

# Exercise: Markdown

Environmental Data Analytics | John Fay and Luana Lima

## List of Tables

1	Summary of Total Nitrogen . . . . .	2
2	Another Summary . . . . .	2

## Set up the coding environment

## Wrangle the data

```
#Subset columns and rows
nutrient_data <- nutrient_data_raw %>%
  select(-c(lakeid,depth_id,comments)) %>%
  filter(depth == 0) %>%
  drop_na()

#Compute summary stats for total nitrogen
nutrient_data_tn <- nutrient_data %>%
  group_by(lakename) %>%
  summarize(
    mean_tn_ug = mean(tn_ug),
    min_tn_ug = min(tn_ug),
    max_tn_ug = max(tn_ug),
    sd_tn_ug = sd(tn_ug)
  )
```

## Report the summary

This raw data set has 157 rows and 11 columns.

Table 1: Summary of Total Nitrogen

lakename	mean_tn_ug	min_tn_ug	max_tn_ug	sd_tn_ug
Paul Lake	368.7564	45.67	628.625	106.3474
Peter Lake	561.8752	219.72	2048.151	305.6491

Table 2: Another Summary

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Paul Lake	1991	147	5	1991-05-27	0	483.000	8.000	18.981	10.299	8.000
Paul Lake	1991	154	6	1991-06-03	0	512.000	17.000	20.736	5.934	4.000
Peter Lake	1991	155	6	1991-06-04	0	573.000	5.000	21.533	3.818	4.000
Paul Lake	1991	161	6	1991-06-10	0	421.000	11.000	20.303	11.381	6.000
Peter Lake	1991	162	6	1991-06-11	0	296.000	9.000	14.579	6.827	4.000
Paul Lake	1991	168	6	1991-06-17	0	474.000	8.000	6.441	2.375	5.000
Peter Lake	1991	169	6	1991-06-18	0	321.000	8.000	5.749	2.429	4.000
Paul Lake	1991	175	6	1991-06-24	0	400.000	9.000	19.559	1.550	4.000
Peter Lake	1991	176	6	1991-06-25	0	292.000	4.000	5.817	1.510	4.000
Paul Lake	1991	182	7	1991-07-01	0	506.000	9.000	21.958	11.954	7.000
Peter Lake	1991	183	7	1991-07-02	0	346.000	10.000	12.448	2.742	7.000
Paul Lake	1991	189	7	1991-07-08	0	341.000	11.000	18.406	5.232	3.000
Peter Lake	1991	190	7	1991-07-09	0	266.000	5.000	9.495	8.907	12.000
Paul Lake	1991	196	7	1991-07-15	0	436.000	9.000	21.606	3.500	3.000
Peter Lake	1991	197	7	1991-07-16	0	490.000	9.000	24.334	5.071	4.000
Paul Lake	1991	203	7	1991-07-22	0	431.000	6.000	20.225	3.863	0.000
Peter Lake	1991	204	7	1991-07-23	0	364.000	7.000	17.350	3.003	1.000
Paul Lake	1991	210	7	1991-07-29	0	442.000	9.000	8.904	2.993	1.000
Paul Lake	1991	217	8	1991-08-05	0	380.000	11.000	8.653	1.320	8.000

