



# pH and exchangeable base cation change at the Turkey Lakes Watershed 1986 to 2003/2005

Paul Hazlett

Natural Resources Canada, Canadian Forest Service,  
Sault Ste. Marie, Ontario, Canada



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Canada

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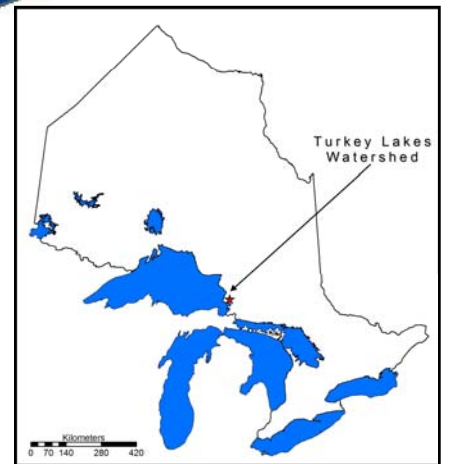
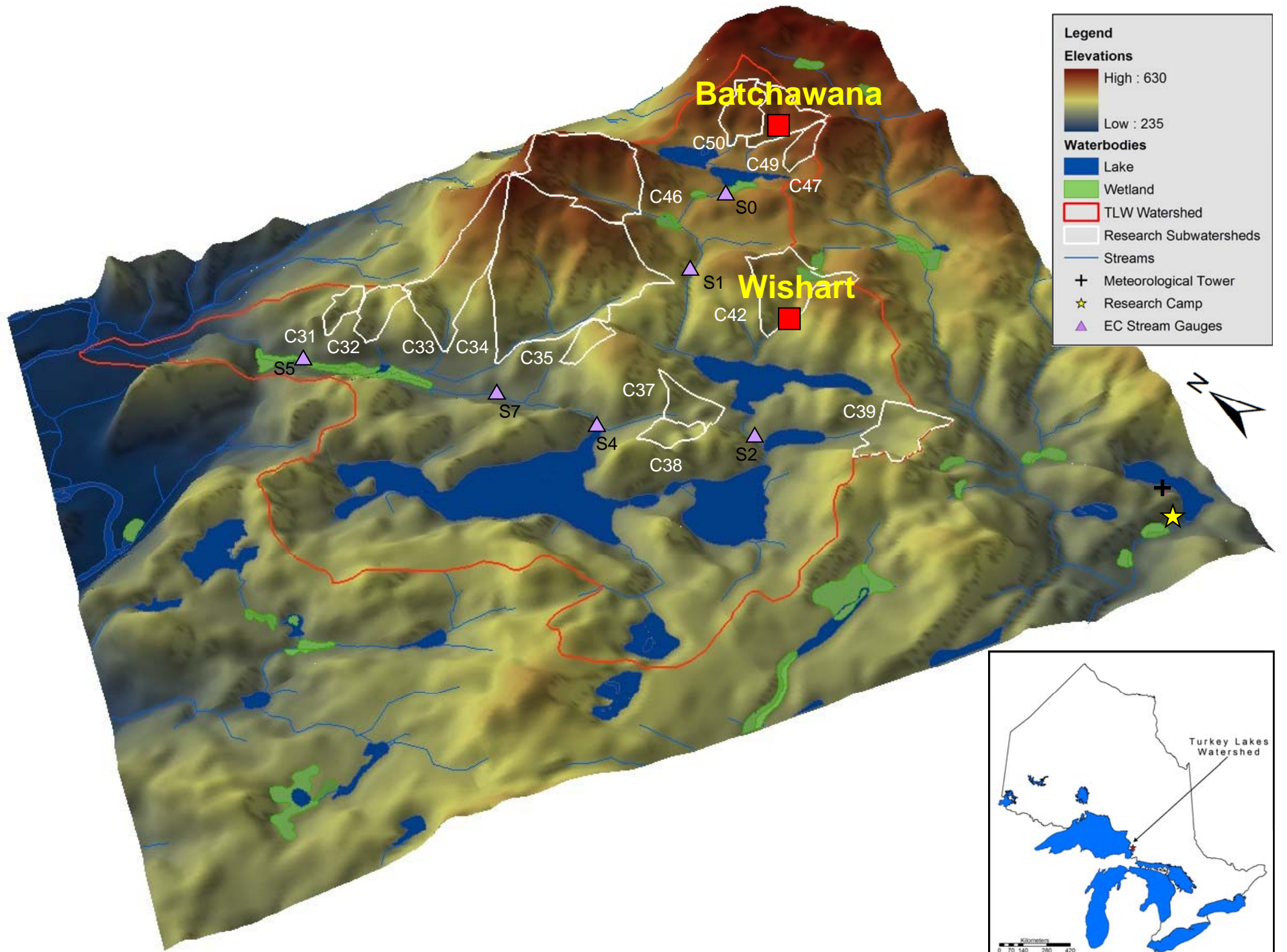
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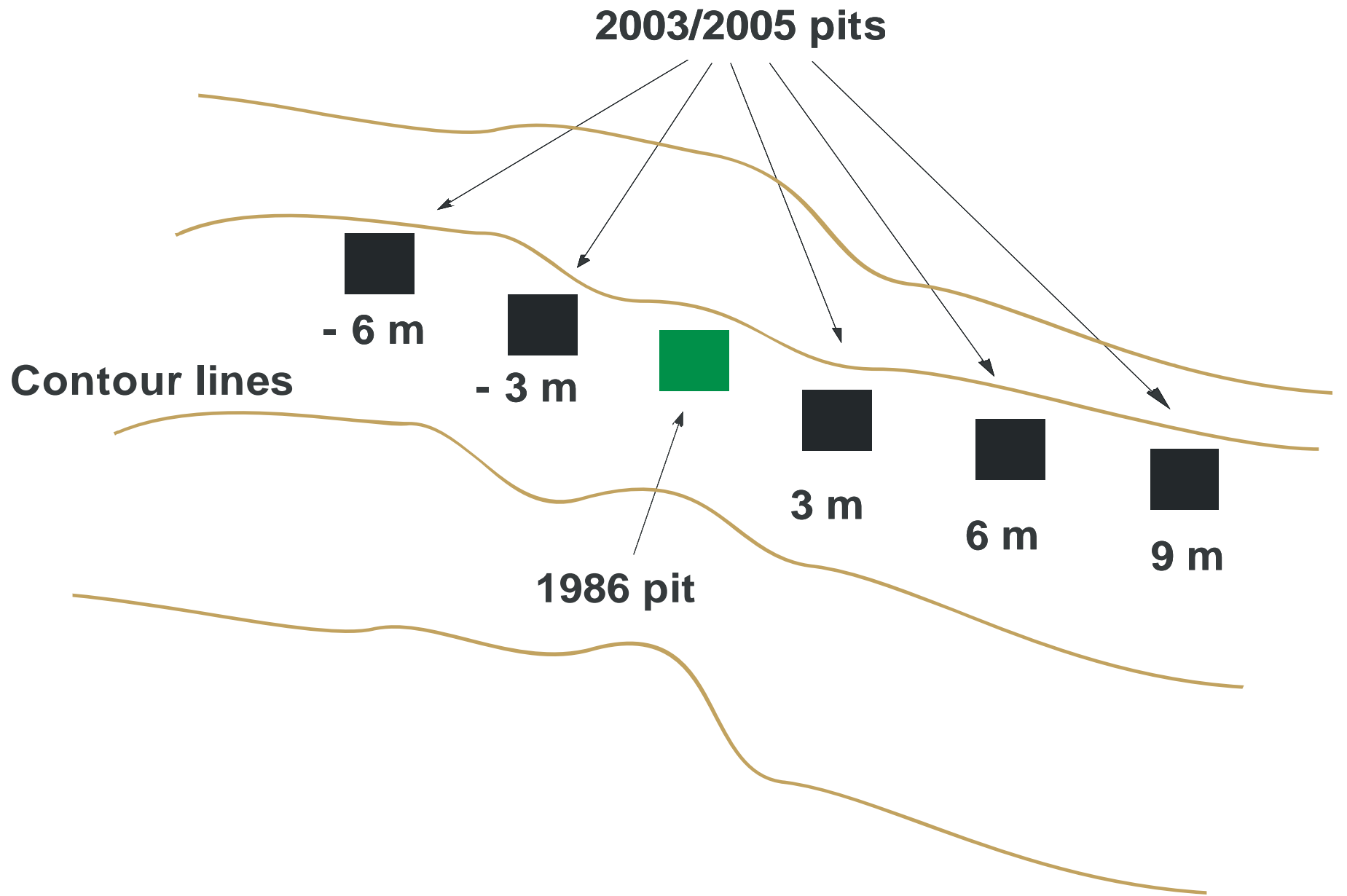


