KERR WOOD LEIDAL
consulting engineers

Appendix A

Connaught Creek Hydrological Analysis, KWL, January 2017

Technical Memorandum

DATE: March 22, 2017

TO: Robin Parker

FROM: Eva Li, P.Eng.

RE: **Connaught Creek Hydrological Analysis**
   Our File 234.006-300

Hydrology

Connaught Creek is located in Glacier National Parkland and passes through Rogers Pass, BC. It originates in the Hermit Range and flows northeast for approximately 13 km before joining the Beaver River. The Connaught Creek watershed is located within the Upper Columbia Basin hydrologic zone. The Water Survey of Canada (WSC) operated a hydrometric station on Connaught Creek (ID 08NB018) from August 11, 1980 to December 31, 1986. The station is located at the diversion site at Rogers Pass, where the proposed water collection system is located. The watershed area upstream of the hydrometric station is estimated to be 11.9 km^2.

Daily discharge data from this station was used to characterize the hydrological regime in the study area. Peak flows occur from late spring (May) through the summer months (July) in response to the freshet. The mean monthly discharge (MMD) and mean annual discharge (MAD) for Connaught Creek were computed using 1980-1986 discharge data, as shown in Figure 1.
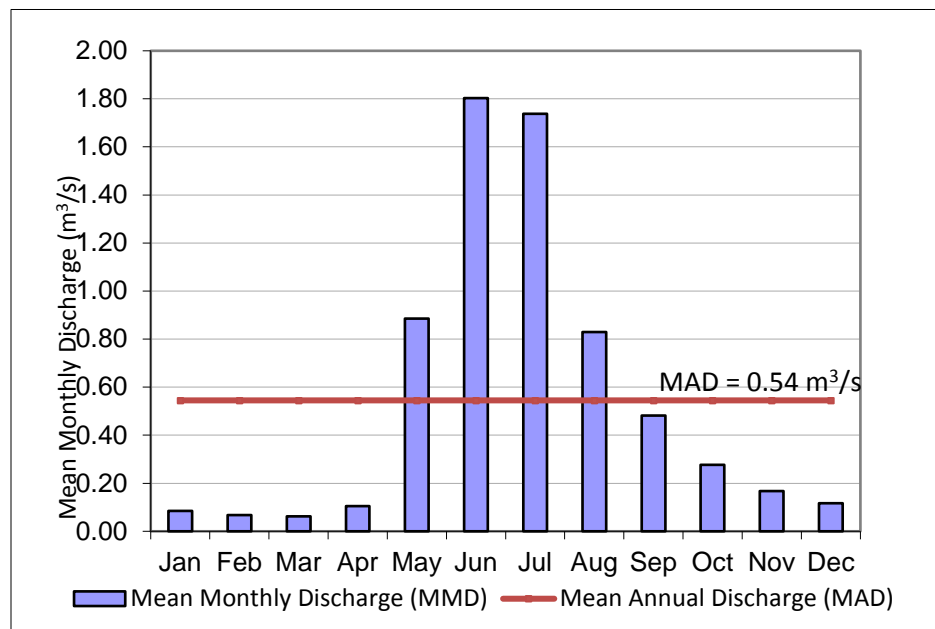

Figure 1: Mean Annual Discharge at Connaught Creek

Development of Synthetic Discharge

To prepare conceptual designs for the water collection system, a long-term streamflow time series, ideally greater than 20 years, is required at the project site. The six years of discharge data on Connaught Creek is not sufficient to meet the design requirements. However, they can be used to conduct a regression analysis with representative regional hydrometric stations. The regression equation can be used to develop a synthetic long-term daily flow series for Connaught Creek.

To identify the most suitable hydrometric station in the region, flow data was reviewed from 19 regional hydrometric stations, as shown in figure below.
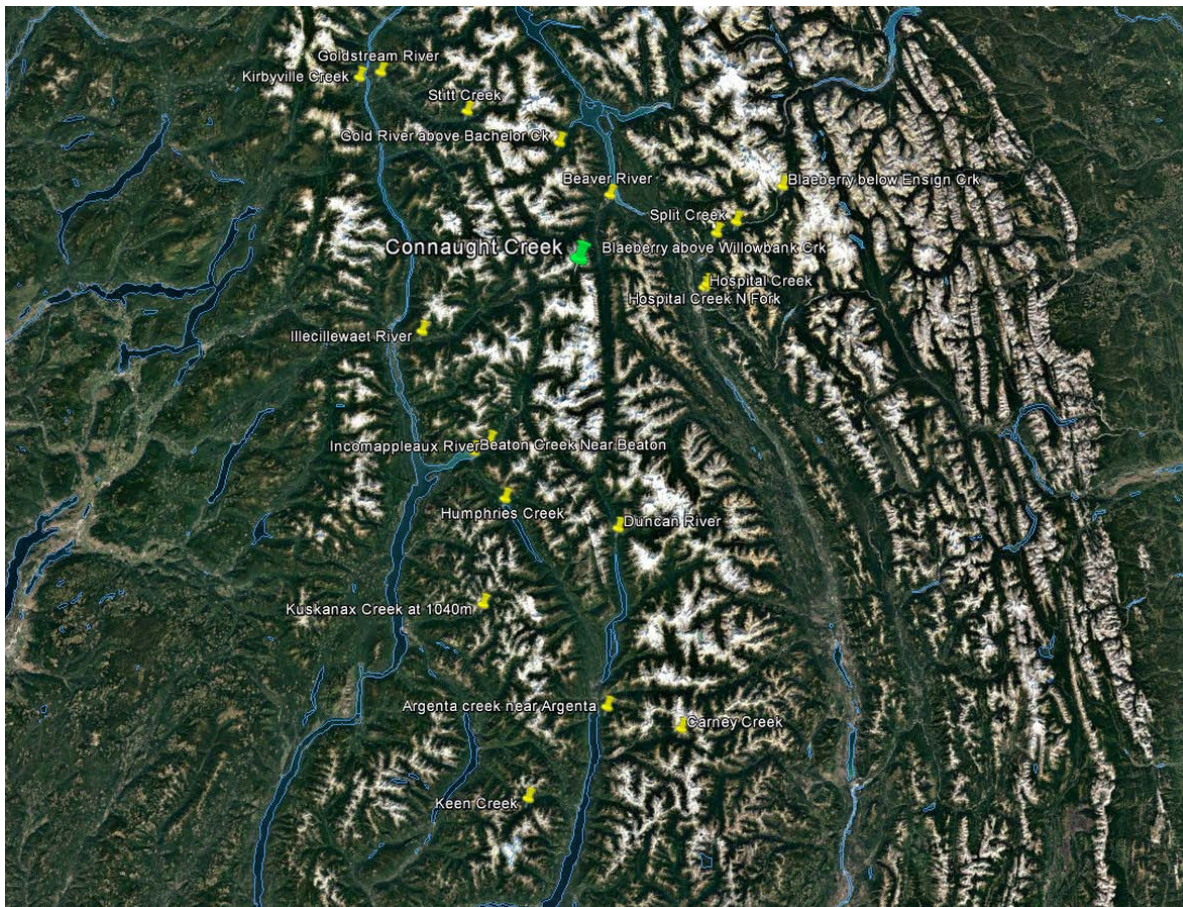
Figure 2: Regional WSC Hydrometric Stations

The following criteria were used to select the most suitable regional hydrometric station, in order of importance:

1) Period of record greater than 20 years and overlapping with Connaught Creek record (1981-1986),
2) Proximity to Connaught Creek,
3) Drainage area,
4) Mean annual runoff,
5) Mean basin elevation,
6) Watershed aspect, and
7) Watershed gradient.

KERR WOOD LEIDAL ASSOCIATES LTD.

consulting engineers

Screening led to the selection of the Stitt Creek at the Mouth (08ND018) hydrometric station as the most applicable. Despite the magnitude difference in the Stitt Creek and Connaught Creek drainage areas, the two stations have a similar mean basin elevation and the mean annual runoffs are within 5% of one another. On the other hand, the two regional hydrometric stations (on Argenta Creek and Carbonate Creek) with similar watershed areas as Connaught Creek both have insufficient or missing discharge data during 1981 to 1986 period. The station information is provided in the table below for comparison with the Connaught Creek hydrometric station.

Table 1: Summary of WSC Station Characteristics

Hydrometric Station	Period of Record	Distance to Site (km)	Area (km^2)	Mean Annual Runoff *(mm)	Mean Basin Elevation (m)	Month of Max Runoff	Watershed Gradient
Stitt Creek at the Mouth (08ND018)	1973-1998	58	139	1512	1950	July	9%
Connaught Creek above Diversion (08NB018)	1980-1986	0	11.9	1451	1900	July	14%
Note: *Mean annual runoff for the overlapping period of 1981-1986.							

A regression analysis of the daily flows was conducted with no adjustment as the watershed characteristics of Connaught Creek and Stitt Creek are similar. The flow data used in the regression analysis are for April 1 to September 30, 1981-1986.
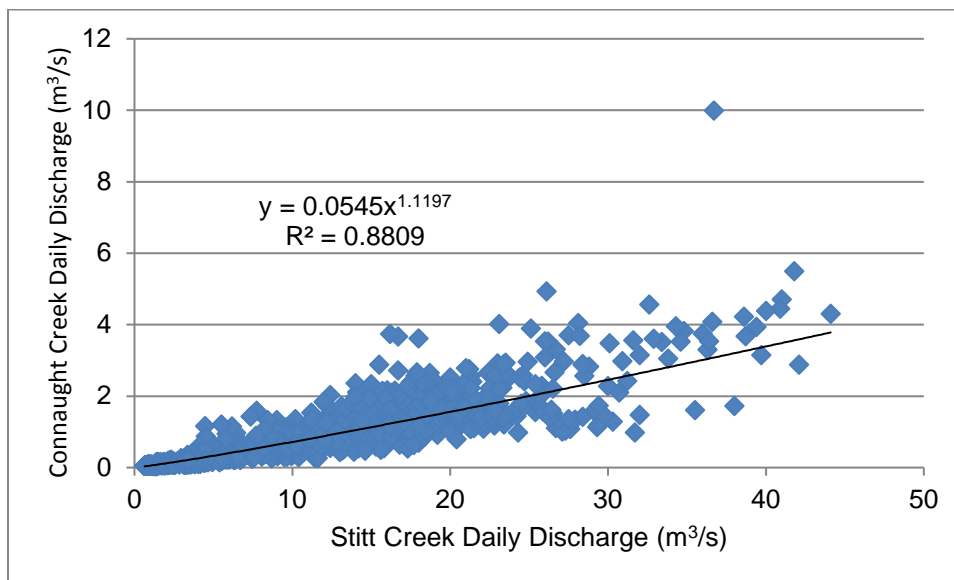
Figure 3: Daily Discharge Regression Analysis

The regression analysis shows a relatively strong correlation with R^2=0.88. This is close to the perfect correlation of R^2=1 and is considered acceptable. The regression equation, as shown in Figure 3, was applied to the corresponding portions of the long-term Stitt Creek record to develop a 19-year synthetic daily flow series (1973-1980 and 1987-1998) for the Connaught Creek hydrometric station. Combined with the existing 7 years of daily discharge data (1980-1986), a 26-year composite daily flow dataset was generated for the Connaught Creek intake site. The long-term mean annual discharge is estimated to be 0.52 m^3/s. The composite daily flow series for the period of April 1 to September 30 is provided in Appendix A.

KERR WOOD LEIDAL ASSOCIATES LTD.
consulting engineers

Withdrawal Rates and Instream Flow Needs

For operational maintenance and paving needs, water is withdrawn from Connaught Creek using multiple trucks with tanks using a standpipe in Parks Canada's service yard. It takes about 20 minutes to fill the larger tanks which equates to a flow rate of 8.3 L/s (0.008 m^3/s). This rate may change depending on the pressure at the hydrant after the new system is in place. The daily demand rates will vary per the two scenarios below:

- Operational Maintenance Needs: 8 water trucks per day = 80,000 L/day (on average 0.9 L/s) for about 7 days in early spring (May). Operations staff have indicated a desire to fill 40,000 L/hr (11 L/s) up to 8 trips per day to meet peak snowshed washing needs in early spring.