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Peter Lake	1991	218	8	1991-08-06	0	288.000	10.000	4.556	0.463	2.000
Paul Lake	1991	224	8	1991-08-12	0	383.000	7.000	16.211	0.314	0.000
Peter Lake	1991	225	8	1991-08-13	0	317.000	12.000	8.638	0.579	1.000
Paul Lake	1991	231	8	1991-08-19	0	415.000	8.000	11.667	1.685	5.000
Peter Lake	1991	232	8	1991-08-20	0	280.000	12.000	9.608	1.294	5.000
Paul Lake	1992	148	5	1992-05-27	0	301.320	22.620	6.220	0.000	0.000
Peter Lake	1992	148	5	1992-05-27	0	272.000	5.650	15.020	0.080	11.000
Paul Lake	1992	162	6	1992-06-10	0	299.610	7.390	9.940	4.920	3.000
Peter Lake	1992	162	6	1992-06-10	0	258.240	8.300	8.160	1.360	4.000
Paul Lake	1992	176	6	1992-06-24	0	182.910	8.780	8.130	2.470	6.000
Peter Lake	1992	176	6	1992-06-24	0	219.720	0.000	10.810	1.810	6.000
Paul Lake	1992	190	7	1992-07-08	0	191.370	36.070	17.270	18.060	3.000
Peter Lake	1992	190	7	1992-07-08	0	329.070	13.680	7.580	5.370	5.000
Paul Lake	1992	204	7	1992-07-22	0	442.310	19.650	12.590	1.900	6.000
Peter Lake	1992	204	7	1992-07-22	0	292.630	11.230	8.010	1.690	5.000
Paul Lake	1992	218	8	1992-08-05	0	495.360	11.210	10.530	2.320	10.000
Peter Lake	1992	218	8	1992-08-05	0	376.940	7.520	8.970	3.830	8.000
Paul Lake	1992	232	8	1992-08-19	0	490.260	9.610	16.770	0.500	1.000
Peter Lake	1992	232	8	1992-08-19	0	301.570	9.040	22.250	0.000	1.000
Peter Lake	1993	139	5	1993-05-19	0	373.081	18.534	0.000	5.497	1.000
Paul Lake	1993	140	5	1993-05-20	0	248.665	10.697	0.000	1.147	2.000
Peter Lake	1993	146	5	1993-05-26	0	312.593	16.814	9.701	9.925	2.000
Paul Lake	1993	147	5	1993-05-27	0	258.300	7.001	8.658	3.210	1.000
Peter Lake	1993	153	6	1993-06-02	0	414.602	24.580	10.638	11.537	3.000
Paul Lake	1993	154	6	1993-06-03	0	45.670	7.443	4.374	2.118	1.000
Peter Lake	1993	160	6	1993-06-09	0	514.523	32.909	20.739	39.475	4.000

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Paul Lake	1993	161	6	1993-06-10	0	117.556	5.361	11.071	3.403	2.000
Peter Lake	1993	167	6	1993-06-16	0	616.316	51.881	89.413	79.911	5.000
Paul Lake	1993	168	6	1993-06-17	0	149.364	11.380	7.684	5.125	0.000
Peter Lake	1993	174	6	1993-06-23	0	605.458	41.970	58.699	48.244	8.000
Paul Lake	1993	175	6	1993-06-24	0	342.826	12.604	75.649	1.766	2.000
Peter Lake	1993	181	6	1993-06-30	0	418.173	25.141	0.000	4.579	2.000
Paul Lake	1993	182	7	1993-07-01	0	395.482	9.072	10.168	4.432	1.000
Peter Lake	1993	202	7	1993-07-21	0	395.310	23.143	4.312	8.945	1.000
Paul Lake	1993	203	7	1993-07-22	0	345.660	8.689	9.121	0.789	1.000
Peter Lake	1993	209	7	1993-07-28	0	352.001	27.056	35.613	26.438	3.000
Paul Lake	1993	210	7	1993-07-29	0	281.421	7.108	2.048	1.417	1.000
Peter Lake	1993	216	8	1993-08-04	0	641.684	21.373	6.303	30.800	1.000
Paul Lake	1993	217	8	1993-08-05	0	298.507	9.888	11.436	1.763	1.000
Peter Lake	1993	223	8	1993-08-11	0	517.016	25.603	15.706	16.092	0.000
Paul Lake	1993	224	8	1993-08-12	0	187.672	11.542	39.431	1.439	0.000
Peter Lake	1993	230	8	1993-08-18	0	513.473	21.112	4.847	6.293	1.000
Paul Lake	1993	231	8	1993-08-19	0	171.015	10.257	0.000	0.000	0.000
Peter Lake	1993	237	8	1993-08-25	0	465.333	18.787	0.317	1.658	0.000
Paul Lake	1993	238	8	1993-08-26	0	163.148	7.732	8.239	0.066	0.000
Paul Lake	1993	243	8	1993-08-31	0	277.235	11.321	0.000	2.026	0.000
Peter Lake	1993	243	8	1993-08-31	0	448.049	18.417	0.000	2.969	0.000
Paul Lake	1993	250	9	1993-09-07	0	223.799	11.671	0.000	4.672	2.000
Peter Lake	1993	250	9	1993-09-07	0	420.378	20.819	1.364	2.506	1.000
Peter Lake	1994	145	5	1994-05-25	0	460.791	14.504	13.789	2.862	2.337
Paul Lake	1994	146	5	1994-05-26	0	417.345	17.090	13.631	3.664	2.632
Peter Lake	1994	152	6	1994-06-01	0	379.781	12.581	11.417	9.359	1.848

