Supplementary Material: Stratigraphy and lithosedimentological properties of subplinian eruptions from Mt. Taranaki, New Zealand, encompassed by the Ngaere and Pungarehu edifice collapses.

Location, thickness, and largest pumice grain size information.

Table 1:Locations of the thirteen sample locations across the eastern and southeastern sector of the Taranaki ring plain in latitude and longitude, their thickness and largest grain size (where applicable).

Location name	**Ronald Road**	Poto reference location		**Climie Rd**			**Climie Rd/SH3**		
Location number	**1**			**2**			**3**		
	Latitude	**Longitude**		**Latitude**	**Longitude**		**Latitude**	**Longitude**	
Co-ordinates Latitude/Longitude	-39.361454	174.222222		-39.375576	174.274383		-39.375582	174.296024	
	Poto type section	Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**
	Paetahi.f	2		Paetahi.d	2		Paetahi.f	2	
	Paetahi.e middle	9	**-3**	Paetahi.c	11		Paetahi.e middle	7	**-2.5**
	Paetahi.c	10		Paetahi.b	3	**-4**	Paetahi.d	2	

	Paetahi.b	3	**-3**	Paetahi.a lower	13	**-4**	Paetahi.c	5	
	Paetahi.a upper	7	**-4**	Poto.o	15	**-3.5**	Paetahi.b	2	**-2.5**
	Paetahi.a middle	3	**-3.5**	Poto.n	11		Paetahi.a upper	3	
	Paetahi.a lower	5	**-3.5**	Poto.m	11		Paetahi.a lower	11	**-3**
	Poto.o	5	**-4**	Poto.l upper	15	**-2.5**	Poto.o	3	**-2.5**
	Poto.n	8	**-4**	Poto.l lower	5		Poto.n	3	
	Poto.m	6	**-4**	Poto.b	3		Poto.m	8	
	Poto.l upper	7	**-4**	Poto.a	5	**-3**	Poto.l upper	4	
	Poto.l lower	5	**-4**				Poto.l lower	2	**-3.5**
	Poto.k upper	4	**-3.5**				Poto.k lower	5	

	Poto.k lower	8	**-4**				Poto.j	2	
	Poto.j	3	**-3.5**				Poto.h	7	
	Poto.i	4_7	**-4**						
	Poto.h	4	**-3.5**						
	Poto.g	3_8	**-3**						
	Poto.f	6	**-3.5**						
	Poto.e	4	**-2**						
	Poto.d	3	**-2.5**						
	Poto.c upper	3	**-2.5**						
	Poto.c lower	4	**-3.5**						
	Poto.b	5	**-1.5**						
	Poto.a	9	**-3.5**						

Location name	**<u>Meerman Farm</u>**			**<u>Opunake Rd</u>**	Paetahi reference location		**<u>Cardiff Road</u>**	Paetahi reference location	
Location number	**4**			**5**			**6**		

	Latitude	**Longitude**		**Latitude**	**Longitude**		**Latitude**	**Longitude**	
Co-ordinates Latitude/Longitude	-39.38985	174.294782		-39.355958	174.244338		-39.342975	174.2283056	
		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**
	Paetahi.f	4		Paetahi.f	3	**-3.5**	Paetahi.f	5	**-2.5**
	Paetahi.e middle	10	**-2.5**	Paetahi.e middle	14	**-3**	Paetahi.e upper	9	**-3**
	Paetahi.d	1	**-3**	Paetahi.d	2	**-4**	Paetahi.e middle	6	**-3.5**
	Paetahi.c	8	**-3**	Paetahi.c	13	**-3.5**	Paetahi.e lower	7	**-4**
	Paetahi.b	6	**-3.5**	Paetahi.b	2	**-3.5**	Paetahi.c	9	**-4**
	Paetahi.a middle	5	**-3.5**	Paetahi.a upper	4	**-3**	Paetahi.a middle	7	**-4**
	Paetahi.a lower	6	**-3**	Paetahi.a middle	2	**-3**	Paetahi.a lower	10	**-4**

	Poto.n	1	**-2**	Paetahi. a lower	8	**-3**	Poto.o	3	**-3**
	Poto.l upper	2		Poto.o	6		Poto.n	5	**-3**
	Poto.l lower	2	**-4**	Poto.m	9		Poto.m	5	**-2**
	Poto.f	4	**-2.5**	Poto.l upper	10				
	Poto.e	2	**-1.5**	Poto.l lower	12	**-4**			
	Poto.b	2	**-0.5**	Poto.k upper	2				
	Poto.a	10		Poto.j	8				
				Poto.h	6				
				Poto.f	6	**-3**			
				Poto.e	2	**-3**			

Location name	**Upper Palmer Rd**			**Eltham Rd Kapuni Stream**			**Turuturu Rd**		
Location number	**8**			**9**			**10**		

	Latitude	**Longitude**		**Latitude**	**Longitude**		**Latitude**	**Longitude**	
Co-ordinates Latitude/Longitude	-39.365312	174.169401		-39.426708	174.179163		-39.566992	174.293545	
		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**
	Paetahi.f	3		Paetahi.e lower	6		Paetahi.c	7	
	Paetahi.e upper	5		Paetahi.d	3		Paetahi.b	5	**-3**
	Paetahi.e middle	6	**-4**	Paetahi.c	4		Poto.o	3	**-2**
	Paetahi.e lower	5		Paetahi.b	3	**-4**	Poto.k upper	5	
				Paetahi.a middle	4		Poto.j	5	
				Paetahi.a lower	3	**-2.5**	Poto.h	6	
				Poto.d	2		Poto.f	7	**-1.5**

				Poto.c lower	3		Poto.e	7	**-2.5**
							Poto.c lower	5	
							Poto.a	8	**-2.5**

Location name	**650 South Rd SH3**			**147 South Rd SH45**			**Tihi Rd East**		
Location number	**11**			**12**			**14**		
	Latitude	**Longitude**		**Latitude**	**Longitude**		**Latitude**	**Longitude**	
Co-ordinates Latitude/Longitude	-39.616647	174.338685		-39.586839	174.251921		-39.585792	174.40098	
		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**		Thickness (cm)	**Max grain size (phi)**
	Poto.h	3.5		Poto.f	3	**-2**	Paetahi.e upper	1	
	Poto.b	1		Poto.d	6		Paetahi.e middle	6	**-2.5**

				Poto.c lower	5		Paetahi.e lower	10	
							Paetahi.c	3	
							Paetahi.a upper	6	
							Paetahi.a middle	9	
							Paetahi.a lower	1	**-2.5**
							Poto.n	1	
							Poto.l upper	4	
							Poto.k upper	6	
							Poto.j	6	
							Poto.i	3	
							Poto.h	11	
							Poto.g	4	

							Poto.e	3	**-1.5**
Location name	**Allen rd.**								
Location number	**15**								
	Latitude	**Longitude**							
Co-ordinates Latitude/Longitude	-39.58562	174.43456							
		Thickness (cm)	**Max grain size (phi)**						
	Paetahi.a lower	6							
	Poto.c lower	3							

Stratigraphic fence diagrams for the eastern and southeastern site locations.

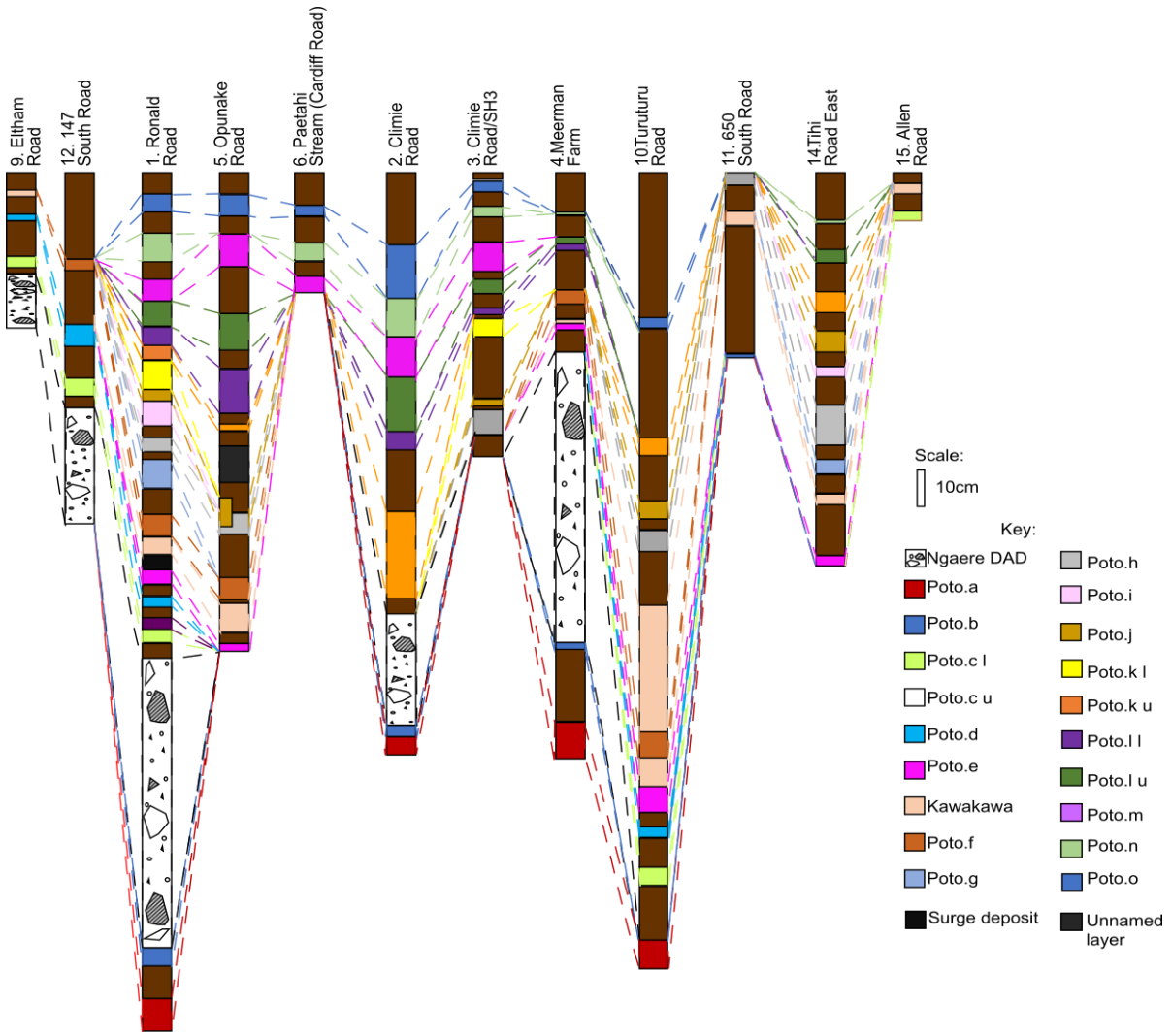


Figure 1: Stratigraphic fence diagram showing correlations of the Poto tephra units across the Taranaki ring plain.

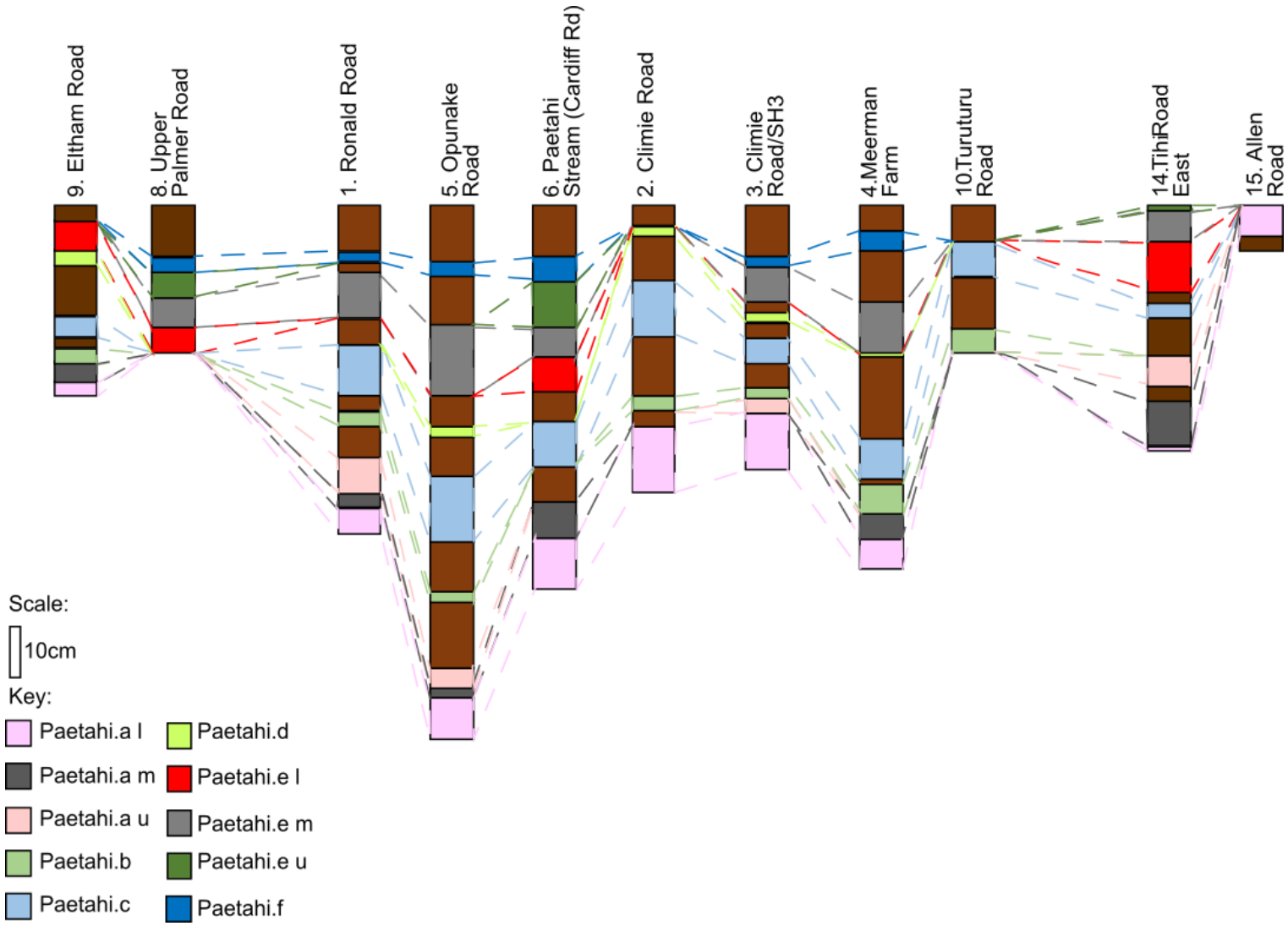


Figure 2: Stratigraphic fence diagram showing correlations of Paetahi tephra units across the Taranaki ring plain.

