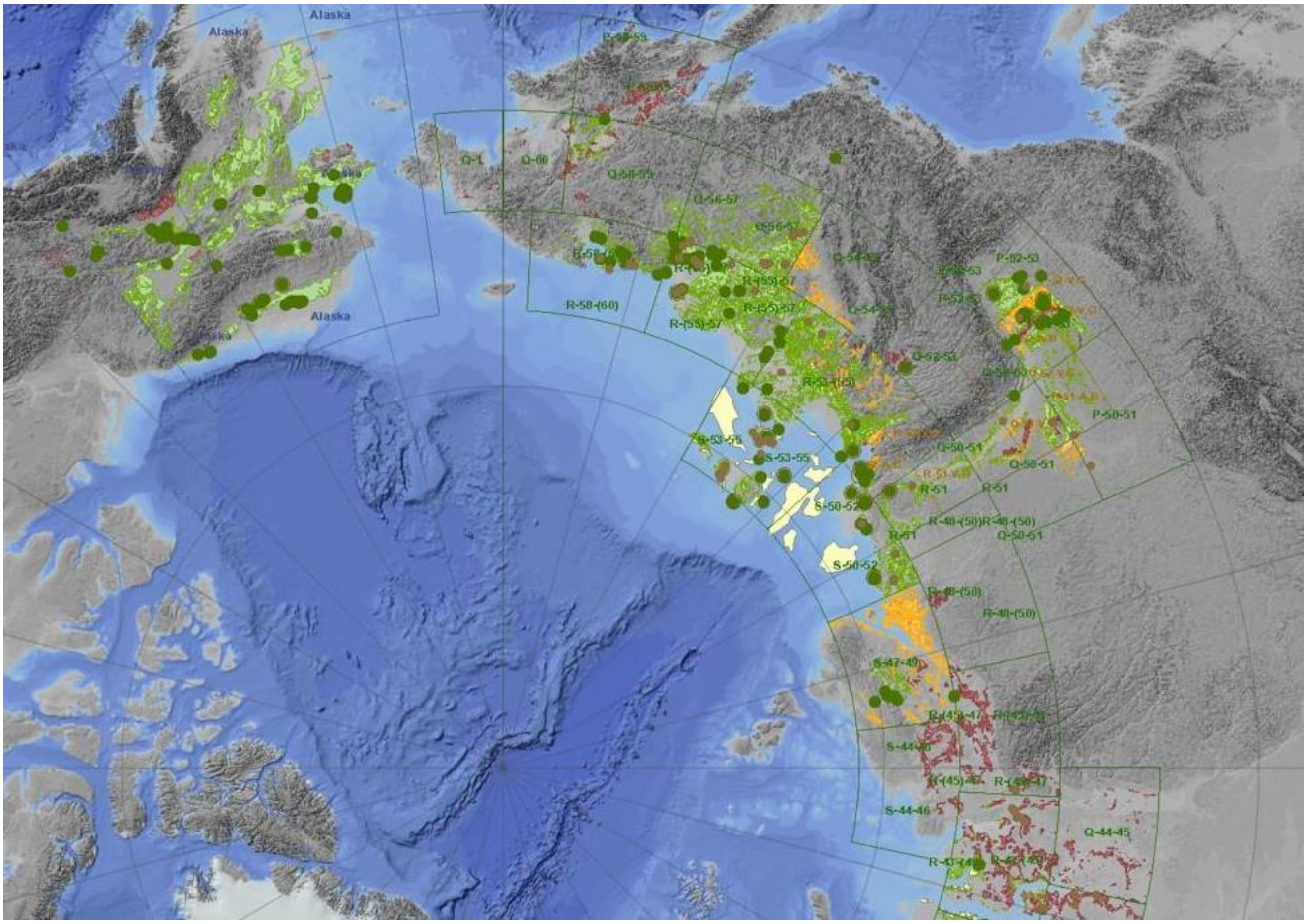
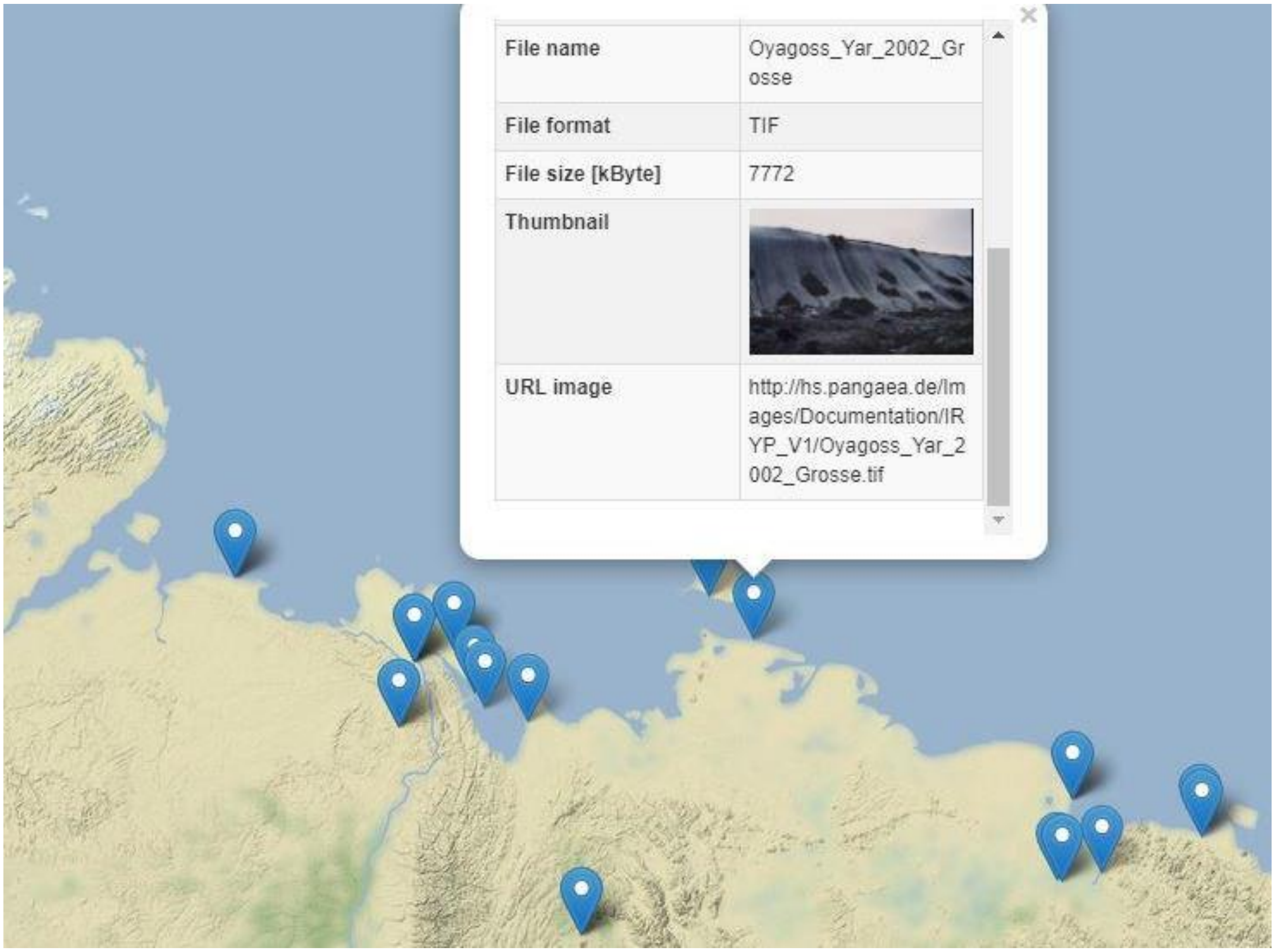
Supplementary Material

