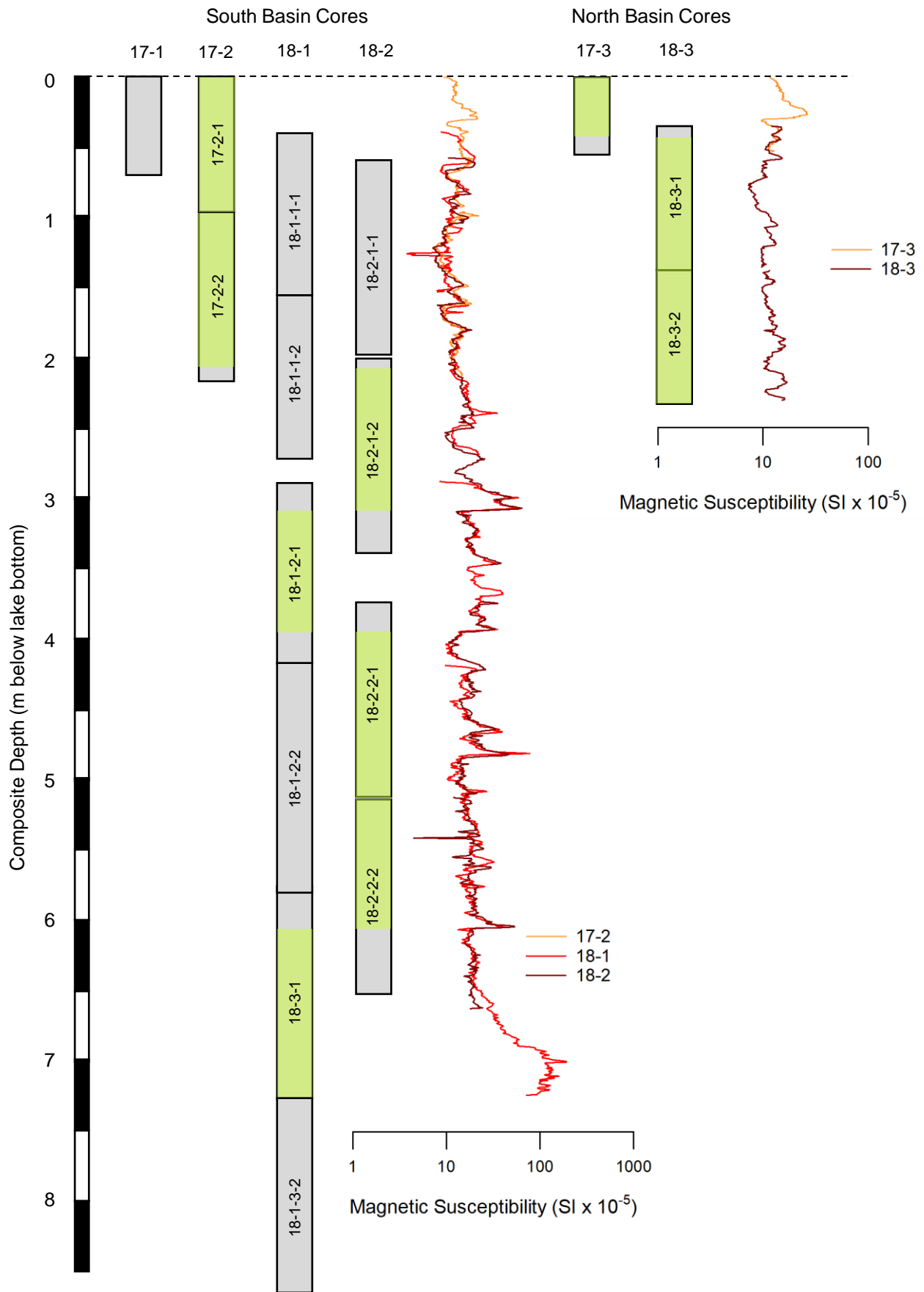