Isopach data.

Table 2. Isopach thicknesses, area and volumes for the twenty-eight Poto and Paetahi fall units. Eruptive volumes calculated using AshCalc (Daggitt et al., 2014).

Isopach – Poto Formation.												
T (m)	A (km²)	A½	√ area	Perimeter (km)	Shape factor	Long axis	Short axis	Aspect ratio	k	theta	lambda	Ashcalc Volume (km³)
Poto.a									0.9774	0.01208	90.85	0.20
0.10	104.95	10.24	10.24	85.00	0.18	40.62	5.03	0.12				
0.05	340.01	18.44	18.44	97.00	0.45	43.93	13.78	0.31				
Poto.b									1.14	0.01138	40.1	0.03
0.05	37.71	6.14	6.14	34	0.066745	16.37	3.05	0.2				
0.03	116.31	10.78	10.78	47	0.061324	21.09	6.78	0.3				
0.02	192.86	13.89	13.89	57	0.053723	24.63	10.14	0.4				
0.01	595.26	24.40	24.4	106	0.027289	43.02	20.5	0.5				
Poto.c lower									0.3398	0.004603	79.62	0.17
0.05	185.03	13.60	13.6	83	0.34	39.68	7.54	0.19				
0.03	320.66	17.91	17.91	92	0.48	42.26	11.96	0.28				
Poto.c upper									0.1806	0.0274	12.69	0.05
0.03	53.82	7.34	7.34	36	0.521853	15.91	3.94	0.2				
Poto.d									0.4657	0.009935	49	0.10
0.06	120.26	10.97	10.97	46	0.714193	50.14	10.31	0.2				

0.02	407.38	20.18	20.18	106	0.455615	18.24	10.3	0.6				
Poto.e									1.105	0.2122	11.74	0.05
0.05	208.95	14.46	14.46	92	0.31	43.49	9.23	0.21				
0.02	423.48	20.58	20.58	109	0.45	50.56	16.48	0.33				
Poto.f									1.225	0.01908	73.86	0.17
0.06	201.42	14.19	14.19	92	0.299045	42.88	8.06	0.2				
0.03	776.4	27.86	27.86	135	0.535338	56.97	17.61	0.3				
Poto.g									1.409	0.02509	53.8	0.10
0.08	47.63	6.90	6.9	35	0.488601	16.35	3.86	0.2				
0.04	300.97	17.35	17.35	97	0.401966	43.7	8.13	0.2				
Poto.h									1.661	0.264	15.44	0.08
0.05	410.72	20.27	20.27	98	0.537407	45.47	14.8	0.3				
0.03	559.48	23.65	23.65	107	0.614083	49.1	18.07	0.4				
Poto.i									1.562	0.04235	30.08	0.05
0.07	54.55	7.39	7.38	34	0.592989	16.04	4.61	0.3				
0.03	396.8	19.92	19.92	96	0.541052	44.46	10.64	0.2				
Poto.j									1.975	0.04934	19.88	0.02
0.05	230.9	15.20	15.19	104.3	0.27	49.88	8.59	0.17				
0.02	313.4	17.70	17.7	109	0.33	51.47	10.58	0.21				
Poto.k lower									1.113	0.01081	65.35	0.08
0.08	39.68	6.30	6.3	33	0.457882	15.9	3.33	0.2				
0.05	102.01	10.10	10.1	50	0.512758	22.86	5.15	0.2				
Poto.k upper									1.639	0.207	10.31	0.03

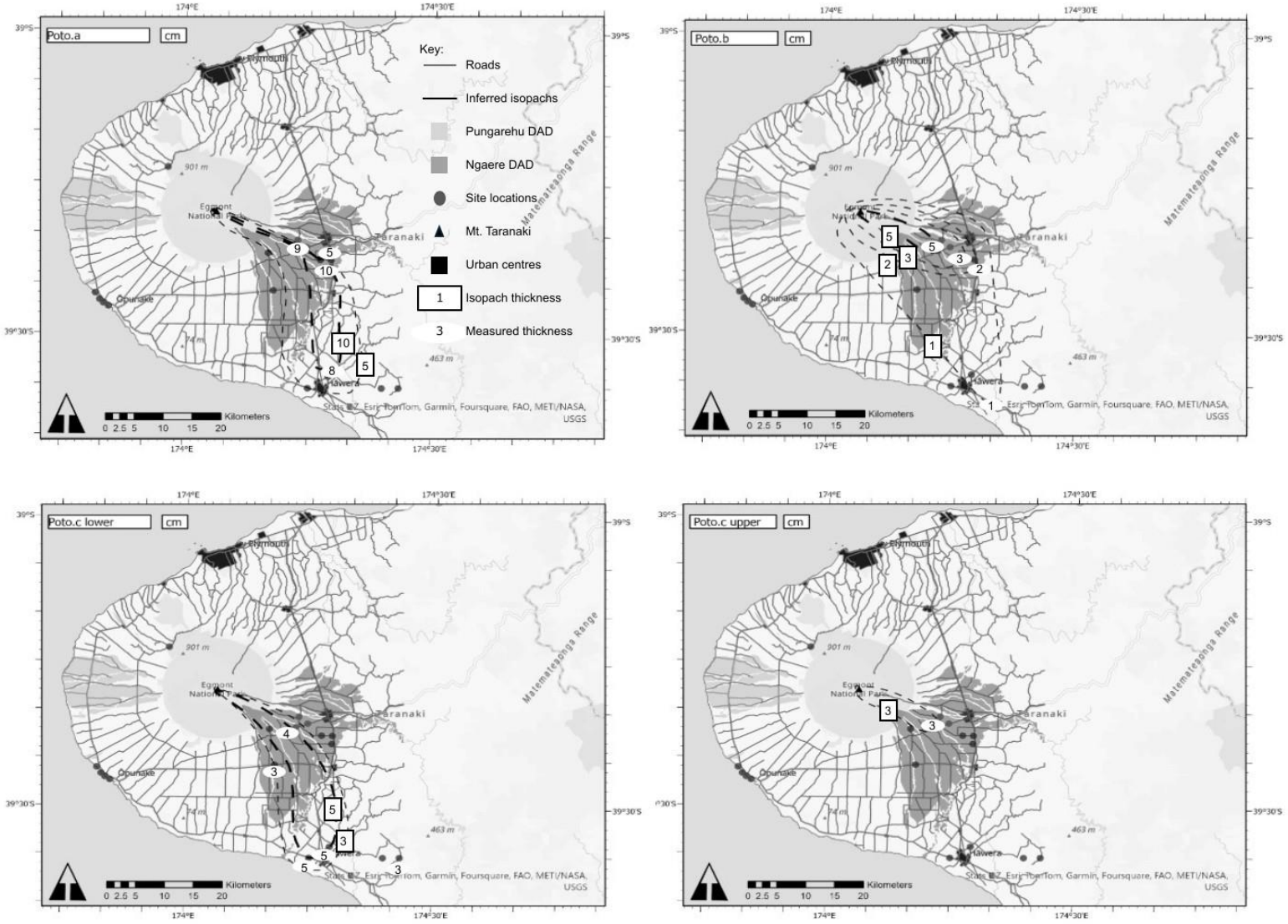
0.05	153.63	12.39	12.39	105	0.18	50.21	6.77	0.13				
0.02	272.78	16.52	16.52	109	0.29	52.21	8.88	0.17				
Poto.l lower									1.953	0.2257	6.885	0.01
0.1	37.69	6.14	6.14	51	0.182094	24.48	1.83	0.1				
0.05	73.2	8.56	8.56	54	0.315452	25.5	3.67	0.1				
0.02	115.71	10.76	10.76	59	0.417712	26.75	5.12	0.2				
Poto.l upper									1.417	0.03813	32.03	0.06
0.15	8.35	2.89	2.89	42	0.059484	20.73	0.76	0.0				
0.1	28.95	5.38	5.38	45	0.179653	21.87	1.34	0.1				
0.04	246.08	15.69	15.69	99	0.315512	45.37	8.21	0.2				
Poto.m									1.13	0.04689	18.98	0.03
0.1	34.39	5.86	5.86	45	0.628629	21.88	2.03	0.1				
0.05	101.3	10.06	10.06	57	0.133012	26.29	4.95	0.2				
Poto.n									1.355	0.08397	12.08	0.02
0.1	29.78	5.46	5.46	46	0.176856	21.95	1.98	0.1				
0.05	85.15	9.23	9.23	48	0.464421	22.66	4.77	0.2				
0.01	357.56	18.91	18.91	99	0.458446	45.79	11.67	0.3				
Poto.o									1.498	0.01226	91.46	0.14
0.05	29.01	5.39	5.39	40	0.23	19.54	2.08	0.11				
0.03	187.18	13.68	13.68	90	0.29	43.13	7.16	0.17				

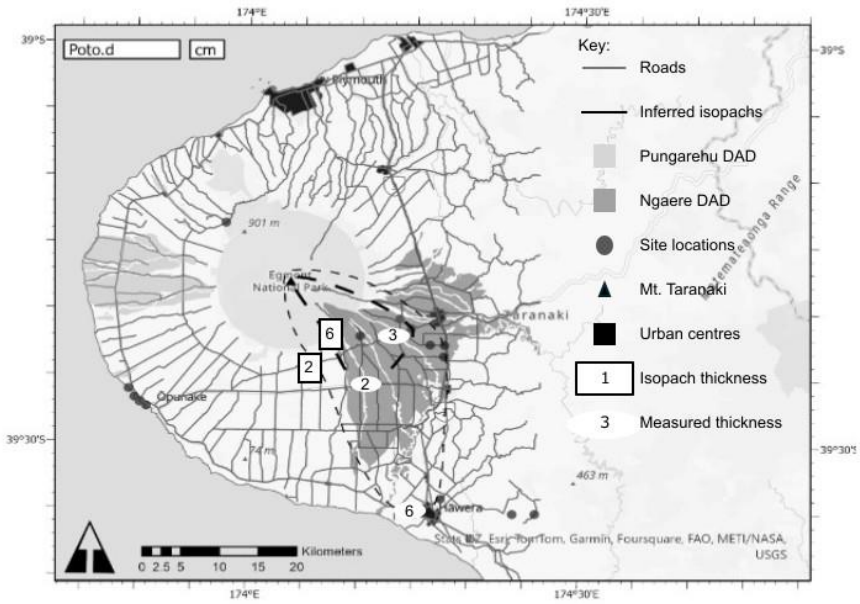
Isopach – Paetahi Formation.

T (m)	A (km²)	A½	√ area	Perimeter (km)	Shape factor	Long axis	Short axis	Aspect ratio	k	theta	lambda	AshCalc Volume (km³)
Paetahi.a lower									0.93	0.01	99.36	0.26
0.10	157.23	12.54	12.54	93.00	0.23	43.43	7.58	0.17				
0.05	419.26	20.48	20.48	114.00	0.41	52.02	11.31	0.22				
0.03	1042.52	32.29	32.29	138.00	0.69	58.19	23.53	0.40				
Paetahi.a middle									1.13	0.02	41.16	0.06
0.05	131.87	11.48	11.48	103.00	0.16	50.10	5.75	0.11				
0.02	550.64	23.47	23.47	107.00	0.60	48.97	14.50	0.30				
Paetahi.a upper									1.31	0.01	70.97	0.11
0.07	44.04	6.64	6.64	34.00	0.48	15.68	7.31	0.5				
0.03	353.94	18.81	18.81	96.00	0.48	44.50	15.88	0.4				
Paetahi.b									0.78	0.16	11.91	0.06
0.05	168.41	12.98	12.98	89.00	0.27	42.89	7.31	0.17				
0.02	386.82	19.67	19.67	92.00	0.57	40.71	15.88	0.39				
Paetahi.c									1.91	0.09	24.75	0.06
0.10	22.78	4.77	4.77	45.00	0.14	21.68	2.81	0.1				
0.05	374.16	19.34	19.34	92.00	0.56	41.13	13.09	0.3				
0.04	502.33	22.41	22.41	99.00	0.64	41.80	16.23	0.4				
Paetahi.d									0.57	0.00	60.70	0.01
0.02	28.38	5.33	5.33	47.00	0.16	23.11	1.21	0.1				
0.01	67.89	8.24	8.24	52.00	0.32	24.45	2.98	0.1				

Paetahi.e lower									1.32	0.04	66.89	0.26
0.10	182.79	13.52	13.52	97.00	0.24	46.32	6.02	0.13				
0.05	789.35	28.10	28.09537	123	0.66	58	21.61	0.37				
Paetahi.e middle									1.50	0.02	89.86	0.26
0.10	27.15	5.21	5.21	47.00	0.15	22.82	2.16	0.09				
0.05	320.96	17.92	17.92	102.00	0.39	48.00	10.69	0.22				
Paetahi.e upper									0.36	6.22	2.60	0.24
0.10	131.73	11.48	11.48	49.00	0.69	21.04	9.69	0.46				
0.03	372.60	19.30	19.30	72.00	0.90	43.52	27.40	0.63				
0.01	918.84	30.31	30.31	116.00	0.86	27.30	18.19	0.67				
Paetahi.f									1.98	0.05	19.88	0.02
0.05	9.43	3.07	3.07	31.00	0.12	15.44	0.62	0.0				
0.03	254.42	15.95	15.95	78.00	0.53	35.92	9.32	0.3				
0.02	320.17	17.89	17.89	84.00	0.57	37.91	11.13	0.3				

