

REPORT NR. 28

GEOARK 2008

Archaeological and Zoo-archaeological Report on Investigations of the
Southern Coast of Clavering Ø, the Revet area, Hvalros Ø and the Estuary
of Young Sund

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Appendix 1

Single site registration

Contents

Introduction

The structure of the 2008 report	5
The description of the archaeological sites in the report	6
The numbering of the archaeological sites	7
Background of the interdisciplinary GeoArk project	12
Participants, organization and collaboration partners	14
Research objectives and localities of the 2008 season	15
Sampling and registration procedures of bone material	16
Logistics during the 2008 field season	17

The coast of southern Clavering Ø

Site 45, 46 & 47. Dødemandsbugten	19
Site 112, 113 & 114	24
Site 41. Fladstrand	24
Site 44. Holmevig	32
Site 43. Bådsted	35
Site 111. Bådsted vest	35
Site 42. Eskimovig	36
Site 36 and 37. Eskimonæs	39
Site 110. Falske Næs vest 1	43
Site 48. Falske Næs vest 2	43

Survey and investigations in the Revet area

Site 107	45
Site 115	45
Site 60	45
Site 61	45
Site 108	45
Site 57. Moskusheimen trapper station	47
Site 105	49
Site 116	49
Site 109	49
Site 102	50
Site 100	50
Site 104	50
Site 103	50
Clavering Ø/Tangen.	50
Site 101. Louise Elv	52

Hvalros Ø

Site 96	53
The structures at Hvalros Ø	55
Archaeozoological analysis	63
Spatial analysis of the structures at Hvalros Ø	66
AMS dating of bone materials related to structures on Hvalros Ø	72

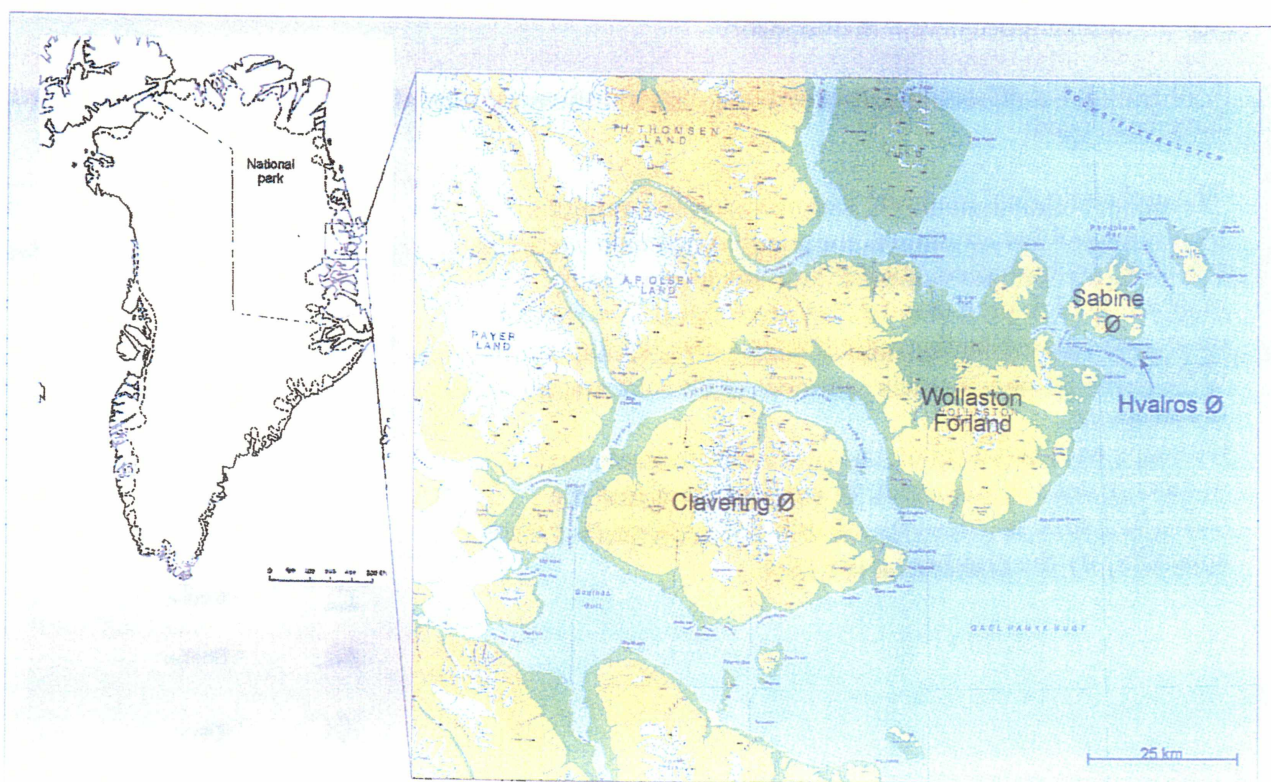
The estuary of the Young Sund area	74
Site 17. Kap Berghaus	74
Site 66. Henning Elv	77
Site 67, 68. Grønnedal øst and Grønnedal vest	80
Site 73. Dahls Skær vest	82
Examination of miniature features in the GeoArk 2008 field season	84
Archaeological and Zoological conclusions and perspectives	88
The prehistoric settlements in the Wollaston Forland, Clavering Ø region	88
The regional sea ice situation	96
AMS dating of the Thule Culture in the region	98
The faunal material – some preliminary conclusions	99
References	102
Appendixes	
1. Single site registration	
2. All sites total registration	
3. Artefact list	
4. AMS dating	
5. Photo list	
6. Playing features	

Introduction

This report comprises the archaeological and archaeozoological accounts of the GeoArk fieldwork conducted around Clavering Ø, Wollaston Forland and Sabine Ø in Northeast Greenland in 2008 (see map). In this report archaeozoological and archaeological analyses of each site are integrated. The results of the archaeozoological work are, however, summarized separately. The geographical account of the fieldwork will be presented in an independent report (Jakobsen, Pedersen and Kroon in prep).

This is the third and final report on the archaeological aspects of the Wollaston, Clavering region within the GeoArk project (see also Sørensen & Andreassen 2006, Jensen et al. 2008). The report provides first and foremost an account of the data collected during the fieldwork in 2008 as well as some preliminary results to be considered as basis for further studies and scientific publications. However, in the report the analysis of the prehistoric settlement through time and for the Thule Culture in particular, is presented. These analyses are based on data from all the four field seasons in the region.

We have chosen to write the present report in English first of all because the GeoArk project has become part of an international collaboration between projects under the IPY-initiative # 6: "Dynamic Social Strategies in Arctic Environments" but also in order to share our data with a larger international audience.



The geographical research area is located between 74 and 75 degrees north at the central northeast coast of Greenland.

The structure of the 2008 report

In contrast to earlier GeoArk- reports the background and general scientific goals for the entire GeoArk project are reiterated before the specific goals of the 2008 season are described.

Then the “where’s and when’s” of the 2008 fieldwork are briefly presented in a chronological order. Four main areas of specific cross-disciplinary interest were selected for detailed analysis in 2008. We managed to reach all the areas and carry out our investigations successfully due to good weather conditions and a lot of logistic aid from the staff of the Zackenberg Research Station and The Danish Military Sledge Dog Patrol “Sirius” in Daneborg. The four areas are: 1) The Eskimonæs area and the coasts of southern Clavering Ø. 2) The Revet area, an inner fjord area at northern Clavering Ø and Payer Land. 3) Hvalros Ø, east of Sabine Ø. 4) The estuary of the Young Sund. The analysis of the prehistoric settlement through time is presented and for the Thule Culture the seasonal mobility is outlined and the turf house settlements are seen in a regional geological and geographical context. Finally a chapter summarizing the archaeozoological results is provided.

During the 2008 fieldwork a specific analysis was carried out on material evidence of children in the Thule Culture as a part of a MA-thesis at Memorial University, St Johns, Newfoundland. A brief summary of this particular project is presented. Finally some perspectives of the fieldwork and the collected data is discussed and summarized.

The description of the archaeological sites in the report

During fieldwork sites and structures were described by drawings of single structures, archaeological mapping of some of the sites and/or by high precision GPS mapping of archaeological structures on the sites. These descriptions have resulted in drawings and different types of maps as presented in this report.

Concerning the archaeological site mapping the following symbols for the different structure types have been used:

The archaeological mapping is not precise concerning the positioning of the structures, but many of the sites were also measured by high precision GPS. Some sites are only mapped by high precision GPS of the structures and plotted on an aerial photo background. However, the global position of the aerial photos is not as accurate as the GPS mapping of the structures.

On maps with aerial photo background the structures has a number instead of a symbol. The reader must find the individual structure description in the site registration (in the appendix) by the number on the map.

	Thule Culture turf house
	Tentring
	Grave
	Fox trap
	Cache
	Shelter
	Other

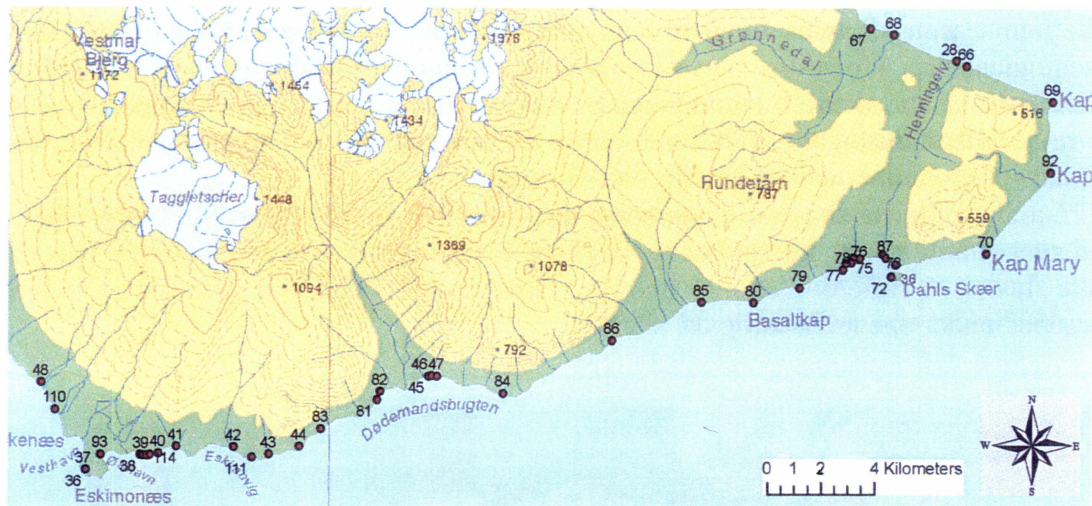
The numbering of the archaeological sites

During the four seasons of archaeological fieldwork different number systems have been used for the archaeological sites. However, to avoid confusion about the different numbers used during the various field seasons the sites are renumbered by numbers from 1 to 116 in this report. In case a site had been re-described during the 2008 field season the new site no. will appear first, followed by the previously used number and eventually the site name.

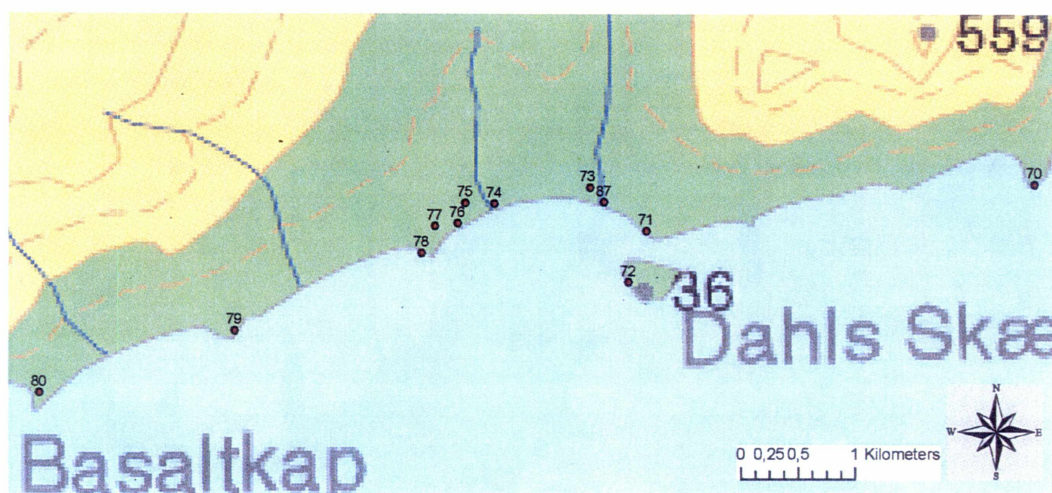
In total 116 archaeological sites were numbered and described in the region (see map). The numbered sites should not be interpreted as single prehistoric entities as sites often consist of several site clusters of different function and age. Thus several prehistoric sites and periods are often described under one archaeological site no.



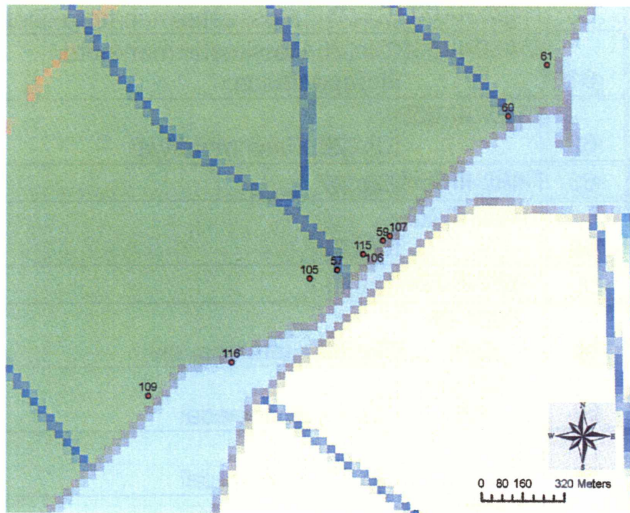
The 116 archaeological sites, marked by site numbers at their precise location in the research area.



Zoom of the site numbering at the southern Clavering Ø



Zoom at the site numbering at Dahls Skær, southern Clavering Ø



Zoom of the site numbering in the Revet are, southern Payer Land



Zoom at the site numbering at Kap Schumacher, northern Wollaston Forland

Site no.	Official no.	Site Name	Site no.	Official no.	Site Name
1		Slettedalen vest 1	59	7402-II-051	Cla 23, Moskushiemen nord
2		Slettedalen vest 2	60	7402-II-037	Cla 24, Moskusheimen nord, Dorset
3		Slettedalen øst	61	7402-II-038	Cla 25, Moskusheimen nord, Independence.I
4		Kap Schumacher, Sydskrænten	62	7402-II-052	Cla 26, Finch nordkyst
5		Kap Schumacher, 1 strand	63	7402-II-054	Cla 27
6		Kap Schumacher, 2 strand	64	7402-II-20	Cla 28
7		Kap Schumacher, 3 strand	65	7402-II-004	Cla 29
8		Kap Schumacher, nordstrand	66	7401-III-024	Cla 30, Hennning elv
9		Kap Schumacher, nordøststrand	67	7401-III-005	Cla 31, Grønnedal
10		Schumacher ø, vest	68		Cla 32, Grønnedal
11		Schumacher ø, syd	69	7401-III-012	Cla 33, Kap Breusing (A+B)
12		Schumacher ø, øst	70	7401-III-007	Cla 34, Kap Mary
13		Schumacher ø, sydøst	71	7401-III-013	Cla 35, Dahls skær fastland
14		Kuhn Ø, 1 strand	72	7401-III-023	Cla 36, Dahls skær
15		Kuhn Ø, 2 strand	73		Cla 70, Dahls skær vest
16		Kuhn Ø, 3 strand	74	7402-II-039	Cla 37
17		Kap Berghaus	75	7402-II-040	Cla 38
18		Kap Berghaus, øst	76	7401-III-025	Cla 39
19		Kap Borlase Warren, nord	77	7402-II-053	Cla 40
20		Kap Borlase Warren, syd	78	7402-II-041	Cla 41, Blåkløkkenæs
21		Kap Borlasse Warren, øst	79	7401-III-022	Cla 42
22		Blæsedalen 1	80	7402-II-042	Cla 43, Basalt Kap
23		Blæsedalen 2	81	7402-II-045	Cla 44
24		Blæsedalen 3	82	7402-II-043	Cla 45
25		Blæsedalen 4	83	7402-II-044	Cla 46
26		Grønlænderhuse	84	7402-II-046	Cla 47
27		Sandøen	85	7402-II-047	Cla 48
28	7401-III-022	Hennning elv, vest	86	7402-II-048	Cla 49
29		Basalt Ø, 1 strand	87	7401-III-024	Cla 50
30		Basalt Ø. 2 strand	88	7402-II-049	Cla 51, Dolomit dal delta
31		Basalt Næs	89	7402-II-015	Cla 52, Zackenberg Thulehus

32		Tyrolerfjord 1	90	74Ø2-II-024	Cla 53, Zackenberg Pal. "Norske Hytte"
33		Tyrolerfjord 2	91	74Ø2-II-024	Cla 54
34		Bjørnnesstua	92	74Ø1-III-006	Cla 55, Kap Arnakke
35		Kap Ehrenberg	93	74Ø2-II-057	Cla 56, Eskimonæs _basestation
36	74Ø2-II-10	Cla 1	94	74Ø1-01V-024	Lb.1, Vardenæs
37	74Ø2-II-10	Cla 2	95	74Ø1-01V-007	Lb.2, Observatory Peninsula
38	74Ø2-II-031	Cla 3	96	74Ø1-01V-004	Lb.3, Hvalros Ø
39	74Ø2-II-32	Cla 4	97	74Ø1-III-001	Lb.4, Kap Wynn (A-C)
40	74Ø2-II-33	Cla 5	98		Lb.5, Kap Wynn (D-E)
41	74Ø2-II-009	Cla 6, Fladstrand	99		Lb.6, Kap Wynn (F)
42	74Ø2-II-008	Cla 7, Eskimovig	100		Cla 60
43	74Ø2-II-007	Cla 8, Bådsted	101		Cla 61 Louise Elv
44	74Ø2-II-034	Cla 9, Holmevig	102		Cla 62
45	74Ø2-II-005	Cla 10, Dødemandsbugten gr.I	103		Cla 63 Clavering Ø/Tangen
46	74Ø2-II-005	Cla 10, Dødemandsbugten gr.II	104		Cla 64
47	74Ø2-II-005	Cla 10, Dødemandsbugten gr.III	105		Cla 68
48	74Ø2-II-035	Cla 11, Falske næs vest 2	106		Cla 22
49	74Ø2-II-002	Cla 12, Lille Finch	107		Cla 65 Grav
50	74Ø2-II-055	Cla 13	108		Cla 66 Payer Land indland
51	73Ø1-001-012	Cla 14	109		Cla 67
52	73Ø1-001-013	Cla 15	110		Cla 69, Falske Næs vest 1
53	74Ø2-II-036	Cla 16, Kalvens nordvestpynt	111		Cla 71, Bådsted vest
54	74Ø2-II-012	Cla 17	112		Cla 72
55		Cla 18	113		Cla 73
56	74Ø2-II-050	Cla 19	114		Cla 74
57	74Ø2-II-029	Cla 20, Moskusheimen	115	74Ø2-II-022	Cla 22
58		Cla 75	116		Cla 21

The site numbering of all sites investigated by GeoArk from 2003 to 2008

The appendixes

The following appendixes are enclosed:

Site registration

The radio carbon dating

Artefact list

Photo list

Background of the interdisciplinary GeoArk programme

The GeoArk-project is an interdisciplinary project between the Humanities, represented by researchers from SILA - The National Museum of Denmark, The Greenland National Museum and the Natural sciences, represented by researchers from Institute of Geography and Geology, University of Copenhagen and the Zoological Museum, Natural History Museum of Denmark, University of Copenhagen. The project is part of the IPY-program: "Dynamic Social Strategies in Arctic Environments" and is financed by the Danish Ministry of Science, Technology and Innovation.

Inuit and their ancestors, the Palaeo- and Neo-Eskimos, have migrated into, colonized and abandoned North East Greenland at least four times during the last four millennia. However, the environmental, cultural and demographic variables and their delicate interplay, which sporadically opened 'windows' for these discontinuous settlement episodes, have previously received little attention.

The GeoArk-project is established as an interdisciplinary research program exploring the dynamics of the High Arctic environment - climate, coasts, natural resources - and the cultural strategies applied by the native cultures of North East Greenland in order to cope with ever-changing life conditions.

During the IPY-years, 2007-2009, the GeoArk-project focuses on the era during which the Thule Culture migrated into and settled North East Greenland, from about 1400 AD to 1823 AD, when Europeans for the first and last time encountered Inuit in this part of Greenland. The Thule Culture era of 400 - 500 years provides splendid possibilities to elucidate the objectives of the general IPY-program.

The Key Issues of GeoArk aims at elucidating important and complex cultural historical and environmental problems, which must be approached via an interdisciplinary framework. Thus, researchers from the humanities (archaeology/history) and natural sciences (geo- and biosciences) collaborate across disciplinary borders in order to answer the following questions:

- Which environmental and cultural preconditions favoured the initial Thule Culture colonization of the High Arctic during the first part of the 1400s AD after probably more than 1500 years of desolation?
- Which factors – including environmental and/or external cultural changes like European commercial whaling and sealing – and native cultural strategies triggered the disappearance of the Thule Culture in North East Greenland during the first half of the 19th century?
- Which were the key game species of the Thule Culture, and how were their distribution and availability linked to climatic fluctuations, sea ice conditions, snow coverage on land, and other dynamic environmental factors?

- Did the yearly hunting cycle and hunting strategies change throughout the Thule period in the study area?
- In which way and at which time did regional climatic changes – primarily in temperatures, precipitation and wind regimes - determine substantial changes in snow- and ice coverage, ice margins and polynias during the Thule era? Polynias – ice free openings in the sea ice – and ice margins are essential to human existence in the High Arctic since they provide high concentrations of marine mammals and sea birds in certain seasons.
- How are these critical and often non-linear environmental changes - including sea level changes - connected to the overall Holocene climatic changes as can be deduced from the Greenland ice cores and deep ocean sediments?

Archaeology, History and Archaeozoology in 2008

Comprehensive archaeological sources from previous investigations around Clavering Island (e.g. Bartlett & Bird 1931, Larsen 1934, Bandi & Meldgaard 1952), and from GeoArk's pilot projects in 2003, 2005 and 2007 are at our disposal (e.g. Sørensen & Andreasen 2006, Jensen et al. 2008, Jakobsen et al. 2008, Bennike et al. 2008, Sørensen et al. 2008).

Re-analyses of artefacts and faunal materials from earlier expeditions, e.g. Lauge Koch's Three Year Expedition, 1930-32 (Larsen 1934, Bandi & Melgaard 1952), during which a significant number of Thule Culture winter houses were excavated by Helge Larsen, are in progress at the National Museums in Denmark and Greenland and at the Natural History Museum of Denmark. Supplemented by a series of new AMS-datings on artefacts and terrestrial fauna this 'old' material is re-activated and utilised by the GeoArk-project in order to elucidate Thule Culture chronology, hunting technology, material culture changes and subsistence.

The archaeozoological component of GeoArk aims at uncovering the dynamics of the living resources in the study area around Clavering Island/Young Sound. The annual cycle of the hunting groups, their migrations and long-term subsistence strategies are closely linked to the occurrence, frequency and availability of the game animals. Information from bone materials retrieved during excavations is currently being combined with faunal data from GeoArk's recent investigations. In particular the winter site of Fladstrand provided well preserved bones encapsulated in turf layers. In contrast, some of the tent sites show very low sedimentation rates and sparse vegetation. Consequently, animal bones and artefacts lie on the surface, and in certain places they form undisturbed 'snap shots' of summer life and subsistence at the site. In 2008 a couple of these sites were investigated in order to provide us – for the first time - with detailed knowledge about exploitation patterns on "summer season" sites.

Information from recent monitoring of the fauna in North East Greenland, palaeo-ecological data on vegetation and fauna as well as historic sources from European commercial large scale whaling and sealing in the Greenland Sea are being compiled, and comparative analyses between different regions of North East and East Greenland will be carried out.

The ultimate goal is to gain a holistic understanding of developments in climate, environment and culture of Northeast Greenland. Besides being an integral part of the GeoArk-project, the archaeozoological component is also an initial step in a study of the environmental history of the Gulf Stream and its impact on human societies of the North Atlantic during the Holocene.

The physical environment, including the quantity of the natural resources and human access to them, is influenced by cyclic as well as chaotic climatic changes. In addition, snow coverage on land and sea ice coverage affected the necessary communication and travelling in relation to Inuit

societies. Therefore, GeoArk's studies of the natural history and physical geography in the area focus on the late Holocene and on the environmental dynamics in coastal landscapes and near coastal waters during the "cultural era" of North East Greenland.

Recent studies of the environment reveal that the physical geography and biology of the ice-free landscape, fjords, and coastal waters are closely linked to the estuarine circulation. This circulation depends on land/ocean exchanges and interactions. The ice and open water/polynia dynamics close to the coastal landscapes are determined by both the climatic sensitive run off from land and the impact of and input from oceanic and atmospheric circulation to the area.

A preliminary outline of the Holocene environmental variability is based on knowledge on the local Young Sound area. In addition, existing information about geomorphology and palaeo-biology from central East Greenland is being compiled and used to provide a general framework for the understanding of the coastal landscapes and their dynamics. Modern environmental data series including weather station records and satellite data are used to assess present variability and dynamics in snow and ice coverage.

Detailed mappings and descriptions of erosion and accumulation patterns due to geomorphological processes in coastal, lagoonal, lacustrine and nivation landscapes were made at selected sites during the earlier field seasons. Data on fossil soils, nivation sediments and sediments in lakes and lagoons were gathered on sites along the south coast of Clavering Island in 2007 and 2008, including cores from lakes close to Thule settlements. The cores are now being analysed.

The 2008-campaign included an important new activity: High-resolution sediment cores were extracted from the Young Sound, the Clavering Strædet, Germania Havn and off Sabine Ø. The cores will be dated and analyzed for biotic and abiotic palaeo-environmental signals. Present hydrographical conditions, estuarine circulation, sediment distribution, and open water area dynamics will be recorded. This international collaboration facilitates access to advanced analyses of the bottom sediments, and thus we are aiming at describing changes in estuarine processes, land/ocean interactions, and ice coverage of the sea with a special emphasis on polynia formation and variability during the late Holocene.

The GeoArk-project includes development and test of new methods: luminescence (OSL) dating of palaeo-Eskimo and Thule dwellings and beach ridges is tested in order to pave the way to high resolution chronologies of sites with no organic preservation.

Participants, organization and collaboration partners

The GeoArk-project is directed by senior researcher Bjarne Grønnow (BG), SILA. The archaeological research is conducted by Bjarne Grønnow, professor Hans Christian Gulløv (HCG), post.doc Mikkel Sørensen (MS) and stud mag. Mariane Hardenberg (MH). Associated professors Bjarne Holm Jakobsen (BHJ), Aart Kroon (AK) and post.doc Jørn Torp Pedersen (JTP) are responsible for the physical geographical and marine ecological research activities.

The zoologists, professor Morten Meldgaard (MM) and post. doc Anne Birgitte Gotfredsen (ABG) are in charge of the zoological research.

The post. doc's are forming a separate working group, concerning research, publication and general organization, within the project

GeoArk's collaboration partners are: National Environmental Research Institute (University of Aarhus), The Greenland Institute of Natural Resources (contact: professor Søren Rysgaard), Danish

Polar Center, The Royal Danish Geographical Society, Dept. of Geography (University of Toronto, Canada (contact: professor Joe R. Desloges)), Dept. of Anthropology (University of Toronto, Canada (contact: ass. professor Max Friesen)), and Avataq Cultural Institute (Montreal, Canada (contact: head of centre Daniel Gendron)).

Research objectives and research localities during the 2008 season

In accordance with the research objectives of GeoArk it was important to gain knowledge on the entire Thule settlement and subsistence pattern in the study area. These objectives were addressed by specific research questions and investigations during the 2008 field season. Due to surveys during the field seasons 2003, 2005 and 2007 the GeoArk team was in the 2008 season also to concentrate on the following specific research localities in the landscape, qualified by earlier surveys and previous scientific work from the area.

1. The southern coast of Clavering Ø

During 2003 and in particular in 2007, Thule sites in the area were located and surveyed, in 2007 sites were also test excavated in order to locate preserved organic materials in well-defined contexts. Surprisingly we located only one site, "Fladstrand", providing midden layers with well-preserved organic materials. Earlier excavations, e.g. from the 1930'ies, displayed excellent preservation of wood, bone and tooth due to the permafrozen conditions especially inside Thule Culture turf houses. However, such conditions do seemingly no longer exist in the area.

Other research problems in the area were: 1) How was the southern Clavering area used during the Thule period, economically as well as seasonally? 2) Why were the largest Thule winter sites in northeast Greenland situated exactly on southern Clavering Ø? 3) Did the settlement pattern and the resource exploitation change in the study area within the Thule Culture period? 4) Can the precise location of Clavering's landing on Clavering Ø during his encounter with an Inuit group in 1823 be located?

2. The Revet area

The Revet area is probably the most fertile area concerning vegetation in the surveyed region, containing large areas of grassy slopes e.g. at A.P. Olsen Land and towards the Greenland Ice Sheet. Today the area contains a large number of muskoxen. The Revet area was visited both in 2003 and 2007, however it was still unclear if, and possibly how, the inland area behind Revet was in use during the prehistory. The inland area was surveyed and mapped and bone materials from prehistoric structures lying on the surface were sampled or *in situ* registered. Moreover a test excavation was carried out near the trapper station Moskusheimen. By studying this area it was our aim to enlighten the Thule Culture exploitation of the inner fjord and inland areas in the Clavering region.

3. The aggregation site on Hvalros Ø (site 96)

This site was visited and partly surveyed in 2005 by GeoArk. The site is overwhelming due to its very large numbers of apparently short time used structures. The island consists of boulders and raised boulder beaches. The site must, due to its many structures, have been very important to the prehistoric Inuit societies. The research objectives was thus to make a complete registration and description of the archaeological features in order to discuss the purpose, the cultural attribution, the economy and the seasonality of this particular site in the Thule society of Northeast Greenland.

4. The estuary of the Young Sund

Surveys by GeoArk in 2003 and 2007 revealed large and varied archaeological sites. Kap Breusing and Dahls Skær contain very large numbers of Thule Culture tent rings. The Henning Elv site is also a large site, Thule Culture turf houses are here thread by coastal erosion. The Kap Berghaus site is located in the outermost Young Sund close to Sandøen. This site shows a horizontal stratigraphy including structures and artefacts from all the different prehistoric cultural groups found in the region (Independence I, Saqqaq, Greenlandic Dorset and Thule Culture).

Sampling and registration procedures of bone material during the 2008 season

Excavation

The main objective for the archaeozoological investigations was for both the 2007 and the 2008 field season to provide well stratified bone samples from the three main ecotypes in the region; the inner fjord or “inland” system, the mid fjord with somewhat protected settlements and the exposed outer coast localities, including both winter habitations and sites representing other seasons. During the 2007 field season, test pits at site 57 (Moskusheimen) and trial excavations at site 41 (Fladstrand) revealed well-preserved bone material. Caribou bone from Moskusheimen, test pit no. 2 was dated to AD 1519-1664 (2 sigma range) (KIA 36001) documenting a Thule horizon underlying deposits from the hunter trapper period of the 20th century. At Fladstrand only one culture layer could be recognized during the 2007 field season. However, two dates of AD 1434-1618 (2 sigma range) (KIA 35999) and AD 1639-1800 (2 sigma range) (KIA-36000) documented use for a prolonged period or several periods of habitation at the site. Consequently these two sites were revisited in 2008 for further excavation. At Moskusheimen test pit no. 2 was reopened and expanded to five quadrants and test pit no. 3 was expanded to two quadrants. At Fladstrand we succeeded in identifying two separate culture layers, which were excavated in 50 x 50 cm squares. A Thule tent ring was excavated in 50 x 50 cm squares at site 44 (Holmevig).

