Q2. Smoothened Weeks

To produce the chart to your right we first smoothened the Global Intensity data for each week using the moving average, with a time window of 10 consecutive observations.

We then computed the average smoothened week. This was produced by finding the averaged value for time t for all times for one whole week.

Letting:
X_i = The smoothened week for week i
Y = average smoothened week

We then computed:

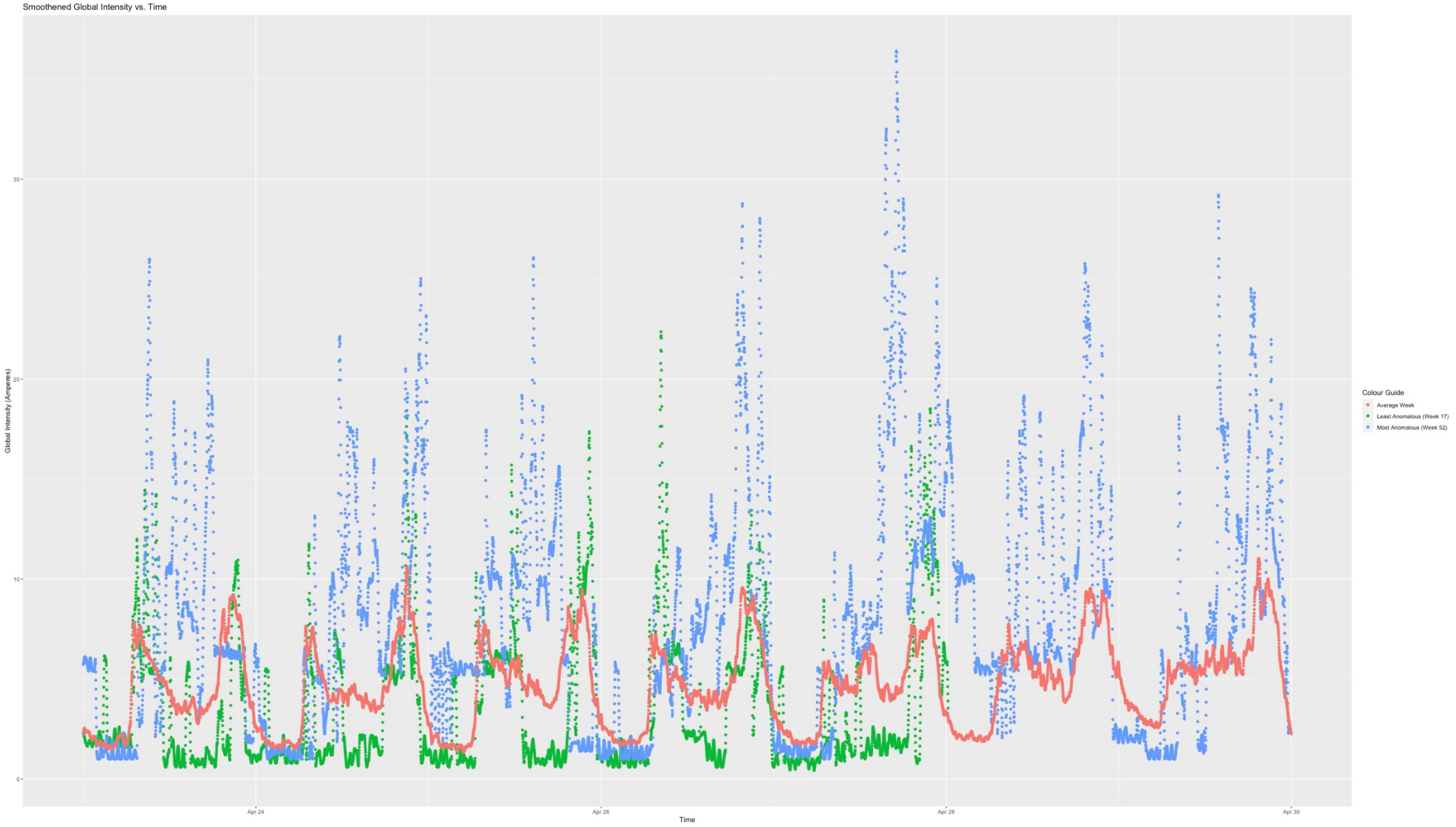
MSE = $\frac{1}{n} \sum (Y - f(X_i))^2$ for each i

This is what we see in the Mean Squared Error column, which represents how closely the observed values match the expected values. Smaller MSE values mean that the observed values were close to the predicted values, while larger MSE values mean the opposite.

From the rank column of the table, we can see that week 17 had the lowest MSE, while week 52 had the highest MSE. Thus, week 17 was the least anomalous, while week 52 is the most anomalous.

Please see the following page for a visual depiction of the findings.

	Week	Mean Squared Error	rank
1	17	7.855640	1
2	30	9.199078	2
3	37	9.941774	3
4	22	10.601794	4
5	39	10.652057	5
6	26	10.835727	6
7	29	11.050475	7
8	21	11.096155	8
9	28	11.188536	9
10	36	11.287955	10
11	16	11.421882	11
12	38	11.680019	12
13	31	11.746983	13
14	27	11.865673	14
15	23	12.111498	15
16	24	12.220430	16
17	25	12.326450	17
18	19	12.797205	18
19	40	13.049467	19
20	42	13.322988	20
21	15	13.325616	21
22	20	13.397533	22
23	18	14.851236	23
24	11	15.067981	24
25	41	15.264631	25
26	45	15.530791	26
27	35	15.716157	27
28	47	15.841395	28
29	44	17.223420	29
30	14	17.255287	30
31	6	17.319861	31
32	4	17.505312	32
33	9	17.522911	33
34	43	17.687334	34
35	50	17.816556	35
36	32	18.011579	36
37	33	19.105649	37
38	13	19.189228	38
39	46	19.362322	39
40	34	19.451300	40
41	51	19.698678	41
42	49	20.690451	42
43	12	21.135304	43
44	7	22.554368	44
45	10	22.586364	45
46	48	23.332091	46
47	2	25.759179	47
48	3	25.794341	48
49	5	27.934082	49
50	1	28.133050	50
51	8	28.490432	51
52	52	39.543071	52


Smoothened Global Intensity vs. Time
Global Intensity (Amperes)
30
20
10
0
Apr 24
Apr 26
Apr 28
Apr 30
Time
Colour Guide
Average Week
Least Anomalous (Week 17)
Most Anomalous (Week 52)