Isopach map images for all of the twenty-eight Poto and Paetahi tephras

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174°30'E
39°S
39°30'S
New Plymouth
Egmont National Park
Opunake
Matemateaonga Range
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Kilometers
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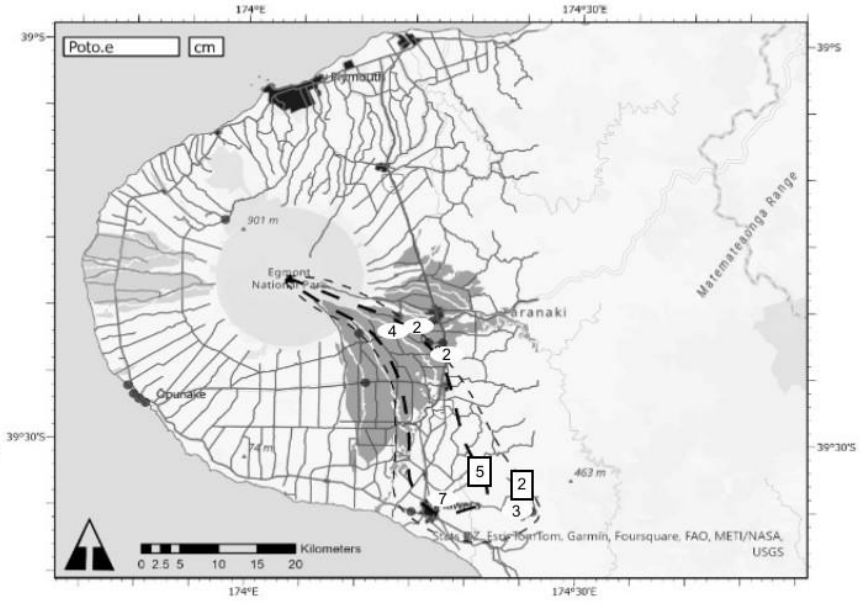
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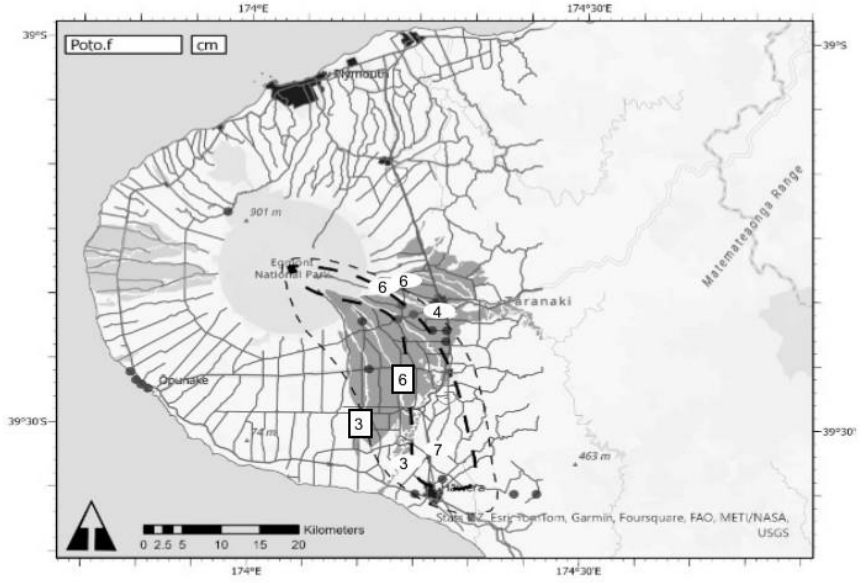
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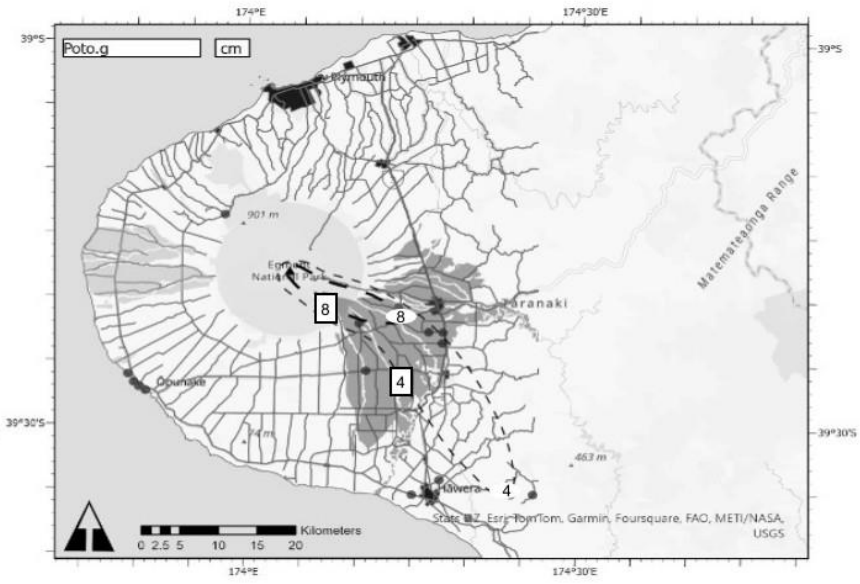
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Kilometers
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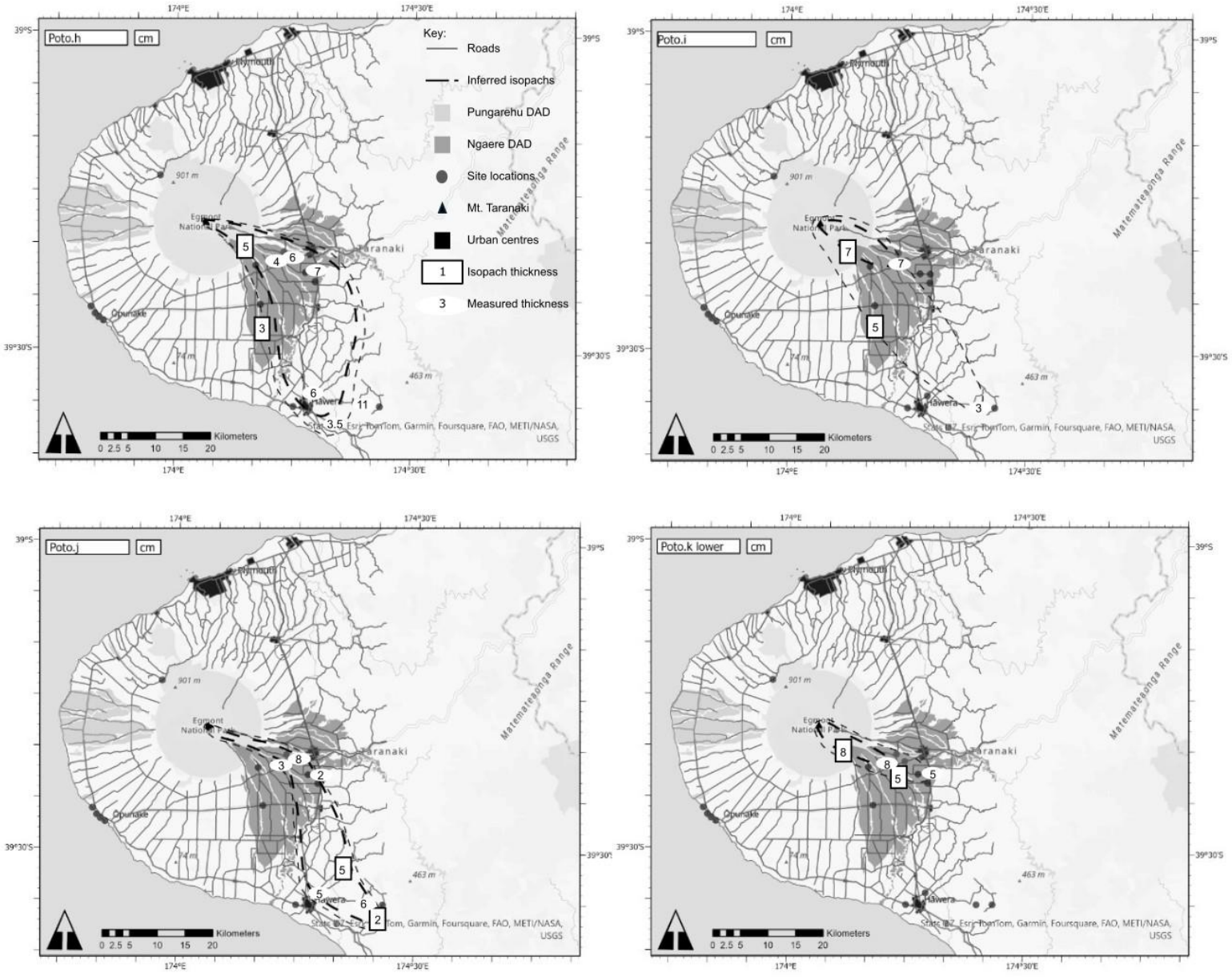
Poto.h
cm
Key:
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Inferred isopachs
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1 Isopach thickness
3 Measured thickness
Poto.i
cm
Poto.j
cm
Poto.k lower
cm
174°E
174°30'E
39°S
39°30'S
Egmont National Park
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Hawera
Kilometers
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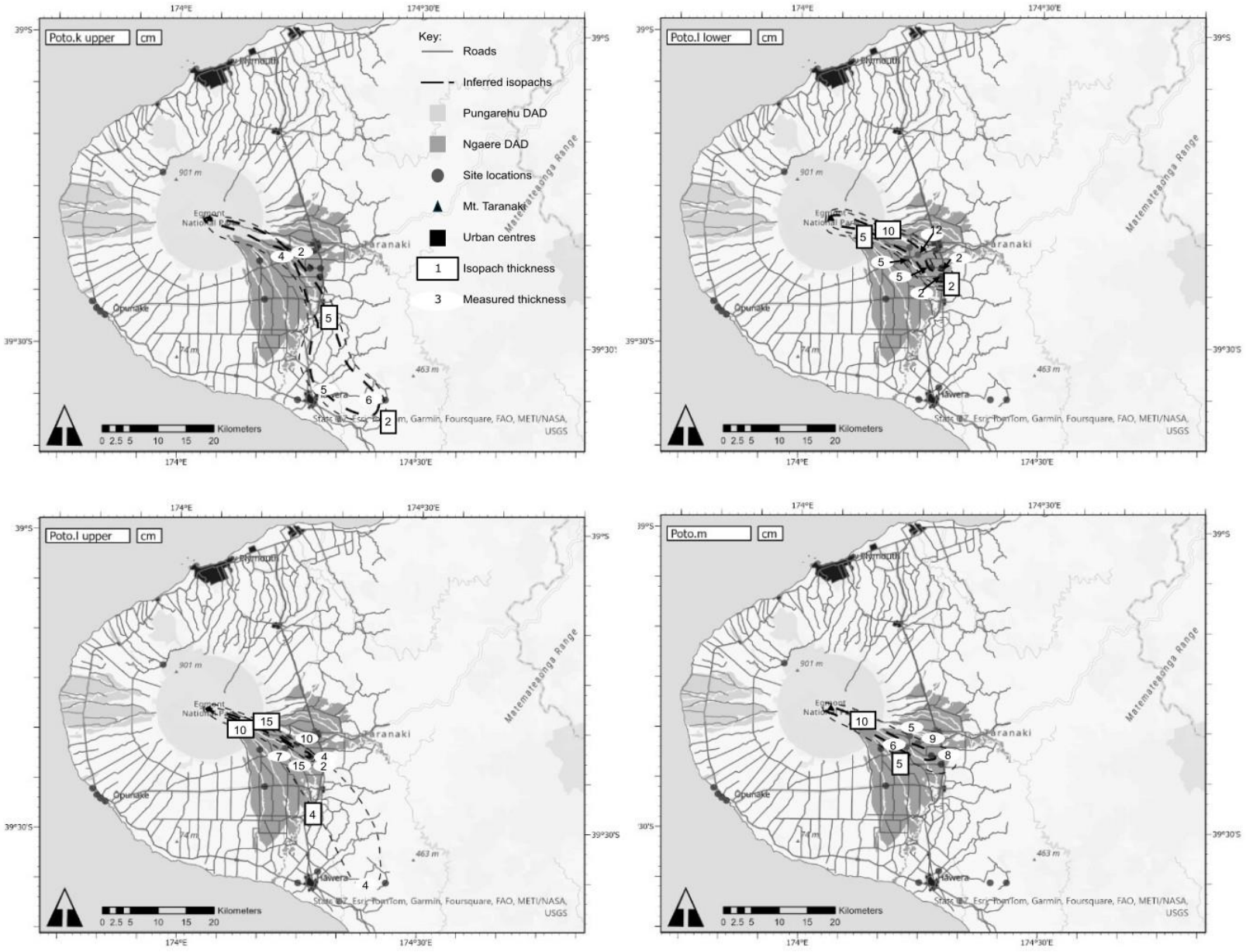
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS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Mt. Taranaki
Urban centres
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3 Measured thickness
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Poto.l upper
cm
Poto.m
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174°30'E
39°S
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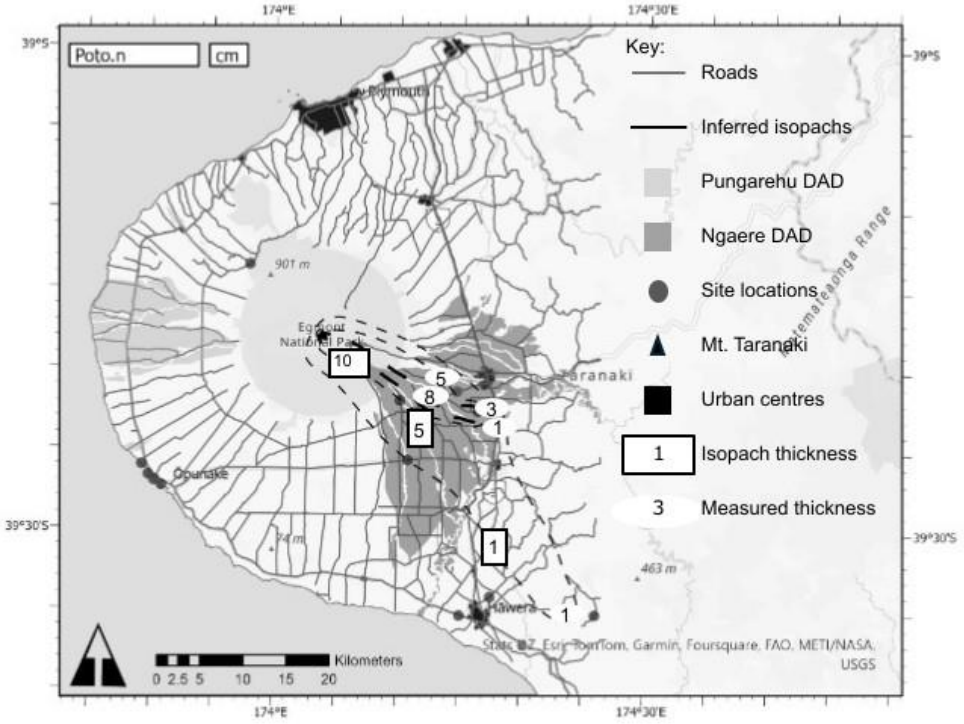
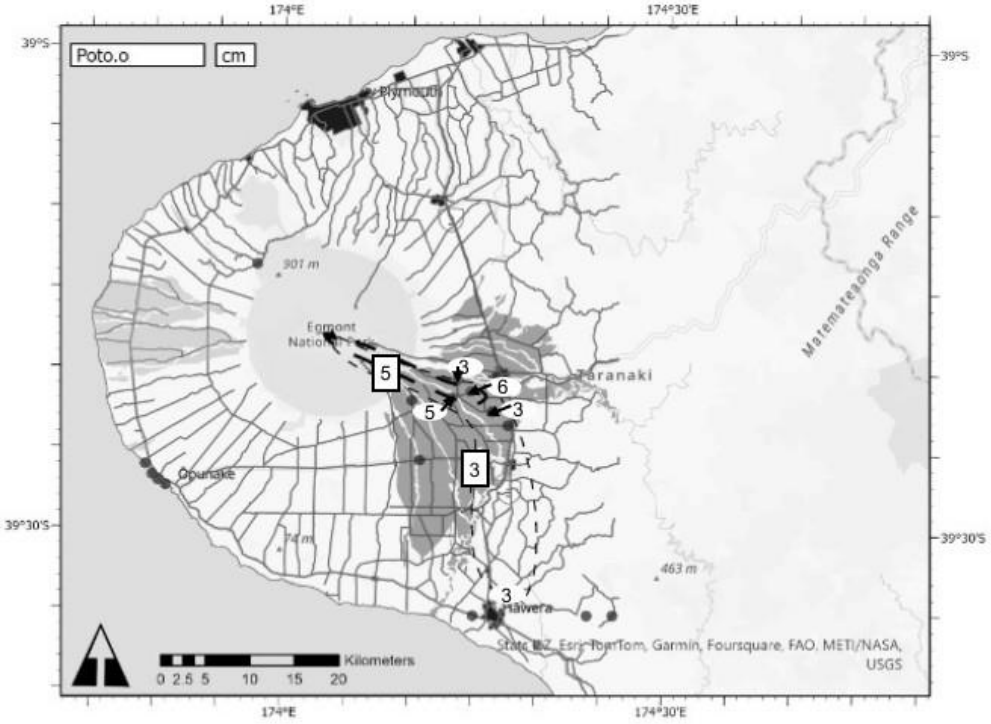
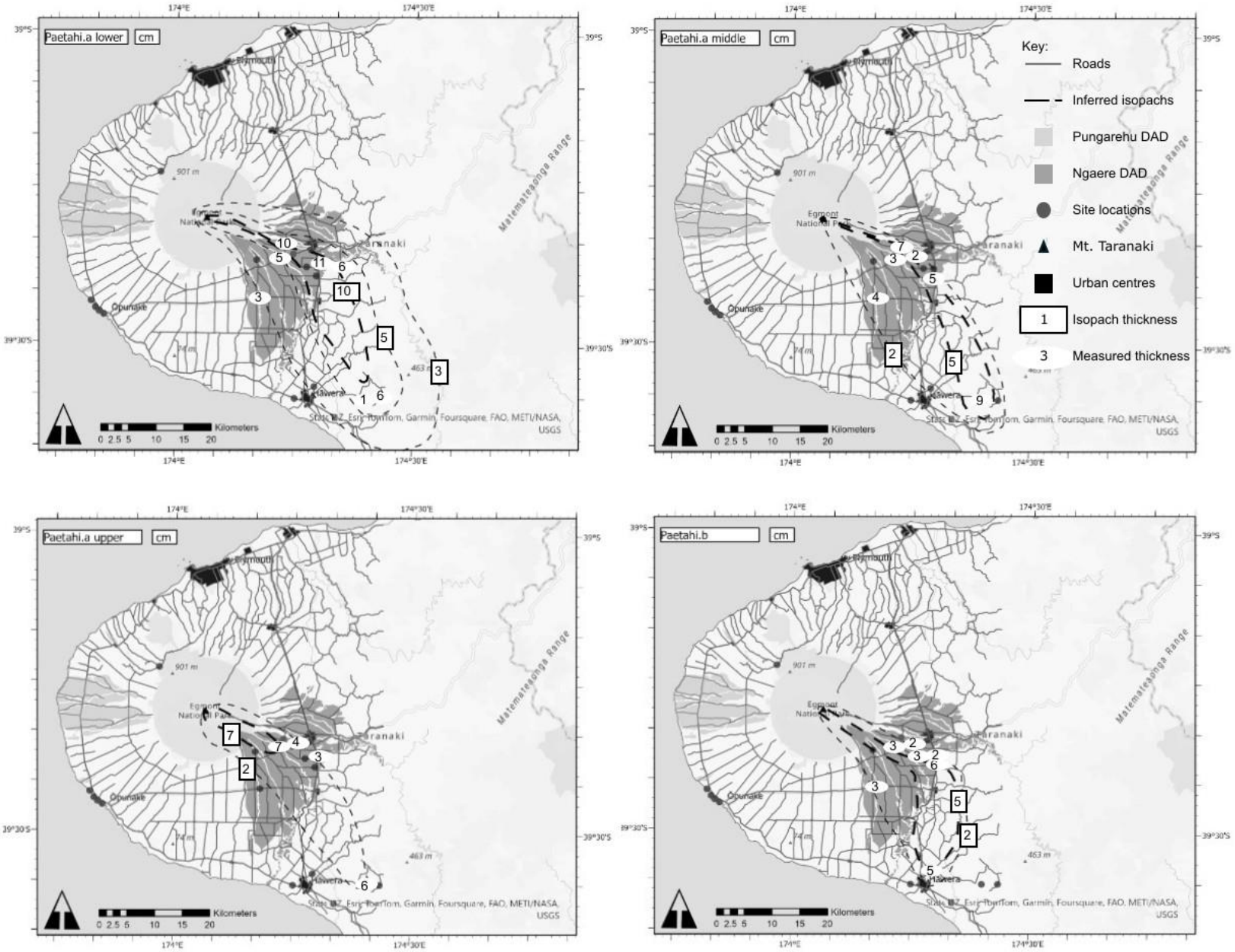
Plymouth
Egmont National Park
Taranaki
Opunake
Hawera
Matemateaonga Range
901 m
74 m
463 m
Kilometers
0 2.5 5 10 15 20
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS


Poto.n
cm
Key:
Roads
Inferred isopachs
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1 Isopach thickness
3 Measured thickness
174°E
174°30'E
39°S
39°30'S
Plymouth
Opunake
Hawera
Taranaki
Matemateaonga Range
901 m
463 m
10
5
8
3
1
5
1
1
Kilometers
0 2.5 5 10 15 20
Source: Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS


Poto.o
cm
174°E
174°30'E
39°S
39°30'S
Plymouth
Opunake
Hawera
Taranaki
Matemateaonga Range
901 m
463 m
5
3
6
5
3
3
3
Kilometers
0 2.5 5 10 15 20
Source: Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS


Paetahi.a lower
cm
Paetahi.a middle
cm
Paetahi.a upper
cm
Paetahi.b
cm
Key:
Roads
Inferred isopachs
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1 Isopach thickness
3 Measured thickness
Kilometers
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Opunake
Kaweka
Matemateaonga Range
Egmont National Park
174°E
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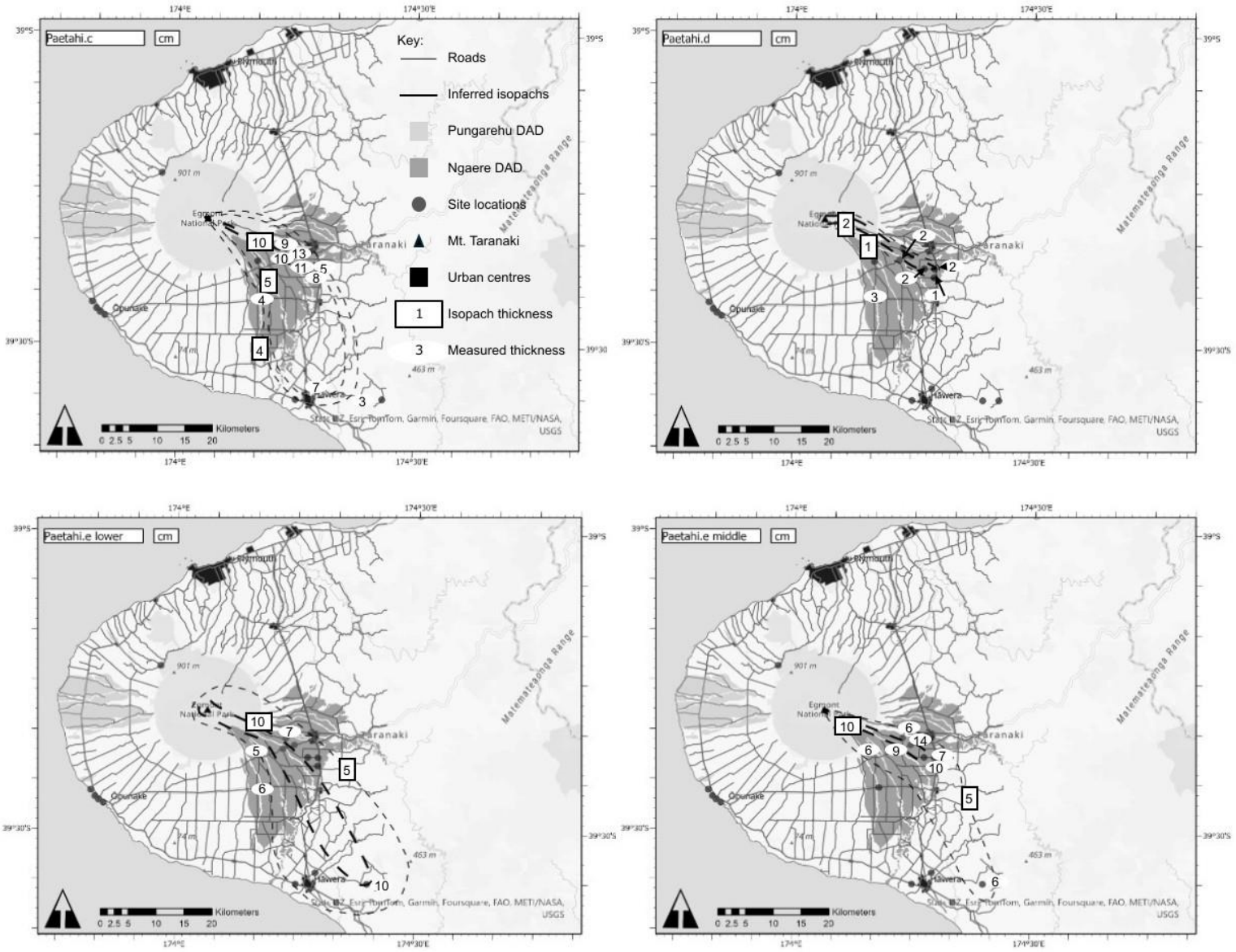
39°S
39°30'S


Paetahi.c
cm
Key:
Roads
Inferred isopachs
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1 Isopach thickness
3 Measured thickness
Paetahi.d
Paetahi.e lower
Paetahi.e middle
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S
Opunake
Hawera
Matemateaonga Range
901 m
463 m
Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

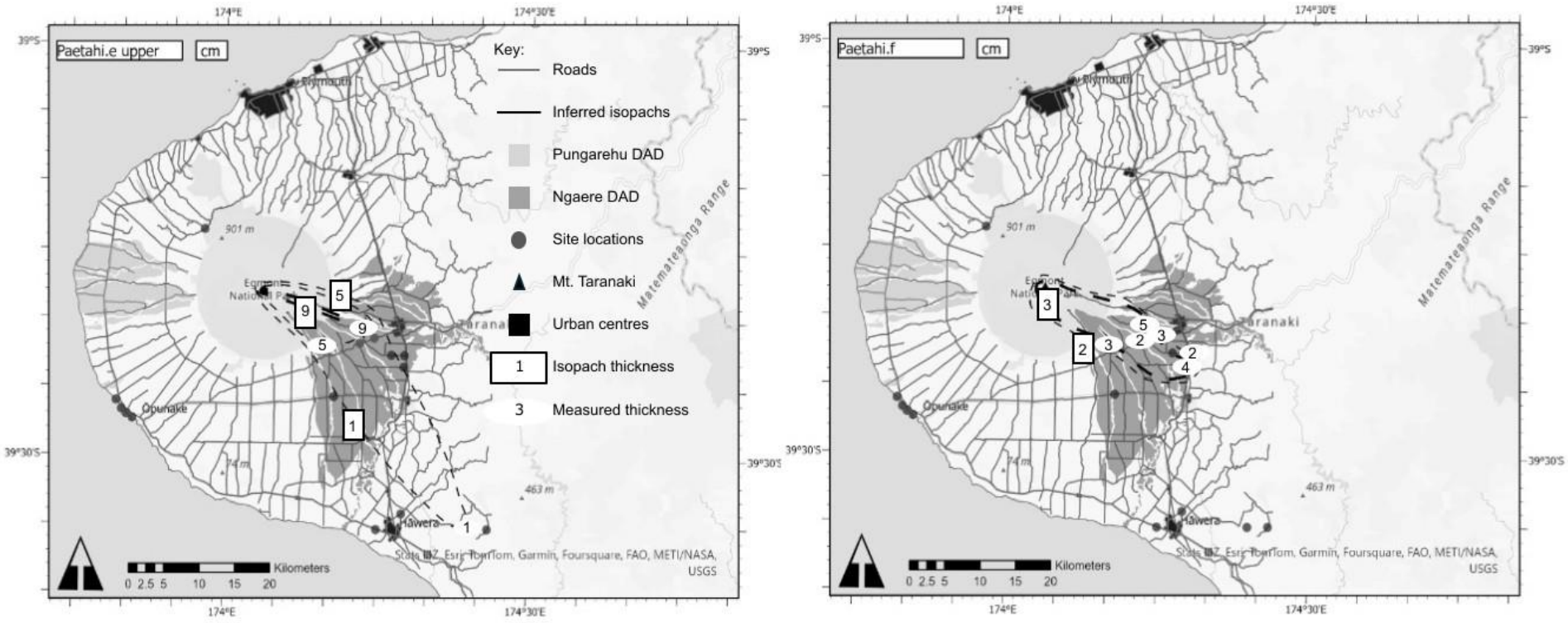


Figure 3:Isopach maps of the Poto and Paetahi tephras showing their distribution across the Taranaki ring plain. The black dots mark the studied locations. Road and Topographic data sourced from the LINZ Data Service licensed for reuse under CC by 4.0.

