

Keep your report to no more than 2 pages of text. Show all your calculations (separate pages are ok to show calculations)

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2. What are 2 examples of microclimate information that could be useful when considering land management choices? Explain 'why' for each.
3. Soil samples have been collected in your sites in St Edward St Pk and analyzed for BD and total N concentrations. Those results along with your field trip data are presented in the Friday lecture of the Soil's Module. Using these data, **calculate the TOTAL amount of N** (in kg ha⁻¹) present **in each soil profile at the two sites** you visited in the field. (*Be sure to sum the N from ALL horizons at each site.*) **SHOW** your calculations and tell us what this total N value says about your two sites (hint: compare N w average N presented in Wed lecture).
4. Each of the 4 sites that we visited at St. Edward St. Park had soils that may or may not have matched what was mapped for that area. *Briefly summarize your conclusions* for all 4 sites as to **what was found in the field relative to the soil map and comment on the value of the soils map to management activities.**

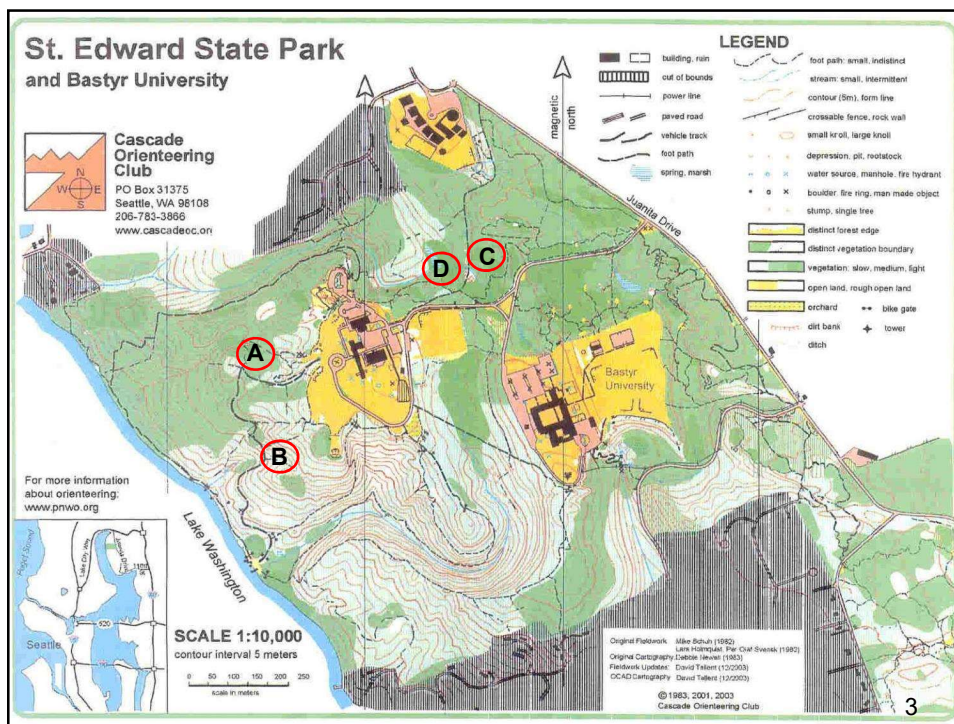
Field Trip Sites:

Tuesday: Upland = Site C
 Lowland = Site D

Wednesday: Upland = Site A
 Lowland = Site B

For Soils: think about productivity, appropriate uses, inappropriate uses, sensitive areas, soils map information

Microclimate: any effects with land use changes



Site A

Physical Environment Data
 Slope $\frac{-18\%}{10}$ W 272°
 Aspect $\frac{-10}{10}$

Soil Data
 Air Temp. Minimum Maximum Current
 site: wed. Upland conifer 6.4 17.9 13 °C

