I would like to thank the anonymous reviewer, the suggestions are very pertinent and the majority was implemented into the corrections improving the quality of the paper.

1.- In the "Abstract" section paragraph 10 you say, ".. the influence of climate chance over the permafrost". You must say, "...the influence of climate change over the permafrost".

Page 2, line 13

Please substitute

"The controls of weather on the thermal regime of the active layer have been identified, providing insights about the influence of climate chance over the permafrost."

By

"The controls of weather on the thermal regime of the active layer have been identified, providing insights about the influence of climate change over the permafrost."

2.- In the "Introduction" section paragraph 25 you cited Ledley, 2012, but in the bibliography appears like Ledley, 1985, you must correct it.

Page 3, line 3

Please substitute "Ledley, 2012"

By

"Ledley, 1985"

3.- In the "Studied site" section, paragraph 5 appers Köppen, 1936, that is not in the bibliography section. Add to bibliography.

Page 12

Please include Köppen, 1936 in the reference list.

Köppen, W., 1936. Das geographisca System der Klimate, in: Köppen, W. and Geiger, G., 1. C. (Eds.), Handbuch der Klimatologie, Gebr, Borntraeger, pp. 1-44.

4.- In the "Methods" section you must define what is F1, F2, F3 and F4 to clarify to the lector that are thermistor located in a shallow borehole, give details of the borehole, depth, diameter. . ..

Please substitute

"The active layer monitoring site (– 62°12′12″ S, 58°57′37″ W, and 60 m of altitude) was installed (10.5cm (F1), 32.5cm (F2), 67.5cm (F3), 83.5cm (F4)) in the summer of 2008, and consist of thermistors (accuracy ±0.2◦C) (model 107 Temperature Probe, Campbell

Scientific Inc, Utah, USA) arranged in a vertical array at different depths down to the permafrost table, the site was selected during soil survey and represents most of Turbic Cryosols occurring at the peninsula. All probes were connected to a data logger (model CR 1000, Campbell Scientific Inc, Utah, USA) recording data at hourly intervals from 1 March 2008 until 30 November 2012."

By

"The active layer monitoring site (– 62°12′12″ S, 58°57′37″ W, and 60 m of altitude) was installed in the summer of 2008, and consist of thermistors (accuracy ±0.2◦C) (model 107 Temperature Probe, Campbell Scientific Inc, Utah, USA) arranged in a vertical array at different depths down to the permafrost table (10.5cm (F1), 32.5cm (F2), 67.5cm (F3), 83.5cm (F4)), the site was selected during soil survey and represents most of Turbic Cryosols occurring at the peninsula. All probes were connected to a data logger (model CR 1000, Campbell Scientific Inc, Utah, USA) recording data at hourly intervals from 1 March 2008 until 30 November 2012."

5.- In "Results and discussion" section I recommend use only one decimal to the temperature values and one decimal too for the error. In the case of the TDD and FDD and ALT values I recommend to round off the units in °C days and cm respectively.

Page 7, line 5

Please substitute

"Interannual variability of the active layer temperature shows parallel behavior despite contrasts between different years, daily temperatures records are presented in Fig. 2. The temperature at 10.5cm reaches a maximum daily average (4.06◦C±0.46) in early January, reaching a minimum (−8.03◦C±1.36) between late July and early August. At 83.5cm maximum temperature (0.30◦C±0.24) occurs in late March and the minimum reading (−4.06◦C±0.98) was recorded around mid August. Disparities can be noticed when comparing the different years; 2008 had a mild winter (21 freezing days and −0,88 freezing degree days at 83.5 cm in July) contrasted by a severe winter in 2011 (31 freezing days and −80,00 freezing degree days at 83.5 cm in July), the summer of 2009 was considerably warmer (31 thawing days and 64.77 thawing degree days at 10.5 cm in January) compared to the summer of 2010 (17 thawing days and 21,15 thawing degree days at 10.5 cm in January). Daily Air temperature at Fildes Peninsula over the studied period averaged −2.3◦C (±4.1), reaching a maximum and a minimum of 5.75 ◦C and −21.20 ◦C, in early January and late June, respectively. The difference between maximum and minimum daily averages was greater for 2009 and 2011, in this years more extreme minimum temperatures were recorded (−17.4 ◦C for 2009 and −18.6 ◦C for 2011). The freezing season started in late May and the thawing season in mid December with small variability between the years. Soil temperature averaged −1.2 ◦C (avg. max 2.1 ◦C and avg. min −7.3 ◦C) considering all layers, maximum soil temperature for the upper most layer (F1) considering hourly measurements was 8.7 ◦C and minimum −9.8 ◦C and 0.5 ◦C and −5.4 ◦C at the bottom most layer (F4)."