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Peter Lake	1994	159	6	1994-06-08	0	509.244	16.359	15.810	10.064	1.557
Paul Lake	1994	160	6	1994-06-09	0	437.168	16.697	8.260	4.259	2.076
Peter Lake	1994	166	6	1994-06-15	0	477.839	15.346	18.911	1.117	1.070
Paul Lake	1994	167	6	1994-06-16	0	423.307	13.946	7.221	1.848	0.982
Peter Lake	1994	173	6	1994-06-22	0	480.660	19.304	14.800	7.688	2.349
Paul Lake	1994	174	6	1994-06-23	0	422.934	10.605	11.994	2.699	1.036
Peter Lake	1994	180	6	1994-06-29	0	609.005	24.788	30.133	10.607	1.807
Paul Lake	1994	181	6	1994-06-30	0	439.984	15.738	19.486	2.787	5.070
Peter Lake	1994	187	7	1994-07-06	0	571.092	24.207	49.395	37.282	6.265
Paul Lake	1994	188	7	1994-07-07	0	412.669	21.763	16.571	4.681	2.436
Peter Lake	1994	194	7	1994-07-13	0	746.728	19.149	22.593	49.247	0.896
Paul Lake	1994	195	7	1994-07-14	0	402.942	4.501	3.935	2.438	0.823
Peter Lake	1994	201	7	1994-07-20	0	699.476	23.381	8.049	0.421	2.279
Paul Lake	1994	202	7	1994-07-21	0	387.608	11.473	5.831	4.901	1.604
Peter Lake	1994	208	7	1994-07-27	0	779.086	21.692	7.239	3.690	2.633
Paul Lake	1994	209	7	1994-07-28	0	375.783	7.527	3.008	2.370	3.708
Peter Lake	1994	215	8	1994-08-03	0	814.424	24.463	3.017	2.053	0.650
Paul Lake	1994	216	8	1994-08-04	0	499.251	9.512	9.548	2.125	0.466
Peter Lake	1994	222	8	1994-08-10	0	833.706	36.581	86.092	34.278	0.828
Paul Lake	1994	223	8	1994-08-11	0	498.227	7.430	5.120	2.739	1.299
Peter Lake	1994	229	8	1994-08-17	0	807.511	16.842	94.697	49.864	2.063
Paul Lake	1994	230	8	1994-08-18	0	408.059	10.515	9.403	1.428	1.523
Peter Lake	1994	236	8	1994-08-24	0	653.576	22.552	77.811	59.668	2.403
Paul Lake	1994	237	8	1994-08-25	0	424.318	8.694	9.775	2.348	0.729
Peter Lake	1994	243	8	1994-08-31	0	747.822	14.551	111.259	91.963	1.779
Paul Lake	1994	244	9	1994-09-01	0	437.397	10.192	13.376	5.957	0.836

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Paul Lake	1994	249	9	1994-09-06	0	557.812	16.281	10.272	4.390	0.467
Peter Lake	1994	249	9	1994-09-06	0	680.558	16.281	116.107	99.193	1.133
Peter Lake	1995	144	5	1995-05-24	0	436.333	18.922	10.342	72.863	4.086
Paul Lake	1995	145	5	1995-05-25	0	291.780	7.287	6.253	2.059	1.372
Peter Lake	1995	151	5	1995-05-31	0	444.782	15.279	9.860	63.721	0.916
Paul Lake	1995	152	6	1995-06-01	0	342.140	14.365	16.443	2.763	0.148
Peter Lake	1995	158	6	1995-06-07	0	388.163	10.974	23.319	49.610	3.685
Paul Lake	1995	159	6	1995-06-08	0	307.812	1.222	8.879	4.075	3.657
Peter Lake	1995	165	6	1995-06-14	0	478.125	13.505	19.993	58.040	1.317
Paul Lake	1995	166	6	1995-06-15	0	338.845	6.448	9.692	1.843	1.220
Peter Lake	1995	172	6	1995-06-21	0	486.462	12.958	18.306	58.865	1.226
Paul Lake	1995	173	6	1995-06-22	0	324.447	5.567	12.210	0.539	1.858
Peter Lake	1995	179	6	1995-06-28	0	535.325	14.590	34.268	66.545	0.000
Paul Lake	1995	180	6	1995-06-29	0	422.260	10.353	21.643	5.331	0.736
Peter Lake	1995	186	7	1995-07-05	0	576.806	19.982	13.667	79.151	0.666
Paul Lake	1995	187	7	1995-07-06	0	335.737	10.420	26.361	6.323	2.873
Peter Lake	1995	193	7	1995-07-12	0	582.801	19.157	13.762	62.473	0.830
Paul Lake	1995	194	7	1995-07-13	0	379.554	10.444	16.969	5.912	0.460
Peter Lake	1995	200	7	1995-07-19	0	590.792	19.617	13.529	42.341	0.938
Paul Lake	1995	201	7	1995-07-20	0	306.801	8.151	17.282	6.119	1.480
Peter Lake	1995	207	7	1995-07-26	0	688.018	21.664	12.064	16.348	2.018
Paul Lake	1995	208	7	1995-07-27	0	325.446	10.728	10.387	0.631	1.656
Peter Lake	1995	214	8	1995-08-02	0	688.511	23.225	5.748	5.642	2.427
Paul Lake	1995	215	8	1995-08-03	0	419.592	10.973	13.018	0.923	1.321
Peter Lake	1995	221	8	1995-08-09	0	686.848	24.684	8.216	7.193	2.046
Paul Lake	1995	222	8	1995-08-10	0	431.447	10.538	10.487	1.257	1.263

