Supporting Information

Alaskan soil carbon stocks: Spatial variability and dependence on environmental factors

U. Mishra[1*], W. J. Riley[1]

[1]Earth Sciences Division, Lawrence Berkeley National Laboratory, 1 Cyclotron Road, 50A4037 Berkeley, CA 94720, USA.

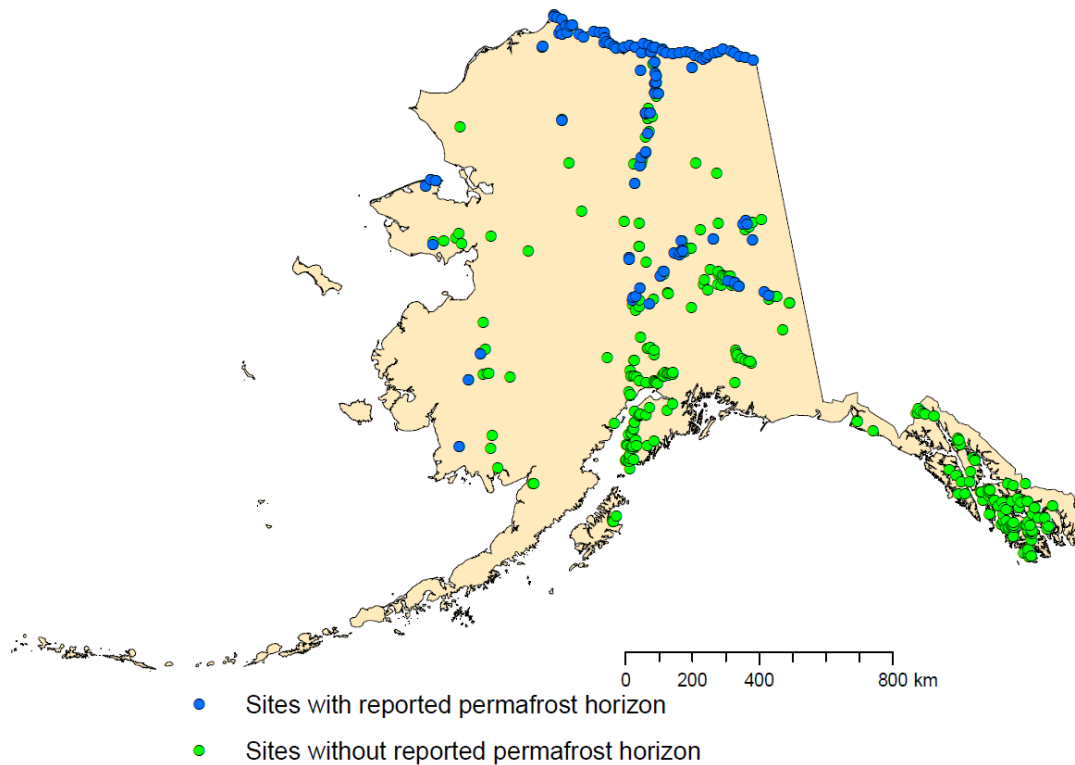[*]Corresponding author, tel: 510-495-2735, email:umishra@lbl.gov

Figures:

Figure S1. Distribution of soil organic carbon profile observations across Alaska.
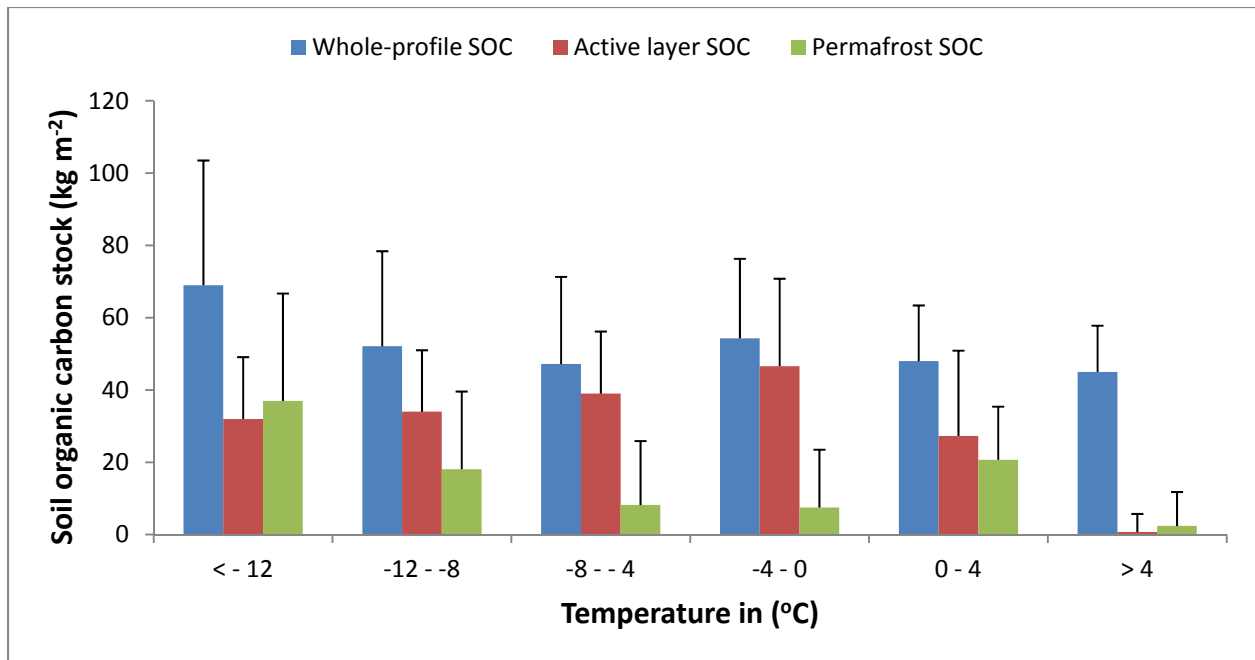
Figure S2. Average SOC stocks in each temperature zone. Error bar is the standard deviation.
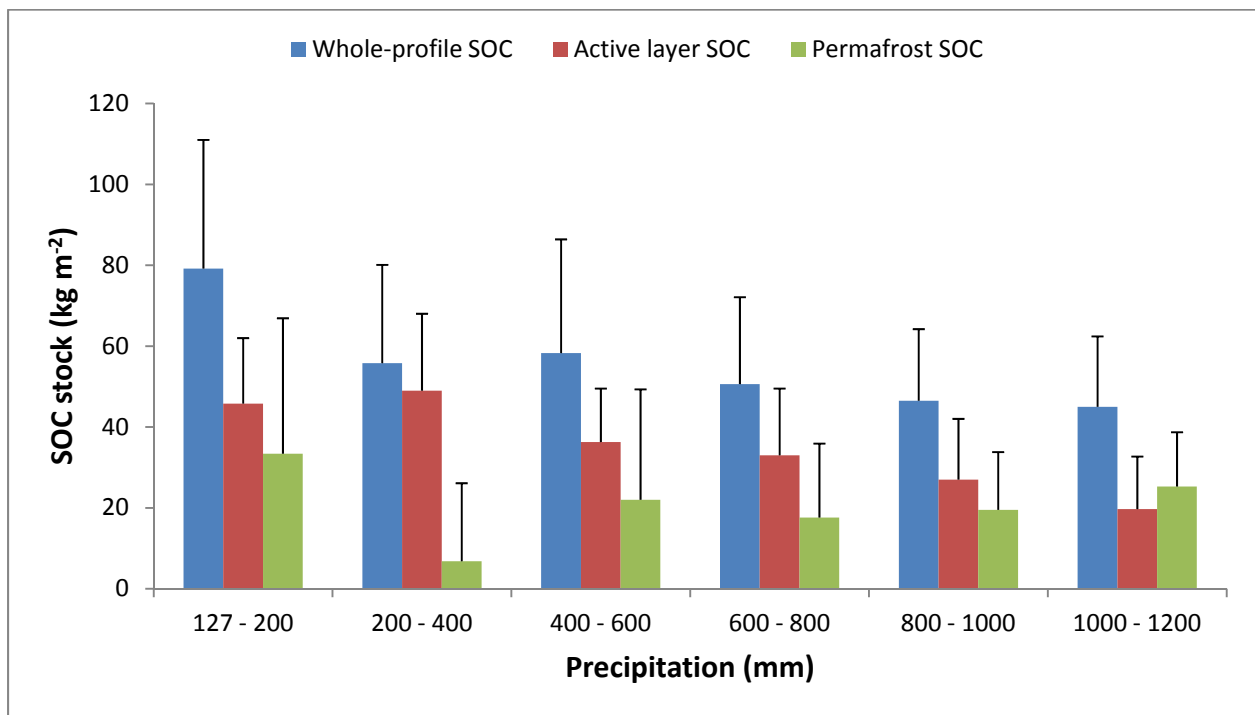