By

“Interannual variability of the active layer temperature shows parallel behavior despite contrasts between different years, daily temperatures records are presented in Fig. 2. The temperature at 10.5cm reaches a maximum daily average (4.1◦C±0.5) in early January, reaching a minimum (−8.0◦C±1.4) between late July and early August. At 83.5cm maximum temperature (0.3◦C±0.2) occurs in late March and the minimum reading (−4.1◦C±1.0) was recorded around mid August. Disparities can be noticed when comparing the different years; 2008 had a mild winter (21 freezing days and −1 freezing degree days at 83.5 cm in July) contrasted by a severe winter in 2011 (31 freezing days and −80 freezing degree days at 83.5 cm in July), the summer of 2009 was considerably warmer (31 thawing days and 65 thawing degree days at 10.5 cm in January) compared to the summer of 2010 (17 thawing days and 21 thawing degree days at 10.5 cm in January). Daily Air temperature at Fildes Peninsula over the studied period averaged −2.3◦C (±4.1), reaching a maximum and a minimum of 5.8 ◦C and −21.2 ◦C, in early January and late June, respectively. The difference between maximum and minimum daily averages was greater for 2009 and 2011, in this years more extreme minimum temperatures were recorded (−17.4 ◦C for 2009 and −18.6 ◦C for 2011). The freezing season started in late May and the thawing season in mid December with small variability between the years. Soil temperature averaged −1.2 ◦C (avg. max 2.1 ◦C and avg. min −7.3 ◦C) considering all layers, maximum soil temperature for the upper most layer (F1) considering hourly measurements was 8.7 ◦C and minimum −9.8 ◦C and 0.5 ◦C and −5.4 ◦C at the bottom most layer (F4).”

Page 8, line 1

Please substitute

“ALT was estimated for every season, results summarized in Table 1 (2008 and 2012 being incomplete), maximum ALT ranged between 89.0 cm and 105.8 cm, mean 101.0 cm; the totality of the active layer froze during winter every year over the studied period. During 2010 curious phenomena occurred, temperatures at F3 remained negative the whole year, reaching values above zero at the bottom most layer (F4), in this year ATL was estimated slightly below the deepest probe, this is probably due to the accumulation of water over the permafrost table.”

By

“ALT was estimated for every season, results summarized in Table 1 (2008 and 2012 being incomplete), maximum ALT ranged between 89 cm and 106 cm, mean 101 cm; the totality of the active layer froze during winter every year over the studied period. During 2010 curious phenomena occurred, temperatures at F3 remained negative the whole year, reaching values above zero at the bottom most layer (F4), in this year ATL was estimated slightly below the deepest probe, this is probably due to the accumulation of water over the permafrost table.”

Page 8, line 20

Please substitute

“The cumulative sum of the daily averages reached an maximum in 2009 and a minimum in 2011 for all layers, values varied greatly over the years, December and January being the hottest months and June always the coldest (Fig. 4). Over all the 57 months the TDD were 901.7 ◦C day (F1), 448.9 ◦C day (F2), 95.6 ◦C day (F3) and 64.0 ◦C day (F4) and the FDD were −3229.0 ◦C day (F1), −2623.1 ◦C day (F2), −2433.3 ◦C day (F3), −2040.8◦C day (F4). Contrast between different years was significant, in 2011 FDD accumulated −819◦C day in surface and −516◦C day at F4; in contrast 2011 accumulated −527 in surface and −382 at F4. There is a clear preponderance of negative soil temperatures in the studied profile, despite the percolation of liquid water and above freeze temperatures during summer, positive temperatures are mild in the soil profile.”

By

“The cumulative sum of the daily averages reached an maximum in 2009 and a minimum in 2011 for all layers, values varied greatly over the years, December and January being the hottest months and June always the coldest (Fig. 4). Over all the 57 months the TDD were 902 ◦C day (F1), 449 ◦C day (F2), 96 ◦C day (F3) and 64 ◦C day (F4) and the FDD were −3229 ◦C day (F1), −2623 ◦C day (F2), −2433 ◦C day (F3), −2040◦C day (F4). Contrast between different years was significant, in 2011 FDD accumulated −819◦C day in surface and −516◦C day at F4; in contrast 2011 accumulated −527 in surface and −382 at F4. There is a clear preponderance of negative soil temperatures in the studied profile, despite the percolation of liquid water and above freeze temperatures during summer, positive temperatures are mild in the soil profile.”

Tables.- 3.- Insert in the table the units to the temperatures and the thermal diffusivity. I recommend use only one decimal to temperature values.

Please substitute

Table 3: Average season temperatures for Air, F1, F2, F3, and F4; and ATD for F2 and F3.