- Paving Water Needs: 40,000 L/day (on average 0.5 L/s) from July to mid-October

When withdrawing from a river or creek, it is important to consider Instream Flow Needs (IFN) to support the biota that rely on the water body. There are a number of methods used to determine this, with some much more complicated than others based on the competing demands on the system. Further to discussions with Parks Canada staff, it was agreed to set the IFN to be equivalent to 20% of the Mean Annual Discharge (MAD) of 0.52 m^3/s, i.e. 0.11 m^3/s. Given the demands and habitat requirements of Connaught Creek, this is considered to be a conservative allowance (i.e. favouring natural habitat).

Typical Daily Hydrographs

To identify stream flow variation within 24 hours, hourly discharge data on Connaught Creek was obtained from the WSC for the period of 1982 to 1986.

Scenario 1 - Operational Maintenance Period

Figure 4 shows hourly discharge hydrographs for the period May 1 to May 31, for 1982 through 1986. In the base flow period (i.e. early to mid-May), daily discharge remains fairly constant with minimal hourly variation. The base flow generally ranges from to 0.07 m^3/s to 0.4 m^3/s, except for 1985 when a rainfall-induced peak occurred. The spring freshet generally starts in the second half of May, when the hourly discharge displays a diurnal fluctuation pattern in response to solar radiation, which is the main driver of snowmelt. The extent of the fluctuation varies significantly with the weather pattern in each year. A typical daily hydrograph for the spring freshet is provided in Figure 5.
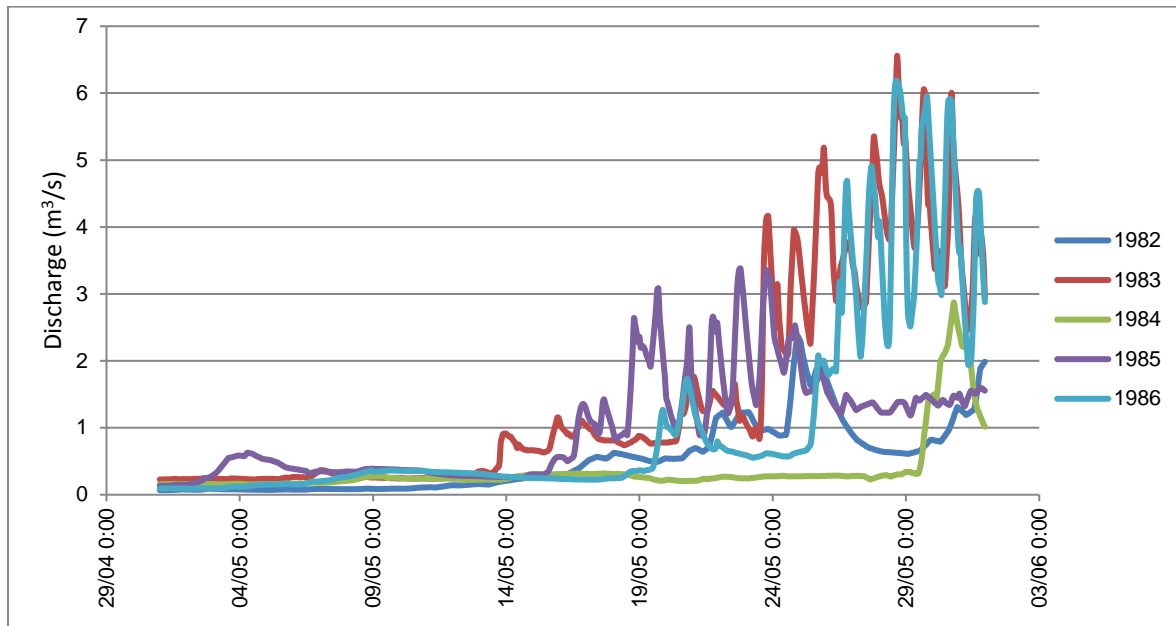
Figure 4: Connaught Creek Hydrographs for May
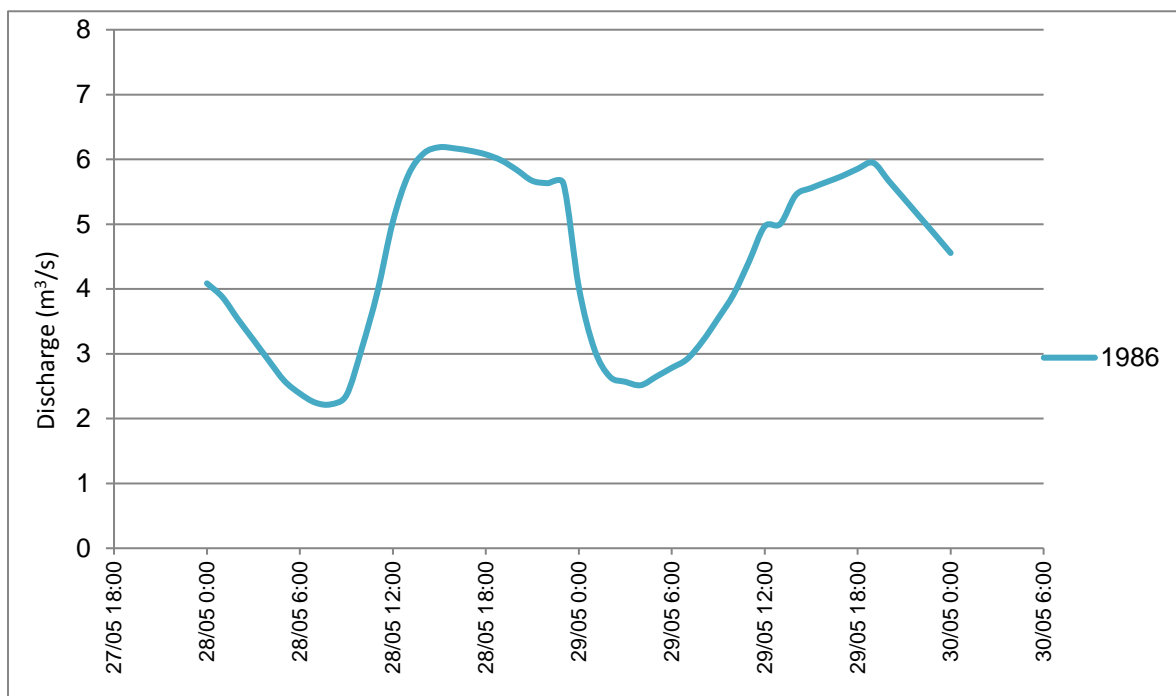
Figure 5: Connaught Creek Typical Daily Hydrograph in May

Scenario 2 - Paving Period (July – October)