Surface in situ registration and restricted sampling

During the 2007 expedition it was realized that the preservation of organic material had deteriorated drastically during the past century and that the state of preservation of bones was very different from that observed during the large archaeological expeditions of the 1930'ies (e.g. Larsen 1934). Only few localities provided well-preserved bone material and therefore it was decided to extend the sampling and registration procedures to include surface *in situ* registration of bones. Due to the generally sparse vegetation layer and the dry high arctic conditions bones accumulate on the surface and faunal remains can easily be registered especially on seasonal sites with little or no turf accumulation. For the 2008 field season data sheets for quick registration were used and the faunal remains were identified to taxon, bone element, and if possible to side and ontogenetic age. In addition the position of the particular animal bone was registered; i) inside the structure i.e. within the limits of the structure, ii) in the stone construction of a structure, iii) or outside a structure and in that case the direction and distance from the structure was noted. With the GPS mapping of each structure it will be possible to plot the animal bones in the same manner as structures. In order to get a proxy for the age of the bone the surface characteristics of each bone was observed in relation to weathering, coverage by lichens or whether ligaments were still adhering to the bones.

The surface *in situ* registration method was used in the 2007 season on site 69, site 71 and site 78. In 2008 this method was applied on the huge Hvalros Ø settlement. Bones suitable for C-14 dates, worked bones or characteristic bones suitable for understanding butchering practice were, however, sampled for further analysis. In addition this method was used on Fladstrand, for all features except the excavated midden layers in front of winter house A, on Eskimonæs, site 36, activity area C and

Thule tent ring J, on site 37, in an 8 x 6 m field adjacent to a sampled Thule tent ring and on site 101.

A few sites with bones lying on the surface were sampled; site 60, a Greenland Dorset site, site 103, two Thule Culture tent rings and site 105, defined as a Thule Culture activity area. At Eskimonæs, site 37, a Thule Culture tent ring faunal remains were surface collected from a grid of 50 x 50 cm squares in order to register the spatial distribution of bones on a summer camp site.

All bone materials recovered from surface collections and excavations were brought to the Natural History Museum of Denmark, University of Copenhagen for further analysis and storage.

Logistics during the 2008 field season

The research team (BG, HCG, MS, MH, BHJ, AK, JTP, ABG) left Copenhagen July 21 and arrived 22 and 23, respectively at Daneborg, Wollaston Forland. The trip went via Reykjavík, Akureyri, and Constable Pynt, before landing in Daneborg with Twin Otter flights.

From July 23-24 our equipment and food were reorganised while the zodiacs were assembled, inflated and tested. The 24 the drift ice at the mouth of the Young Sund did not allow the boats to get around Kap Breusing and into Gael Hamke Bugt but July 25 we left Daneborg in three four person zodiacs and one RIB from Zackenberg research station towards Eskimonæs. The RIB was sailed by staff from the Zackenberg station. The weather was fine and we managed to come through the drift ice without any problems and subsequently establish our base camp at Eskimonæs.

July 27 the team split into two. BHJ, AK, JTP, ABG, MS left in two boats to carry out investigations in the Revet area (north side of Clavering Ø/ A. P. Olsen Land). While BG, HCG and MH stayed at Eskimonæs to carry out investigations of the Bådsted and Holmevig sites at southern Clavering Ø.

August 1 journalist Poul-Erik Philbert (PEP) arrived at Revet from Zackenberg. The same day the Revet team sailed back to the base camp at Eskimonæs bringing in PEP to make interviews and photos for the media.

From August 1-10 investigations were carried out at the rich area of southern Clavering Ø, especially at Fladstrand (excavation) and Holmevig (excavation) while additional registration and GPS mapping was conducted at Dødemandsbugten, Eskimonæs, Bådsted and Eskimovig. The whole period was favoured by excellent weather conditions.

August 10 the base camp was moved. First from Eskimonæs to Daneborg, where we packed supplies and extra equipment, secondly (during the night) from Daneborg to Germania Havn at Sabine Ø. This large move was only possible due to assistance from Egon R. Frandsen (the Marine Basic programme), who sailed the boat "Aage V. Jensen" with most of our equipment and gear.

From the August 10-22 we stayed in Germania Havn, tenting near the trapper station. During the period we surveyed, described and GPS mapped structures on Hvalros Ø. Moreover the team spent 1½ day surveying Eastern Sabine Ø and visiting the bombed German weather stations in Hansa Bugt. The weather during the period was generally windy and some times very foggy. However, only one working day was lost due to fog and bad weather conditions.

August 22 we sailed back to Daneborg, by much appreciated assistance from the Sirius Patrol by one boat (a RIB). Much of our equipment was left, to be picked up later by a helicopter. The return

to Daneborg went fine even though a good deal of wind and fog and an engine problem made trouble during the first half of the journey.

From August 23-25 the whole team stayed in Daneborg at the “boathouse” kindly put at our disposal by the Marine Basic research team. A rainstorm commenced the 23 with blasts of wind up to 29 m per second. The storm continued for three days while the team stayed indoor feeling lucky that we had succeeded in departing Germania Havn in time.

August 28, part of the team (HCG and JFJ, TK) left Daneborg for Copenhagen.

From August 26-30, the archaeological sites in the mouth of Young Sund were revisited and their structures was re-described and mapped by high precision GPS. The sites were: Henning Elv, Grønnedal, Kap Berghaus and Dahls Skær vest. The weather was generally good during the whole period, but due to the storm and a surprising lack of any kind of drift ice in Grønlands Havet off Wolloaston Forland, large swells made boat landings extremely difficult during the days August 26-29.

August 31 the team moved to Zackenberg research station in inner Young Sund. A few days was spent here under luxury conditions such as fresh food, a cook and hot running water. During this last stay we surveyed the inland and climbed the Aucella Mountain. Moreover, we packed down the equipment, the excavated artefacts and scientific samples for shipment. The weather was beautiful during our stay, even though the autumn came fast with temperatures at night below zero.

September 3 we started our return travel from Zackenberg to Konstable Pynt, Reykjavík and Copenhagen where we landed the September 4.

The southern Clavering Ø area

Site 45, 46 & 47.

Dødemandsbugten

The Dødemandsbugten site was visited and all archaeological features were registered on sketch maps and GPS mapped with high precision GPS-equipment in order to create a reliable map of all the structures and their internal position within Larsen's three ruin groups (Larsen 1934). Compared with Larsen's analysis and mapping we were able to document many previously un-described caches, some tent rings but also activity areas centrally placed within ruin group 2 and 3. The activity areas are characterized by stray finds of artefacts (bone materials, lithics and worked wooden pieces) and fireplaces seen as dense, hard conglomerates of charcoal and bone splinters, but without structural remains. The appearance of the activity areas located within the ruin groups, made us regard these as commonly used spaces deliberately kept free of permanent structures. One lesson to be learned from documenting the site was that the three ruin groups represent three independent winter sites (group I: site 45, group II: site 46, group III: site 47) in the same way as they appear further to the west of the Clavering Island coast, e.g. Holmevig, Bådsted, Fladstrand, Eskimovig and Eskimonæs.

Description of the recorded structures at Dødemandsbugten:

Nr. 1-46: Turf house ruins, described by Larsen (1934).

Nr. 47: Large tent ring, 5 m across, made from large stones with constructions made for tent poles.

Nr. 48: Tent ring made by large rocks in a circular formation and a rock centrally placed, 3.5 m across.

Nr. 49: Tent ring of large stones in a circle and a possible cache or tent pole support in its western side, 3 m across the sleeping platform.

Nr. 50: Tent ring with large stones in the wall opposite to the entrance, 2.5 m across.

Nr. 51: Large depression with compact stonewalls. Either a cache or a house ruin, 1.5 m across.

Nr. 52: Tent ring made from head sized stones in a circle, 4 m across (H. Larsen no. 1).

Nr. 53: Tent ring made from small stones, 3.5 m across (H. Larsen no. 2).

Nr. 54: Tent ring made from large stones, 4 m across (H. Larsen no. 3).

Nr. 55: Large cache, 1.5 m inside.

Nr. 56: do

Nr. 57: Large cache made from large stones approximately 10 m behind no. 55.

Nr. 58: Grave (H. Larsen no. 1)

Nr. 59: Diffuse tent ring with two caches placed against a rock.

Nr. 60: Oval tent ring, 3.5 x 2.5 m.

Nr. 61: Tent ring made from large stones, 4 m across.

Nr. 62: Two tent rings and three caches.

Nr. 63: Tent ring, 3 m across.

Nr. 64-66: Three small caches placed in a row, 0.5 m inside each.

Nr. 67: Tent ring with two caches placed against the back wall.

Nr. 68: "U" shaped cache.

Nr. 69: Fox trap

Nr. 70: Tent ring, seemingly an old one!

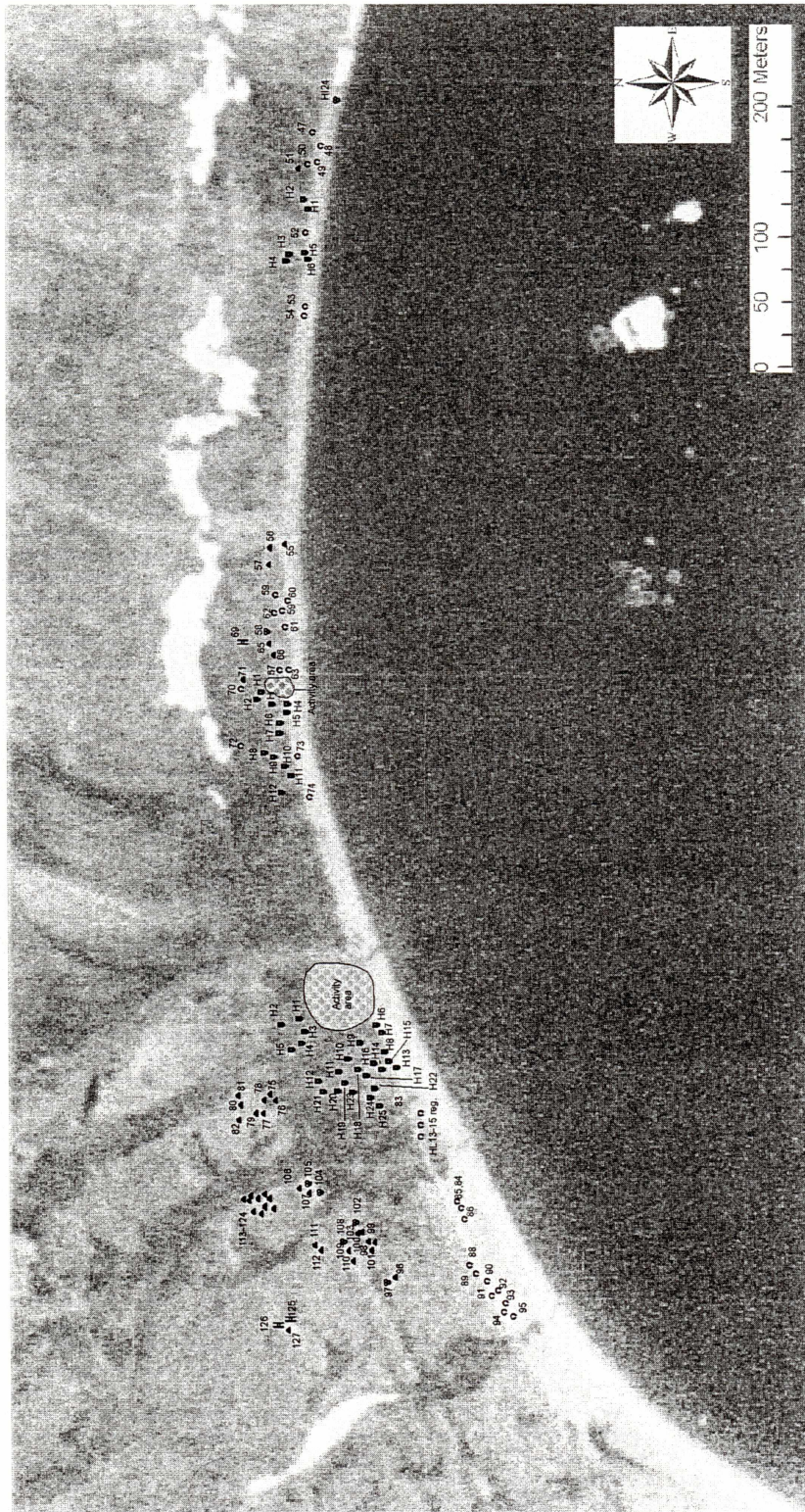
Nr. 71: Cache.

Nr. 72: Tent ring with cache or tent pole support.

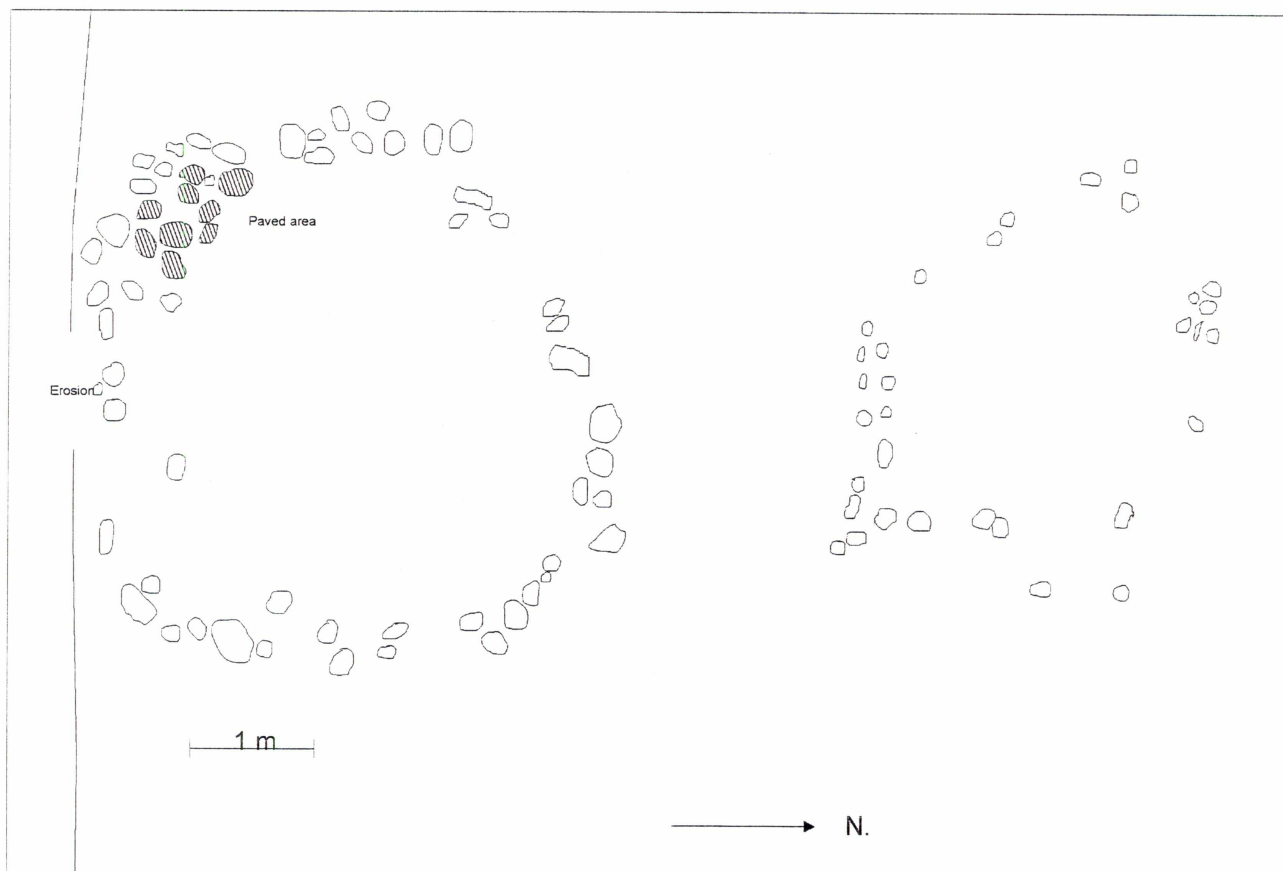
Nr. 73-74: Two tent rings west of ruin group II.

Nr. 75-82: Caches and graves (Nos. 75-77 are probably empty graves (H. Larsen no. 22 & 23).

- Nr. 84-86: Three tent rings (at least). The area is eroded by the sea.
Nr. 87: Fox trap, the trapper period.
Nr. 88-95: 8 tent rings (nos. 91 & 92 was drawn).
Nr. 96-103: Empty graves (H. Larsen nos. 22 & 23).
Nr. 104-105: Empty graves (H. Larsen nos. 20 & 21).
Nr. 106-107: Caches situated in the boulders at river bank.
Nr. 108-112: Grave or caches situated in the boulders at the river bank.
Nr. 113-124: Small caches (0.2-0.3 m across) scattered at the plateau beneath the 2 world war gun shelter.



The map shows Dødemandsbugten with precise positions of the various Thule Culture structures



Two tent rings no. 91 and 92 at site 47 (Site 47, group III). No. 91 is the largest and has its entrance through a low coastal erosion slope. A cache area is seen inside this tent ring. No. 92 is a smaller and disturbed tent ring, which is probably older than no. 91.

Several of the tent rings described were large, up to 5 m across, and could have been used during autumn by a large family while building the turf winter house. The large tent rings seem chronologically most recent and they should probably be associated with the latest turf houses, which also appear as the largest turf houses in the region.



Artefacts lying at the surface within the activity area in ruin group II, Site 46, Dødemandsbugten. Ground slate implements, knapped basalt flakes, bone splinters, and a wick trimmer are seen. The wick trimmer is 10 cm long.

Absolute dating of the Dødemandsbugten sites

As a part of our study of the Dødemandsbugten site, material excavated by Larsen was reanalysed. AMS dating was made from terrestrial bone material in: house 10, group II (KIA 35995), from house 1, group III (KIA 35996), from house 2, group II (KIA 35997) and from Grave 6 (KIA 35998) (see appendix with AMS dating).

The AMS dating of the materials group in the 15 century and they thereby support the general relative chronology of the site, based on types of architecture, artefacts and preservation, as put forward by Larsen in 1934. However, Larsen's Early Culture and 1 stage of Mixed Culture cannot be separated on basis of the new absolute dating.

The dating of an antler arrowhead in Grave 6 revealed that the person most likely was buried in the second half of the 15 century. This dating is particularly interesting for two reasons: 1) The grave contains a "shaman's bag handle" with Dorset-like ornaments. 2) The C13 and N15 isotope levels of the buried person were measured and was discovered that the C13 level is among the lowest in prehistoric Greenland, suggesting that the diet of the person had a relatively high terrestrial proportion (Nelson & Gulløv (n.d.)).

Site 112, 113 & 114

The coast from Eskimonæs to Fladstrand (Cla.1-9) was surveyed and a few sites can thus be added to the settlement of the Southern Clavering Island. The survey confirmed that the coast between Dødemandsbugten and Eskimonæs have been intensely settled by the Thule Culture, not only during the winter (turf houses), but also during the warm season, by many single and double tent rings which must have been used on short stays during travelling.

Site 112

Two Thule Culture tent rings, located around 200 m west of a promontory.

Site 113

Two Thule Culture tent rings located at small grass fields between gneiss rocks.

Site 114

A palaeo-Eskimo box fireplace made from stone slabs. No artefacts could be found in its vicinity. A paved area, interpreted as part of palaeo-Eskimo midpassage structure and a tent ring of Thule Culture type was found.

Site 41**Fladstrand**

During 2003 and particularly in 2007 Thule Culture sites in the area were located, and in 2007 they were also test excavated in order to locate preserved organic materials in well-defined contexts. Only at the site of Fladstrand these conditions were met. A moist carpet of mosses had sealed off the Thule Culture midden layers containing large amounts of well preserved organic materials. Bone and tooth were very well preserved, while in general antler and wood were less well preserved.

In front of turf house A the excavated trench of 2007 was reopened and expanded towards the east and the west of the profile. The excavation was carried out in $\frac{1}{4} \text{ m}^2$ in contextual layers. Towards the west the excavation was expanded with four $\frac{1}{4} \text{ m}^2$ along profile 100.5/200.0 – 100.5/202.0 and additional four $\frac{1}{4} \text{ m}^2$ towards the west. However, both culture layer 1 and layer 2 contained very few items and the excavation was not expanded further towards the west. Towards the east six squares of 50 x 50 cm were opened along the profile 100.0/200.0 – 100/203.0 of the 2007 excavation. These squares produced large quantities of bones and artefacts and the field was further expanded with 12 more $\frac{1}{4} \text{ m}^2$ towards the east. Especially the squares closest to the turf house A contained many finds whereas the culture layers became thinner towards the south. Due to time lack and the fact that the bone density was decreasing only four additional $\frac{1}{4} \text{ m}^2$ were opened along the 98.5/200 – 98.5/202.0 profile towards the east.

The total amount of excavated $\frac{1}{4} \text{ m}^2$ were 30 equalling $7\frac{1}{2}$ square metres.

The profile 95.5/200.0 – 95.5/203.0 and 98.5/200.0 – 85.5/203.0 were photo documented, while profile 90.0/200.0 – 90.0/203.0 was drawn.

Layer 1 and 2 could be separated by a thin sand layer in the m^2 , so that two contexts representing an early and later Thule Culture period could be sampled.

The layers are defined as:

Layer 0: Upper grass and vegetation layer.

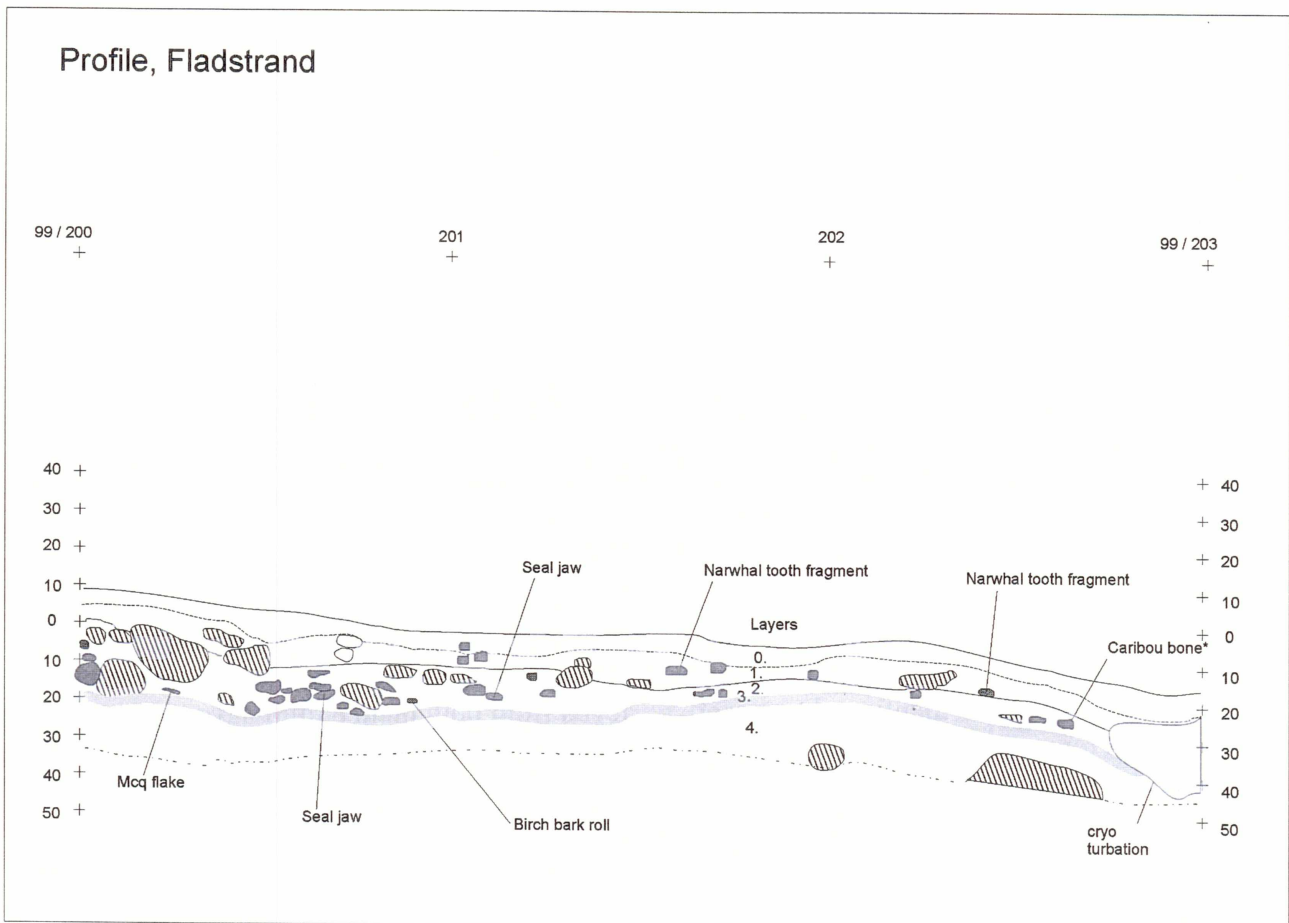
Layer 1: Brown soil/turf layer with thin roots preserved, occasionally spots of silt. Many organic Thule Culture artefacts appear in the layer.

The bottom of the layer ends, and separates this layer, with a ½-1 cm thin layer of sterile sand.

Layer 2: Layer of brown soil without preserved root materials, many Thule Culture organic materials are preserved in this layer. In the bottom the layer ends with a thin, 1-3 cm, layer of sterile sand.

Layer 3: Black to dark brown layer, 3-4 cm thick, with lots of preserved organic materials, especially willow twigs. No artefacts are found in this layer.

Layer 4: Silt and brown soil mixed together. The layer is strongly cryoturbated.



Drawing of the profile 99.0/200.0 – 99.0/203.0 at Fladstrand.



Photos of the profile 99.5/200.0 – 99.5/203.0

Sampling in the field:

Sediment samples:

Sediment samples totalling 2 litres were sampled in the squares 99.0/201.0; 99.0/201.5 and 98.5/201.5 containing large concentrations of chips of narwhal tusk.

A sediment sample of the sand lens between layer 1 and layer 2, in square 99.0/202.0 was sampled.

A sediment sample of the sand lens between layer 2 and layer 2, in square 99.0/202.5 was sampled.

Samples for C-14 dating:

Layer 1, profile 99.5/201.0-99.5/201.5, from the lower part of layer 1, caribou mandible (dextra), KIA37727

Layer 1, profile 99.5/201.0-99.5/201.5, caribou ulna (sinistra), KIA37728

Layer 2, profile 99.0/200.5-99.0/201.0, caribou humerus (sinistra), KIA37729

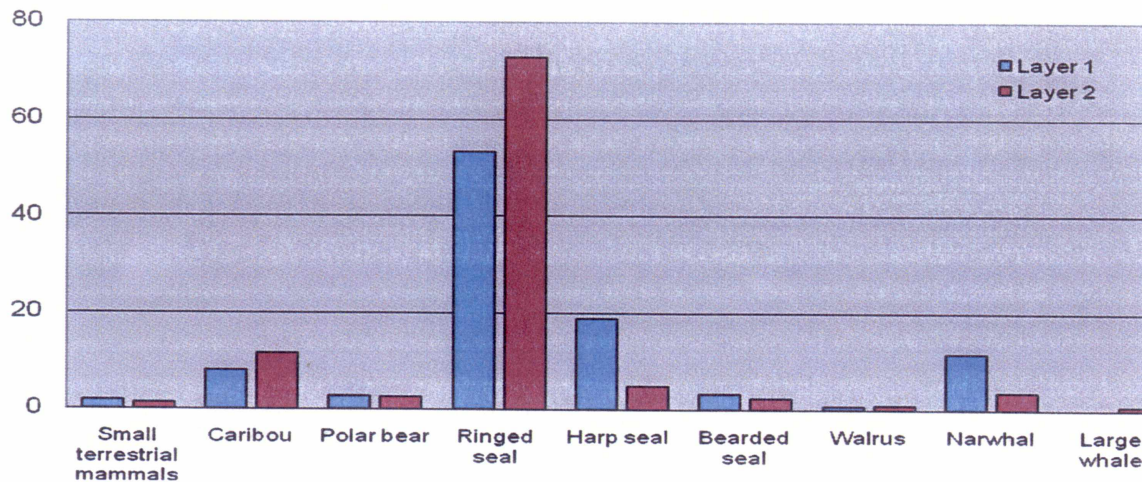
Layer 2, square 99.0/202.5, upper part of layer 2, caribou tibia (sinistra) (not dated)

Layer 2, square 98.0/200.0, upper part of layer 2, caribou metatarsus (sinistra), (KIA37730)

From layer 3, 99.5/201.0 and 99.5/202.0 *Salix* sp. twigs.

The bone material was in general well preserved. However, there was a strong bias against small and fragile bones of birds, and small terrestrial species, e.g., arctic hare and polar fox. The caribou bones also showed signs of having been exposed to acidic soil conditions with poor preservation conditions of e.g. antler and spongy bone elements like ribs and vertebra. The preservation conditions deteriorated towards the west especially in the four $\frac{1}{4}$ m² squares 98.0/200.0 to 98.0/202.0 which contained large quantities of wood and pockets of poorly preserved bones.

Nearly 7000 bone fragments were retrieved during the 2008 campaign at Fladstrand. The sample comprised at least 14 taxa; unidentified fish, goose, rock ptarmigan, arctic hare, dog, polar fox, polar bear, walrus, ringed seal, harp seal, bearded seal, caribou, narwhal, bowhead whale and unspecified whale. The most numerous species was ringed seal followed by caribou, narwhal and bearded seal. The above mentioned taxa were retrieved from both main culture layers. However, narwhal was represented most numerous in layer 1 by small chips of narwhal tusk concentrating in the four squares: 99.0/201.5; 99.0/202.0; 98.5/201.5 and 98.5/202.0. Baleen of bowhead whale and a few fragments of unspecified large cetacean were documented in layer 2 only.