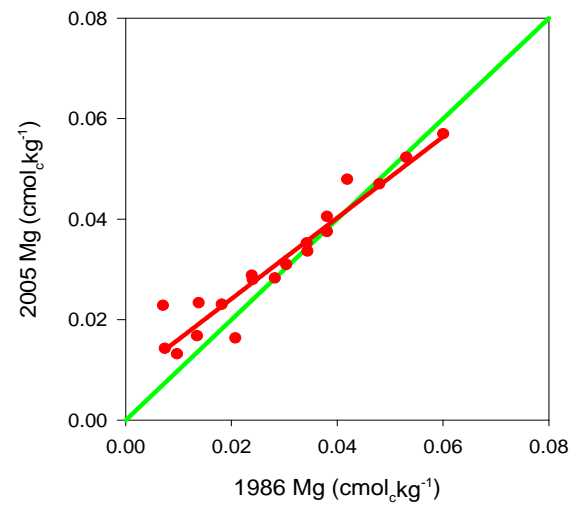
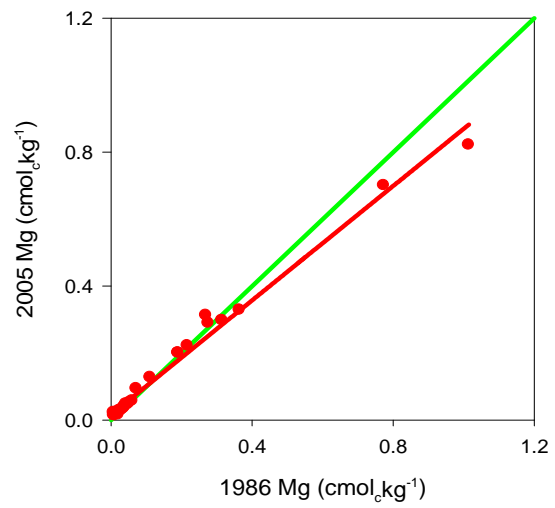
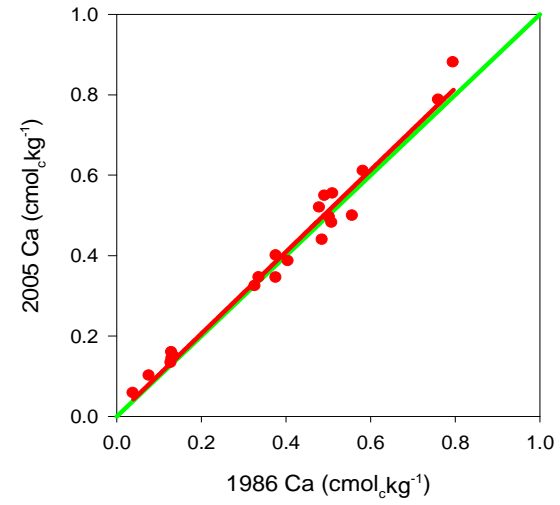
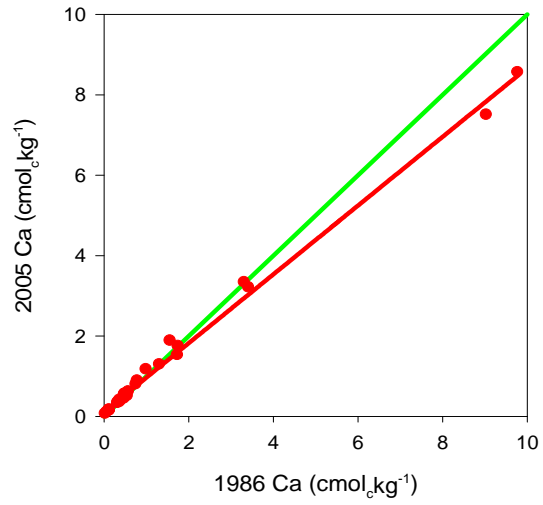
- uneven-aged old-growth maple-birch forest - net accumulation of nutrients low due to mortality
- 2007 - 14 and 15 kg/ha/yr SO<sub>4</sub> and NO<sub>3</sub>  
early 1980's - 30 and 20 kg/ha/yr
- input/output - deposition: 3 and 1 kg/ha/yr Ca and Mg  
leaching: 30 and 4 kg/ha/yr  
export: 25 and 3 kg/ha/yr
- comparative watershed studies - high soil nitrification, high base cation leaching
- 1986 sampling - archived original samples