Figure 6 shows discharge hydrographs for the period July 1 to October 31 for 1982 through 1986. Hourly discharge fluctuates in response to solar radiation throughout this period. Both daily discharge and the extent of fluctuation decrease towards the end of the October. A number of spikes occurred in response to rainfall events. The timing of the spikes is unpredictable. Typical daily hydrographs for July to October are provided in Figures 7-10.
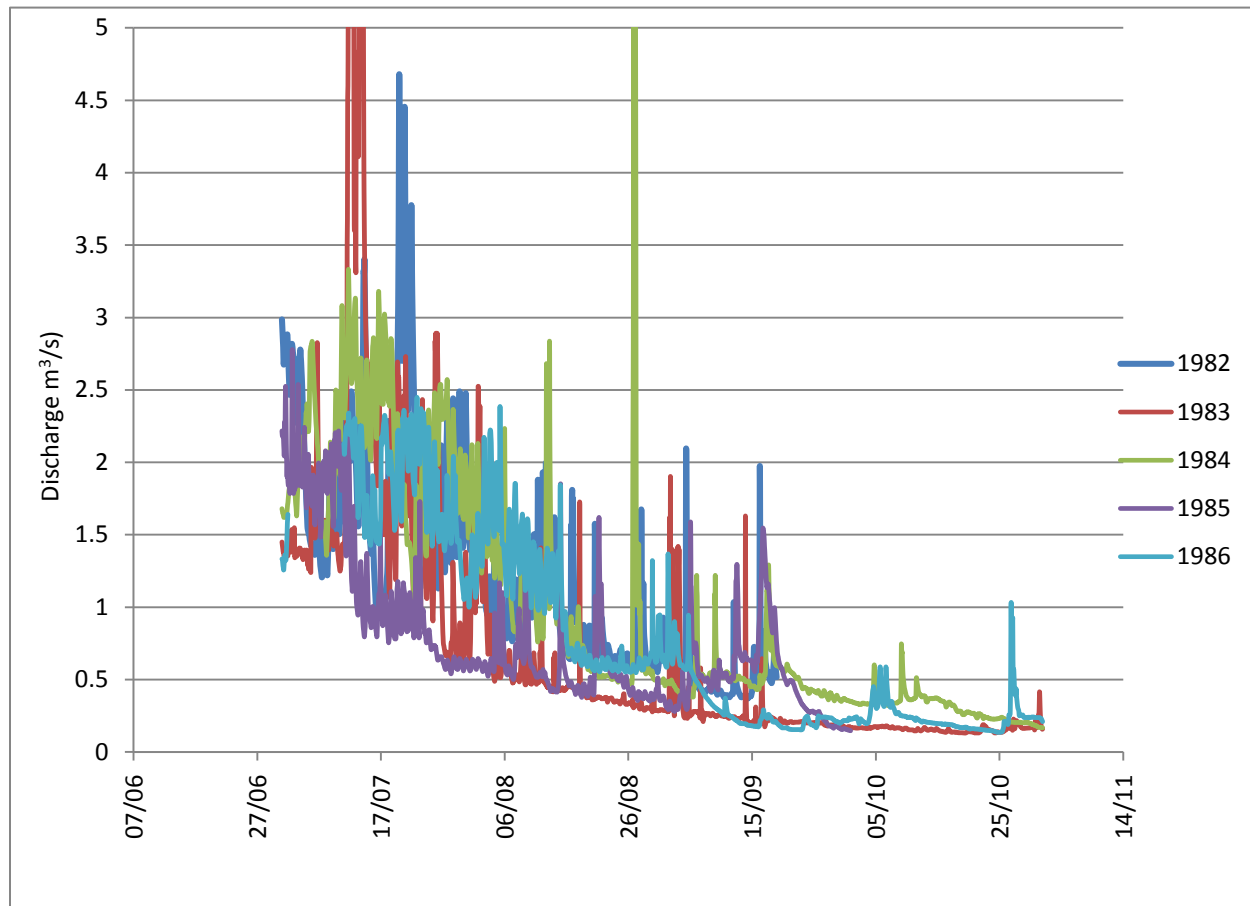
Figure 6: Connaught Creek Hydrographs for July to October
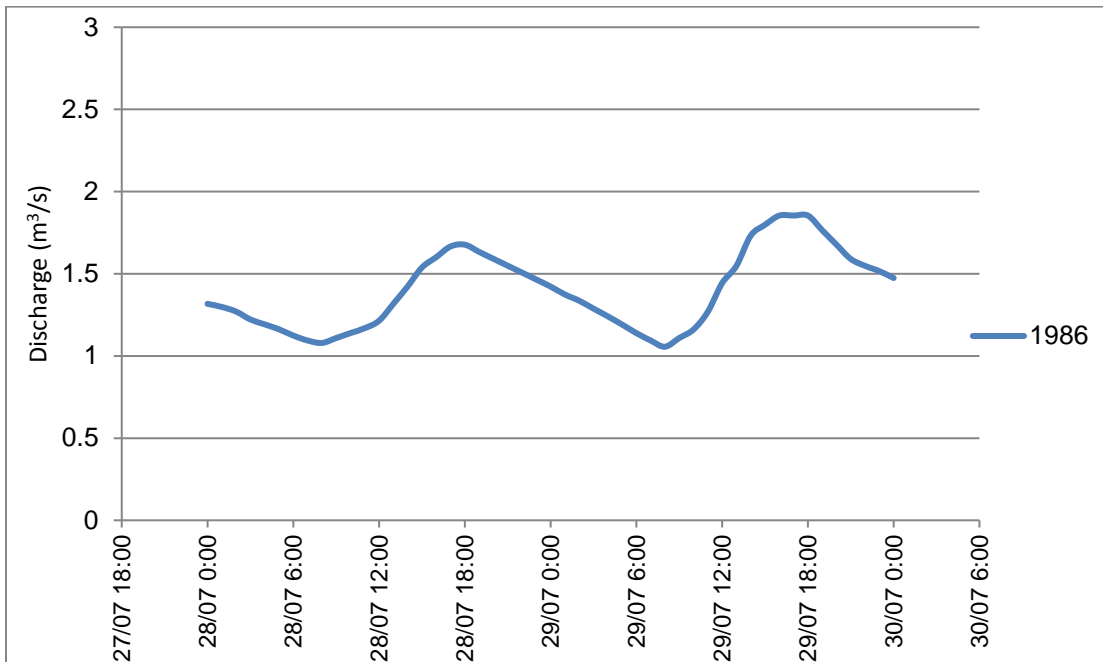
Figure 7: Connaught Creek Typical Daily Hydrograph in July
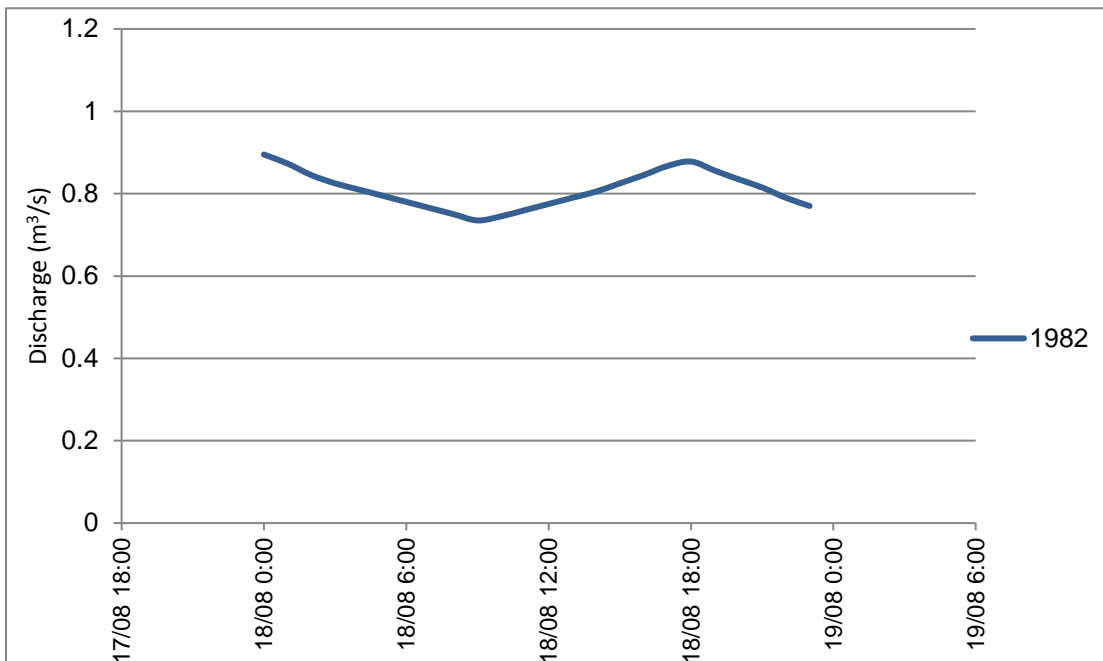
Figure 8: Connaught Creek Typical Daily Hydrograph in August
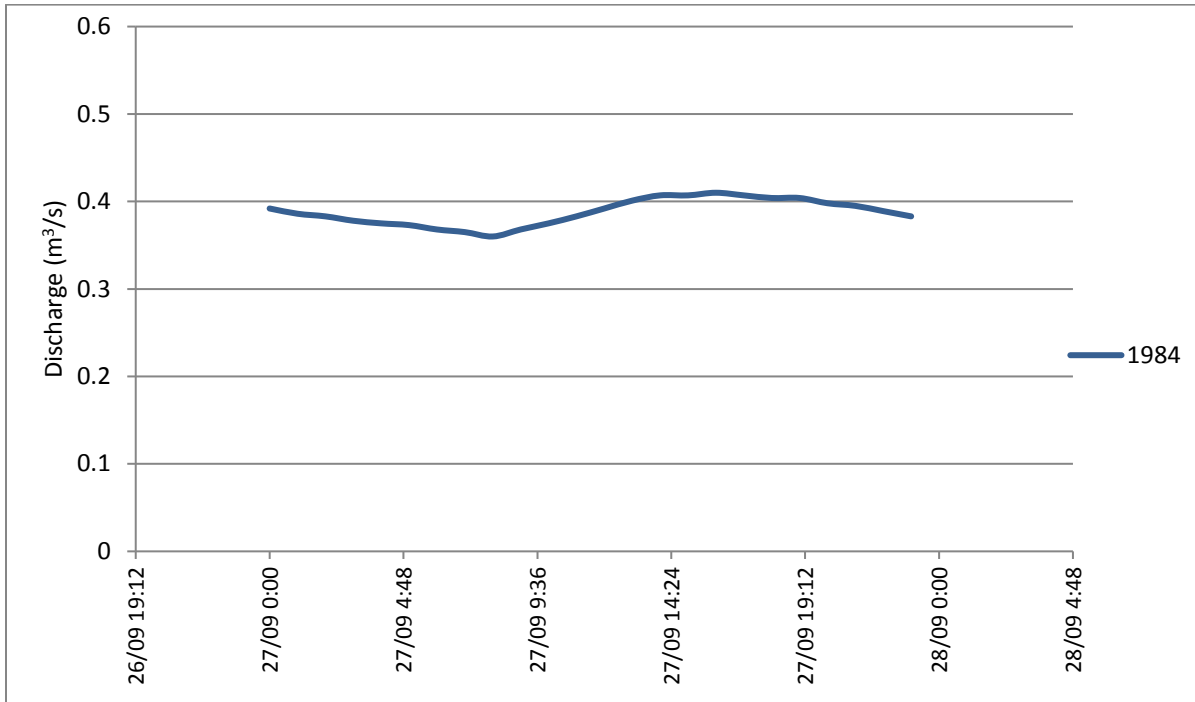
Figure 9: Connaught Creek Typical Daily Hydrograph in September
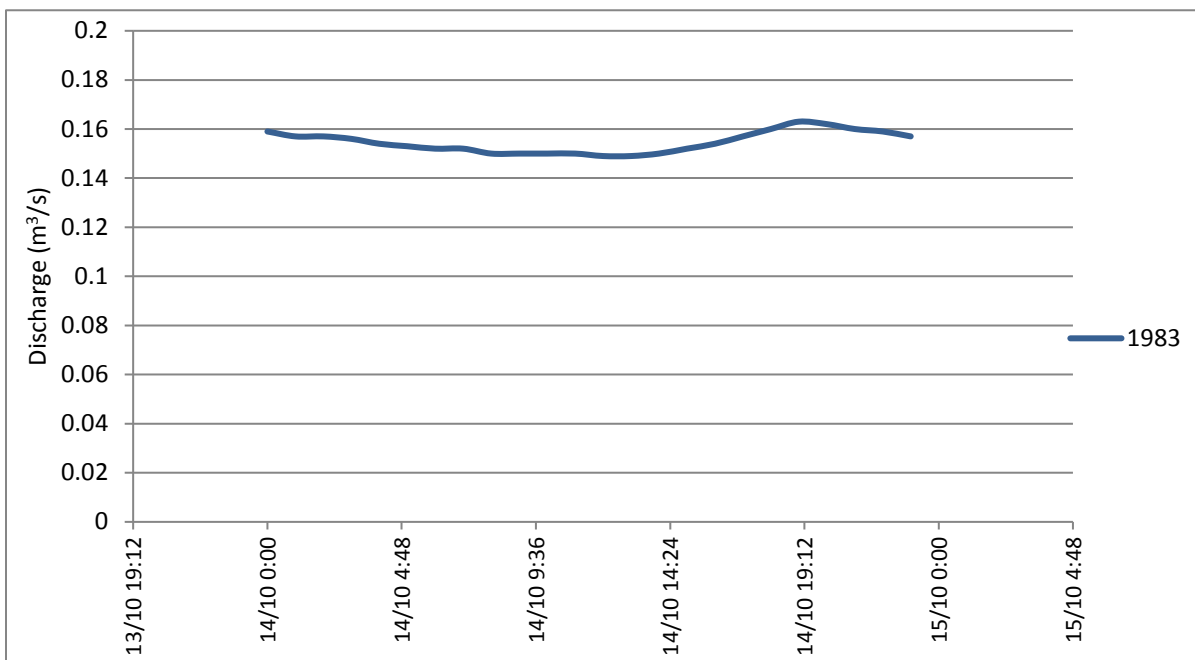
Figure 10: Connaught Creek Typical Daily Hydrograph in October

Conclusions

- Connaught Creek is a typical mountain creek that experiences very low (< 0.2 m³/s) flow during winter months (typically between November to April);

- Peak sustained runoff coincides with the spring freshet and usually occurs during the third week of May. Creek flows follow a diurnal pattern coinciding with solar radiation (i.e. daytime warming);

- Flow rates decay through the summer as the snowpack melts, but very large, short duration, peak flows are common due to rainfall events;

- The mean annual discharge is estimated to be 0.52 m³/s using 26-year of composite daily flow dataset;

- Based on the foregoing analysis and our understanding of Parks Canada's operational water needs at Rogers Pass, Connaught Creek can be expected to supply the peak operational need of 11 L/s (0.011 m³/s) throughout the May to October season, even when considering the base IFN of 0.11 m³/s.

We trust this memo meets your present requirements for a synthetic flow series and typical hydrographs for Connaught Creek. If you have any questions or comments, please contact the undersigned.

KERR WOOD LEIDAL ASSOCIATES LTD.

Prepared by:

Reviewed by:

_____
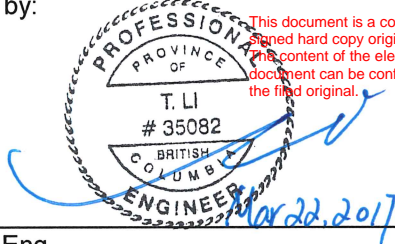
Eva Li, P.Eng.
Water Resources Engineer

_____

Adrian Chantler, P.Eng.
Senior Technical Specialist

Encl.

        Appendix A: Connaught Creek Above Diversion – Synthetic Discharge April 1 – October 31
                Connaught Creek Above Diversion – Synthetic Discharge Chart

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of Parks Canada Agency. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

Revision History

Revision #	Date	Status	Revision	Author
1	March 22, 2017	Final		EL
A	March 2, 2017	Draft		EL