Soil Horizon	Depth	Bulk Density	Temperature	Color	Sample	Comments
O	57-0cm		11.4°C			
A	0-8cm		10.9°C			
Bw	8-36cm		10.5°C			
B ₁ C	36-60cm		10.7°C			Loamy Sand
C	60-90+cm		11.2°C			

Notes:
 Aspect = 10°
 Slope = 18%
 - Indian plum
 - trailing blackberry
 - western red cedar
 - salal
 - sword fern
 - hazelnut
 - Douglas fir
 - bigleaf maple
 - oval-leaved blueberry
 - salmon berry

Depth	Sample
Throughfall	21.9mm
Groundwater	no water

Speed	Direction
0 mph	

Depth	Sample	Flow Rate	Sample

Air Temp.	Minimum	Maximum	Current	Temp

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Site B

Physical Environment Data Slope: 50%
Aspect: 310°N

Soil Data Soil: Wed Air Temp. Minimum: 6.4°C Maximum: 17.8°C Current: 11°C

Soil Horizon	Depth	Bulk Density	Temperature	Color	Sample	Comments
O	2-0cm	X				
A	0-9cm		10.4°C		Clay content / Silt	mineral + org.
Bw	9-30cm		14.5°C		aggregated / mottled / oxidized / more compaction / small rocks	well developed / clay / mottled
B/C(g)	30-57cm		11°C			
Cg	57-70+cm		11.6°C		grit / higher zone / coherent	Parent material / under developed
Parent	?		?	?	N/A	lacustrine

Notes: * Stable nutrients (based on observation)
 Veg. Station:
 # Western Red Cedar @ Red hickalberry
 # Douglas Fir @ Short Oregon
 # W. Hemlock @ Bracken Fern
 # Indian Plum @ Ocean Spray
 # Holly @ Hazelnut
 # Red Alder @ Blackberry
 @ Sword Fern @ Noddy Rose
 @ Licorice Fern @ Vine maple?
 @ Salal

Throughfall	Depth	Sample
	21.8mm	
Groundwater	Depth	Sample
	NONE	
Wind	Speed	Direction
	0mph	N/A

Rainfall	Depth	Sample	Streamflow	Flow Rate	Sample
Air Temp.	Minimum	Maximum	Current	Temp	
	6.4°C	17.8°C	11°C		



Site C

Physical Environment Data
 Slope -12%
 Aspect 269°

Soil Data
 Site: Thuesday Upland Center
 Air Temp. Minimum 5.7°C Maximum 18.8°C Current 11°C

Soil Horizon	Depth	Bulk Density	Temperature	Color	Sample	Comments
O	0-1cm	885.6 cm ³ (M)		dark brown		
A	0-7cm		11°C	black	slightly sandy	lots of roots
Bw1	7-18		11.3°C	red-brown	gully	
Bw2	18-24		11.4°C	brown	no gully base	
BC	24-73		12.1°C	tan	sandy	
C	73-90+		12.9°C	sandy loam	sandy	no roots

Notes:
 Glacial out wash - parent material
 fill
 west red cedar
 Doug fir, west holly, big leaf maple, &
 Arise haw blackberry
 Brimley ferns
 Salal
 lichen
 holly
 salmonberry

Depth	Sample
Throughfall	11.8 mm
Groundwater	0

Wind	Speed	Direction
	0	

Rainfall	Depth	Sample	Streamflow	Flow Rate	Sample

Air Temp.	Minimum	Maximum	Current	Temp

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Site D

Physical Environment Data

Slope 15 1/2
Aspect SE

Soil Data

Site: Tree Rowland Dead

Air Temp. Minimum Maximum Current

5.3°C	17.6°C	5.0°C
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Soil Horizon	Depth	Bulk Density	Temperature	Color	Sample	Comments
O Horizon						organic soil decomposing → leaves
A Horizon	4-3 Peds		11°C	dark brown		not too dry
CG1 Horizon	4.2-7.3		11.1°C	grey		mineral decomposed → organic
CG2 Horizon	7.3 →		11.3°C	grey		