'Circum-Arctic Map of the Yedoma Permafrost Domain'
by Strauss et al. (https://doi.org/10.3389/feart.2021.758360)

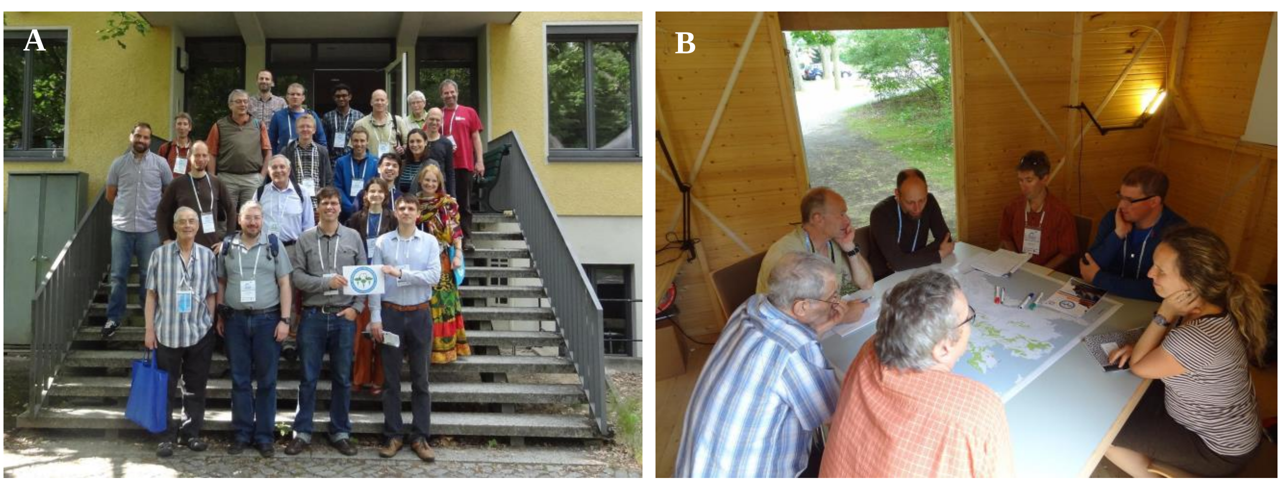
1 Supplementary Figures



Supplementary Figure S1. WebGIS for immediate user-friendly visualizations to make our data easily usable for the community. Available at https://maps.awi.de/awimaps/projects/public/?cu=ice_rich_yedoma_permafrost

