

Extreme North American heatwaves in 1941 and 2021 drove widespread but contrasting impacts

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This manuscript has been previously reviewed at another journal. This document only contains information relating to versions considered at Communications Earth & Environment.

This file contains all reviewer reports in order by version, followed by all author rebuttals in order by version.

Version 0:

Reviewer comments:

Reviewer #1

(Remarks to the Author)

I appreciate the considerable amount of effort that the authors dedicated to revising the manuscript. The comparison between the two heat waves is scientifically interesting, and I believe that it also is of popular interest. Below are comments on the substance and style that I hope will help strengthen the manuscript further.

Use of present tense throughout is confusing.

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line 30. Clarify that the magnitude of the heat wave was unlikely without anthropogenic climate change.

line 37. Here and elsewhere, no need to reiterate that the 2021 event was record-shattering. The many mentions become distracting.

line 40. Delete "surprisingly"

line 50. No need for a summary sentence here.

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line 62. Again this sentence seems to belabor the point.

Figure 1 is difficult to read. The table at top left is just that, not a figure, and should be included as a separate supporting element. The table at bottom left can be covered in the text. Then the actual figure on the right can be enlarged, and referenced in the results rather than the introduction.

line 85, 114, 143, 157, 192, and elsewhere. No need to state "We note" or "notably." By stating it, you are noting it.

line 123. This might suggest that the heat index was particularly high in eastern Canada and the eastern United States, and consequently that impacts to humans were exacerbated.

line 149, 267, 413-416. Do you mean e.g. rather than i.e.? Here and elsewhere, where you truly mean i.e., you often can delete the words preceding the i.e. and simply state what follows the i.e. The number of i.e.s, especially in the methods, becomes distracting.

line 225. No need to state that it's a map in print, although doing so might be useful in alt-text. The headlines are too small to read in the figure. I appreciate the inset to the left, but it is difficult to see the blue rectangle.

line 232. By anecdotes, do you mean newspaper articles? Why are these statements characterized as anecdotes, but not others?

line 242. What was the normal number of bushels per day, and the associated income? Context for these numbers would be quite helpful.

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line 435. “levels . . . were”

line 436. What do you mean by presumptively?

line 501, 559. Please remove prescriptive statements from the manuscript. Alternatively, clearly identify this statement as your opinion.

line 522. Differences in wind speeds also could contribute to the differences in wildfire size.

line 551. I think you mean “caused the death,” but this is the third time the number is mentioned. Additionally, context still is lacking. It seems possible that marine observation systems over 80 years also could contribute to the differences in reporting.

line 567. The same is true of newspaper coverage at any point in time.

line 574. Media coverage can use, or analysis of media coverage can use?

Reviewer #2

(Remarks to the Author)

This study assesses the documented impacts of the 1941 heatwave in Western North America. Through extraction of newspaper articles from 1941 the impacts of a heatwave similar to the one in June 2021 are investigated. The article is an enjoyable read, interesting, and clearly written, however, I am unsure Comms E&E is the correct journal.

Major comments –

1. The title and abstract suggest the paper will provide a comparison of 1941 and 2021, however the article focuses on reviewing impacts of the 1941 heatwave without any similar assessment of 2021 media reports. I do think this study is a useful and interesting contribution – but I feel the title and abstract overpromise. I would suggest the paper should refocus, with the 1941 event made central (as comes across in most of the paper already). As stated in the intro (line 102): ‘To our knowledge, there are no detailed assessments of the impacts of the 1941 heatwave.’ therefore this alone could be the focus.
2. Intro is missing any clear section on the need to understand past events – i.e. to help prepare for future events, more about ‘past as key to the future’ would be useful for scene-setting and motivating the study.
3. Discussion missing clear implications of the work.
4. Highlighting the limitations of the method further would be beneficial. There is a brief comment about the lack of impacts on indigenous people, but by using only newspaper articles as a source of impacts will severely limit the impacts captured. A discussion of possible other sources, e.g. proxy records of ecological metrics, word-of-mouth / generational memory, and others, would be useful. Similarly the meteorology of the 1941 event is only assessed through ERA5, incorporating other data sources or at least addressing that they exist (e.g. station data) would be beneficial.

Minor comments:

Line 333 – Sentence starts with a number, so should be spelt out.

Line 335 – Either define BC at first occurrence (maybe line 327) or spell out in full. You go back to spelling out in full later in the paper

Line 340 – I am not keen of the wording ‘fires drove news coverage’, consider rewording

Line 358 – errors in ref ordering

Line 388 – formatting (bold?)

