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8 Editorial Office
9 Natural Hazards and Earth System Sciences

10 7th February 2018,

11 Dear Dr. Glade (Editor),

12

13 Please find below all responses and actions to the points raised by two reviewers for the manuscript
14 “Māori oral histories and the impact of tsunamis in Aotearoa-New Zealand”. In addition, as requested,
15 the ‘revised’ manuscript is provided showing all final marked changes. The authors are grateful for the
16 opportunity to improve this manuscript.

17

18 Response to Referee #1 - Michael Crozier.

19 (1) **Referee comment #1A:** “Given that this manuscript has been submitted to NHESS, one can assume
20 that the aim was to add to our understanding of a hazard, in this case tsunami. In New Zealand, where
21 the historic / written record is so short, the opportunity to extend the information base by exploring
22 orally transmitted stories of the pre-European Māori is certainly worth investigating. The authors thus
23 found an appropriate story that contained reference to three catastrophic waves (the story was
24 written-down by Grace (1907) from a conversation with Karepa te Whetu, who lived for some time in
25 the north of the South Island). They then asked members of two Iwi with residential history in the north

26 of the South Island, essentially ‘was it their story?!’ First, none had heard the story, nor could any
27 specific location of the three big waves be unequivocally determined. However, the original Māori
28 source used by Grace, Kerepa te Whetu, was known of by some of the respondents of one of the Iwi,
29 and they were also familiar with people’s names used in the story. After sifting through the
30 respondents’ comments and dealing with apparent contradictions by resorting to a number of
31 reasonable devices such as identifying miss-spellings, different concepts of what constitutes a place,
32 and changes of meaning (e.g. ‘sound’s and ‘arms of the sea’ could conceivably represent the rivers
33 referred to in the story) the authors considered that they had the general location of the story right. I
34 must say that using the presence Kahawai and sharks to point to the proposed location in the story was
35 stretching credibility, as they are abundant in many widespread parts of New Zealand; and I would have
36 expected critical comment on this aspect.”

37 (2) **Author's response #1A:** The referee provides a very thoughtful account of the logic of the
38 manuscript, and is correct in his assumption that the aim/thesis of the research is to add to scientific
39 and Māori narratives about tsunami hazard (and history) across the northern South Island of
40 Aotearoa-New Zealand. The secondary aim of the manuscript (identified later in his commentary) is to
41 demonstrate the need for closer attention by the geoscience community to epistemological, political
42 and methodological issues when exploring the benefits of differences in Māori knowledge (and by
43 inference Indigenous Knowledge) and science about tsunamis. The referee also helpfully points out
44 the need for a critical comment about the ubiquitous nature of kahawai and sharks around the A-NZ
45 coast. Notwithstanding our agreement about the added value that such a sentence would make, it is
46 important to make clear that the authors do not actually confirm the specific location of the story
47 based on the presence of kahawai and sharks. Rather we argue that the key elements in the story
48 (which includes close relationships with kahawai and sharks in areas where there were previously
49 large settlements) provide strong collective evidence for connecting the story to the Rangitoto
50 (D’Urville Island) area, not a specific place on the Island.

51 (3) **Author's changes in manuscript #1A:** The authors consider that editing the abstract to more clearly
52 reflect the principal objectives and outcomes of the work will address any uncertainty about the aims
53 of the research. In addition, a new sentence will be added to the relevant paragraph within '6.2 – Key
54 elements and story-telling devices' to provide a critical comment about the ubiquitous nature of
55 kahawai and sharks in A-NZ waters; including acknowledgment that such information alone is
56 insufficient to draw any critical conclusions about a proposed location for the story. Added to this, in
57 order to remove any remaining ambiguity an extra sentence will be added to the manuscript to
58 confirm that it is the collective evidence from multiple informants that connects the story to
59 Rangitoto (D'Urville Island).

60 All changes have been made. Please see the amended Abstract, section 6.2 and the Conclusion.

61 -----

62 (1) **Referee comment #1B:** "Convinced that they had the general area of NZ correct, if not the specific
63 locality of the big waves, it followed that they must be talking to the right Iwi. So therefore, what did
64 we learn about Tsunami from this story? If the three big waves in the story were in fact a reference to
65 a tsunami (rather than a literary device, or representation of some super natural force, or a physical
66 manifestation of an emotion such as revenge) what information did we gain from this form of
67 discourse analysis. The least we could hope for is some understanding of magnitude, date and
68 location of the assumed tsunami. The study could not convincingly provide this or indeed much else
69 about a proposed paleo-tsunami (thus I believe the first sentence of the abstract greatly overstates
70 what the study revealed about the ancestral experience with tsunamis)."

71 (2) **Author's response #1B:** The authors understand that this general comment reflects a desire for
72 new information from Māori Knowledge that would help shed light on tsunami magnitude, date and
73 location; however, framing such preferences as "the least we can hope for" underscores a preference
74 for certain kinds of data that sometimes simply are not part of, or important, within the 'knowledge'
75 complex that is Mātauranga Māori. Notwithstanding this lack of "data" and respecting the reviewer's

76 point about not overstating what the study can reveal about ancestral experience with pre-written
77 tsunamis on Rangitoto (D'Urville Island), we consider that the presentation of the collective narrative
78 in this work provides layers of place-based experience that relate in the words of the 'home-people'
79 at least one, if not multiple, encounters with pre-written tsunami on Rangitoto (D'Urville Island). Such
80 a confirmation is a step towards not only plural knowledge co-existence but also plural knowledge
81 development.

82 (3) **Author's changes in manuscript #1B:** The opening sentence of the abstract will be modified to
83 reflect experience with at least one pre-written tsunami event on Rangitoto (D'Urville Island).

84 All changes have been made. Please see the amended Abstract.

85 -----

86 (1) **Referee comment #1C:** "So is the study worth recounting? The answer is yes, for the following
87 reasons. This paper is not really about hazards and Tsunami. Rather, it is about a methodology for
88 cross-cultural, cross-temporal investigation. It is about exploring and relating two different
89 approaches to understanding the world in both the human and natural settings. In this sense it makes
90 an excellent well-written contribution to our pursuit of knowledge. The study presented here shows a
91 very sensitive and thorough approach to investigating a record that is different from the ones
92 normally resorted to by modern western science. It outlines the pitfalls of working without an
93 understanding of epistemology. On the whole, the claims and 'confirmations' are treated with
94 adequate caveats and the authors are acutely aware of the mistakes that can be made by not fully
95 understanding the purpose and power of the narrative and the disposition of the narrator. This paper
96 will provide useful guidance to future investigators of pre-European oral histories irrespective of
97 whether credibility can be ascribed to this story as account of a Tsunami."

98 (2) **Author's response #1C:** The authors are grateful for the reviewer's close examination and
99 endorsement of the methodological benefits of this research work. They have forced us to check our
100 own assumptions about providing sufficient detail. Notwithstanding this, as explained above the

101 aim/thesis of the research is to also add to scientific and Māori narratives about tsunami hazard (and
102 history) across the northern South Island of Aotearoa-New Zealand. The authors thereby consider
103 that editing the abstract to more clearly reflect these dual objectives and outcomes will address any
104 potential uncertainty by future readers about the aims of the research.

105 (3) **Author's changes in manuscript #1C:** The authors consider that editing the abstract and the
106 conclusions to more clearly reflect principal objectives and outcomes of the work will address any
107 uncertainty about the aims of the research (this includes signaling planned work ahead to search for
108 any remaining physical evidence of tsunami inundations on Rangitoto (D'Urville Island)).

109 All changes have been made. Please see the amended Abstract.

110 -----

111 (1) **Referee comment #1D:** “Whether the paper would have more impact and value in a journal
112 devoted to the philosophy of science; or indeed cultural studies or social anthropology is a question
113 for the editor.”

114 (2) **Author's response #1D:** This work is pitched at the natural hazards and earth system sciences
115 research community and highlights not only the value and benefits of epistemological and empirical
116 differences in knowledge about tsunamis, but also the increasing requirement for a broader set of
117 skills among the geosciences. To place this work elsewhere would limit its impact across the
118 Geosciences.

119 (3) **Author's changes in manuscript #1D:** No changes are required to the manuscript.

120 Not applicable.

121 -----

122 (1) **Referee comment #1E:** “Incidentally, there does not appear to be any reference to recurring
123 impact of tsunamis in the study – therefore the title should be modified. Perhaps the methodological
124 value of this paper could also be reflected in the title.”

125 (2) **Author's response #1E:** The use of the word 'recurring' in the manuscript title is a general
126 acknowledgement that there are multiple Māori oral histories from across A-NZ that record ancestral
127 experiences with pre-written tsunami impacts (e.g. King and Goff, 2010 – NHESS). Notwithstanding
128 this, if this confuses potential readers we agree that it should be removed from the manuscript title.
129 With respect to incorporating a message about the methodological value of the paper in the
130 manuscript title, the authors maintain that promoting plural knowledge learning and development
131 about tsunamis from respectful and humble encounters between different knowledge paradigms is of
132 paramount importance.

