Supplementary Table 1. Historical MIS 3 radiocarbon ages in the Midwest of Canada and the USA.

Site (Fig. 1)	Lab code	Material, species	Field-site name	Location	Latitute N	Longitude W	Setting	Convention (ka ^{14}C BP)	Calendar 2σ cal ka BP[a]	Cal ka BP 2σ median[a]	2σ error[b]	Calibrated 2σ probability[a]	Interpretation	Source
A[1]	BGS-625	wood	149	study area (~275 m asl)	49.196	-96.874	sand 'loess' | coarse gravel | fine sand and silt | carbonaceous silt - sample from hereish | till| blue grey silty sand	29.50 ± 1.10	31.5–35.9	33.8	2.3	1.000	Possibly MIS 3 interstadial	MORLAN, R. E., MCNEELY, R. & NIELSEN, E. 2000. Manitoba radiocarbon dates. Open File Report OF2000-1. 198
A[2]	GSC-1663	wood, *Picea* sp.	FWS-21	study area (~261 m asl)	49.194	-96.919	in cross-bedded sand; log has bark and twigs	> 41	-	-	-	-	non-finite	FENTON, M. M. 1974. The Quaternary Stratigraphy Of A Portion Of Southeastern Manitoba, Canada. PhD, Western University; LOWDON, J. A. & BLAKE, W. J. 1976. Geological Survey of Canada Radiocarbon Dates XVI. Paper 76-7. 21
A[3]	GSC-1801	wood, *Picea* sp.	FWS-35	study area (~266 m asl)	49.187	-96.863	13.3 m depth, in sandy silt beneath till	> 43	-	-	-	-	non-finite	FENTON, M. M. 1974. The Quaternary Stratigraphy Of A Portion Of Southeastern Manitoba, Canada. PhD, Western University; LOWDON, J. A. & BLAKE, W. J. 1976. Geological Survey of Canada Radiocarbon Dates XVI. Paper 76-7. 21
A[4]	GSC-5837 HP	wood, *Picea* sp.	Grape Section	study area	49.198	-96.903	Surface collection on riverbank silt and/or diamicton	> 49	-	-	-	-	non-finite, transported	MORLAN, R. E., MCNEELY, R. & NIELSEN, E. 2000. Manitoba radiocarbon dates. Open File Report OF2000-1. 198
B	GSC-4760	wood, coniferous	GS86	7 km to the east of the study area (~291 m asl)	49.163	-96.718	~1.3 m depth, in fine sand with organic layers, beneath 0.45 m gravelley sand with disseminated organics and 0.5 m fine sand with minor organic ripples	35.48 ± 0.87	38.7–42.1	40.5	1.8	1.000	Possibly MIS 3 interstadial	MCNEELY, R. & JØRGENSEN, P. K. 1992. Geological Survey of Canada radiocarbon dates XXX. Paper no. 90-7. 88
C	GX-3527	charcoal	HF	13 km east of the study area (~291 asl)	49.163	-96.726	8 m depth in silty sand with disseminated organics, below 5 m of till and 1 m of pebbly silty clay	> 32	-	-	-	-	non-finite	KEATINGE, R. 1975. Late Quaternary till stratigraphy of southeastern Manitoba based on clast lithology. M.Sc thesis, University of Manitoba.
D	BGS-635	charcoal, wood fragments	GB 161	15 km to the northeast of study area (~280 m asl)	49.304	-96.758	4 m depth in fine sand and silt, beneath boulders interpreted as washed till	29.60 ± 0.90	31.8–35.7	33.9	2.1	1.000	Possibly MIS 3 interstadial	MORLAN, R. E., MCNEELY, R. & NIELSEN, E. 2000. Manitoba radiocarbon dates. Open File Report OF2000-1. 198
E	TO-4639	tusk, *Mammuthus*	FI-94-0037	southwest Manitoba, CA	49.102	-100.281	Below a till in advance glaciofluvial gravels	33.86 ± 0.33	37.6–39.6	38.8	1.2	1.000	Eroded from an MIS interstadial deposit	FULTON, R. J. 1995. Proboscidean tusk of Middle Wisconsinan age from sub-till gravel, near Turtle Mountain southwestern Manitoba. In: GEOLOGICAL SURVEY OF CANADA (ed.) Current Research 1995-E.