Averages	Air	F1	F2	F3	F4	ATD_F2	ATD_F3
Fall _2008	-2,36	-1,12	-0,32	-0,10	0,09	1,4E-04	6,3E-05
Winter_2008	-3,54	-3,23	-2,69	-2,19	-1,64	1,0E-05	-3,4E-06
Spring_2008	-0,28	0,38	-0,38	-0,82	-0,77	1,3E-04	-8,8E-06
Summer_2009	1,64	2,55	1,55	0,37	0,11	3,5E-05	2,6E-07
Fall _2009	-2,49	-1,49	-0,48	-0,11	0,11	-1,9E-04	-1,3E-05
Winter _2009	-6,40	-4,95	-4,19	-3,52	-2,86	-9,3E-07	-4,0E-06
Spring _2009	-1,96	-1,66	-1,79	-2,02	-1,87	1,1E-05	1,1E-05
Summer _2010	0,41	1,44	0,49	-0,33	-0,27	2,3E-04	5,9E-06
Fall _2010	-2,24	-1,25	-0,62	-0,43	-0,21	1,5E-04	1,6E-05
Winter _2010	-4,09	-3,70	-3,27	-2,92	-2,45	8,4E-06	-1,0E-06
Spring _2010	-0,63	-0,38	-0,87	-1,30	-1,23	2,9E-05	2,9E-05
Summer _2011	1,63	2,22	1,34	0,21	-0,02	2,9E-05	1,9E-06
Fall _2011	-4,28	-1,75	-0,60	-0,12	0,09	8,6E-05	2,9E-05
Winter _2011	-7,91	-5,69	-4,93	-4,19	-3,51	4,8E-08	-5,9E-06
Spring _2011	-1,21	-1,14	-1,60	-2,04	-1,99	6,3E-06	1,6E-05
Summer _2012	1,35	1,86	0,94	-0,18	-0,20	4,4E-05	5,0E-05
Fall _2012	-3,91	-1,66	-0,72	-0,36	-0,09	1,0E-06	1,1E-05
Winter _2012	-5,47	-4,33	-3,88	-3,55	-3,04	6,8E-06	7,3E-07
Spring _2012	-3,14	-2,08	-2,19	-2,47	-2,33	3,4E-05	1,2E-05
AVG	-2,18	-1,18	-1,14	-1,29	-1,10	4,2E-05	1,1E-05
Standard Deviation	2,75	2,45	1,90	1,45	1,25	8,3E-05	1,9E-05

by

Table 3: Average season temperatures (^{o}C) for Air, F1, F2, F3, and F4; and ATD ($m^2 s^{-1}$) for F2 and F3.

Averages	Air	F1	F2	F3	F4	ATD_F2	ATD_F3
Fall _2008	-2,4	-1,1	-0,3	-0,1	0,1	1,4E-04	6,3E-05
Winter_2008	-3,5	-3,2	-2,7	-2,2	-1,6	1,0E-05	-3,4E-06
Spring_2008	-0,3	0,4	-0,4	-0,8	-0,8	1,3E-04	-8,8E-06
Summer_2009	1,6	2,6	1,6	0,4	0,1	3,5E-05	2,6E-07
Fall _2009	-2,5	-1,5	-0,5	-0,1	0,1	-1,9E-04	-1,3E-05
Winter _2009	-6,4	-5,0	-4,2	-3,5	-2,9	-9,3E-07	-4,0E-06
Spring _2009	-2,0	-1,7	-1,8	-2,0	-1,9	1,1E-05	1,1E-05
Summer _2010	0,4	1,4	0,5	-0,3	-0,3	2,3E-04	5,9E-06
Fall _2010	-2,2	-1,3	-0,6	-0,4	-0,2	1,5E-04	1,6E-05
Winter _2010	-4,1	-3,7	-3,3	-2,9	-2,5	8,4E-06	-1,0E-06
Spring _2010	-0,6	-0,4	-0,9	-1,3	-1,2	2,9E-05	2,9E-05
Summer _2011	1,6	2,2	1,3	0,2	0,0	2,9E-05	1,9E-06
Fall _2011	-4,3	-1,8	-0,6	-0,1	0,1	8,6E-05	2,9E-05
Winter _2011	-7,9	-5,7	-4,9	-4,2	-3,5	4,8E-08	-5,9E-06
Spring _2011	-1,2	-1,1	-1,6	-2,0	-2,0	6,3E-06	1,6E-05
Summer _2012	1,4	1,9	0,9	-0,2	-0,2	4,4E-05	5,0E-05
Fall _2012	-3,9	-1,7	-0,7	-0,4	-0,1	1,0E-06	1,1E-05
Winter _2012	-5,5	-4,3	-3,9	-3,6	-3,0	6,8E-06	7,3E-07
Spring _2012	-3,1	-2,1	-2,2	-2,5	-2,3	3,4E-05	1,2E-05
AVG	-2,2	-1,2	-1,1	-1,3	-1,1	4,2E-05	1,1E-05
Standard Deviation	2,8	2,5	1,9	1,5	1,3	8,3E-05	1,9E-05

Figures.

2.- Introduce the units (˚C) and increase text size in x and y axis. OK

4.- The unit at the y-axis (days) are not correct, are ˚C days, correct it. OK

5.- In the up figures appears the deep without units add (cm). In the b) figures add unit in the y-axis. OK

6.- Add unit in the y-axis (˚C). OK

7.- Add unit in the y-axis (˚C). OK

8.- Add unit in the y-axis. There is no unit in the y-axis, these are autocorrelation and partial autocorrelation, minimum -1 and max 1.

9.- Add unit in the y-axis. There is no unit in the y-axis, this is the standard layout for this kind of analysis.