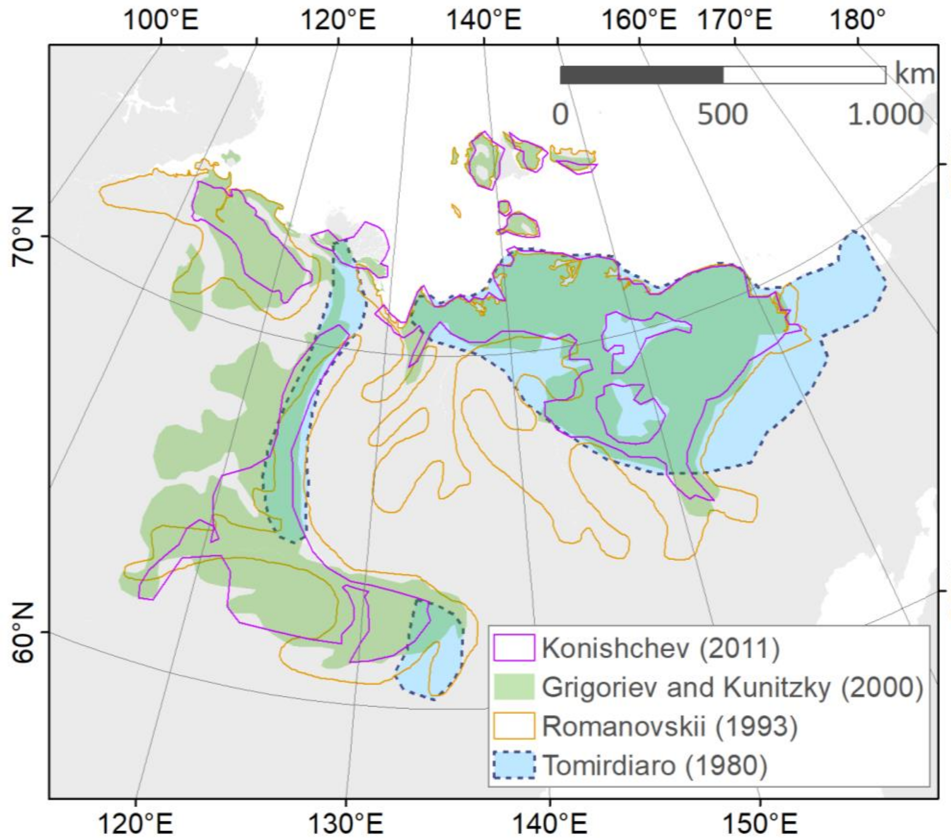


Supplementary Figure S2. Spatially explicit visualization tool showing known locations of Yedoma exposures and example photographs, which were also used in the Yedoma confidence classification. The map subset shows the Laptev Sea region in North Siberia with an example of a photograph of the icy Yedoma cliff at Oyagos Yar on the main land of the Dmitrii Laptev Strait. Available at Strauss et al. 2016 and https://apgc.awi.de