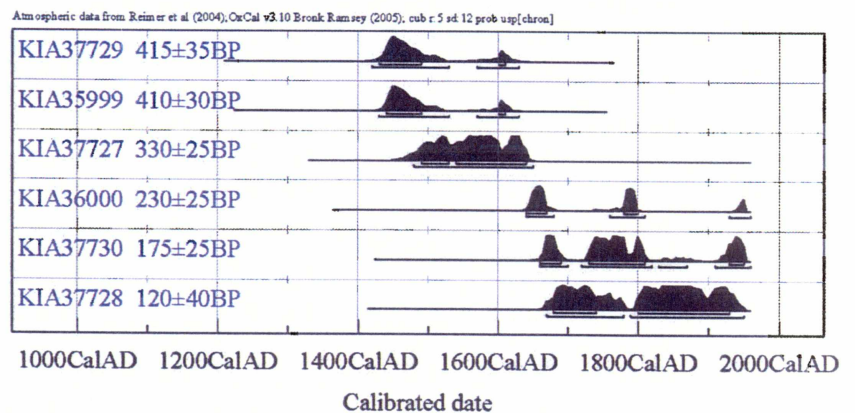


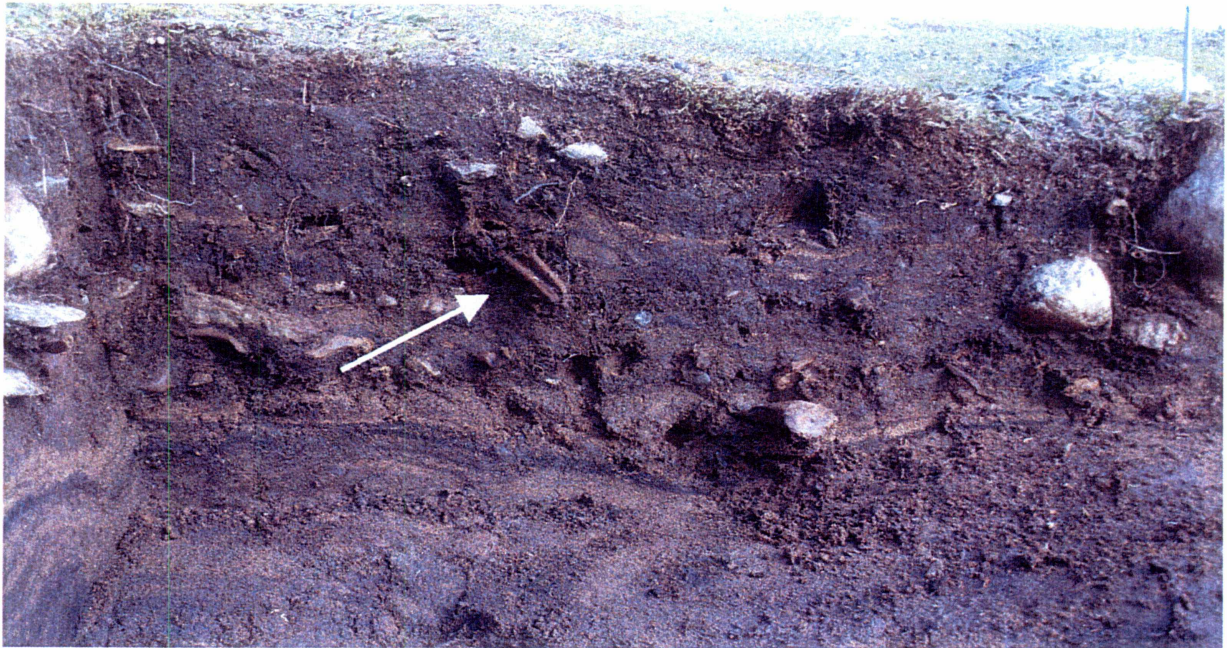
*The relative distribution of the identified mammal bones at Fladstrand. Small terrestrial mammals are arctic hare and polar fox. Bones of unspecified seal (*Phoca* sp.) were distributed proportionately on ringed seal and harp seal. A large number of small flakes of narwhal tusk was excluded from the diagram. Layer 1 (n= 969) Layer 2 (n=2062).*

AMS dating of layer 1 and 2

The dating of terrestrial bone material (caribou bone) from the profile (KIA 35999, KIA 36000, KIA 37727, KIA 37728, KIA 37729, KIA 37730) reveals that layer 2 was formed during the 15th century (KIA 37729 KIA 35999) while layer 1 was in use both during a period in the 16 century (KIA 37727) and during one, or several periods in the late 17, 18 or early 19 century (KIA 37728, KIA 37728). The

dating KIA 36000 was sampled in 2007 from a part of the profile which had been cryoturbated. The layer of this dating is thus unknown. The dating KIA 37730 is much younger than the other datings of layer 2. Probably the bone for this dating is problematic, as it was sampled from the upper part of layer 2 close to the transition between the two layers (from the most northern end of the profile) (see photo below) (See appendix with datings). The datings of the midden suggests that the nearest Thule Culture turf house was used and reused several times during the Thule Culture.





The caribou bone centrally in the profile was sampled for AMS. It is seen that the bone is situated in the profile very close to the sand layer, separating layer 1 and 2.



The start of the excavation at Fladstrand. The midden layer has preserved organic materials, probably from the inhabitants of the turf house behind the midden



The excavation in progress

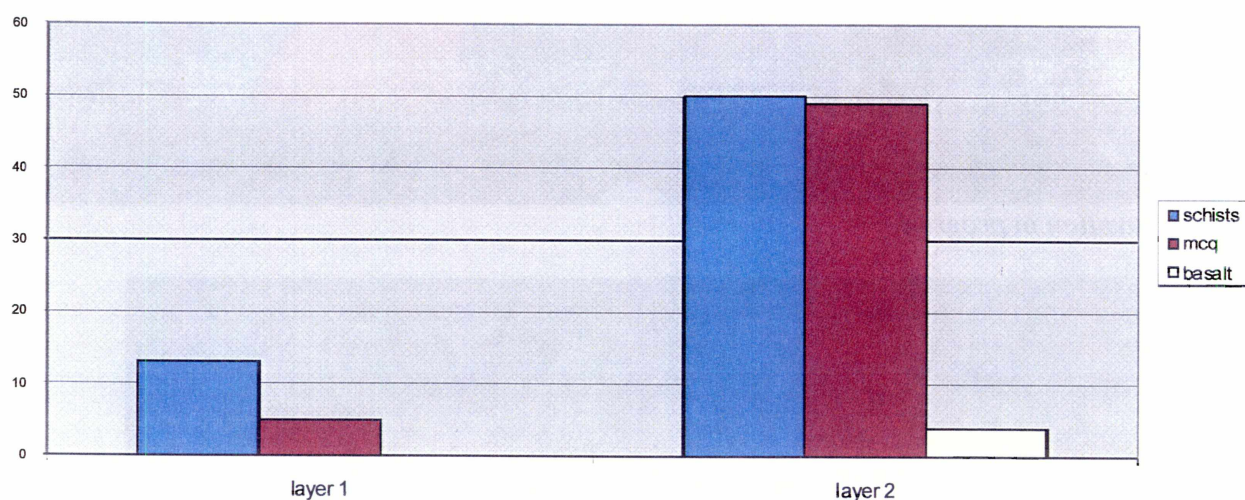


Well preserved faunal material. Square 99.5/200.5 layer 1, seal bones seen from East

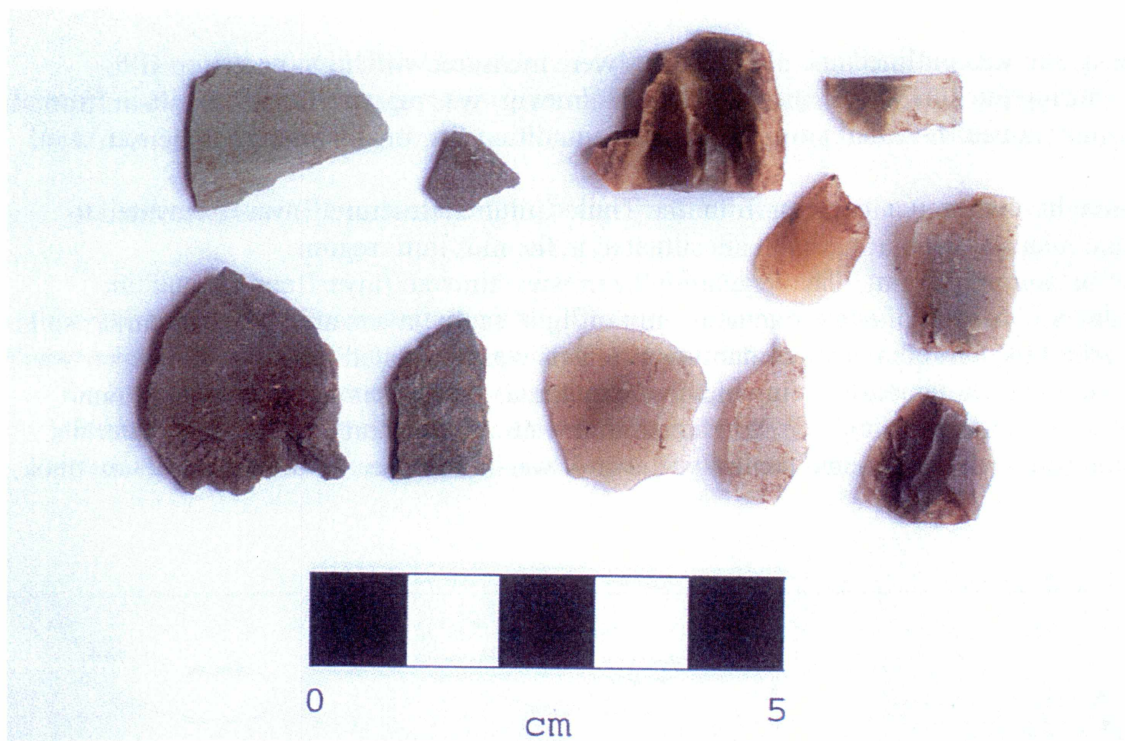
Lithic artefacts

In total 121 lithic artefacts made from slate, microcrystalline quartz (mcq) and basalt were found in layer 1 and 2. Analysis of their quantities within the two layers show that the inhabitants of the early Thule Culture at Fladstrand (layer 2) used more lithic materials than during the later period. Moreover, a larger frequency of mcq characterize layer 2. Basalt, probably deriving from Basalt Ø in Young Sound, is commonly in use during the early Thule Culture periods at Fladstrand. A tendency towards a decrease in use of lithic materials during Thule Culture in the region, was earlier suggested by Larsen (1934) and Bandi and Meldgaard (1951). The excavation at Fladstrand supports these earlier observations. However, the changes can be qualified concerning the specific lithic technology, changes in the raw material choice and procurement with evidence from the 2008 excavation.

Site 41, Fladstrand. Artefacts from lithic materials in Layer 1 and Layer 2
(n=121)



The lithic artefacts found in layer 1 and 2 in excavation at site 41



Lithic materials from Fladstrand 98/200 layer 2, x39. To the left side fragments of ground slate are seen. To the right side different flakes typical of bipolar technology, made from mcq, is seen

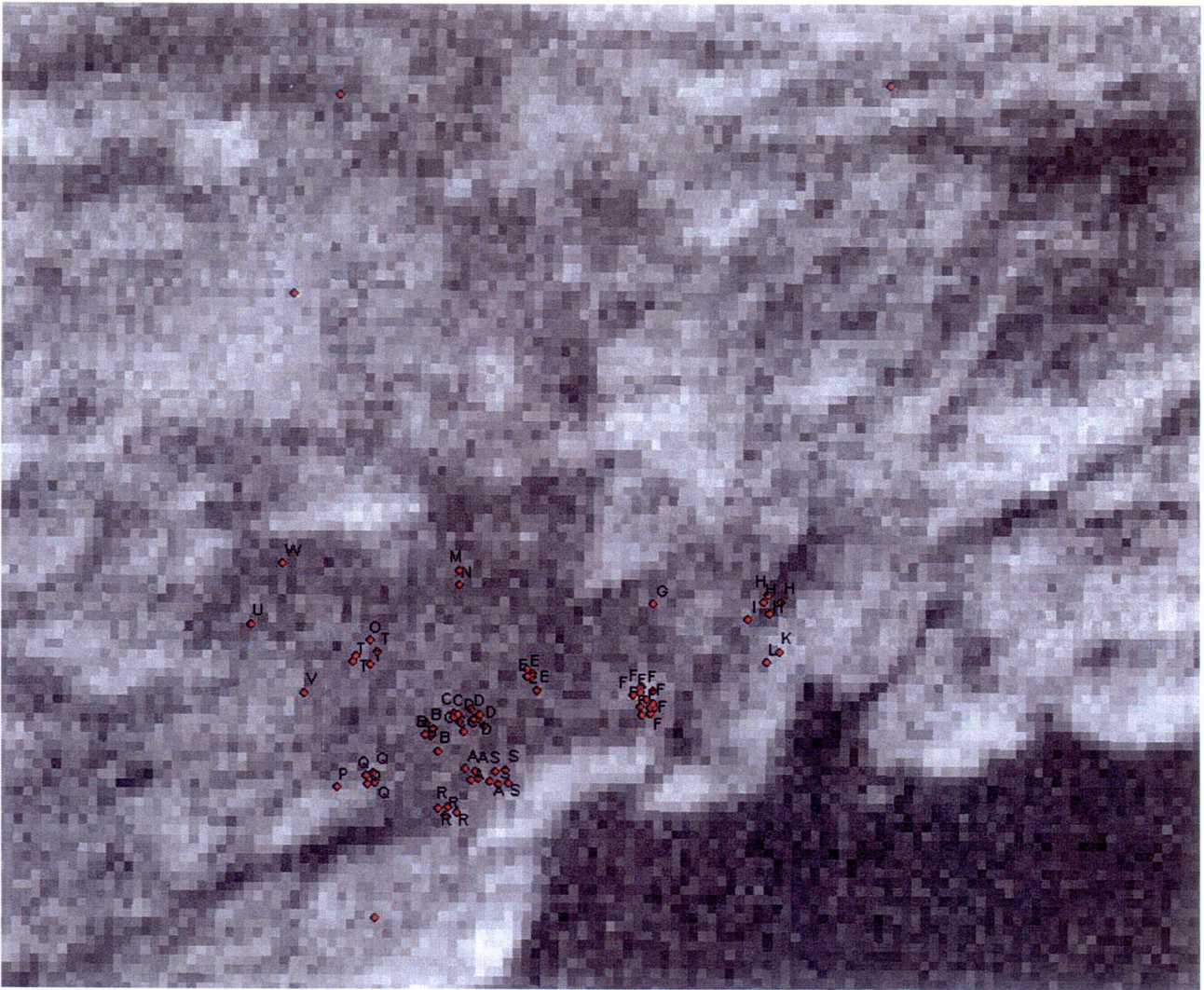
Site 44.**Holmevig**

The Holmevig site was outlined and all structures were measured with high precision GPS equipment. During the 2007 field season site 44 (Holmevig) was registered and test pits in front of the Thule winter houses revealed poor preservation conditions for organic material (Jensen et al 2008: 20).

A midden area in relation to a tent ring from the Thule Culture (structure F) was excavated to provide faunal material from a seasonal site situated in the mid fjord region.

The excavation comprised 6 m². The vegetation layer was removed (layer 1 and 2), and the subsequent layer consisted of a heterogeneous mix of light sandy layers and layers of darker soils (layer 3). Under this, a midden layer containing artefacts was excavated (layer 4). This layer was 5-7 cm thick and included depressions in which bone material was preserved. The underground consisted of gravel and sand (layer 5). Artefacts found were of bone, antler and lithic materials. Inside the tent ring 1 m² was opened centrally. Layer 4 was in this area no more than 10 cm thick.



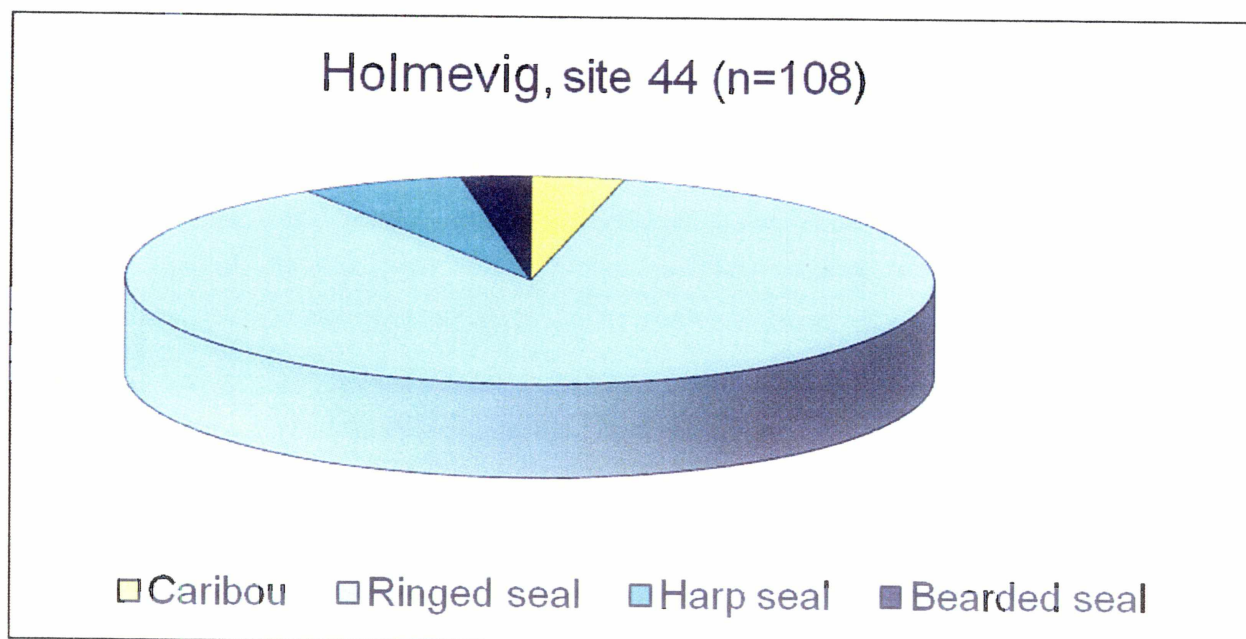


The high precision position of the structures at Holmevig



The excavated Thule Culture tent ring, structure F, at Holmevig (Site 44)

The bone material ($n=326$) deriving from a total of 6 m^2 was in a poor state of preservation and only 34% of the bones could be identified. The sample comprised six taxa; unspecified fish, ringed seal, harp seal, bearded seal, caribou and narwhal with ringed seal as the most frequent species.

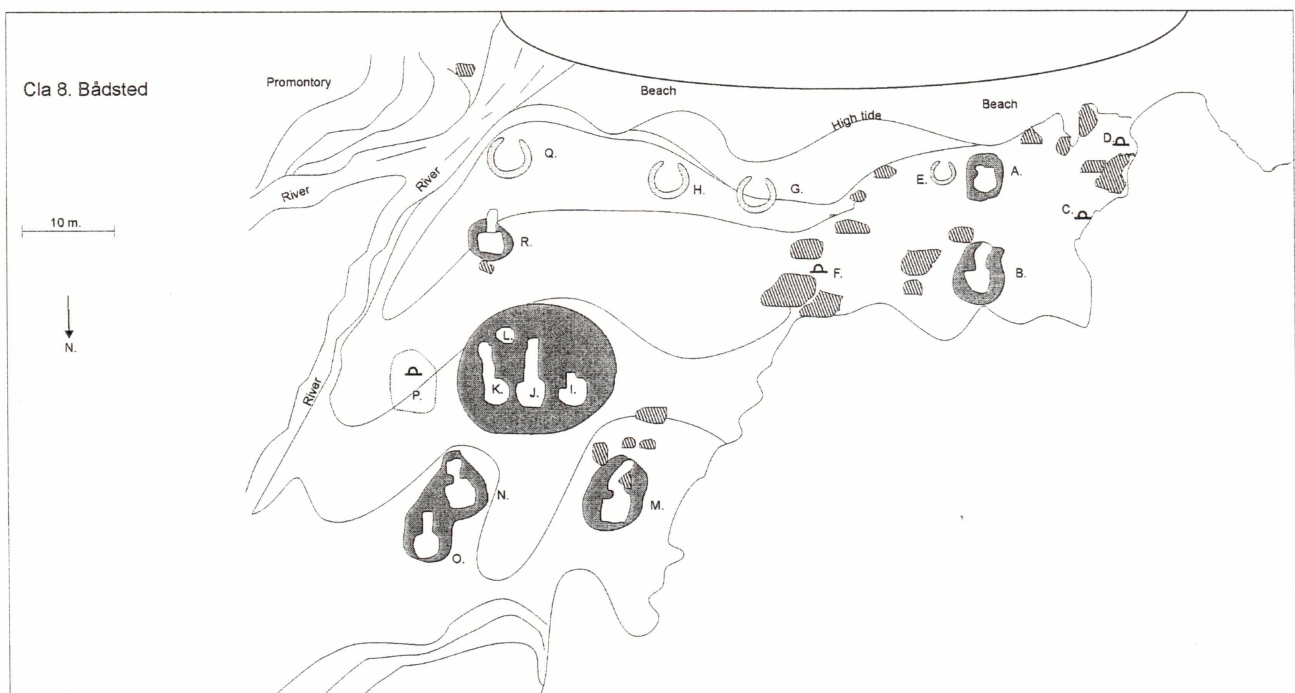


Relative distribution of the four highest ranking taxa at Holmevig

Site 43 Bådsted

The Bådsted site was mapped and all structures were mapped with high precision GPS equipment. The central site area contained 8 Thule turf houses, 4 tent rings and 4 caches. Moreover there was mapped, in the area behind and to the sides of the central area, 2 more tent rings, 8 caches, 2 children's playhouses and 2 graves.

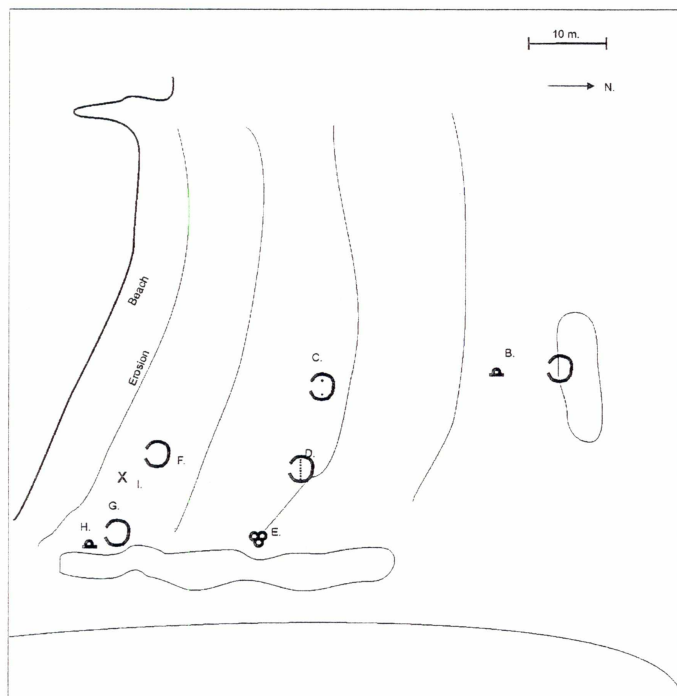
Several of the turf houses were quite well preserved and may not have been disturbed by previous excavations (house A, B, I, J, K, M, N & O). The smallest and most overgrown houses were A, B and R, all lying in the periphery of the central site area. These houses are most probable also the oldest at the site.



The Bådsted site (Site 43)

Site 111 Bådsted vest

The Bådsted vest site is a small site consisting of 5 Thule Culture tent rings, 1 grave and 2 caches. This small site is found in a small and rocky cove just west of the Bådsted site. It is a typical summer site of the south Clavering Island coast.



The Bådsted vest site (Site 111)

Site 42

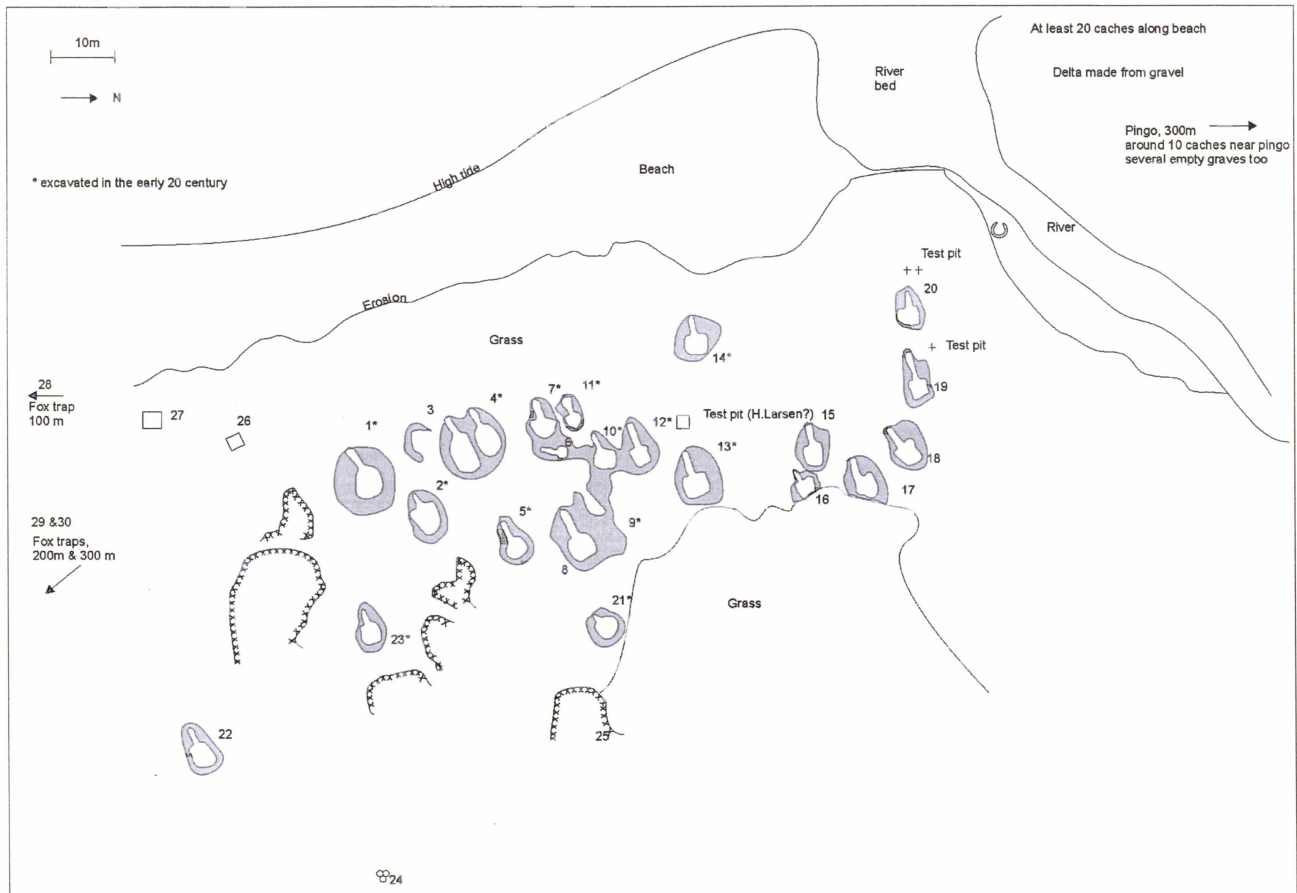
Eskimovig

The Eskimovig site was outlined and all structures were measured with high precision GPS equipment. In total 23 Thule turf houses were located, most of these were severely damaged by former excavations. At the site two ruins of trapper's cabins were found and two fox traps from the same period. Only one tent ring was recorded and one grave was found. North of the site, along the beach, at least 20 caches were seen. In the river delta, also north of the site, a pingo was situated and around this approximately 10 caches and several empty graves were found.

The recording of the turf house ruins revealed that the ruins were of different architecture and state of preservation suggesting that they had been built, used and reused during many periods of the Thule Culture. The oldest ruins would probably be no. 22 & 23 which are situated in the outer periphery of the site. The ruins of the youngest phases situated centrally and close to the sea show preserved walls but are generally very damaged by excavations, e.g. nos. 1, 8, 12, 13, 17 & 18. The double ruin no. 3-4 must also be considered as the youngest type. The rooms of most of the turf ruins at the site had trapezoid outline. The longest back walls were seen in ruins nos. 21, 22 & 23, and the longest front walls in ruin no. 2, 7, 12 & 18. In all the houses the entrances were shorter than otherwise seen in Greenland during the Thule Culture. It seems like the entrances have been entered directly in front of the house through an approximately 2 m long entrance tunnel.

A series of test excavations were conducted. West of ruin no. 20 three small test pits were made in order to test the preservation of organic materials, in what may be a Thule Culture midden area. The following layers were recorded, described from the top: 1) vegetation (1.5 cm), 2) sand (1 cm), 3) dark to black earth, former vegetation layer (1 cm), 4) light brown mixed layer with artefacts and a willow twigs (4 cm), 5) as layer 3 (1.5 cm), 6) subsoil, sandy.

West of ruin 19, another test pit was made. It produced the same sequence of layers as the first test pits. The total thickness of the layer was 16.5 cm. One preserved pelvis from seal and one flake made from mcq were retrieved.



The Eskimovig site (Site 42) is the second largest turf house site in Northeast Greenland, after Dødemandsbugten group III (Site 45)

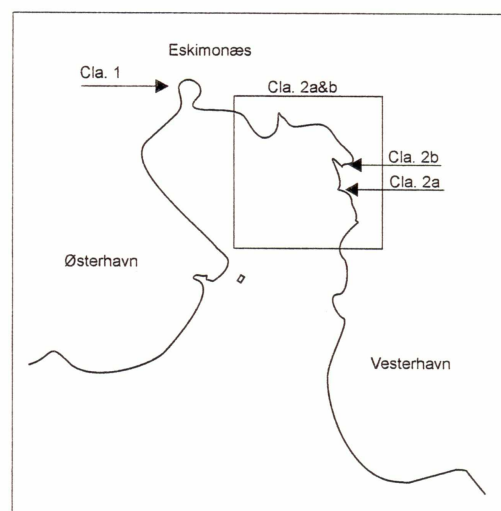
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Site 36 and 37

Eskimonæs

The southernmost promontory of the Eskimonæs (Site 36, Cla. 1) and the western side (Site 37, Cla. 2) were revisited surveyed and the structures were recorded archaeologically.

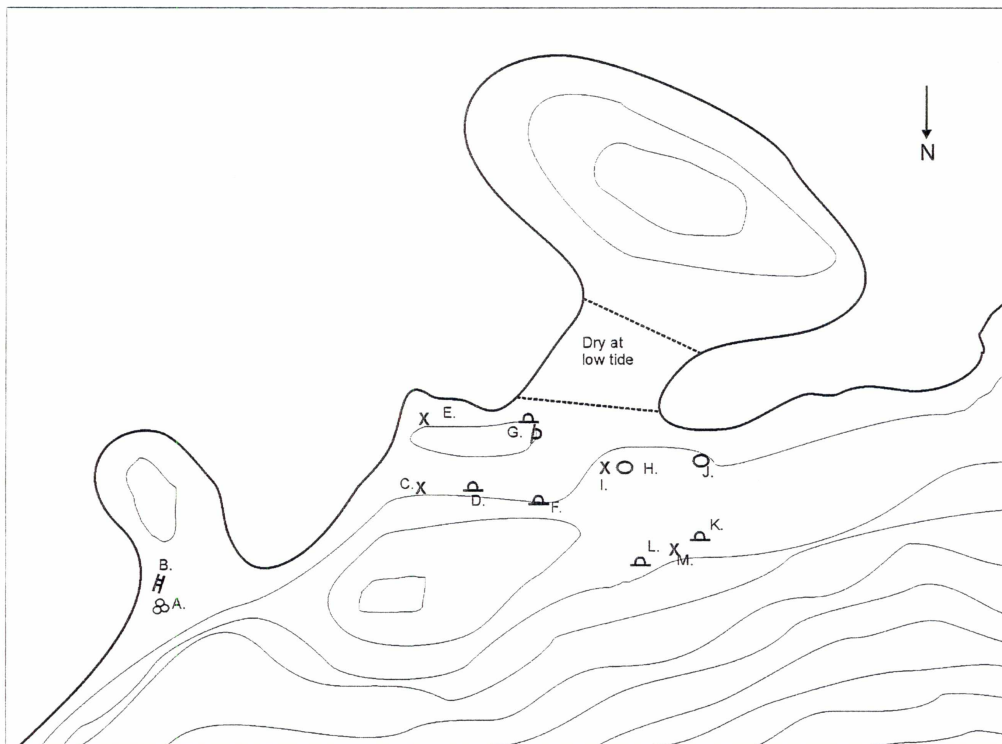


Site 36

Site 36, Cla.1 yielded two tent rings of Thule Culture type, six caches, a grave with a single preserved human femur and a fox trap from the trapper period. Moreover some structures could not be classified e.g. C and E (possible activity areas for processing drying/treating skins), I (rows of stones). Structure M, is a box fireplace with a stone slab used as a pan, possibly from the Thule Culture.