F	GSC-653	charcoal	KJ-7-66	Zelena, Manitoba, CA	51.406	-101.234	beneath a till, in lacustrine silt above a marl zone	37.70 ± 1.50	39.8–44.0	41.9	2.1	1.000	uncertain very different from other sample; requires re-dating	LOWDON, J. A. & BLAKE, W. J. 1968. Geological Survey of Canada radiocarbon dates VII. Paper no. 68-2B. 245; KLASSEN, R. A. 1969. Quaternary stratigraphy and radiocarbon chronology in southwestern Manitoba. Paper 69-27. 26.
F	GSC-1279	charcoal	KJ-10-69	Zelena, Manitoba, CA	51.406	-101.234	beneath a till, in lacustrine silt above a marl zone	23.7 ± 2.90	27.3–28.6	27.9	0.7	1.000	uncertain very different from other sample; requires re-dating	LOWDON, J. A. & BLAKE, W. J. 1973. Geological Survey of Canada radiocarbon dates XIII. Paper 73-7. 61
G	S-554	wood	-	southeast Saskatchewan, CA	50.580	-102.650	depth of 53.4 m in alluvium (?), dates at 50.6 m and above are all <12 ka 14C BP)	28.89 ± 0.31	32.2–34.1	33.3	1.1	1.000	MIS 3 interstadial	MORLAN, R. E., MCNEELY, R., WOLFE, S. A. & SCHREINER, B. T. 2001. Quaternary dates and vertebrate faunas in Saskatchewan. Open File 3888. 139
H	SacA16558	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 1, 48-53 cm	41.20 ± 1.20	42.6–45.9	44.1	1.8	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16559	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 1, 66-77 cm	39.43 ± 0.94	42.1–44.4	43.0	1.4	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16560	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	duplicate of SacA16559	43.80 ± 1.60	43.7–49.6	46.4	3.2	0.988	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16561	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 1, 90-92 cm	39.03 ± 0.89	41.9–44.2	42.8	3.2	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16562	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	duplicate of SacA16561	44.20 ± 1.70	43.4–50.3	46.8	3.5	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16563	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 1, 108-117 cm	41.00 ± 1.10	42.6–45.5	44.0	1.5	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16566	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 1, 149-163 cm	43.80 ± 1.60	41.8–47.7	44.4	3.2	0.988	MIS 3 or older	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16565	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	duplicate of SacA16566	> 50	nonfinite	nonfinite	nonfinite	-	MIS 3 or older	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA16567	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 1, 176-183 cm	50.00 ± 3.50	44.4–>53.0	nonfinite	nonfinite	-	MIS 3 or older	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27174	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 2, 50-60 cm depth	22.30 ± 1.30	23.74–29.2	26.5	2.8	1.000	prior to MIS 2 advance	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27175	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 2, 70-80 cm depth	38.25 ± 0.79	41.4–43.1	42.3	0.9	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27176	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 2, 80-100 cm depth	40.00 ± 1.00	42.3–44.6	43.4	1.2	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27177	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 2, 100-120 cm depth	50.10 ± 3.30	*	*	*	*	MIS 3 or older	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27178	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 3, 50-60 cm depth	38.96 ± 0.85	41.9–44.1	42.7	1.4	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27179	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 4, 50-60 cm depth	29.03 ± 0.26	32.8–34.2	33.5	0.7	0.975	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
H	SacA27173	charcoal	-	Montreal Lake, Saskatchewn, CA	54.681	-105.499	sand dune paleosol 5, 80-100 cm depth	28.29 ± 0.26	31.7–33.2	32.1	1.1	1.000	MIS 3 interstadial	BÉLANGER, N., CARCAILLET, C., PADBURY, G. A., HARVEY-SCHAFER, A. N. & VAN REES, K. J. C. 2014. Periglacial fires and trees in a continental setting of Central Canada, Upper Pleistocene. Geobiology, 12, 109-118.