Notes: Vegetation: Stinky Bob
 Shinn Cabbage, Stinging Nettle
 Trailing Blackberry
 Ladyfinger, Siskel fern
 Salmon berry
 Huckleberry
 Onestary → Red alder, big leaf maple
 Western red cedar, Doug-Fir
 Devil club
 Licorice Fern on stump
 Lots of moss
 Epithemic branches

Depth	Sample
Throughfall	22.4
Groundwater	48 cm

Wind	Speed	Direction
0 mph		

Rainfall	Depth	Sample	Streamflow	Flow Rate	Sample

Air Temp.	Minimum	Maximum	Current	Temp

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Bulk Density Calculations

Bulk Density = dry soil mass / volume

Dry Mass:

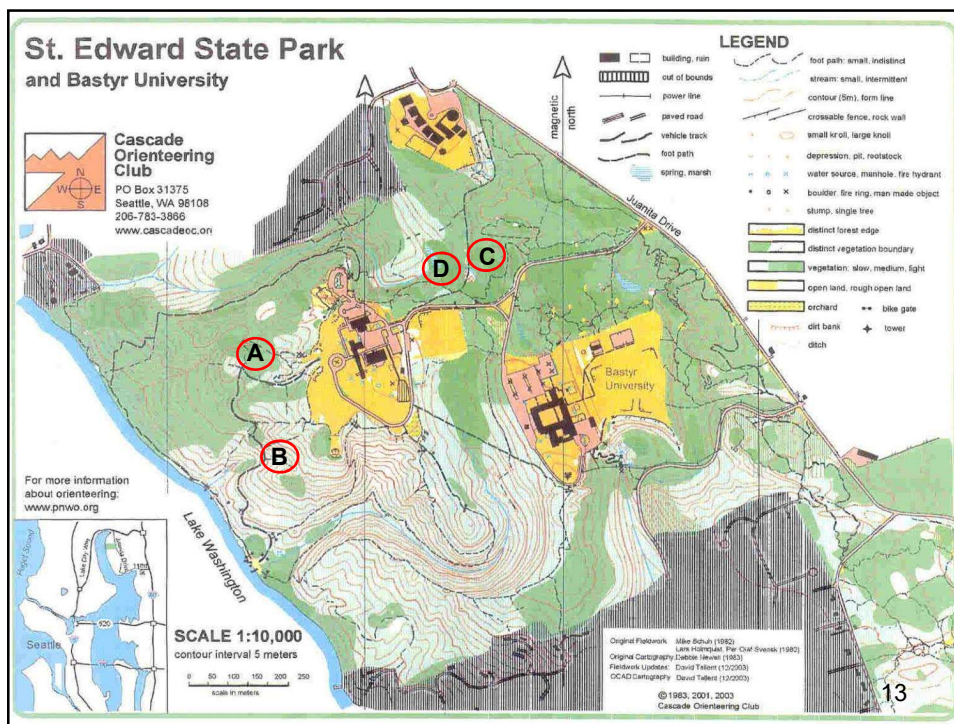
O horizon (organic detritus) dried at 70 – 75C
 Mineral soil dried at 105C

Volume:

Mineral Soil: e.g.,
 core volume of 2 rings = 137.4 cm³ (π r² h = vol)

Organic horizons: e.g.,
 Volume = average depth of 4 measurements x 18 cm x 11.5 cm
 (area of cut-out template)