133 (3) **Author's changes in manuscript #1E:** The word 'recurring' will be removed from the manuscript
134 title.

135 All changes have been made.

136 -----

137 (1) **Referee comment #1F:** "Note: suggest reformulating the abstract to reflect better the aim,
138 method, findings and principal contribution made by your study (see comment in papa 2 above)."

139 (2) **Author's response #1F:** The authors acknowledge the reviewer's helpful suggestion here and agree
140 that further work on the Abstract would help to give greater account of the principle objectives,
141 methods, and findings of this research.

142 (3) **Author's changes in manuscript #1F:** Modifications will be made to the Abstract.

143 All changes have been made. Please see the amended Abstract.

144 -----

145 Response to Referee #2 - Walter Dudley.

146 (1) **Referee comment #2A:** "This is extremely important work. Indigenous populations have had their
147 own experiences with natural hazards and many have developed techniques for coping in traditional
148 ways. Western science can learn a great deal from indigenous knowledge, furthermore combining the

149 two helps emergency managers more effectively educate local populations about the best way to
150 prepare, respond, and cope with natural hazards, thus bridging the gap between western science and
151 indigenous knowledge and thereby creating a more effect synergistic relationship.”

152 (2) **Author's response #2A:** We are grateful for the reviewer’s endorsement of this research work.

153 (3) **Author's changes in manuscript #2A:** No changes are required to the manuscript.

154 **Not applicable.**

155 -----

156 In summary, on behalf of the contributing authors, I would again like to thank Natural Hazards and Earth
157 System Sciences for the opportunity to improve this manuscript. I would also like to acknowledge the
158 very thorough and constructive comments provided by the reviewers.

159

160 Yours faithfully,

161

162 Darren Ngaru King

163 Māori oral histories and the recurring impact of tsunamis in Aotearoa-New
164 Zealand

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166

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178

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181

182 Manuscript = 8,560-565 words

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184

185 Key words: Tsunami, Palaeotsunami, Oral history, Māori, Aotearoa, New Zealand

186

187 **ABSTRACT**

188 Māori oral histories from the northern South Island of Aotearoa-New Zealand provide details of
189 ancestral experience with tsunami(s) ~~on, and surrounding, Rangitoto (D'Urville Island). Applying an~~
190 ~~inductive-based methodology informed by 'collaborative storytelling', exchanges~~ Exchanges with key
191 informants from the Māori kin groups of Ngāti Koata and Ngāti Kuia, reveal that a 'folk tale' ~~recording'~~
192 ~~titled 'The Rival Wizards', published in 1907, could be these histories, compared to and combined~~
193 ~~with active oral histories to recorded in a narrative form, provide are not merely~~ insights into another
194 ~~source of information about~~ past catastrophic saltwater inundations. ~~S-but, rather, uch histories~~
195 reference multiple layers of experience and meaning, from memorials to ancestral figures and their
196 accomplishments, to claims about place, authority and knowledge. Members of Ngāti Koata and Ngāti
197 Kuia, who permitted us to record some of their histories, share the view that there are multiple
198 benefits to be gained by learning from differences in knowledge, practice and belief. ~~Notwithstanding~~
199 ~~these confirmations, However, while~~ This work adds to scientific as well as Māori
200 ~~understandings~~ narratives about tsunami hazards (and histories). ~~It~~ it also demonstrates that to
201 engage ~~as insider-outsiders~~ with Māori oral histories (and the people who genealogically link to such
202 stories) requires close attention to a politics of representation, in both past recordings and current
203 ways of retelling, as well as sensitivities to the production of 'new' and 'plural' knowledge ~~s-itself.~~ This
204 paper demonstrates an in and Individuals and families from Ngāti Koata and Ngāti Kuia permitted us
205 to record some of *their* histories. They share the view that there are multiple benefits to be gained by
206 ~~learning from differences in knowledge, practice and belief.~~ This paper makes these narratives are
207 now available to a new audience, ~~(including those families who no longer have access~~ to them, as
208 well as the broader scientific community). ~~This~~ and recites these in ways that might encourage plural
209 knowledge development, and co-existence. ~~those more intimately connected to know and transmit~~
210 such these histories differently.

211

212 **WHAKARĀPOPOTOTANGA**

213 Ko ngā kōrero tuku Māori o Te Taihū o te Waka a Māui e whakaahua nei i tā ngā tūpuna rongō i te
214 aituā nui o te parawhenua waitai. Nā runga i ētahi whakawhitinga kōrero ki ētahi māngai matua o
215 Ngāti Koata me Ngāti Kuia, i mārama ai ko ēnei kōrero tuku, he mea mau ā-pakiwaitara nei, ehara noa
216 i te puna kōrero mō te tai āniwhaniwha o nehe, engari kē, he mea whai tikanga maha, mai i te
217 whakamaumahara i ētahi tūpuna o nehe me ngā mahi i oti i a rātou, tae atu ki ngā kōrero mō te rohe,
218 mō te mana, mō te mātauranga anō. Hāunga ēnei whakaūnga, e whai kiko ai te whai wāhi atu hei
219 'rāwaho whai hononga' ki ngā kōrero tuku Māori (me te hau kāinga e hono ā whakapapa ana ki ngā
220 kōrero), me aro pū ki te taha tōrangapū o te tū hei māngai mō iwi kē, ā, me ngā kaupapa mana nui me
221 mātua whakaaro i te whakaritenga o te mātauranga 'hōu', o te mātauranga 'mātāpuna-tini' anō. I
222 whakaae mai ētahi māngai takitahi me ētahi whānau anō o Ngāti Koata me Ngāti Kuia kia hopukina
223 ētahi o ā rātou kōrero tuku. E whakaae ana rātou he hua nui ka puta i te whai māramatanga ki ngā
224 rerekētanga ā mātauranga, ā tikanga, ā whakapono anō. Ko tā ngā kōrero i tēnei tuhinga he
225 whakawātea i ngā pakiwaitara tuku nei ki tētahi whakaminenga hōu (tae atu ki ngā whānau kāore i
226 whai wāhi ki ngā kōrero nei i mua), ā, ko te āhua e takoto nei ēnei kōrero hei akiaki pea i ērā e whai
227 hononga ana kia mātau ka tahi, ka rua, kia tuku hoki i ngā kōrero mā ara kē atu anō. Ko ngā kōrero
228 tuku ā-waha Māori o Te Taihū o te Waka a Māui e whakaahua nei i ngā wheako o ngā tūpuna ki
229 te/ngā tai āniwhaniwha ki runga i te motu o Rangitoto (D'Urville Island), ki tōna takiwā anō hoki. Mā
230 te whai i tētahi pūnaha, ko tōna tūāpapa ko ngā tirohanga ki te hāpori, ā, he mea tohutohu hoki e 'te
231 tuku kōrero ā-kāhui', i mārama ai i ētahi whakawhitinga kōrero ki ētahi māngai matua o ngā iwi Māori
232 o Ngāti Koata me Ngāti Kuia, tērā tētahi 'pūrākau' i tāngia i te tau 1907, ka taea tōna whakataurite me
233 tōna whakakotahi atu ki ētahi kōrero tuku ā-waha e ora tonu nei, kia whai tirohanga ai ki ētahi aituā
234 parawhenua waitai nui o nehe. Ko ēnei momo kōrero tuku he whai wheako maha, he whai tikanga
235 maha anō hoki, mai i te whakamaumahara i ētahi tūpuna o nehe me ngā mahi i oti i a rātou, tae atu ki
236 ngā kōrero mō te rohe, mō te mana, mō te mātauranga anō. Ko tā ngā mema o Ngāti Koata me Ngāti
237 Kuia i tuku kia hopukina ētahi o ā rātou kōrero tuku e whakaae nei, he hua nui ka puta i te whai
238 māramatanga ki ngā rerekētanga ā-mātauranga, ā-tikanga, ā-whakapono anō. Ka whakawhānui tēnei

239 mahi i ngā māramatanga ā-pūtaiao, otirā, i ngā māramatanga o te Māori ki ngā pūmate o te tai
240 āniwhaniwha (me ngā kōrero tuku anō). He mea whakatauirā anō e tēnei, e whai kiko ai te whai wāhi
241 atu ki ngā kōrero tuku ā-waha Māori (me te iwi e hono ā-whakapapa ana ki ngā kōrero), me aro pū ki
242 te taha tōrangapū o te tū hei māngai mō tangata kē, ki ngā hopukanga kōrero o mua, ki ngā ara tuku
243 kōrero anō o nāianei, ā, me aro pū hoki ki ngā kaupapa mana nui me mātua whakaaro i te
244 whakaritenga o te mātauranga 'hou', o te mātauranga 'mātāpuna-tini' anō hoki. Ko tā tēnei tuhinga he
245 whakawātea i ngā pakiwaitara tuku nei ki tētahi whakaminenga hou, tae atu ki ngā whānau kāore i
246 whai wāhi ki ngā kōrero nei i mua, ā, ko te āhua e tukuna ai ēnei kōrero hei akiaki pea i te
247 whakawhanaketanga o te mātauranga mātāpuna-tini me te tū motuhake anō o ia o ēnei momo
248 mātauranga.
249