Structure J (see map), a Thule Culture tent ring was investigated in detail. The structure was covered with a very thin vegetation layer and was situated directly on the bedrock close to the steep cliff sloping towards the seaside with no soil in front of the structure. The amount of information to be gained from an excavation was considered to be negligible and therefore all bones in front of and inside the structure were *in situ* registered on data sheets. The visible bones (n=14) comprised ringed seal, unspecified seal presumably ringed seal and caribou with ringed seal as the most numerous species.

To gain further information of the site, area C was surface *in situ* registered. This area was interpreted as an activity area for cutting up and butchering of the game as no structures were identified. This sample (n=29) comprised the species of ringed seal, bearded seal, unidentified seal, narwhal, and caribou with ringed seal as the most abundant species. Several of the bones showed signs of abrasion from continued wave action. And the quality of the sample is thus difficult to evaluate. At the site several caches were documented one of them with the caudal part of a narwhal calvarium.

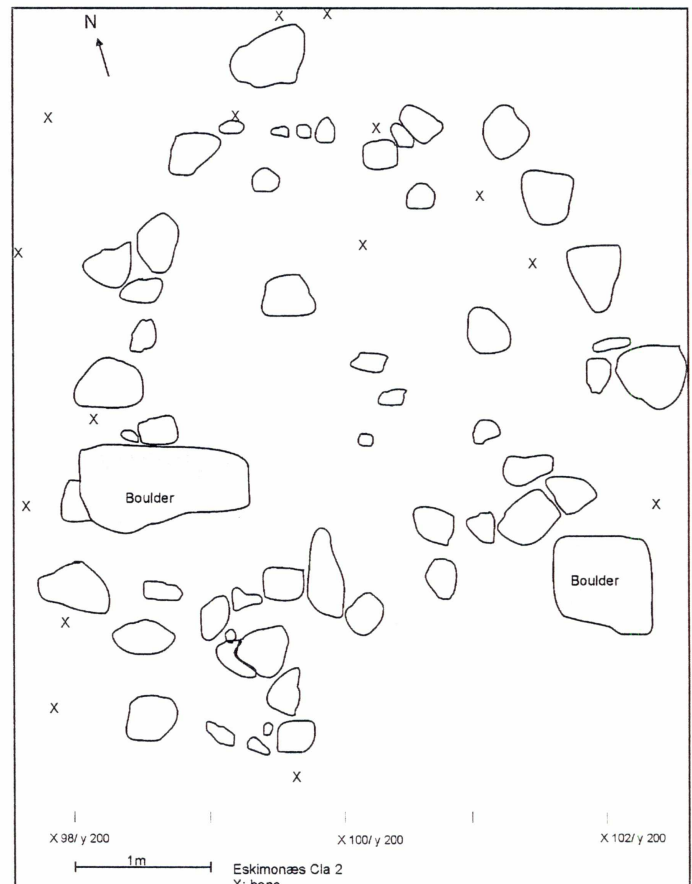


Site 36, Cla 1

Site 37

The western side of the promontory show several small and protected bays and beaches in which Thule Culture activity had taken place and turf house settlements could be documented. The area cannot be described as one site rather it should be considered as three small sites each with its own beach. The following features were found in the area: 4 turf house ruins, 5 Thule Culture tent rings, 1 shelter made in a rock cleft, 11 caches and 4 graves. Cache no. A, was of a large type and contained two mandibles from narwhal. The turf house ruins were all severely damaged by earlier excavations.

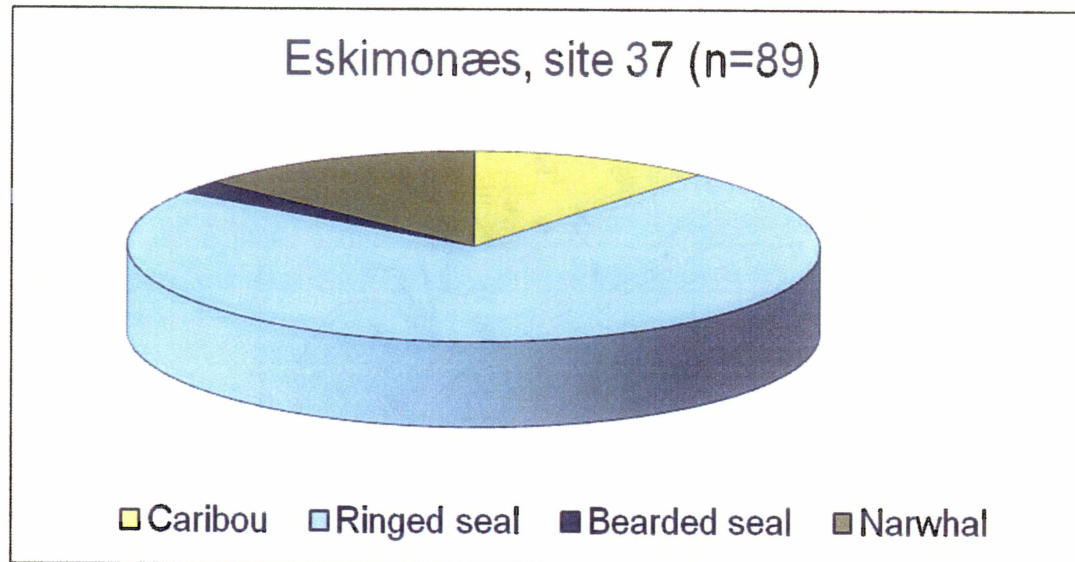
The Thule tent ring with the largest distance to the erosion slope in area 2b was chosen for systematic surface sampling. A grid of 50 x 50 cm squares was established and the faunal remains were collected by square. The sampling was carried out in a distance of four metres from the centre line (see figure). All unidentifiable fragments were left on the site. To provide further information on the site



Thule Culture tent ring in area 2b, from which a bone material was surface collected

bones in an area of 8 x 6 m north of the tent ring were surface *in situ* registered.

The surface sampled portion (n=76) comprised six species; arctic hare, ringed seal, bearded seal, walrus, caribou and narwhal. Seal was by far the most numerous species followed by narwhal and caribou. The surface registered material north of the tent ring (n=24), exhibited the same pattern with dominance of ringed seal, followed by narwhal and caribou.

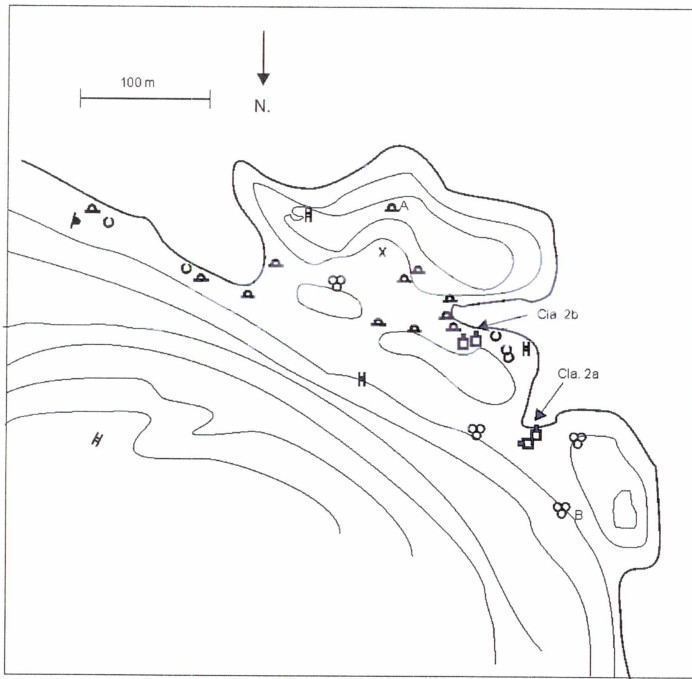


Relative distribution of the four highest ranking taxa of a tent ring in area 2b

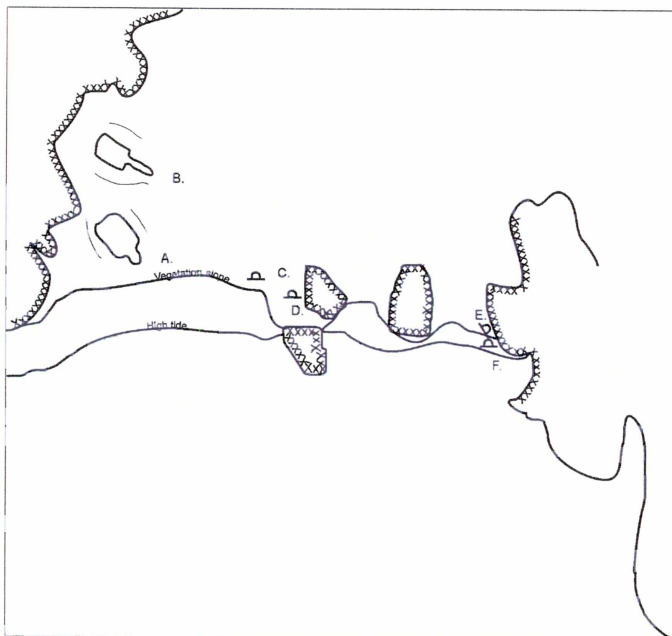


Tent ring in area 2b, seen from west and east

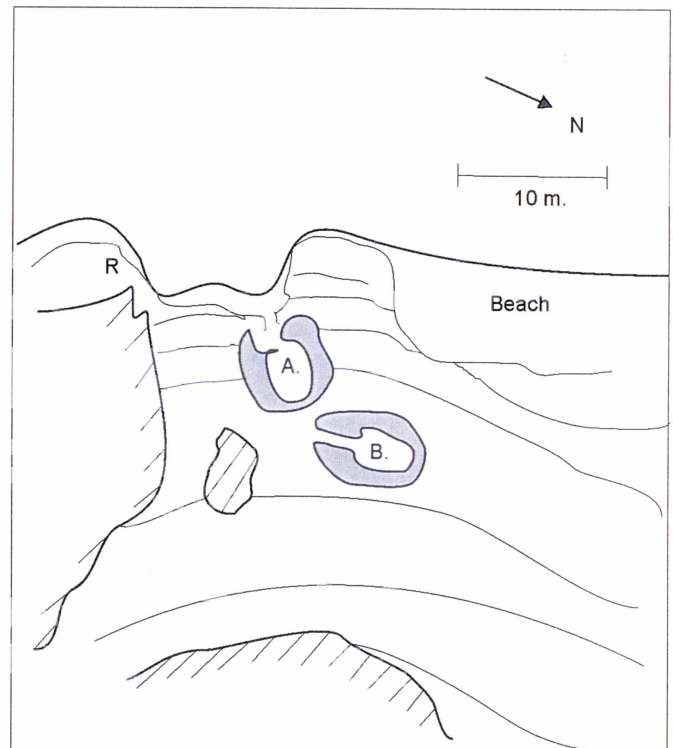




The western part of Eskimonæs (Site 37, Cla 2) with the turf house sites Cla. 2a and Cla. 2b



Cla. 2a. Two turf houses are located in the northern part of a small bay. At the small promontory and in the southern part of the bay several caches were found.



Cla 2b. The turf house ruin A was under erosion from the sea thus its entrance was only partly preserved. Moreover the turf house suffered from earlier excavations. The room is 2.5 x 2 m. The ruin B had a better preservation but has previously been roughly excavated as well. The size of the ruin is L: 2.9 m, W: 2.2 m, Entrance 2.2x0.6 m.

Site 110**Falske Næs vest 1**

At the first promontory west of Falske Næs a small site was found, consisting of a Thule tent ring, in a small cove just east of the promontory, a diffuse partly eroded palaeo-Eskimo midpassage structure, and a large cache or fox trap at the point of the promontory. Just west of the promontory, on a sequence of beach ridges, several small palaeo-Eskimo structures were found. The structures were situated at different elevations but were difficult to define; they were most probably former fireplaces, which in some of the cases may have been surrounded by tent constructions.

In the midpassage structure flakes made from basalt and mcq, and a small preform, were found. Judged from the lithic material it is most likely that the structure was used by Greenlandic Dorset palaeo-Eskimos.

Two large caches were found at a promontory east of this site.

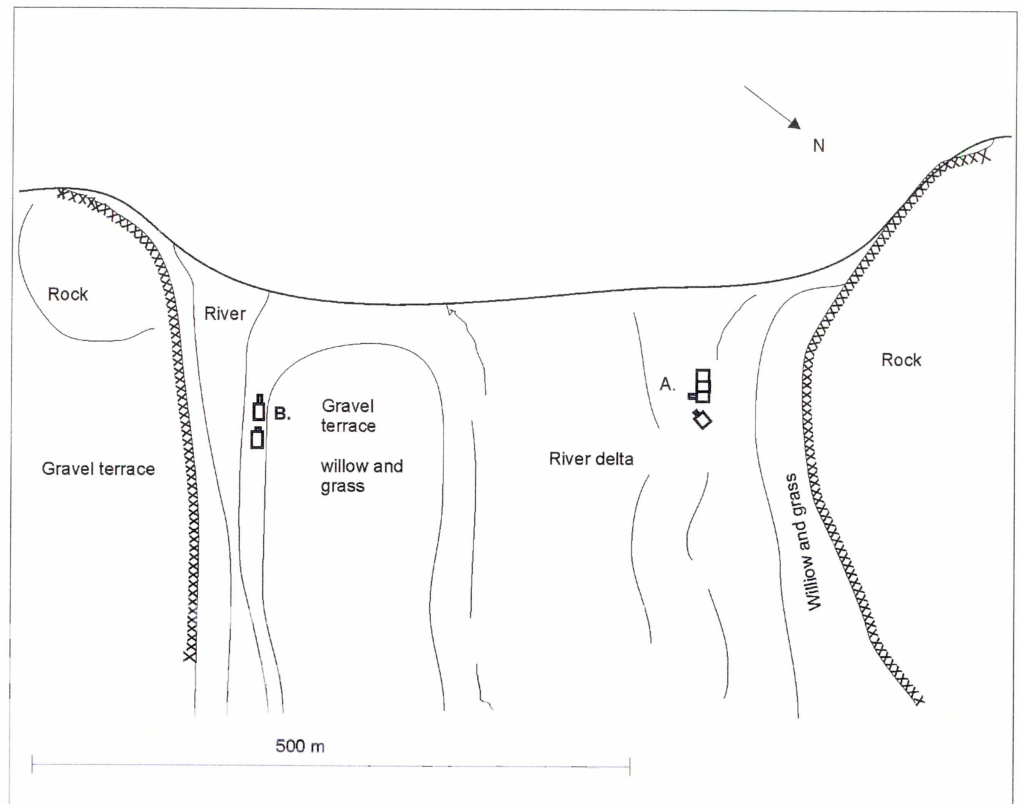


Site 110, Cla 69. In the foreground a Thule Culture tent ring, in the back the promontory on which a palaeo-Eskimo midpassage structure was found

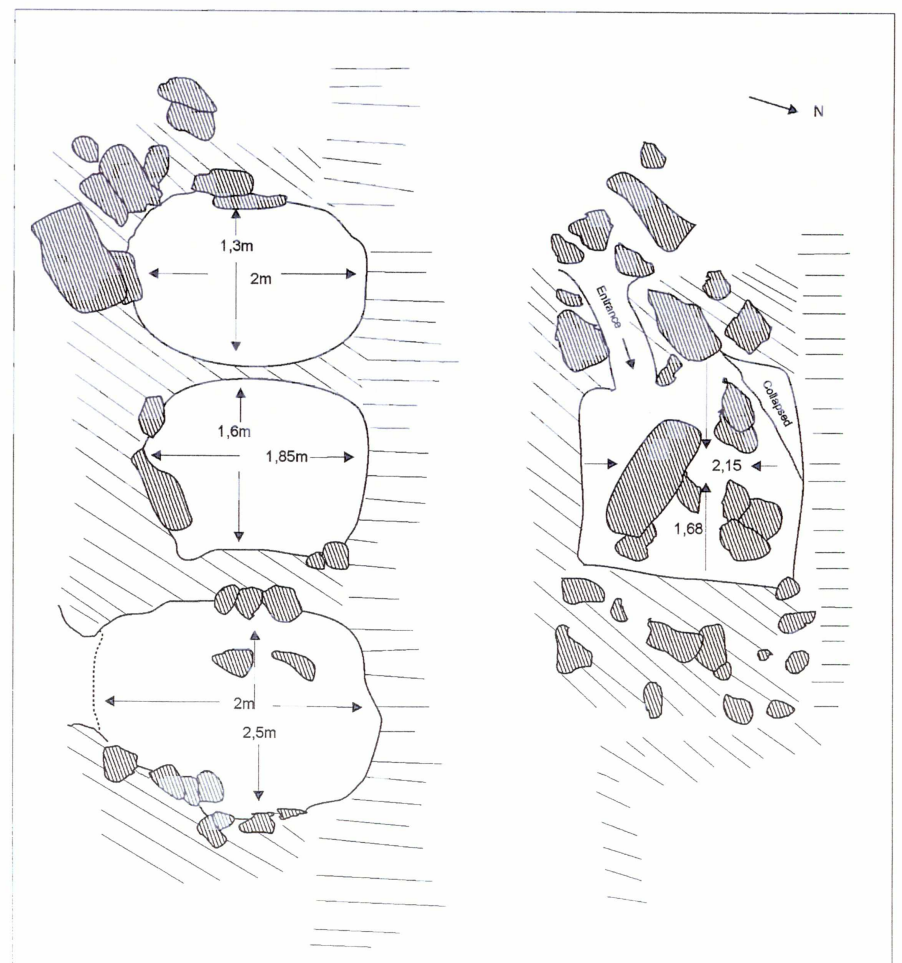
Site 48**Falske Næs vest 2**

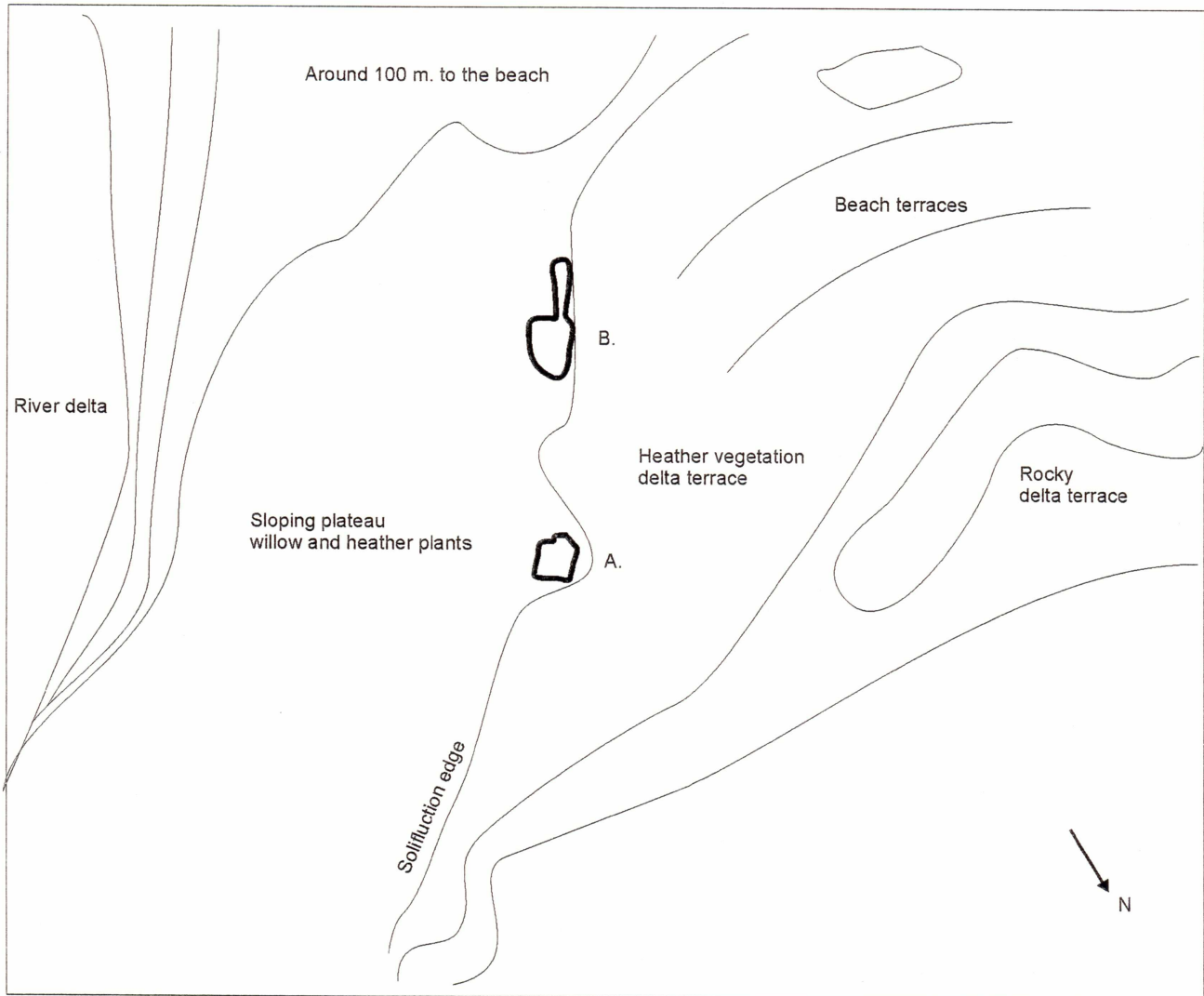
The site was visited in 2007, and two turf house ruins were recorded (group B). In 2008 the site was revisited and four more ruins were found (group A). Both ruin groups are situated at a distance from the beach along the river delta, on sloping gravel areas covered with vegetation. In 2008 ruin group A was described and drawn. These four ruins are all badly preserved due to sliding sediments and erosion in the area. The rooms in the 4 ruins are small, at largest 2x2 m, and the entrances are hardly preserved. The ruin group B was described in Jensen et al. (2008).

Site 48. Cla.11. Six turf house ruins from the Thule Culture situated at the eastern and western side of a river delta west of Falske Næs at the south-west coast of Clavering Island.



The ruin group Site 48, Cla. 11A. Four turf house ruins from the Thule Culture.





The ruin group Site 48, Cla. 11B. Two turf house ruins from the Thule Culture

Survey and investigations in the Revet area

Site 107

A Thule Culture grave, excavated by S.H. Andersen in 1975, situated at the edge of an erosion slope was revisited in 2008. The excavated area measured 1.5 x 4 m. Several stone flags and large wooden fragments were lying both beside and within the grave area.

The excavator describes the grave as a stone heap in which charcoal, animal bones and antler pieces were found. Under the heap, a rectangular grave made from wooden “planks” measuring 1.25 x 0.75 m. was situated. Some of the planks looked like pieces from an Eskimo sledge. A skeleton was inside the grave. The cranium was situated in the eastern end of the grave, but the bones were not lying in anatomical order. The grave was interpreted as disturbed by erosion. The animal bones as well as the charcoal were seen as parts of an earlier habitation at the grave. No worked implements or grave goods were unearthed (Andersen 1975).

Site 115

This site was registered as a trapper’s tent ring in 2007 (Jensen et al. 2008). The position is, however, identical with a tent ring dated to the Thule Culture, and excavated in 1975 by S.H. Andersen (Andersen 1975). The tent ring was circular and had a diameter of 3-3.5 m. From the excavation Andersen unearthed animal bones, charcoal and lithic artefacts. The excavated bone material is deposited at the Natural History Museum of Denmark and artefacts are repatriated to Greenland.

Site 60

This Dorset site (found in 2007) was revisited and reinvestigated in 2008. Several bones and antler pieces were found in the area, washed out by ongoing erosion. 20 m north of cache B (Cla 24 see the 2008 report) an Independence I bifacial knife blade was located (position 74 22.066 / 21 50.492 5 m a.s.l.).

One antler piece with groove incisions was collected in the area with numbered artefacts that were sampled of the 2007 season sampling on the site (Jensen et al. 2008: 28). The bone sample (n=17) comprised two taxa; caribou was the most numerous species and goose, either pink-footed goose or barnacle goose was included.

AMS dating

An incised antler piece retrieved during the 2007 survey was dated by AMS dating (KIA 36002) to c. 400 BC (see appendix). Another AMS dating was made on a surface collected musk ox distal tibia (KIA 36003). This bone, dated to the 9th century BC (see appendix), did not exhibit any traces of having been worked by humans.

Site 61

This Independence I site (found in 2007) was revisited. A diffuse structure with a concentration of flake material made from mcq was surface investigated. The structure was interpreted as an oval tent structure in which some centrally lying slabs and a willow plant (in the former fireplace) was situated centrally. From the area four mcq flakes were collected as samples for regional raw material analysis.

Site 108

In order to understand the Thule Culture exploitation of the inland areas a large plateau (around 3x1 km) was surveyed. The plateau was located c. 3 km northwest of the Moskusheimen station at about

300 m a.s.l. The plateau was, when surveyed during the beginning of august, wet and fertile, due to the melting snow from the nearby mountainsides. The vegetation consisted of various grasses and sedges especially cotton grass. At the plateau some moraine ridges and small hills were dry and from these we had the best view. Possibly these areas were used for habitation and storage if this particular inland plateau had been exploited. Thus the survey mainly focused on these locations. During the survey at least 20 muskoxen were observed grouped from 2-5 individuals. Moreover, red-throated diver, long-tailed skuas, pipers, raven, arctic hare and scattered in the terrain ancient caribou antlers were observed.

On the plateau and along the different routes into the plateau, i.e. the river valleys, only one possible human made structure (site 108) was identified. The structure consisted of fist-sized stones in a circle. The structure was found at a gravel ridge 280 m a.s.l. on a plateau in the inland behind Moskusheimen station. The structure was interpreted as a fireplace, even though no charcoal was found in relation to it. No artefacts or other structural remains could be located in the vicinity.



Site 108. The only inland structure found at Payer Land, 280 m a.s.l. about 3 km from the coast of Copeland Fjord

Site 57

Moskusheimen trapper station

The area close to the Moskusheimen station was surveyed in 2003 and 2007, and also test-excavated in 2007. The test-excavation revealed that some pits contained preserved bone material. One caribou bone from test pit no. 3 was radiocarbon dated to 280 ± 25 BP calibrated 1527 – 1654 cal AD (KIA36001). During the research in 2008 it was therefore our hope that, by extending some

of the most interesting test pits, a stratigraphically well-defined layer or context could be identified and excavated.

Test pit no. 2 was reopened and two quadrants were excavated yielding caribou bones. The pit was then further expanded to cover five quadrants providing only few additional faunal remains. The excavation revealed a thick humus-rich soil consisting of turf penetrated by deep cracks through the layers made by former ice formations. No permafrozen conditions were met.

Test pit no. 3 was reopened representing quadrant 2, and further extended towards west with quadrant 1. Test pit no. 2 yielded very few bones. The faunal material was well preserved but occurred rather scattered in both test areas reflecting an area of activity but no true midden deposits. The excavation was therefore not extended any further.

Site 57 (Cla.20) was probably sporadically in use during the Thule Culture as an area for caribou hunting and processing. No turf houses could be identified and the somewhat even and scattered distribution of bone material in the local area does not support the existence of a permanent Thule Culture habitation, which could accumulate a midden. Moreover, the soils were disturbed by the building of the trapper station and also by later trapper activities and turf digging.

The excavated bone sample (n=27) comprised five species; polar fox, unspecified seal, bearded seal caribou and muskoxen with caribou as the most numerous taxon. A pelvic bone of muskoxen retrieved from the turf layer of test pit no. 3 seemed to be of recent origin. Thus the present sample did not provide any additional information compared to the results based on the faunal material from the 2007 season. The caribou skeletal elements may reflect primary butchering activity with e.g., two articulated cervical vertebrae (atlas and axis) and a portion of the backbone (the last thoracic vertebra and the first lumbar vertebra) represented.



The excavation at the Moskusheimen site, site 57 (Cla.20)

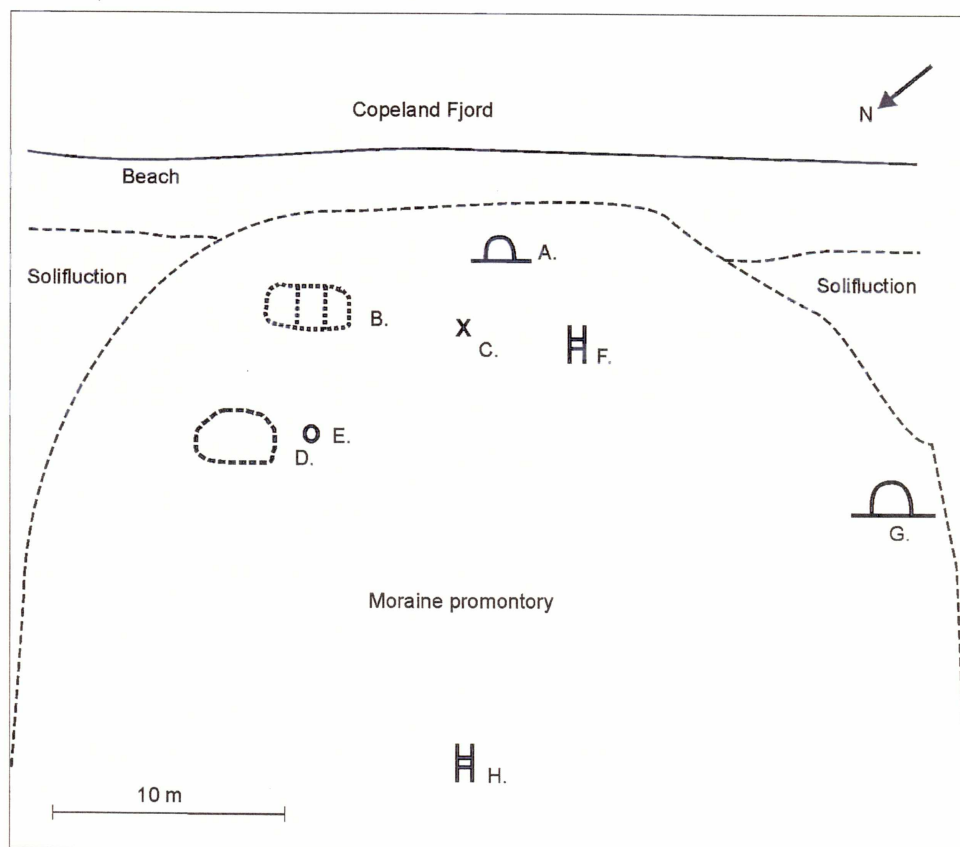
Site 105

An area of 10x15 m, just south of the small river running by Moskusheimen trapper station (Cla 20), in which bone materials were lying on the surface, was discovered. The surface consisted of gravel with several loose lying larger stones. However, no constructions could be recognized in the area. The bone material was generally fragmented and in some cases split in order to extract marrow.

All animal bones were collected from the 10 x 15 m area except for one complete radius of musk ox, which seemed to be of recent origin. All other sampled bones were weathered and with orange lichens on the bone surface. The bone sample (n=29) comprised three species; polar bear, unspecified seal and caribou, with caribou as the most frequent species. The caribou long bones were marrow split; however a number of the caribou fragments consisted of tarsal bones from both the left and the right hand side. The site most likely reflects a single event with the butchered caribou heal bone portions discarded as lumps held together by sinews. Caribou was probably hunted in late summer or autumn, while seal and polar bear do not indicate any particular season. It cannot be ruled out that the bone sample, although small, accumulated through several events.

Site 116

This site is situated on a small promontory south of the Moskusheimen station, next to the Copeland Fjord. The site was revisited and mapped during the 2008 field season. The following structures was found: A) a large cache of Thule type, B) midpassage structure with several flagstones inside the structure, C) children's playhouse, D) tent ring of Thule Culture type, E) a box made from three flagstones and a flag in the bottom, most possible a fireplace F) fox trap (trapper period), G) cache, H) fox trap (trapper period).



