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Storm-triggered landslides in the Peruvian Andes and implications for topography, carbon cycles, and biodiversity

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Supplement

Tables

Table S1: Landsat images used and visibility

#	year	day-month	Landsat	% visibility
1	1988	22-Jun	5	68
2	1988	25-Jun	5	79
3	1989	27-Jul	5	78
4	1990	02-Oct	5	77
5	1991	01-Jul	5	79
6	1991	17-Jul	5	77
7	1992	30-Apr	5	47
8	1993	04-Jun	5	77
9	1994	25-Jul	5	63
10	1995	09-May	5	72
11	1996	12-Jun	5	76
12	1996	17-Jul	5	76
13	1997	18-Aug	5	56
14	1998	04-Jul	5	63
15	1999	21-Jun	5	75
16	1999	07-Jul	5	77
17	2000	23-Jun	5	74
18	2001	09-May	5	59
19	2002	20-May	7	53
20	2003	19-May	5	66
21	2004	18-Jun	7	59
22	2004	13-Aug	7	59
23	2004	05-Aug	5	66
24	2005	15-Jul	7	60
25	2006	15-May	7	72
26	2007	22-Aug	7	66
27	2007	26-May	5	66
28	2007	06-Aug	7	60
29	2008	06-Jun	7	69
30	2009	19-Aug	5	64
31	2010	06-Aug	5	74
32	2011	06-Jun	5	52
33	2011	02-Sep	7	44
24	2012	02-Jul	7	48

Table S2: Interannual landslide variability and Landsat image visibility

Rank	Year	Area affected by landslides (km^2)	% of valley affected by landslides	% visibility in Landsat imagery
1	2010	0.752	0.502	74
2	1995	0.344	0.230	72
3	2007	0.327	0.218	66
4	2001	0.196	0.131	59
5	2003	0.132	0.088	66
6	1991	0.120	0.080	79
7	2004	0.119	0.080	66
8	2009	0.115	0.077	64
9	2012	0.110	0.073	48
10	2011	0.106	0.071	52
11	1999	0.087	0.058	77
12	1998	0.078	0.052	63
13	2008	0.072	0.048	69
14	1996	0.059	0.039	76
15	2005	0.046	0.030	60
16	2000	0.044	0.029	74
17	2006	0.040	0.027	72
18	1993	0.036	0.024	77
19	1988	0.026	0.017	79
20	1994	0.016	0.011	63
21	2002	0.013	0.009	53
22	1990	0.003	0.002	77
23	1997	0.001	0.001	56
24	1989	0.000	0.000	78
25	1992	0.000	0.000	47

Table S3 : Soil stock summary for the forest plots of the Kosñipata Valley

Plot	Lat/Long (S, W)	Landscape description	plot elevation (m)	Plot slope (°)	Number of pits	Average pit depth (m)	Average C stock (tC km^{-2})
Tono	12°57'33", 71°32'57"	LMRF	1000	8	6	1.33	22194
SP2	13°2'57", 71°32'11"	LMRF	1522	29	46	0.96	17707
SP1	13°2'32", 71°32'32"	LMCF	1769	33	30	1.02	24136
TRU-8	13°4'14", 71°33'21"	LMCF	1883	38	6	1.25	22212
TRU-7	13°4'26", 71°33'35"	LMCF	2040	30	6	1.25	20464
TRU-4	13°6'21", 71°35'22"	UMCF	2758	20	6	1.33	41556
ESP	13°10'32", 71°35'41"	UMCF	2862	27	51	0.99	24294
TRU-3	13°6'34", 71°35'58"	UMCF	3039	23	6	1.58	28500
WQ	13°11'26", 71°35'15"	UMCF	3043	30	39	0.96	53885
TRU-2	13°06'38", 71°36'15"	UMCF	3239	30	6	0.57	21753
TRU-1	13°06'49", 71°36'25"	Dwarf forest	3396	37	6	0.33	13161

Mean plot elevation and slope determined by CAO DEM at 3m x 3m resolution (Asner et al., 2012).