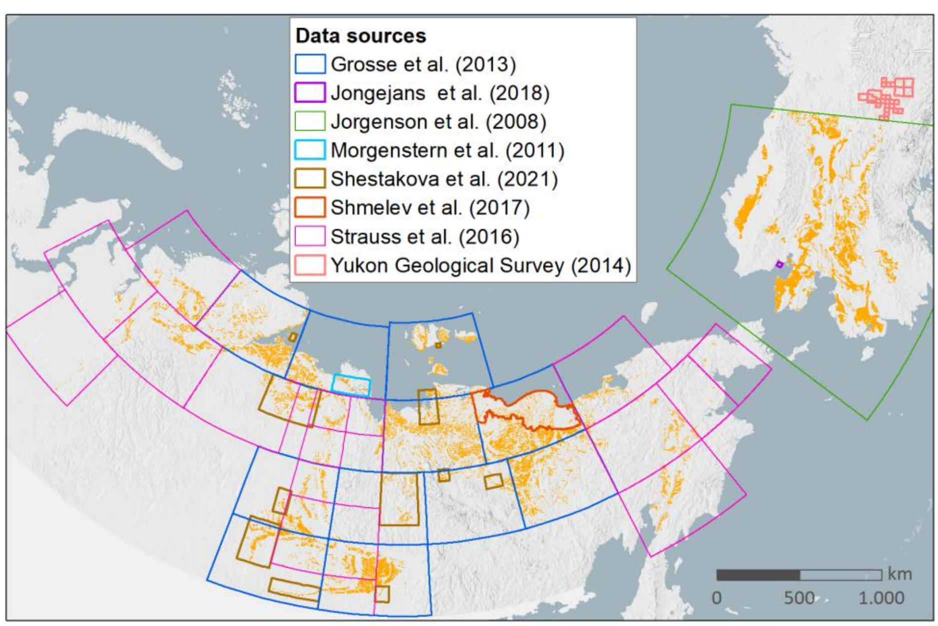


Supplementary Figure S3. Yedoma Workshop during the 11th International Conference on Permafrost (ICOP), Potsdam in 2016. A) Group picture of workshop participants. B) Alaska/ Yukon regional expert group during discussion and evaluation of mapped Yedoma distributions.

1.1 Broader coverage Yedoma maps



Supplementary Figure S4. Other spatial datasets for Yedoma. Historical ones including Tomirdiaro (1980), Romanovskii (1993), as well as Grigoriev and Kunitsky (2000), Konishchev (2011). Coverage estimates are given in Supplementary Table S11.



Supplementary Figure S5. Data sources used for the Yedoma map compilation

Supplementary Table S1. Previously published maps including spatial Yedoma information

map name	*covered region*	*year*	*short summary or original figure caption*	*reference*
General permafrost and glacial setting in the late Pleistocene and its relicts in recent times	global	1980	Map showing the "general permafrost and glacial setting in the late Pleistocene and its relicts in recent times" including the distribution of Yedoma (dark shaded area (no. 5 in the legend). The legend shows the following: 1: boundary of surface glaciations; 2: cohesive [united] perennial sea ice; 3: late Pleistocene monolithic marine ice cover of perennial freezing in the Arctic Ocean [glaciated Arctic Ocean]; 4: late Pleistocene periglacial loesses, containing signs of permafrost formation, called cold-facies loesses; 5: initial late Pleistocene loess-ice deposits of the Yedoma Complex that are preserved until today [modern Yedoma uplands]; 6: southern warm-facies loess without signs of permafrost formation; 7: dried shelf areas in the late Pleistocene [-> Beringia in the North]; 8: permafrost boundary in the late Pleistocene; 9: permafrost boundary in modern times; basing on Velichko (1973)	Tomirdiaro (1980)
Modern distribution of late Pleistocene loess-ice Yedoma [uplands] and Holocene thermokarst basins by example of the East Siberian lowland.	Yana Indigirka Lowland	1980	The legend says: 1a: Holocene alluvial floodplains, deltas and low terraces; 1b: Holocene thermokarst lake-alas basins with palustrine-lacustrine cover deposits; 2: large Yedoma [uplands] and preserved late Pleistocene plains built of loess-ice aeolian-cryogenic surface complex [Yedoma Ice Complex]; 3: mountain framing; 4: water area of the Arctic seas; 5: boundary of the zone with sufficient wetting K > 1 in the North and the zone with moderate wetting 0.99 > K > 0.6 in the South; 6: boundary of the zone with moderate and [reduced] wetting 0.59 > K > 0.3	Tomirdiaro (1980)
Schematic map of the distribution of ice wedges	Siberia	1993	The legend on the map includes "1: region of wide distribution of "Ice Complex" (Yedoma) ; 2: Yedoma distribution in river valleys; 3: Active ice wedges; 4: Active sand-ice wedges (low-temperature); 5: Active sand-ice wedges (high-temperature); 6: Active ground wedges; 7: Sorted polygons; 8: Small diameter polygonal ground (1.5-3.0 meters); 9: Boundaries of active ice wedge occurrence in peats; 10: in sandy silts and silty sands, and 11: in coarse grained sands, gravels, and pebbles; 12: Southern boundaries of low-center polygons and 13: of permafrost.	Romanovskii (1993)
Schematic map of the Ice Complex distribution	Yakutia, Siberia	2000	Yedoma domain are shown in the shaded areas, based on Solov'ev (1989)	Grigoriev and Kunitsky (2000)
Permafrost Characteristics of Alaska	Alaska	2008	Permafrost map and other maps like the "Surficial Geology", Ground Ice" and "Thermokarst Landforms", scale 1:7,500,000	Jorgenson et al. (2008)
Map of ice complex	Siberia	2011	Map showing Yedoma distribution, Siberia, with three distinct types of Yedoma distribution: Dark blue, widely distributed; Medium blue, fragmented; Light blue, sporadic. Red dashed line is the boundary of permafrost. White dotted areas are glaciers. Compiled by V.N. Konishchev and N.A. Koroleva after Romanovskii, 1993; Konishchev, 1997; Kunitsky, 2007; Streletskaya et al., 2007	Konishchev (2011)
Preliminary map of Yedoma distribution in Alaska	Alaska	2011	Preliminary map of Yedoma outline in Alaska with sites of our field investigations (letters A to I on the map) and Yedoma identified from the literature sources (Numbers 1-34, references given in Kanevskiy et al. 2011). This map has been revised in 2016 (Kanevskiy et al., 2016) and 2021 (Shur et al., 2021a)	Kanevskiy et al. (2011)
Distribution of aeolian deposits of northwestern North America.	Alaska and Canada	2015	Distribution of aeolian deposits of northwestern North America. From Murton et al. (2015) basing on synthesized references given therein.	Murton et al. (2015)
Land cover classification map of Baldwin Peninsula	Baldwin Peninsula, Alaska	2018	Land cover classification of Baldwin Peninsula with Yedoma, drained thermokarst lake basins, thermokarst lakes and lagoons.	Jongejans et al (2018)
Map of ground ice content.	Yakutia, Siberia	2021	Map of ice content in percent. High to very high contents (0.6–0.8 and more) shown as deep blue colors were found to be typical for 11.8% of the territory. This includes mainly Yedoma, wetlands, and glaciers are also attributed to it.	Shestakova et al. (2021)
Quaternary deposits map of Yana-Indigirka and Kolyma lowlands tundra zone	Yana-Indigirka and Kolyma lowlands, Siberia	2021	Quaternary deposit map created by using Government Geological Map R-(55)-57, northern part and Landsat imagery	Veremeeva (2021) Shmelev et al (2017)

