Président du jury (R. Soucy La Roche)

Commentaires principaux

Maximum 350-400 words for a PhD thesis

L'INRS permet une flexibilité sur la taille des abstracts et d'ailleurs il y a de nombreux précédents pour des thèses de doctorat avec des abstracts allant jusqu'à 2 pages.

Writing guide: "The French abstract is a translation of the English abstract and is subject to the same conditions (e.g., length, keywords)."
This section corresponds to the French Synopsis, which is not a replacement of the French abstract.

Effectivement le guide des thèses de doctorat de l'INRS préconise une traduction de l'abstract anglais en français. Comme ce doctorat est entièrement en anglais, un résumé étendu en français est obligatoire. Il semble répétitif d'avoir un résumé deux pages plus un résumé étendu de 7 pages en français.

Commentaires : Introduction

Page 1: The introduction should set the stage for the thesis (current knowledge, knowledge gaps, objectives, etc.). this first paragraph jumps way too fast into the subject, which is odd considering that the next section is a general section on maar-diatreme volcanoes.

I prefer to introduce the research topic quickly. I then present a long section on maar-diatreme volcanoes because they are not widely known, even by volcanologists.

Commentaires sur le Chapitre 1

Fig. 1.1: An approximate scale on the diagram would be a nice addition, or at least mention in the caption the range of height and width of maar-diatreme volcanoes. Is there any vertical exaggeration on the diagram? is the cone always that narrow, or can it be very broad?

This diagram is a conceptual model representing both small and large maar-diatremes. A scale would be hard to add and I detail the size of the different parts of maar-diatremes in the following paragraphs.

Commentaires sur le Chapitre 2

Tables 1-3: I suggest to include a note explaining the facies codes:
b or n: bedded or non-bedded
(): grain size
L and/or T: lapilli and/or tuff

I didn't add explanations because this chapter is already published and because the full name of each code is provided in the adjacent column.

Page 46: Or that they were formed by the same process, but not necessarilly during the same event?

Yes, but I can't clarify this point because the paper is already published.

Page 52: It sounds like the zone below the unconformity should be better described as an upper diatreme section disturbed by subsequent volcanic activity?

This zone is an upper diatreme disturbed by subsequent debris jets (non-bedded deposits) but is it also the transition between a typical upper diatreme and a typical lower diatreme.

Page 62: I suppose this is sample RB-31? I suggest to include in a note in the caption explaining that it is not used for interpretations (some people will only look at the data quickly in the figure...)

> I understand that you propose to add it in the caption but this information is in the preceding paragraph.

Commentaires sur le Chapitre 3

Page 71: The whole point of the previous chapter was to demonstrate that the Round Butte exposes the transition zone, not the lower diatreme... the reference may not be appropriate here.

> Effectivement la conclusion principale de cet article porte sur la zone de transition mais une autre conclusion importante porte sur les mécanismes de formation du diatrème inférieur même s'il n'est pas directement observé à Round Butte.

Page 73-74: You may want to include a table of the distinctive features of each Formation/Member.
You could also include a list of non-distinctive lithologic units, if there are any, that could have been mis-classified or that you did not classify.
Maybe it's because I haven't visited the field area, but with the descriptions alone, I don't think I'd be able to confidently separate all the clasts in the appropriate Fm!
I'm sure such a Table would be useful to anyone working in that field area.

> This table will be added to the paper before submission, to highlight problems in the recognition of those sedimentary formations. The paper will then use pXRF data to separate the formations. But the table is not needed for the thesis.

Page 97: I suggest to expand on that, how does it relate to your work? at present the point of the paragraph is not clear.

> Expanding on this subject would be too speculative. The point of this paragraph is to discuss the model proposed by Lefebvre et al. (2013).

Commentaires sur le Chapitre 4

Page 111: Is this discussion interesting? Do you provide new information, propose new criteria, argue against some criteria, etc.? the last sentence of the conclude the abstract with a strong point, so some readers may be less encouraged to read any further.

> Yes, this discussion is important mainly because this is the first time that a review of those criteria in ultramafic to mafic maar-diatremes is made. Indeed, another strong point of Table 4.4 is to introduce those criteria in diatreme deposits and compare them with those of the ejecta ring. Twin Peaks is a perfect place to test those criteria in diatreme deposits.

Pages 120-121: First, line counts are not mentioned in Latutrie and Ross (2019) (chapter 2 of this thesis. They are used in Chapter 3 (unpublished mansucript).
Second, this statement is irrelevant. If someone has just read Chapter 3, than they know the difference. If they did not, then they don't even know what you are talking about.

> You are right this is a mistake introduced because in the first version of Latutrie and Ross (2019) the Chapter 2 and 3 were condensed. I wrote this sentence during the peer review of Latutrie and Ross (2019) and I forgot to delete it. But sadly, I can't remove it now!!

Page 126: what is the reasoning to separate this unit into to sub-unit instead of just unit 3 and 4? especially if you interpret them to have been formed by different processes.

> Because sub-unit 3a is very small and only found in North Peak. The other reason is because these sub-units (3a and 3b) are the only units rich in spatter at TP.

Page 131: Are the results the same as these two different scales?

They are both point count methods giving volumetric abundances, but one is looking at clasts larger than 4 mm and the other is looking at small clasts in thin section.

Page 134: odd that you use the previous observation (color of juvenile clast) for a genetic interpretation, and that this sentence left the reader hanging... what does it mean?

Yes, it is weird to finish this way but I can't make this change since the paper is already published.

Page 137: It sounds to me that this unit should have been separated as a distinct unit?

Not necessarily, because the main feature is the high concentration of spatter that are distinctive to proximal deposits of a lava fountain. The presence of fine matrix in Unit 3a is not enough to separate this unit in two.

Page 138: paragraph is partly a repetition of the previous paragraph, and partly contradictory, (e.g. stating that craters may have formed sequentially after having said that evidence suggest they did not). This needs to be clarified.

Its seems contradictory mainly because there are two hypotheses and no strong evidence favorable for one or the other.

Page 142: Do you mean that your observations at Twin Peaks are consistent with these criteria?

Yes

Page 145: Is it not a circular argument to use these criteria to classify your units, than use the characteristics of your units to confirm the criteria used to classify them?

No single criterion is strongly diagnostic on its own, but I show that the combination of criteria still works.

The discussion would have been a lot stronger if data from Twin Peaks was compared more clearly to these criteria (assuming that unit classification is done according to other criteria).

There is no strong mention of Twin Peaks deposits in the text mainly because the manuscript was already too long for journal requirements. The observed criteria at Twin Peaks are highlighted in Table 4.4.

Page 146: how did you came up to this conclusion?

After having described the 4 units in the field at TP, characteristics of the deposits and my interpretations of their origin were consistent with main criteria of the litterature.

<u>Commentaires sur le Chapitre 5</u>

Page 161: Would the change in chemical composition have any impact on the style of eruptive styles?

The slight change in Mg found between units 1-3 and 4 would not change the eruptive styles because the magma remains a basanite.