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Aquatic Sciences

CORRECTION

Correction to: Patterns and controls of mercury accumulation in sediments from three thermokarst lakes on the Arctic Coastal Plain of Alaska

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Correction to: Aquatic Sciences (2018) 80:1
https://doi.org/10.1007/s00027-017-0553-0

The following corrections pertain to a calculation error associated with sediment focusing factors.

Page 1, Abstract, lines 6–8: The following sentence, which previously read:

"Mercury accumulation in two of the three lakes was variable and high over the past century (91.96 and 78.6 µg/m^2/year), and largely controlled by sedimentation rate. Mercury accumulation in the third lake was lower (14.2 µg/m^2/year), more temporally uniform, and was more strongly related to sediment Hg concentration than sedimentation rate."

should read:

"Mercury accumulation in two of the three lakes was variable and high over the past century (37.4 and 45.84 µg/m^2/year), and largely controlled by sedimentation rate. Mercury accumulation in the third lake was lower (6.46 µg/m^2/year), more temporally uniform, and was more strongly related to sediment Hg concentration than sedimentation rate."

Page 5, Table 1: The following table which previously read:

Table 1 Physical characteristics and summary Hg accumulation results of the three study lakes (BRW100, ATQ206, RDC312) on the Arctic Coastal Plain of Alaska; Hg accumulation trends were assessed using Mann–Kendall tests (a p value < 0.05 denotes a significant temporal trend and the Kendall's tau denotes the direction and magnitude of the relationship); McLeod (2011); catchments were delineated, and percent growth was calculated using ArcMap™10.2.2 (ESRI 2016)

	BRW100	ATQ206	RDC312
Latitude (decimal degrees)	71.24163	70.41557	69.95348
Longitude (decimal degrees)	− 156.77391	− 156.98128	− 156.63817
Surface area (km^2)	1.7	1.8	0.7
Catchment area (km^2)	24.0	22.8	29.9
Catchment to surface area ratio	13.7	12.8	41.0
Growth since 1948 (%)	12.7	− 0.3	5.4
Landscape type	Lake thermokarst	Lake thermokarst	Lake thermokarst
Mean Hg accumulation (µg/m^2/year)	92.0	14.2	78.7
Standard deviation	36.1	3.6	68.5
Hg accumulation trend	No trend	Positive	No trend
Kendall's tau (τ)	0.28	0.42	0.61
Mann–Kendall p value	0.17	0.04	0.84

Should read:

The original article can be found online at https://doi.org/10.1007/s00027-017-0553-0.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s00027-020-0707-3) contains supplementary material, which is available to authorized users.

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Catchment to surface area ratio	13.7	12.8	41.0
Growth since 1948 (%)	12.7	− 0.3	5.4
Landscape type	Lake thermokarst	Lake thermokarst	Lake thermokarst
Mean Hg accumulation (μg/m^2/year)	37.4	6.5	45.8
Standard deviation	14.7	1.6	40.5
Hg accumulation trend	No trend	Positive	No trend
Kendall's tau (τ)	0.28	0.42	0.61
Mann–Kendall p value	0.17	0.04	0.84

Page 6, Table 2: The following Table which previously read:

Table 2 Mean Hg accumulation and Mann–Kendall results for thirty-seven previously studied Arctic and subarctic lakes; landscape types were designated using the maps generated by Olefeldt et al. 2016; further lake information available in the Supplemental Materials