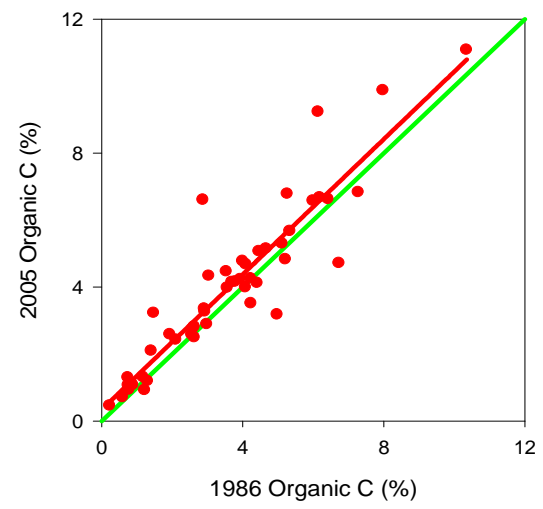
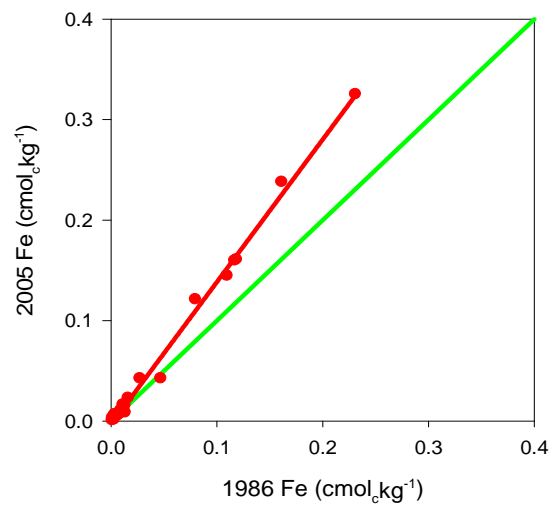
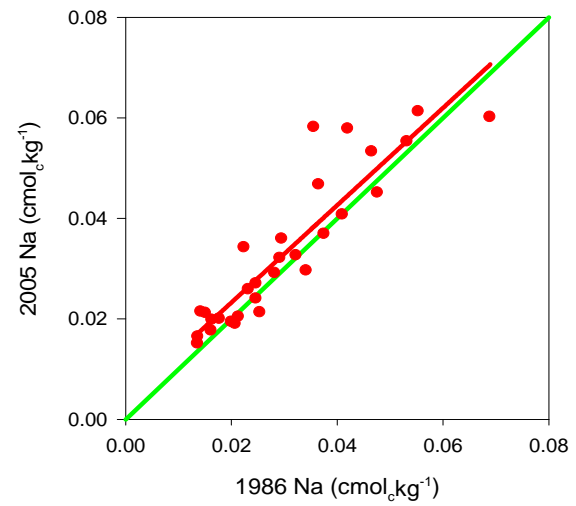
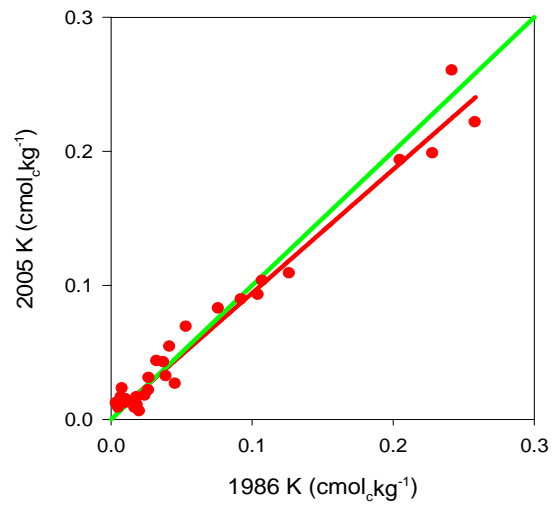