I	Beta-1764	wood	Dows Quarry	north-central Iowa, USA	42.392	-93.986	Within the Sheldon Creek Fm	25.39 ± 1.38	26.9–32.2	29.6	2.7	0.991	MIS 3 interstadial	MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-2763	wood	Brushy Creek, 94-BCA	north-central Iowa, USA				25.19 ± 0.28	28.9–30.0	29.5	0.6	1.000	MIS 3 interstadial	HALLBERG, G.R., BETTIS, E.A.I., KEMMIS, T.J., MILLER, G.A., BAKER, R.G. 1981. Unique Quaternary Stratigraphic Sections along Brushy Creek, Webster County. Iowa. Iowa State Historical Department, Division of Historic Preservation, Des Moines.; MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-2764	plant	Brushy Creek, 94-BHM	north-central Iowa, USA	42.378	-93.984	Within Soil Below Sheldon Creek Fm	32.58 ± 0.39	36.1–38.4	37.0	1.4	1.000	MIS 3 interstadial	HALLBERG, G.R., BETTIS, E.A.I., KEMMIS, T.J., MILLER, G.A., BAKER, R.G. 1981. Unique Quaternary Stratigraphic Sections along Brushy Creek, Webster County. Iowa. Iowa State Historical Department, Division of Historic Preservation, Des Moines.; MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-2765	wood	Brushy Creek, 94-BHM	north-central Iowa, USA	42.378	-93.984	Within colluvium between Sheldon Creek tills	37.43 ± 0.72	41.0–42.6	41.9	0.9	1.000	MIS 3 interstadial	HALLBERG, G.R., BETTIS, E.A.I., KEMMIS, T.J., MILLER, G.A., BAKER, R.G. 1981. Unique Quaternary Stratigraphic Sections along Brushy Creek, Webster County. Iowa. Iowa State Historical Department, Division of Historic Preservation, Des Moines.
I	Beta-2766	wood	Brushy Creek, 94-BHM	north-central Iowa, USA	42.378	-93.984	At the base of the Sheldon Creek Fm	29.31 ± 0.43	32.8–34.6	33.8	1.2	0.959	MIS 3 interstadial	HALLBERG, G.R., BETTIS, E.A.I., KEMMIS, T.J., MILLER, G.A., BAKER, R.G. 1981. Unique Quaternary Stratigraphic Sections along Brushy Creek, Webster County. Iowa. Iowa State Historical Department, Division of Historic Preservation, Des Moines.; MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-2796	wood	US Gypsum	north-central Iowa, USA	?	?	Within the Sheldon Creek Fm	30.06 ± 0.4	33.8–35.3	34.5	0.8	1.000	MIS 3 interstadial	MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-5297	wood	US Gypsum	north-central Iowa, USA	42.536	-94.083	Within the Sheldon Creek Fm	39.76 ± 1.54	41.4–45.4	43.3	2.1	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	Beta-10004	wood	National Gypsum	north-central Iowa, USA	42.536	-94.083	Within the Sheldon Creek Fm	26.62 ± 0.52	29.9–31.7	30.7	1.0	1.000	MIS 3 interstadial	MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-59951	humic acids	Brushy Creek, 94-CAB	north-central Iowa, USA	42.389	-93.977	Organic silts at bottom of Sheldon Creek Fm	38.88 ± 0.74	42.0–43.5	42.6	0.9	0.966	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	Beta-59952	wood	Brushy Creek, 94-CAB	north-central Iowa, USA	42.389	-93.977	Within the Sheldon Creek Fm	26.58 ± 0.28	30.2–31.2	30.8	0.6	1.000	MIS 3 interstadial	MUHS, D. R., BETTIS III, E. A. & SKIPP, G. L. 2018. Geochemistry and mineralogy of late Quaternary loess in the upper Mississippi River valley, USA: Provenance and correlation with Laurentide Ice Sheet history. Quaternary Science Reviews, 187, 235-269.