Lake	Country	Landscape type	Mean Hg Accum (μg/m^2/year)	σ	Trend	τ	p
2-A	Canada	Lake	62.23	18.04	neg	− 0.71	0.019
2-B	Canada	Lake	23.88	13.58	pos	0.91	0.007
Amituk	Canada	Non-thermokarst	17.98	7.48	pos	0.70	0.02
AX-AJ	Canada	Hillslope	9.85	4.17	pos	0.94	< 0.001
BI-02	Canada	Hillslope	4.94	1.40	pos	0.39	0.047
BK-AH	Canada	Hillslope	4.54	0.98	n/a	− 0.39	0.062
Brady	USA	Non-thermokarst	8.36	1.62	pos	0.46	0.033
Burial	USA	Hillslope	4.40	1.12	pos	0.71	0.019
CF-11	Canada	Non-thermokarst	2.56	1.47	pos	1.00	0.009
Char	Canada	Non-thermokarst	14.38	6.04	pos	0.89	0.0001
Daglet	USA	Non-thermokarst	8.29	1.61	pos	0.78	0.002
Daltjørna	Norway	Non-thermokarst	22.70	4.81	pos	0.78	0.0001
DV-E	Canada	Hillslope	0.89	0.15	n/a	0.67	0.308
Efficient	USA	Hillslope	8.71	3.26	pos	0.64	< 0.0001
Forgetful	USA	Hillslope	10.13	2.66	pos	0.49	0.013
Hazen	Canada	Hillslope	31.55	3.30	n/a	− 0.10	0.442
Lake 53	Greenland	Non-thermokarst	3.69	1.32	pos	0.86	< 0.0001
Lake 70	Greenland	Non-thermokarst	6.23	3.00	n/a	0.41	0.127
Matacharak	USA	Non-thermokarst	3.64	1.52	pos	0.83	0.002
MB-AC	Canada	Hillslope	6.15	1.25	pos	0.84	< 0.0001
MB-S	Canada	Hillslope	2.44	0.14	n/a	0.00	1
Mcleod	USA	Hillslope	17.93	4.73	pos	0.48	0.006
North	Canada	Hillslope	53.96	20.98	pos	0.82	0.0003
Nunatak	Greenland	Non-thermokarst	8.24	1.62	pos	0.81	0.016
Ossian Sarsfjellet	Norway	Non-thermokarst	4.00	1.86	pos	0.72	0.009
Perfect	USA	Hillslope	7.07	1.94	pos	0.88	< 0.0001
Relaxing	USA	Hillslope	2.43	0.97	pos	0.85	< 0.0001
Rocky Basin	Canada	Non-thermokarst	1.26	0.53	pos	1.00	0.03
Romulus	Canada	Hillslope	198.19	67.70	pos	0.78	0.002
Rummy	Canada	Hillslope	13.19	1.83	n/a	0.62	0.072
SHI-L4	Canada	Non-thermokarst	20.00	9.39	pos	0.82	< 0.0001
SHI-L7	Canada	Non-thermokarst	2.64	0.73	n/a	0.17	0.602
Surprise	USA	Hillslope	20.98	11.47	pos	0.90	< 0.0001
Vassauga	Norway	Non-thermokarst	7.30	3.35	pos	0.93	0.002
West	Canada	hillslope	23.44	11.79	pos	0.76	0.006
Wonder	USA	hillslope	31.50	15.31	pos	0.93	0.002
Yterjørna	Norway	non-thermokarst	12.21	9.69	pos	0.84	< 0.0001

Should read:

Table 2 Mean Hg accumulation and Mann–Kendall results for thirty-seven previously studied Arctic and subarctic lakes; landscape types were designated using the maps generated by Olefeldt et al. 2016; further lake information available in the Supplemental Materials