Throughout – when locations are mentioned (e.g. Vancouver, Seattle, New Westminster) sometimes the state is included and sometimes not. This could be made more consistent.

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We respond to all editor and reviewer comments below. Line numbers refer to the revised manuscript (without tracked changes), and new text is emphasized as **bold blue**.

Comments from the Editor:

Your manuscript titled "Widespread impacts and insights contrasted between extreme North American heatwaves in 1941 and 2021" has now been seen by 2 reviewers. Please note that reviewer 1 is original reviewer 2 and reviewer 2 is new reviewer. Based on their comments, we are happy to invite a final revision of your work. You will find the reviewers' reports below.

We are glad to provide a final revision of our work. We address all reviewer comments below.

In particular, for publication in Communications Earth & Environment, we request that you: (1) refocus the title and Abstract on the 1941 event

We add clarifying text to both the abstract and the introduction. Please see our response to the first major comment of the second reviewer, in which the reviewer requests that we change the title to focus primarily on the 1941 event because we do not perform a similar analysis of media coverage of the 2021 event.

As we note in our response to their comment: 'In summary, we do not provide an assessment of 2021 media reports – as the reviewer suggests would be needed to maintain the manuscript's emphasis on comparing the two heatwaves – because such analysis has been done by others, and is furthermore not required in order to compare impacts between the two events. Instead, we do compare the impacts of the two heatwaves using multiple other data sources. Therefore we do not change the title of the manuscript.'

(2) expand the introduction, include a clear motivation

We expand the introduction with additional text related to our motivation. Please see our response to the second major comment of the second reviewer, in which we address this concern.

and (3) expand the discussion, including the implications of your work.

We expand the discussion, including the implications of our work. Please see our response to the third major comment of the second reviewer, in which we address this concern.

Reviewer #1 (Remarks to the Author):

I appreciate the considerable amount of effort that the authors dedicated to revising the manuscript. The comparison between the two heat waves is scientifically interesting, and I believe that it also is of popular interest. Below are comments on the substance and style that I hope will help strengthen the manuscript further.

We are pleased that the reviewer recognizes and appreciates the efforts taken during the prior round of revision. We agree that the comparison between the two heat waves is both scientifically interesting and of popular interest. We address all comments below.

Use of present tense throughout is confusing.

We review tense usage and update in some instances. We will defer to suggestions made in the copyediting stage.

line 13 and 69. “newspaper issues from publications” confused me. “357 issues of 25 newspapers” might be clearer.

We revise both instances to:

Line 12 and 72: “... 357 issues **of** 25 **news** publications ...”

line 25. A billion is a large number, but there is little context for whether that loss is biologically meaningful in the short term or long term.

We add additional context to clarify the significance of the marine invertebrate mortality:

Line 25: "... **killed** over a billion marine invertebrates **with mortality rates of some species in excess of 70% in some coastal areas...**"

line 30. Clarify that the magnitude of the heat wave was unlikely without anthropogenic climate change.

We clarify:

Line 30: "... **with a magnitude that** was virtually impossible without anthropogenic climate change"

line 37. Here and elsewhere, no need to reiterate that the 2021 event was record-shattering. The many mentions become distracting.

We reduce the number of mentions of the qualifier "record-shattering". However, we do not remove all reiterations because it is important to distinguish such record-shattering events from more typical heatwaves. The reason why it is important to compare the 1941 and 2021 events to one another – and not, for example, simply against other more typical hot events – is because they both stand out against other temperature maxima in the observed record (Malinina & Gillett, 2024). Prior reviewer comments encouraged us to more clearly differentiate between 'record-shattering' and 'run-of-the-mill' heatwaves.

line 40. Delete "surprisingly"

We delete "surprisingly".

line 50. No need for a summary sentence here.

We remove this sentence.

line 52. Already stated at line 38.

Yes. We reiterate this point because a key part of our work is translating how different heatwaves – defined by temperature, timing, and location – have different impacts when temperatures are different but time-of-year and location are similar.

line 62. Again this sentence seems to belabor the point.

We were encouraged to belabour this point in a prior review cycle.

Figure 1 is difficult to read. The table at top left is just that, not a figure, and should be included as a separate supporting element. The table at bottom left can be covered in the text. Then the actual figure on the right can be enlarged, and referenced in the results rather than the introduction.

We recognize that Figure 1 is unfortunately a bit blurry in the Word document / PDF. The resolution of Figure 1 is clearer in its high-resolution/vector form, submitted alongside the within-document version in this final iteration.