250 1. INTRODUCTION

251 "What is all this? " he asked. "These are the fish I have caught," replied Titipa. "This is the
252 result of my power as a *tōhunga* [priest; expert in traditional lore; person skilled in
253 specific activity; healer]." "But didn't I tell you I should expect the pick of the catch?" cried
254 Te Pou. "If you want fish, catch them yourself," retorted Titipa. "You don't get the pick of
255 my haul." "Indeed," said Te Pou, and he walked along the beach and inspected the fish
256 that were drying in the sun. "We shall see whose catch this is presently." Walking to the
257 water's edge and stretching out his arms towards the sea, he repeated mighty spells
258 before the people. Everyone wondered what would happen, but it was not long before Te
259 Pou came running up the beach. "Get back!" he cried. "Get back to the high ground, or
260 you will be drowned," and running past his people he climbed the high cliff, where he
261 took his stand, and repeated more spells. The people, thoroughly terrified, followed
262 helter-skelter, and left Titipa alone upon the beach. Soon the sea grew dark and troubled
263 and angry, and presently a great wave, which gathered strength as it came, swept
264 towards the shore. It advanced over the sandy beach, sweeping Titipa and all his fish
265 before it, till with the noise of thunder it struck the cliff on which the people stood. "That
266 is one," said Te Pou. "That is for the first fish. There will be two more." The great wave
267 receded, sucking with it innumerable boulders and the helpless, struggling Titipa. Then
268 another wave, greater than the previous one, came with tremendous force and,
269 sweeping the shore, struck the cliff with a thunderous roar. This was followed by a third
270 which, when it receded, left the beach scoured and bare. Titipa and all his fish had
271 disappeared. "I have finished," said Te Pou. "That is all. There will be no more trouble..."

272 [The Rival Wizards: Grace, 1907a]

273 In 1907, Alfred Grace (1867-1942) published a series of Māori “folk stories”, imparted by the Ngāti
274 Koata¹ elder Karepa Te Whetu. Within the extensive narrative of one of these stories, ‘The Rival
275 Wizards’ the “wizard-chief”, Te Pou, summoned three great waves to exact retribution upon the rival
276 Titipa for openly defying his instructions. Descriptive details of the impact of great waves striking and
277 scouring the beach were narrated, including many contextual details about the relationships and
278 connections between people, place and the metaphysical world. The reciting of this narrative in print,
279 however, did not occur again until King et al. (2007) and McFadgen (2007) cited the story, among
280 other traditional stories, and made a case for the scientific value of Māori oral histories in
281 understanding catastrophic saltwater inundations or tsunamis in pre-colonial Aotearoa-New Zealand
282 (A-NZ). King and Goff (2010) surmised that the descriptive nature of the language in the story
283 resembled those of modern-day tsunami survivors and argued that it might represent an historical
284 narrative recording direct experience with one (or multiple) tsunami inundations, prior to the arrival
285 of the first Europeans to A-NZ in the late eighteenth century. However, they also acknowledged that
286 the interpretation of Māori stories by ‘outsiders’ is fraught with the potential for misrepresentation
287 and concluded the need to engage with Māori who share ancestral and kinship linkages with specific
288 oral histories to tell our/their own stories.

¹ Ngāti Koata is one of several Māori kin-groups [*iwi*] who hold territorial rights, power and authority associated with possession and occupation of *iwi*-land over the northern South Island (Mitchell and Mitchell, 2004). They date their occupation in the area from the late 1800's, and recognise the successive movements of earlier peoples migrating to and through the area. Details surrounding occupational patterns are provided in: Keyes (1960), Mitchell and Mitchell (2004).

289 This study builds upon these collective contributions by working alongside key informants from the
290 Māori kin groups of Ngāti Koata and Ngāti Kuia² from the northern coast of the South Island of A-NZ
291 (Figure 1). These informants share linkages not only with Karepa Te Whetu but also the places and
292 ancestral figures named in the ‘The Rival Wizards’ story. The paper begins by providing an overview of
293 past work in the geosciences to have benefitted from the insights provided by indigenous oral
294 histories. This necessarily includes a brief review of complementary lessons in political,
295 epistemological and methodological theory. The research framing for this work and the methods of
296 analysis are next outlined, before providing detailed accounts of the key elements of the story
297 supported by examples of contemporary dialogue, ~~discussion and conversation~~. Finally, consideration
298 is given to the lessons, challenges and opportunities that can come from bringing the knowledge-
299 practice-belief complex of Māori Knowledge [Mātauranga Māori] together with the earth system
300 sciences.

301 2. INDIGENOUS ORAL HISTORIES AND TSUNAMIS

302 Consideration of Indigenous oral histories as tsunami narratives is not new. Vitaliano (1973) discussed
303 the scientific benefits to be gained by considering “myths and legends” as transmission devices for
304 knowledge about (and experience with) tsunamis, among other geologic phenomena. Her work
305 detailed examples of coastal deluge attributed to tsunamis (and their likely sources) from classical
306 Greek history through to more recent times from the Pacific coasts of the Americas to islands across
307 the Pacific Ocean. Accordingly, Vitaliano (1973) argued that such insights provide invaluable
308 information about extreme environmental disturbances in the pre-written past. A series of scientific
309 contributions have since emerged from the Pacific Northwest coast of North America detailing ‘Indian
310 myths’ and the transmission of knowledge about great sea level disturbances (Heaton and Snaveley,

² Ngāti Kuia is one of several Māori kin-groups (*iwi*) who hold territorial rights, power and authority associated with possession and occupation of *iwi*-land over the northern South Island. They are often referred to as one of the ancestral *iwi* of the region (Mitchell and Mitchell, 2004).

311 1985; Clague, 1995; Hutchinson and McMillan, 1997; McMillan and Hutchinson, 2002; Ludwin et al.,
312 2005; Ludwin and Smits, 2007; Thrush and Ludwin, 2007; Vitaliano, 2007).

313 Heaton and Snavely (1985) and Clague (1995) concluded that many details within indigenous oral
314 histories are consistent with tsunami inundation processes (e.g. the sudden receding of coastal
315 waters). Recognising this experience with earthquakes and tsunamis along the northern Washington
316 and southern British Columbia coasts McMillan and Hutchinson (2002) argued that oral histories can
317 provide independent sources of information which can complement geological and archaeological
318 knowledge about the role of infrequent yet catastrophic events in landscape evolution and social-
319 cultural transformation. They also made explicit that such histories may have other independent
320 meanings. Advancing this scholarship, Ludwin et al. (2005) considered 40 stories from 32 independent
321 sources about coastal earthquakes and marine flooding; and with help from Japanese historical
322 records determined that the most recent large-scale event captured in multiple stories along the
323 Cascadia coast occurred on 26 January 1700. Importantly, Thrush and Ludwin (2007) recognised that,
324 Native American and First Nations oral histories not only include rich and explicit accounts of seismic
325 events, but also that scientific inquiry is grounded in the historical relationships between indigenous
326 and settler societies, and that this has resulted in the privileging and production of certain kinds of
327 knowledge about the region's seismic past. Likely informed by transformative and decolonising
328 research theories, this corollary point raised important questions about geology's relationship with
329 colonialism, intellectual and cultural property, as well as the complex and fractious relationships
330 between researchers and the researched. Thrush and Ludwin (2007) highlighted the tremendous
331 potential for benefitting from differences in knowledge, practice and belief about some of the largest
332 seismic events known to human-kind.

333 Considerable scholarship has outlined the scientific value of indigenous expertise and information
334 about tsunamis referenced in oral histories from the Pacific Islands (Nunn, 2001; Lum-Ho and Lum-
335 Ho, 2005; Nunn and Pastorizo, 2007; Goff et al., 2008; Stewart, 2009; Goff et al., 2011; Johnston and
336 Dudley, 2009) and in A-NZ (Goff et al., 2003; King et al., 2007; McFadgen, 2007; McFadgen and Goff,

337 2007; King et al., 2010; Pearce and Pearce, 2010; Goff et al., 2012; Goff and Chagué-Goff, 2015; King,
338 2015; King et al., 2017). Further, there are likely to be contributions from other non-English science
339 communities about the potential value of indigenous histories enriching the geo-archaeological
340 sciences, but such references were not identified in the sweep of English language scholarship
341 conducted here. Notable contributions from the Pacific include Nunn (2001), who identified
342 ethnographic narratives of probable experiences with tsunami inundation, including a story from
343 Pukapuka Atoll in the northern Cook Islands where time is divided into before and after a huge wave
344 swept over the island. Nunn and Pastorizo (2007) also identified that Pacific Islander ‘myths’ might
345 inform the chronology and social impacts of such hazards. Similarly, Hawaiian scholars are also re-
346 examining their own oral histories that relate an extended history of exposure to tectonic and
347 geologic hazards – including tsunamis (Lum-Ho and Lum-Ho, 2005; Stewart, 2009). This work is as
348 much about adding to the scientific pool of scholarship surrounding Hawaii’s tsunami risk-scape as it
349 is about cultural revitalisation and connecting with the ancestors.