OQM | Organizational Quality Management Program

KERR WOOD LEIDAL ASSOCIATES LTD.
consulting engineers

\\\\vicfs1.kwl.ca\Projects\0000-0999\0200-0299\234-006\400-Work\Hydrology

Appendix A

Connaught Creek Above Diversion – Synthetic Discharge April 1 to October 31

Connaught Creek above Diversion - Synthetic Discharge April 1 to October 31

Catchment Area 11.9 km²

	1973 (m³/s)	1974 (m³/s)	1975 (m³/s)	1976 (m³/s)	1977 (m³/s)	1978 (m³/s)	1979 (m³/s)	1980 (m³/s)	1981 (m³/s)	1982 (m³/s)	1983 (m³/s)	1984 (m³/s)	1985 (m³/s)	1986 (m³/s)	1987 (m³/s)	1988 (m³/s)	1989 (m³/s)	1990 (m³/s)	1991 (m³/s)	1992 (m³/s)	1993 (m³/s)	1994 (m³/s)	1995 (m³/s)	1996 (m³/s)	1997 (m³/s)	1998 (m³/s)	AVG
01-Apr	0.035	0.037	0.024	0.029	0.030	0.125	0.132	0.028	0.068	0.053	0.065	0.046	0.074	0.065	0.098	0.049	0.040	0.091	0.059	0.145	0.053	0.118	0.067	0.013	0.062	0.078	**0.065**
02-Apr	0.038	0.037	0.025	0.030	0.030	0.084	0.130	0.027	0.068	0.051	0.066	0.048	0.096	0.065	0.105	0.058	0.039	0.130	0.074	0.196	0.056	0.133	0.068	0.013	0.062	0.079	**0.070**
03-Apr	0.042	0.037	0.025	0.032	0.030	0.036	0.124	0.021	0.068	0.053	0.066	0.049	0.077	0.065	0.122	0.062	0.043	0.144	0.067	0.278	0.059	0.131	0.069	0.011	0.062	0.083	**0.071**
04-Apr	0.050	0.039	0.025	0.035	0.032	0.030	0.124	0.032	0.068	0.053	0.065	0.050	0.074	0.065	0.143	0.059	0.040	0.136	0.066	0.272	0.060	0.132	0.071	0.013	0.058	0.090	**0.072**
05-Apr	0.056	0.042	0.025	0.038	0.033	0.030	0.124	0.033	0.068	0.053	0.065	0.048	0.073	0.066	0.162	0.058	0.038	0.139	0.061	0.232	0.064	0.133	0.077	0.013	0.060	0.085	**0.072**
06-Apr	0.053	0.043	0.026	0.041	0.040	0.029	0.135	0.035	0.068	0.055	0.065	0.047	0.071	0.067	0.178	0.059	0.040	0.153	0.069	0.213	0.062	0.128	0.076	0.037	0.060	0.077	**0.074**
07-Apr	0.046	0.042	0.026	0.045	0.049	0.031	0.135	0.033	0.068	0.053	0.066	0.048	0.074	0.069	0.185	0.061	0.043	0.160	0.069	0.192	0.064	0.116	0.074	0.053	0.061	0.081	**0.075**
08-Apr	0.047	0.043	0.026	0.050	0.074	0.035	0.124	0.030	0.068	0.052	0.067	0.048	0.076	0.072	0.190	0.061	0.042	0.149	0.066	0.181	0.067	0.111	0.074	0.101	0.059	0.089	**0.077**
09-Apr	0.052	0.051	0.027	0.066	0.095	0.040	0.125	0.030	0.071	0.051	0.067	0.047	0.081	0.077	0.184	0.062	0.044	0.138	0.069	0.181	0.074	0.109	0.078	0.182	0.059	0.084	**0.082**
10-Apr	0.061	0.057	0.027	0.092	0.088	0.039	0.099	0.030	0.071	0.051	0.067	0.046	0.090	0.082	0.180	0.066	0.047	0.130	0.071	0.173	0.083	0.113	0.078	0.249	0.059	0.072	**0.085**
11-Apr	0.073	0.064	0.027	0.128	0.082	0.049	0.067	0.032	0.071	0.050	0.069	0.047	0.112	0.081	0.171	0.082	0.066	0.132	0.070	0.164	0.081	0.124	0.078	0.250	0.062	0.092	**0.089**
12-Apr	0.090	0.066	0.028	0.167	0.076	0.029	0.052	0.036	0.071	0.051	0.068	0.049	0.151	0.079	0.175	0.106	0.076	0.124	0.077	0.166	0.082	0.172	0.076	0.216	0.066	0.090	**0.094**
13-Apr	0.090	0.061	0.029	0.239	0.073	0.078	0.052	0.041	0.071	0.051	0.068	0.048	0.175	0.079	0.171	0.140	0.086	0.124	0.085	0.156	0.082	0.191	0.076	0.182	0.068	0.074	**0.100**
14-Apr	0.081	0.068	0.029	0.198	0.077	0.076	0.051	0.048	0.074	0.050	0.068	0.051	0.234	0.079	0.167	0.232	0.116	0.131	0.099	0.149	0.083	0.155	0.074	0.173	0.067	0.072	**0.104**
15-Apr	0.071	0.076	0.030	0.189	0.074	0.072	0.049	0.071	0.076	0.049	0.067	0.057	0.223	0.079	0.176	0.349	0.192	0.143	0.101	0.171	0.082	0.140	0.072	0.187	0.067	0.067	**0.113**
16-Apr	0.071	0.076	0.031	0.169	0.074	0.078	0.044	0.086	0.079	0.048	0.069	0.078	0.204	0.079	0.189	0.464	0.176	0.175	0.120	0.211	0.094	0.149	0.072	0.225	0.080	0.066	**0.123**
17-Apr	0.079	0.100	0.032	0.155	0.072	0.107	0.047	0.096	0.085	0.049	0.073	0.101	0.194	0.079	0.178	0.554	0.164	0.211	0.139	0.278	0.100	0.216	0.072	0.258	0.092	0.069	**0.139**
18-Apr	0.074	0.141	0.033	0.132	0.070	0.109	0.054	0.092	0.091	0.048	0.092	0.125	0.179	0.079	0.174	0.799	0.171	0.252	0.159	0.261	0.117	0.283	0.070	0.240	0.089	0.070	**0.154**
19-Apr	0.074	0.133	0.035	0.123	0.068	0.125	0.051	0.118	0.096	0.050	0.113	0.141	0.163	0.080	0.166	0.667	0.192	0.290	0.192	0.273	0.138	0.332	0.072	0.226	0.092	0.076	**0.157**
20-Apr	0.079	0.128	0.037	0.116	0.066	0.145	0.048	0.203	0.105	0.051	0.140	0.161	0.159	0.082	0.172	0.539	0.201	0.370	0.234	0.294	0.143	0.410	0.077	0.205	0.104	0.077	**0.167**
21-Apr	0.086	0.116	0.030	0.104	0.066	0.150	0.048	0.217	0.110	0.052	0.174	0.196	0.158	0.090	0.176	0.506	0.228	0.399	0.286	0.289	0.151	0.472	0.081	0.208	0.122	0.089	**0.177**
22-Apr	0.099	0.113	0.027	0.092	0.066	0.152	0.051	0.211	0.122	0.057	0.178	0.206	0.155	0.106	0.182	0.498	0.220	0.449	0.366	0.278	0.158	0.526	0.085	0.221	0.135	0.111	**0.187**
23-Apr	0.104	0.148	0.027	0.084	0.088	0.142	0.055	0.229	0.136	0.065	0.207	0.180	0.149	0.116	0.191	0.469	0.217	0.469	0.452	0.288	0.167	0.518	0.101	0.235	0.148	0.205	**0.200**
24-Apr	0.099	0.206	0.027	0.073	0.128	0.140	0.062	0.389	0.150	0.068	0.228	0.175	0.150	0.112	0.208	0.440	0.217	0.478	0.462	0.300	0.163	0.457	0.130	0.274	0.152	0.224	**0.212**
25-Apr	0.099	0.279	0.029	0.088	0.380	0.171	0.086	0.518	0.164	0.061	0.240	0.166	0.149	0.100	0.215	0.398	0.229	0.419	0.397	0.315	0.170	0.461	0.134	0.254	0.162	0.215	**0.227**
26-Apr	0.103	0.306	0.032	0.118	0.509	0.271	0.125	0.578	0.193	0.061	0.222	0.153	0.143	0.100	0.223	0.360	0.243	0.362	0.312	0.380	0.184	0.419	0.135	0.220	0.177	0.170	**0.235**
27-Apr	0.110	0.290	0.075	0.131	0.532	0.438	0.191	0.783	0.227	0.072	0.214	0.151	0.139	0.098	0.293	0.350	0.261	0.314	0.253	0.585	0.180	0.392	0.138	0.191	0.280	0.175	**0.264**
28-Apr	0.112	0.278	0.054	0.149	0.389	0.525	0.257	0.930	0.340	0.078	0.215	0.152	0.134	0.095	0.567	0.374	0.291	0.283	0.239	0.677	0.183	0.375	0.147	0.172	0.276	0.236	**0.289**
29-Apr	0.104	0.321	0.048	0.173	0.410	0.545	0.313	0.963	0.481	0.072	0.227	0.150	0.134	0.093	0.840	0.398	0.350	0.254	0.229	0.996	0.194	0.389	0.148	0.173	0.234	0.302	**0.329**
30-Apr	0.117	0.407	0.052	0.203	0.418	0.499	0.380	0.980	0.651	0.069	0.228	0.152	0.133	0.093	0.938	0.349	0.436	0.252	0.239	1.249	0.201	0.427	0.136	0.169	0.215	0.353	**0.359**
01-May	0.136	0.438	0.069	0.342	0.451	0.492	0.380	0.922	0.951	0.072	0.231	0.159	0.141	0.093	1.207	0.308	0.494	0.268	0.253	0.807	0.218	0.482	0.134	0.128	0.203	0.422	**0.377**
02-May	0.167	0.340	0.081	0.578	0.449	0.488	0.342	0.963	0.708	0.080	0.239	0.161	0.207	0.094	0.864	0.281	0.465	0.284	0.268	0.612	0.237	0.442	0.143	0.116	0.210	0.599	**0.362**
03-May	0.224	0.283	0.084	0.668	0.451	0.401	0.310	1.005	0.470	0.082	0.238	0.158	0.480	0.107	0.631	0.260	0.457	0.302	0.316	0.584	0.218	0.398	0.171	0.122	0.211	0.726	**0.360**
04-May	0.290	0.267	0.092	0.791	0.429	0.336	0.414	0.947	0.464	0.075	0.234	0.157	0.578	0.134	0.551	0.252	0.444	0.395	0.346	0.694	0.244	0.385	0.180	0.126	0.211	0.614	**0.371**
05-May	0.286	0.298	0.097	0.872	0.359	0.298	0.433	0.996	0.453	0.076	0.244	0.162	0.459	0.155	0.576	0.258	0.575	0.671	0.343	1.046	0.371	0.399	0.197	0.143	0.212	0.635	**0.408**
06-May	0.259	0.399	0.113	0.758	0.325	0.288	0.378	1.114	0.442	0.080	0.278	0.172	0.355	0.171	0.758	0.278	0.831	0.856	0.342	1.352	0.475	0.533	0.240	0.153	0.262	0.766	**0.461**
07-May	0.234	0.485	0.189	0.938	0.340	0.300	0.361	1.114	0.430	0.085	0.334	0.190	0.342	0.232	1.156	0.339	0.881	0.580	0.366	1.560	0.441	0.905	0.329	0.145	0.285	0.807	**0.514**
08-May	0.215	0.512	0.363	0.996	0.389	0.354	0.329	1.080	0.425	0.086	0.278	0.240	0.364	0.314	1.499	0.452	0.856	0.457	0.384	1.421	0.356	1.013	0.405	0.132	0.295	0.766	**0.538**
09-May	0.194	0.442	0.560	1.207	0.459	0.378	0.316	0.988	0.419	0.088	0.250	0.262	0.382	0.354	1.412	0.573	0.955	0.439	0.415	1.005	0.330	1.224	0.517	0.122	0.328	0.750	**0.553**
10-May	0.175	0.376	0.692	1.905	0.477	0.380	0.300	0.988	0.402	0.098	0.247	0.239	0.364	0.355	1.181	0.734	1.046	0.435	0.421	0.783	0.425	1.369	0.521	0.113	0.397	0.718	**0.582**
11-May	0.166	0.338	0.815	2.429	0.831	0.380	0.304	1.038	0.467	0.120	0.243	0.242	0.312	0.337	1.122	0.864	0.856	0.459	0.526	0.660	0.913	1.318	0.518	0.111	0.462	0.823	**0.641**
12-May	0.186	0.315	0.922	2.743	0.565	0.371	0.321	1.046	0.566	0.147	0.270	0.227	0.282	0.322	2.457	1.258	0.615	0.466	0.698	0.600	1.665	1.464	0.675	0.112	0.606	1.173	**0.772**
13-May	0.286	0.291	0.726	1.922	0.438	0.346	0.315	0.988	0.682	0.174	0.477	0.225	0.269	0.290	1.258	1.490	0.541	0.447	0.963	0.557	2.219	1.147	0.554	0.150	0.864	1.309	**0.728**
14-May	0.525	0.291	0.718	1.301	0.378	0.392	0.331	0.922	0.651	0.241	0.744	0.275	0.268	0.257	1.013	1.114	0.550	0.482	0.840	0.546	2.256	0.848	0.608	0.298	1.173	1.114	**0.697**
15-May	1.021	0.279	0.856	1.674	0.336	0.451	0.399	1.105	0.623	0.288	0.771	0.302	0.389	0.244	0.971	0.799	0.562	0.533	0.703	0.591	2.265	0.774	1.021	0.361	1.578	0.726	**0.755**
16-May	1.709	0.267	0.783	1.063	0.313	0.503	0.466	1.173	0.592	0.362	0.975	0.312	0.814	0.230	0.938	0.881	0.636	0.591	0.706	0.567	2.120	0.840	0.881	0.361	1.798	0.553	**0.786**
17-May	2.093	0.261	0.638	1.905	0.291	0.527	0.416	1.232	0.665	0.549	0.870	0.313	1.130	0.232	0.963	1.038	0.634	0.609	0.980	0.656	1.905	0.783	1.046	0.399	1.639	0.489	**0.856**
18-May	2.559	0.271	0.549	1.164	0.283	0.558	0.389	1.207	0.906	0.587	0.790	0.294	1.400	0.300	0.905	0.774	0.564	0.594	1.569	0.774	1.780	0.774	0.734	0.569	0.988	0.522	**0.838**
19-May	1.798	0.275	0.442	1.013	0.291	0.686	0.348	1.097	1.190	0.514	0.797	0.232	2.280	0.632	0.726	0.649	0.492	0.603	1.887	0.783	1.762	0.783	0.518	0.629	0.864	0.505	**0.838**
20-May	1.147	0.304	0.353	0.848	0.336	0.938	0.331	1.080	1.230	0.570	1.150	0.211	1.470	1.230	0.634	0.633	0.430	0.675	2.039	0.791	1.922	0.889	0.441	0.597	0.799	0.591	**0.832**
21-May	0.734	0.374	0.363	0.691	0.410	1.335	0.346	1.122	1.290	0.806	1.430	0.231	1.620	0.882	0.564	0.718	0.407	0.695	2.003	0.701	1.949	1.005	0.381	0.555	0.661	0.644	**0.843**
22-May	0.636	0.429	0.429	0.840	0.457	1.352	0.416	0.889	1.360	1.150	1.330	0.258	2.200	0.644	0.547	0.980	0.400	0.687	1.517	0.652	1.438	0.971	0.407	0.606	0.576	0.706	**0.841**
23-May	0.634	0.499	0.475	1.105	0.530	0.726	0.578	0.783	1.420	1.040	2.030	0.262	2.320	0.583	0.539	1.560	0.436	0.799	1.088	0.663	1.156	1.021	0.530	0.774	0.591	1.130	**0.895**
24-May	1.114	0.503	0.392	1.816	0.670	0.686	0.766	0.783	1.490	1.320	2.880	0.276	2.220	0.594	0.567	1.164	0.446	0.980	0.913	0.815	1.241	1.266	0.645	0.913	0.791	1.318	**1.022**
25-May	1.499	0.547	0.327	1.543	0.475	0.632	0.988	0.774	1.450	1.880	3.620	0.278	1.680	1.250	0.668	1.046	0.441	1.207	0.840	1.309	1.404	1.613	0.683	1.156	1.088	1.326	**1.143**