Lake	Country	Landscape type	Mean Hg Accum. (μg/m²/year)	σ	Trend	τ	p
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Amituk	Canada	Non-thermo-karst	1.34	0.56	pos	0.70	0.02
AX-AJ	Canada	Hillslope	32.55	13.79	pos	0.94	<0.001
BI-02	Canada	Hillslope	6.53	1.86	pos	0.39	0.047
BK-AH	Canada	Hillslope	2.73	0.59	n/a	−0.39	0.062
Brady	USA	Non-thermo-karst	11.84	2.30	pos	0.46	0.033
Burial	USA	Hillslope	5.69	1.45	pos	0.71	0.019
CF-11	Canada	Non-thermo-karst	1.07	0.62	pos	1.00	0.009
Char	Canada	Non-thermo-karst	1.49	0.62	pos	0.89	0.0001
Daglet	USA	Non-thermo-karst	10.23	1.99	pos	0.78	0.002
Daltjørna	Norway	Non-thermo-karst	22.70	4.81	pos	0.78	0.0001
DV-E	Canada	Hillslope	4.02	0.66	n/a	0.67	0.308
Efficient	USA	Hillslope	2.44	0.91	pos	0.64	<0.0001
Forgetful	USA	Hillslope	3.16	0.83	pos	0.49	0.013
Hazen	Canada	Hillslope	21.91	2.29	n/a	−0.10	0.442
Lake 53	Green-land	Non-thermo-karst	3.69	1.32	pos	0.86	<0.0001
Lake 70	Green-land	Non-thermo-karst	6.23	3.00	n/a	0.41	0.127
Matacha-rak	USA	Non-thermo-karst	2.33	1.00	pos	0.83	0.002
MB-AC	Canada	Hillslope	12.56	2.56	pos	0.84	<0.0001
MB-S	Canada	Hillslope	6.77	0.40	n/a	0.00	1
Mcleod	USA	Hillslope	2.65	0.70	pos	0.48	0.006
North	Canada	Hillslope	1.35	0.53	pos	0.82	0.0003
Nunatak	Green-land	Non-thermo-karst	8.24	1.62	pos	0.81	0.016
Ossian Sarsfjel-let	Norway	Non-thermo-karst	4.00	1.86	pos	0.72	0.009
Perfect	USA	Hillslope	5.85	1.61	pos	0.88	<0.0001
Relaxing	USA	Hillslope	2.48	0.99	pos	0.85	<0.0001
Rocky Basin	Canada	Non-thermo-karst	2.35	1.00	pos	1.00	0.03
Romulus	Canada	Hillslope	7.77	2.65	pos	0.78	0.002
Rummy	Canada	Hillslope	6.80	0.94	n/a	0.62	0.072
SHI-L4	Canada	Non-thermo-karst	6.46	3.03	pos	0.82	<0.0001
SHI-L7	Canada	Non-thermo-karst	20.34	5.61	n/a	0.17	0.602
Surprise	USA	Hillslope	3.83	2.10	pos	0.90	<0.0001
Vassauga	Norway	Non-thermo-karst	7.30	3.35	pos	0.93	0.002
West	Canada	hillslope	8.21	4.13	pos	0.76	0.006
Wonder	USA	Hillslope	2.59	1.26	pos	0.93	0.002
Yterjørna	Norway	Non-thermo-karst	12.21	9.69	pos	0.84	<0.0001

Page 7, Results, under heading Historical changes in lake sediment mercury and primary production, lines 2–4: The following sentence, which previously read:

"The bottom of the core was dated to 1942, suggesting a relatively high rate of sediment accumulation (mean 0.10 ± 0.06 g/cm²/year)."

Should read:

"The bottom of the core was dated to 1942, suggesting a relatively high rate of sediment accumulation (mean 0.042 ± 0.023 g/cm²/year)."

Page 7, Results, under heading Historical changes in lake sediment mercury and primary production, lines 12–14: The following sentence, which previously read:

"Mercury accumulation rates were variable (mean = 91.96 ± 36.1 μg/m²/year), and no significant monotonic trend was detected"

Should read:

"Mercury accumulation rates were variable (mean = 37.40 ± 14.69 μg/m²/year), and no significant monotonic trend was detected"

Page 8, left column, paragraph 1, lines 4–5: The following sentence, which previously read:

"Sedimentation rate was lower than that observed in BRW100 (mean 0.03 ± 0.01 g/cm²/year)."

Should read:

"Sedimentation rate was lower than that observed in BRW100 (mean 0.014 ± 0.0061 g/cm²/year)."

Page 8, left column, paragraph 1, lines 14–17: The following sentence, which previously read:

"Mercury accumulation rates (mean 14.2 ± 3.6 μg/m²/year) increased significantly between the 1880s and 2014, more than doubling from 7.0 to 15 μg/m²/year (Fig. 3; Mann–Kendall: $S = 107$, $\tau = -0.42$, $p = 0.04$)."

Should read:

"Mercury accumulation rates (mean 6.46 ± 1.64 µg/m^2/year) increased significantly between the 1880s and 2014, more than doubling from 3 to 7 µg/m^2/year (Fig. 3; Mann–Kendall: S = 107, $\tau = -0.42$, $p = 0.04$)."

Page 8, right column, paragraph 2, lines 2–4: The following sentence, which previously read:

"accumulation rate (mean 0.13 ± 0.12 g/m^2/year) of similar magnitude to BRW100 and > fourfold higher than ATQ206."

Should read:

"accumulation rate (mean 0.08 ± 0.07 g/m^2/year) of similar magnitude to BRW100 and > fourfold higher than ATQ206."