350 Meanwhile in A-NZ, Goff et al. (2003) emphasised the limited time frame of the historical record for
351 understanding tsunami risk in A-NZ and thereby pointed to the Māori oral record as a potentially rich
352 source of information about tsunamis occurring prior to European arrival. Succeeding this work, there
353 have been varying attempts to link geo-archaeological evidence and modelling output with historical
354 events inferred from Māori tsunami narratives (Walters et al., 2006; McFadgen and Goff, 2007; King
355 and Goff, 2010). King et al. (2007) argued that Mātauranga Māori is a neglected area of expertise in
356 scientific assessment and declared that greater Māori involvement is required in natural hazards
357 science to make the most of all the knowledge and skills that Māori possess. After this, King and Goff
358 (2010) mapped selected Māori oral histories that potentially related experience with tsunamis around
359 the A-NZ coast. These narratives were compared with contemporary scientific data and the
360 implications of this ‘new’ information for tsunami science were considered. Importantly, this work
361 signalled the need for new research approaches that openly and respectfully engage with Māori who
362 hold ancestral and kinship linkages to oral histories to tell our/their own stories. Such perspectives

363 have the potential to amend (and perhaps replace) accepted scientific views about pre-colonial
364 written tsunami disturbance and risk in A-NZ.

365 3. DEVELOPMENTS IN POLITICAL, EPISTEMOLOGICAL AND METHODOLOGICAL THEORY

366 Developments in political, epistemological and methodological theory from a range of disciplines are
367 relevant to research that explores the potential of indigenous narratives to inform about
368 environmental histories and extreme disturbances such as tsunamis. A key debate relates to how
369 knowledge is constructed and legitimised, including whether a meaningful transfer of knowledge
370 between different knowledge histories can occur (or alternatively do harm) when removed from its
371 cultural context. As Mikaere (1995) argued, the outcomes of early 'research on' Māori (or rather the
372 inaccurate recordings and imaginary portrayals of narratives) rendered oral histories as “fantasy” and
373 resulted in “epistemological disarray”. Bishop and Glynn (1999) contend that this reflected the
374 inadequacy of non-Māori to understand and accept the nature of Mātauranga Māori. Whatever the
375 case may be an ongoing challenge is to understand that narratives embedded within indigenous
376 knowledge systems provide more than alternative sources of information or even alternative
377 perspectives (Binney, 1987; Smith, 1999; Mead, 2003). Rather they have their own purposes, which
378 may include devices that help to establish meaning for discrete and repeated events through time
379 (Masse et al., 2007).

380 According to Cruickshank (1994), debates or understandings about knowledge construction are as
381 much about “epistemology” as they are about “authorship”. She explains that for many Indigenous
382 peoples there is a reluctance to analyse and publicly explain the meanings of oral histories as this
383 takes away from the value and different messages that come from listening to repeated tellings from
384 family and extended kin, in place. This contrasts with a scholarly approach which encourages the
385 scrutiny of texts, and contends that by openly addressing conflicting interpretations, meanings can be
386 determined to enrich understanding. Many Indigenous commentators are thereby challenging
387 researchers within the academy of science to reframe how they construct and use knowledge. This
388 includes the treatment of Indigenous experience and knowledge as archaic and unchanging which

389 can, without consequence, be used by science to produce “authoritative” and “universal” insights
390 (Howitt and Suchet-Pearson, 2003; Shaw et al. 2006; Coombes et al. 2010). In response, Johnson et al.
391 (2016: 3) argue “scientists have to learn to see our own privilege, our own context, our own deep
392 colonizing. We have to learn to think anew - to think in ways that take seriously and actually respond
393 to information, understanding and knowledges as if difference confronts us with the possibility of
394 thinking differently”.

395 The production of knowledge is deeply entwined with power relationships and who holds control and
396 authority over knowledge and its applications (Stephenson and Moller, 2009). This challenge is based
397 on the premise that power underpins the place of science in contemporary society, and that the
398 narrators of science (and history) ultimately hold power, whether knowingly or not (Johnson et al,
399 2016). Indigenous commentators (and others) have discussed legacies of extractive research practice,
400 whereby non-Indigenous researchers have treated the holders of Indigenous knowledge as if they
401 have no moral or legal rights to decide how it will be represented or used within the wider world.
402 Such practices have often resulted in leaving those studied disenfranchised from the knowledge they
403 have shared (Kovach, 2009). Indigenous scholars have thereby mounted a critique of the way history
404 has been told from the perspective of the colonisers – and this has resulted in debates over who gets
405 to frame and legitimise knowledge, whose voices are prominent in these discussions, and for whom
406 the writing is being done (Smith, 1999). A number of scholars have also challenged the notion of
407 including 'voices' in projects that aim to speak (or write) on behalf of 'others' (Howett and Suchet-
408 Pearson, 2003). For example, Coombes et al. (2014, 849) argue that “research that took the once-
409 radical step of ‘giving voice’ now patronizes and silences those whose voice is quite capable of self-
410 expression”. While we recognise as researchers and authors the contradiction in the work completed
411 here, we acknowledge at the same time the collaborative basis of the research and the contribution
412 such grounded histories provide to scholarship.

413 In response to these histories and ethical challenges, all of which are taking place against a broader
414 background of indigenous self-determination and cultural affirmation, there is increasing recognition

415 of 'decolonising' and 'counter-colonial' research methodologies that seek to reframe and transform
416 the way research and knowledge is produced (Smith, 1999; Mead, 2003; Kovach, 2007). Key elements
417 of this discourse (although not limited to) include (i) valuing not only specific forms of Indigenous
418 knowledge but also the values underpinning such systems, (ii) recognising the authority of Indigenous
419 peoples to determine the rules for producing new knowledge, (iii) safeguarding the authenticity of
420 indigenous narratives, (iv) supporting research that enriches everyone who is connected with the
421 research project, and (v) promoting the benefits that come from learning from different ways of being
422 and knowing. Howitt and Suchet-Pearson (2003: 559) remind us also that "choosing whom to include
423 and how to include them, the choices other people have made in representing themselves to the
424 author and other authors, the ways the readers interpret the words and the ulterior motive for the
425 usage of the 'voices', all involve relationships of power".

426 **4. RESEARCH FRAMING**

427 **4.1 Methodological approaches**

428 This research applies an inductive-based methodological approach informed by 'collaborative
429 storytelling' to consider the meaning and memorials presented in the 'Rival Wizards' narrative. The
430 methodology does not fit neatly into any category, but draws on decolonising research approaches
431 (Smith, 1999; Kovach, 2009) and grounded theoretical principles (Glaser and Strauss, 1967; Pidgeon,
432 1996), while simultaneously seeking plural spaces of learning (Howitt and Suchet-Pearson, 2003;
433 Zanotti and Palomino-Schalsha, 2006; Johnson et al., 2016). This theoretical framing was underpinned
434 by Kaupapa Māori research principles (Smith, 1990; Te Awekotuku, 1991; Smith, 1999; Mead, 2003).
435 All informants were assured of their right to maintain authority over their contributions by reviewing,
436 editing and approving the 'new' narrative produced through this work. The National Institute of
437 Water and Atmospheric Research (HREC2017-005) and the University of New South Wales (HREC-
438 17085) provided human research ethics approvals.

439 **4.2 Methods, analysis and interpretation**

440 Semi-directive individual and paired interviews with 20 key informants from Ngāti Koata and Ngāti
441 Kuia were used to discuss the construction, key elements and purposes of ‘The Rival Wizards’
442 narrative. In advance of all interviews a copy of the ‘Rival Wizards’ story (Grace, 1907a) was provided
443 to all informants from Ngāti Koata and Ngāti Kuia. Interview participants self-selected and/or were
444 recommended by participants and extended family members. Each session lasted between 0.5-2
445 hours and was attended by a research facilitator. All interviews were electronically recorded. Analysis
446 of interview material was inductive and consisted of (i) ‘content analysis’ whereby ideas or words
447 were identified along with the frequency of their use, (ii) ‘thematic analysis’ whereby the principal
448 elements emerging from the data were examined and sorted, and (iii) cross-checking the integrity of
449 emergent ideas and interpretations through follow-up discussions with key informants with
450 adjustments made where necessary. Central to these analyses was an emphasis on participant views
451 about the narrative (rather than the meaning the researchers brought to the research). Secondary
452 sources of information provided supplemental support. In following such methods, we sought to
453 avoid subjecting the story to external judgements, or in other words, risk turning the story into
454 something it is not.