2 Supplementary Methods and Tables

2.1 Digitization steps (see Figure 2)

2.1.1 Clipping the scan to map frame (Photoshop)

To improve working with many georeferenced maps in a map view, overlapping map parts like legend and further information were clipped with Photoshop.

2.1.2 Define Projection (ArcGIS tool)

In ArcGIS, we attributed a projection and datum to the geological maps. To simplify further processing of the data, we chose WGS 1984 instead of a Pulkovo datum, which is common especially in older Russian maps.

2.1.3 Georeferencing (ArcGIS tool)

With the 1st Order Polynomial Transformation, we defined the coordinates of the corners of the map by adding control points and map coordinates. We checked the grid of the scanned map with the grid of the defined coordinate system. In newer maps, this quality check was enough and the georeferencing was completed. For older maps, more (up to 50) control points had to be set.

2.1.4 Export of the georeferenced maps to 8bit version (from ArcGIS)

We decided to vectorize areas of the maps in MAPublisher. Therefore, we exported the tiffs in a 8bit version to be readable by Adobe Illustrator.

2.1.5 Create mapframe (MAPublisher, ArcGIS)

For overview maps, we created the mapframe (map outline) as a polygon feature from every digitized map.

2.1.6 Defining the relevant map contents

We used different sources from different continents for our study. Even if having the same publisher, which is the case for the Russian maps, the maps were compiled with diverse geological foci and in different times. In addition, here the content is categorized differently and does not fit together. For every map, we defined the relevant categories, and for the Russian maps the legend content had to be translated to English.

2.1.7 Vectorization (Adobe Illustrator / MAPublisher)

We used Adobe Illustrator for vectorization as it is a fast and uncomplicated tool for our tasks. Illustrator graphic-tools like spline or pathfinder together with the GIS-tools of MAPublisher was a great way to get high quality vector data. From the Geological Map of Yakutia in 1:500,000 scale, we digitized 818 (multi-)polygon features. For the 1:1,000,000 State Geological Map of Russia, about 2,138 (multi-)polygon features and 75 deposits thickness point features were digitized, and from the Quaternary map of the territory of Russian Federation (1:2,500,000) we got about 771 (multi-)polygon features.

2.1.8 Feature attribution (MAPublisher, ArcGIS)

We connected the digitized polygons to the specific relevant attributes, which were very different for each data source. Please see the Supplementary Tables S5 to S8 for details.

2.1.9 Merging all digitized parts in one polygon feature class (ArcGIS tool)

Now the Yedoma database was built (projection: EPSG: 3571 WGS 1984 North Pole LAEA Bering_Sea) containing a dataset of following feature classes that are organized in polygons as spatial representation:

- GK_500_1000_map_frames (polygon features)
- GK500_yedoma (polygon features)
- GK1000_yedoma_russia (polygon features)
- GK2500_yedoma (polygon features)
- SG7200k_yedoma_alaska (polygon features)
- western_yukon_loess (used in Strauss et al. 2016) (polygon features)
- Yukon Digital Surficial Geology Compilation 50k, 100k - 125k,250k (polygon features)

2.1.10 Simplifying Polygon (ArcGIS tool)

The point density retrieved from the digitized polygons from MAPublisher is extremely dense. To speed up the handling of the dataset with as little as possible quality loss, we applied a simplification (point removal with simplification tolerance 10 m).