Isopleth data.

Table 3. Isopleth, grain size, area and volumes for the twenty-eight Poto and Paetahi fall units.

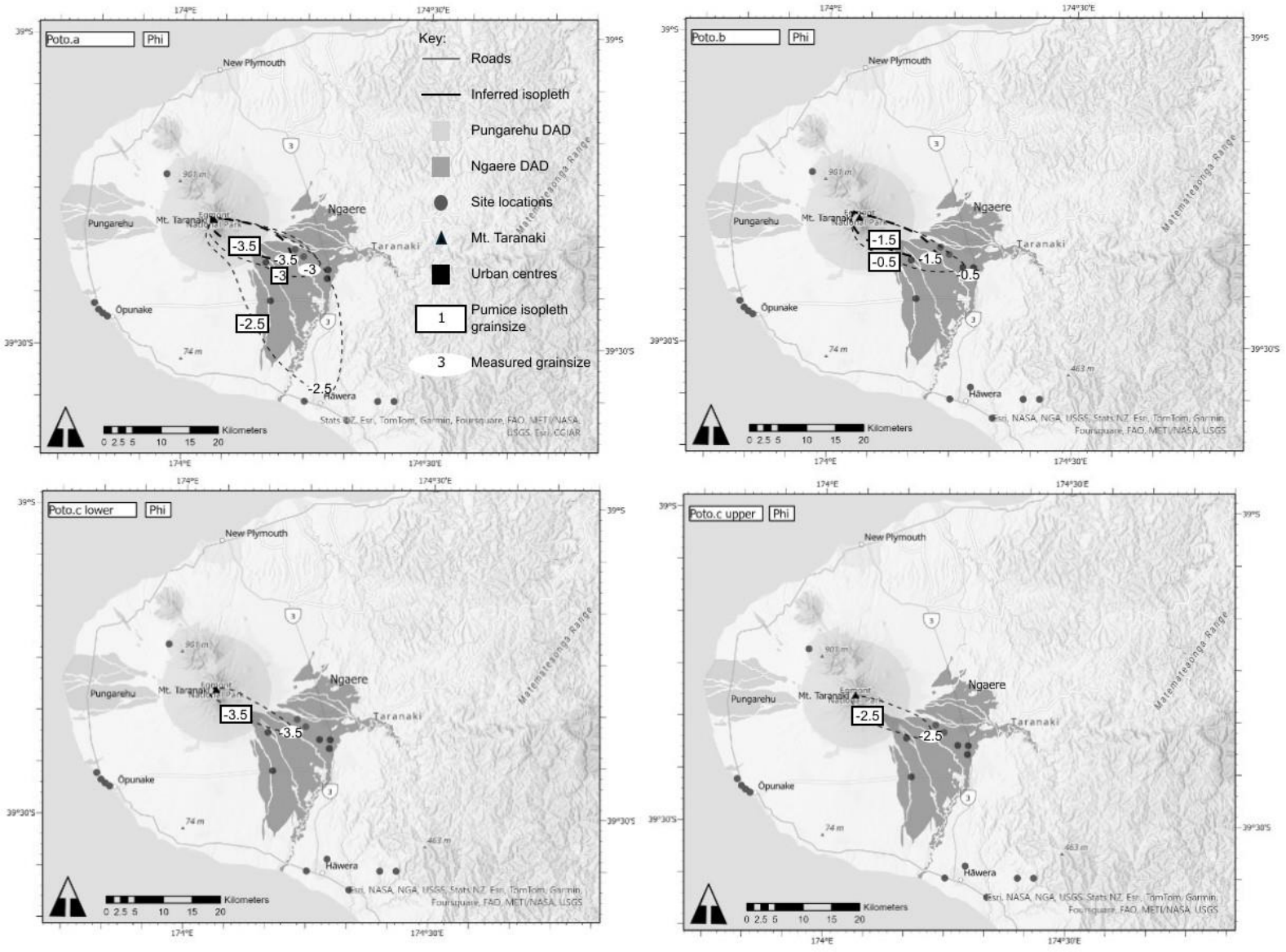
Isopleth					
Phi	A (km2)	A1/2	√ area	Perimeter (km)	Shape factor
Poto.a					
-2.5	415	20.37	20.37	86	0.71
-3	112	10.58	10.58	47	0.64
-3.5	60	7.75	7.75	35	0.62
Poto.b					
-0.5	105	10.25	10.25	48	0.57
-1.5	61	7.81	7.81	37	0.56
Poto.c lower					
-0.5	43	6.56	6.56	29	0.64
-3.5	45	6.71	6.71	35	0.46
Poto.c upper					
-2.5	55	7.42	7.42	34	0.60
Poto.d					
-2.5	50	7.07		35	0.51
Poto.e					
-1.5	1155	33.99	33.99	145	0.69
-2	874	29.56	29.56	134	0.61
-2.5	491	22.16	22.16	105	0.56
-3	40	6.32	6.32	37	0.37
Poto.f					
-2	1168	34.18	34.18	130	0.87
-2.5	551	23.47	23.47	92	0.82
-3	334	18.28	18.28	73	0.79
-3.5	210	14.49	14.49	63	0.66
Poto.g					
-3	63	7.94	7.94	36	0.61
Poto.h					
-3.5	57	7.55	7.55	36	0.55
Poto.i					

-4	55	7.42	7.42	35	0.56
Poto.j					
-3.5	54	7.35	7.35	35	0.55
Poto.k lower					
-4	37	6.08	6.08	34	0.40
Poto.k upper					
-3.5	37	6.08	6.08	34	0.40
Poto.l lower					
-3.5	113	10.63	10.63	55	0.47
-4	54	7.35	7.35	50	0.27
Poto.l upper					
-2.5	71	8.43	8.43	46	0.42
-4	35	5.92	5.92	34	0.38
Poto.m					
-2	71	8.43	8.43	41	0.53
-4	35	5.92	5.92	35	0.36
Poto.n					
-2	122	11.05	11.05	53	0.55
-3	66	8.12	8.12	40	0.52
-4	36	6.00	6.00	36	0.35
Poto.o					
-2	449	21.19	21.19	99	0.58
-2.5	185	13.60	13.60	62	0.60
-3	123	11.09	11.09	56	0.49
-4	48	6.93	6.93	44	0.31

Isopleth					
Phi	A (km2)	A1/2	√ area	Perimeter (km)	Shape factor
Paetahi.a lower					
-2.5	601	24.52	24.52	124	0.49
-3	206	14.35	14.35	77	0.44
-4	132	11.49	11.49	69	0.35
Paetahi.a middle					

-3.5	85	9.22	9.22	52	0.40
-4	26	5.10	5.10	34	0.28
Paetahi.a upper					
-3	86	9.27	9.27	44	0.56
-4	41	6.40	6.40	36	0.40
Paetahi.b					
-2.5	405	20.12	20.12	91	0.61
-3.5	312	17.66	17.66	85	0.54
-4	220	14.83	14.83	77	0.47
Paetahi.c					
-3	179	13.38	13.38	58	0.67
-3.5	84	9.17	9.17	43	0.57
-4	47	6.86	6.86	37	0.43
Paetahi.d					
-3	154	12.41	12.41	56	0.62
-4	73	8.54	8.54	42	0.52
Paetahi.e lower					
-4	41	6.40	6.40	36	0.40
Paetahi.e middle					
-2.5	448	21.17	21.17	105	0.51
-3	177	13.30	13.30	55	0.74
-3.5	124	11.14	11.14	45	0.77
-4	48	6.93	6.93	31	0.63
Paetahi.e upper					
-3	45	6.71	6.71	36	0.44
Paetahi.f					
-2.5	115	10.72	10.72	64	0.35
-3.5	36	6.00	6.00	39	0.30

Isopleth map images for all of the twenty-eight Poto and Paetahi Formations.