We appreciate the reviewer’s suggestion to reformat this figure as a table, text, and smaller figure. However, we choose to keep the figure as-is. In its current form, it offers a summary of the many sources of data, the qualitative coding of the articles, and the relationships between the articles’ themes and categories. We believe that figures like this are useful in qualitative textual analysis (see Figure 2 in Tetzlaff et al., 2024), especially when there are multiple data sources each with different time periods.

line 85, 114, 143, 157, 192, and elsewhere. No need to state “We note” or “notably.” By stating it, you are noting it.

Good point. We remove such instances.

line 123. This might suggest that the heat index was particularly high in eastern Canada and the eastern United States, and consequently that impacts to humans were exacerbated.

Yes, we agree. We bring up this point in the discussion.

line 149, 267, 413-416. Do you mean e.g. rather than i.e.? Here and elsewhere, where you truly mean i.e., you often can delete the words preceding the i.e. and simply state what follows the i.e. The number of i.e.s, especially in the methods, becomes distracting.

The reviewer is correct, and we change multiple instances of 'i.e.' to 'e.g.'. We also remove several instances of 'i.e.' in the text through line edits. There are now fewer usages of 'i.e.'.

line 225. No need to state that it's a map in print, although doing so might be useful in alt-text.

We make this change.

The headlines are too small to read in the figure. I appreciate the inset to the left, but it is difficult to see the blue rectangle.

We increase the transparency of the background topography and hillshade, and we increase the font size of the headlines. We also zoom in on the inset on the left to increase the size blue rectangle, so that it is a bit bigger in the figure while still indicating the continental context.

line 232. By anedcotes, do you mean newspaper articles? Why are these statements characterized as anecdotes, but not others?

By anecdotes, we meant newspaper articles about a person who discusses their own personal experience or story. For example, the articles here referred to a farmer who provided an estimate of crop damage (often qualitative), contrasting with other newspaper articles that offer quantitative, aggregate characterizations, sometimes from institutional sources (for example, government agencies that summarize regional crop losses). However, we recognize that our text is not clear and we edit:

Line 238: “**Articles** described acute damages...”

line 242. What was the normal number of bushels per day, and the associated income? Context for these numbers would be quite helpful.

We add:

Line 250: “**For context, the total Prairie wheat crop was 296 million bushels and the total farm value of all Alberta wheat was \$58.8 million in 1941 (see Methods).**”

Line 725: “**We also use values of production (bushels) and total farm value (dollars) of wheat (all) for Prairie provinces as a whole and Alberta separately as reported in Table 32-10-0359-01 (“Estimated areas, yield, production, average farm price and total farm value of principal field crops, in metric and imperial units”) for 1941.**”

line 281. Should be “data are”

We make this change.

Figure 6. It is difficult to see red circles on red squares.

We change the soil moisture colourmap so that negative anomalies are now brown instead of red.

line 297. Should be “responded most strongly”

We make this change.

Figure 7. I think fewer methods and less discussion could be included in the caption.

We move and edit some of the text from the caption and bring it into the main text.

Figure 8. Again difficult to read the headlines in the figure, and difficult to understand how the figures themselves provide context. The idea is nice but I think this figure can be eliminated.

The purpose of this figure is to offer spatial context to the basins discussed in the text (which ones are bigger, which are more glacierized, which locations are downstream from one another, etc). For that reason, we decide to keep it. We increase the transparency of the underlying topography, hillshade, glaciers, and water bodies, and we adjust the location of the headlines to enhance readability.

line 435. “levels . . . were”

We make this change.

line 436. What do you mean by presumptively?

In some cases, water consumption data were unofficial. For example: “The city probably consumed more water Wednesday than at any time in its history” (*The Saskatoon Star-Phoenix*, 17 July 1941, Page 3).

line 501, 559. Please remove prescriptive statements from the manuscript. Alternatively, clearly identify this statement as your opinion.

We revise:

Line 509: “**In light of these findings, we suggest that** cities like Vancouver, Seattle, and Portland should prepare for future wildfire emergencies...”

Line 575: “~~Future work should further investigate~~ **It is not currently known** if the physical mechanisms of heating during the 1941 heatwave were similar or different to those in 2021. ~~Future work should also explore~~ **The spatiotemporal correlation and process connections between drought that preceded the heatwave in some regions, and rain and storms that followed, are also not well understood.** Further, it is difficult to discern how and why extreme heat ~~was observed in Eastern North America, and future work should answer: why did the 1941 heatwave persisted~~ **ed** in Eastern North America **in 1941.**”

line 522. Differences in wind speeds also could contribute to the differences in wildfire size.