2.1.11 Corrections of topology and attribution (ArcGIS)

We defined topology rules to identify and solve errors like gaps between bordering areas and area overlapping within a layer. Some content errors have been resolved by checking the dataset manually. For the Alaskan dataset, we cut out lakes and used the ‘Global Lakes and Wetlands Database ’ (Lehner and Döll, 2004) to clipped lake polygons.

2.2 Input data: scanned and georeferenced geological and quaternary formations maps of Russia

The publisher of Russian geological maps is the ‘Ministry of Natural Resources and Ecology of the Russian Federation, Federal Agency of Mineral Resources, Federal State Unitary Enterprise, ‘Karpinsky Russian Geological Research Institute (VSEGEI)’ 74, Sredny prospect, 199106, St. Petersburg, Russia.

Supplementary Table S2. Listing of input data: scanned and georeferenced geological maps 1:500,000 of Yakutia.

map name	*map type*	*map number*	*scale*	*date*	*projection*	*datum*
Sapadno-Verkhoyanskii Block, List 46	Geological Map of Yakutia	Q-51-V,G	500k	1999	Gauß-Krüger 21N	Pulkovo 1942
Zentralnyu-Yakutskii Block, List 54	Geological Map of Yakutia	P-51-A,B	500k	2000	Gauß-Krüger 21N	Pulkovo 1942
Zentralnyu-Yakutskii Block, List 55	Geological Map of Yakutia	P-52-A,B	500k	2000	Gauß-Krüger 22N	Pulkovo 1942
Sapadno-Verkhoyanskii Block, List 47	Geological Map of Yakutia	Q-52-V,G	500k	1999	Gauß-Krüger 22N	Pulkovo 1942
Zentralnyu-Yakutskii Block, List 62	Geological Map of Yakutia	P-52-V,G	500k	2000	Gauß-Krüger 22N	Pulkovo 1942
Sapadno-Verkhoyanskii Block, List 36	Geological Map of Yakutia	Q-51-A,B	500k	1999	Gauß-Krüger 21N	Pulkovo 1942
Sapadno-Verkhoyanskii Block, List 25	Geological Map of Yakutia	R-51-V,G	500k	1999	Gauß-Krüger 21N	Pulkovo 1942
Sapadno-Verkhoyanskii Block, List 26	Geological Map of Yakutia	R-52-V,G	500k	1999	Gauß-Krüger 22N	Pulkovo 1942
Sapadno-Verkhoyanskii Block, List 16	Geological Map of Yakutia	R-52-A,B	500k	1999	Gauß-Krüger 22N	Pulkovo 1942

Supplementary Table S3. Listing of input data: scanned and georeferenced quaternary geological maps 1:1,000,000 of Russia.*****digitized and published by Grosse et al. (2013). Please refer to Table D1 in Grosse et al. (2013) for details on the geologic units in each map tile interpreted as late Pleistocene syngenetic, ice-rich Yedoma deposits.

map name	***map type***	***map number***	***scale***	***date***	***projection***	***datum***
State Geological Map of Russia	Quaternary formations map	P-50-51*	1000k	1994	Gauß-Krüger 20N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	P-52-53*	1000k	1999	Gauß-Krüger 22N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	P-58-59	1000k	1987	Web Mercator Auxiliary Sphere	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-42-43	1000k	1996	Web Mercator Auxiliary Sphere	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-44-45	1000k	1998	Web Mercator Auxiliary Sphere	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-50-51*	1000k	1993	Gauß-Krüger 20N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-52-53*	1000k	1984	Gauß-Krüger 22N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-54-55*	1000k	1985	Gauß-Krüger 24N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-56-57*	1000k	1991	Gauß-Krüger 26N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-58-59	1000k	1999	World Mercator	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	Q-60-1	1000k	2001	Web Mercator Auxiliary Sphere	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-(40)-42	1000k	2000	World Mercator	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-43-(45)	1000k	2000	World Mercator	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-(45)-47	1000k	2000	UTM Zone 46N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-48-(50)	1000k	1984	World Mercator	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-51	1000k	2013	UTM Zone 51N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-53-(55)*	1000k	1993	UTM Zone 54N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-(55)-57*	1000k	2000	Gauß-Krüger 26N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	R-58-(60)	1000k	1998	UTM Zone 59N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	S-44-46	1000k	2000	UTM Zone 45N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	S-47-49*	1000k	1998	Gauß-Krüger 18N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	S-50-52*	1000k	2001	UTM Zone 51N	Pulkovo 1942
State Geological Map of Russia	Quaternary formations map	S-53-55*	1000k	1999	UTM Zone 54N	Pulkovo 1942

Supplementary Table S4. Input data: quaternary map of the territory of Russian Federation 1:2,500,000 of Russia

map name	***map type***	***scale***	***date***	***projection***	***datum***
Quaternary map of the territory of Russian Federation	quaternary geology	2500k	2014(?)	Equidistant Conic	Krasovsky 1940

Supplementary Table S5. Feature attribution (MAPublisher, ArcGIS) for digitized polygon content from 1:500,000 maps.

