General Comments:

Crichton et al. described a simplified permafrost model to study permafrost carbon feedbacks within the climate in longer timescales than centuries. It is indeed a valid field to study considering most of the recent permafrost models focused on 21st century. They have described the model briefly and successfully validated their approach with several datasets.
I agree on the approach that a simple and fast permafrost model is useful and needed to study long-time interactions with the climate, but the presentation of the paper could be much improved with a little more effort.

Specific Comments and Technical Corrections:

Most of the motivation comes from the technical difficulties related to the numerical modeling approaches. Although it is important to point this out, authors should make it clear that there are other statistical/empirical approaches for permafrost modeling.

In several places, authors mentioned permafrost coverage reduction equal to active layer thickening. However, a gridbox can have a reduced permafrost fraction but still have a shallow ALT. And conversely a gridcell can have higher permafrost fraction but still having large active layer and significant decomposition activities... This is not considered in the paper. Please mention this in your discussions.

p4935.l22   What do you mean by termination1?

p4937.l16   were -> where

            List all variables in equations.

p4937.   In Eq. 2, you also need soil temperature Tsoil. Since CLIMBER2
            doesn't simulate this, where did you take these values?

            Is there a difference between Tmat, Tmaat and Tsurf?

p4940.l6   Isolated region permafrost -> isolated permafrost region?

fig4   Needs improvement. I suggest showing different boxes for
            gridcells with changing permafrost coverage. Plot them clearly
            separate from each other to have a better view.
            And I don't understand figure 4c. What is the arrow for alt doing in
            the middle?
            Also in caption: MAT -> MAAT

fig5   What do you mean by PI values? You should specify the
            exact dates of simulation results from which these values are
            taken. Are these dates really comparable to Modis 2000-2005
            averages? If there are no other datasets to compare, please

	mention the possible errors arising from this. That could be a reason for the mismatch in Australia for example
fig6	Same goes for fig 6. Please indicate time range used in these plots. Also in caption "Fig. 4" should be Fig. 5
p4940.l19	Remove "is"
p4940.l23	Explain "LGM(eq)" or refer to where it is explained
	It is very important to see how different CLIMBER2 simulates the soil carbon input. It would be nice to add difference maps for fig 5 and fig 6. The grid sizes are different but a selected grid averaging can be performed to produce the difference values.
fig8	There is a problem with this figure. Where are the other parts of the map? Please put the whole map in order to compare the pf extent in Russia, Canada and Alaska.
fig9	In the caption: "are small" -> is small? In the caption: "land is less that 25%"-> less than ?
Table2	It should be Eq 5, not 6
p4943.l20	Model described in sect3.4? Please check.
fig10	What do permafrost fraction of land values above 1 and below 0 mean? Please show in values how well Climber matches Zhang et al. (2000) estimates of permafrost area.
p4945.l1-13	The paragraph can be shortened. There is the fast pool and the slow pool. When the soil carbon is transferred from slow to fast pool, it decays faster. There is not much need to mention more carbon in the fast pool.
p4945.l8	loose -> lose
fig11	Include units to CO_2 in the plot y axis
p4947.l3,4	Revise sentence.
p4947.l5	validtion -> validation
fig13	Please add (a) and (b) to plots.
p4949.l2	Please show other dynamic settings in the plot.
p4949.l6	Can you show the data for the N.Canada location?

fig14   modelled - > Modelled

p4949.l17   LGM should be 1480 and PI should be 2199, not the other way!

p4950.l3   I can't see the numbers 1339 and 1945 in Table 8. It's rather
             between 1620 and 2226 GtC!

             Also why does the "medium" scenario create more carbon than
             "slow" scenario?

p4950.l15   Do you have more explanation why you chose 40%? Is it the best
             estimate from other percentage choices for example? Then it
             would be good to mention in the text.

p4951.l21   fig4 -> fig5

fig15   Please describe "socc" also in the caption. Same goes for Fig16.

fig16   The underlying map is not visible in most parts. I can see Western
             Europe and USA but not the rest of the borders.

p4951.l19   I don't think Lena river is considered to be in western Siberia.

p4953.l13   World -> world

p4953.l14   Loess -> loess?

figA1   in caption: first "(b)" is unnecessary
figA2   you say "... temperatures at snow-depth or snow-ground
             interface...". What do you mean by temperature at snow depth?