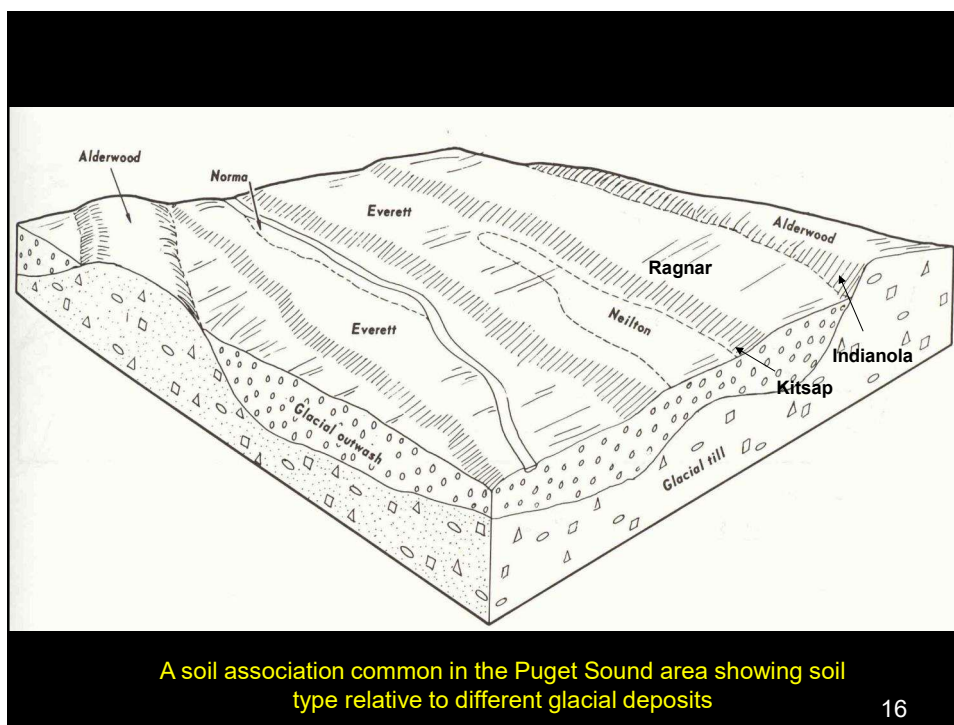
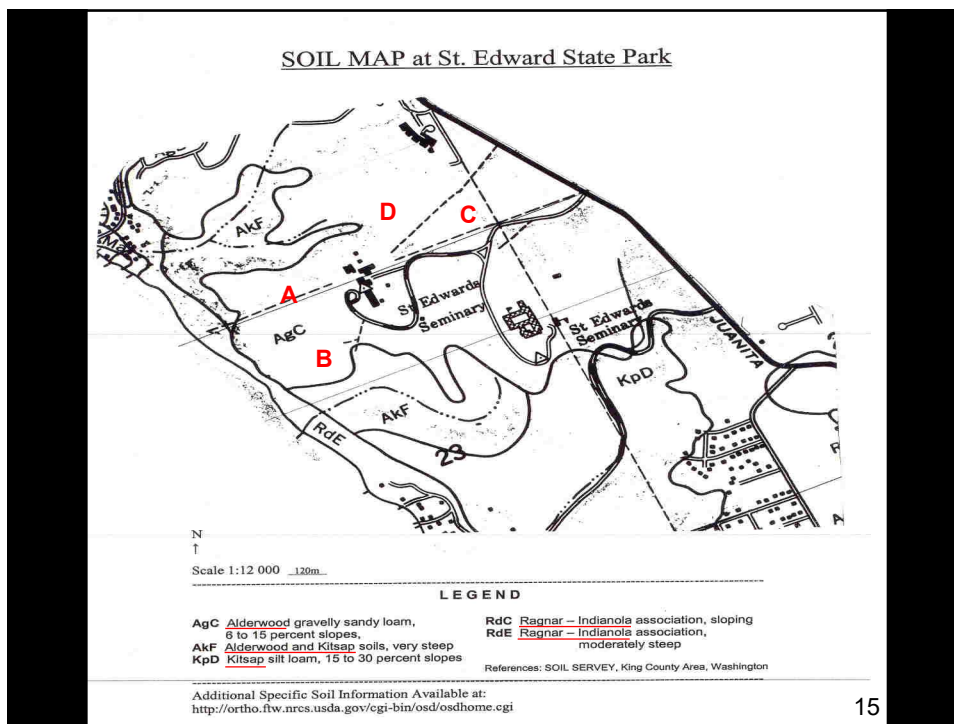
Bulk Density = dry weight / field volume