Geolog	***Litho***
QII 2- QIII 4	polygenetical
QIII 2-3	aeolian/cryogene
QIII 2-4	limnic alluvial
QIII 2-4	aeolian/cryogene
QIII 2-4	limnic-boggy/proluvial
QIII 2-4	aeolian/cryogene baidzharakhs
QIII 3- QIV	limnic-boggy/proluvial
QIII 3-4	limnic alluvial
QIII 3-4	aeolian/cryogene
QIII 3-4	aeolian/cryogene baidzharakhs
QIII 3-4 dl	aeolian/cryogene
QIII 4	aeolian/cryogene
QIII 4- QIV 1	aeolian/cryogene
QIII 4b	aeolian/cryogene

Supplementary Table S6. Feature attribution (MAPublisher, ArcGIS) for digitized polygon content from digitized polygon content from 1:1,000,000 maps.

ID	***GeneticType (from map)***
lIIIed	Yedoma formation, loess-like, ice wedges (up to 50m)
lIIIej	Ejkskaya formation, loess-like, ice and ice wedges (up to 40m)

Supplementary Table S7. Feature attribution (MAPublisher, ArcGIS) for digitized polygon content from the "Permafrost Characteristics of Alaska" map, scale 1:7,200,000 published by Jorgenson et.al. (2008).

Map name	***Yedoma selection criterion***
Surficial Geology	Aeolian: loess
further included maps for plausibility check	
Ground ice	High (>40% volume)
Thermokarst Landforms	Deep Thermokarst Lakes, Basins, Troughs, Pits, or Deep Lakes, Slumps, Troughs, Pits, Sinks

Supplementary Table S8. Feature selection criteria yukon maps, #*Material E = Aeolian, Texture s = sand, Texture z = silt, Expression p = plain*

map	***combination of selection criteria#***
yukon_50k	*SELECT * From surficial_polygons_50k WHERE "LABEL_FNL" LIKE '%**E**%' AND "LABEL_FNL" LIKE '%**sz**%' AND "LABEL_FNL" LIKE '%**p**%'*
yukon_100k_125k	*SELECT * From surficial_polygons_100k_125k WHERE "LABEL_FNL" LIKE '%**E**%' AND "LABEL_FNL" LIKE '%**sz**%' AND "LABEL_FNL" LIKE '%**p**%'*
yukon_250k	*SELECT * From surficial_polygons_250k WHERE "LABEL_FNL" LIKE '%**E**%' AND "LABEL_FNL" LIKE '%**sz**%' AND "LABEL_FNL" LIKE '%**p**%'*

2.2.1 Yedoma thickness data

Supplementary Table S9. Synthesis of Yedoma depth estimates.

location name	***thickness [m]***	***°N***	***°E/W***	***source***
Cape Blossom exposure	16	66.73262	-162.4945	Jongejans et al. 2018
Colville River exposure	15	69.0326	-155.4358	Strauss et al. 2013, Schirrmeister et al. 2011
Colville River exposure	8	69.2469	-152.8528	Strauss et al. 2013, Schirrmeister et al. 2011
Colville River exposure	20	69.3038	-152.3274	Strauss et al. 2013, Schirrmeister et al. 2011
Itkillik exposure	29.8	69.3404	-150.5157	Strauss et al. 2013, Schirrmeister et al. 2011
Irish Gulch	20	63.914833	-139.329317	Froese, unpub.
Thistle Creek	9	63.0733	-139.311283	Orlando et al., 2014; Reyes et al, 2010
Bear Creek	6	63.981967	-139.222883	D'Costa et al., 2011
Lower Hunker	10	64.023683	-139.170117	Froese, unpub.
Lower Hunker	5	64.01735	-139.1541	Mahony, 2015
Little Blanche	20	63.842017	-139.117017	Froese, unpub.
Last Chance Creek	12	63.990022	-139.113634	Zazula et al., 2003
Quartz Creek	14	63.819367	-139.03305	Demuro et al., 2008
Upper Quartz Creek	20	63.82425	-139.026617	Froese et al., 2009; Mahony, 2015; Porter et al., 2016
Upper Quartz Creek	15	63.822944	-139.0261	Demuro et al., 2008; Zazula et al., 2011
Christie Mine	15	63.822944	-139.0261	Sanborn et al., 2006; Zazula et al., 2011
Uer Quartz Creek	6	63.8256	-139.024233	Sanborn et al., 2006; Zazula et al., 2011
Upper Quartz Creek	10	63.8248	-139.023833	Mahony, 2015
Upper Goldbottom	12	63.898283	-138.991333	Mahony, 2015
Upper Hunker	8	63.958333	-138.950667	Mahony, 2015
Lower Goldbottom	14	63.959017	-138.949667	Mahony, 2015
Brimstone	6	63.74	-138.948333	Mahony, 2015
Mint	15	63.932538	-138.907748	Froese, unpub.
Upper Sulphur	5	63.766133	-138.898333	Froese, unpub.
Lucky Lady II	11	63.73745	-138.85675	Sanborn et al., 2006; Zazula et al., 2011
Ash Bend	12	63.503	-137.27	Westgate et al., 2008; Demuro et al. 2013