455 **5. THE RIVAL WIZARDS (ABRIDGED)**

456 An abridged version of the Rival Wizards story is outlined below to provide context for the
457 summarised commentaries that follow. Importantly, in abridging the story, we are mindful that where
458 one chooses to begin and end a story can alter its shape and meaning, and so we encourage a reading
459 of the full story as published by Grace (1907a).

460 **5.1 Synopsis of the story**

461 The story begins with Rongomai, a “wizard-chief” renowned for being able to shape-shift from
462 monstrous to human form. One day, with his revered greenstone fish-hook (named Huakai after one
463 of his most famous ancestors) Rongomai paddled from his island settlement of Motiti to the shore of
464 the mainland opposite the settlement of Motu to fish for *hapuku* [wreckfish] and *kahawai* [A-NZ

465 salmon]. Boastful of his prowess as a fisherman Rongomai soon lost Huakai to a large fish, leaving him
466 miserable and despairing. Te Pou, the rival “wizard-chief” from Motu, watched these proceedings
467 from the shore. Famed also for his shapeshifting capabilities, Te Pou waited until after dark and then
468 stepped into the water turning himself into a shark and searched for the coveted hook. However,
469 Rongomai initiated an immense fishing haul, and relocated ‘Huakai’; although there was
470 consternation at a large hole in one of his nets presumably caused by a shark. Te Pou was furious at
471 Rongomai for having found ‘Huakai’, and for almost having been caught in his fishing nets. Vowing
472 revenge, Te Pou later swam to the village of Motiti and in the middle of night he thrust a burning stick
473 into the thatch of Rongomai’s house. Rongomai’s human form was burnt and he was thereafter
474 confined to an aquatic existence as a voracious and malevolent salmon. The fish from the coast near
475 Motu were soon thereafter driven away by Rongomai, and then while swimming, Te Pou’s son,
476 Kopara, was eaten by Rongomai. The mourning Te Pou subsequently planned a great farewell for his
477 son, but realising the scarcity of fish he transformed himself into a porpoise and travelled to have an
478 audience with Tangaroa, the supreme ruler of the sea. Here Te Pou requested that all the salmon
479 over whom Tangaroa held sway to come to Motu, be summoned to the mouth of the river, to weep
480 for his son. Tangaroa agreed to the request, but also indicated his interest in joining the occasion. In
481 reply Te Pou acknowledged the great pleasure this would bring, but he cautioned that the water at
482 Motu is hardly deep enough, with extensive mudflats and the river so shallow that it would be a most
483 inconvenient place for Tangaroa. Returning home Te Pou advised his people to prepare their nets for
484 the fish that would come, advising that he expected the pick of three fish for his own use. Standing on
485 the shore Te Pou proceeded to say incantations while Titipa, the next chief in command and secret
486 rival, ignored Te Pou’s requests. When the great haul of fish was pulled ashore, Te Pou returned to
487 inspect the catch only to find Titipa claiming it. Te Pou therein warned all to stand back from the
488 beach as three great waves were called forth, advancing and receding from the beach, eventually
489 taking Titipa with them. The story ends with Te Pou selecting the three largest fish from the collective

490 haul, gifting the first to his son and the sea, the second to his wife, and the third for himself, ending
491 Rongomai's existence.

492 6. STORY-TELLING THROUGH WHAKAPAPA³

493 6.1 Narrative sources

494 The published version of the 'Rival Wizards' story (Grace, 1907a) was "not known" by the informants
495 from Ngāti Koata and Ngāti Kuia prior to the formal discussions carried out for this study. There were,
496 however, many repeated qualifications about parts of the narrative being very familiar. Independent
497 of one another, informants from both kin groups initially expressed "I am not familiar with the story",
498 "the story does not ring a bell for me", "I've never heard our people talk about it" and, among others
499 "the first time you gave me the story is the first time I had come across this". There was, however,
500 widespread awareness of Karepa Te Whetu (the informant of the story), first by the research
501 participants from Ngāti Koata who hold direct genealogical connections, and second by those from
502 Ngāti Kuia who recognised his name from pan-tribal history. From these collective voices, we know
503 that Karepa Te Whetu lived on D'Urville Island (Rangitoto) and that he was the elder son of Te Whetu,
504 a respected Ngāti Koata leader who migrated with other Ngāti Koata descendants from the North
505 Island in the 1820s to settle on Rangitoto and other areas across the northern South Island (Figure 1).
506 Te Whetu had a settlement at Te Marua (north-eastern side of Rangitoto), which is known for its
507 swampy ground and cliffs. An informant suggested that Karepa Te Whetu most likely grew up at Te
508 Marua alongside kin from Ngāti Koata and the already occupying people of Ngāti Kuia. For example,
509 an informant from Ngāti Koata reflected: "Ngāti Koata moved down here in the 1820s. And there was
510 a whole big history on that island [Rangitoto] before we moved in so I wonder how much of that
511 history, those stories, that he [Karepa Te Whetu] heard". In his later years, it was widely understood
512 that Karepa moved to Croiselles Harbour where he spent his final days (although one informant

³ Ancestral and kinship linkages to people and place, genealogy, literally means 'to place in layers'.

513 suggested that he may also have lived at Taranaki for a while). According to Grace (1907b) it was
514 during this period that he got to know Karepa Te Whetu, leading eventually to the sharing of
515 numerous stories, until Karepa's death in 1903.

516 Reflecting further upon the 'Rival Wizards' story shared by Karepa Te Whetu with Alfred Grace, many
517 informants from Ngāti Koata and Ngāti Kuia noted that knowledge holders had probably passed on
518 and/or moved away from the Island, thereby taking many of their stories with them. One informant
519 also remarked that, "Some of our old people were cautious about who they told things to, so they
520 never told them". Other explanations for not knowing the 'Rival Wizards' story included reference to
521 changes in the resident population of Rangitoto following the arrival of the first Ngāti Koata peoples
522 and thereafter the broader social-cultural changes stemming from the arrival of the first missionaries.
523 Statements from both Ngāti Koata and Ngāti Kuia informants included: "What happened prior to the
524 *heke* [migration] ... there are a lot that probably won't know what those stories were ... so yeah it is
525 probably a Ngāti Kuia story", and "These events [in the story] are before Ngāti Koata. It's probably a
526 Ngāti Kuia story eh?" and "Ngāti Kuia lived on the Island, right up until the 1870s, early 1880s. My
527 great grandfather was born on the island [Rangitoto] but he was straight Kuia... And then all the Kuia
528 left... so lots of those *korero* [stories] about Rangitoto were not spoken about anymore. Ngāti Kuia lost
529 a lot of those *korero* whereas our Ngāti Koata-Kuia relations who stayed on the island retained their
530 knowledge of the place". Whatever the case might be, two informants (one from Ngāti Koata and the
531 other who recognised their links to both Ngāti Koata and Ngāti Kuia) also affirmed that they had no
532 reason to doubt the story from Karepa Te Whetu: "If it [the story] came from Karepa, I have no reason
533 to doubt it". Finally, upon questioning the informants about the role of Alfred Grace in the telling of
534 the story there was no mention of misgiving or distrust, as is common for other Māori when reflecting
535 on the work of other ethnographers of the time (Mikaere, 1995; Smith, 1999; Haami, 2012).

536 **6.2 Key elements and story-telling devices**

537 Many of the informants expressed familiarity with the places and contextual details described in
538 Grace's account. The most common reflections included reference to the two settlements named in

539 the story, Motiti and Motu. Initial discussions suggested informants were unaware of such settlement
540 names on, or surrounding, Rangitoto. However, several informants from Ngāti Koata and Ngāti Kuia
541 (in conversations independent of one another) were quick to point out that there is a Motuiti Island,
542 also known as Moutiti, Motiti and Victory Island, just off the northern coast of Rangitoto (Figure 1).
543 For example, one Ngāti Kuia informant stated: “In the old books, it is referred to as Motiti and
544 Moutiti. Motiti - that could be just a misspelling if it has been orally translated. That kind of thing was
545 prevalent when they [ethnographers] were transcribing as they heard it and I would expect it would
546 have been the same kind of situation here...Motiti, Moutiti, Motuiti”. However, one Ngāti Koata
547 informant questioned these possible linkages, drawing specific attention to there being no beaches
548 on Motuiti and no visible signs of having been occupied (i.e. pits or middens). Notwithstanding these
549 literal inconsistencies, the same informant described the island as an important site for ongoing
550 traditional harvesting of wild-foods.