Poto.a
Phi
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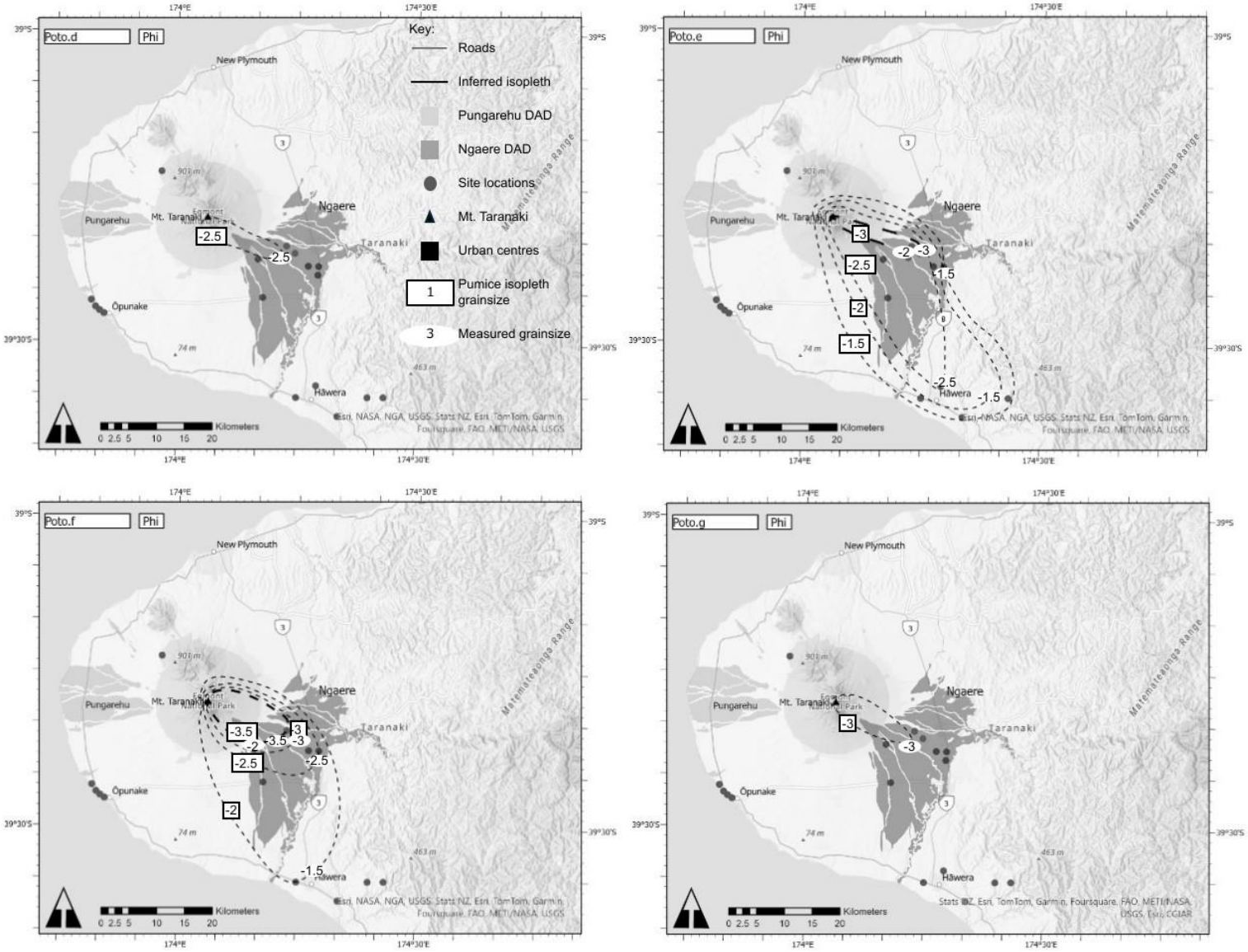
Inferred isopleth
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1
Pumice isopleth grainsize
3
Measured grainsize
-3.5
-3.5
-3
-3
-2.5
-2.5
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Ōpunake
Hāwera
Matemateaonga Range
Kilometers
0 2.5 5 10 15 20
Poto.b
-1.5
-0.5
-1.5
-0.5
Poto.c lower
-3.5
-3.5
Poto.c upper
-2.5
-2.5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Phi
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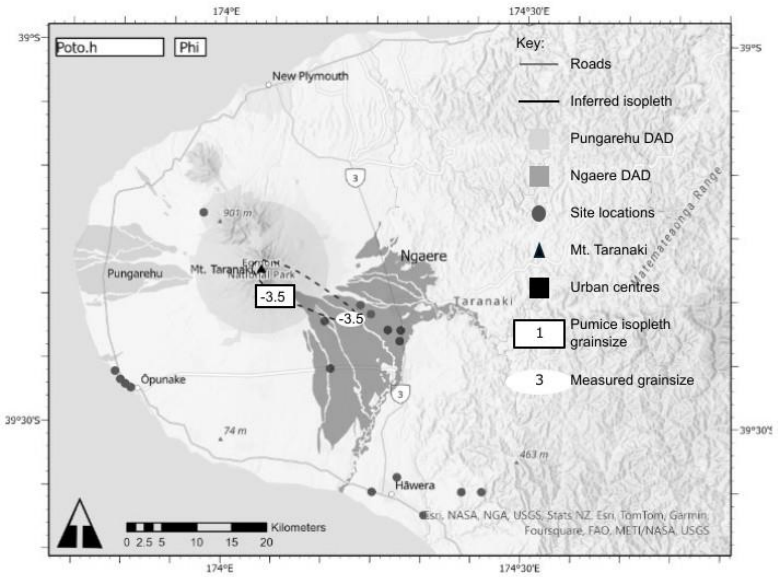
Roads
Inferred isopleth
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1
Pumice isopleth grainsize
3
Measured grainsize
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Ōpunake
Hāwera
Matemateaonga Range
-2.5
-2.5
Kilometers
0 2.5 5 10 15 20
Esri, NASA, NGA, USGS, Stats NZ, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
Poto.e
Phi
-3
-2
-3
-2.5
-1.5
-2
-1.5
-2.5
-1.5
Poto.f
Phi
-3.5
-3
-2
-3.5
-3
-2.5
-2.5
-2
-1.5
Poto.g
Phi
-3
-3
Stats NZ, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR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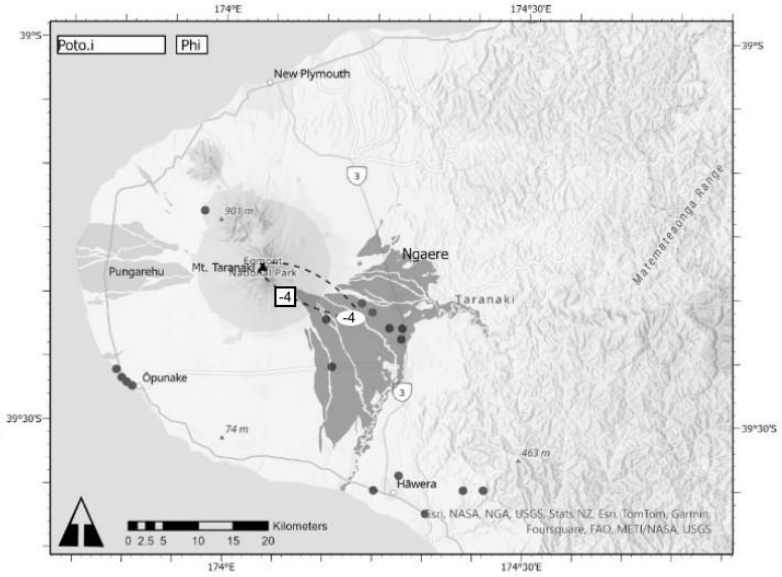
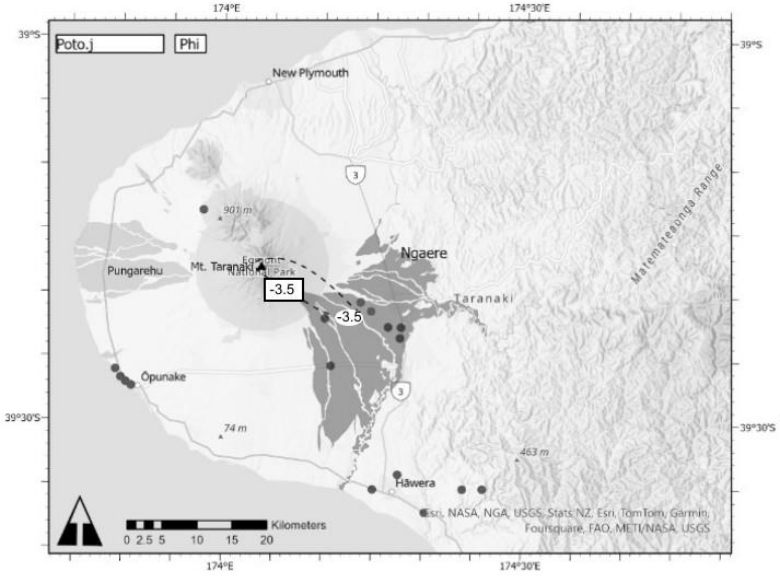
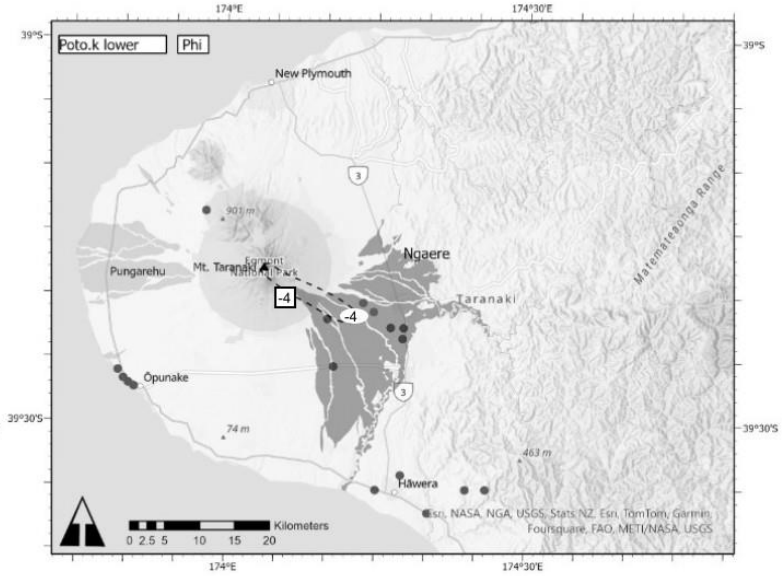
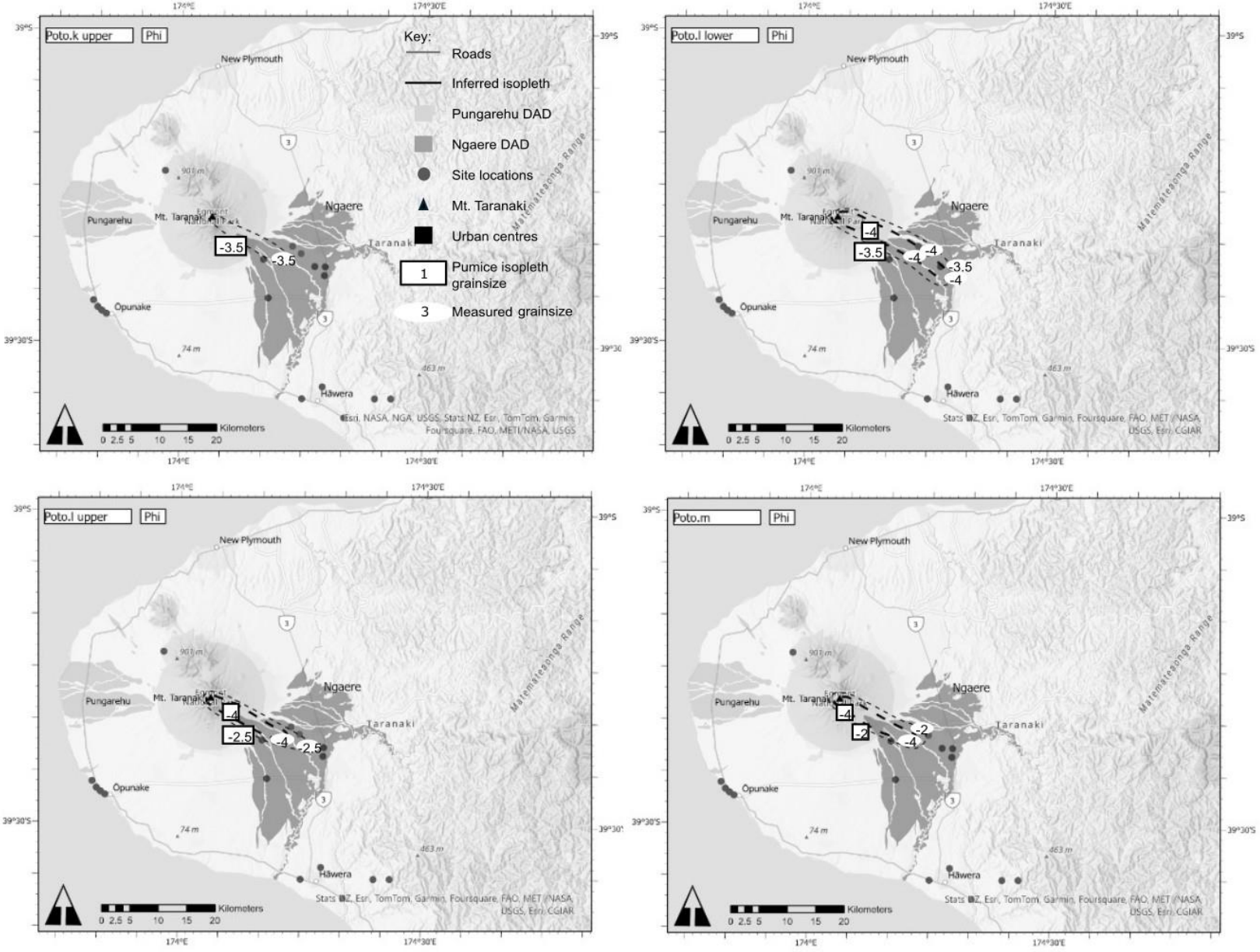
Phi
Key:
Roads
Inferred isopleth
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1
Pumice isopleth grainsize
3
Measured grainsize
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Matemateaonga Range
Ōpunake
Hāwera
-3.5
-3.5
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S


Poto.i
Phi
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Matemateaonga Range
Ōpunake
Hāwera
-4
-4
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S


Poto.j
Phi
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Matemateaonga Range
Ōpunake
Hāwera
-3.5
-3.5
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S


Poto.k lower
Phi
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Matemateaonga Range
Ōpunake
Hāwera
-4
-4
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S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Phi
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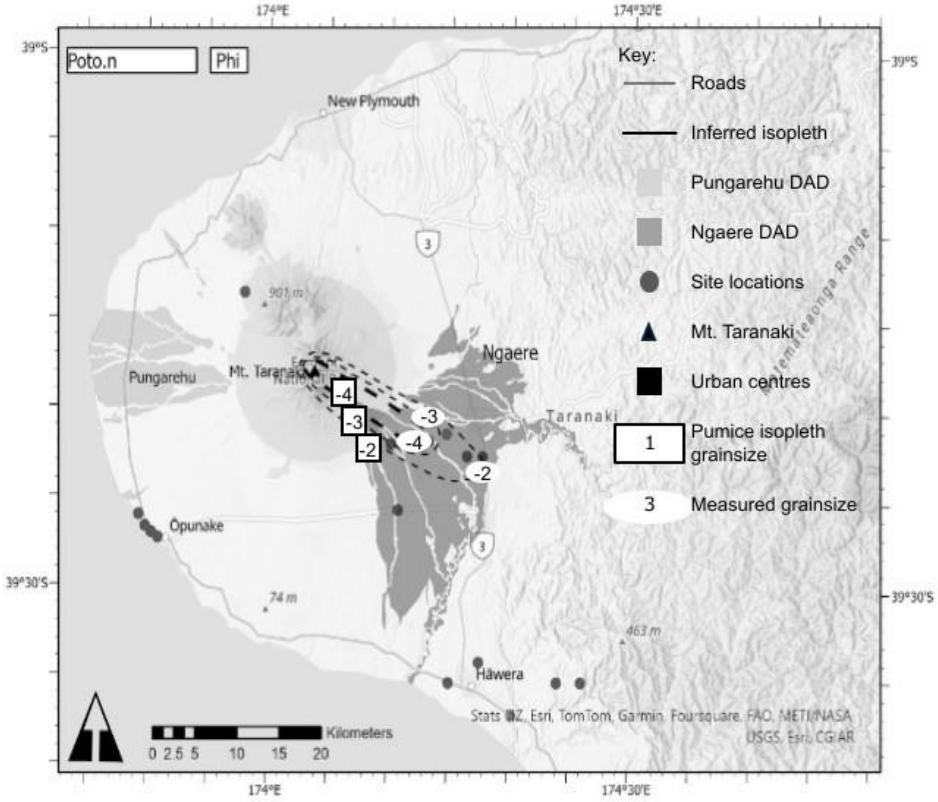
Inferred isopleth
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1 Pumice isopleth grainsize
3 Measured grainsize
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Matemateaonga Range
Ōpunake
Hāwera
-3.5
-3.5
Kilometers
0 2.5 5 10 15 20
Poto.l lower
Phi
-4
-3.5
-4
-4
-3.5
-4
Poto.l upper
Phi
-4
-2.5
-4
-2.5
Poto.m
Phi
-4
-2
-2
-4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Phi
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Roads
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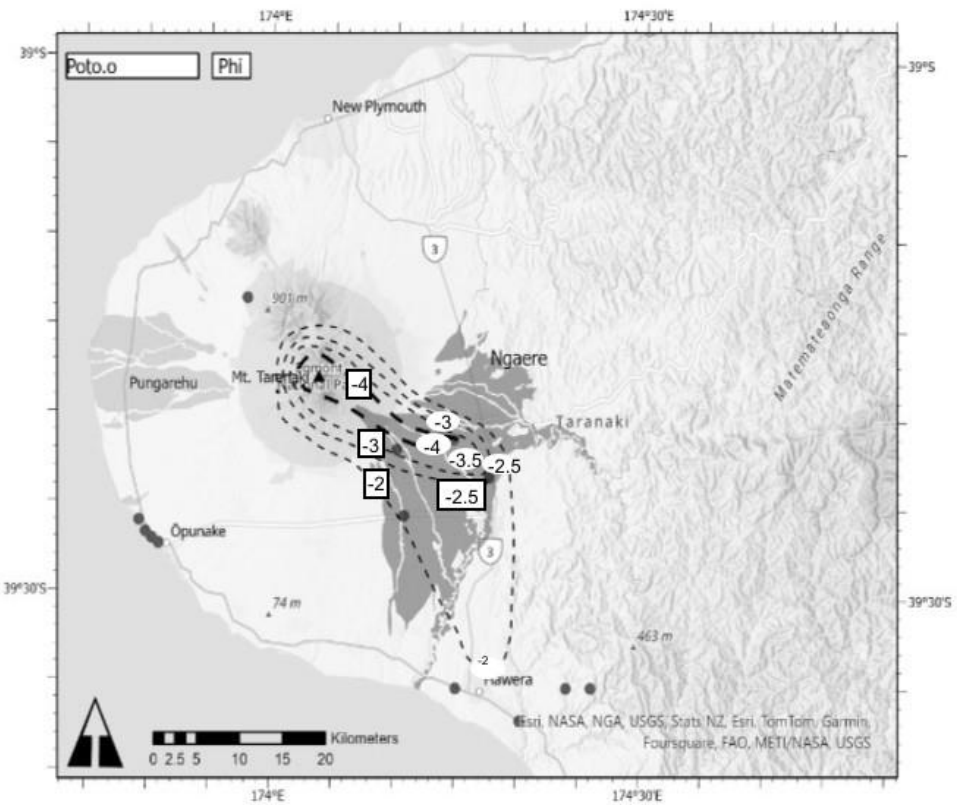
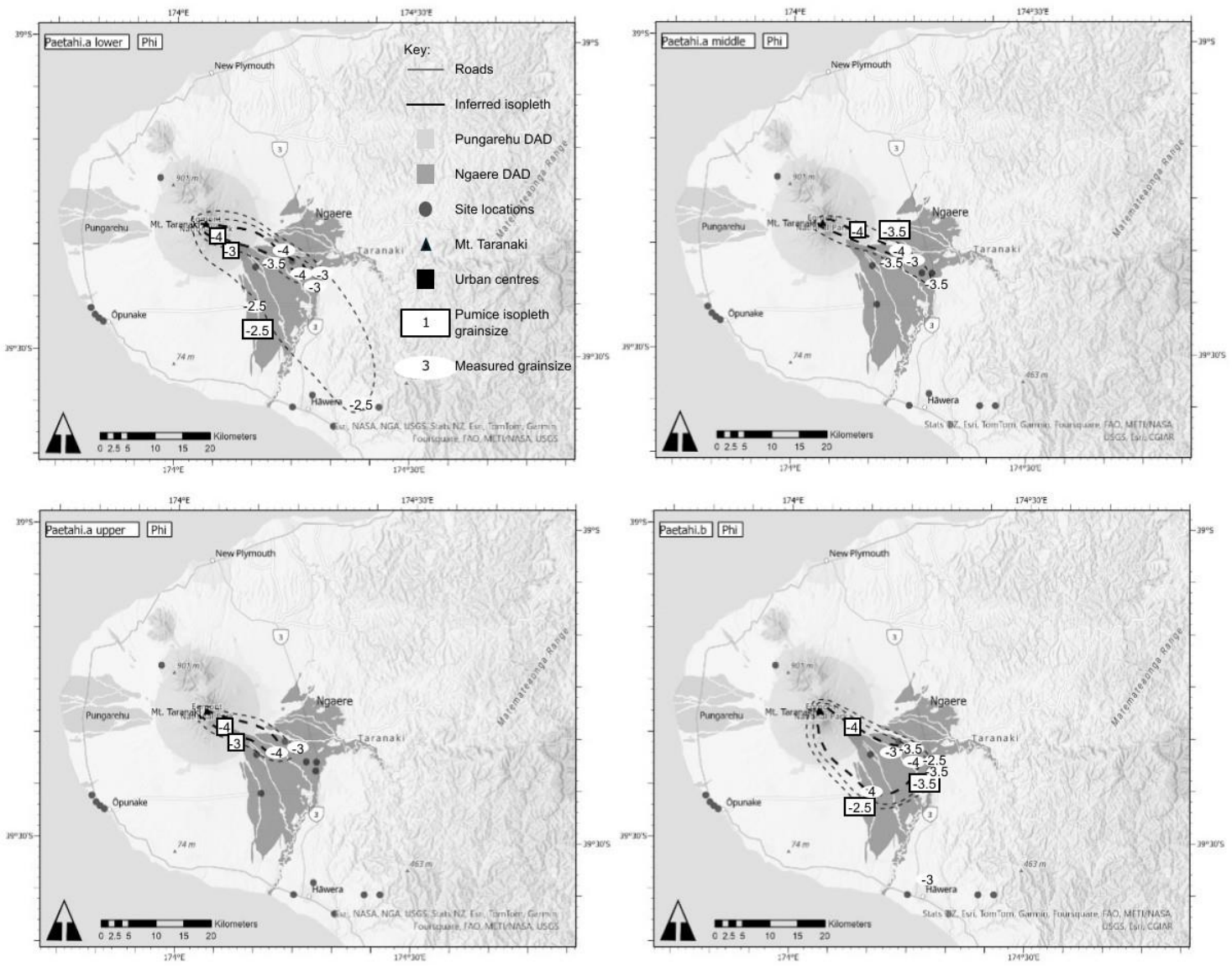
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1
Pumice isopleth grainsize
3
Measured grainsize
New Plymouth
Pungarehu
Mt. Taranaki
Ngaere
Taranaki
Ōpunake
Hāwera
Matemateaonga Range
901 m
74 m
463 m
-4
-3
-2
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S