LMRF = Lower montane rainforest, LMCF = Lower montane cloud forest,

UMCF = Upper montane cloud forest

SP = San Pedro, TRU = Trocha Union, ESP = Esperanza, WQ = Wayqecha

Sampling notes : SP1 sampled only to 100cm, TRU 1 to 8 sampled to rocks or to 200cm, ESP and WQ stopped around 100 cm because of rocks

Figures

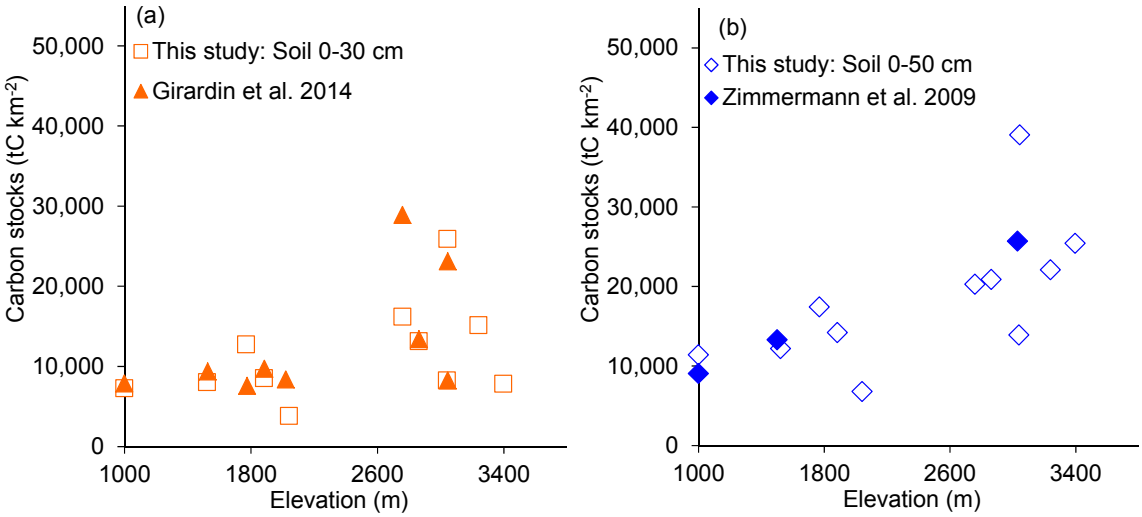

Figure S1: Soil carbon stocks from this study for the Kosñipata Valley, at 0-30 cm (a) and 0-50 cm (b) depths compared with previously published soil stocks measured from 0-30 cm (Girardin et al., 2014) and 0-50cm respectively (Zimmermann et al., 2009).

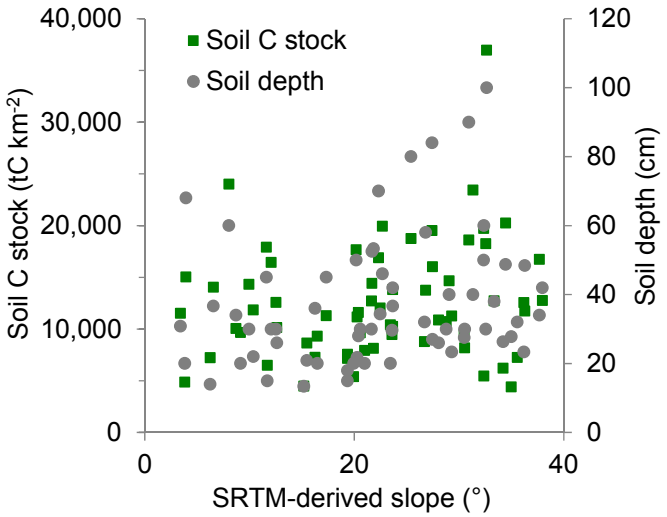

Figure S2: Soil carbon stocks and soil depth over various slopes derived from Shuttle Radar Topography Mission (STRM) (Gibbon et al., 2010; Farr et al., 2007). Soil stocks are consistent over a range of hillslopes, with no strong dependence on slope angle, suggesting that the plot-level data on soil stocks for the Kosñipata Valley may not be strongly based by selective topographic position.

Supplementary references

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