Date																											
26-May	0.799	0.758	0.316	1.156	0.395	0.538	1.613	0.955	1.440	1.270	3.670	0.280	1.380	2.900	0.872	1.088	0.451	1.046	0.758	2.057	1.508	1.718	0.648	1.525	1.301	1.949	**1.246**
27-May	0.634	0.621	0.353	1.525	0.401	0.485	1.674	1.005	1.430	0.743	3.740	0.263	1.330	3.540	1.105	1.139	0.462	1.173	0.766	1.842	1.508	1.412	0.758	1.241	1.258	2.420	**1.263**
28-May	0.583	0.527	0.468	2.329	0.378	0.530	0.799	0.971	1.420	0.631	4.930	0.295	1.300	4.450	1.207	1.147	0.512	1.430	0.905	1.464	1.404	1.038	1.046	1.114	1.301	1.551	**1.297**
29-May	0.625	0.490	0.695	2.021	0.359	0.509	0.607	0.922	1.430	0.689	4.570	0.682	1.380	4.310	0.980	1.046	0.622	1.816	1.130	1.464	1.674	0.864	1.534	1.030	1.438	1.147	**1.309**
30-May	1.173	0.470	0.881	1.665	0.348	0.483	0.708	0.881	1.490	0.970	4.080	2.160	1.400	4.390	0.930	0.930	0.766	1.976	1.241	1.490	1.343	0.734	1.745	1.021	1.771	1.301	**1.398**
31-May	1.387	0.470	1.072	1.309	0.407	0.576	0.872	0.840	1.540	1.460	3.300	1.700	1.500	3.150	1.005	0.905	0.963	1.745	1.421	1.499	1.447	0.734	1.887	0.766	3.088	1.361	**1.400**
01-Jun	0.864	0.494	1.190	0.889	0.488	0.791	1.105	0.971	1.590	2.160	2.430	0.561	1.640	2.880	0.856	0.872	1.241	1.780	1.447	1.878	2.201	0.881	1.878	0.823	3.267	1.139	**1.397**
02-Jun	0.686	0.677	1.421	0.711	0.783	1.190	1.473	1.038	1.640	2.510	1.580	0.365	1.580	1.730	0.742	0.791	1.361	1.878	1.361	1.976	1.709	0.938	1.958	1.005	1.816	0.726	**1.294**
03-Jun	0.661	0.815	1.430	0.599	0.576	1.780	1.833	1.005	1.740	2.650	1.670	0.376	1.480	0.986	0.766	0.971	1.421	1.754	1.173	1.361	1.482	1.088	1.994	1.940	1.456	0.659	**1.295**
04-Jun	0.791	0.686	1.438	0.488	0.488	2.129	2.484	0.980	1.750	2.370	1.410	0.408	1.500	1.040	1.080	0.938	1.586	1.639	0.971	1.283	1.301	1.139	1.816	2.512	1.958	0.629	**1.339**
05-Jun	1.292	0.587	1.387	0.420	0.509	2.356	2.484	0.913	1.760	2.000	1.490	0.866	1.500	1.080	2.192	1.013	1.887	1.301	0.963	1.292	1.275	1.387	2.030	1.173	2.165	0.525	**1.379**
06-Jun	2.402	0.573	1.147	0.599	0.688	2.356	1.657	0.799	1.770	1.510	1.520	1.540	1.250	1.140	2.192	1.621	1.931	1.164	1.130	1.326	1.224	1.560	1.648	0.930	1.887	0.577	**1.390**
07-Jun	3.305	0.580	0.897	0.930	0.963	2.084	1.097	0.774	1.610	1.010	1.640	1.740	1.430	1.340	1.683	2.274	1.657	1.164	1.369	1.430	1.232	1.569	1.473	1.630	1.657	0.633	**1.430**
08-Jun	1.692	0.679	0.706	1.569	1.745	2.102	0.922	0.897	1.470	0.973	1.690	2.110	1.280	1.200	1.887	2.057	1.639	1.190	1.674	1.701	1.326	1.275	1.258	1.896	1.745	0.604	**1.434**
09-Jun	1.105	0.610	0.766	1.447	2.301	1.833	0.971	1.105	1.360	1.740	1.510	2.150	0.941	1.110	2.402	1.630	1.842	1.190	1.665	2.057	1.005	1.063	1.232	1.378	1.604	0.662	**1.411**
10-Jun	0.799	0.585	1.038	1.258	1.301	1.361	1.639	1.241	1.210	2.570	1.520	1.880	0.940	1.420	2.030	1.456	1.648	1.464	1.842	1.709	0.922	1.030	1.232	0.963	1.833	1.046	**1.382**
11-Jun	0.708	0.913	1.309	1.156	1.105	1.173	2.201	1.249	1.090	2.920	1.420	2.390	1.180	1.610	1.456	1.309	1.736	1.595	2.641	1.648	0.750	1.097	1.283	0.988	2.650	1.139	**1.489**
12-Jun	0.758	1.709	1.508	1.072	1.080	1.181	2.383	1.258	1.040	3.310	1.340	2.730	2.180	1.010	2.329	1.130	2.048	1.309	2.093	2.576	0.675	1.352	1.181	0.766	2.530	0.799	**1.590**
13-Jun	1.241	2.210	2.219	1.114	1.207	1.456	1.878	1.395	1.120	3.710	1.340	2.960	1.630	0.988	2.138	1.258	2.201	1.173	1.534	2.687	0.715	1.842	1.156	0.988	2.548	0.579	**1.665**
14-Jun	1.181	2.457	2.084	1.258	1.309	1.224	1.224	1.499	1.180	4.050	1.500	2.870	1.960	1.450	2.120	1.543	3.013	1.198	1.326	1.967	0.783	1.430	0.905	1.122	2.365	0.497	**1.674**
15-Jun	0.988	3.352	2.138	1.754	1.283	0.938	0.963	1.709	1.250	4.020	1.450	2.280	1.670	1.480	2.613	1.833	2.493	1.387	1.198	1.824	1.046	0.996	0.988	1.181	2.567	0.864	**1.703**
16-Jun	0.848	4.255	1.789	1.922	1.198	0.750	1.021	1.860	1.210	3.890	1.290	1.790	1.720	1.080	2.229	2.229	1.754	1.543	1.088	1.931	1.156	0.840	1.088	1.326	2.798	0.481	**1.657**
17-Jun	0.799	4.168	1.736	2.356	1.266	0.799	1.412	1.931	1.190	3.530	1.610	1.730	1.570	1.180	1.692	1.976	1.352	1.613	1.046	1.887	1.147	0.840	1.258	0.980	2.724	0.459	**1.625**
18-Jun	0.742	3.657	1.842	3.173	1.387	1.072	1.833	1.490	1.140	3.540	1.390	1.320	1.870	2.100	1.639	1.833	1.232	2.084	1.130	1.701	1.207	0.897	1.164	0.750	2.873	0.485	**1.675**
19-Jun	0.807	3.839	1.665	2.770	1.508	0.947	1.887	1.361	1.130	3.690	1.300	1.480	2.230	1.310	1.851	1.709	1.326	2.093	1.361	1.674	1.097	0.930	1.072	0.758	1.560	0.463	**1.608**
20-Jun	1.139	4.090	1.994	2.329	1.369	1.164	1.595	1.464	1.090	3.820	1.240	1.660	2.100	1.030	2.039	1.692	1.038	2.093	1.692	1.816	0.947	0.988	1.198	0.750	1.038	0.504	**1.611**
21-Jun	2.429	4.148	1.958	1.833	1.473	1.613	1.404	1.378	1.100	4.230	1.220	1.870	2.090	0.880	2.138	1.736	0.971	2.120	1.709	1.851	1.072	1.343	1.482	0.799	0.881	0.573	**1.704**
22-Jun	4.226	5.060	2.021	1.771	1.648	1.648	1.421	1.318	1.100	3.940	1.310	2.140	1.910	1.130	1.378	2.567	1.063	2.539	1.595	2.030	1.198	1.807	1.335	0.963	0.840	0.695	**1.871**
23-Jun	5.139	4.754	2.093	1.604	1.692	1.464	1.517	1.283	1.110	3.520	1.380	2.410	1.360	1.480	1.021	2.319	1.198	2.808	1.745	2.210	0.799	2.066	1.456	1.072	0.774	0.823	**1.888**
24-Jun	4.528	3.897	2.256	1.525	1.283	1.683	1.604	1.038	1.120	3.680	1.450	2.420	1.080	1.740	0.897	1.887	1.232	2.733	1.905	1.896	0.774	1.931	1.508	1.292	0.691	0.791	**1.802**
25-Jun	3.762	3.248	2.770	1.343	1.156	1.727	1.665	1.055	1.380	3.530	1.310	2.580	0.964	1.400	1.046	1.824	1.224	2.475	2.030	1.807	0.823	1.701	1.490	1.309	0.758	0.742	**1.735**
26-Jun	5.308	3.305	1.896	1.198	0.938	1.780	1.913	1.156	1.420	3.610	1.270	2.660	1.340	1.300	1.482	2.229	1.525	2.347	2.030	1.869	1.005	1.798	1.249	1.701	1.080	0.556	**1.845**
27-Jun	3.955	2.429	1.378	1.013	1.030	1.994	2.147	1.030	1.300	3.560	1.350	3.090	1.830	1.390	1.683	2.668	1.292	2.238	2.084	1.727	1.473	1.762	1.013	1.517	0.799	0.621	**1.784**
28-Jun	3.628	1.878	1.114	0.872	0.815	2.084	2.402	0.963	1.210	2.980	1.530	2.970	2.340	1.350	1.630	2.274	0.963	2.012	2.156	1.913	0.881	1.896	1.046	1.931	0.717	0.856	**1.708**
29-Jun	3.116	1.447	0.889	1.258	0.823	3.542	2.512	1.055	1.180	3.150	1.680	3.960	2.670	1.620	1.639	1.922	1.046	1.949	2.429	1.851	0.750	2.129	1.139	1.543	0.709	0.707	**1.797**
30-Jun	2.012	2.030	0.840	1.701	0.583	4.724	2.356	0.864	1.350	3.050	1.570	1.800	2.170	1.420	1.754	1.438	1.181	2.129	2.329	1.543	0.726	1.816	1.301	1.335	0.774	0.815	**1.677**
01-Jul	1.387	2.985	1.046	3.352	0.520	3.839	1.807	0.947	1.770	2.830	1.370	1.650	2.150	1.380	1.985	1.241	1.266	2.274	2.210	1.164	0.799	2.641	1.404	2.147	0.947	0.848	**1.768**
02-Jul	1.198	2.854	1.404	2.558	0.679	3.013	1.404	1.088	1.560	2.670	1.460	1.910	1.990	1.360	2.048	1.648	1.088	2.057	2.558	0.930	0.823	1.754	2.641	3.079	1.055	0.930	**1.760**
03-Jul	1.745	2.183	1.994	1.543	0.623	3.352	1.164	1.543	1.770	2.520	1.380	1.850	2.000	1.480	1.780	1.473	1.030	1.931	3.069	0.856	0.840	1.301	3.514	4.971	1.207	1.038	**1.852**
04-Jul	2.715	1.896	2.715	1.604	0.468	3.628	1.258	1.569	1.910	2.240	1.370	2.190	1.920	1.350	1.762	1.335	1.046	1.595	2.845	0.905	0.881	1.292	2.210	5.259	1.387	1.207	**1.868**
05-Jul	2.613	2.585	3.088	1.842	0.490	3.705	1.905	1.215	1.770	1.480	1.440	2.570	1.830	1.250	1.896	1.543	1.021	1.736	2.374	0.913	0.864	1.030	2.338	2.457	1.940	0.831	**1.797**
06-Jul	1.508	2.030	3.088	3.013	0.483	4.255	2.292	0.980	1.530	1.460	1.850	2.310	1.800	1.310	1.275	1.543	1.046	2.265	1.789	1.072	0.766	0.963	1.949	1.833	2.475	0.897	**1.761**
07-Jul	1.080	1.922	3.060	4.090	0.440	3.984	2.957	0.930	1.280	1.340	1.540	1.610	1.790	1.390	1.164	1.335	1.147	1.985	1.595	1.130	0.815	1.164	1.922	1.869		1.275	**1.713**
08-Jul	1.088	1.985	3.088	3.868	0.451	3.466	2.383	1.097	1.230	1.540	1.520	1.710	1.940	1.420	1.130	1.335	1.130	1.994	1.683	1.258	0.971	1.412	1.887	2.365	2.420	1.063	**1.748**
09-Jul	1.318	2.402	3.409	3.600	0.532	3.820	2.274	1.164	1.060	1.700	1.470	2.030	1.950	1.600	0.955	1.456	1.046	2.174	1.949	1.030	0.889	1.326	2.039	3.926	2.808	0.980	**1.881**
10-Jul	1.851	2.696	3.173	2.957	0.621	4.558	2.265	1.258	1.280	1.900	1.340	2.390	1.980	1.890	0.922	1.621	1.292	2.292	2.138	0.881	0.783	1.156	2.129	2.687	2.229	0.938	**1.893**
11-Jul	1.421	2.457	2.743	2.283	0.621	3.791	1.736	1.482	1.280	1.960	4.710	2.760	1.840	2.210	0.930	2.030	1.395	2.715	2.192	0.823	0.938	1.063	1.207	2.274	1.798	1.215	**1.918**
12-Jul	1.097	2.048	2.641	1.887	0.643	2.512	1.499	1.232	1.280	2.250	9.990	2.780	1.360	2.180	1.013	1.994	1.464	2.901	2.129	0.971	0.791	1.055	1.080	2.631	2.374	0.905	**2.027**
13-Jul	1.421	1.621	2.484	2.075	0.623	2.585	1.164	1.147	1.280	2.010	5.500	2.520	1.060	1.960	1.207	1.604	1.745	2.752	2.808	1.780	0.750	1.088	1.030	2.374	2.356	0.586	**1.828**
14-Jul	1.896	1.701	2.075	1.464	0.640	3.352	0.988	1.430	1.420	2.590	3.750	2.340	1.020	1.710	1.318	1.395	1.807	2.021	2.429	1.097	0.678	1.190	1.072	2.595	2.438	0.464	**1.726**
15-Jul	2.585	3.495	2.402	1.701	0.670	3.839	1.130	1.482	1.280	1.440	2.550	2.420	0.944	1.600	1.122	1.164	2.120	1.727	1.762	0.791	0.633	1.266	1.139	3.381	2.374	0.575	**1.754**
16-Jul	2.283	2.668	1.905	2.329	0.691	3.013	1.404	1.701	1.230	1.010	2.080	2.650	1.010	1.520	0.864	1.097	1.754	1.896	1.718	0.791	0.675	1.258	1.139	2.854	2.102	0.608	**1.625**
17-Jul	1.674	2.048	1.692	2.283	0.799	1.976	1.780	1.156	1.320	1.010	1.670	2.660	0.979	2.220	0.791	1.080	1.543	1.508	1.736	0.930	0.712	1.378	1.215	1.976	1.674	0.758	**1.483**
18-Jul	1.727	2.696	1.438	2.174	0.872	1.534	1.976	1.063	1.420	2.000	1.660	2.560	0.903	1.970	0.734	1.130	1.404	1.275	1.709	0.955	0.742	1.665	1.173	2.835	1.464	0.799	**1.534**
19-Jul	2.021	3.352	1.164	2.292	0.643	1.378	2.102	1.063	1.290	2.570	1.930	2.160	0.949	1.850	0.783	1.283	1.456	1.207	1.543	0.930	0.774	1.335	1.207	1.508	1.473	0.823	**1.503**
20-Jul	2.219	2.770	0.996	2.641	0.520	1.387	2.219	0.988	1.260	3.480	2.100	1.780	0.969	2.020	0.913	1.464	1.887	1.105	1.387	0.938	0.791	1.335	1.318	1.021	1.736	0.693	**1.536**
21-Jul	2.147	2.283	0.905	2.238	0.494	1.595	2.084	1.181	1.230	2.900	1.890	1.440	0.939	2.170	0.872	1.665	1.508	1.147	1.727	1.055	1.038	1.613	1.232	0.831	2.484	0.565	**1.509**
22-Jul	1.709	2.457	0.848	1.534	0.551	1.896	1.692	1.525	1.120	2.270	1.500	1.400	0.940	2.100	0.913	1.499	1.164	1.232	1.630	1.072	0.988	1.595	1.657	0.840	2.438	0.609	**1.430**
23-Jul	1.560	3.305	0.815	2.183	0.594	1.860	1.456	1.701	1.090	1.460	1.600	1.650	0.995	2.230	0.996	1.232	1.013	1.292	1.833	0.938	1.005	1.499	2.567	1.147	1.657	0.799	**1.480**
24-Jul	1.198	3.305	0.881	2.147	0.591	1.780	1.215	1.369	1.120	1.360	1.570	1.840	0.805	1.910	1.063	1.387	1.038	1.473	2.229	0.971	0.872	1.604	2.310	1.543	1.207	0.938	**1.451**
25-Jul	1.080	3.333	1.030	2.256	0.587	1.727	1.139	1.215	1.380	1.290	1.660	2.030	0.722	1.730	1.309	1.464	1.005	1.438	2.301	0.930	0.856	1.621	2.966	1.692	1.038	1.072	**1.495**
26-Jul	1.173	2.929	1.173	1.745	0.650	1.762	1.080	1.224	1.180	1.540	1.810	2.290	0.649	1.620	1.215	1.560	1.055	1.718	2.084	0.897	0.913	1.569	4.333	1.648	0.938	1.249	**1.539**