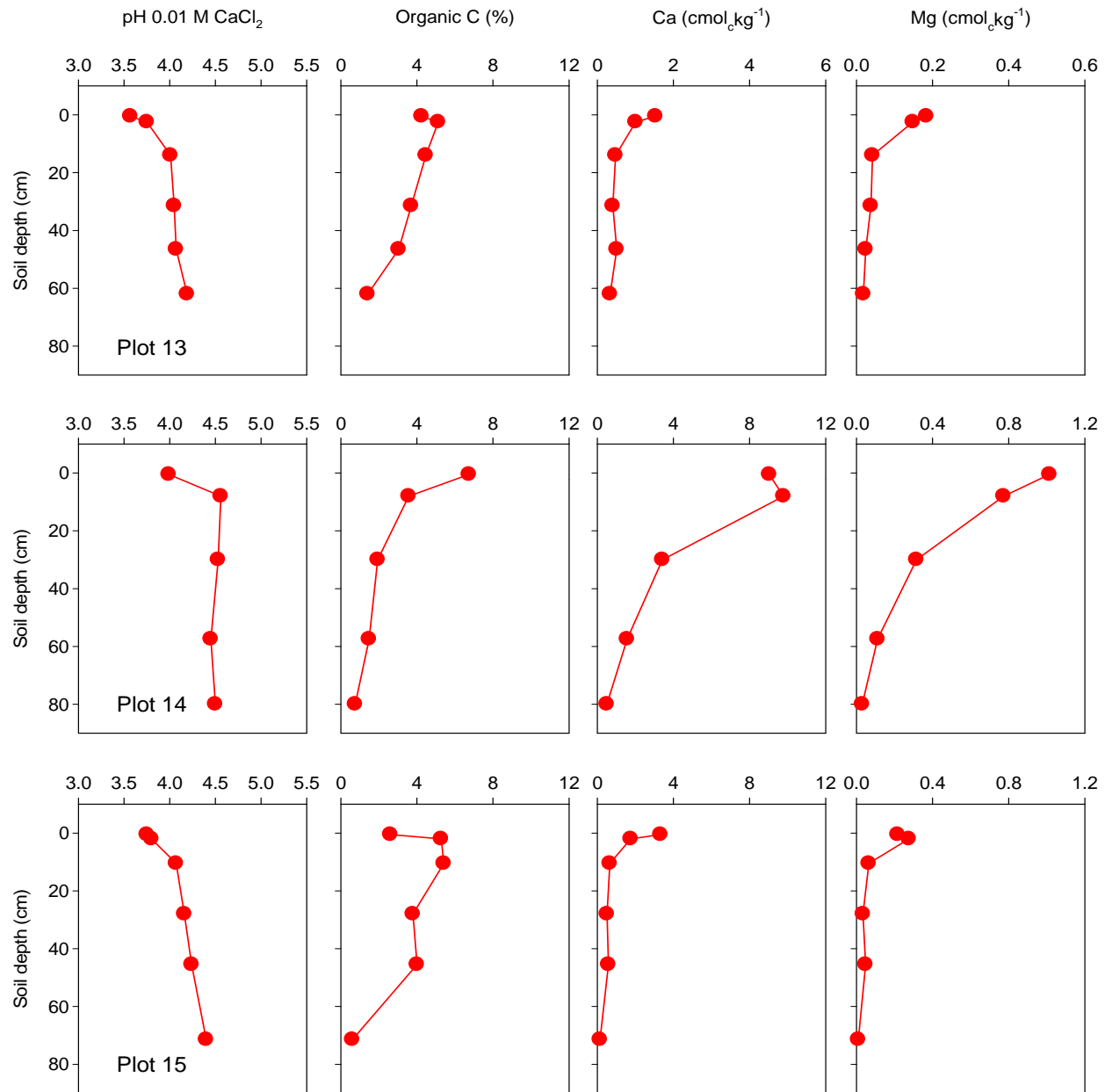




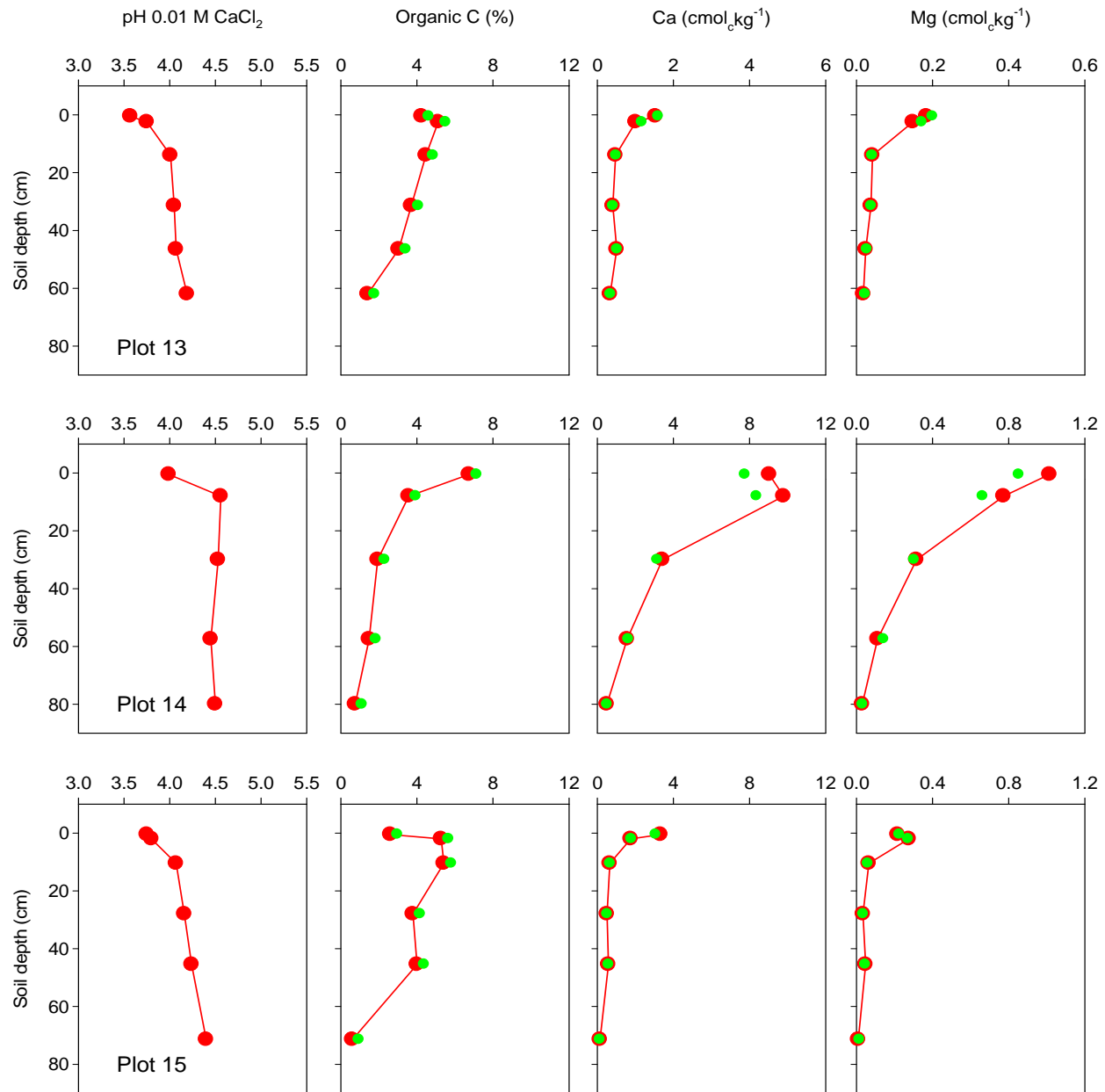


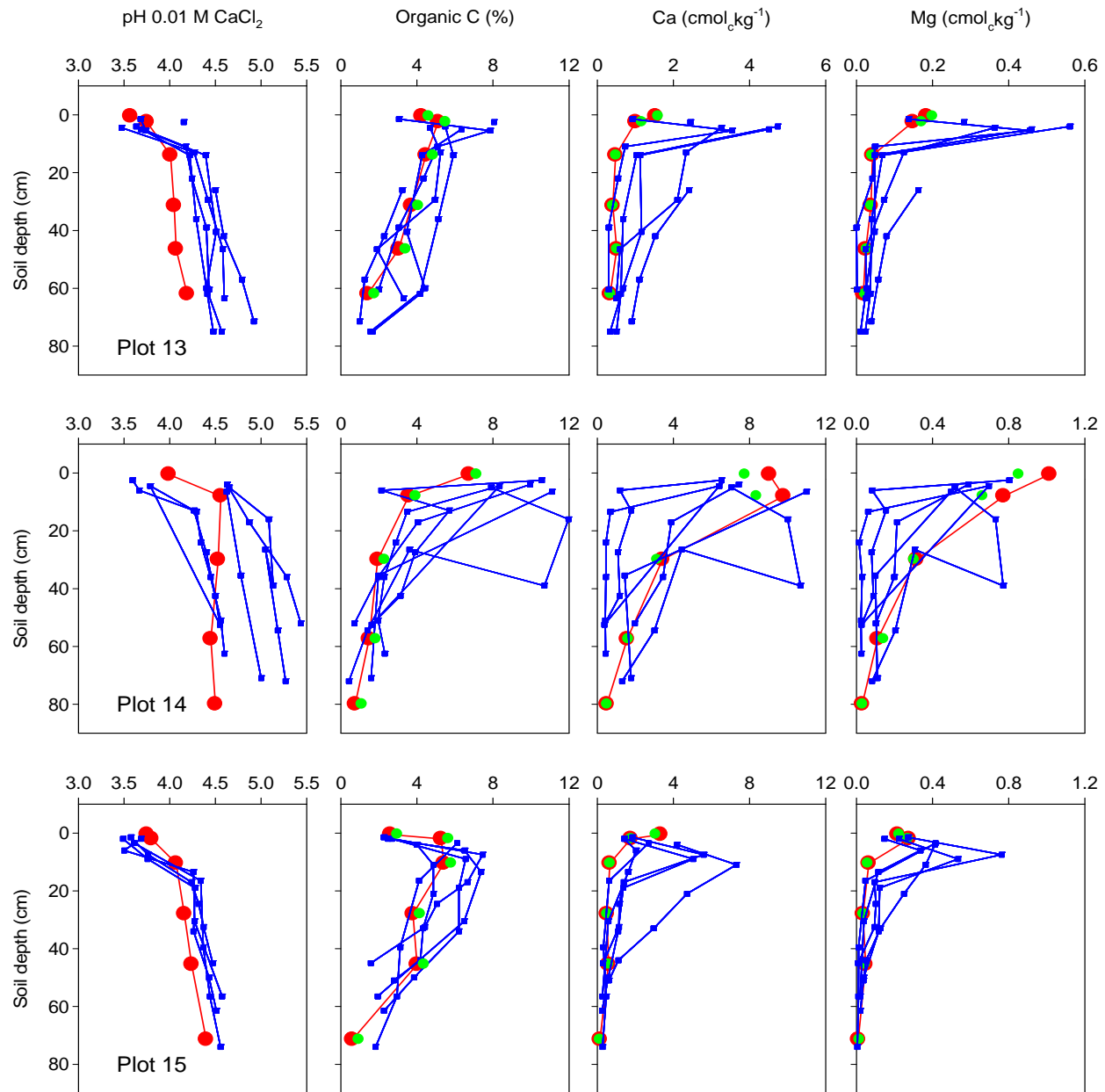