Site Characteristics

Site Parameter	Site A Upland	Site B Lowland	Site C Upland	Site D Lowland
Forest Type	Conifer	Decid	Conifer	Decid
Max temp, C	17.9	17.8	18.8	17.6
Min temp, C	6.4	6.4	5.7	5.3
Aspect, °	10	310	269	4
Slope, %	18	50	12	15
Grdwater depth, cm	none	none	none	48
Throughfall, mm	21.9	21.8	11.8	22.4

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Soil Horizons, depths and bulk densities							
Site A HORIZONS Moderate Hillslope (higher)	Depth (cm) and BD g/cm ³	Site B HORIZONS Steep Hillslope /lower	Depth (cm) and BD g/cm ³	Site C HORIZONS UPLAND	Depth (cm) and BD g/cm ³	Site D HORIZONS LOWLAND	Depth (cm) and BD g/cm ³
O	5.7 – 0 cm .04 g/cm ³	O	2 – 0 cm .05 g/cm ³	O	4.1 - 0 cm .04 g/cm ³	O	2 – 0 cm .02 g/cm ³
A	0 – 8 1.1	A	0 – 9 1.0	A	0 – 7 1.0	A	0 – 15 1.0
Bw	8 – 36 0.9	Bw	9 – 30 1.2	Bw1	7 – 18 1.2	Cg1	15 – 27 1.3
BC	36 - 60 1.1	BC or Bg	30 – 57 1.3	Bw2	18 – 24 1.2	Cg2	27 – 40+ 1.3
C	60 – 90+ 1.2	C or Cg	57 – 70+ 1.3	BC	24 – 73 1.3		
				C	73 – 90+ 1.3		
<u>loamy sands,</u> <i>glacial outwash</i>		<u>silty clay loams,</u> <u>silty clays</u> <i>lacustrine</i>		<u>sandy loams,</u> <i>glacial outwash/till</i>		<u>sandy loams & sandy clay loams,</u> <i>alluvial</i> 17	

Chemical Analyses:

Total N in Soil

Site A Moderate Hillslope	mg N /g soil	Site B Steep Hillslope /lower	mg N /g soil	Site C UPLAND	mg N /g soil	Site D LOWLAND	mg N /g soil
O	15.0	O	19.0	O	17.1	O	24.0
A	4.1	A	5.0	A	6.7	A	6.8
Bw	1.2	Bw	3.8	Bw1	1.8	Cg1	0.9
BC	1.0	BC or Bg	1.3	Bw2	1.1	Cg2	0.5
C	0.9	C or Cg	1.2	BC	1.0		
				C	0.01		18

Soil N conc		Soil BD		Horizon Thickness		Mass Conver		Area Conver
$\frac{0.3 \text{ mg N}}{1 \text{ g soil}}$	x	$\frac{1.1 \text{ g soil}}{\text{cm}^2 \cdot \text{cm}}$	x	$\frac{10 \text{ cm}}{1}$	x	$\frac{1 \text{ kg N}}{10^6 \text{ mg N}}$	x	$\frac{10^8 \text{ cm}^2}{\text{ha}}$
$= \frac{3300 \text{ kg N}}{\text{ha}} \text{ per 10cm horizon}$								