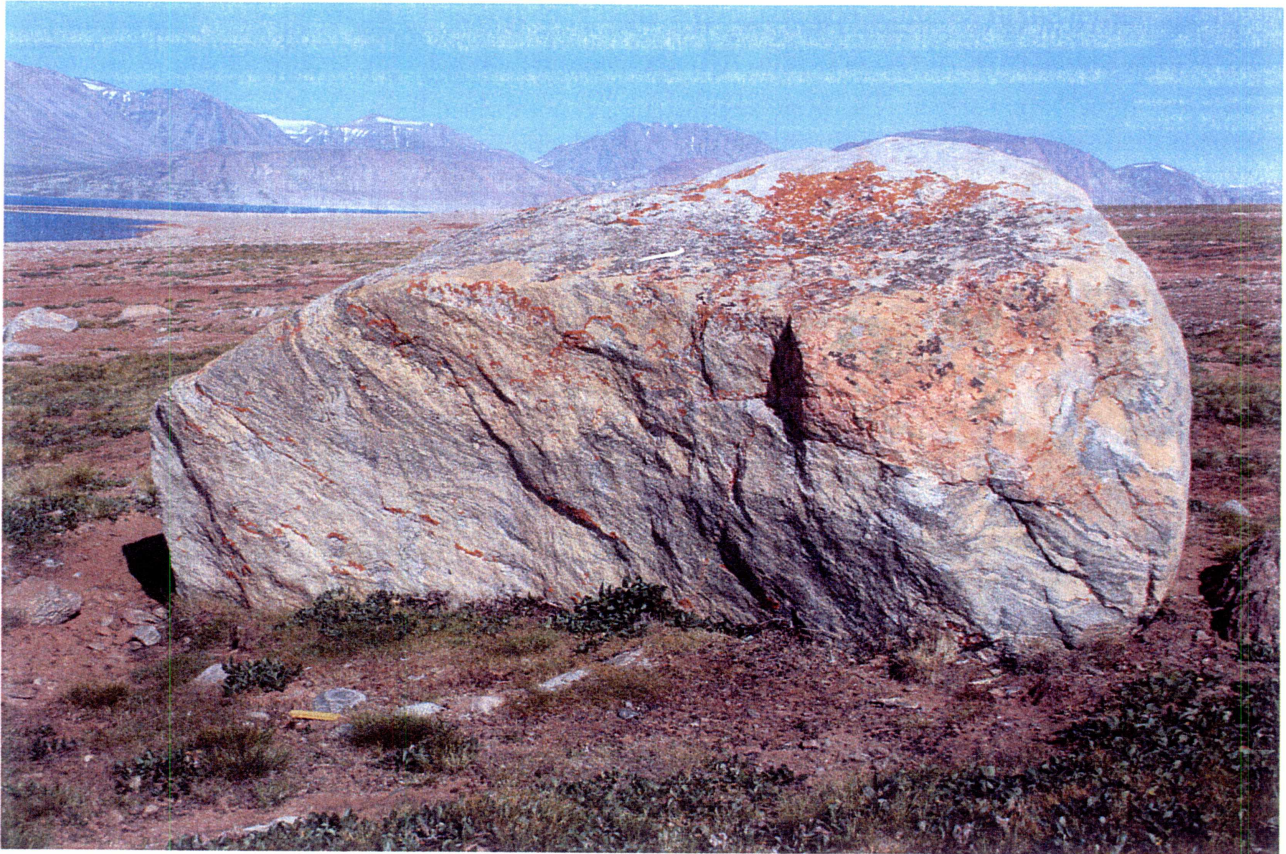
Site 116. (Cla.21)

Site 109

A single shelter measuring 2x1 m. The shelter or hunters bed, was stone build 2x1 m and "U" shaped in its construction. It was located in a small natural depression in the landscape 20m from the erosion slope towards the coast of Copeland fjord.

Site 102

Shelter/hunters bed build against large rock. Two large rocks are situated alone on a large level terrain sloping down towards Rudi Bugt, around 100 m from the coast. On the southern side of one of these rocks a shelter is build. The shelter consists of a half circle of stones. It measures 1x1½ m inside and is of Thule Culture type.



Site 102. Cla.62. Shelter built adjacent to a large rock, at northern Clavering Ø

Site 100

Large stone build solitary cache. It was found near the coast of Rudi Bugt at northern Clavering Ø. The cache is typically of the Thule Culture.

Site 104

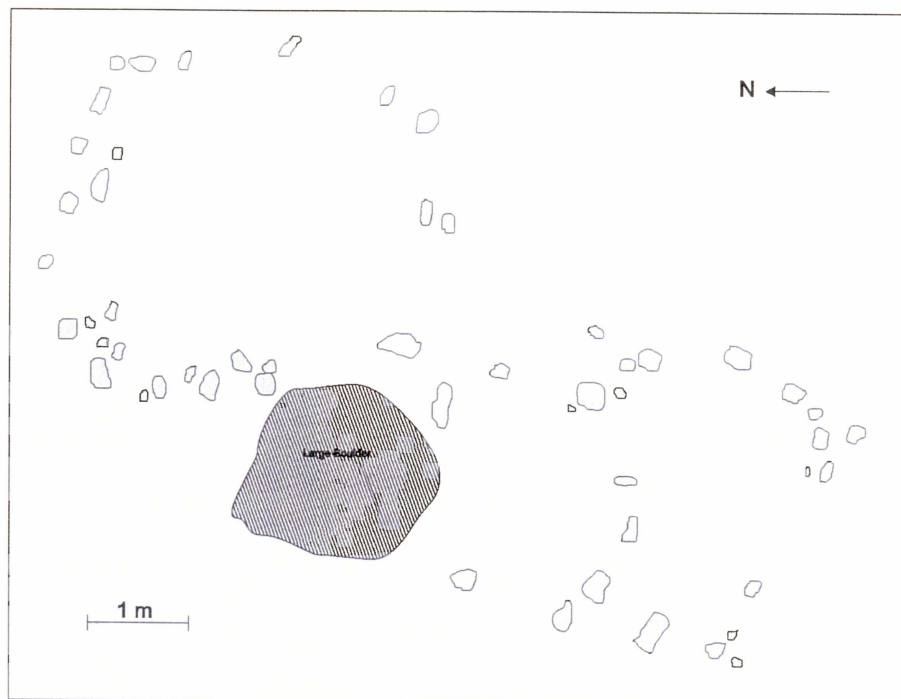
Two tent rings and a cache. The two tent rings were situated on sliding soils at the corner of a river delta, between Revet and Tyroler Fjord at northern Clavering Ø. The tent rings were circular and measured each 3 m across. The cache was found 50 m north of the tent rings and 10 m from the erosion slope towards the coast.

Site 103**Clavering Ø/Tangen**

Two Thule Culture tent rings and a cache described in 2003, located at northern Clavering Ø near Revet. The location was revisited and reinvestigated in 2008. The structures were drawn on a plan 1:20 (see drawing).

A surface investigation of the area revealed that a good deal of bone material was preserved. All visible animal bones from the two Thule tent rings and the area in front of the tent rings towards the coastal erosion slope were collected. Additionally bones at the nearby cache were sampled.

The bone collection (n=50) comprised the species of pink-footed goose, caribou, unidentified seal, and a single piece of walrus tusk. Goose was the most abundant taxon followed by caribou and seal. Goose bones dominated inside and in front of the tent rings while most of the caribou bones including ribs and two specimens of antler, one of them drilled, were found at the meat cache. The skeletal elements of goose were primarily from the meat bearing parts of the skeleton i.e., the pectoral girdle and upper thigh bones and are therefore interpreted as leftovers from meals. The large number of goose bones from the location makes it probable that the site had been used during July when the geese lose their flight feathers. It was also interesting to note that a large amount of goose footprints at a small lagoon nearby were observed documenting, that geese had been resting there recently.



The two tent rings at site 103 are lying in connection with a large boulder

In a previous GeoArk report it was reported that an antler was dated by AMS from this site (KIA 22759) (Sørensen & Andreassen 2006: 50-51). However, this dating is not from Site 103. It is instead from Site 34, "Bjørnnasstua" at A.P. Olsen Land (dated on caribou tooth). The site 103 is still undated by AMS.



Site 103 during investigation in 2008

Site 101

Louise Elv

Tent ring and caches. Below the ruined trapper's cabin close to the erosion slope two tent rings were found. The tent rings were of circular type but only partly preserved, probably due to activities of the trappers but also caused by the ongoing erosion. In front of the tent rings, on the erosion slope and beneath it, several animal bones were found. At the coastal cliff, where the cabin was situated several caches were observed. Also east of the Louise Elv one large cache was found probably of Thule Culture origin.

The 2-3 large caches in front of the hunters cabin c. 20 m.a.s.l., containing several dog bones and in addition bones of rock ptarmigan and arctic hare, clearly represent rubbish from the European hunter and trapper period. One of the caches may be interpreted as a dog burial as it contained most of a complete dog skeleton. Scattered among the large caches a few bones of presumed older age over grown with lichens were observed. Among these was an antler fragment which with certainty can be dated to the Thule period.

All bones found in and nearby the two eroded Thule tent rings were collected for registration on data sheets but were not brought back for further analysis. The easternmost Thule tent ring produced a single rib of unidentified seal, while bones of goose either barnacle or pink-footed goose and marrow fractured caribou long bones were retrieved from the erosion slope c. 10 m west of the identified Thule tent ring. This area was presumed to represent another now completely destroyed and eroded Thule tent ring registered by Andersen (1975). This sample, although small (n=13) supports the picture from Site 103/Cla. 63 showing presence of goose, caribou and seal, reflecting summer hunting.



Surface collected bone material from two Thule Culture tent rings at Site 101, Louise Elv

Hvalros Ø

Site 96.

Hvalros Ø

Hvalros Ø (Walrus Island) is a basaltic island, 2x1 km long oriented north-south in the Sabine Ø Stræde. It has a very characteristic morphology being low lying at its south-western corner and from here rising towards north-east up to an altitude of 85 m from where it drops with steep north facing cliffs vertically towards the sea.

GeoArk visited Hvalros Ø in 2005, where some structures at the south-west coast were recorded and described (Jensen et al 2008). However, it was during the 2005 season soon realised that the site was overwhelming comprehensive with its huge number of structures of which a large proportion were difficult to interpret. First of all the structures on the site were generally meant for short term use. Structures are typically light constructions i.e. tents, shelters and probably snow-houses (see descriptions of structures below) and can therefore be hard to define. Artefacts and middens do not accumulate in any of the structures and a cultural attribution of many of the structures and structure-types was thus difficult to assess. Moreover, Hvalros Ø is a basaltic island consisting solely of basalt, mostly seen as boulders and gravel terraces. Especially the raised beaches towards the south-west coast, where most of the structures are situated were boulder-fields challenging the archaeological process. In addition many areas at Hvalros Ø were popular to all the cultural groups visiting the region, since 2500 BC, and the structures found in such areas had therefore in many cases been reused and rebuilt, making the interpretation of the cultural history even more complex.

During 10 days the whole team worked hard to describe and map all structures with high precision GPS equipment. The following method was employed to locate, describe and register the structures: We started from the north-west corner of the island. The archaeologists (HCG, BG, MH & MS) located structures and marked every structure with a numbered flag with numbers from 1-200 walking in a chain towards south. After marking, the archaeologist described each structure, recorded artefacts and made photo documentation. A mark was added to the flag when the description was finished. In the same process all organic material was documented in relation to the structures by the archaeozoologist (ABG), thus the majority of animal bones could be left in place at Hvalros Ø, while we still had the necessary information (see below). Finally the geographers (AK, JTP & BHJ) recorded the position of the structure and its flag no., while in the same process removing the flag so that it was easy to see if any structure missed mapping. This process was by and large continued until the entire island was surveyed.

After each day at Hvalros Ø the data was processed and stored at a computer in the base camp, so that all described positions could be mapped and checked visually. This procedure ensured the quality of our data during the recording process and made us able to analyse the settlement at the island day by day, thus securing that no areas on the island missed recording.



Our base camp 10-22 of August at Germania Havn on Sabine Ø, with a view to Hvalros Ø

In total 2011 archaeological descriptions with a GPS position were made. In some cases of more than one archaeological structure were included in the description. The complete recorded number of archaeological structures on Hvalros Ø was 2094.

The following classification of the structures was employed on basis of the descriptions:

- 1) Tent ring of Thule Culture type,
- 2) Shelter (small circular wall build as wind protection or “U”-shaped hunters bed)
- 3) Habitation structure of palaeo-Eskimo type
- 4) Tent ring/habitation structure, culturally undefined
- 5) Shelter wall (half circular or “S” shaped wall build to shelter from the wind)
- 6) Cache, small (circular and less than 0.5 m inside)
- 7) Cache, large (circular and more than 0.5 m inside)
- 8) Cache, box (square room build from slabs)
- 9) Children’s playhouse
- 10) Grave
- 11) Boat stand
- 12) Cairn
- 13) Other

These feature types were registered in the following numbers at Hvalros Ø:

1) Tent ring of Thule Culture type	118
2) Shelter	70
3) Habitation structure of palaeo-Eskimo type	423
4) Tent ring/habitation structure, culturally undefined	176

5) Shelter wall	164
6) Cache, small	479
7) Cache, large	459
8) Cache, box	131
9) Children's playhouse	26
10) Grave	6
11) Boat stand	12
12) Cairn	12
13) Other	18
Total	2094

The structures at Hvalros Ø

Palaeo-Eskimo structures

The palaeo-Eskimo structures are, when counted in this report, not separated in relation to the different palaeo-Eskimo traditions discovered at Hvalros Ø (Independence I, Saqqaq and Greenlandic Dorset). However, there are differences in how the island was settled by the different palaeo-Eskimo traditions as well as their use of different types of structures.



A 320, midpassage structure in which a burin of Independence I type was found



A 548. A possible palaeo-Eskimo snow house. The gravel surface is cleared from stones and the gravel is compressed in a circular area of 2.5 m in diameter

Compressed gravel was often seen in relation to midpassage structures and other palaeo-Eskimo tent rings and pavings, e.g. at the upper terraces. However, some areas, typical in size of a palaeo-Eskimo structure, were cleared of larger stones and compressed, and seen without tent stones. Furthermore areas of compressed gravel could easily be spotted due to a colour difference. Compressed gravel areas were typically light grey compared to the red colour of the surrounding basalt gravel terrace. Possibly the compression of the gravel resulted in a less permeable gravel surface that prevent melted snow to penetrate through the gravel, resulting in a “washing” and a change of the patina colour of the gravel in latent habitation areas. The change in colour of the gravel is clearly seen in the palaeo-Eskimo structure, A548, on the photo above.



A 596. A typical palaeo-Eskimo habitation, seen as a paved area at the "Dorset terrace"



A 600. A paved triangular structure measuring 1x1x1 m. These structures were seen at several places at the Dorset terrace

During fieldwork in 2003 (Sørensen & Andreassen 2006) artefacts from the Greenlandic Dorset was found associated with this structure type. The triangular structures are, due to the lack of tent stones and presence of compressed gravel in their association, interpreted as platforms in Greenlandic Dorset snow houses.

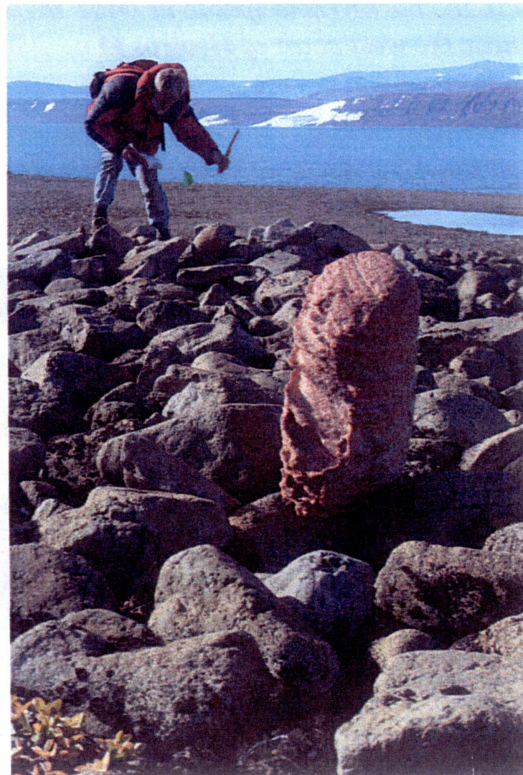


A 551. Large box-like cache built from large elongated basalt slabs. This structure is found in association with palaeo-Eskimo habitation structures. Probably this type of structure is a cache from Greenlandic Dorset.

Thule Culture structures



A 1774 (in front) and A 1787. Shelter constructions measuring 2x1.5 m. inside



A1912 and A1996. Thule grave covered with parts of a large Thule Culture sledge made from driftwood. The red stone is one of two raised grave cairns of either side of the grave. Note that the material of the cairn is not basalt, as is generally found on the island, thus this stone has been selected and brought to the grave. H.C. Gulløv is describing the grave behind the cairn.



A426 and A444 in the background (photo nr 0401 BG). Thule tent ring in association with a small cache situated near the west coast of Hvalros Ø



Row of large caches (meat caches) along a beach ridge at the northwest beach. Large caches were generally made by removing boulders in beach terraces thus creating a large (1-3 m) pit for meat storage. In several of these meat caches single bones of walrus were found. (photo 0362 BG).



A typical shelter wall, north of A 1328 (cache) at the southwest coast. The shelter wall is photographed from east. (photo 0523 BG).

The shelter walls were always made in an east-west direction, so that they would shelter from the prevailing wind directions from south and north. The prevailing wind directions in the region, and in particular on Hvalros Ø, still are either north or south. Often the shelter walls are half-circular facing towards either north or south, and related to a habitation structure. In some cases, the shelter walls are “S” shaped so that one could change side of the shelter depending on the wind direction. Shelter walls were seen both in relation to palaeo-Eskimo and Thule Culture structures, but the most and the largest were from the Thule Culture. These could be up to 1 m high and 6-8 m long.



A 1147 (photo 0527 BG). A large (10 m inside) circular shelter wall, probably build and used as a communal structure during the Thule Culture. In this structure a single cervical vertebra of bowhead whale was found. Thus this structure may be related to Thule Culture aggregation in connection with large whale hunting during the 15th or 16th century.



Axis of *Balaena* sp. with scale from structure A 1147



A 1340, 1343 & 1680. *Umiag* stands at the south west coast. Boat stands indicates that the site was in use at times when the polynya around Hvalros Ø was quite well developed, i.e. the late spring and summer period.

Archaeozoological analysis

The procedure for sampling and registering animal bones on Hvalros Ø is described in the introduction chapter. To make the registering method as efficient and fast as possible it was decided to leave the majority of the bones *in situ* on the site. A small fraction of terrestrial bone for C-14 dating and characteristic portions of bone elements from walrus suitable for illustrating butchering practices were, however, collected and brought back to the laboratory for further analyses.

Sampling for C-14 dating:

A 0338 Tent ring/habitation structure, *A. brachyrhynchus*, tibiotarsus

A 1438 Shelter wall, *Rangifer tarandus*, humerus, sinistra

A 1706 Tent ring of Thule Culture type, *Rangifer tarandus*, metatarsus, sinistra

A 1920 Habitation structure of palaeo-Eskimo type, *Ovibos moschatus*, metacarpus

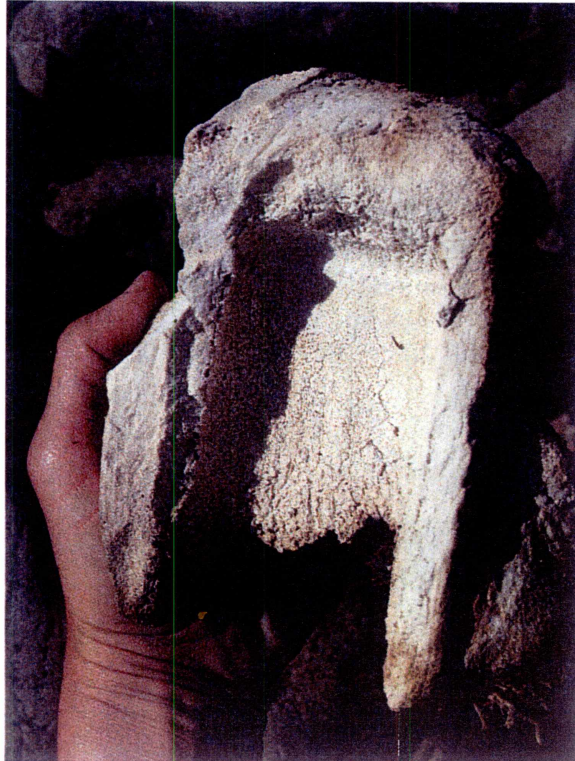
The bone assemblage (n=1218) registered at Hvalros Ø comprises at least 15 taxa with at least five bird species and 10 mammal species. As we are dealing with surface registrations it cannot be totally ruled out that some of the bird bones are of recent origin. The five highest ranking species are walrus followed by ringed seal, bearded seal, narwhal and polar bear while only few fragments of caribou, musk ox, fox, dog and bowhead whale were recorded.

Of the 2011 GPS mapped positions with archaeological descriptions 503 positions were recorded with animal bones situated in the structures or in close association with the structures. No bones

were observed at 1353 GPS positions while the remaining 155 GPS positions for various reasons were neither observed nor registered.



A heavily weathered walrus scapula found on the pebbled beach close to the sea. Photo: ABG.

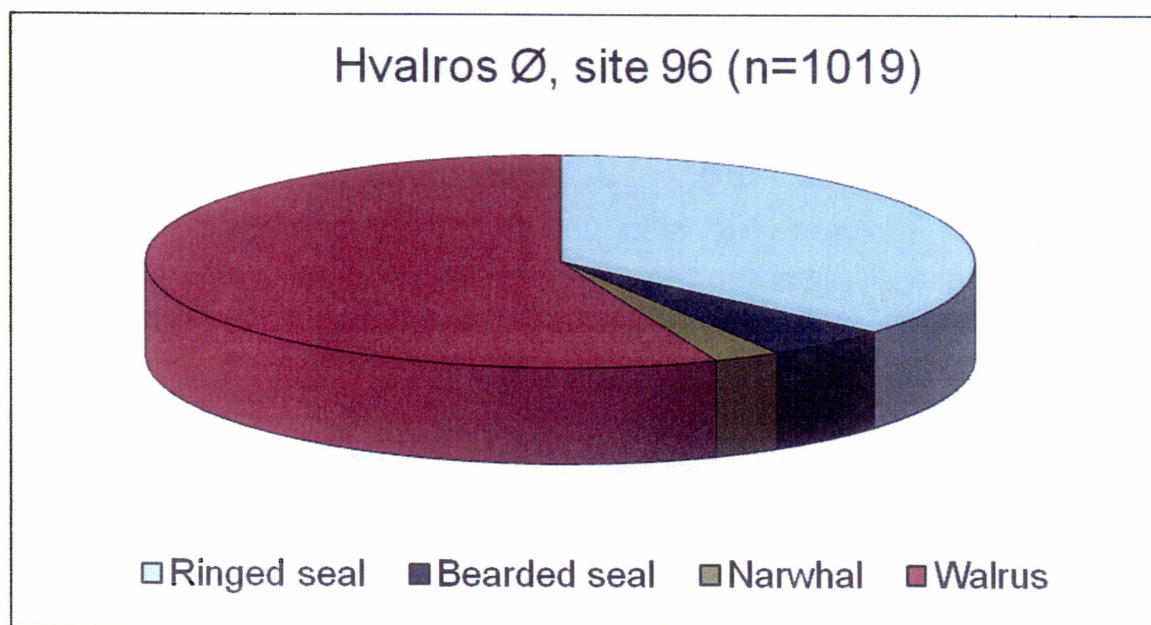


A well-preserved walrus maxillary bone from a small cache A 737. Photo: ABG

Animal bones were in general found in association with Thule Culture structures or habitation structures of uncertain cultural affinity. But faunal material was also associated with palaeo-Eskimo structures, and in that case mostly in contexts where we found traces of both Thule Culture and palaeo-Eskimo cultures. The preservation conditions of bones varied from well preserved with only moderate weathering and cracking of the bone surface to heavily weathered in a poor state of preservation. It is the general impression that no bones survived from the palaeo-Eskimo period and that the bone remains we see today are from the Neo-Eskimo period or later. During the 2007 and 2008 field seasons we only located bones with a palaeo-Eskimo dating at the Site 60, near Moskusheimen.

The prehistoric use of Hvalros Ø is rather complex to interpret. Still walrus is the most abundant taxon on the site as a whole followed by ringed seal and bearded seal. Terrestrial game like polar fox, caribou and musk ox was found in very low frequencies. However, the various taxa are not evenly distributed among feature types. Associated to tent rings of Thule Culture type (1) and tent ring/habitation structure (4) the seals (ringed seal and bearded seal) are the highest ranking taxon. While walrus bones are absolutely dominating in or associated with caches of various types. Besides the massive presence of walrus remains, goose bones with medullary bone found in a tent ring/habitation structure A 338 and bones e.g., a radius at A 754, of quite juvenile bowhead whales also indicate that Hvalros Ø was used during the spring and early summer months.

This pattern is in accordance with the interpretation of Hvalros Ø as a huge gathering site where walrus hunting was an important if not the most important activity.

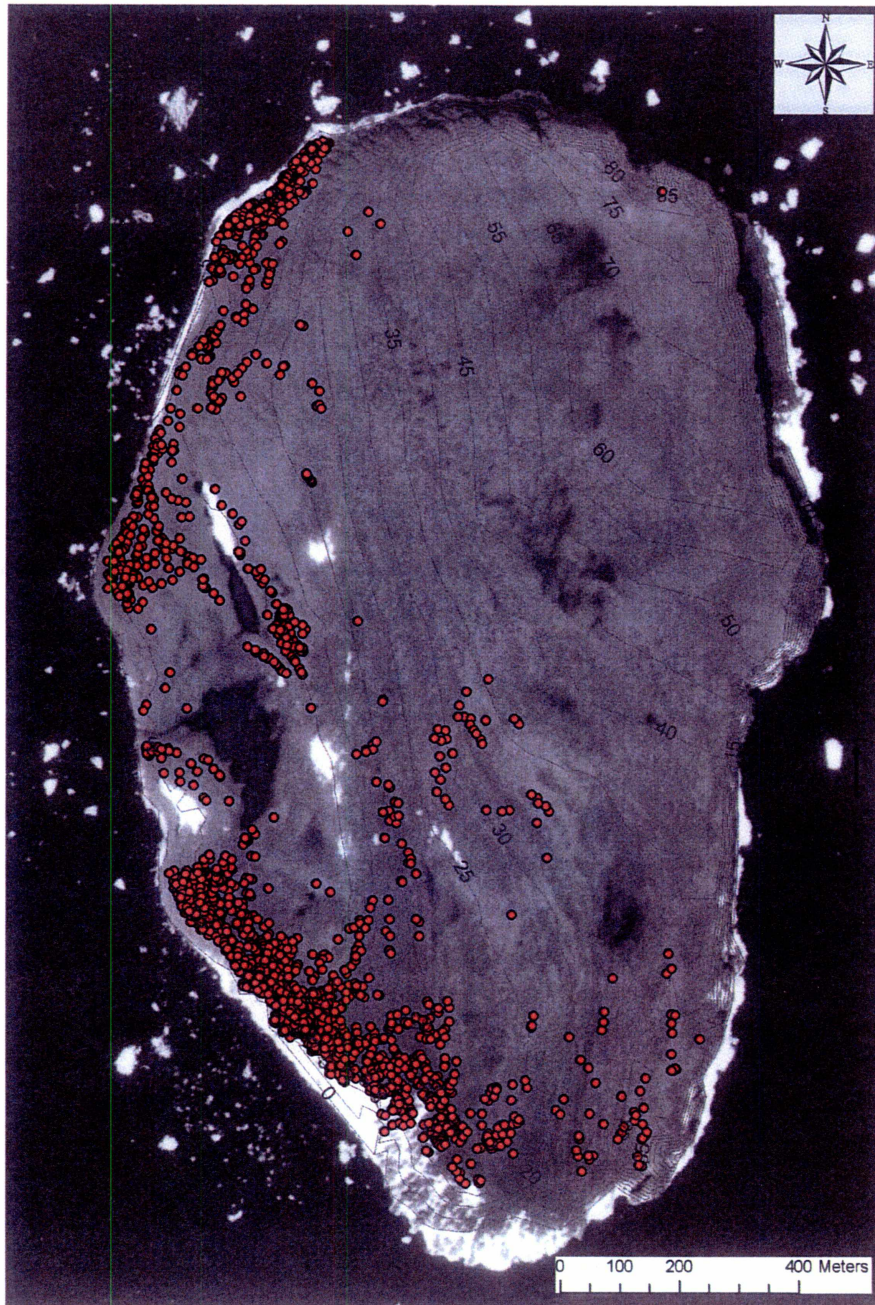


Relative distribution of the four highest ranking taxa at Hvalros Ø

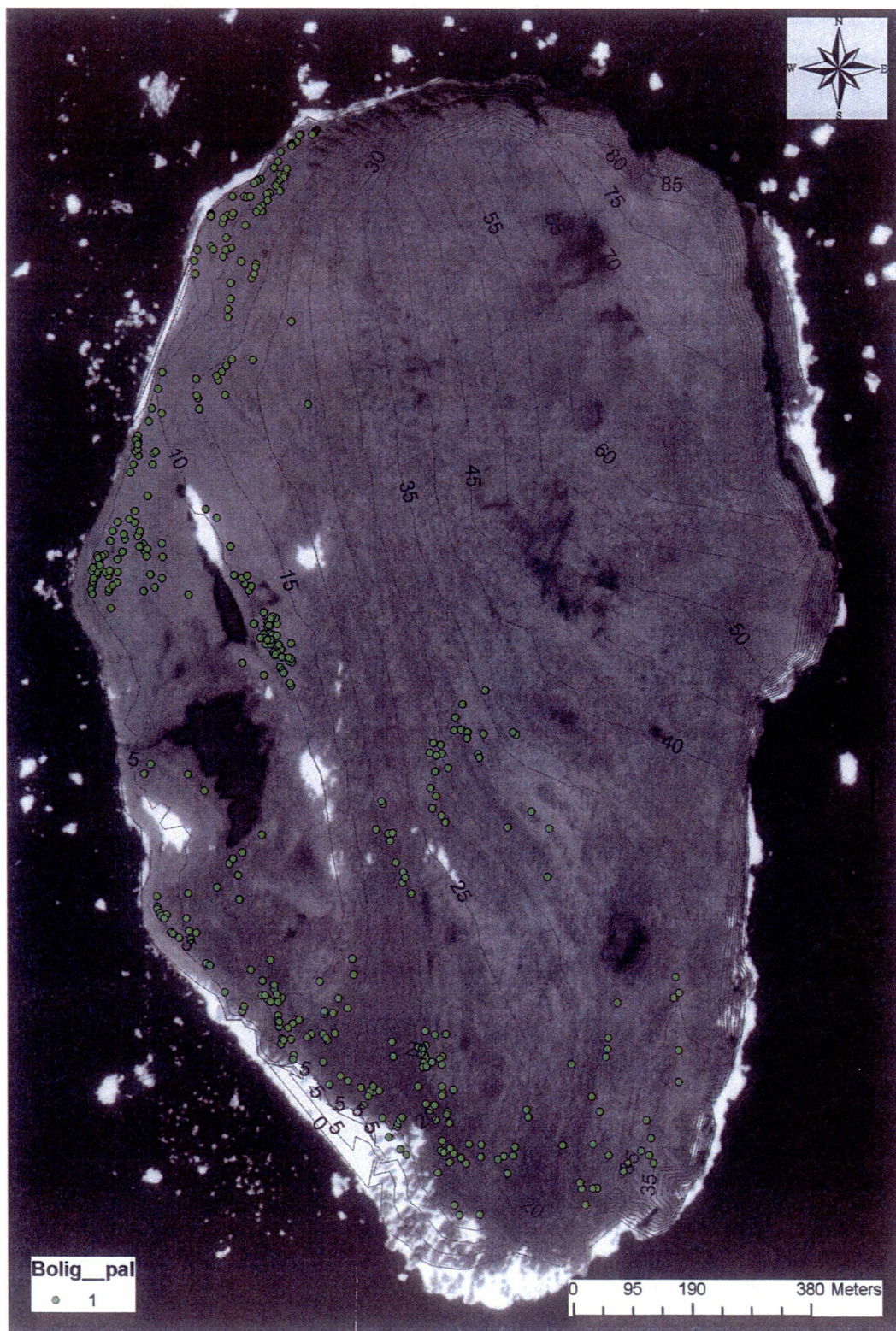
Spatial analysis of the structures at Hvalros Ø

In order to evaluate the spatial pattern of the different types of structures at Hvalros Ø a number of selected plots are made. All structures were recorded with high precision GPS and are plotted on an aerial photo of Hvalros Ø.