Figure S3. Average SOC stocks in each precipitation zone. Error bar is the standard deviation.
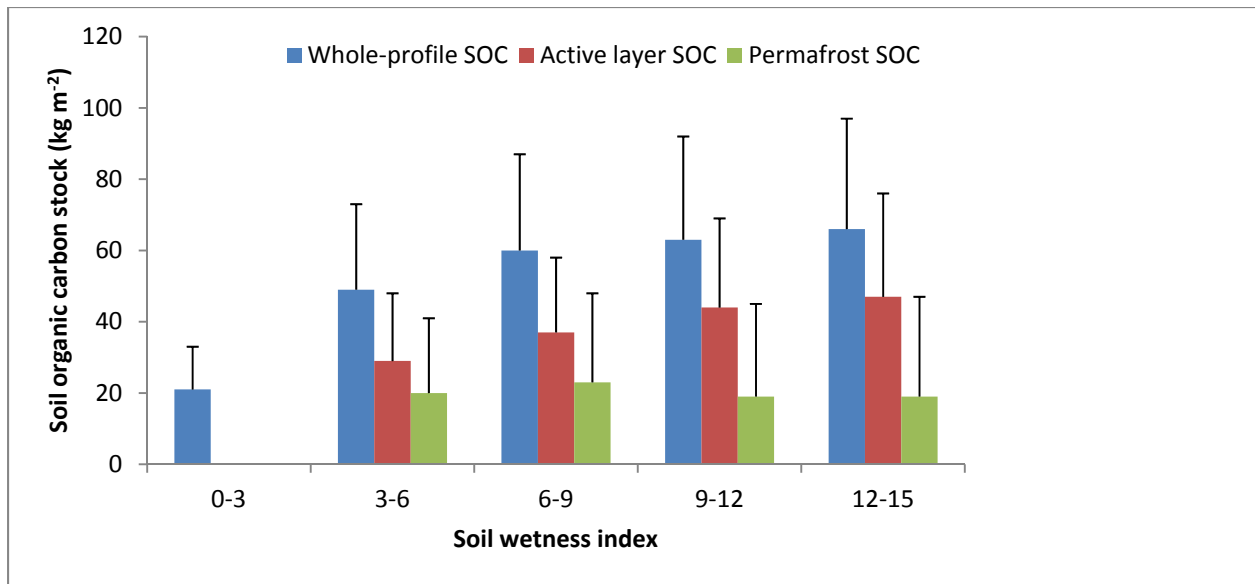
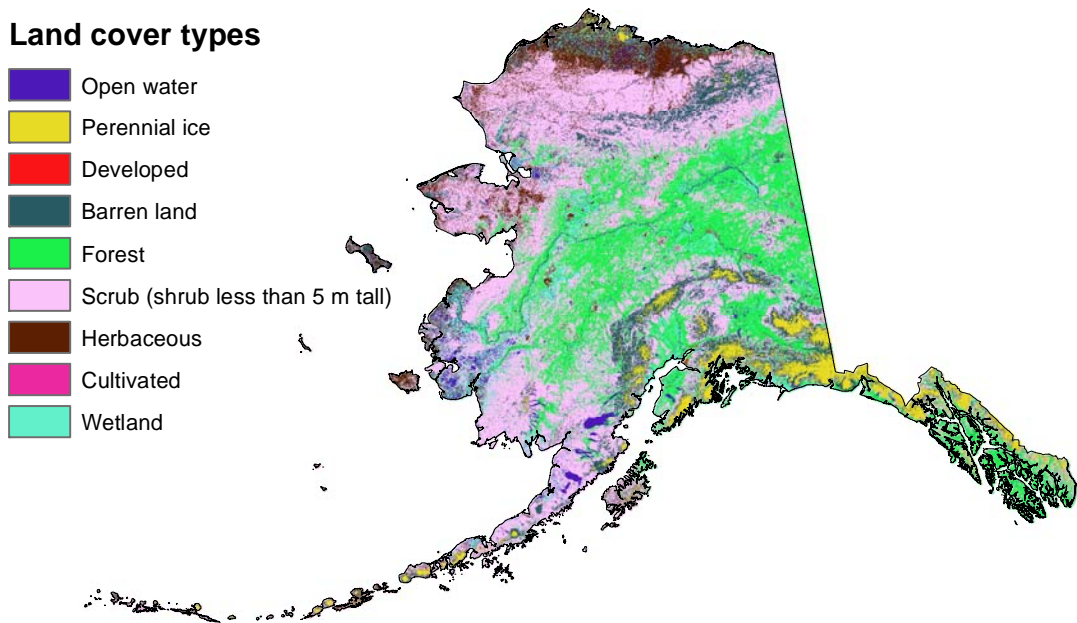Figure S4. Average SOC stocks in each soil wetness zone. Error bar is the standard deviation.