551 With reference to the settlement of Motu, one Ngāti Kuia informant noted the proximity of Motuiti
552 Island to the historical settlement at Otu Bay at the northern end of Rangitoto, and questioned
553 whether Otu Bay might be a misspelling of Motu (Figure 1). Another Ngāti Kuia informant questioned
554 whether Motu might be a shortening of a longer name such as Motungararara (now formally named
555 Titi Island) which was not only the site of a settlement held by Te Pou Whakarewarewa [an historical
556 figure understood to have lived during the late 18th century] but also a position where he had control
557 of all the area. It was surmised by another informant from Ngāti Koata that by using the name Motu
558 (translates as Island) Karepa Te Whetu may have been ‘generically’ referring to all the islands in the
559 area, not just a specific place. Alternatively, another informant from Ngāti Koata offered that “just
560 because people don’t know this name ‘motu’ it doesn’t mean that there wasn’t a place called motu,
561 but the name may have been buried or usurped by new peoples coming in...”. Given these initial
562 commentaries, there was general agreement that the story was derived from (and/or around)
563 Rangitoto but it was not possible to confirm any specific location.

564 The description of extensive mudflats and a shallow river at the settlement of Motu, also led some
565 informants to specifically reflect on several locations on Rangitoto and its surrounds with similar
566 physical characteristics. For example, a Ngāti Koata informant stated “When I think about that, I think
567 about Whangarae on the Nelson mainland, just before Okiwi Bay. It was closer than other places on
568 the Island. My recollection is going there as a child for a *tangi* [funeral] and we anchored our boat out
569 there and on the low tide it was stranded. We just waited for the tide to come back in again. And
570 there was a big settlement in that place...at Whangarae... That area is still owned by Ngāti Koata. Not
571 many people live there now but there are a lot of owners...you could class that as part of D’Urville
572 Island [Rangitoto]” (Figure 1). The same informant emphasised that these places were not regarded
573 as separate by the people living in these areas and that any attempts to locate places referred to in
574 the story need to understand that the sea connected all the islands and the mainland as well as the
575 settlements situated along their coasts. The informant added “there is another place on D’Urville
576 Island which is in the Manuhakapakapa Bay. The water there and particularly Opitiki Bay was heavily
577 populated pre-Ngāti Koata and probably even Ngāti Kuia...and the water there is shallow”.

578 ~~In addition,~~ Specific reference to ~~the a~~ “river” at Motu also led some informants to contemplate the
579 absence of rivers on the Island as well as the neighbouring mainland. While this was inexplicable for
580 some, informants from both Ngāti Koata and Kuia recounted that the extensive use of geomorphic
581 names such as ‘sounds’ and ‘arms’ across the northern South Island today refer to locations that were
582 traditionally referred to as *awa* [river]. For example, “Te Hoiere – is a good example of that. Today we
583 talk about the Pelorus River and Pelorus Sound, as opposed to Te Hoiere being one big entity into the
584 Cook Strait. Even some of the place names through the sounds Awaiti and Awanui, they were calling
585 arms at the time also, so even if we were thinking about D’Urville Island and Port Hardy and Greville
586 Harbour and all of those places, there are lots and lots of little arms all over the place [that would
587 have had names]” (Figure 1). Such contextual nomenclature may thereby explain the use of the term
588 ‘river’ in the story.

589 Ancestral protagonists were another common element discussed by all informants. However, it is
590 important to qualify that most key informants from Ngāti Koata either declared no knowledge of the
591 names or that the names (or at least some) pre-dated the arrival of Ngāti Koata people to the region.
592 In contrast, most of the key informants from Ngāti Kuia recognised the names of the central
593 protagonists, and quickly confirmed linkages, citing genealogical books and historical transcripts (e.g.
594 Meihana Whakapapa Book, no date; Hemi Whakapapa Book, no date), and the ongoing use of such
595 names today. As one respondent declared, “Rongomai, Te Pou and Titipa - I know all those names”
596 and another stated “Te Pou - yep that’s my father’s middle name. Te Pou is a very common name for
597 Ngāti Kuia. Every Peter is a Pou ... so that name’s a common one”. Another said, “Te Pou and
598 Rongomai have been commemorated down to the present day by the repeated use of their names in
599 the lines of Ngāti Kuia *whānau* [families]”. The sacred fishing hook ‘Huakai’ used by Rongomai was
600 recognised by another Ngāti Kuia informant as a term used by recent generations of Ngāti Kuia. It was
601 also noted that the ancestors named in the story also derived from quite different periods of time.
602 Thereby, any attempts to historicise elements within the story based on genealogy would more likely
603 than not result in looking for detail that is not there. Two commentaries summarise these sentiments:
604 “Such stories were not necessary told in a linear fashion” and “The stories don’t follow linear ways of
605 telling a story and that is important because you can have different ancestors from different times to
606 celebrate those people, to remember them, to remember a lesson... so they are not forgotten”. In
607 this way, it is the protagonists rather than chronological dimensions of time that are of most
608 relevance.

609 Other contextual aspects in the story considered highly relevant to connecting the narrative to the
610 Rangitoto area ~~locating the narrative~~ included the multiple references to large (lamniform) sharks and
611 kahawai (salmon). Many of the informants from Ngāti Koata who grew up on Rangitoto described
612 deep familiarity with large sharks and kahawai (salmon) in the area, particularly at Manuhakapakapa
613 Harbour (Figure 1). For example, multiple references to kahawai were made by Ngāti Koata
614 informants who grew up on Rangitoto Island: “Kahawai is everywhere [around Motuiti Island] ...we

615 ~~catch *kahawai*, we get it quite easy...”, “*Kahawai* were plentiful around the Island [Rangitoto]... like at~~
616 ~~Kape [Manuhakapakapa Bay] ... there was a big *kāinga* [settlement] there” and “*Kahawai* is~~
617 ~~everywhere, we get it quite easy...”. And, “I can tell you a story. We had my dad’s uncle, and he was~~
618 ~~Ngāti Kuia. He was brought to live with us on the Island [Rangitoto], and he didn’t like the people he~~
619 ~~was staying with. This was at Ohana. So, he left for two or three days and there was no sign of him.~~
620 ~~So, they sent back to his people in Okoha (in the Pelorus Sound) about where to find him, and they~~
621 ~~asked are any fish there? Our people responded that there is a lot of *kahawai* on the Puna (Te Puna~~
622 ~~Bay) side of Ohana. They said that’s where you will find him. What he used to do is dive under the~~
623 ~~water and put his thumb and fingers into the gills of the *kahawai* and that’s what he lived on until~~
624 ~~they found him”. Notwithstanding that *kahawai* and lamniform varieties of shark are common around~~
625 ~~A-NZ coastal waters (Roberts et al., 2015a, 2015b), some informants considered the potential linkages~~
626 ~~between specific locations well-known for their shark and *kahawai* abundance on the Island and the~~
627 ~~traditional settlement of Motu named in the story. Upon querying informants about which bay might~~
628 ~~represent the traditional settlement of Motu named in the story, some considered the~~
629 ~~Manuhakapakapa Harbour, as a possible analogue, while others pointed out that Whangarae, Otu Bay~~
630 ~~as well as Skull Bay in Port Hardy are equally possible given the significant settlements at all of~~
631 ~~these neighbouring places in the past. Notwithstanding these reflections, many informants~~
632 ~~considered these contextual aspects in the story highly relevant for connecting the story to the area.~~
633 ~~For example, o were all identified as possible analogue sites given the significant settlements that~~
634 ~~once existed at all of these neighbouring places. While such information alone was recognised as~~
635 ~~insufficient to draw any firm conclusions about the specific location for the story, many informants~~
636 ~~nonetheless regarded the multiple layers of contextual information in the story as highly relevant for~~
637 ~~connecting the story to the Rangitoto area. One of the informants from Ngāti Kuia summarised/stated:~~
638 “It is not only the descriptive language of catastrophic waves being called ashore, but the other
639 details, that make us believe we are in the place”.