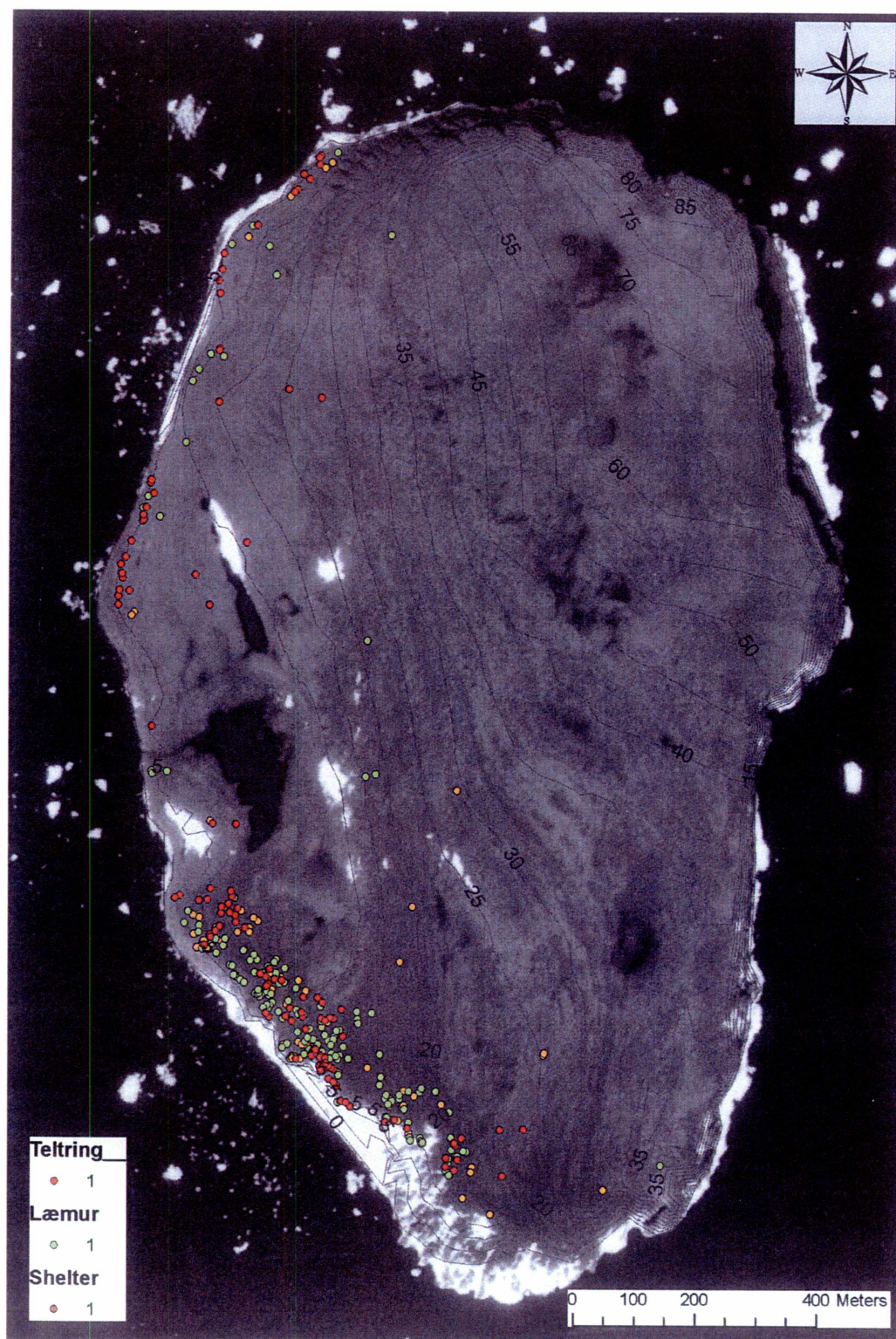
The total amount of prehistoric structures at Hvalros Ø (n:2094)



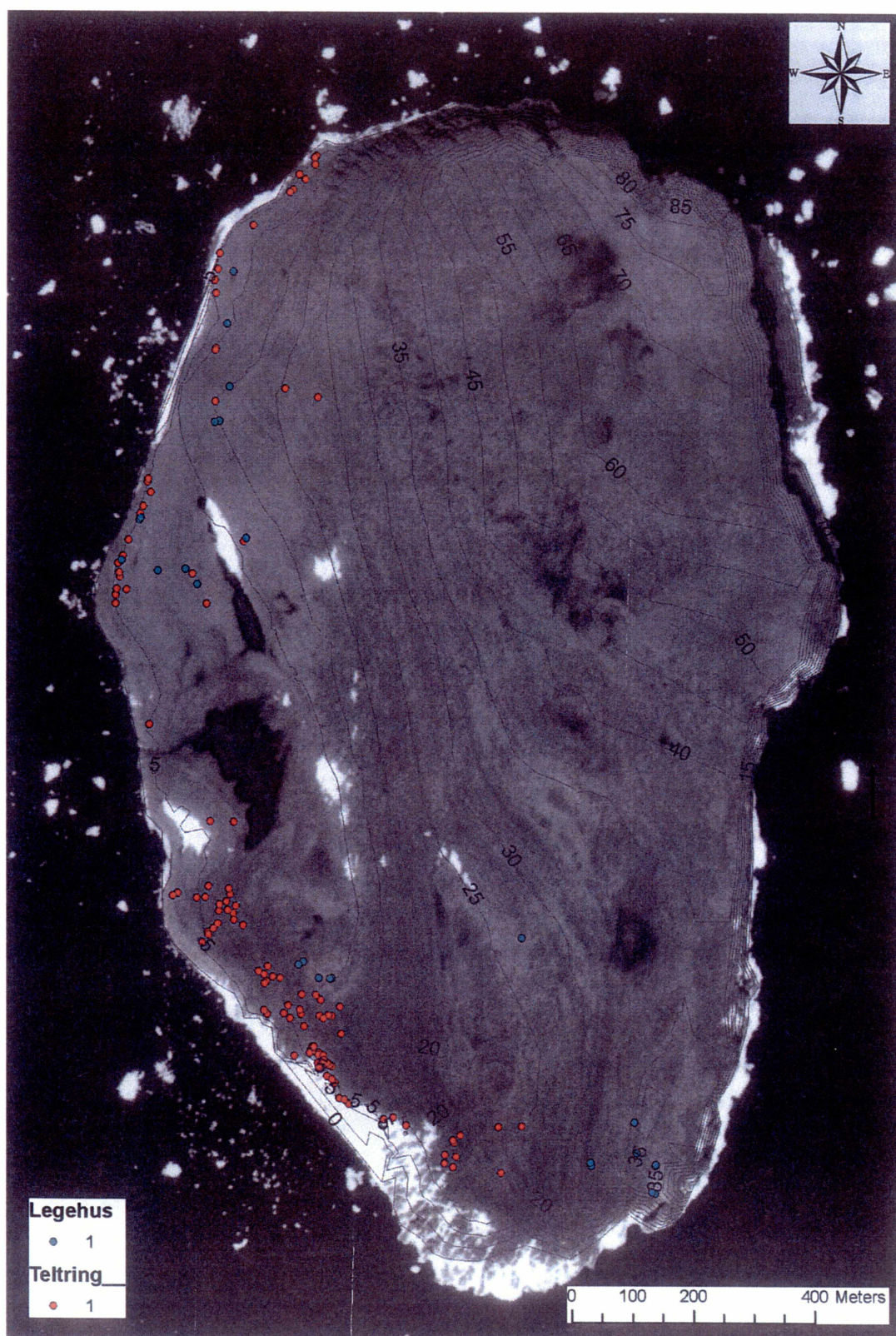
Palaeo-Eskimo habitation structures (Bolig_pal) (n: 423)



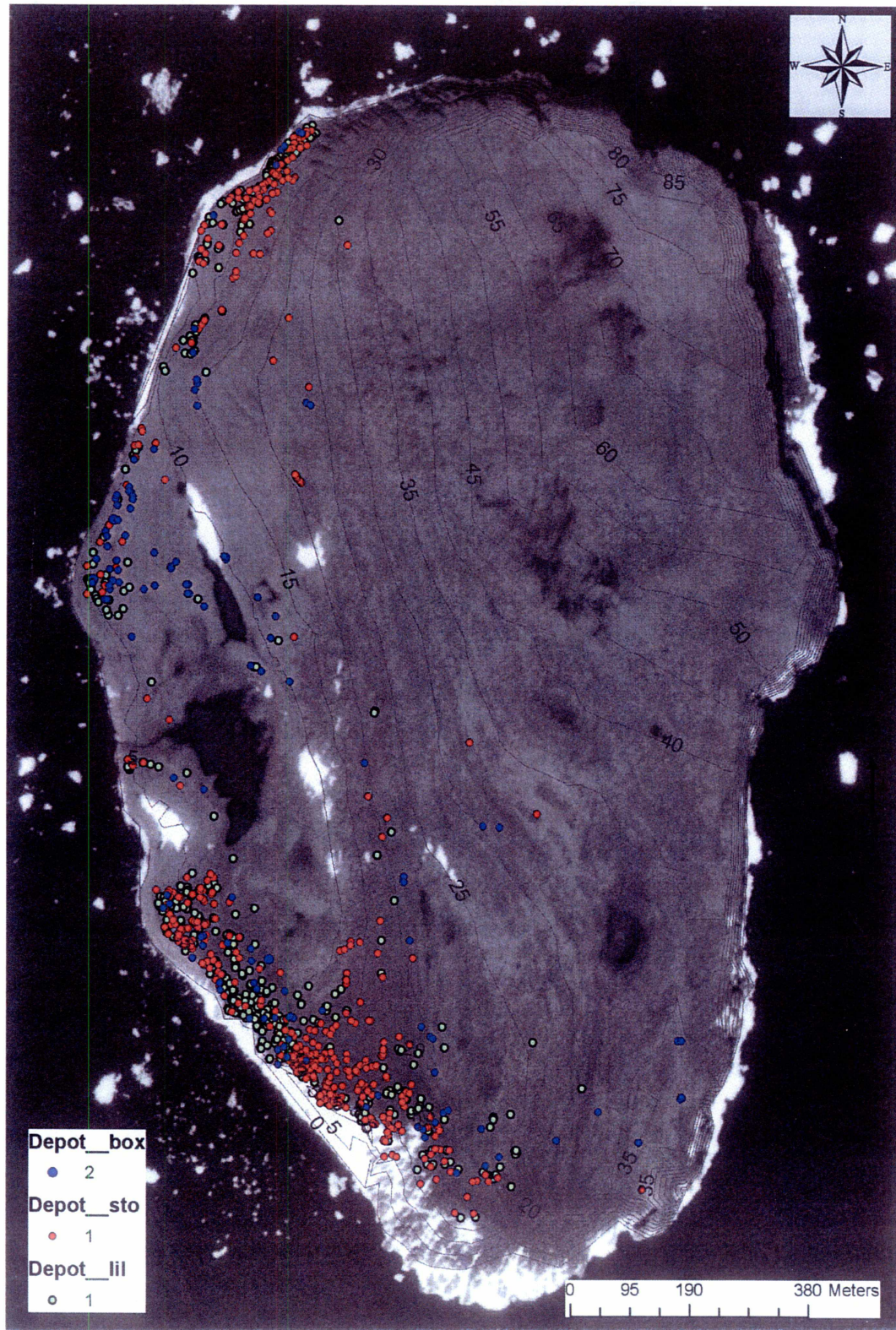
Thule tent rings (Teltring)(n:118), shelters (Shelter)(n:70) and shelter walls (Læmur)(n:164)



Thule Culture tent rings (Teltring)(n:118) and childrens playhouses (Legehus)(n:26)



Caches. Large caches (Depot_sto)(n:459), small caches (Depot_lil)(n:479) and box caches (Depot_box)(n:131)



Thule Graves (Grav)(n:6), cairns (Varde)(n:12) and boat stands (Bådstøtte)(n:12)



AMS dating of bone materials related to structures on Hvalros Ø

Four datings of terrestrial bone materials in association with Thule Culture structures were completed.

KIA 37731: In relation to structure A338, a tent ring, an *Anser brachyrhynchos* (pink-footed goose) medullary bone of a tibiotarsus was dated to the very beginning of the 15th century or even the end of the 14th century.

KIA 37732: In relation to structure A1438, a tent ring, a bone from *Rangifer tarandus* (caribou) was dated to either the late 17th century or the late 18th century (due to the calibration plateau).

KIA 37733: In relation to structure A1706, a tent ring, a bone from *Rangifer tarandus* (caribou) was dated to the 16th century or the early 17th century (due to the calibration plateau).

KIA 37734: in relation to structure A1920, an oval stone structure, a bone from *Ovibos moschatus* (musk ox) was dated to the first half of the 15th century.

The AMS dating of the bone material from Hvalros Ø document that the qualities of Hvalros Ø was discovered immediately by the Thule population in Northeast Greenland and that it played a crucial role from their very first migration into this region. The Thule people continued to use the island during the following centuries, and Hvalros Ø must therefore be considered as an extremely important site for the Thule Culture in Northeast Greenland.



Structures dated by AMS C14 at Hvalros Ø



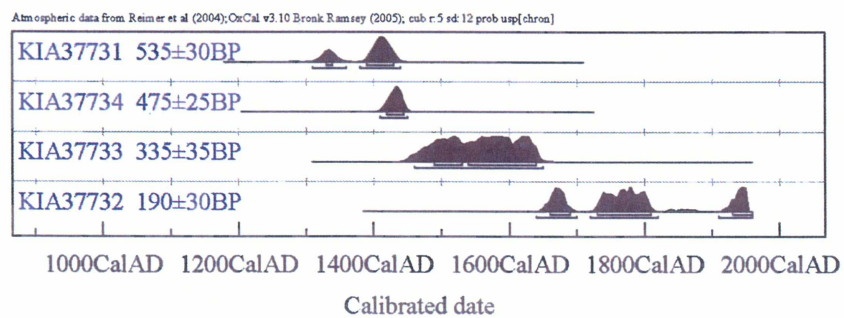
Structure A338 (KIA 37731)



Structure A1438 (KIA 37732)



Structure A1706 (KIA 37733)



The AMS dating of terrestrial bone materials in structures from Hvalros Ø

The estuary of the Young Sund area

The estuary of Young Sund holds several large archaeological sites. Many of the sites have been located and surveyed by GeoArk during 2003 and 2007. During the 2008 season most of the sites were revisited, mapped with high precision GPS and in several cases reinterpreted.

Site 17.

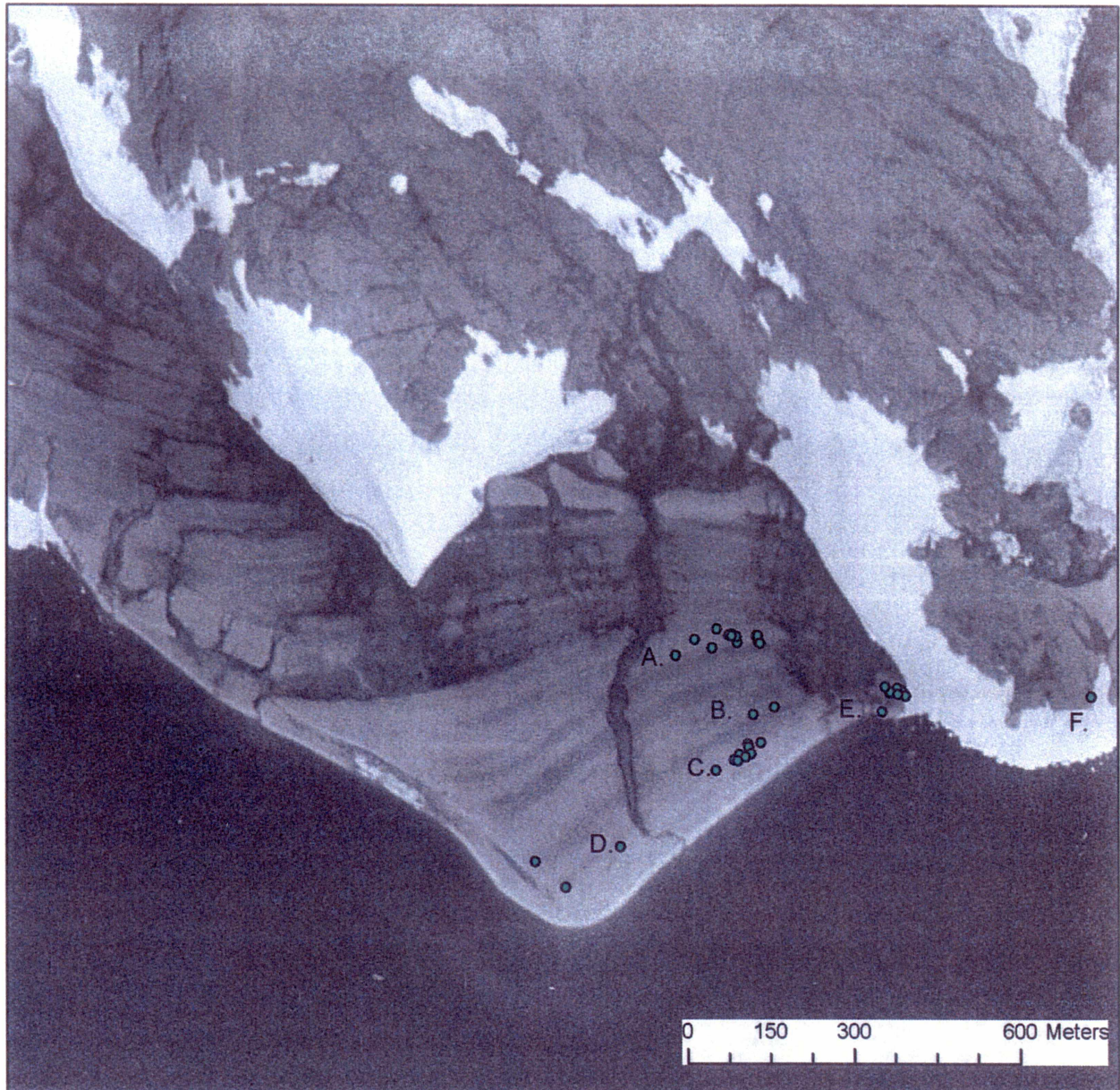
Kap Berghaus

This angular foreland has a long history of several cultures. The strategic position of Kap Berghaus as the outer most land spit in Young Sund and as the nearest land to Sandøen has been favoured of all hunter-gatherer cultures in the region. Moreover, historically Kap Berghaus was a hall-out for walrus (see Born et al. 1997: 13). The first European hunting/sealing vessel, named Hekla, arrived here in 1889 and slaughtered about 200 walruses at Kap Berghaus. They named the foreland “Heklas Hvalrosnæs” (Hekla’s walrus foreland). The “churchyard” of this slaughtering was located in 2008.

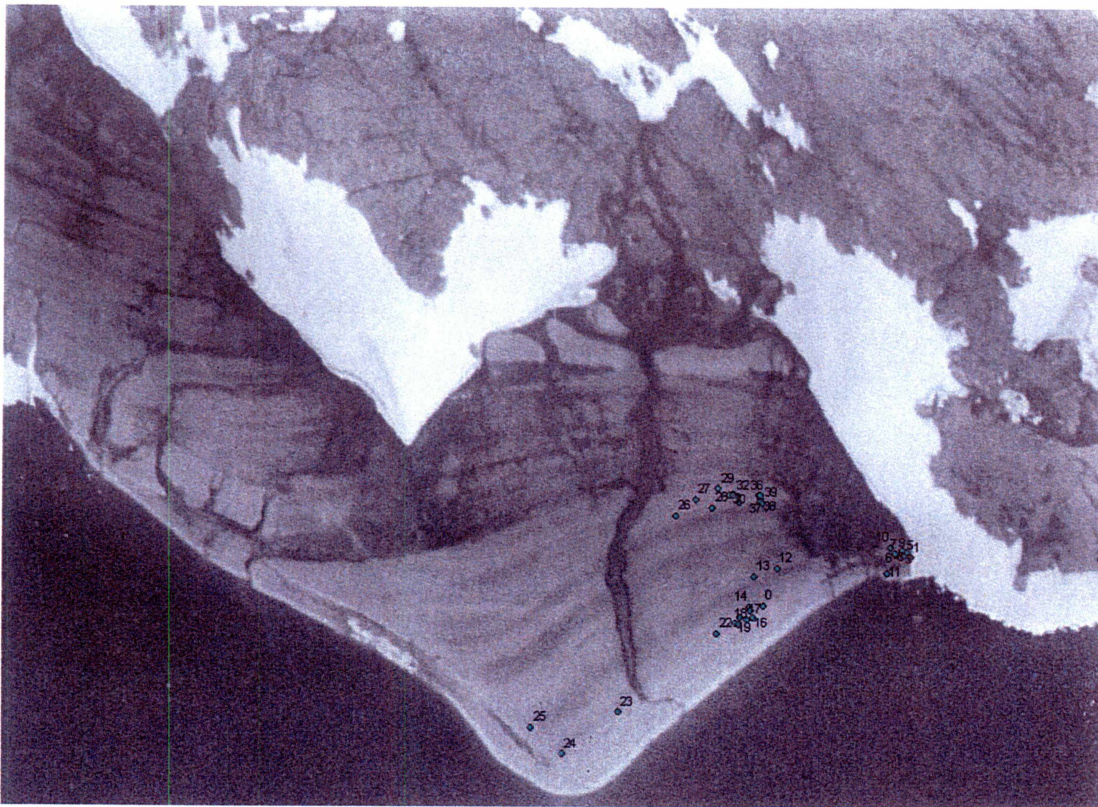
In 1975 the Danish archaeologist S.H. Andersen collected a large amount of lithic artefacts from the eastern most part of the foreland near the trapper’s cabin. It was later discovered that the artefacts were diagnostic of the Independence I, Saqqaq and Greenlandic Dorset (Sørensen 2006; Bennike et al. 2008).

Interestingly it was during the 2008 survey recognized that the foreland showed a horizontal stratigraphy: The first Independence I occupations and artefacts were found at the highest terraces far away from the present sea. At a structure, below the Independence I terrace, artefacts from the Saqqaq culture were discovered in 2003. This structure was excavated in 2008 in order to produce a sample for OSL-dating. The excavation revealed a classical box hearth of Saqqaq type, filled with fire cracked rocks made from basalts and a large stone slab at the bottom. At the terrace below structures mostly seen as irregular pavements, interpreted as belonging to the Greenlandic Dorset, were found. At the same terraces a few children’s playhouses were located as evidence of Thule Culture presence. However, the following terrace was partly transgressed by wave activity from the Greenland Sea especially during a recent storm, thus only one possible habitation structure from the Thule Culture could be located.

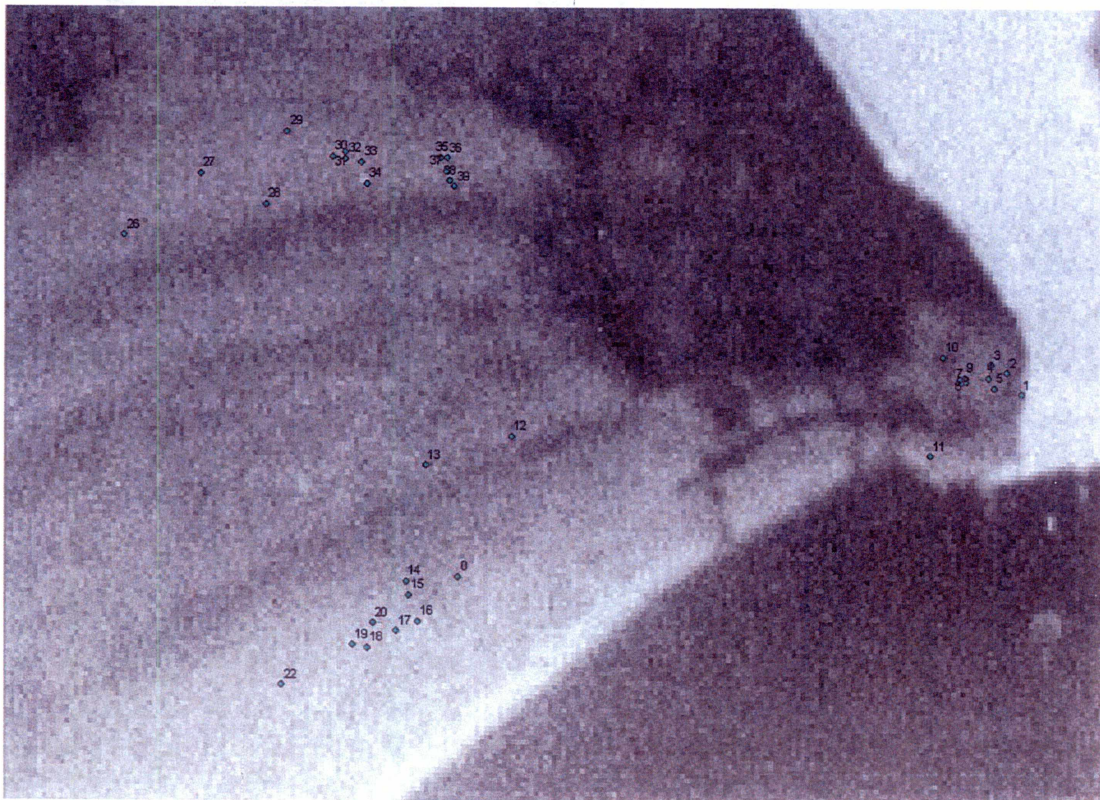
The reason for the horizontal stratigraphy of the site is probably not only an uplift of the land since the difference in meters above sea level between the oldest and the most recent structures is only around 2 m. Rather the difference lies with the sedimentation and the building up of new beaches during the period from 2500-100 BC, a period where the isostatic uplift was moderate in the region. In total 11 palaeo-Eskimo habitation structures, 1 Thule Culture tent ring, 1 shelter, 4 undefined tent rings, 4 caches, 2 fireplaces, 2 areas with lithic stray finds and 1 children’s playhouse were located.



Kap Berghaus and the different structures measured in 2008. A) the Independence I structures, B) the Saqqaq structures, C) the Greenlandic Dorset and the Thule Culture structures, D) The walrus churchyard area, E) the Eastern area with a trapper cabin and many lithic stray finds. F) Site 18, Berghaus øst, area with Dorset structures and children's playhouses (described in 2003).



The structure numbering at Kap Berghaus



The structure numbering of the inhabited terraces at Kap Berghaus

Site 66.**Henning Elv**

The Henning Elv site has been investigated by GeoArk in 2003 and 2007. In 2008, the features were measured with precision GPS equipment and the site was re-described and monitored.

At the site the following features were described: 11 Thule Culture turf houses, 15 Thule Culture tent rings, 2 Shelter constructions, 6 palaeo-Eskimo habitation structures, 9 caches, 2 areas with fireplaces, 1 children's playhouse.

Special of the Site 66 are the so-called fireplace columns. These features can be described as large fireplaces being gradually eroded in the coastal slope. But "mysteriously" the fireplaces and the their subsoil does not erode as fast as the surrounding gravel in the slope, which causes column like features in the slope with fireplaces on the top. Investigations of the fireplaces reveal that they consist of a solid conglomerate of charcoal, and burned bone. Thus, our interpretation is that large quantities of blubber and fat from the fireplaces have penetrated into the gravel beneath and impregnated it, leading to a greater resistance against erosion.

It could be concluded that the site is under heavy erosion, especially the area where the Thule Culture turf houses are situated near the sea at the coastal slope. A large Thule fireplace column is in immediate danger of being eroded into the sea (see fig). Therefore, describing and understanding these structures in the erosion zone received particular attention. The area in which the turf houses are located yielded many stray finds of Thule Culture artefacts such as knapped basalt of the Basalt Ø type and bone materials. This entire area seems to have been used intensively as a midden and for various activities during the Thule Culture period.

It was discovered that the area between the fireplace on the column and the turf house (H 1704), yielded many large fireplaces similar to the column fireplace. Some of the fireplaces were found in situ in the erosion zone while others had been relocated and tilted down the slope. The fireplaces are up to 1m² large consisting of thick layers of charcoal, driftwood and bone materials metamorphosed into a solid conglomerate. Several of the fireplaces in situ are lying beneath turf house constructions and therefore must have been constructed during the Early Thule Cultural period, i.e. during the 15th century AD. The many and large fireplaces at Henning Elv represent a mystery within the Thule Culture as such large fireplaces hitherto were unknown from this period in Greenland.



The characteristic fireplace on a column in the erosion zone. A Bowhead rib is seen to the left.



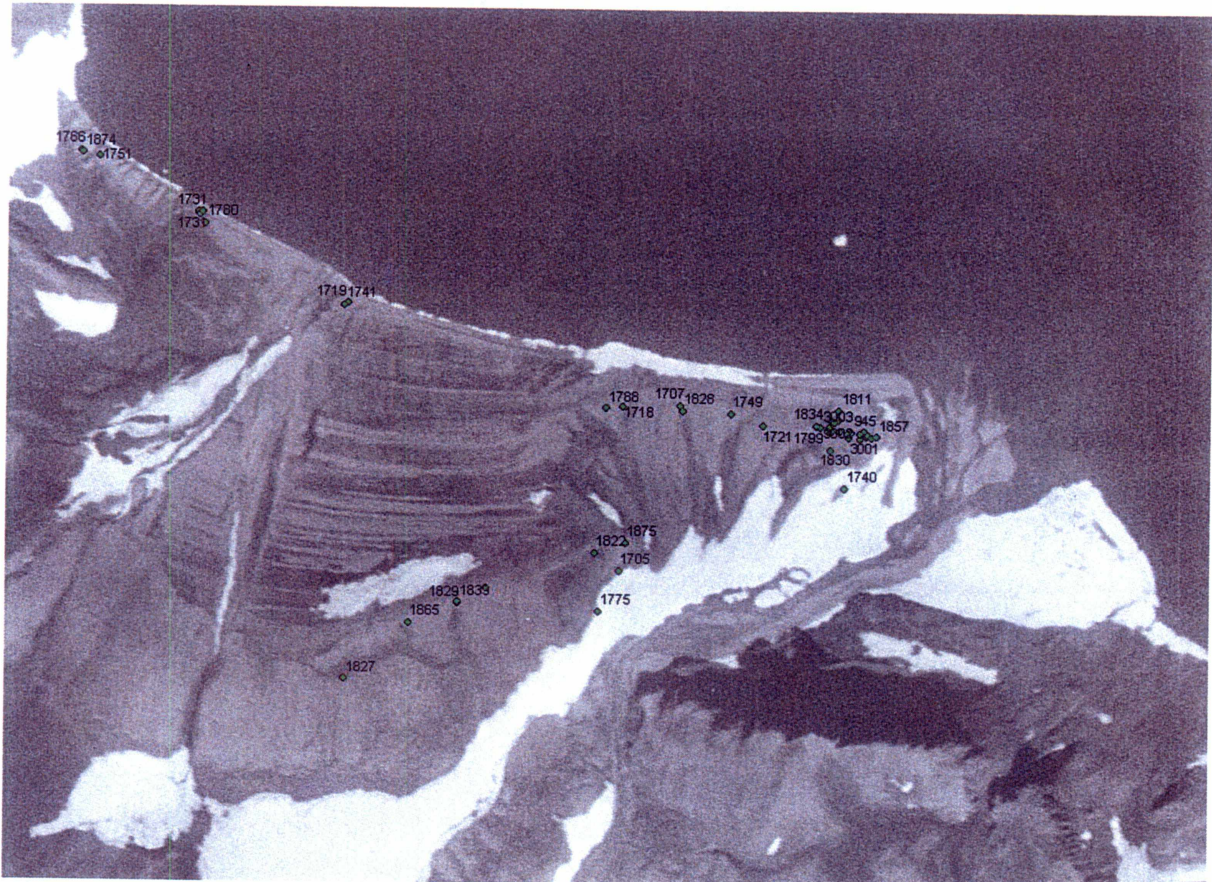
The erosion zone towards the beach at Henning Elv reveals constructions, large fireplaces and middens from the Thule Culture. In front, basalt slabs from a turf house entrance construction. In the back, a thick layer of charcoal and bone material representing a fireplace. On top of the fireplace a turf wall from a late Thule Culture house.