Wind speeds could have contributed to differences in wildfire size. However, we do not elaborate on this point, and keep our discussion of wildfire related to the cooler and wetter post-heatwave weather – because these were reported at the time as being helpful in aiding wildfire suppression – and positive trends in fire weather (of which wind speed is a parameter) in recent decades.

line 551. I think you mean “caused the death,” but this is the third time the number is mentioned.

We revise:

Line 559: “As a result, the 2021 heatwave caused **widespread mortality of marine invertebrates**, whereas in 1941, widespread marine mortality was not reported.”

Additionally, context still is lacking. It seems possible that marine observation systems over 80 years also could contribute to the differences in reporting.

It is true that there were different marine observation systems in 1941 relative to 2021. However, we note that the death of marine invertebrates in 2021 was observed by people at public beaches in populated areas who smelled the rotting intertidal ecosystems. Had these same intertidal ecosystems experienced widespread mortality in 1941, we suggest that it would likely have been reported, given the level of granularity reported on other heatwave-related impacts.

line 567. The same is true of newspaper coverage at any point in time.

Yes. However, we keep this sentence focused on 1941.

line 574. Media coverage can use, or analysis of media coverage can use?

Good catch. We revise:

Line 595: "Whereas **analysis of** media coverage of modern extreme climate events can use automated search features and computational processing on digital news articles..."

Reviewer #2 (Remarks to the Author):

This study assesses the documented impacts of the 1941 heatwave in Western North America. Through extraction of newspaper articles from 1941 the impacts of a heatwave similar to the one in June 2021 are investigated. The article is an enjoyable read, interesting, and clearly written, however, I am unsure Comms E&E is the correct journal.

We are glad the reviewer finds the article to be enjoyable, interesting, and clearly written. The scope of Comms E&E (as published on their website), is as follows:

“Our scope covers all areas of the geosciences, climate and environmental sciences as well as planetary sciences, including those at the interface with ecology, sustainability and environmental social sciences. Primary research of interest to the journal includes important insights gained from field work, novel analyses of existing data, numerical or analytical modelling, theoretical studies or laboratory experiments.”

Our study is directly within the scope of the journal. Our study is a clear example of climate and environmental sciences that interface with environmental social sciences, with insights gained from novel analyses of existing data.

Major comments –

1. The title and abstract suggest the paper will provide a comparison of 1941 and 2021, however the article focuses on reviewing impacts of the 1941 heatwave without any similar assessment of 2021 media reports. I do think this study is a useful and interesting contribution – but I feel the title and abstract overpromise. I would suggest the paper should refocus, with the 1941 event made central (as comes across in most of the paper already). As stated in the intro (line 102): ‘To our knowledge, there are no detailed assessments of the impacts of the 1941 heatwave.’ therefore this alone could be the focus.

We appreciate this comment and we are glad that the reviewer finds the paper to be both useful and interesting. However, we would like to make a clarification. One of our goals is to compare *impacts* between the 1941 and 2021 heatwaves – not necessarily to compare the *impacts of the heatwaves as reported in media*. Therefore, to achieve our goal, it is not necessarily required to assess media reports of the 2021 heatwave, as the reviewer suggests (and in fact, such studies already exist, like Tetzlaff et al., 2024). Instead, we need to compare the impacts themselves.

The impacts of the 2021 heatwave are already known and discussed within the literature, both through quantitative analyses (e.g. White et al., 2023) and qualitative analyses of media reporting (e.g. Tetzlaff et al., 2024). The impacts of the 1941 heatwave are not discussed within the literature. Therefore, to compare the impacts between the two events, we must first identify what the impacts of the 1941 were. We rely on media reporting in 1941 to achieve this first step.

Then, after identifying impacts in 1941 from the qualitative analysis of newspaper articles, we can compare them with 2021, where possible (see: Figures 3, 5, 7, and 9). Here we list comparisons we make in each section of the paper (note that some of this text is repeated from the response to the prior review cycle):

Meteorological Overview

We consider weekly anomalies of maximum temperature, precipitation, and upper level soil moisture from 1941 (Figure 2) and 2021 (Figure S2).

Human Health

We discuss both qualitative differences between mortality (i.e. deaths in 1941 occurred in both Western and Eastern North America, including deaths that occurred by drowning, whereas 2021 deaths occurred in Western North America, primarily due to high indoor temperatures). We also quantitatively compare drowning rates in British Columbia to identify how modes of mortality during 1941 and 2021 have changed.