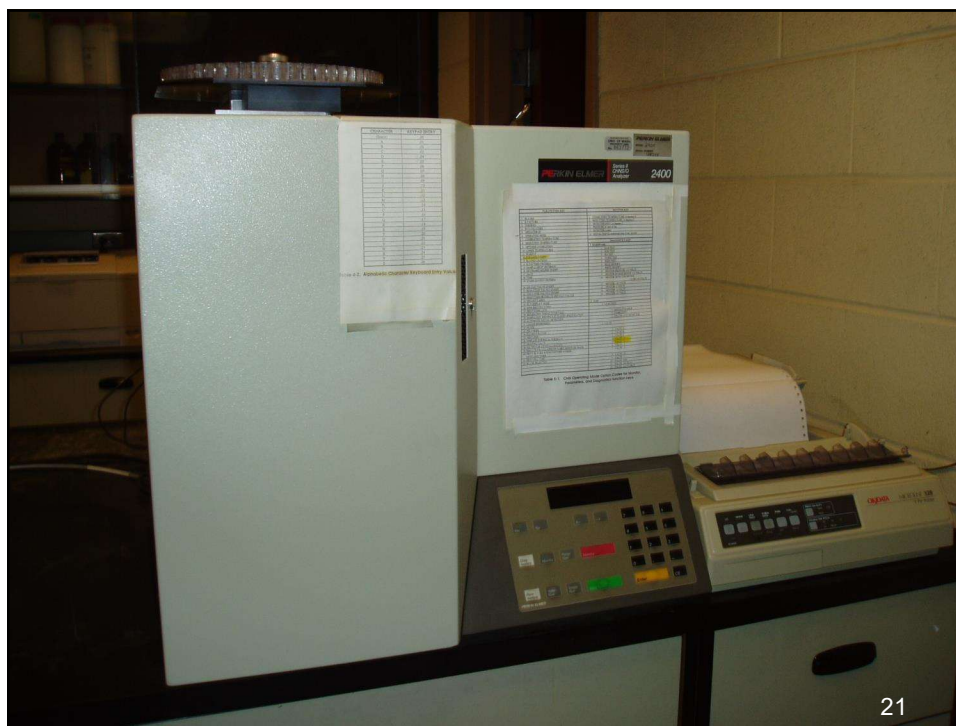
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Chemical analysis:

Total N using a CHN analyzer

and

dissolved ammonium and nitrate in solution using an Autoanalyzer



Throughfall Data:

Site A (DF):	21.9 mm
Site B (RA):	21.8 mm
Site C (DF):	11.8 mm
Site D (RA):	22.4 mm



Chemical Analyses: Collectors installed Oct 3
Total of 1 weeks

Solution Ammonium and Nitrate PPT: NH₄ = .013 mg L⁻¹
NO₃ = .040 mg L⁻¹

Sample	mg NH ₄ ⁺ / L	mg NO ₃ ⁻ / L	Sample	mg NH ₄ ⁺ / L	mg NO ₃ ⁻ / L
Site A throughfall	0.11	0.5	Site C throughfall	0.18	0.7
Site B throughfall	0.39	0.6	Site D throughfall	0.5	0.9
Site B groundwater			Site D groundwater	0.41	0.70
			Site D Streamwater	0.72	0.80

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MONROE, WASHINGTON (45525)

Period of Record Monthly Climate Summary
Period of Record : 6/ 1/1948 to 12/31/2006

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	45.1	50.0	53.9	59.9	66.1	71.2	76.5	76.6	71.1	60.9	50.8	45.2	60.6
Average Min. Temperature (F)	32.9	34.3	36.4	39.9	45.0	49.7	52.2	52.6	48.6	43.0	37.3	34.1	42.2
Average Total Precipitation (in.)	6.46	4.64	4.73	3.61	3.06	2.45	1.39	1.65	2.66	4.48	6.73	6.70	48.50
Average Total SnowFall (in.)	3.3	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.4	8.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 97.6% Min. Temp.: 97.5% Precipitation: 97.7% Snowfall: 97.4% Snow Depth: 96.1%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.

Western Regional Climate Center, <http://www.wrcc.dri.edu/summary/climsmwa.html>
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