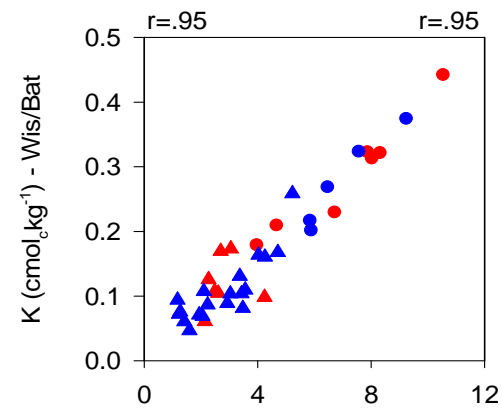
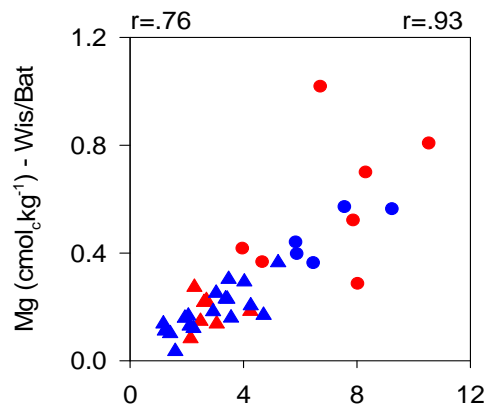
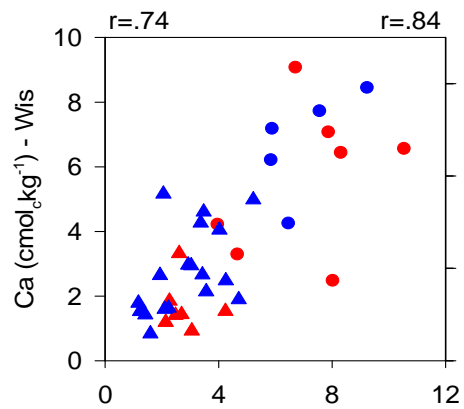