Wildfire

We emphasize:

(1) differences between the locations of fires in 1941 and 2021, including the number and proximity of fires that surrounded a major population centre (Vancouver, BC) in 1941 but not 2021, and

(2) differences between sizes of individual fires, because differing reporting methods, the general sparsity of regional data from 1941, and the different firefighting contexts (i.e. relatively few firefighters during WWII due to military service) make it difficult to make comprehensive comparisons of total area burned by wildfires between the two heatwaves.

Agriculture

We compare agricultural yields and relative differences between 1941, 2021, and the decadal average yields for each time period.

Hydrology

We compare the streamflow responses in both 1941 and 2021.

Relation to Conflict

The 2021 heatwave did not have significant relation to conflict in a comparable way as in 1941 because Canada and the United States were not engaged in war during the summer of 2021. Nevertheless, we consider the heatwaves' relation to co-occurring crises more broadly, and we discuss the role of WWII in 1941 and the COVID-19 pandemic in 2021 as being one of the reasons why policy responses and outcomes differed.

Social Customs and Behaviours

We discuss the popularity of sleeping outdoors in public parks and beaches in 1941, but policy changes since that have aimed to limit those actions. As mentioned above, we also quantitatively compare drowning rates in British Columbia and link changes to the increased prevalence of swimming training over the 20th century.

Business and Industry, Infrastructure, & Consumptive Water Use

In each of these sections, it is difficult to provide direct comparisons. However, we compare with the findings of Tetzlaff et al (2024):

Line 479: “Analysis of media reporting of the 2021 heatwave provides a valuable point of comparison. Many reported themes and characteristics were similar between the two events, albeit with different local contexts and consequences (e.g. high municipal water demand; damage to physical infrastructure like roads and bridges; enhanced business activity in some sectors and reduced activity in others). However, some themes and characteristics were reported in 2021 but not 1941 (e.g. mass die-off of marine invertebrates), whereas others were reported in 1941 but not 2021 (e.g. links to global conflict via agriculture, forestry, and wildfire).”

In summary, we do not provide an assessment of 2021 media reports – as the reviewer suggests would be needed to maintain the manuscript’s emphasis on comparing the two heatwaves – because such analysis has been done by others, and is furthermore not required in order to compare impacts between the two events. Instead, we do compare the impacts of the two heatwaves using multiple other data sources. Therefore we do not change the title of the manuscript.

We do revise both the abstract and introduction to clarify these points:

Line 10: “The 2021 Western North American heatwave was among the most extreme heatwaves ever recorded. Recent work has identified one event of comparable magnitude and location in 1941. However, little is known about the impacts of the 1941 heatwave. We review 357 issues of 25 news publications from before, during, and after the 1941 heatwave, and we uncover widespread impacts including mortality, water shortages, crop damages, wildfires, flooding, and changes to social customs and behaviours. We **then provide a quantitative analysis of climate reanalysis, streamflow, sea level, crop yield, and mortality data to** compare with 2021. **Both qualitative and quantitative analyses** offer insights into how and why **select** impacts of the two heatwaves differed, including different continental-scale heatwave evolution and post-heatwave weather, policy responses that were related to co-occurring crises of World War II and the COVID-19 pandemic, and differing social norms, daily tidal cycles, technology, engineering, and infrastructure.”

Line 56: “**Many impacts from the 2021 heatwave are well known, including from analysis of media coverage of the event. However,** to our knowledge, there are no detailed assessments of the impacts of the 1941 heatwave. **Therefore, there are no analyses of how impacts were similar or different between 1941 and 2021.** This is a critical knowledge gap because the impacts of the 2021 heatwave were broad and

severe, but any individual record-shattering heatwave does not fully explore the range of possible impacts from record-shattering heatwaves more broadly.”

2. Intro is missing any clear section on the need to understand past events – i.e. to help prepare for future events, more about ‘past as key to the future’ would be useful for scene-setting and motivating the study.