640 Finally, rReferences to the power of prayer and incantation [*karakia*] as well as shapeshifting [*turehu*]
641 in the story were ~~also~~ identified as also highly relevant to any claims of the narrative coming from the
642 northern South Island. Ngāti Kuia informants emphasised not only this power, but also the reputation
643 held by the “tōhunga” [priest; expert in traditional lore; person skilled in specific activity; healer] of
644 Ngāti Kuia to modify the elements. For example, “We were known as *te iwi karakia* [the
645 necromancing people] ...but not the kind that do *makutu* [dark incantations]. Our *karakia* were very
646 much a demand, that was the *mana* [authority, control, influence, prestige] and power of the *tōhunga*
647 [priest; expert in traditional lore; person skilled in specific activity; healer]. We are connected to all of
648 our *Atua* [Gods, deity] and we are made of our *Atua*”. These discussions also led one of the
649 informants from Ngāti Kuia to reflect specifically on the significance of the incantation used in the
650 story and whether the description of destructive waves was due to a tsunami or a phenomenon
651 manifest through metaphysical forces. In response, the informant answered: “what I do know is that
652 our people were recognised as very strong *kaikarakia* [necromancers]”. Mitchell and Mitchell (2004)
653 have also pointed out that Ngāti Kuia have long been recognised for their powers in this regard and
654 historical transcripts are known to contain *karakia* about how to control the sea and the waves, with
655 many references to Rangitoto (Smith, 1889). The story also incorporates multiple references to Te
656 Pou and Rongomai ‘shapeshifting’ or transforming themselves into various life-forms from the sea,
657 from whale and shark, to porpoise and kahawai. Again, several informants from Ngāti Kuia affirmed a
658 deep familiarity with such details, including acceptance of the supernatural and the metaphysical
659 world. For example, “Shapeshifting, that is acceptable to me. I grew up with that *korero* [story]” and
660 “Kaikaiawaro is our *kaitiaki* [person, group, being that acts as a carer, guardian, protector and
661 conserver] and he takes the form of a dolphin”. Further still, the familiarity with these elements in the
662 story extended to recognition among many of the Ngāti Kuia informants that they were descendants
663 of Kaikaiawaro, and that he is present in their genealogy as an ancestor rather than an *Atua*. As an
664 informant declared, “Yes...when I was reading this-that Te Pou goes to visit Tangaroa and ~~when~~ he

665 transforms himself, it was like, we know that because Kaikaiawaro who is in our *whakapapa* as a
666 person, ~~who~~ could manifest himself as a dolphin... We are the descendants of Kaikaiawaro”.

667 6.3 Memorials and analogue stories

668 Reflecting upon the specific narrative of Te Pou [the principal protagonist in the Rival Wizards story]
669 calling forth catastrophic waves, many informants from Ngāti Koata and Ngāti Kuia regarded this
670 account as most likely referencing direct experience with past tsunami inundation. ~~Although~~ However,
671 almost all of these informants ~~were quick to point out~~ openly acknowledged that they did not know
672 where this story occurred and/or when it happened, and that the narrative was being told within a
673 framework of deities and super-natural humans with influence over the elements. Consideration of
674 the narrative as a tsunami tradition also led several of the informants to note similarities with the
675 destructive waves described in another story from Moawhitu [Greville Harbour] on the western side
676 of Rangitoto (Figure 1). According to these commentaries a tsunami, possibly occurring in the 1400s
677 or 1500s, drowned nearly all people living around Greville Harbour, and their bodies now lie in the
678 surrounding sand dunes. For example, “Yes, there was a great big tidal wave. I heard it when I was a
679 kid. My grandmother told me when I was a child. This story is *tuturu tika* [genuinely truthful]. I don’t
680 question it”. The story of Moawhitu was also recounted by Karepa Te Whetu to Elsdon Best and
681 published in the Journal of the Polynesian Society in 1893 (Te Whetu, 1893). It describes the people of
682 Ngai-Tarapounamu who settled Rangitoto Island and a breach of *tapu* [sacrosanct, forbidden,
683 inviolable] by a local woman which led to the gods stirring up the deep ocean and causing great waves
684 to sweep away people where the woman was living. Phillipson (1995) purports that the “tidal wave”
685 occurred some-time in the sixteenth century, while Cope (2011), Chagué-Goff and Goff (2012a,
686 2012b) and Cope et al., (2012) indicate the previous century as more likely based upon the inferred
687 timing of a Māori occupation layer beneath marine gravels at Moawhitu as well as palaeotsunami
688 evidence from neighbouring sites across region. Meanwhile, Mitchell and Mitchell (2004) referred to
689 the “tidal wave” as *Tapu-arero-utuutu* [vengeance for the breaking of strict food preparation practice]
690 and postulated that the people already living on the Island prior to the arrival of the kin-group Ngai-

691 Tarapounamu may have been from the ancient Waitaha peoples and/or early Ngāti Kuia lines. It is
692 also noteworthy that one informant familiar with the name Tapu-arero-utuutu identified a stand of
693 offshore rocks to the south west of Rangitoto by the same name (Figure 1). The association of this
694 name with tsunamis and its close location to Rangitoto however were not mentioned.

695 More than one informant questioned whether the Rival Wizards narrative might be a retelling of the
696 Moawhitu tradition. One informant questioned where knowledge of the Moawhitu tradition had
697 actually come from. For example, “I have heard the *korero* about Moawhitu and the tsunami there,
698 but I was told by my uncle (and he is passed away now) that the people were labouring men but also
699 avid readers so I cannot say whether that story was one that we had or what he had read and then
700 became ours”. Meanwhile another informant reflected that the [Rival Wizards] story might not
701 necessarily be referring to Moawhitu, but rather the Manuhakapakapa area due to the strong
702 references to kahawai and the abundance of people in the area: “This certainly could have been a
703 place where that *korero* might have been had”. In contrast, Otu Bay and Skull Bay were also identified
704 by other informants as equally likely sites referenced in the story. As noted earlier, one Ngāti Koata
705 informant reflected that the name motu might have not only been used in a general sense but also to
706 reflect that there are many places here that were likely affected by the extraordinary waves described
707 in the story and so a generic settlement name was used to capture this. Whatever the case may be, in
708 considering the specific sites and sources for the Rival Wizards story there was widespread agreement
709 (although not total) that the story and its elements derived from Rangitoto and the connected places
710 and peoples that surround the northern South Island. As one respondent noted, “It’s definitely got
711 the feel that it comes from this place”.

712 7. MAORI ORAL HISTORIES AND NATURAL HAZARDS SCIENCE

713 7.1 Lessons and opportunities

714 By engaging directly with informants from Ngāti Koata and Ngāti Kuia it is evident that there is a deep
715 familiarity with the different elements contained in the Rival Wizards story. This includes knowledge

716 of past tsunami impacts on, and surrounding, the island of Rangitoto ([D'Urville Island](#)). Dialogue may
717 not have included familiarity with the specific story itself, but ancestral relationships were confirmed
718 between informants of Ngāti Koata descent and the original informant of the story Karepa Te Whetu
719 as well as those informants of Ngāti Kuia descent and the leading protagonists in the story. Many
720 other aspects of the story are also deeply rooted in the enduring knowledge of Māori histories across
721 the northern South Island. ~~And, while the exact location of catastrophic waves could not be~~
722 ~~confirmed, most of the informants (from both Ngāti Koata and Ngāti Kuia) regarded the story as~~
723 ~~incorporating direct experience with past tsunami inundation(s) on Rangitoto Island and the~~
724 ~~neighbouring coastal surrounds.~~ While such information is insufficient to draw any firm conclusions
725 about a specific location for the occurrence of catastrophic waves, these oral histories from Ngāti
726 Koata and Ngāti Kuia provide strong collective evidence for pre-written tsunami inundation(s) on
727 Rangitoto Island and the neighbouring coastal surrounds.

728 More broadly, this work confirms that Māori oral histories are dynamic, even when committed to
729 writing in an ethnographical text. The Rival Wizards story holds multiple purposes comprising
730 elements of culture, place, identity, lineage, history and in this case, environmental risk. It is also clear
731 that ancestral and kinship linkages to people and place (i.e. *whakapapa*) are central to the
732 construction and ongoing retelling of Māori histories. Royal (1992: 21) affirmed this notion stating
733 that *whakapapa* is “the fabric upon which tribal histories sit” generating meaning for human
734 behaviours and understanding in the Māori tribal world. Further, Roberts (2012) explained that
735 *whakapapa* is used in story-telling as a construct for mapping the natural world and its phenomena;
736 thereby acting as a "mental map" of place. And most recently, Kelly (2016) has reflected that Māori
737 knowledge was stored layer by layer, referencing places, ancestors and the actions of protagonists
738 as ‘memory cues’ to retain vitally important information. The specific layering of contextual detail
739 in the Rival Wizards story affirms these connections and relationships between the natural and
740 metaphysical worlds, including the narrative structures critical to cultural endurance and memory.

741 Our working with informants from Ngāti Koata and Ngāti Kuia also highlights that Māori oral histories
742 can complicate scientific definitions of what constitutes events. That is, the earth sciences typically
743 treat events as discrete and bounded but in the case of the Rival Wizards a different paradigm with
744 non-linear contextual details is used to establish layers of meaning with ancestral protagonists from
745 different epochs of genealogical time. Tau (1999) reflects that events in the Māori world are often
746 recalled relative to known ancestors rather than fixed at some objective point in time. Further he
747 points out that trying to apply chronology to genealogical time is akin to historicising a past that was
748 not intended to constitute a linear history. In short, Mātauranga Māori orders itself differently, and
749 thereby the risk of misinterpretation is high when stories and their elements are not understood
750 within the context of ancestry and cultural experience (Roberts et al., 1995; Berkes, 1998; King and
751 Goff, 2010).