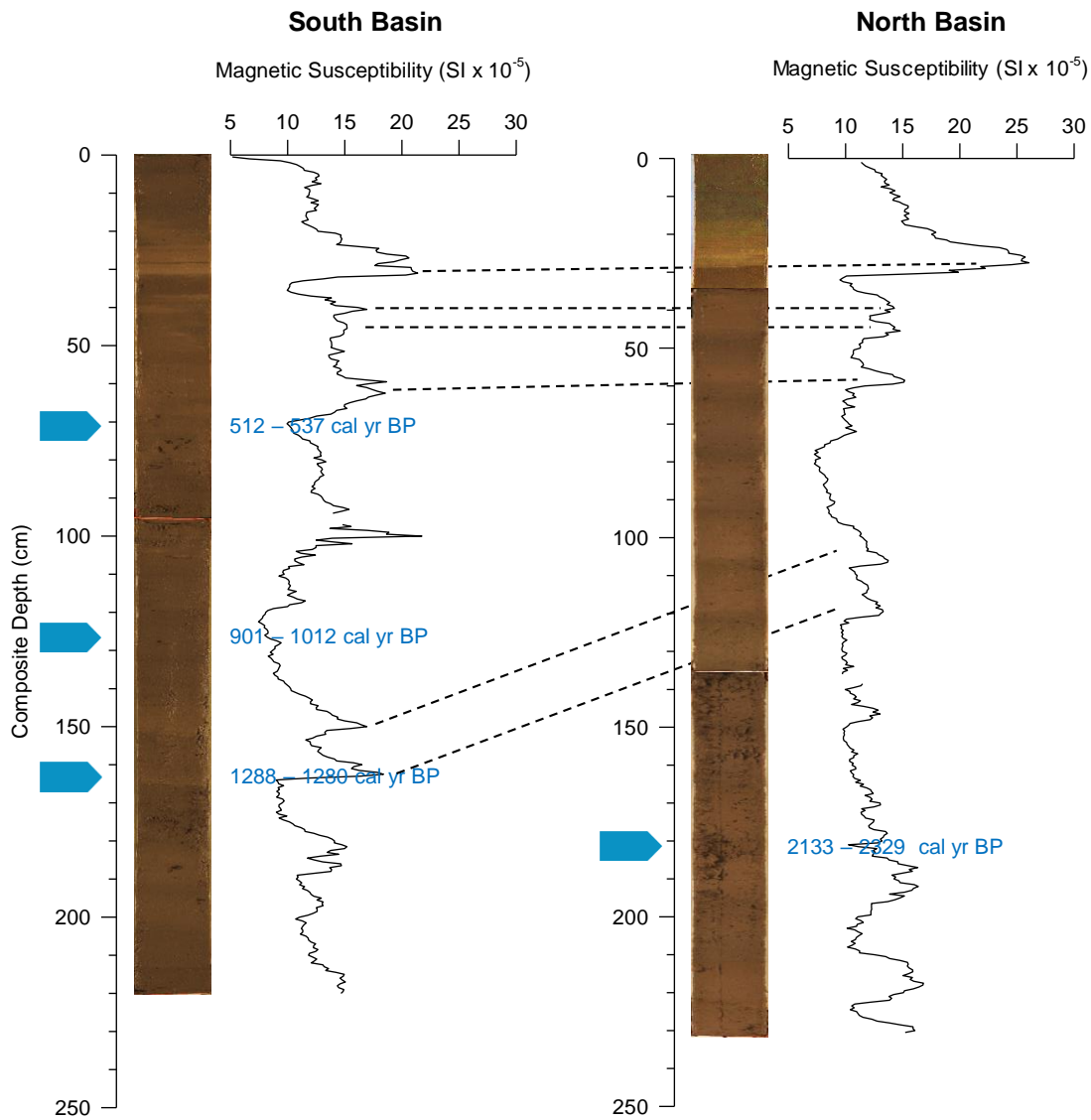