We include a brief section on the need to understand past events to prepare for future events. This section was brief because of word count restrictions. We now expand:

Line 52: “**Understanding the impacts of past extreme events can help inform climate adaptation efforts at both national and local scales.** The 1941 heatwave was approximately 1.7°C cooler than the 2021 heatwave, but what does this mean in terms of impacts? When record-shattering heat occurs twice in the same region during similar times of the year but separated by several decades, how and why do its impacts differ? **Many impacts from the 2021 heatwave are well known, including from analysis of media coverage of the event. However,** to our knowledge, there are no detailed assessments of the impacts of the 1941 heatwave. **Therefore, there are no analyses of how impacts were similar or different between 1941 and 2021.** This is a critical knowledge gap because the impacts of the 2021 heatwave were broad and severe, but any individual record-shattering heatwave does not fully explore the range of possible impacts from record-shattering heatwaves more broadly. For example, the 2021 heatwave provided a single storyline through which to understand how **such** heatwaves impact a wide range of physical and social systems; the 1941 heatwave now provides another through which to compare. Adaptation and mitigation strategies for future heatwaves need to be made with as much context as possible about prior heatwave impacts, and so the 1941 event offers new and unique value as possibly the only known modern historical analogue to the 2021 heatwave.”

We also include new citations on this subject:

Cutter, S., B. Osman-Elasha, J. Campbell, S.-M. Cheong, S. McCormick, R. Pulwarty, S. Supratid, and G. Ziervogel, 2012: Managing the risks from climate extremes at the local level. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi,

M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)). A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 291-338.

Lal, P.N., T. Mitchell, P. Aldunce, H. Auld, R. Mechler, A. Miyan, L.E. Romano, and S. Zakaria, 2012: National systems for managing the risks from climate extremes and disasters. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)). A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 339-392.

3. Discussion missing clear implications of the work.

We revise and/or add several statements throughout the discussion to highlight the implications of the work:

Line 477: **“Such findings are valuable for policymakers to develop climate adaptation and preparedness efforts for future extreme heatwaves.”**

Line 509: **“In light of these findings, we suggest that cities like Vancouver, Seattle, and Portland should prepare for future wildfire emergencies such as the recent fires that extensively damaged Fort McMurray, Lytton, Jasper, and Los Angeles.”**

Line 570: **“These findings emphasize the importance of the social, cultural, historical, and climatological contexts in which heatwaves occur. Preparedness efforts can be strengthened when these contexts are considered as societies are confronted by heatwaves of increasing frequency, duration, and severity.”**

Line 573: **“We suggest avenues for future work to better understand the dynamics and thermodynamics of the 1941 heatwave specifically, with implications for continental-scale heatwaves in North America more broadly.”**

Line 581: **“Addressing these knowledge gaps could advance understanding as to how extreme North American heatwaves initiate, propagate, and terminate.”**

4. Highlighting the limitations of the method further would be beneficial. There is a brief comment about the lack of impacts on indigenous people, but by using only newspaper articles as a source of impacts will severely limit the impacts captured. A discussion of possible other sources, e.g. proxy records of ecological metrics, word-of-mouth / generational memory, and others, would be useful. Similarly the meteorology of the 1941 event is only assessed through ERA5, incorporating other data sources or at least addressing that they exist (e.g. station data) would be beneficial.

Please note that we also address the meteorology of the 1941 event via locally-observed weather as reported in newspapers (see Figure 2 and throughout the manuscript), not only through ERA5. We add the following:

Line 587: **“The impacts of the 1941 heatwave could be more comprehensively understood via investigation of additional documentary sources and oral histories, as well as through analysis of additional data sources such as weather stations and proxy records of ecological metrics.”**

Minor comments:

Line 333 – Sentence starts with a number, so should be spelt out.

We revise:

Line 207: “**On July 16**, 125 forest fires were reported after thunderstorms near Eugene, OR...”

Line 335 – Either define BC at first occurrence (maybe line 327) or spell out in full. You go back to spelling out in full later in the paper

We define BC at first occurrence (Line 94) and review the usage of ‘BC’ vs ‘British Columbia’ throughout. We use ‘BC’ when it follows a city or location within the province, and we use ‘British Columbia’ when referred to as a whole or on its own. We follow these conventions for other provinces and states as well. We leave it to the copy-editing stage to make final suggestions.

Line 340 – I am not keen of the wording ‘fires drove news coverage’, consider rewording

We rephrase:

Line 214: “**Newspapers reported about the** fires ~~drove news coverage~~ in every region studied (Alaska, Alberta, Saskatchewan, Manitoba, Ontario, and the US Midwest).”

Line 358 – errors in ref ordering

We fix this.

Line 388 – formatting (bold?)

We fix this.

Throughout – when locations are mentioned (e.g. Vancouver, Seattle, New Westminster) sometimes the state is included and sometimes not. This could be made more consistent.

We make changes throughout. We mention the province/state when it is the first mention of a location in a section of the paper.