Date																											
27-Jul	1.586	2.929	1.490	1.130	0.688	1.949	1.114	1.326	1.770	1.700	0.696	2.340	0.604	1.570	1.266	1.543	1.318	1.657	1.780	0.783	0.938	1.283	3.013	1.692	0.930	1.318	**1.477**
28-Jul	1.534	3.144	2.156	1.482	0.665	1.395	1.207	1.207	1.290	1.790	0.825	2.010	0.593	1.670	1.266	1.447	1.301	1.352	1.613	0.783	1.275	1.173	1.215	1.940	1.088	1.301	**1.412**
29-Jul	1.630	3.352	1.648	1.404	0.872	1.241	1.190	1.063	1.520	1.850	0.711	1.860	0.605	1.480	1.241	1.378	1.232	1.438	1.543	0.708	1.648	1.130	1.088	1.736	1.369	1.114	**1.387**
30-Jul	1.692	3.409	0.930	1.824	0.872	1.097	1.105	0.963	1.320	1.860	0.879	1.800	0.602	1.140	1.275	1.378	1.309	1.534	1.369	0.823	1.005	1.139	0.905	2.102	1.896	1.352	**1.368**
31-Jul	1.842	2.826	0.726	2.165	0.783	0.963	1.147	0.988	1.210	1.560	1.050	1.790	0.598	1.230	1.517	1.156	1.352	1.421	1.266	0.971	0.766	0.971	1.198	1.905	1.421	0.947	**1.299**
01-Aug	2.030	2.512	0.742	3.277	0.621	0.783	1.156	0.922	1.210	1.510	1.560	1.680	0.612	1.320	1.352	1.326	1.232	1.665	1.318	0.996	0.783	0.947	1.156	1.456	1.215	1.005	**1.322**
02-Aug	2.057	2.798	1.181	3.173	0.587	0.668	1.063	1.088	1.280	1.210	1.440	1.480	0.592	1.610	1.055	0.980	1.190	1.301	1.326	0.955	0.815	0.996	0.980	1.105	1.482	1.021	**1.286**
03-Aug	1.931	3.032	1.013	2.696	0.614	0.692	1.105	0.889	0.923	1.050	0.799	1.460	0.581	1.820	0.840	1.030	1.499	1.072	1.447	1.005	0.881	1.215	1.021	1.046	1.318	1.097	**1.234**
04-Aug	1.762	2.929	0.938	2.457	0.621	0.930	0.872	0.791	0.895	1.140	0.576	1.350	0.680	1.710	0.815	1.190	1.088	1.173	1.639	0.963	0.947	1.249	1.173	1.156	1.499	1.361	**1.227**
05-Aug	2.539	3.220	1.387	2.585	0.554	0.889	0.848	0.996	1.320	0.824	0.591	1.390	0.737	1.640	0.840	1.224	1.055	1.361	1.789	0.815	1.005	1.232	1.490	0.947	1.718	1.438	**1.324**
06-Aug	1.335	2.219	0.938	2.484	0.499	0.742	0.734	0.774	1.350	0.957	0.618	1.350	0.565	1.350	0.758	1.447	1.122	1.447	1.940	0.831	1.318	0.881	1.482	0.913	2.039	0.913	**1.193**
07-Aug	1.005	1.586	0.702	2.512	0.455	0.807	0.688	0.690	1.320	0.958	0.511	0.882	0.591	1.450	0.823	1.122	1.122	1.232	2.003	0.758	1.046	0.807	1.198	1.080	1.994	0.644	**1.076**
08-Aug	1.139	1.241	0.668	2.641	0.444	0.840	0.718	0.703	1.350	0.987	0.547	0.982	0.766	1.450	0.905	1.046	1.097	1.156	1.922	0.555	0.988	1.055	1.241	1.292	1.097	0.677	**1.058**
09-Aug	1.275	1.114	0.543	2.383	0.466	0.872	0.708	0.713	1.290	1.110	0.541	1.130	0.907	1.380	0.963	2.075	1.122	1.207	2.057	0.475	0.881	0.823	1.122	1.604	0.815	0.758	**1.090**
10-Aug	1.378	1.164	0.618	2.093	0.457	0.881	0.766	0.807	1.260	1.180	0.532	1.180	0.584	1.260	0.848	1.301	1.030	1.266	2.770	0.445	1.215	0.594	0.988	1.551	0.758	0.707	**1.063**
11-Aug	1.275	1.173	0.856	1.665	0.449	0.783	0.807	0.637	1.230	1.440	0.634	0.885	0.528	1.170	0.607	1.038	0.955	1.387	1.639	0.528	1.207	0.621	1.224	1.534	0.799	0.750	**0.993**
12-Aug	1.122	1.097	0.645	1.816	0.449	0.905	0.823	0.623	1.190	1.760	0.498	1.400	0.520	1.150	0.580	1.013	1.005	1.412	1.412	0.662	1.046	0.667	1.164	1.438	1.395	0.872	**1.026**
13-Aug	1.147	0.848	0.623	1.878	0.538	0.650	0.881	0.558	1.040	1.310	0.448	1.430	0.439	1.220	0.608	1.063	1.122	1.447	1.139	0.783	0.840	0.726	1.412	1.088	1.190	0.980	**0.977**
14-Aug	1.156	0.799	0.636	1.780	0.591	0.640	0.897	0.544	1.040	1.100	0.475	0.944	0.519	1.210	0.588	1.097	1.021	1.630	1.038	0.864	0.799	0.783	1.378	1.156	1.224	1.055	**0.960**
15-Aug	0.938	0.750	0.659	2.174	0.596	0.955	0.905	0.493	1.060	0.731	0.433	0.806	0.759	1.030	0.562	1.021	1.114	1.326	1.164	0.848	0.840	0.726	1.072	1.198	0.922	0.889	**0.922**
16-Aug	0.872	0.831	0.856	2.770	0.477	0.543	0.881	0.518	0.855	0.915	0.451	0.783	0.474	0.702	0.516	1.404	0.840	1.241	1.318	0.783	0.864	0.668	0.930	0.988	0.734	0.545	**0.875**
17-Aug	0.750	0.988	1.147	2.030	0.412	0.449	0.913	0.762	0.813	1.080	0.445	0.820	0.434	0.677	0.459	1.266	0.672	1.190	1.447	0.783	0.889	0.662	0.840	0.807	0.689	0.374	**0.838**
18-Aug	0.516	1.063	0.864	1.464	0.401	0.583	0.980	0.558	0.980	0.806	0.526	0.726	0.426	0.647	0.429	1.147	0.670	0.913	1.508	0.799	0.881	0.573	0.831	0.678	0.686	0.362	**0.770**
19-Aug	0.433	1.560	1.030	1.241	0.438	0.600	0.889	0.518	0.923	0.755	0.387	0.590	0.432	0.626	0.427	0.971	0.734	0.938	1.404	0.734	0.889	0.659	1.013	0.615	0.666	0.360	**0.763**
20-Aug	0.438	1.430	0.947	1.613	0.462	0.477	0.930	0.464	0.895	0.833	0.370	0.558	0.594	0.592	0.554	0.856	0.897	1.088	1.421	0.567	0.905	0.734	0.897	0.599	0.718	0.409	**0.779**
21-Aug	0.479	1.404	0.881	1.292	0.464	0.412	1.013	0.428	0.787	0.781	0.375	0.526	1.060	0.591	0.399	0.742	1.361	1.156	1.387	0.482	0.963	0.601	0.831	0.501	0.872	0.368	**0.775**
22-Aug	0.499	1.063	0.856	0.971	0.459	0.401	0.980	0.442	0.654	0.699	0.367	0.527	0.597	0.606	0.422	0.783	1.088	1.517	1.198	0.328	1.130	0.512	0.799	0.537	0.807	0.431	**0.718**
23-Aug	0.496	1.771	0.569	1.156	0.536	0.433	0.831	0.428	0.530	0.628	0.359	0.510	0.536	0.588	0.471	0.930	0.783	1.063	1.173	0.271	1.181	0.525	0.488	0.671	0.799	0.459	**0.699**
24-Aug	0.453	1.824	0.455	2.383	0.549	0.397	0.766	0.442	0.719	0.635	0.346	0.505	0.511	0.606	0.502	1.080	0.703	0.599	0.913	0.275	1.130	0.412	0.378	0.742	0.726	0.480	**0.713**
25-Aug	0.438	1.878	0.457	3.088	0.543	0.509	0.783	0.391	0.646	0.636	0.348	0.490	0.476	0.586	0.478	1.190	0.621	0.518	0.750	0.302	0.963	0.404	0.323	0.783	0.653	0.429	**0.719**
26-Aug	0.530	1.258	0.420	2.147	0.444	0.392	0.758	0.365	0.566	0.638	0.331	1.560	0.414	0.569	0.508	1.215	0.591	0.449	0.661	0.389	0.718	0.423	0.401	0.783	0.695	0.384	**0.677**
27-Aug	0.507	1.139	0.525	1.657	0.359	0.365	0.791	0.623	0.654	0.649	0.318	2.360	0.387	0.588	0.559	1.055	0.553	0.399	0.889	0.600	0.758	0.353	0.479	0.848	0.715	0.316	**0.709**
28-Aug	0.392	1.080	1.038	1.378	0.316	0.369	0.807	0.530	0.799	0.872	0.305	0.580	0.384	0.603	0.628	1.072	0.512	0.462	0.889	0.353	0.702	0.380	0.361	1.030	0.672	0.420	**0.651**
29-Aug	0.378	1.130	0.695	1.275	0.401	0.389	0.864	0.402	0.951	0.575	0.303	0.558	0.373	0.698	0.560	1.013	0.501	0.507	0.815	0.256	0.678	0.431	0.414	1.114	0.628	0.509	**0.631**
30-Aug	0.365	1.130	0.549	1.198	0.390	0.455	0.799	0.365	1.020	0.617	0.297	0.493	0.415	0.707	0.482	0.758	0.457	1.525	1.072	0.273	0.622	0.574	0.244	1.586	0.509	0.482	**0.669**
31-Aug	0.294	1.063	0.485	1.114	0.286	0.602	0.791	0.340	1.080	0.764	0.289	0.483	0.367	0.685	0.628	0.664	0.457	0.996	1.578	0.386	0.583	0.509	0.203	1.335	0.513	0.457	**0.652**
01-Sep	0.261	0.881	0.446	1.335	0.291	0.632	0.650	0.413	1.140	0.624	0.572	0.481	0.315	0.811	0.726	0.679	0.477	0.611	1.378	0.533	0.559	0.513	0.219	0.703	0.544	0.437	**0.624**
02-Sep	0.267	0.750	0.519	1.241	0.265	1.114	0.750	0.680	0.654	0.578	0.587	0.451	0.297	0.743	0.670	0.823	0.479	0.526	0.823	0.406	0.591	0.453	0.245	0.498	0.742	0.436	**0.600**
03-Sep	0.397	0.704	0.446	0.947	0.251	1.404	0.750	0.612	0.413	0.580	0.718	0.401	0.392	0.613	0.491	0.980	0.445	0.449	0.654	0.559	0.638	0.490	0.259	0.399	1.021	0.576	**0.600**
04-Sep	0.395	0.672	0.390	1.994	0.296	2.283	0.558	0.558	0.654	1.090	0.269	0.391	0.425	0.632	0.492	0.930	0.485	0.426	0.620	0.758	0.662	0.434	0.273	0.445	0.864	0.449	**0.671**
05-Sep	0.506	0.742	0.418	5.169	0.423	1.258	0.451	0.544	0.413	0.695	0.271	0.443	0.864	0.531	0.487	0.905	0.403	0.436	0.683	0.421	0.646	0.373	0.538	0.406	0.696	0.355	**0.734**
06-Sep	0.656	1.258	0.466	2.798	0.499	1.404	0.602	0.558	0.391	0.535	0.299	0.646	0.552	0.454	0.489	1.021	0.365	0.476	0.709	0.343	0.622	0.405	0.597	0.350	0.614	0.481	**0.677**
07-Sep	0.774	0.848	0.536	1.913	0.477	1.482	0.427	0.847	0.360	1.100	0.252	0.513	0.497	0.382	0.465	0.734	0.401	0.520	0.726	0.305	0.591	0.426	0.472	0.353	0.498	0.437	**0.628**
08-Sep	0.587	0.742	0.475	1.207	0.306	1.378	0.650	0.518	0.470	1.850	0.258	0.579	0.479	0.329	0.435	0.437	0.366	0.532	0.683	0.311	0.606	0.547	0.466	0.614	0.453	0.362	**0.602**
09-Sep	0.629	1.665	0.397	0.988	0.254	1.055	0.503	0.413	0.459	2.940	0.253	0.663	0.506	0.292	0.505	0.379	0.333	0.511	0.523	0.279	0.614	0.494	0.465	0.443	0.461	0.335	**0.629**
10-Sep	0.668	0.889	0.378	0.872	0.234	1.190	0.492	0.442	0.394	1.220	0.248	0.541	0.532	0.292	0.503	0.335	0.319	0.502	0.521	0.355	0.638	0.339	0.464	0.355	0.498	0.265	**0.519**
11-Sep	0.702	0.530	0.353	0.799	0.210	0.823	0.392	0.402	0.328	0.835	0.240	0.527	0.500	0.248	0.495	0.292	0.333	0.506	0.531	0.460	0.702	0.278	0.516	0.363	0.619	0.289	**0.472**
12-Sep	0.605	0.442	0.359	0.947	0.194	0.783	0.348	0.428	0.294	0.700	0.234	0.511	0.892	0.216	0.511	0.338	0.372	0.433	0.532	0.447	0.559	0.239	0.490	0.429	0.621	0.326	**0.471**
13-Sep	0.423	0.423	0.412	0.750	0.193	0.726	0.356	0.479	0.278	0.598	0.345	0.503	0.655	0.196	0.463	0.436	0.415	0.398	0.569	0.327	0.368	0.237	0.480	0.666	0.504	0.330	**0.443**
14-Sep	0.323	0.442	0.455	0.654	0.203	0.726	0.425	0.402	0.289	0.507	0.222	0.473	0.636	0.185	0.515	0.501	0.431	0.434	0.419	0.291	0.229	0.431	0.471	1.701	0.625	0.264	**0.471**
15-Sep	0.288	0.462	0.457	0.612	0.218	1.190	0.512	0.365	0.303	0.475	0.219	0.444	0.611	0.178	0.524	0.456	0.398	0.474	0.413	0.283	0.186	0.373	0.491	0.930	0.542	0.297	**0.450**
16-Sep	0.283	0.459	0.549	0.654	0.230	0.679	0.470	0.379	0.311	0.438	0.290	0.486	1.210	0.231	0.316	0.439	0.340	0.686	0.563	0.260	0.176	0.423	0.452	0.750	0.520	0.324	**0.458**
17-Sep	0.275	0.496	0.369	0.734	0.194	0.607	0.403	0.442	0.294	0.422	0.216	0.929	1.160	0.247	0.264	0.319	0.313	0.548	0.445	0.240	0.173	0.456	0.465	0.533	0.539	0.586	**0.449**
18-Sep	0.254	0.506	0.283	0.750	0.198	0.645	0.348	0.544	0.320	0.434	0.227	0.668	0.875	0.214	0.237	0.244	0.260	0.380	0.431	0.239	0.176	0.451	0.423	0.447	0.550	0.584	**0.411**
19-Sep	0.234	0.483	0.251	0.699	0.200	0.718	0.313	1.330	0.654	0.415	0.216	0.584	0.612	0.180	0.232	0.234	0.252	0.370	0.496	0.304	0.173	0.416	0.327	0.400	0.485	0.274	**0.417**
20-Sep	0.239	0.468	0.267	0.726	0.224	0.815	0.215	0.705	0.787	0.390	0.205	0.573	0.494	0.166	0.250	0.203	0.240	0.310	0.549	0.881	0.169	0.416	0.285	0.339	0.475	0.232	**0.409**
21-Sep	0.253	0.444	0.325	0.726	0.239	0.881	0.237	0.623	0.566	0.401	0.207	0.544	0.476	0.156	0.323	0.187	0.244	0.349	0.368	0.531	0.162	0.328	0.269	0.321	0.462	0.226	**0.379**
22-Sep	0.265	0.446	0.323	0.716	0.215	0.897	0.236	0.504	0.425	0.529	0.207	0.498	0.380	0.155	0.371	0.182	0.272	0.391	0.313	0.533	0.152	0.365	0.273	0.297	0.436	0.251	**0.370**
23-Sep	0.283	0.449	0.350	0.697	0.208	0.840	0.185	0.558	0.286	0.386	0.206	0.440	0.308	0.211	0.407	0.200	0.287	0.441	0.292	0.635	0.142	0.382	0.330	0.267	0.435	0.262	**0.365**
24-Sep	0.267	0.453	0.316	0.711	0.179	0.897	0.166	0.518	0.221	0.384	0.201	0.420	0.278	0.198	0.377	0.193	0.283	0.464	0.357	0.774	0.138	0.399	0.342	0.239	0.408	0.265	**0.363**
25-Sep	0.239	0.501	0.279	0.632	0.167	1.190	0.154	0.464	0.193	0.558	0.203	0.414	0.271	0.205	0.378	0.189	0.289	0.435	0.377	0.523	0.132	0.381	0.360	0.222	0.424	0.186	**0.360**
26-Sep	0.200	0.499	0.234	0.623	0.160	1.021	0.172	0.453	0.170	0.792	0.198	0.400	0.226	0.241	0.455	0.173	0.324	0.330	0.399	0.413	0.145	0.347	0.373	0.229	0.930	0.105	**0.370**