79

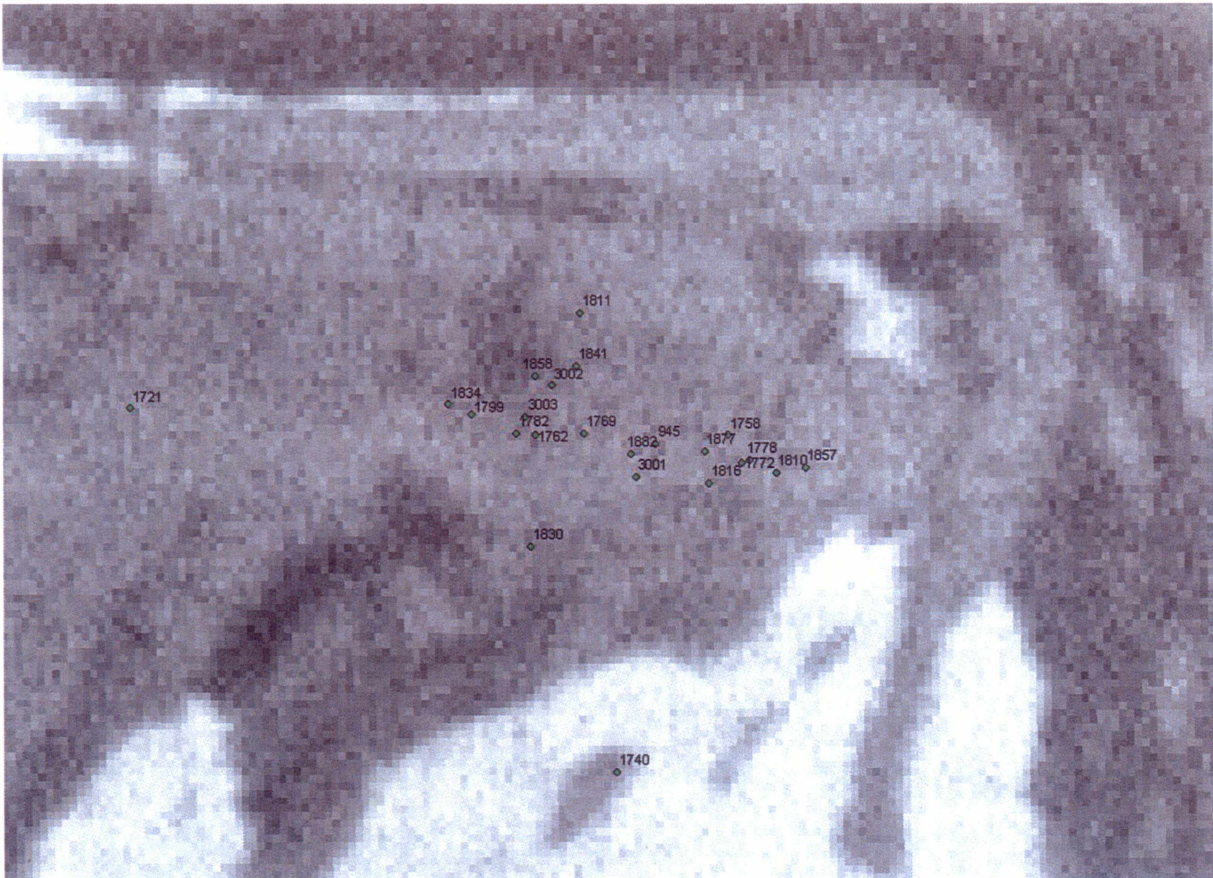
Site 67, 68.

Grønnedal øst and Grønnedal vest

The Grønnedal site was visited and investigated by GeoArk in 2003 and 2007. The features were measured with precision gps equipment and the site was re-described and monitored in 2008. The Grønnedal site consists of two complexes, the western part of the site, also named site 67 (Cla.31) yielding two turf house ruins from the Thule Culture, and the eastern part site 68 (Cla.32), located at a promontory beside the river, yielding light constructions from most prehistoric cultures present in the region. In total 8 Thule Culture tent rings, 1 Shelter, 3 palaeo-Eskimo habitation structures, 1 undefined tent ring, 12 caches, and 2 fireplaces were described.



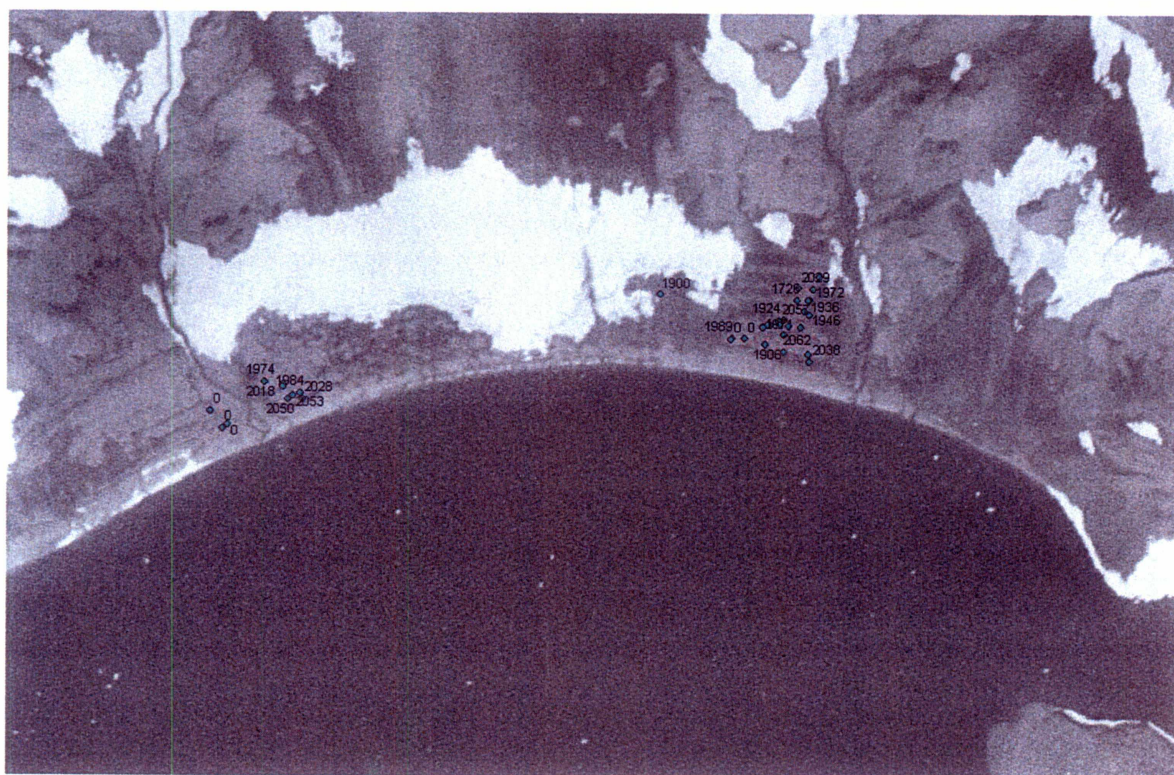
The Grønnedal site, structures are numbered and mapped with high precision GPS equipment



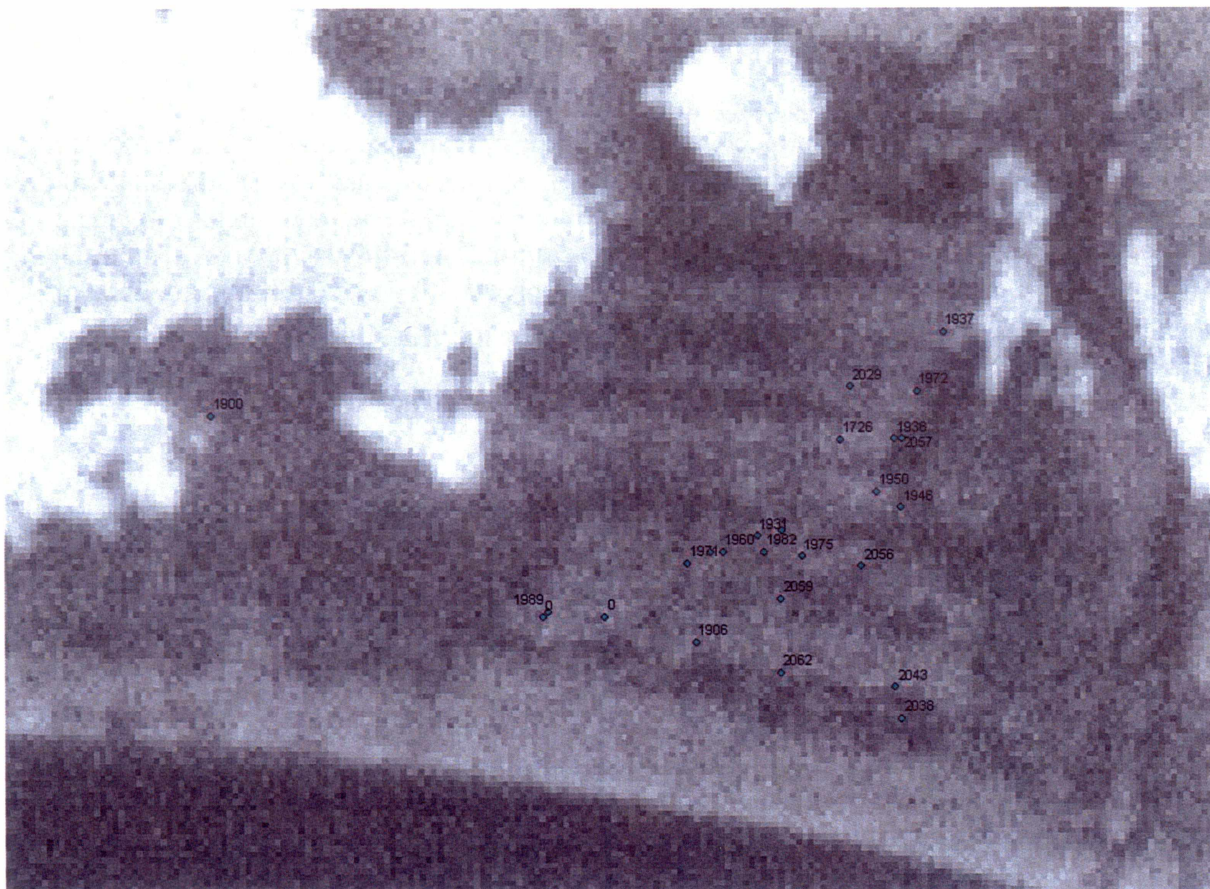
The eastern area of the Grønnedal site, site 68 (Cla.32)

Site 73.**Dahls Skær vest**

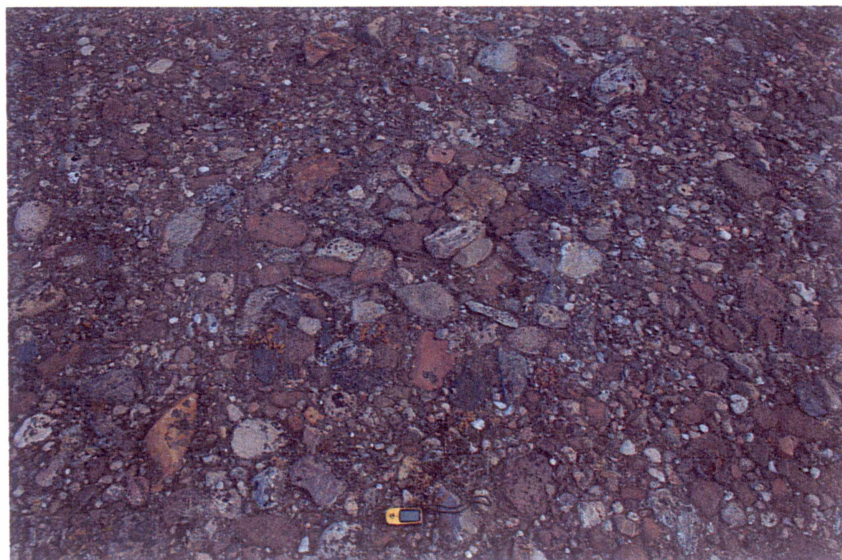
Dahls Skær vest was located in 2007 and revisited in 2008, where the site was systematically surveyed, described and the structures mapped by GPS. The site has a clear habitation pattern in relation to the two rivers, which flow into the bay. There is also a pattern concerning the altitude of the structures in relation to the cultural chronology. The majority of features are situated on the west side of the river next to the Dahls Skær (promontory) while other features are located near the next river to the west. Thule structures are generally located at the very first beach terrace, and several of them were transgressed during the latest storm, as seen on Kap Berghaus. The difference in altitude between the structures can however not be explained by the late Holocene isostatic rebound. It is rather the result of cultural preferences as seen on Hvalros Ø. This site was particularly rich in palaeo-Eskimo habitation structures and many of these showed well preserved pavements centrally placed in the structure. In summary, the following structures were recorded: 5 Thule Culture tent rings, 17 palaeo-Eskimo habitation structures, 2 undefined tent rings, 4 caches, 1 fireplace and 2 children's playhouses.



Site 73. Dahls Skær vest. Note how the structures are located close to the two rivers flowing into the bay



Site 73. Dahls Skær vest. Detail of the location of structures at the beach terraces near the eastern river



Site 73. Pavement in palaeo-Eskimo structure A1726. An OSL sample was taken centrally in this structure during the 2007 fieldwork

Examination of miniature features in the GeoArk 2008 field season

During the 2007 field season, we observed numerous miniature features, which have been considered for analysis in GeoArk-project 2008. This project is fundamental for examining as well as learning about childhood in Thule culture. The GeoArk-project will assist in addressing children in the archaeological reconstruction of the past societies. The project includes archaeological interpretations of how an Inuit person might have lived during the 1400-1823 AD when the Thule Culture migrated and settled in Northeast Greenland. Consequently, by examining any trace of Thule childhood it will offer information as well produce important source material on both prehistoric and historic activities on past human behaviour. The following is a descriptive and preliminary analysis of children's miniature playing houses and other similar playing features that were discovered in 2008 field season.

In the areas of Clavering Ø, Wollaston Forland, Sabine Ø, and Hvalros Ø (Walrus Island) twenty six miniature houses during 2008 were discovered, compared to forty one miniature houses in Finsch Øer, Clavering Ø, Sabine Ø and Hvalros Ø discovered in 2005 & 2007, leaving us with sixty seven miniature playing features. Out of the sixty seven miniature playing features thirty three of them were examined and their details outlined during the 2008 field season. Among these miniature houses diverse types have been discovered from the areas mentioned above. Miniature houses comprise playing houses, doll houses, tent rings and shelter formations. Besides the identifiable miniature houses, there were also less identifiable features among miniature playing features. The latter is a concentration of white pebbles; whereby the outline of its formation is difficult and sometimes challenging to define.

To draw some comparative similarities regarding the playing houses and according to some ethnographic observations, the playing houses were also common activity for children in the Canadian Arctic and Greenland (Birket-Smith 1929). During the winter children could use snow instead of pebbles to construct their miniature houses (Jenness 1922).

Description of the different categories of miniature playing houses

There are five different representations of miniature houses recorded during the 2008 field season. To begin with, eighteen, 54.5 percent, of the playing houses are designed in a way similar to the ground plan of Thule winter dwellings. As such, the miniature houses had platforms placed strategically at the rear side while others were placed at the sides of the houses with recess or blubber and meat caches on either the one or both sidewalls. Moreover, they had a paved front floor with a marked passage entrance or simply an entrance opening. The caches were marked by red pebbles which probably represent the meat, and white pebbles which could be a representation of blubber. The miniature playing houses resembling winter dwellings varied in sizes between 0.85 by 0.70 to 1.50 by 2 meters, which is big enough to have children play inside the formation. Many of the playing houses had a rectangular shape with a rounded back wall.

Subsequently, the design of six, 15.2 percent, playing houses resembles that of summer tent rings, enclosed in circular stone arrangement, but occasionally few were oval in form, and often with stones running across the miniature tent ring as an indication of the platform edge. Some had a gap in the border of their construction indicating entrance part. Some of the miniature summer tent rings were built with use of robust and bigger stones. It is remarkable that three of these could originally have been real tent rings or shelters that were later utilized by children as playing grounds. The miniature tent rings ranged from 0.90 m in diameter to 1.78 by 1.40 meter in size.

Three, 12.1 percent, of the playing houses seem initially to have been tent rings and shelters that have been exploited and utilized by children and rebuilt as playing grounds. Bright coloured pebbles were most likely later placed inside the features. The combination of the tent and shelter constructions and the placement of the bright coloured pebbles inside the features reveal that these features were reused by children. The exploited tent rings and shelter were measuring 2 by 1.85 to 2.40 by 2.60 meters in circumference.

Two, 6.1 percent, miniature houses resembled the design of Thule winter dwelling. It is preferable to call this type “doll houses” since their sizes fit children playing with dolls. The miniature doll houses measured 0.60 by 0.40 meter and 0.70 by 0.50 meter.

The last category comprised of the playgrounds that were dispersed and their formations seemed to be out of context and scattered. Thus, it was difficult to reconcile the original structural outlines of the playing features that were almost entirely consisting of bright coloured smaller sized stones and pebbles. These playing features comprised four, 12.1 percent, formations that showed a concentration of bright coloured pebbles and small tabular stones, which possibly belonged to the original construction feature. The features measured 0.80 by 0.90 to about 2.40 by 2.60 meter.

General observations of the playing houses

It is sufficient to propose some generalizations concerning the playing house formations. The miniature houses are normally situated in the proximity of settlements. They are found at both summer and winter settlements, even though, it is possible that the playing houses were built in the season where stones and pebbles were available to gather. Therefore, it is presumed that the outdoor playing houses were built and played with during the late spring, summer and early fall seasons, where children could carry out outdoor activities. The constructions of playing houses, except for those coupled with exploited features, were built by small or medium sized rocks and tabular stones. In many occasions it seemed that stones in original positions were also utilised. The majority of the miniatures appeared to be following the pattern of the typical Thule dwelling ground plan. In addition, every miniature feature contained a pact of either or both red and white pebbles; except for two out of the thirty-three miniature playing features, which contained no characteristic colourful pebbles. Sixty percent of the miniature features showed use of both white and red pebbles, thirty percent of the playing houses showed only white pebbles, and lastly, ten percent of the playing houses showed only red pebbles.

Two very distinct playing houses must be paid special attention. The houses were built purely of white quartz and were found at the same locality not far from each other. There was a quartz outcrop nearby, which must have been used. The latter constructions of playing houses seemed somehow special as compared to other observed playing houses since the majority of the rocks used for the border construction were basalt and some gneiss.

Fascinatingly some of the miniature houses would be situated on a raised plateau normally behind the settlements. These playing houses, which were separated from the actual settlement, had a remarkable overview facing the ocean and the settlement. It is possible that these playing houses have offered the children a sense of peace to play freely since they were not exposed to adult interference.

Despite this, many playing houses were situated at the same level as the actual remaining settlement. Depending on the exploitation of the landscape for settling throughout time, these

playing houses in time could be expected to have been situated neither too close nor too far from the existing settlement.

Often the miniature houses are in presence of other features. On Hvalros Ø, where the distribution of playing houses is high, the density of other features in near proximity is as well high. This indicates that it is not straightforward to make conclusions on whether the features in connection with playing houses were used synchronously.

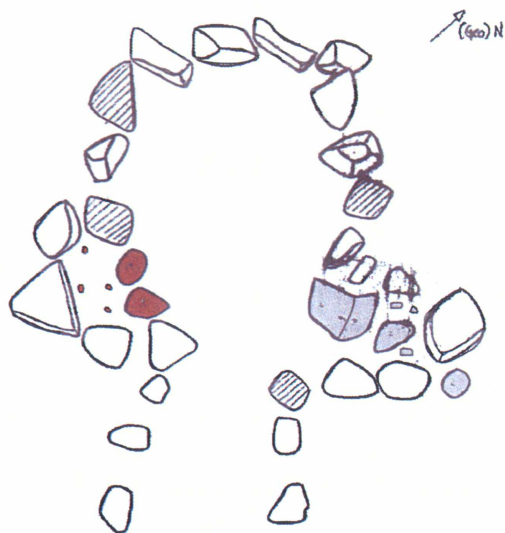
Preliminary perspectives on analysis of miniature playing houses

An observation made by D. Mcl. Johnson when conducting a survey in Northeast Greenland in 1926 is worth to mentioning in this connection. Johnson noticed these small carefully constructed miniature houses, which he called Mosaic formations. He concluded that, these miniature houses had superstitious significance and were not children's playthings (Johnson 1932). Since no ethnographic observations include information about miniature houses being associated directly to a spiritual function Johnson's conclusion should not be accepted uncritically. But it provokes reflections on other interpretations of the miniature features.

Regarding the observed miniature features, it seems reasonable to conclude that they were utilized by children. The general sizes are suited to have been functional for children. The "doll" houses were too small to have facilitated children to play inside, but would be used for playing with dolls inside.

Another aspect of the playing houses is that many of the features seemed to have been built by children themselves. Since the majority sizes of the rocks, stones and pebbles used for the construction of the outline was of small and medium sizes, it can be concluded that these stones could have been lifted and organized by the children themselves.

All in all, the observations and information gathered during 2008 field season concerning playing houses emphasize the necessity of tracing the child's world in different settings, times, spaces, and places and contribute to the production of some important information on the relationship between children, their environment as well as the entire communities where they live in and in particular the Thule Culture in Northeast Greenland.

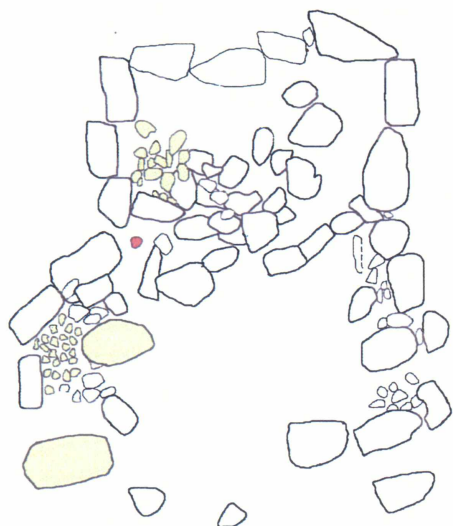


1:10 VARDENÆS L24 (AF)

Vardenæs L24 (1,0x0,80m)

N (geo)
VARDENÆS L27 (2.10x2.20)

Vardenæs L27 (2.10x2.20)



Holmevig L4 (1.65x1,35m)

1:10



Billetet (forvundet)

N (geo)

HVALROS Ø L14 (2.0x1,4m) (FUGLEFJELLET ved siden af spættet mellem af bygningen)

Hvalros Ø L14 (2.0x1,4m)

Archaeological and Zoological conclusions and perspectives

The prehistoric settlements in the Wollaston Forland, Clavering Ø region

The four seasons of archaeological fieldwork by GeoArk, have resulted in an almost complete survey of the coastal landscapes within the region. Only the northeast coast of Wollaston Forland, between Clavering Strædet and Albrecht Bugt, has not been surveyed. However this areas geographical location as well as coastal morphology does not suggest any significant habitation. Prehistoric remains are generally exposed on the surface, allowing archaeologist to discover sites, structures and artefacts much easier and complete than in other parts of the world. Moreover it is, due to the preservation conditions and the ethnographic descriptions from the Thule Culture in East Greenland, possible to determine many prehistoric structures function of, e.g. Thule turf houses, tent rings, caches, etc. Many of the described structures are thus functionally defined, and can be assigned to social, economic as well as seasonal prehistoric activities.

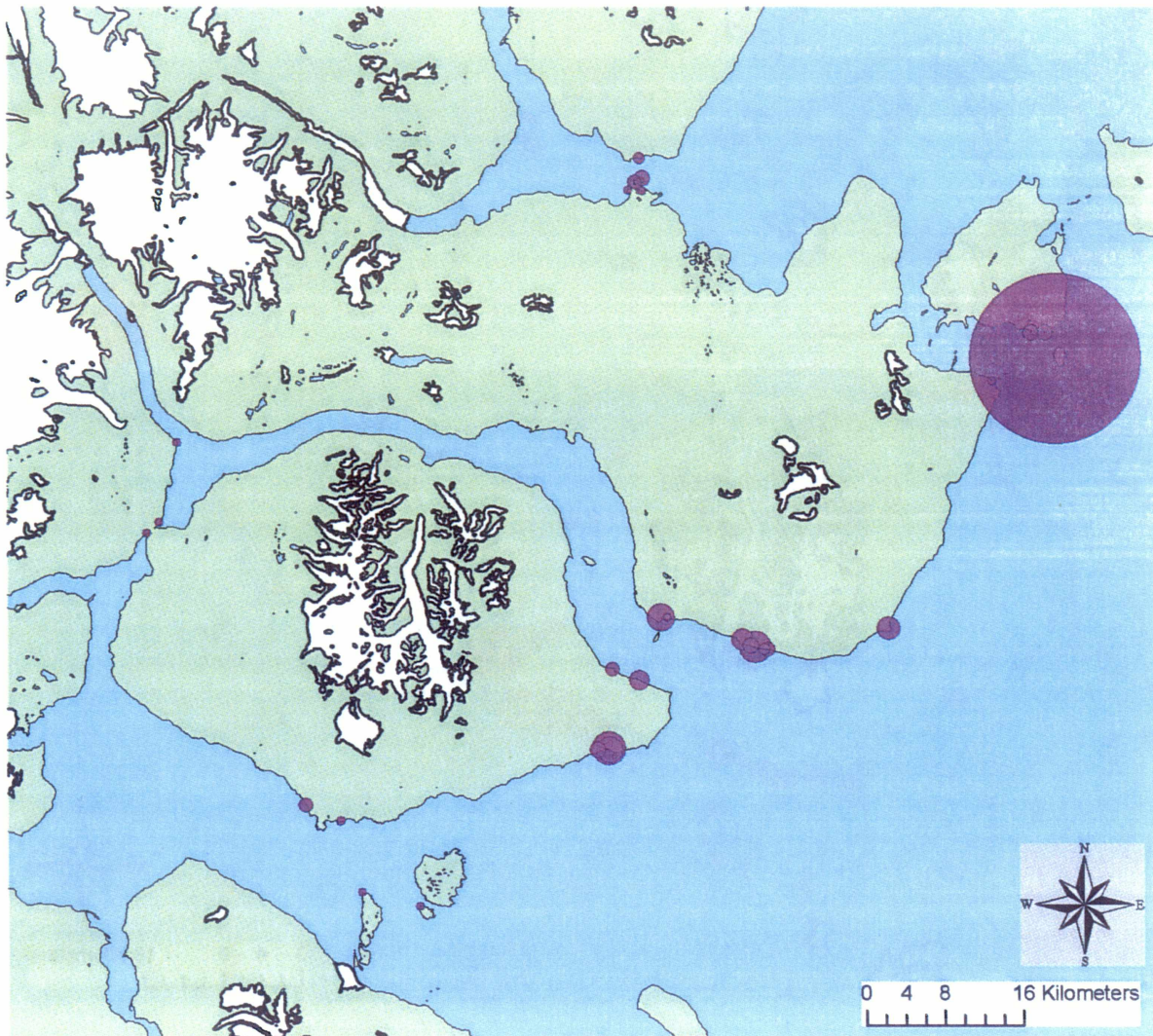
Due to preservation and exposure of the prehistoric remains and the intensive fieldwork including archaeological mapping, a prehistoric settlement pattern for the entire region can now be presented. It is not only possible to plot a genuine pattern of structures in the region, it is also possible to plot functionally and seasonally distinct structures and activities, especially from the Thule Culture, in order to analyse specific behaviour and mobility during the seasons of year in the region.

The archaeological mapping of the area is only one aspect of the GeoArk project. It is even more interesting when the archaeozoological information as well as the geology, the coastal morphology and the annual sea ice variability are integrated with the archaeological data of the region.

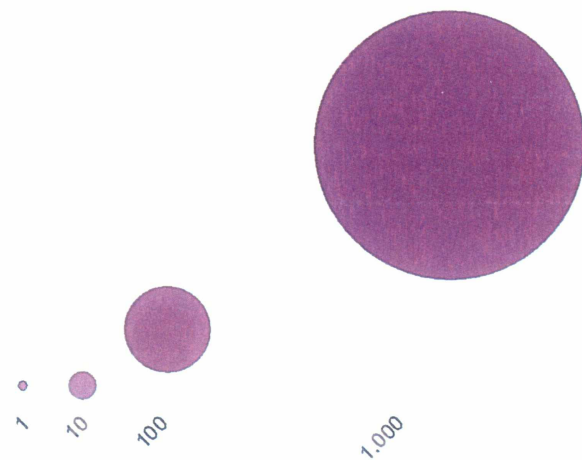
Comparison of the results of the various disciplines obtained from fieldwork in the region will yield genuine new information. In particular, it will elucidate how the Thule Culture perceived and used the land- and seascapes, managed the resources, and lived in the environments and climate of Northeast Greenland.

This chapter will mainly present plots of the archaeological structures as a basis for further analysis and publication.