Page 8, right column, paragraph 2, lines 10–12: The following sentence, which previously read:

"Mean mercury accumulation rate (78.6 ± 68.5 µg/m^2/year) was more similar to BRW100 (91.96 µg/m^2/year) than to ATQ206 (mean 14.2 µg/m^2/year), and similar to BRW100,"

Should read:

"Mean mercury accumulation rate (45.84 ± 40.52 µg/m^2/year) was more similar to BRW100 (37.40 ± 14.69 µg/m^2/year) than to ATQ206 (mean 6.46 ± 1.64 µg/m^2/year), and similar to BRW100,"

Page 10, right column, under heading Comparison of mercury accumulation with other Arctic and subarctic lakes, lines 1–22: The following sentence, which previously read:

"Of the eleven additional Alaskan lakes for which data were available, the majority (8) had mean Hg accumulation rates that were most similar to that observed for ATQ206 (14.2 ± 3.60 µg/m^2/year); that is, much lower (mean Hg accumulation = 11.2 ± 8.8 µg/m^2/year) and more uniform (mean temporal standard deviation = 4.2 ± 4.7) than what we observed in either BRW100 (92.0 ± 36.1 µg/m^2/year) or RDC312 (78.6 ± 69.5 µg/m^2/year; Table 2). When the additional 33 Arctic lakes with available data, including the seven aforementioned Alaskan lakes, and lakes from Canada, Greenland, and Norway (Fig. 1; Table 2) were separated by landscape type (lake thermokarst, hillslope thermokarst, and non-thermokarst), significant differences were found in both mean Hg accumulation (ANOVA, $F_{2,37} = 3.66$, $p = 0.036$) and temporal variability (standard error, ANOVA, $F_{2,37} = 16.64$, $p < 0.0001$; Fig. 6). Post-hoc Tukey's tests indicated that lakes in lake thermokarst landscapes had significantly higher mean Hg accumulation than lakes in non-thermokarst landscapes ($p = 0.03$), and that Hg accumulation in lakes from lake thermokarst landscapes was significantly more temporally variable than that in hillslope thermokarst landscapes (< 0.0001) or non-thermokarst landscapes ($p < 0.0001$).

Should read:

"Of the eleven additional Alaskan lakes for which data were available, the majority (8) had mean Hg accumulation rates that were most similar to that observed for ATQ206 (6.46 ± 1.64 µg/m^2/year); that is, much lower (mean Hg accumulation = 4.83 ± 3.33 µg/m^2/year) and more uniform (mean temporal standard deviation = 1.38 ± 0.55) than what we observed in either BRW100 (37.40 ± 14.69 µg/m^2/year) or RDC312 (45.84 ± 40.52 µg/m^2/year; Table 2). When the additional 33 Arctic lakes with available data, including the seven aforementioned Alaskan lakes, and lakes from Canada, Greenland, and Norway (Fig. 1; Table 2) were separated by landscape type (lake thermokarst, hillslope thermokarst, and non-thermokarst), significant differences were found in both mean Hg accumulation (ANOVA, $F_{2,37} = 17.64$, $p < 0.0001$) and temporal variability (standard error, ANOVA, $F_{2,37} = 18.83$, $p < 0.0001$; Fig. 6). Post-hoc Tukey's tests indicated that lakes in lake thermokarst landscapes had significantly higher mean Hg accumulation than lakes in non-thermokarst and hillslope thermokarst landscapes ($p < 0.01$), and that Hg accumulation in lakes from lake thermokarst landscapes was significantly more temporally variable than that in hillslope thermokarst landscapes (< 0.0001) or non-thermokarst landscapes ($p < 0.0001$).

Figure captions 2, 3 and 4: Previously read:

Fig. 2 Temporal profiles of sediment mercury concentration, accumulation rate, sedimentation rate, percent organic matter, percent mineral matter, and VRS-inferred chlorophyll *a* for lake BRW100 on the Arctic Coastal Plain of Alaska sampled in August 2014

Fig. 3 Temporal profiles of sediment mercury concentration, accumulation rate, sedimentation rate, percent organic matter, percent mineral matter, and VRS-inferred chlorophyll *a* for lake ATQ206 on the Arctic Coastal Plain of Alaska sampled in August 2014

Fig. 4 Temporal profiles of sediment mercury concentration, accumulation rate, sedimentation rate, percent organic matter, percent mineral matter, and VRS-inferred chlorophyll *a* for lake RDC312 on the Arctic Coastal Plain of Alaska sampled in August 2014

should read:

Fig. 2 Temporal profiles of sediment mercury concentration, accumulation rate, sedimentation rate, percent organic matter, percent mineral matter, and VRS-inferred chlorophyll *a* for lake BRW100 on the Arctic Coastal Plain of Alaska sampled in August 2014. The scale changes on the Hg Accumulation (range = 22.9–72.5) and Sedimentation Rate (range = 0.02–0.15) panels of this figure

Fig. 3 Temporal profiles of sediment mercury concentration, accumulation rate, sedimentation rate, percent organic matter, percent mineral matter, and VRS-inferred chlorophyll a for lake ATQ206 on the Arctic Coastal Plain of Alaska sampled in August 2014. The scale changes on the Hg Accumulation (range = 2.7–9.8) and Sedimentation Rate (range = 0.008–0.04) panels of this figure

Fig. 4 Temporal profiles of sediment mercury concentration, accumulation rate, sedimentation rate, percent organic matter, percent mineral matter, and VRS-inferred chlorophyll a for lake RDC312 on the Arctic Coastal Plain of Alaska sampled in August 2014. The scale changes on the Hg Accumulation (range = 20.5–145.9) and Sedimentation Rate (range = 0.04–0.33) panels of this figure

Figure 6: Previously read:

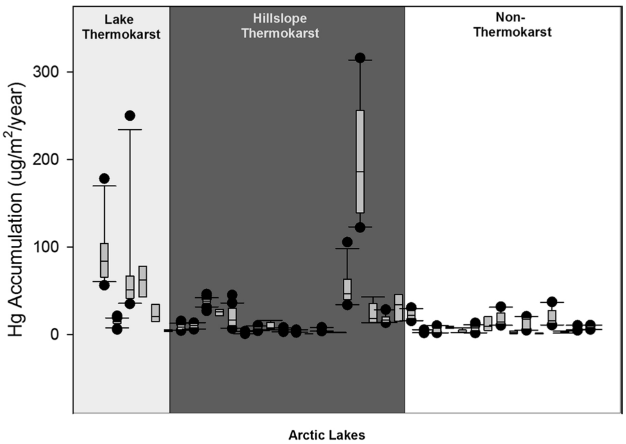

Fig. 6 Box and whisker plots for mercury accumulation rates for 37 circumarctic and 4 subarctic Alaskan lakes on different landscape types, as defined in Olefeldt et (2016). The range bars are 95% confidence intervals; boxes show the inter-quartile ranges (25–75%), the horizontal line indicates the median. The lakes in 'lake thermokarst' panel represent, in order: BRW100, ATQ206, and RDC312 (this study), and lakes 2A, and 2B (data from Deison et al. 2012). Accumulation rates are significantly higher and more variable in Lake Thermokarst lakes than Non-thermokarst lakes. Accumulation rates are focus-corrected when data were available (see Online Resource 1)

Should read:

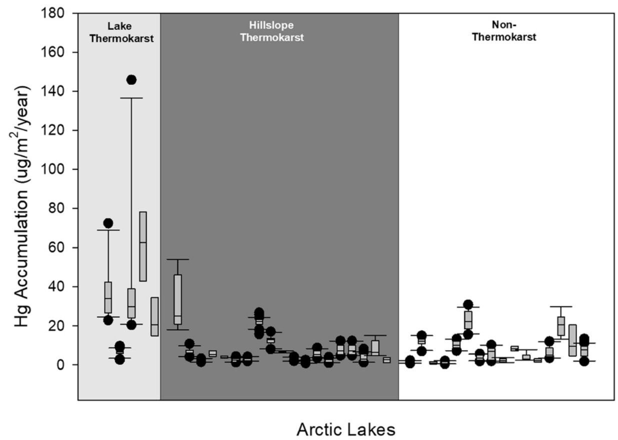

Fig. 6 Box and whisker plots for mercury accumulation rates for 36 circumarctic and 4 subarctic Alaskan lakes on different landscape types, as defined in Olefeldt et (2016). The range bars 95% confidence intervals; boxes show the inter-quartile ranges (25%-75%), the horizontal line indicates the median. The lakes in 'lake thermokarst' panel represent, in order: BRW 100, ATQ 206, and RDC 312 (this study), and lakes 2A, and 2B (data from Deison et al. 2012). Accumulation rates are significantly higher and more variable in Lake Thermokarst lakes than Non-thermokarst lakes and hillslope thermokarst lakes. Accumulation rates are focus-corrected when data were available (see Online Resource)