Date																											
27-Sep	0.227	0.416	0.218	0.605	0.149	1.198	0.207	0.453	0.181	0.568	0.186	0.387	0.183	0.237	0.286	0.210	0.306	0.270	0.439	0.376	0.162	0.372	0.336	0.240	0.692	0.068	**0.345**
28-Sep	0.302	0.399	0.247	0.627	0.142	0.996	0.344	1.590	0.261	0.554	0.188	0.373	0.177	0.214	0.237	0.196	0.310	0.247	0.470	0.353	0.166	0.406	0.333	0.345	0.703	0.066	**0.394**
29-Sep	0.315	0.353	0.181	0.697	0.136	0.856	0.146	2.720	0.227	0.434	0.180	0.360	0.160	0.209	0.249	0.281	0.324	0.267	0.376	0.350	0.171	0.412	0.269	0.362	0.685	0.032	**0.414**
30-Sep	0.241	0.336	0.168	0.711	0.130	0.980	0.130	1.590	0.212	0.386	0.172	0.355	0.153	0.223	0.248	0.532	0.281	0.217	0.310	0.377	0.203	0.905	0.296	0.290	1.798	0.030	**0.434**
01-Oct	0.215	0.331	0.181	0.578	0.125	0.988	0.151	1.190	0.748	0.372	0.167	0.341	0.151	0.234	0.270	0.361	0.215	0.234	0.294	0.395	0.185	0.684	0.252	0.239	1.508	0.033	**0.402**
02-Oct	0.194	0.485	0.206	0.774	0.123	0.823	0.132	0.991	0.402	0.504	0.167	0.332	0.158	0.217	0.278	0.294	0.191	0.198	0.247	0.459	0.203	0.366	0.196	0.222	1.896	0.046	**0.389**
03-Oct	0.179	0.254	0.520	0.509	0.119	0.864	0.108	0.861	0.269	0.418	0.166	0.333	0.152	0.205	0.307	0.271	0.177	0.186	0.227	0.594	0.237	0.270	0.236	0.257	0.980	0.023	**0.335**
04-Oct	0.165	0.237	0.300	0.418	0.114	0.783	0.102	0.748	0.263	0.389	0.171	0.425	0.146	0.356	0.214	0.283	0.178	0.667	0.215	0.482	0.272	0.237	0.192	0.783	0.840	0.014	**0.346**
05-Oct	0.162	0.218	0.271	0.361	0.108	0.742	0.097	0.623	0.255	0.358	0.174	0.377	0.140	0.418	0.186	0.289	0.189	0.377	0.217	0.333	0.304	0.212	0.173	0.497	0.742	0.010	**0.301**
06-Oct	0.158	0.208	0.263	0.336	0.104	0.726	0.104	0.583	0.269	0.338	0.177	0.334	0.135	0.405	0.182	0.284	0.172	0.243	0.222	0.288	0.237	0.182	0.172	0.342	0.655	0.016	**0.274**
07-Oct	0.157	0.210	0.247	0.354	0.101	0.726	0.171	0.558	0.447	0.345	0.169	0.325	0.128	0.321	0.184	0.286	0.155	0.227	0.212	0.254	0.205	0.164	0.168	0.316	0.600	0.016	**0.271**
08-Oct	0.146	0.239	0.230	0.327	0.099	0.679	0.111	0.558	0.320	0.326	0.166	0.343	0.124	0.267	0.173	0.246	0.162	0.212	0.192	0.260	0.185	0.149	0.181	0.307	0.563	0.024	**0.253**
09-Oct	0.146	0.239	0.205	0.313	0.099	0.726	0.101	0.493	0.286	0.324	0.161	0.502	0.122	0.248	0.157	0.252	0.178	0.221	0.197	0.240	0.175	0.147	0.186	0.278	0.556	0.028	**0.253**
10-Oct	0.143	0.229	0.191	0.331	0.097	0.840	0.118	0.453	0.244	0.355	0.154	0.365	0.125	0.239	0.154	0.287	0.572	0.211	0.254	0.247	0.166	0.214	0.278	0.280	0.539	0.018	**0.273**
11-Oct	0.139	0.217	0.193	0.331	0.090	0.766	0.149	0.413	0.221	0.345	0.151	0.413	0.127	0.227	0.153	0.297	0.251	0.193	0.278	0.319	0.157	0.151	0.258	0.404	0.516	0.017	**0.261**
12-Oct	0.143	0.249	0.193	0.290	0.089	0.691	0.168	0.413	0.255	0.303	0.156	0.389	0.124	0.212	0.149	0.275	0.240	0.178	0.252	0.260	0.147	0.136	0.240	0.305	0.472	0.018	**0.244**
13-Oct	0.152	0.227	0.168	0.273	0.097	0.659	0.188	0.413	0.246	0.298	0.155	0.361	0.140	0.205	0.140	0.316	0.215	0.184	0.193	0.237	0.140	0.132	0.216	0.311	0.463	0.029	**0.237**
14-Oct	0.158	0.205	0.158	0.227	0.109	0.668	0.324	0.428	0.246	0.336	0.155	0.371	0.160	0.199	0.126	0.541	0.199	0.186	0.255	0.212	0.136	0.126	0.380	0.304	0.465	0.032	**0.258**
15-Oct	0.138	0.203	0.147	0.206	0.101	0.672	0.214	0.280	0.246	0.333	0.145	0.357	0.185	0.194	0.121	0.334	0.186	0.183	0.320	0.201	0.136	0.122	0.783	0.278	0.475	0.030	**0.253**
16-Oct	0.154	0.206	0.138	0.203	0.090	0.664	0.143	0.220	0.241	0.370	0.145	0.333	0.320	0.192	0.116	0.281	0.177	0.176	0.622	0.196	0.124	0.114	0.930	0.253	2.338	0.028	**0.337**
17-Oct	0.151	0.208	0.269	0.200	0.099	0.677	0.145	0.248	0.249	0.403	0.138	0.319	0.260	0.184	0.115	0.218	0.171	0.169	0.254	0.189	0.113	0.110	0.501	0.239	2.165	0.032	**0.301**
18-Oct	0.229	0.212	0.359	0.177	0.095	0.645	0.126	0.226	0.261	0.317	0.134	0.279	0.210	0.171	0.116	0.188	0.181	0.166	0.199	0.198	0.116	0.108	0.385	0.233	1.130	0.035	**0.250**
19-Oct	0.249	0.222	0.239	0.169	0.090	0.638	0.125	0.220	0.252	0.281	0.134	0.267	0.255	0.169	0.113	0.178	0.174	0.166	0.182	0.231	0.121	0.105	0.315	0.227	0.881	0.034	**0.232**
20-Oct	0.261	0.200	0.210	0.166	0.082	0.783	0.111	0.416	0.244	0.272	0.138	0.268	0.330	0.161	0.113	0.198	0.177	0.166	0.212	0.294	0.103	0.110	0.304	0.214	0.791	0.038	**0.245**
21-Oct	0.353	0.182	0.179	0.158	0.079	0.699	0.111	0.343	0.235	0.254	0.134	0.253	0.285	0.158	0.109	0.207	0.187	0.159	0.354	0.435	0.106	0.120	0.286	0.212	0.750	0.041	**0.246**
22-Oct	0.313	0.181	0.153	0.153	0.079	0.610	0.105	0.296	0.224	0.376	0.175	0.242	0.255	0.153	0.106	0.201	0.184	0.151	0.202	0.395	0.117	0.112	0.262	0.210	0.726	0.043	**0.232**
23-Oct	0.253	0.181	0.123	0.147	0.078	0.594	0.103	0.280	0.218	0.365	0.152	0.231	0.220	0.148	0.105	0.176	0.180	0.156	0.177	0.580	0.149	0.109	0.242	0.206	0.695	0.045	**0.227**
24-Oct	0.234	0.150	0.125	0.143	0.087	0.509	0.099	0.256	0.210	0.306	0.136	0.229	0.205	0.139	0.105	0.186	0.196	0.158	0.161	0.848	0.194	0.103	0.235	0.200	0.644	0.048	**0.227**
25-Oct	0.218	0.134	0.127	0.147	0.088	0.507	0.124	0.256	0.201	0.290	0.141	0.233	0.190	0.164	0.112	0.189	0.185	0.191	0.146	0.497	0.141	0.099	0.227	0.176	0.636	0.052	**0.211**
26-Oct	0.203	0.177	0.120	0.140	0.086	0.549	0.150	0.240	0.249	0.309	0.174	0.211	0.180	0.337	0.099	0.196	0.173	0.203	0.135	0.390	0.123	0.121	0.231	0.166	0.636	0.056	**0.218**
27-Oct	0.198	0.155	0.112	0.138	0.081	0.556	0.160	0.226	0.303	0.291	0.191	0.205	0.250	0.471	0.092	0.155	0.166	0.177	0.122	0.328	0.122	0.118	0.210	0.181	0.629	0.059	**0.219**
28-Oct	0.418	0.154	0.108	0.186	0.077	0.540	0.136	0.226	0.419	0.288	0.176	0.204	0.220	0.256	0.099	0.144	0.153	0.168	0.118	0.294	0.122	0.111	0.193	0.179	0.609	0.074	**0.218**
29-Oct	0.310	0.143	0.107	0.159	0.074	0.543	0.139	0.226	0.286	0.280	0.166	0.203	0.180	0.238	0.103	0.146	0.143	0.170	0.109	0.273	0.118	0.106	0.168	0.173	0.608	0.070	**0.201**
30-Oct	0.257	0.132	0.106	0.148	0.072	0.520	0.134	0.214	0.326	0.268	0.178	0.188	0.178	0.240	0.107	0.150	0.148	0.171	0.099	0.239	0.114	0.097	0.160	0.162	0.610	0.076	**0.196**
31-Oct	0.229	0.130	0.103	0.160	0.072	0.501	0.118	0.201	0.354	0.258	0.229	0.171	0.175	0.232	0.120	0.155	0.142	0.166	0.095	0.227	0.113	0.095	0.155	0.157	0.615	0.079	**0.194**