Figure S5. Land cover map used in the study.

Table S1. Descriptive statistics of observed soil organic carbon (SOC) stocks (total dataset, n=472; permafrost profiles, n=133)

Parameter	Minimum	Maximum	Average	Median	CV (%)	skewness	SD
Profile SOC stock (kg m^{-2})	0.4	296.3	49.5	38.5	80	2.0	39.6
Active layer SOC stock (kg m^{-2})	1.8	167.4	41.2	37.1	62.4	1.8	25.7
Permafrost SOC stock (kg m^{-2})	1	231.5	38.8	33.1	88.6	1.95	34.4

CV is coefficient of variation and SD is standard devation.

Table S2. Reclassification of USGS land-cover types for this study.

NLCD Land Cover Type	Reclassified Land Cover Type
Developed open space, low intensity, medium intensity and high intensity	Developed
Deciduous, evergreen, and mixed forest	Forest
Dwarf scrub and shrub scrub	Scrub
Shrub, sedge, and moss	Herbaceous
Pasture and cultivated lands	Cultivated
Woody and herbaceous wetlands	Wetland
Barren	Barren
Open water	Open water
Perennial ice	Perennial ice

Table S3. Geographically weighted regression model summary for log transformed whole profile SOC stocks.

Predictors	Minimum	Lower quartile	Median	Upper quartile	Maximum
Intercept	2.9	3.2	3.2	3.3	3.4
Elevation	-0.0009	-0.0008	-0.0007	-0.0005	-0.00008
Soil wetness index	0.05	0.06	0.06	0.07	0.09
Sediment transport index	-0.5	-0.2	-0.2	-0.2	-0.2
Scrub	0.01	0.4	0.5	0.6	0.6
Herbaceous	0.4	0.5	0.5	0.6	1
Barren	-2.7	-0.3	-0.1	-0.05	-0.007
Holocene deposits	-0.8	-0.7	-0.6	-0.5	-0.3
Pleistocene deposits	-0.5	-0.4	-0.4	-0.4	-0.3
Silurian rocks	0.3	0.3	0.3	0.3	0.3

Table S4. Geographically weighted regression model summary for log transformed active layer SOC stocks.

Predictors	Minimum	Lower quartile	Median	Upper quartile	Maximum
Intercept	3.7	3.7	3.8	3.9	4
Soil wetness index	0.05	0.07	0.08	0.09	0.09
Flow accumulation	-0.006	-0.006	-0.005	-0.005	-0.004
Precipitation	-0.001	-0.001	-0.001	-0.001	-0.0009
Temperature	0.04	0.04	0.05	0.05	0.06
Barren	0.2	0.4	0. 6	0.8	1.2
Scrub	0.1	0.2	0.3	0.3	0.4
Herb	0.3	0.5	0.5	0.6	0.6
Upper tertiary rocks	-0.7	-0.7	-0.7	-0.7	-0.6
Upper cretaceous rocks	-0.5	-0.5	-0.5	-0.5	-0.4
Lower cretaceous rocks	-0.6	-0.5	-0.5	-0.4	-0.3
Upper Devonian rocks	-3.8	-3.7	-3.7	-3.6	-3.5