Poto.o
Phi
New Plymouth
Pungarehu
Mt. Taranaki
Ngaere
Taranaki
Ōpunake
Hāwera
Matemateaonga Range
901 m
74 m
463 m
-4
-3
-3.5
-2.5
-2
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S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Phi
Key:
Roads
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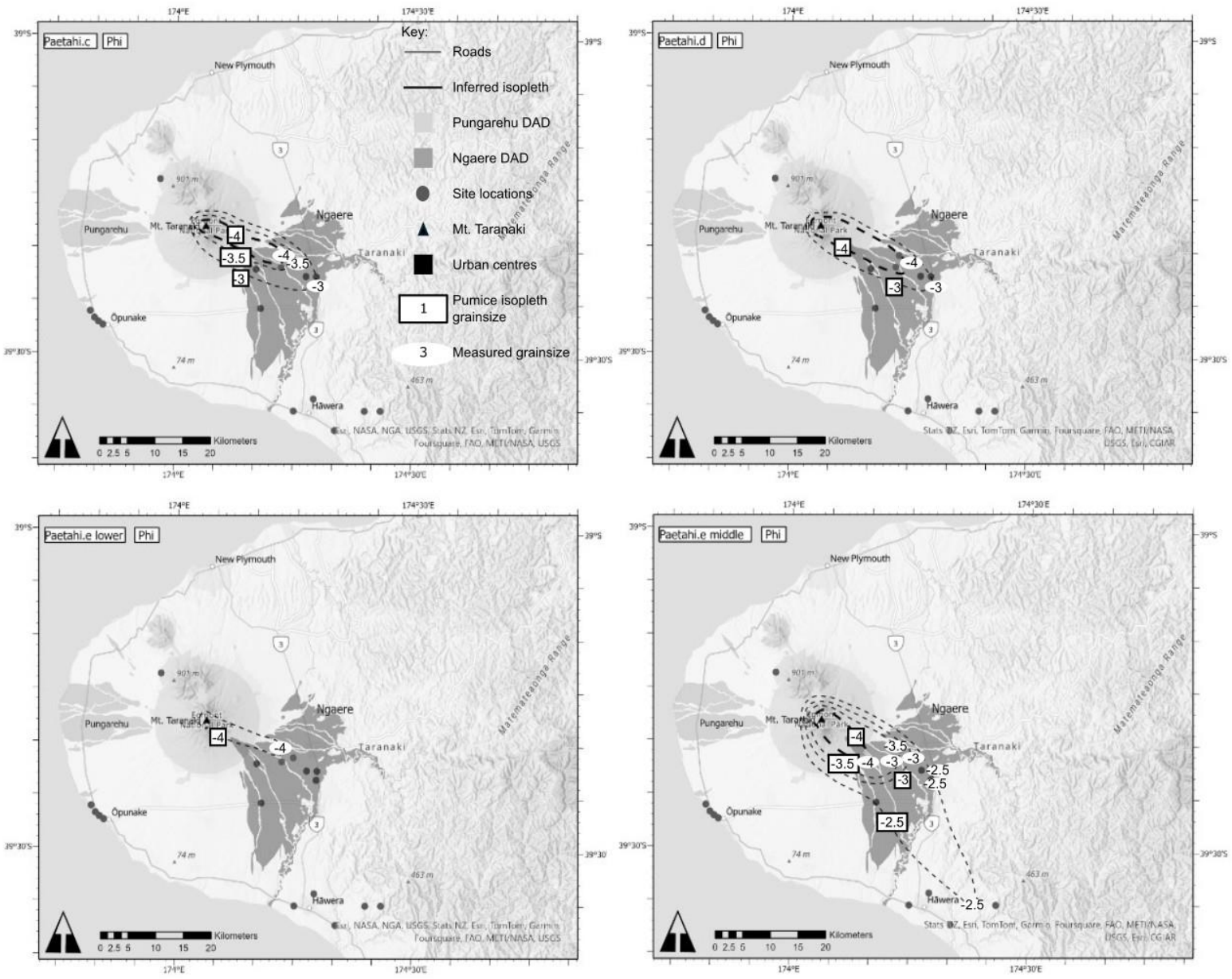
Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
Pumice isopleth grainsize
Measured grainsize
New Plymouth
Ngaere
Pungarehu
Mt. Taranaki
Taranaki
Ōpunake
Hāwera
Matemateaonga Range
Kilometers
Paetahi.a middle
Phi
Paetahi.a upper
Phi
Paetahi.b
Phi


Paetahi.c
Phi
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Pungarehu DAD
Ngaere DAD
Site locations
Mt. Taranaki
Urban centres
1
Pumice isopleth grainsize
3
Measured grainsize
New Plymouth
Ngaere
Pungarehu
Taranaki
Ōpunake
Hāwera
Matemateaonga Range
-4
-3.5
-3
Kilometers
0 2.5 5 10 15 20
174°E
174°30'E
39°S
39°30'S
Paetahi.d
Phi
Paetahi.e lower
Phi
Paetahi.e middle
Phi
-2.5
Esri, NASA, NGA, USGS, Stats NZ, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS
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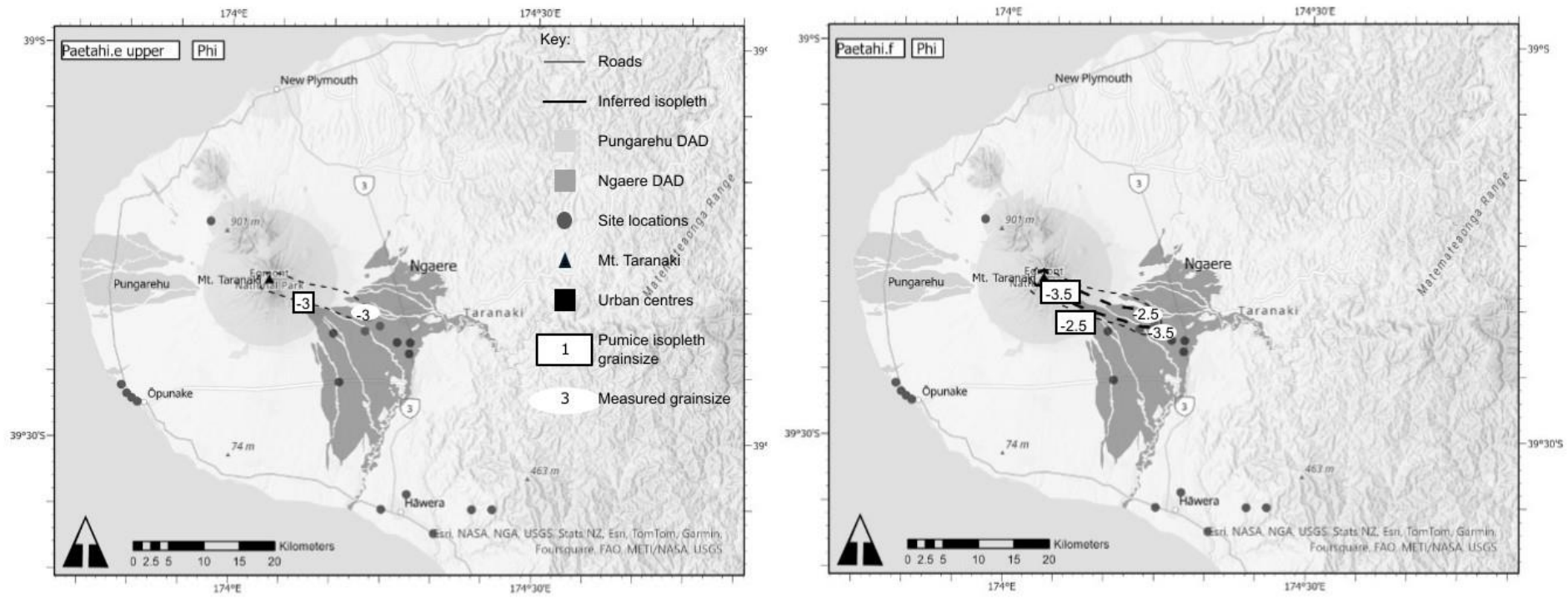
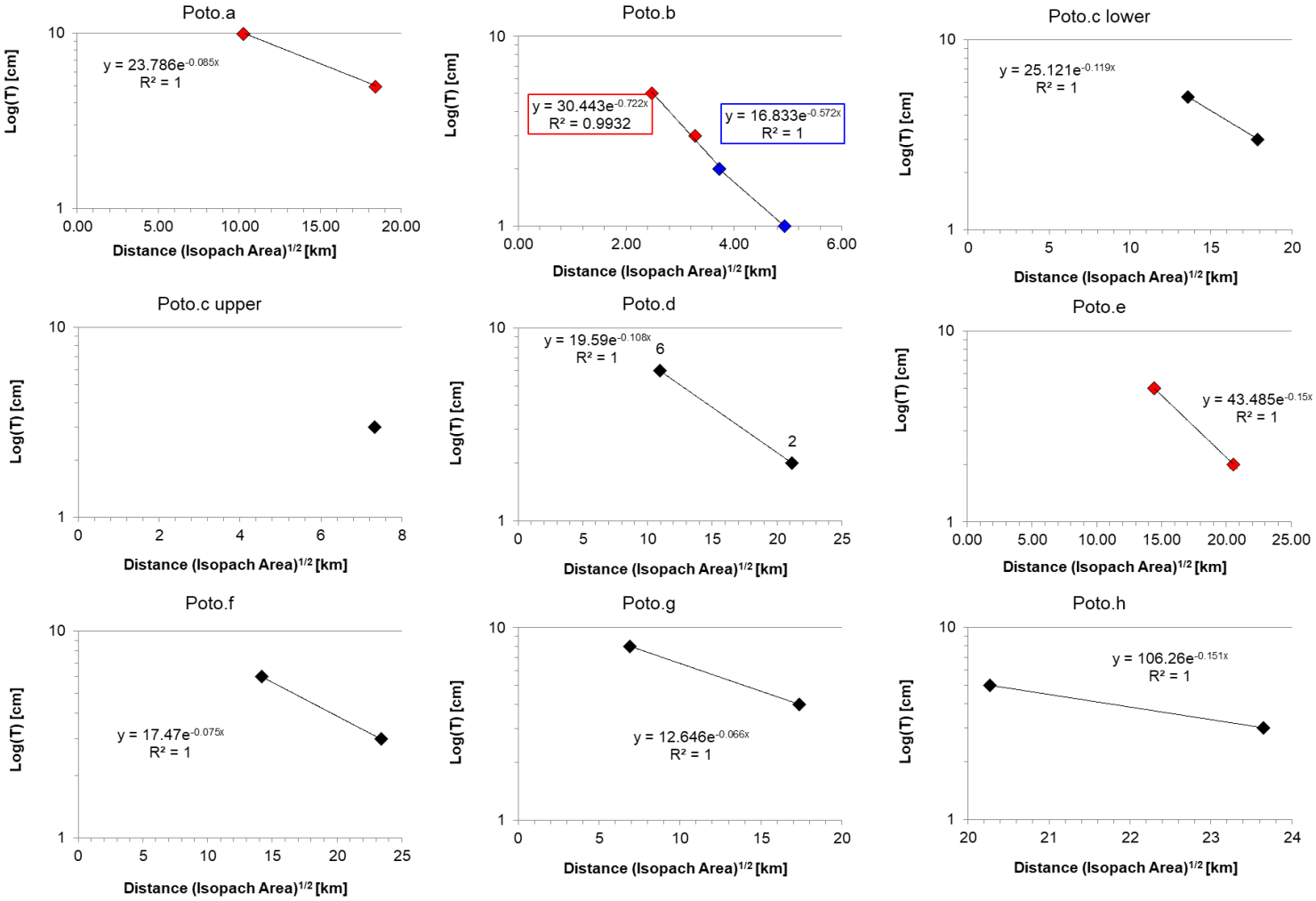
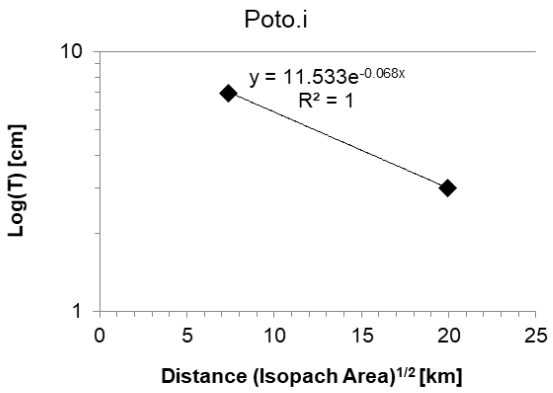