April 1- Oct 31

Days with [	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	213	214	
MEAN	0.871	1.116	0.756	1.211	0.446	1.043	0.765	0.769	0.777	1.073	0.875	0.904	0.751	0.823	0.758	0.859	0.724	0.905	0.970	0.779	0.680	0.745	0.783	0.857	0.983	0.531	**0.837**
MAX	5.308	5.060	3.409	5.169	2.301	4.724	2.957	2.720	1.910	4.230	9.990	3.960	2.670	4.450	2.613	2.668	3.013	2.901	3.069	2.687	2.265	2.641	4.333	5.259	3.267	2.420	
MIN	0.035	0.037	0.024	0.029	0.030	0.029	0.044	0.021	0.068	0.048	0.065	0.046	0.071	0.065	0.092	0.049	0.038	0.091	0.059	0.145	0.053	0.095	0.067	0.011	0.058	0.010	

Jan 1 to December 31

Days with [	365	365	365	366	365	365	365	366	365	365	365	366	365	365	365	366	365	365	365	366	365	365	365	366	364	365	
MEAN	0.537	0.677	0.470	0.727	0.281	0.656	0.480	0.493	0.512	0.671	0.553	0.565	0.469	0.517	0.466	0.532	0.454	0.565	0.600	0.493	0.421	0.460	0.490	0.528	0.638	0.337	**0.523** <<MAD
MAX	5.308	5.060	3.409	5.169	2.301	4.724	2.957	2.720	1.910	4.230	9.990	3.960	2.670	4.450	2.613	2.668	3.013	2.901	3.069	2.687	2.265	2.641	4.333	5.259	3.267	2.420	
MIN	0.031	0.028	0.019	0.017	0.027	0.025	0.040	0.021	0.068	0.048	0.065	0.045	0.039	0.056	0.024	0.022	0.030	0.033	0.038	0.031	0.024	0.028	0.024	0.003	0.037	0.010	