<b>14.8</b>	<b>-4.8</b>								<b>25</b>	<b>72</b>

Daily Data Report for December 2009

<u>D</u> <u>a</u> <u>y</u>	<u>Max</u> <u>Temp</u> °C 	<u>Min</u> <u>Temp</u> °C 	<u>Mean</u> <u>Temp</u> °C 	<u>Heat</u> <u>Deg</u> <u>Days</u> °C 	<u>Cool</u> <u>Deg</u> <u>Days</u> °C 	<u>Total</u> <u>Rain</u> mm	<u>Total</u> <u>Snow</u> cm	<u>Total</u> <u>Precip</u> mm 	<u>Snow on</u> <u>Grnd</u> cm	<u>Dir of</u> <u>Max</u> <u>Gust</u> 10's Deg	<u>Spd of</u> <u>Max Gust</u> km/h 
<a href="#">01</a> †	3.6	-2.3	0.7	17.3	0.0	M	M	14.1		29	59
<a href="#">02</a> †	-1.1	-4.0	-2.6	20.6	0.0	M	M	0.0		30	65
<a href="#">03</a> †	1.5	-1.7	-0.1	18.1	0.0	M	M	0.0		28	61
<a href="#">04</a> †	2.7	-3.7	-0.5	18.5	0.0	M	M	0.0			<31
<a href="#">05</a> †	3.4	-2.1	0.7	17.3	0.0	M	M	0.0		28	46
<a href="#">06</a> †	-1.8	-4.8	-3.3	21.3	0.0	M	M	0.0		31	39
<a href="#">07</a> †	-3.0	-5.0	-4.0	22.0	0.0	M	M	0.0		31	46
<a href="#">08</a> †	-4.8	-7.2	-6.0	24.0	0.0	M	M	0.0		28	39
<a href="#">09</a> †	-4.9	-8.3	-6.6	24.6	0.0	M	M	0.0		28	39
<a href="#">10</a> †	0.5	-6.9	-3.2	21.2	0.0	M	M	0.6		3	52
<a href="#">11</a> †	0.1	-4.0	-2.0	20.0	0.0	M	M	0.0		24	56
<a href="#">12</a> †	-2.3	-7.7	-5.0	23.0	0.0	M	M	0.0		27	48
<a href="#">13</a> †	-6.5	-9.1	-7.8	25.8	0.0	M	M	0.0		28	54
<a href="#">14</a> †	1.3	-8.5	-3.6	21.6	0.0	M	M	0.0			<31
<a href="#">15</a> †	3.9	-5.1	-0.6	18.6	0.0	M	M	0.0		15	50
<a href="#">16</a> †	4.8	-2.6	1.1	16.9	0.0	M	M	0.0		11	46
<a href="#">17</a> †	-2.1	-11.3	-6.7	24.7	0.0	M	M	0.0		26	32
<a href="#">18</a> †	-4.2	-10.1	-7.2	25.2	0.0	M	M	0.0		30	41
<a href="#">19</a> †	-1.9	-12.1	-7.0	25.0	0.0	M	M	0.0			<31
<a href="#">20</a> †	2.2	-2.3	-0.1	18.1	0.0	M	M	0.0		9	46
<a href="#">21</a> †	3.4	0.3	1.9	16.1	0.0	M	M	0.6		6	54
<a href="#">22</a> †	3.6	1.7	2.7	15.3	0.0	M	M	0.0		9	50
<a href="#">23</a> †	1.9	-2.8	-0.5	18.5	0.0	M	M	0.0		9	32
<a href="#">24</a> †	-1.6	-3.9	-2.8	20.8	0.0	M	M	0.0			<31
<a href="#">25</a> †	-1.5	-8.5	-5.0	23.0	0.0	M	M	0.0			<31
<a href="#">26</a> †	0.1	-9.0	-4.5	22.5	0.0	M	M	0.0			<31
<a href="#">27</a> †	-1.2	-6.0	-3.6	21.6	0.0	M	M	0.0			<31
<a href="#">28</a> †	6.1	-4.0	1.1	16.9	0.0	M	M	0.0		16	44
<a href="#">29</a> †	3.6	-0.4	1.6	16.4	0.0	M	M	0.0		20	35
<a href="#">30</a> †	1.3	-11.2	-5.0	23.0	0.0	M	M	0.0		26	50
<a href="#">31</a> †	-7.8	-10.8	-9.3	27.3	0.0	M	M	0.0		30	33
Sum				<b>645.2</b>	<b>0.0</b>	<b>M</b>	<b>M</b>	<b>15.3</b>			
Avg	<b>0</b>	<b>-5.6</b>	<b>-2.81</b>								
Xtrm	<b>6.1</b>	<b>-12.1</b>								<b>30</b>	<b>65</b>