Mamontov Klyk	21.7	73.6075	117.1824	Strauss et al. 2013, Schirrmeister et al. 2011
Nagym	12	72.8814	123.2164	Strauss et al. 2013, Schirrmeister et al. 2011
Khardang Island	13.8	72.951	124.222	Strauss et al. 2013, Schirrmeister et al. 2011
Kurungnakh Island	14.7	72.3344	126.3092	Strauss et al. 2013, Schirrmeister et al. 2011
Sobo Sise Island	30	72.5377	128.2863	Fuchs et al. 2020
Cape Svyatoy Nos	15.2	71.5653	128.7475	Strauss et al. 2013, Schirrmeister et al. 2011
Mamontovy Khayata	50	71.7855	129.4192	Shmelev et al., 2017
Bykovsky Peninsula	36.4	71.89	129.6252	Strauss et al. 2013, Schirrmeister et al. 2011
Muostakh Island	7.5	71.6129	129.9436	Strauss et al. 2013, Schirrmeister et al. 2011
Muostakh Island	30.3	71.6129	129.9436	Günther et al. 2015
Buor Khaya exposure	29.7	71.3836	132.084	Strauss et al. 2013, Schirrmeister et al. 2011
Bel'kovsky Island	12.3	75.3658	135.589	Strauss et al. 2013, Schirrmeister et al. 2011
Stolbovoy Island	26.8	74.06	136.08	Strauss et al. 2013, Schirrmeister et al. 2011
Kotel'ny South	8.4	76.1727	139.2266	Strauss et al. 2013, Schirrmeister et al. 2011
Bol'shoy Lyakhovsky	24.8	73.3304	141.3454	Strauss et al. 2013, Schirrmeister et al. 2011
Oyogos Yar coast	18.5	72.6835	143.4753	Strauss et al. 2013, Schirrmeister et al. 2011
Allaikha river	20	70.55	147.4333	Shmelev et al., 2017
Kytalyk Yedoma	4.6	70.8413	147.4384	Strauss et al. 2013, Schirrmeister et al. 2011
Bolshoy Khomus	25	69.98333	153.5833	Shmelev et al., 2017
Alazeya river	35	69.31667	154.9833	Shmelev et al., 2017
Duvanny Yar	41.3	68.6328	159.0876	Strauss et al. 2013, Schirrmeister et al. 2011
Cape Maly Chukochy	25	70.08333	159.5833	Shmelev et al., 2017
minimum	**4.6**			
maximum	**50.0**			
mean	**17.2**			
median	**15.0**			

Supplementary Table S10. Areal estimates of the digitized Yedoma areas with percentage share. The percentage is related to the total area of the Yedoma region. *correction factor of 0.5

	Digitized area	Area with correction factor	% (with correction)
Area name	[km²]	[km²]	[%]
Yedoma domain	2,586,825	2,586,825	na
Yedoma deposits total*	568,620	479,741	100
Yedoma Tundra	206,270	170,009	35.4
Yedoma Taiga	362,350	309,731	64.6
Yedoma Siberia	390,404	390,404	81.4
Yedoma Alaska*	177,758	88,879	18.5
Yedoma Canada	457	457	0.1
Yedoma confirmed	484,905	399,060	83.2
Yedoma confirmed Siberia	313,214	313,214	65.3
Yedoma confirmed Alaska*	171,691	85,846	17.9
Yedoma confirmed Canada	0	0	0.0
Yedoma likely	21,873	21,873	4.6
Yedoma likely Siberia	21,873	21,873	4.6
Yedoma likely Alaska*	0	0	0.00
Yedoma likely Canada	0	0	0.00
Yedoma uncertain	61,841	58,808	12.2
Yedoma uncertain Siberia	55,317	55,317	11.5
Yedoma uncertain Alaska*	6,067	3,033	0.6
Yedoma uncertain Canada	457	457	0.1
Yedoma Kolyma Veremeeva (2021)	12,492	12,492	50 less than quantified area below
Yedoma Kolyma (same extend like Veremeeva 2021)	24,850	24,850	

Supplementary Table S11. Digitized regional maps from Supplementary Table S1, illustrated in Supplementary Figure S4, *from Grosse et al. (2013).

Previous Ice Complex distribution - Yakutia	Area (km²)	reference region
Konichev et al. 2011	691,479	NE Siberia
Grigoriev and Kunitsky 2000	973,818	Yakutia
Romanovsky 1993*	1,141,390	NE Siberia
Tromirdiaro 1980	753,960	NE Siberia

3 References Supplementary Material

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