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Peter Lake	1995	228	8	1995-08-16	0	754.679	22.252	3.019	4.349	2.600
Paul Lake	1995	229	8	1995-08-17	0	331.686	8.368	3.664	2.458	1.690
Peter Lake	1995	235	8	1995-08-23	0	692.486	21.661	17.985	3.750	2.381
Paul Lake	1995	236	8	1995-08-24	0	381.551	9.231	7.465	2.005	2.126
Paul Lake	1996	148	5	1996-05-27	0	244.870	13.689	6.768	2.193	5.723
Peter Lake	1996	149	5	1996-05-28	0	312.133	15.573	17.509	37.764	10.493
Paul Lake	1996	176	6	1996-06-24	0	391.882	7.583	7.141	7.825	3.468
Peter Lake	1996	177	6	1996-06-25	0	1962.902	49.435	230.895	217.750	11.770
Paul Lake	1996	204	7	1996-07-22	0	351.499	7.967	8.329	2.906	0.687
Peter Lake	1996	205	7	1996-07-23	0	2048.151	64.383	532.858	451.758	5.624
Paul Lake	1997	146	5	1997-05-26	0	412.409	13.570	34.550	15.485	3.077
Peter Lake	1997	147	5	1997-05-27	0	508.968	13.334	22.591	188.394	3.099
Paul Lake	1997	174	6	1997-06-23	0	477.193	9.206	16.580	0.839	1.975
Peter Lake	1997	175	6	1997-06-24	0	917.878	21.881	25.692	290.803	5.930
Paul Lake	1997	202	7	1997-07-21	0	374.651	9.420	13.505	2.448	2.011
Peter Lake	1997	203	7	1997-07-22	0	1162.929	25.869	10.216	317.931	1.976
Paul Lake	1997	230	8	1997-08-18	0	360.280	13.873	10.344	11.250	0.000
Peter Lake	1997	231	8	1997-08-19	0	1251.840	41.426	6.642	272.335	8.218
Paul Lake	1998	145	5	1998-05-25	0	473.371	7.743	24.666	4.178	4.122
Peter Lake	1998	146	5	1998-05-26	0	593.138	8.475	14.821	5.033	6.541
Paul Lake	1998	173	6	1998-06-22	0	628.625	5.564	15.343	2.425	2.962
Peter Lake	1998	174	6	1998-06-23	0	587.544	8.086	15.322	0.819	3.152
Paul Lake	1998	201	7	1998-07-20	0	338.512	2.305	13.237	1.151	1.499
Peter Lake	1998	202	7	1998-07-21	0	537.964	8.593	7.981	4.868	7.327
Paul Lake	1998	236	8	1998-08-24	0	576.302	8.005	24.279	5.386	4.770
Peter Lake	1998	237	8	1998-08-25	0	488.017	13.222	6.349	0.988	1.659

lakename	year4	daynum	month	sampledate	depth	tn_ug	tp_ug	nh34	no23	po4
Paul Lake	1999	144	5	1999-05-24	0	340.252	8.806	21.375	4.255	1.106
Peter Lake	1999	144	5	1999-05-24	0	560.862	11.140	15.550	35.375	0.943
Paul Lake	1999	172	6	1999-06-21	0	393.202	15.827	26.973	5.075	0.750
Peter Lake	1999	172	6	1999-06-21	0	538.694	16.863	22.951	1.858	0.954
Paul Lake	1999	200	7	1999-07-19	0	355.795	5.253	14.758	5.033	3.130
Peter Lake	1999	200	7	1999-07-19	0	594.585	8.732	9.380	1.333	1.255
Paul Lake	1999	228	8	1999-08-16	0	395.547	11.063	11.579	3.994	0.020
Peter Lake	1999	228	8	1999-08-16	0	588.069	11.917	7.545	1.625	1.703