I	Beta-75228	humic acids	Brushy Creekm 94-CAB	north-central Iowa, USA	42.389	-93.977	Within the Sheldon Creek Fm	37.98 ± 0.62	41.5–42.8	42.2	0.7	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	Beta-75229	wood	Brushy Creek, 94-CAB	north-central Iowa, USA	42.389	-93.977	Within the Sheldon Creek Fm	37.72 ± 3.9	33.8–48.5	41.4	7.1	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	Beta-496634	wood	34 - Franklin 1	north-central Iowa, USA	42.966	-92.994	At the base of the Sheldon Creek Fm	>46.5	non-finite	non-finite	non-finite	-	non-finite	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	Beta-496635	peat	34 - Franklin 2	north-central Iowa, USA	42.966	-92.994	At the base of the Sheldon Creek Fm	>46.5	non-finite	non-finite	non-finite	-	non-finite	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	Beta-496636	wood	34 - M Staudt 2	north-central Iowa, USA	43.125	-92.815	At the base of the Sheldon Creek Fm	>46.5	non-finite	non-finite	non-finite	-	non-finite	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-3198	wood	Cardiff Carbon Quarry	north-central Iowa, USA	42.469	-94.113	At the base of the Sheldon Creek Fm	40.4 ± 2	41.1–47.0	43.8	3.2	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-3199	wood	Cardiff Carbon Quarry	north-central Iowa, USA	42.469	-94.113	Within the Sheldon Creek Fm	39.23 ± 0.65	42.2–43.9	42.8	1.1	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-3200	wood	National Gypsum	north-central Iowa, USA	42.526	-94.078	At the base of the Sheldon Creek Fm	41.8 ± 1.6	42.5–47.3	44.7	2.8	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-4222	humic acids	DML-4	north-central Iowa, USA	42.717	-93.705	Organic silts at bottom of Sheldon Creek Fm	38.3 ± 1.4	40.5–44.4	42.4	2.0	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-4871	humic acids	Alden Quarry	north-central Iowa, USA	42.508	-93.359	Palosol A horizon beneath the Sheldon Creek Fm	40.2 ± 1.4	42.0–45.5	43.6	1.6	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-A4272	wood	17 - White	north-central Iowa, USA	43.164	-93.299	Below Sheldon Creek Fm.	>50	non-finite	non-finite	non-finite	-	non-finite	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-A4273	wood	Rosenburg	north-central Iowa, USA	43.374	-93.044	Within the Sheldon Creek Fm	35.4 ± 0.72	39.2–41.8	40.5	1.3	1.000	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-A4276	humic acids	C Benjegerdes	north-central Iowa, USA	43.244	-93.252	Palosol A horizon beneath the Sheldon Creek Fm	46.5 ± 2.8	*	*	*	*	MIS 3 or older	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-A4277	humic acids	Suchy	north-central Iowa, USA	43.332	-92.814	Palosol A horizon beneath the Sheldon Creek Fm	45 ± 2.3	43.3–52.5	47.8	4.7	0.981	MIS 3 interstadial	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
I	ISGS-A4278	humic acids	66 - Sprung	north-central Iowa, USA	43.241	-93.019	Soil organics below Sheldon Creek Fm.	>50	non-finite	non-finite	non-finite	-	non-finite	KERR, P. J., TASSIER-SURINE, S. A., KILGORE, S. M., BETTIS III, E. A., DORALE, J. A. & CRAMER, B. D. 2021. Timing, provenance, and implications of two MIS 3 advances of the Laurentide Ice Sheet into the Upper Mississippi River Basin, USA. Quaternary Science Reviews, 261, 106926.
J	Beta-129847	wood, *Fagus* sp.	-	Plymouth, Wisconsin, USA	43.750	-87.980	Silt interbedded between two lowermost till units	34.61 ± 0.39	39.0–40.7	39.8	0.9	1.000	MIS 3 interstadial (maximum advance)	CARLSON, A. E., TARASOV, L. & PICO, T. 2018. Rapid Laurentide ice-sheet advance towards southern last glacial maximum limit during marine isotope stage 3. Quaternary Science Reviews, 196, 118-123.
J	OS-24520	wood	-	Plymouth, Wisconsin, USA	43.750	-87.980	Lacustrine sediments above the lower three tills	26.40 ± 0.92	28.7–32.3	30.6	1.9	0.984	MIS 3 interstadial (minimum retreat)	CARLSON, A. E., TARASOV, L. & PICO, T. 2018. Rapid Laurentide ice-sheet advance towards southern last glacial maximum limit during marine isotope stage 3. Quaternary Science Reviews, 196, 118-123.

[a]Calibrated using Calib 8.2 and the IntCal20 northern hemisphere curve

[b]The uncertainty value represents the 68% confidence interval which is reported as the difference between the midpoint and the upper or lower limit, using the greater value.

*Dates not calibrated because its greater than 46,401 ^{14}C yr BP