Supplemental Table 1. List of all cores collected from Ossipee Lake. First two digits of the core section ID denote the year of collection. Core sections highlighted in green were used in the construction of the composite sequence from the south basin in the sequence indicated. Core sections highlighted in yellow were used in the construction of the composite sequence from the north basin in the sequence indicated. Also indicated are the vertical position of the top and bottom of each core section as well as the start and end depths of the subsections used in the composite sequence.

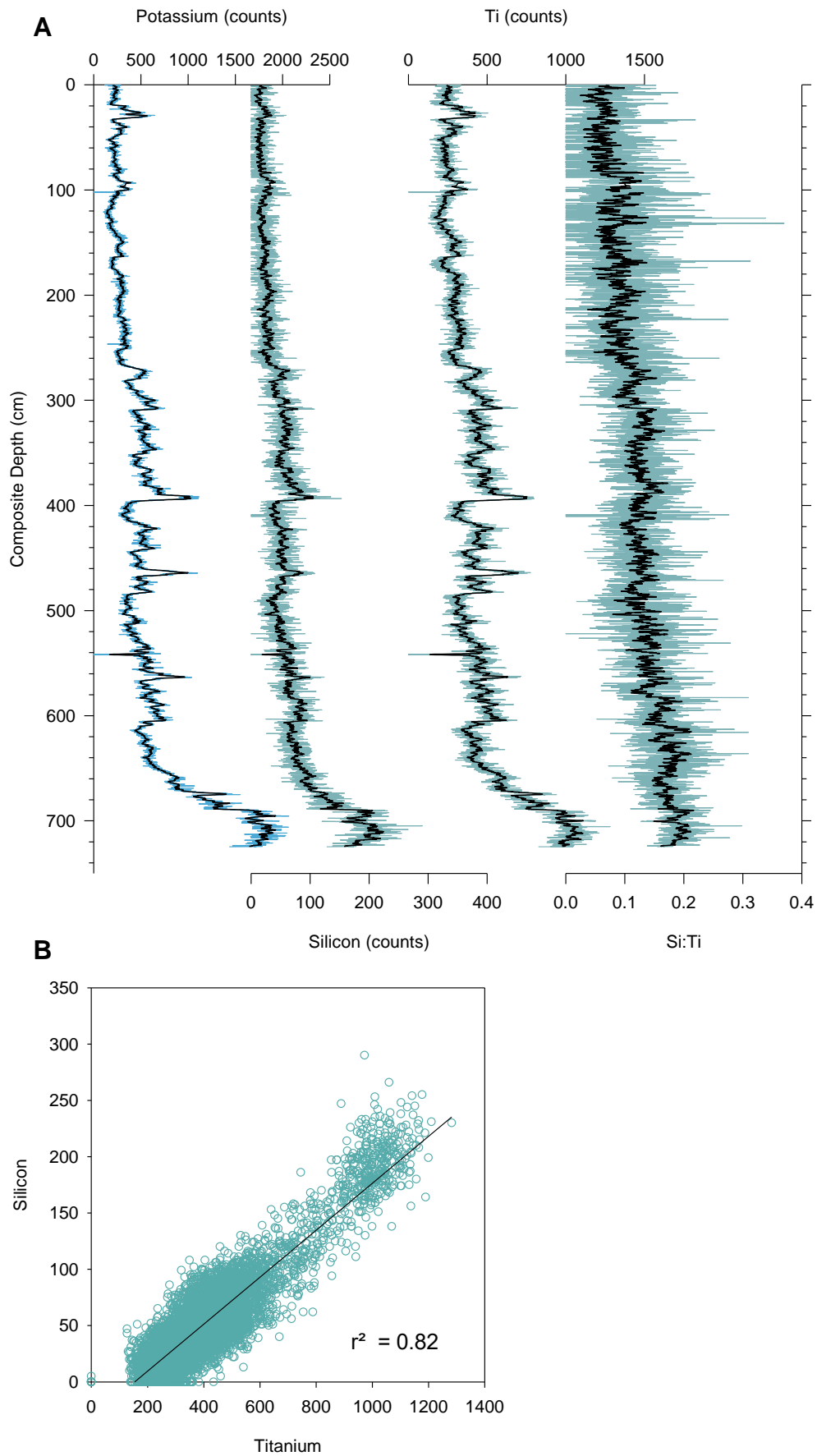
Core Section	Basin	Core Length (cm)	composite depth of core top (cm)	composite depth of core bottom (cm)	Order in composite Sequence	Section Depth of portion used in composite sequence, top (cm)	Section Depth of portion used in composite sequence, bottom (cm)	Composite Depth of portion used in composite sequence, top (cm)	Composite Depth of portion used in composite sequence, bottom (cm)
17-1	South	68	0	68					
17-2-1	South	96	0	96	1	0	96	0	96
17-2-2	South	119.5	96	215.5	2	0	110	96	206
18-1-1-1	South	115	40	155					
18-1-1-2	South	116	155	271					
18-1-2-1	South	127.5	288	415.5	4	20	105.5	308	393.5
18-1-2-2	South	162.5	416	578.5					
18-1-3-1	South	151	574	725	7	30.5	151	604.5	725
18-1-3-2	South	138	725	863					
18-2-1-1	South	138	59	199.5					
18-2-1-2	South	138	200	348.5	3	6.5	107.5	206.5	307.5
18-2-2-1	South	138	373	512	5	21	139	394	512
18-2-2-2	South	138	512.5	663	6	0	91.5	512.5	604
17-3	North	55	0	55	1	0	42	0	42
18-3-1	North	102	35	137	2	7.5	102	42.5	137
18-3-2	North	94.5	137	231.5	3	0	94.5	137	231.5



Supplemental Figure 1. Scale illustration of the vertical alignment of all cores collected from Ossipee Lake. Core segments highlighted in green contributed to the final composite sequences used for subsequent analyses. Also shown is magnetic susceptibility for all cores, demonstrating the high degree of correlation among cores collected from each basin. Data from core 18-1-3-2 were not measured as it was determined this section predates our primary focus period and has limited age control.



Supplemental Figure 2. Core photographs and magnetic susceptibility measurements from the north and south basin composite cores demonstrating similar stratigraphy at both locations. Dashed lines correlate basin wide event deposits. Blue flags indicate position of radiocarbon age control points labeled with the highest probability calibrated age ranges (cal yrs BP; Table 1; Modified from LeNoir, 2019).



Supplemental Figure 3. (A) Down core variations in potassium, silicon, titanium and Si:Ti. Black lines are 11 point running means calculated from the raw XRF data measured at 1 mm intervals. (B) Scatter plot with a linear regression between raw measurements of silicon and titanium. Note that zero values for Si and subsequently Si:Ti are a consequence of poor detection limits for Si at the count times used in our XRF analyses.