## Index horizons - seven plots

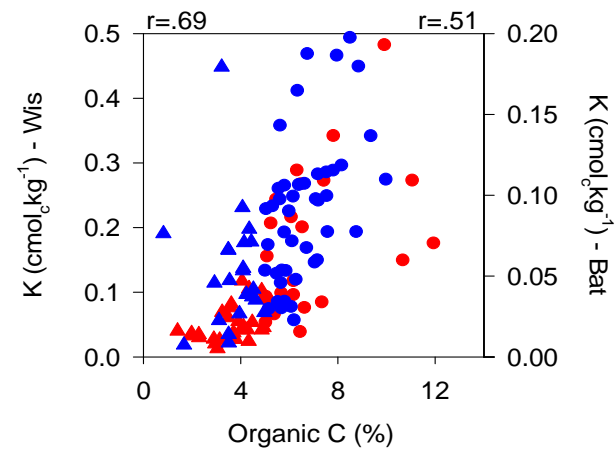
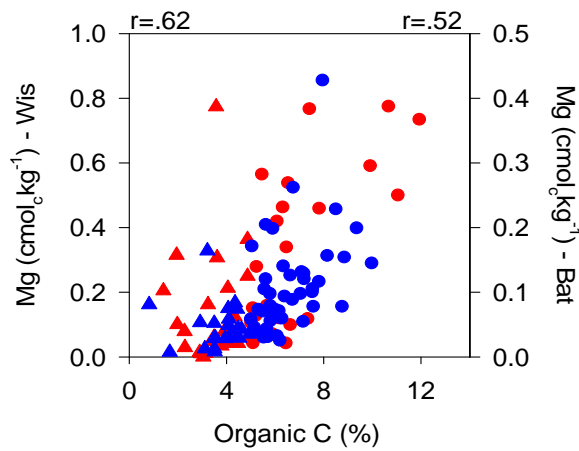
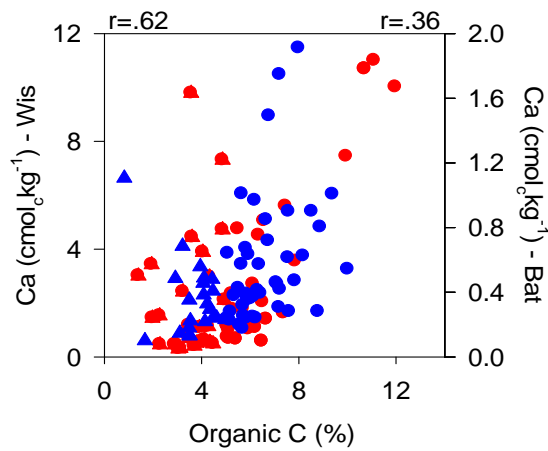
	pH H <sub>2</sub> O		Ca		Mg	
	1986	2003 2005	1986	2003 2005	1986	2003 2005
	cmol <sub>c</sub> kg <sup>-1</sup>					
Ae	4.16	4.00	1.54	1.11	0.23	0.18
Bhf1	4.45	4.34	1.00	1.90	0.19	0.26
Bf1	4.71	4.87	1.57	1.31	0.13	0.09
IIC	5.12	5.12	0.29	0.47	0.02	0.03