752 The methodology underpinning this research provides an example of how the earth system sciences
753 as well as the knowledge-practice-belief complex of Mātauranga Māori can benefit from engaging
754 collaboratively with one another. Confirmation of deep connections to the Rival Wizards story and
755 subsequent affirmation of ancestral experience with past tsunami(s) across the northern South Island,
756 casts off earlier assumptions that the story might derive from the eastern Bay of Plenty (King and
757 Goff, 2010). Further, this study emphasizes the value of such engagements, particularly for scientific
758 researchers who seek to learn from the historical experience captured in Māori oral histories. From
759 this epistemological position, we agree with Styres (2008) who argued that the challenge for
760 researchers from the academy of science is to go beyond traditional methodological approaches and
761 assumptions about research which select and frame stories from the point of view of the dominant
762 culture. Further, we concur with Johnson et al. (2016: 3) that a reframing of science is needed
763 whereby “one is drawn to the wider value of a dialogue across knowledge systems that is humble,
764 respectful and hopeful; which recognizes not only the need to acquire knowledge, but also the need
765 to transform and respond to different knowledges, understandings, meanings, and opportunity”.
766 Although, we simultaneously acknowledge that this is deeply challenging because the research

767 structures around us constantly push and pull us to neglect and compromise these values, ethics and
768 practices. Further, we recognise that research framing will not solve all the problems associated with
769 the hierarchies of power and knowledge production (Mustonen, 2014).

770 Notwithstanding these ongoing tensions, engaging in this work can help to promote “plural spaces” of
771 learning that contribute to the reclaiming of stories and culture as well as the development of new
772 knowledge and new questions (Howitt and Suchet-Pearson, 2003; Zanotti and Palomino-Schalsha,
773 2006). For example, ~~the work undertaken in~~ this study contributes to a number of projects currently
774 being undertaken by Ngāti Koata and Ngāti Kuia by adding to their existing stores of socio-cultural
775 knowledge and history. This research space also provides an opportunity for the knowledge-practice-
776 belief complex of Mātauranga Māori to engage with the academy of science about tsunami
777 disturbance, recurrence and risk. And, as already articulated, there remain many unrealised
778 opportunities for Mātauranga Māori to inform the earth system sciences about extreme hazard
779 episodes and risk along the A/NZ coastline over the past 1000 years (King and Goff, 2010; King, 2015;
780 King et al., 2017). Such work however will require greater attentiveness to relationships among
781 people involved in the research, including the need to be aware of contemporary developments in
782 political, epistemological and methodological practice.

783 8. CONCLUSIONS

784 Working alongside key informants from the Māori kin groups of Ngāti Koata and Ngāti Kuia this
785 work confirms northern South Island Māori links to ‘The Rival Wizards’ narrative, including knowledge
786 of Māori ancestral experience with a past tsunami, possibly ~~even~~ multiple events, on, and
787 surrounding, Rangitoto (D’Urville Island). While it is not possible to draw any firm conclusions about a
788 specific location for the occurrence of past ‘catastrophic waves’, While we cannot confirm the exact
789 location of the story, it is evident ~~from the multiple exchanges with key informants from Ngāti Koata~~
790 ~~and Ngāti Kuia,~~ that the Māori oral histories are highly contextual and purposeful, narrative
791 comprising multiple layers of- meaning and history experience of tsunamis, and cultural meanings
792 and representations of such events. However, notwithstanding these confirmations, Further, to

793 engage with such oral histories (and the people who link genealogically to such stories) requires close
794 attention to a politics of representation of those stories, in both past recordings and current ways of
795 retelling, as well as, which includes sensitivities concerning considerations about how knowledge is
796 constructed, distributed and applied and legitimised. ~~It also demands sensitivities to the production~~
797 ~~of 'new' and 'plural' knowledge itself. Individuals and families from Ngāti Koata and Ngāti Kuia have~~
798 ~~permitted us to record some of their history, because they share the view that there are multiple~~
799 ~~benefits to be gained by learning from differences in knowledge, practice and belief. Further still, the~~
800 ~~'retelling' of this narrative offers an opportunity to relive ancestral experience across different epochs~~
801 ~~of genealogical time. The account offered in this paper makes these narratives available to a new~~
802 ~~audience (including those families who no longer have access) and recites these in ways that might~~
803 ~~encourage those more intimately connected to know and transmit these oral histories differently.~~
804 the geosciences are to advance scholarship that promotes plural knowledge development (and plural
805 knowledge co-existence), then a commitment to the acquisition of new skills in trans-cultural research
806 enquiry will be required. The potential of such work to contribute to the production of 'new'
807 narratives about tsunami disturbance, recurrence and risk around the A-NZ coast is regarded as high.

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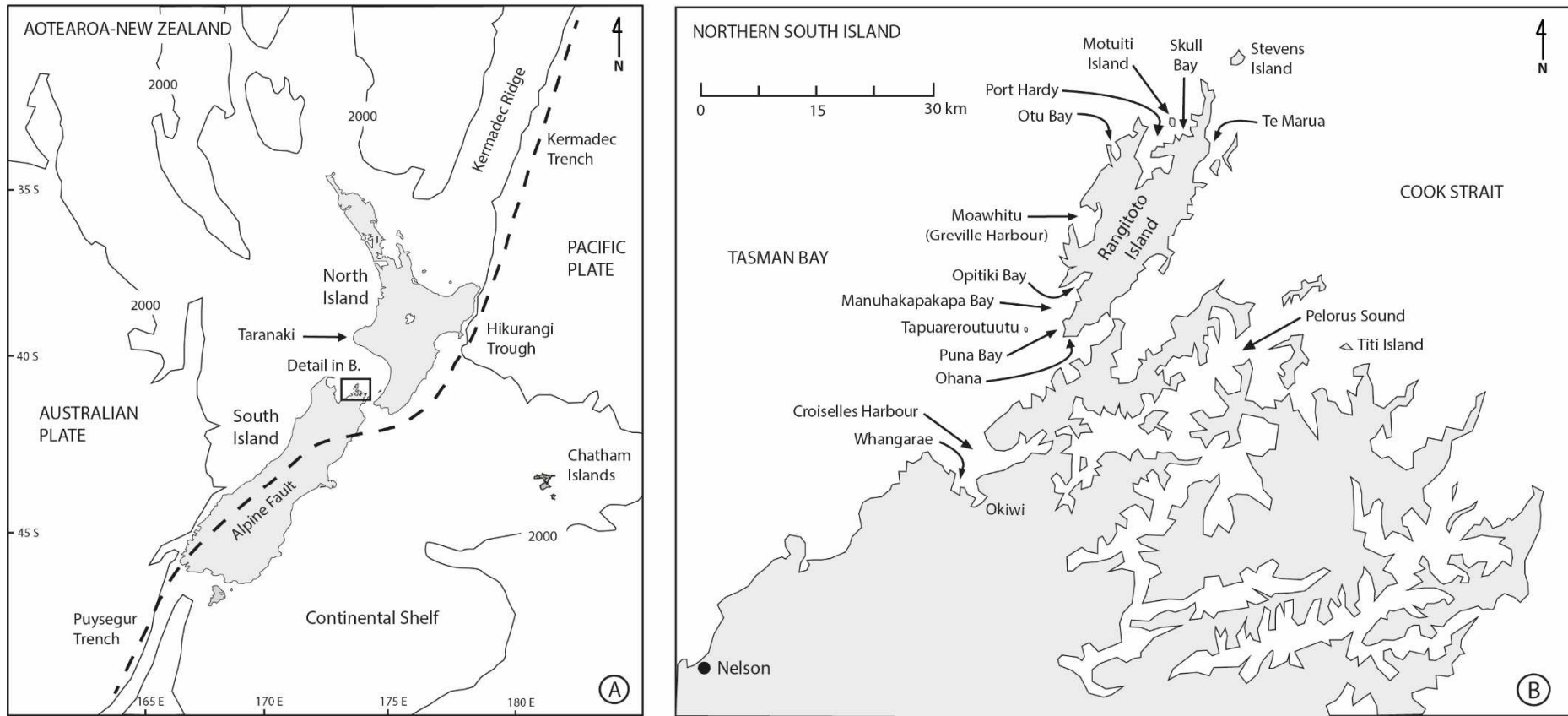


Figure 1: **(A)** Aotearoa-New Zealand's tectonic location in the South Pacific showing the Australian-Pacific plate boundary as a dashed line. The submerged continental shelf boundary is loosely defined by the 2000 m isobaths (adapted from Carter et al. (1988)). **(B)** Rangitoto Island (D'Urville Island) and surrounding locations mentioned in the text.