



Arctic driftwood – an indicator of multiyear sea ice and transportation routes in the Holocene

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Driftwood on the shores of northern Greenland comes from the boreal woods and taiga along large Siberian and North American rivers. The c. 3000 km voyage to Greenland takes c. 5 years, and since the maximum buoyancy of the wood is 1-2 years, the transportation must be afforded by sea ice. The driftwood is therefore an indicator of multiyear sea ice in The Arctic Ocean. Driftwood on Greenland's Arctic Ocean coast is sparse, consisting mostly of small pieces, c. 10 cm in diameter and c. 0.5 m long, with torn and battered ends, and concentrated on projections from the coastline. We have 14C dated 60 pieces of wood from this coast. The frequency distribution of ages show a minimum in the early Holocene, a high frequency period from c. 5.5 to c. 3 ka, a minimum between this and c. 1 ka, and finally a maximum in the last millennium. Presently these coasts are bordered by permanent sea ice. For c. 10 months of the year the coast is brimmed by landfast stationary ice, which prevents landing of driftwood. However, in the autumn storms usually break up the landfast ice and pack ice with its driftwood can reach the shore. Tentatively, we interpret the early minimum as a period with much open water and only scattered multiyear ice reaching this coast. This period coincides with a period of beach ridge formation on the exposed coastlines – supporting that there was seasonally open water along the coast, and possibility for landing driftwood. The first high frequency period marks an increase in multiyear sea ice, while the second minimum probably indicates prolonged barring of the coast by landfast ice. The maximum in the last millennium is concentrated before and after the little ice age, indicating that the coasts were regularly open for pack ice – possibly as at present. The majority (59%) of the identified driftwood comes from *Larix* sp., which is main constituent in the Siberian taiga. 38% is *Picea* sp., presumably from North America where spruce dominates the boreal forest. Finally, 3% are *Populus*, which occurs both in Asia and America. The distribution between the types indicate that the majority came over from Siberia on the Transpolar Current, while the spruce shows influx from the Beaufort Gyre north of Alaska and Canada.