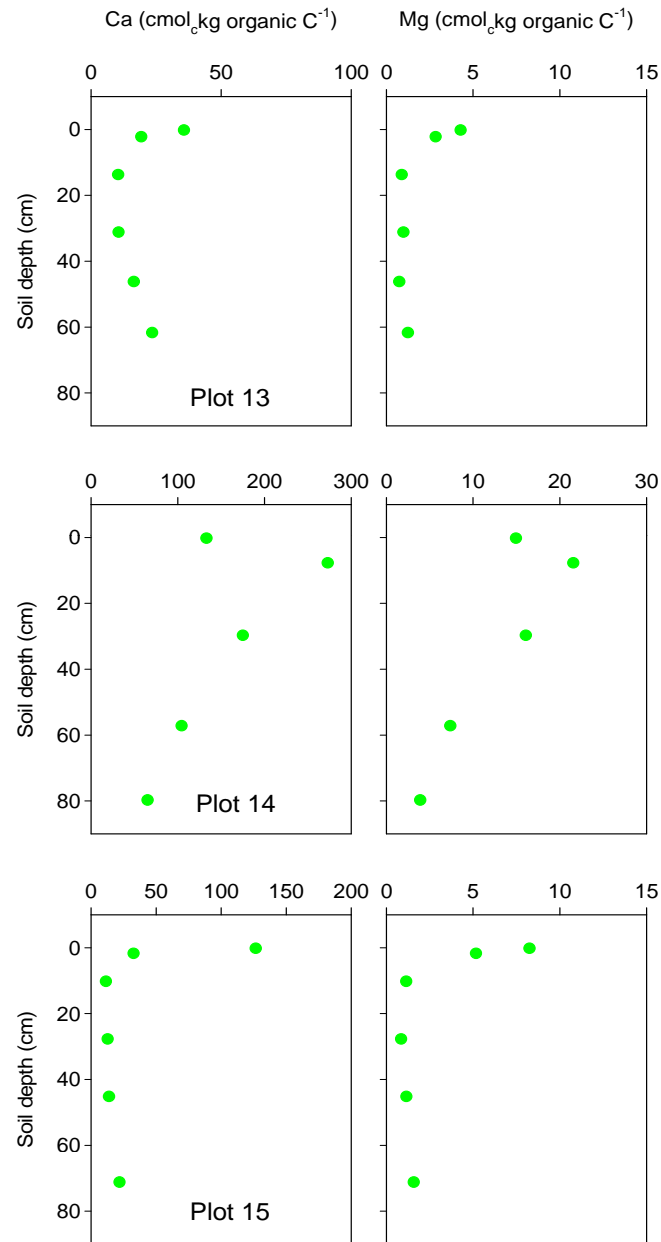
### A horizons

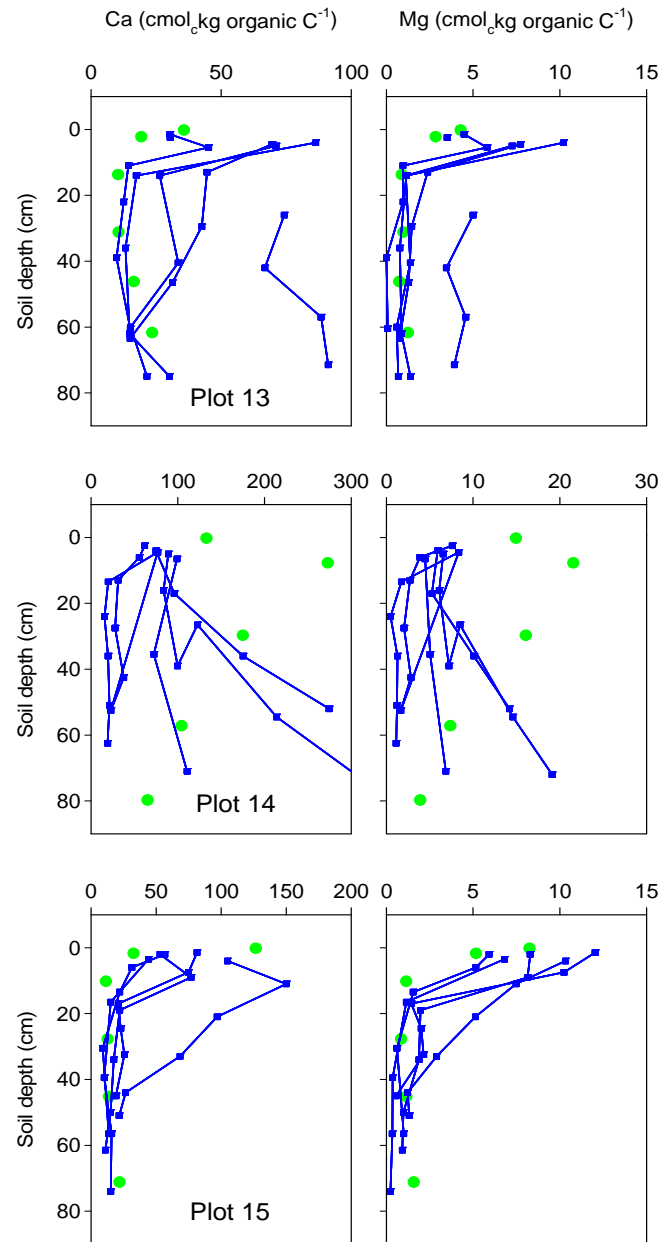


### B horizons



Wishart = Wis = red  
 Batchawana = Bat = blue







## Index horizons - seven plots - normalized

	Organic C		Ca:OC		Mg:OC	
	1986	2003 2005	1986	2003 2005	1986	2003 2005
	%		cmol <sub>c</sub> kg organic C <sup>-1</sup>			
Ae	4.2	2.6	40.6	44.1	5.7	7.0
Bhf1	6.2	7.0	16.4	28.8	3.0	3.8
Bf1	4.3	4.2	38.8	31.5	3.3	2.3
IIC	1.3	2.1	24.2	41.6	1.8	2.5





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Exchangeable				Total		
Ca	Mg	Ca	Mg	Ca	Mg	
cmol <sub>c</sub> kg <sup>-1</sup>		kg ha <sup>-1</sup>				
A 1.1	A .18	653	39	36715	17992	Turkey Lake
B 1.3 1.1	B .17 .08					
0-15 .70	0-15 .14	399	50	2110	5990	Johnson et al., 2008
45-60 .44	45-60 .12					
A 1.1	A .38					Bailey et al., 2005
B .09 .10	B .05 .04					
A .35	A .14	88	25			Watmough and Dillion, 2004
B .15	B .07					





- storage impacts
- no site declines in pH or exchangeable base cation concentrations (including normalized)
- large pool of exchangeable and total base cations - stability in spite of high leaching losses
- plot level changes - role of spatial heterogeneity - drivers of heterogeneity: profile base status, topography...