Figure 4: Isopleth maps for the Poto and Paetahi tephras showing their distribution across the Taranaki ring plain. The black dots mark the studied locations. Road and Topographic data sourced from the LINZ Data Service licensed for reuse under CC by 4.0.

Isopach graphs.

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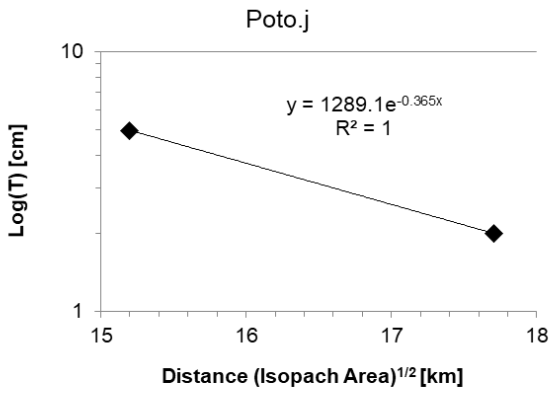
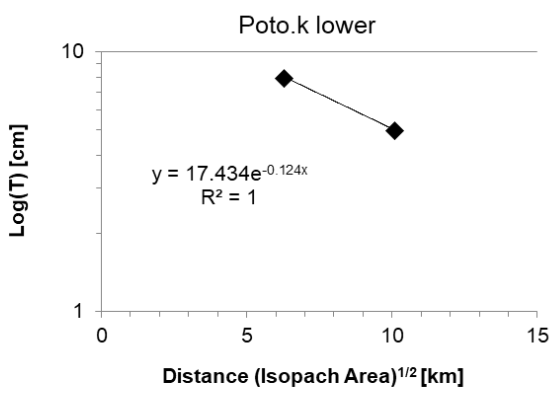
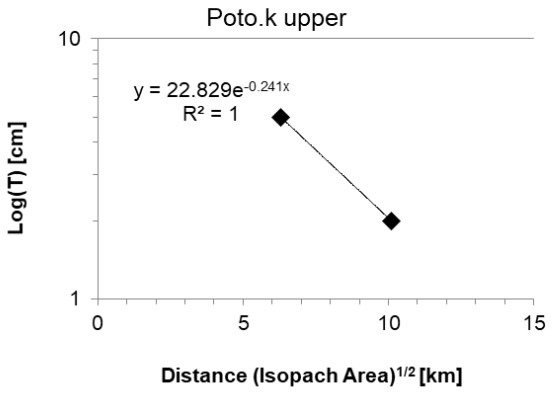
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.j
y = 1289.1e-0.365x
R² = 1
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.k lower
y = 17.434e-0.124x
R² = 1
Log(T) [cm]
Distance (Isopach Area)1/2 [km]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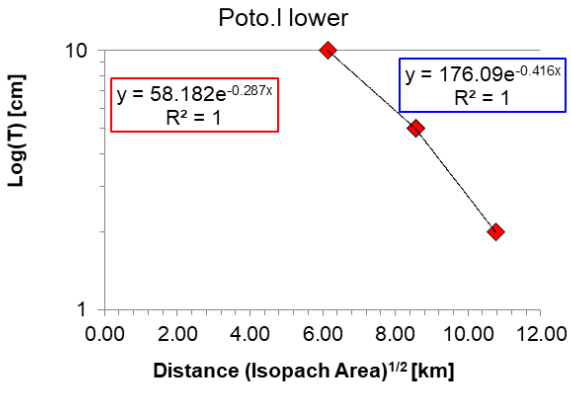
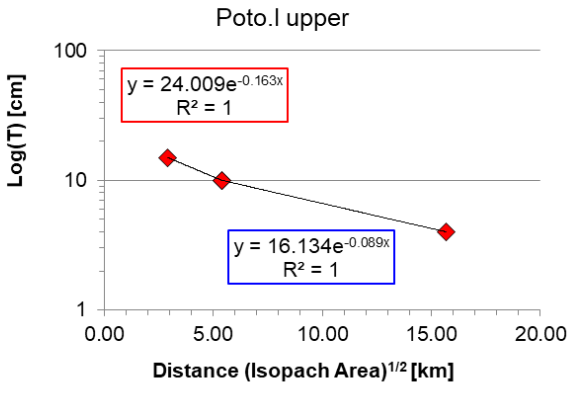
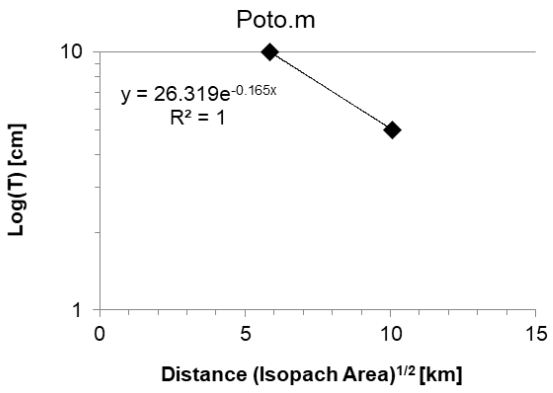
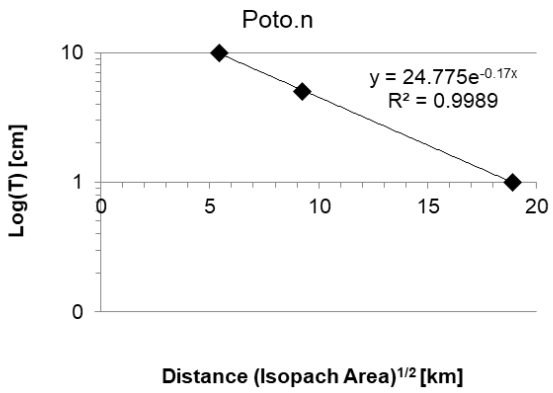
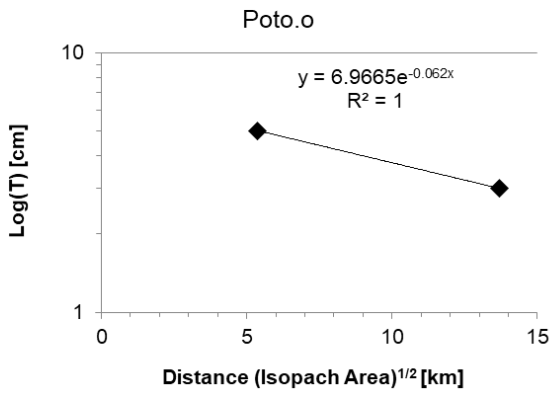
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.l lower
y = 58.182e-0.287x
R² = 1
y = 176.09e-0.416x
R² = 1
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.l upper
y = 24.009e-0.163x
R² = 1
y = 16.134e-0.089x
R² = 1
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.m
y = 26.319e-0.165x
R² = 1
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.n
y = 24.775e-0.17x
R² = 0.9989
Log(T) [cm]
Distance (Isopach Area)1/2 [km]


Poto.o
y = 6.9665e-0.062x
R² = 1
Log(T) [cm]
Distance (Isopach Area)1/2 [km]

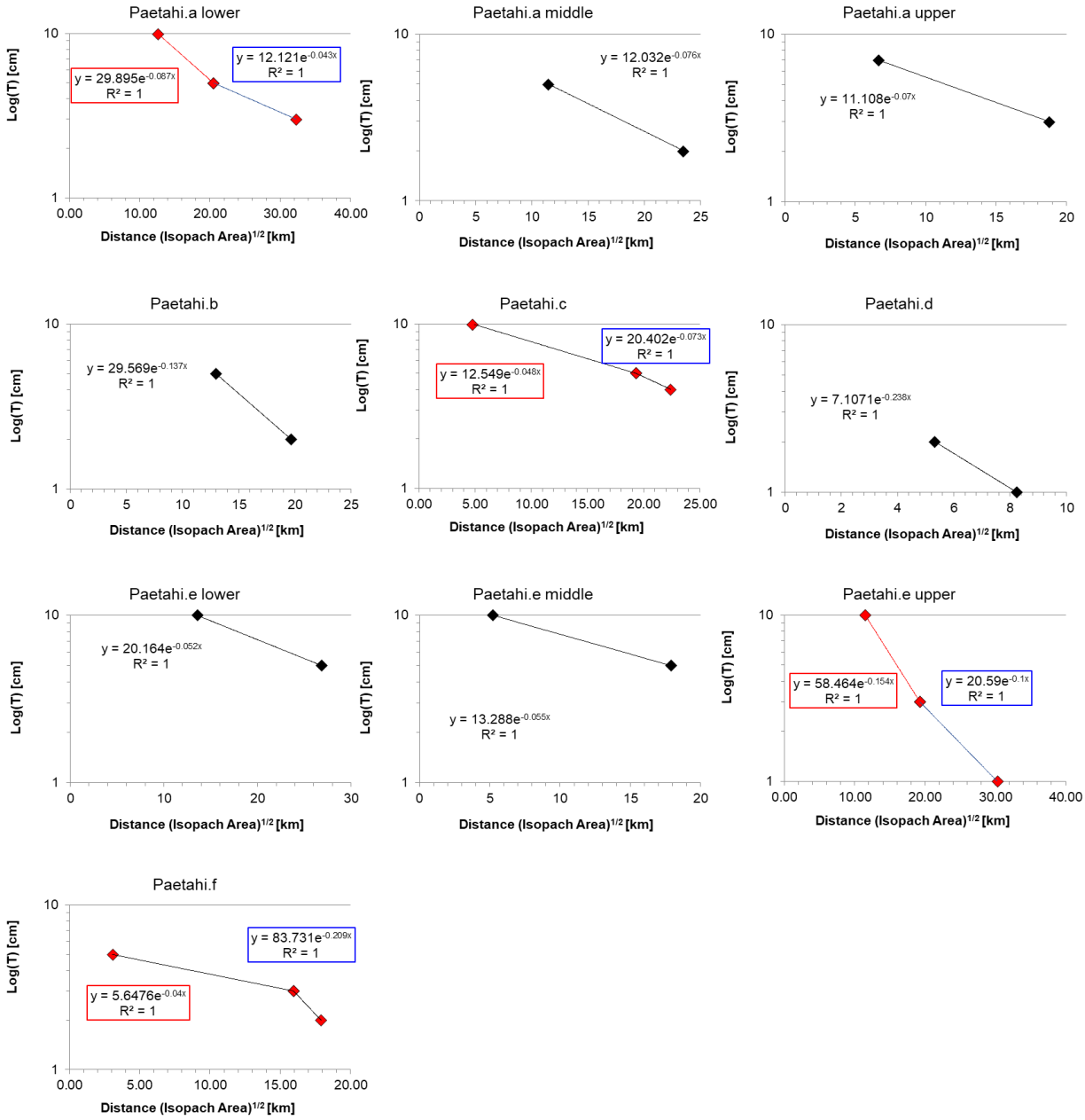


Figure 5: Isopach data plots for the individual eruptive layers of the Poto and Paetahi Formations showing segments with different slopes. The coloured boxes show the slopes of the different segments.

References:

Daggitt, M. L., Mather, T. A., Pyle, D. M., & Page, S. (2014). AshCalc–a new tool for the comparison of the exponential, power-law and Weibull models of tephra deposition. *Journal of Applied Volcanology*, *3*(1), 7. https://doi.org/10.1186/2191-5040-3-7

Land Information New Zealand. (n.d). LINZ Data Service. https://data.linz.govt.nz/