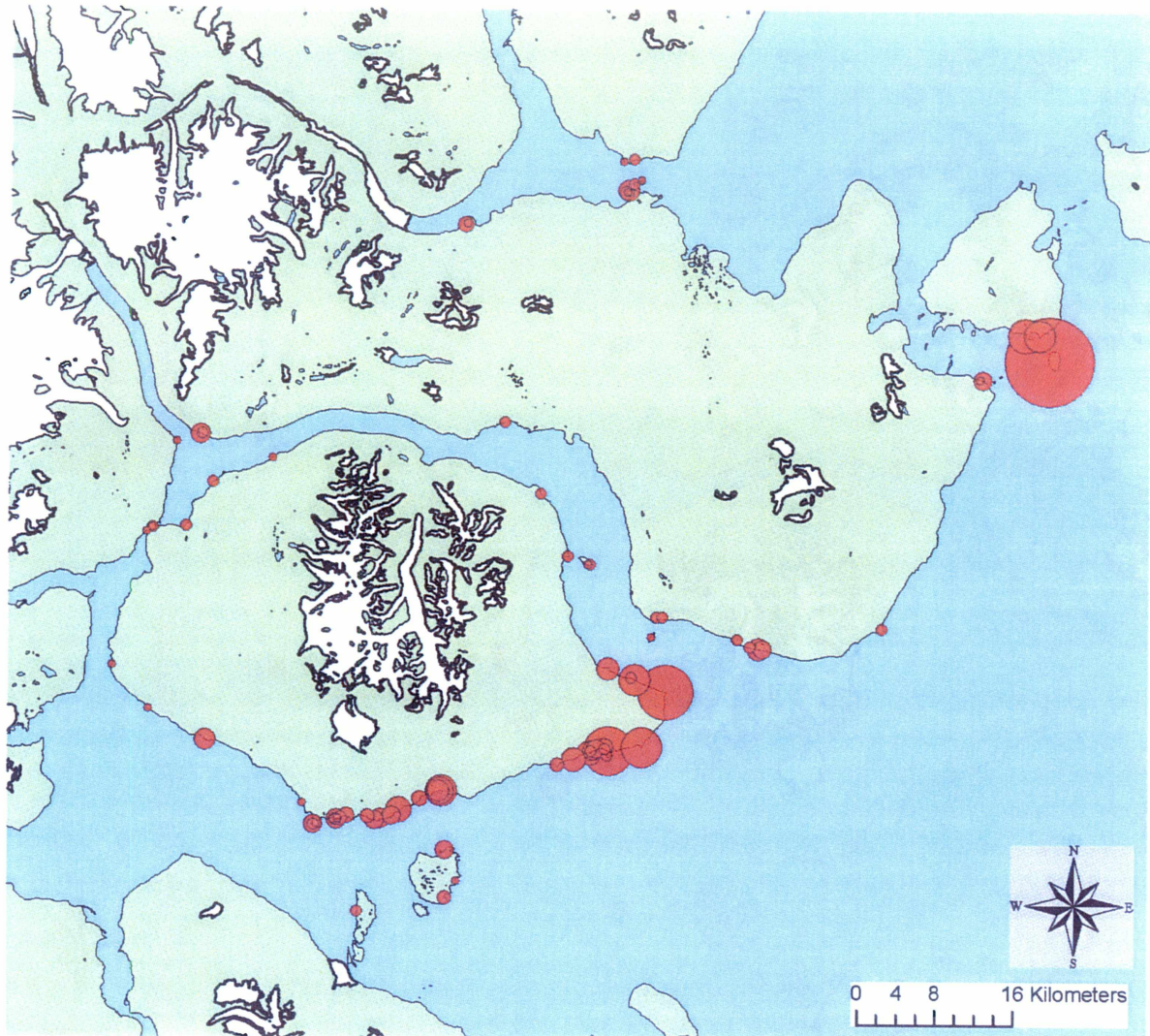
The palaeo-Eskimo habitation structures (Pal Hab)(n:549)



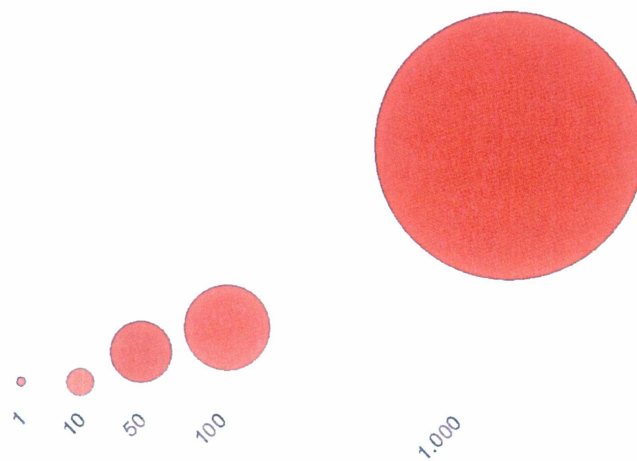
Pal Hab



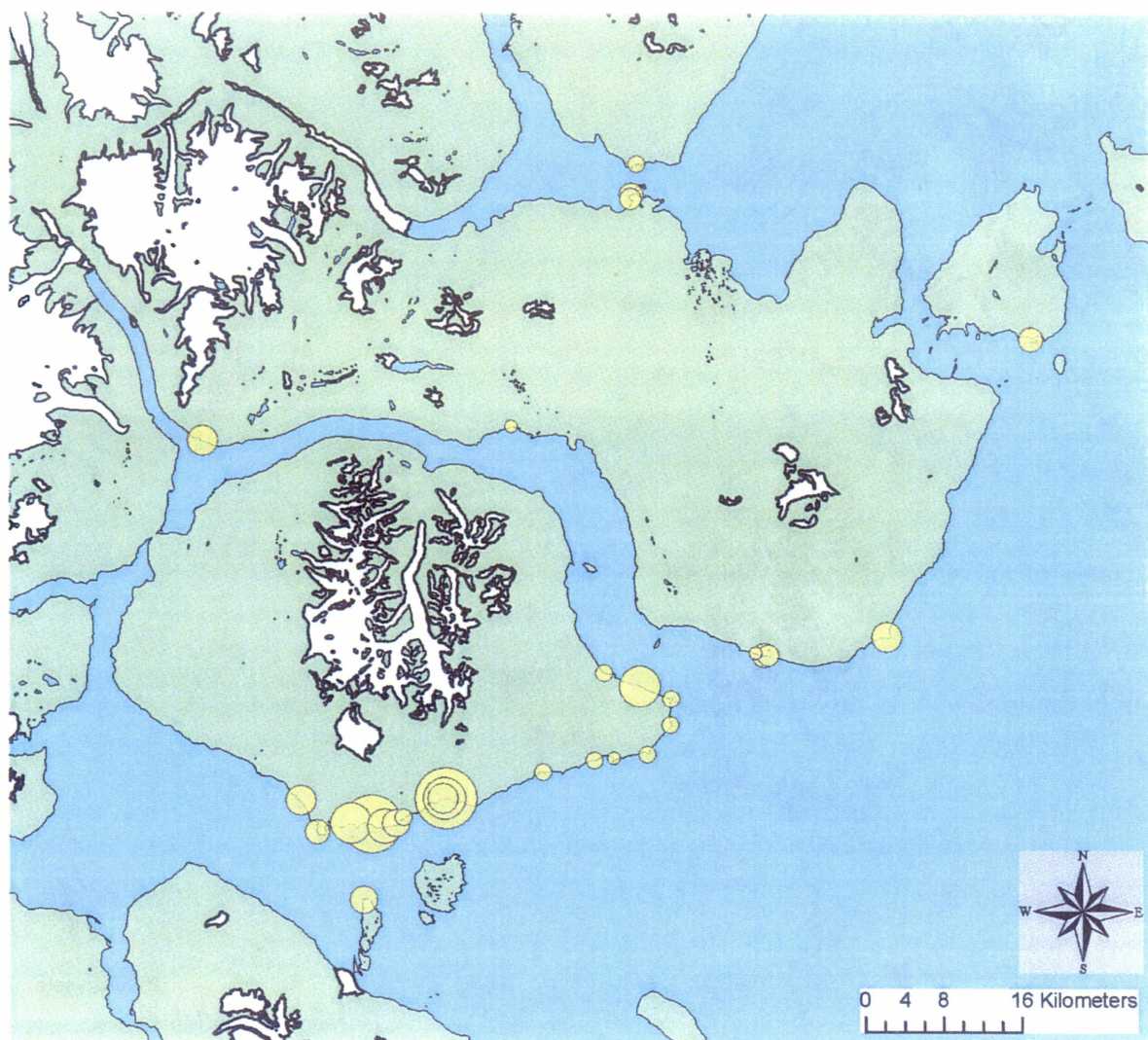
The Thule Culture tent rings (tetrling_t)(n:520)



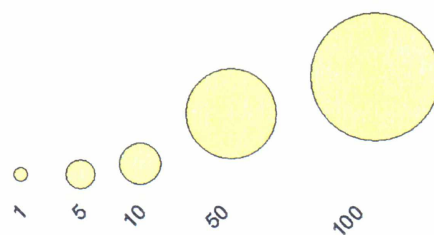
Thule tent



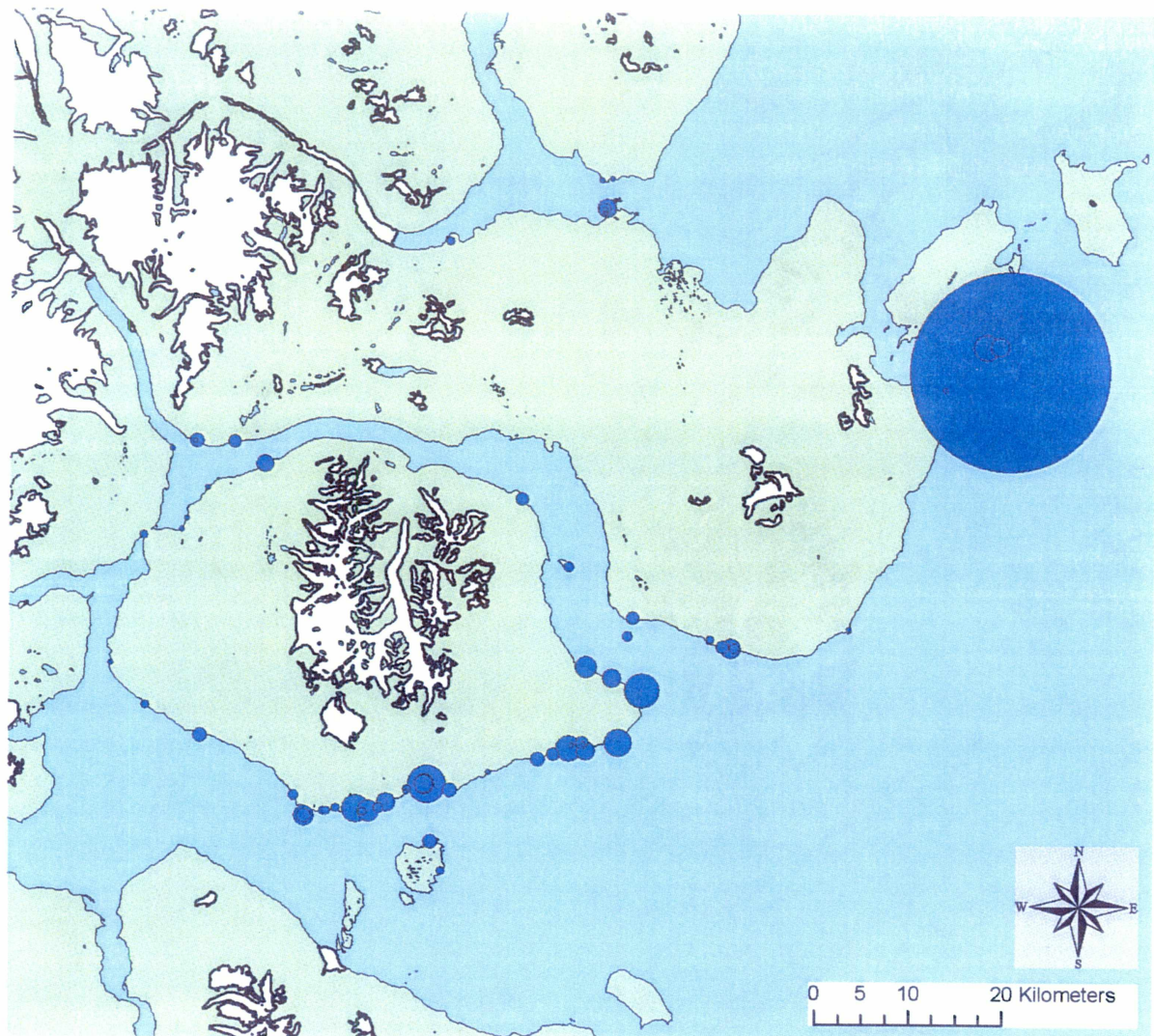
Thule Culture turf houses in the region (Thule house)(n:165)



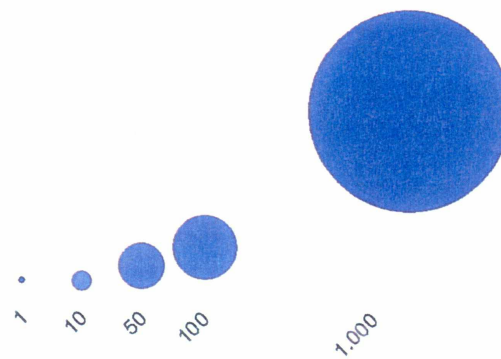
Thule house



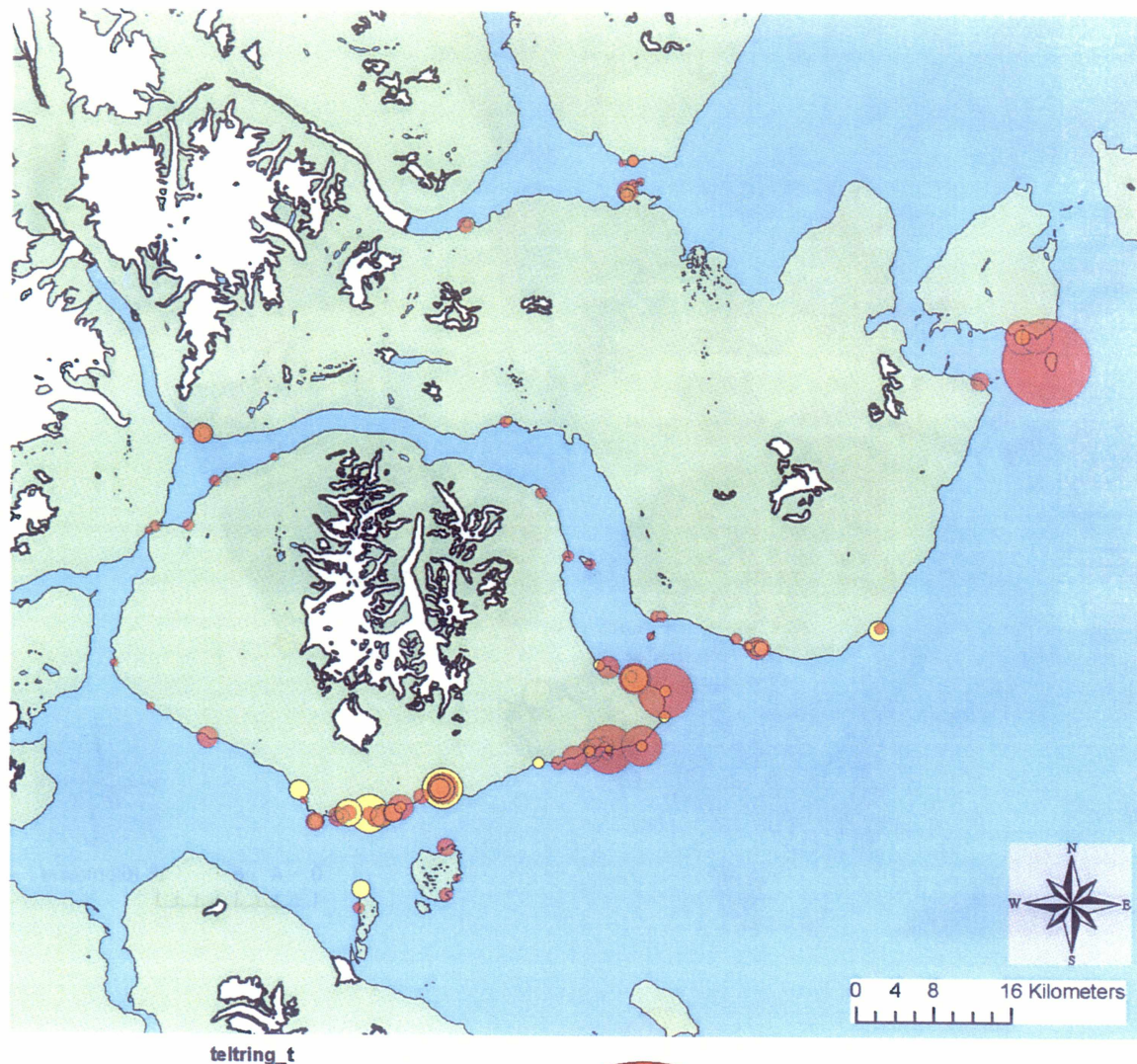
Caches in the region (Cashes) (n:1446)



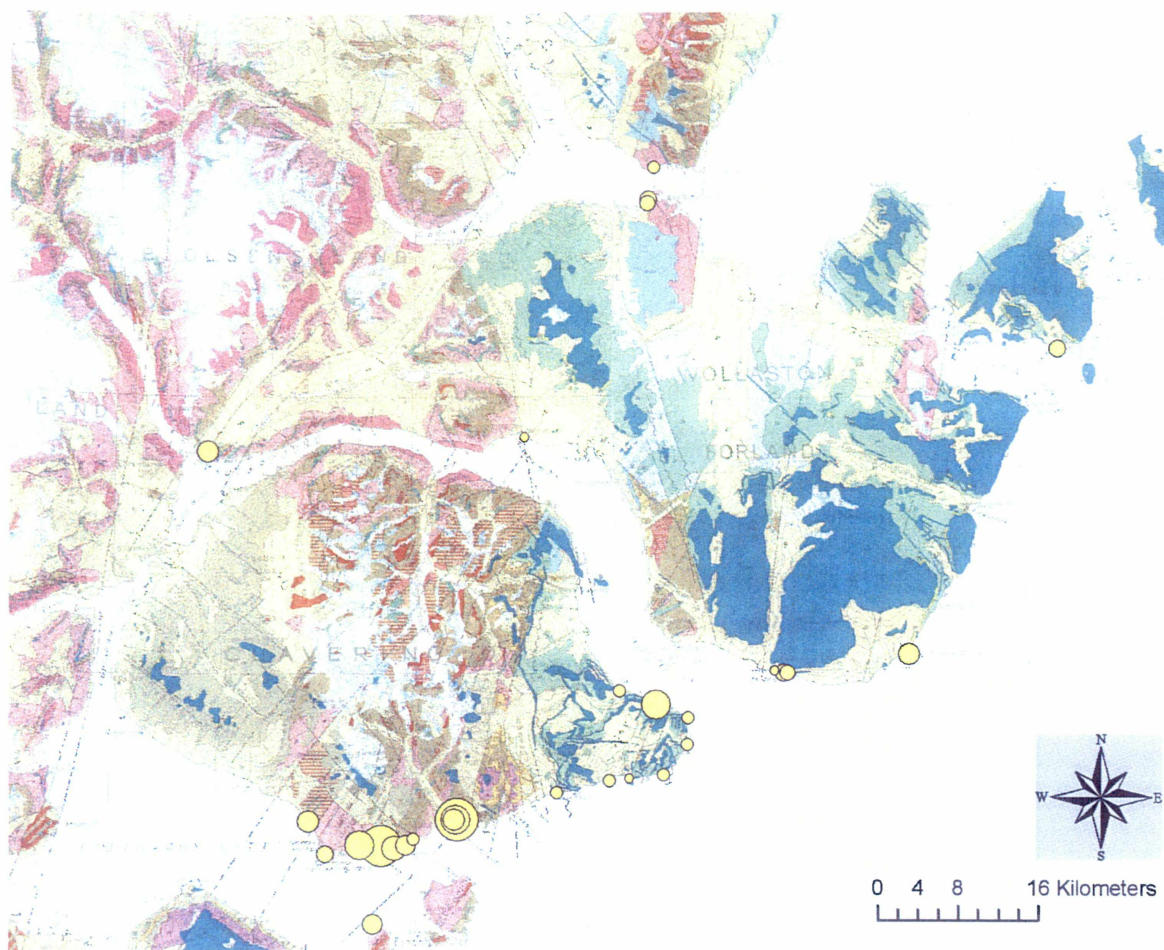
Caches



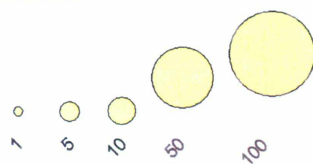
A comparison of Thule Culture turf houses (tørvehus) and tent rings (tettring_t) in the region



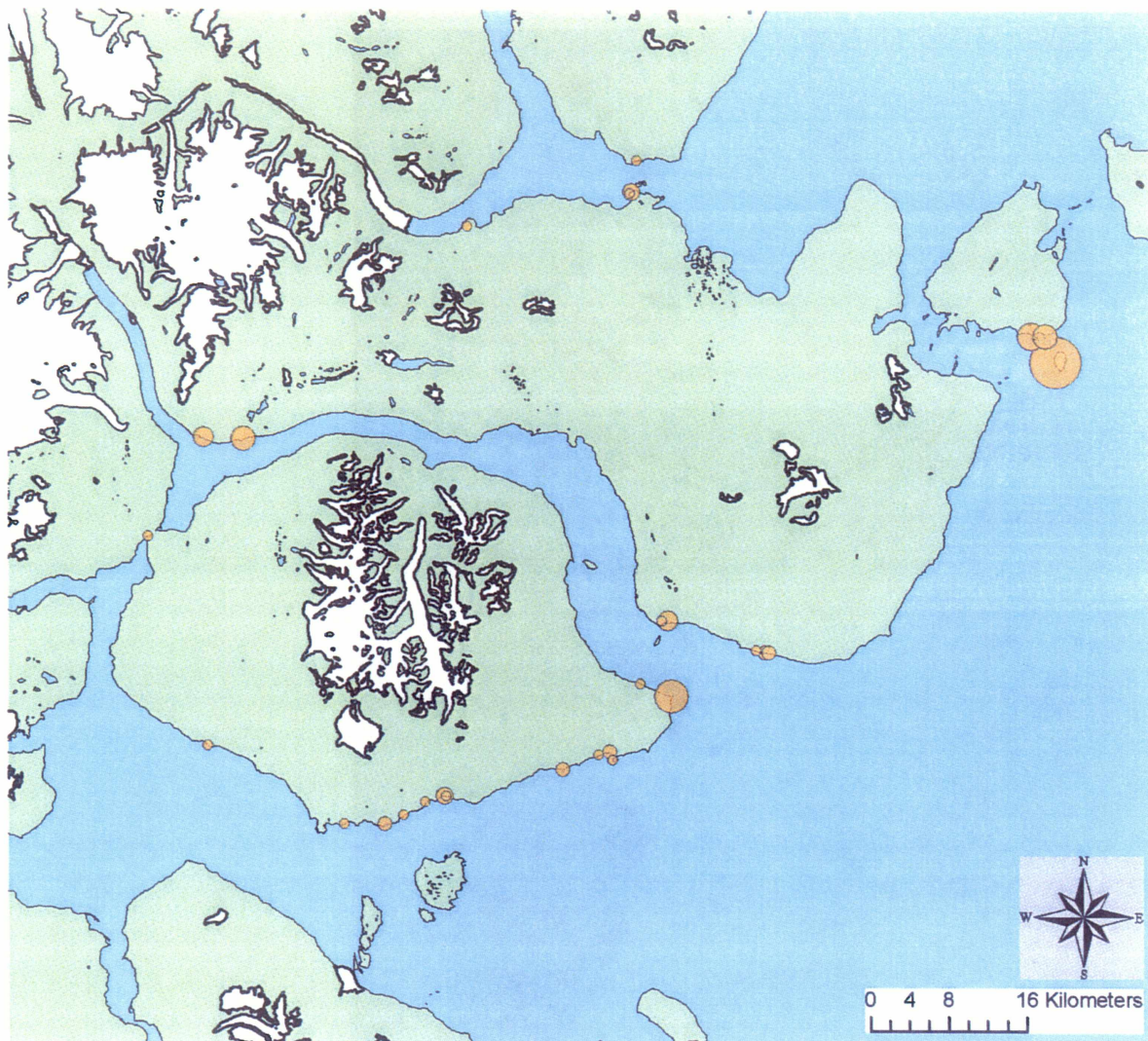
Comparison of geology and Thule Culture turf house (tørvehus) for the region



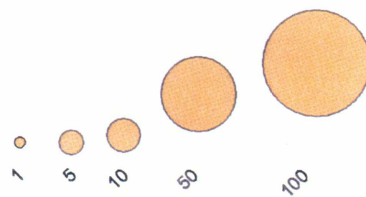
tørvehus



Miniature playing houses in the region

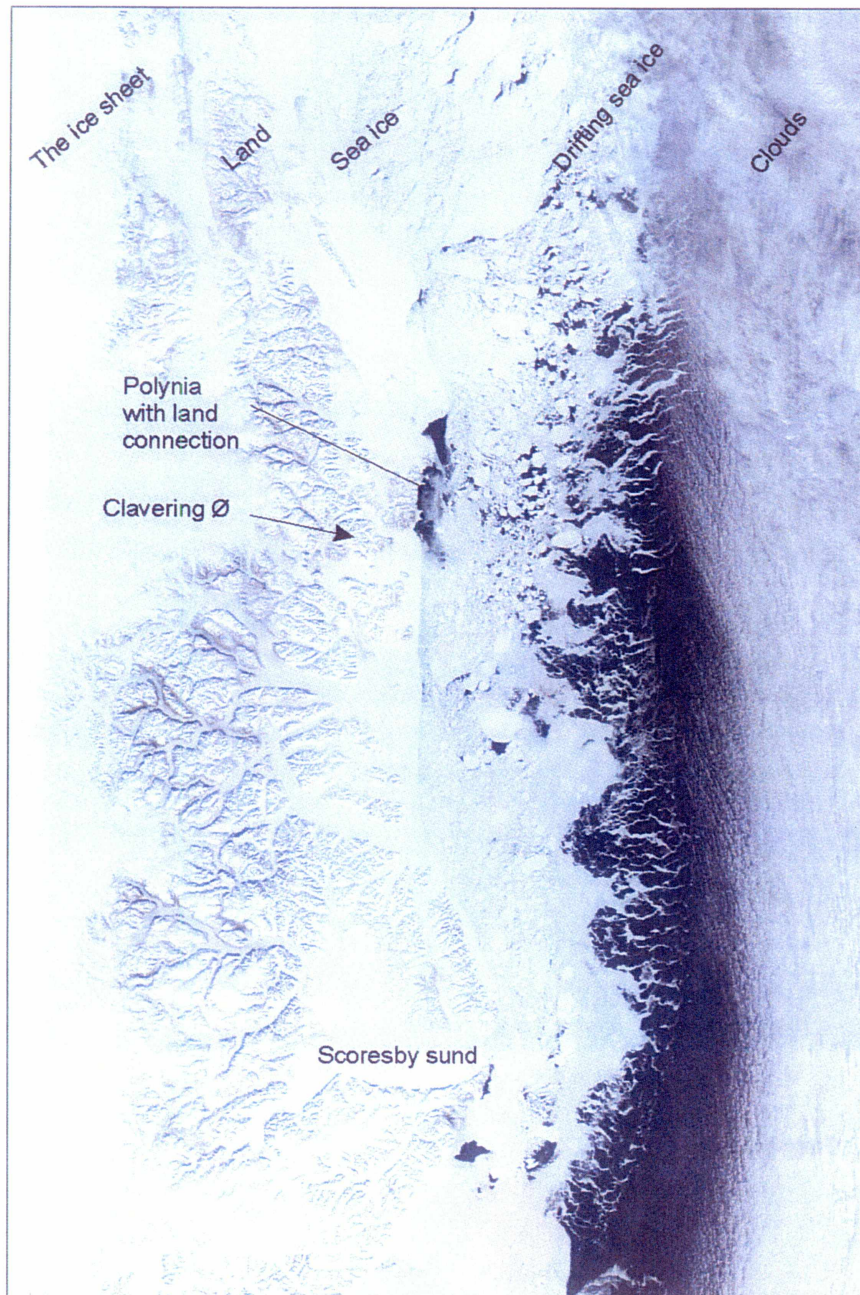


Play house



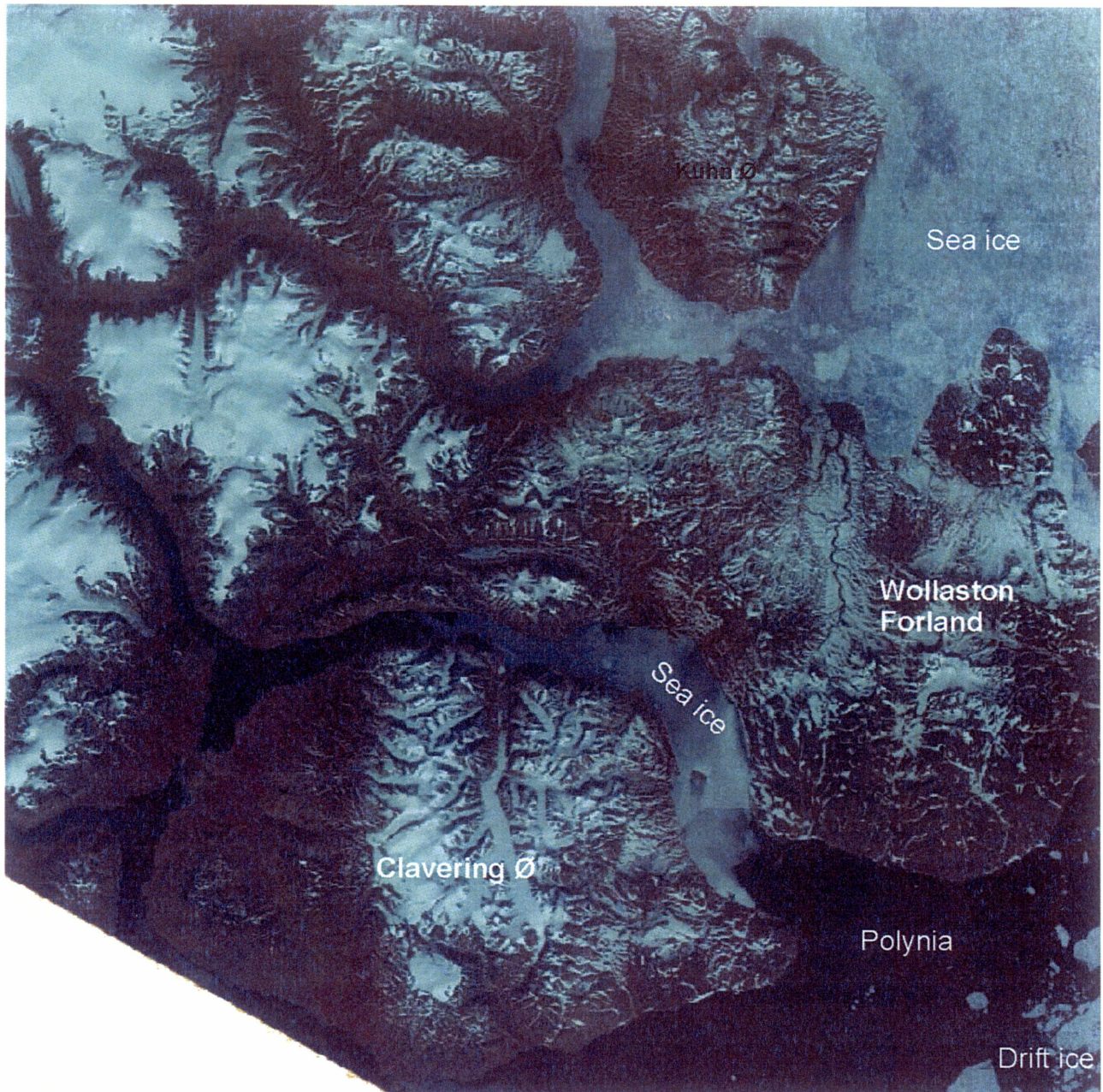
The regional sea ice situation

Satellite photo of Northeast Greenland 28 of April 2002 (Terra Nova).



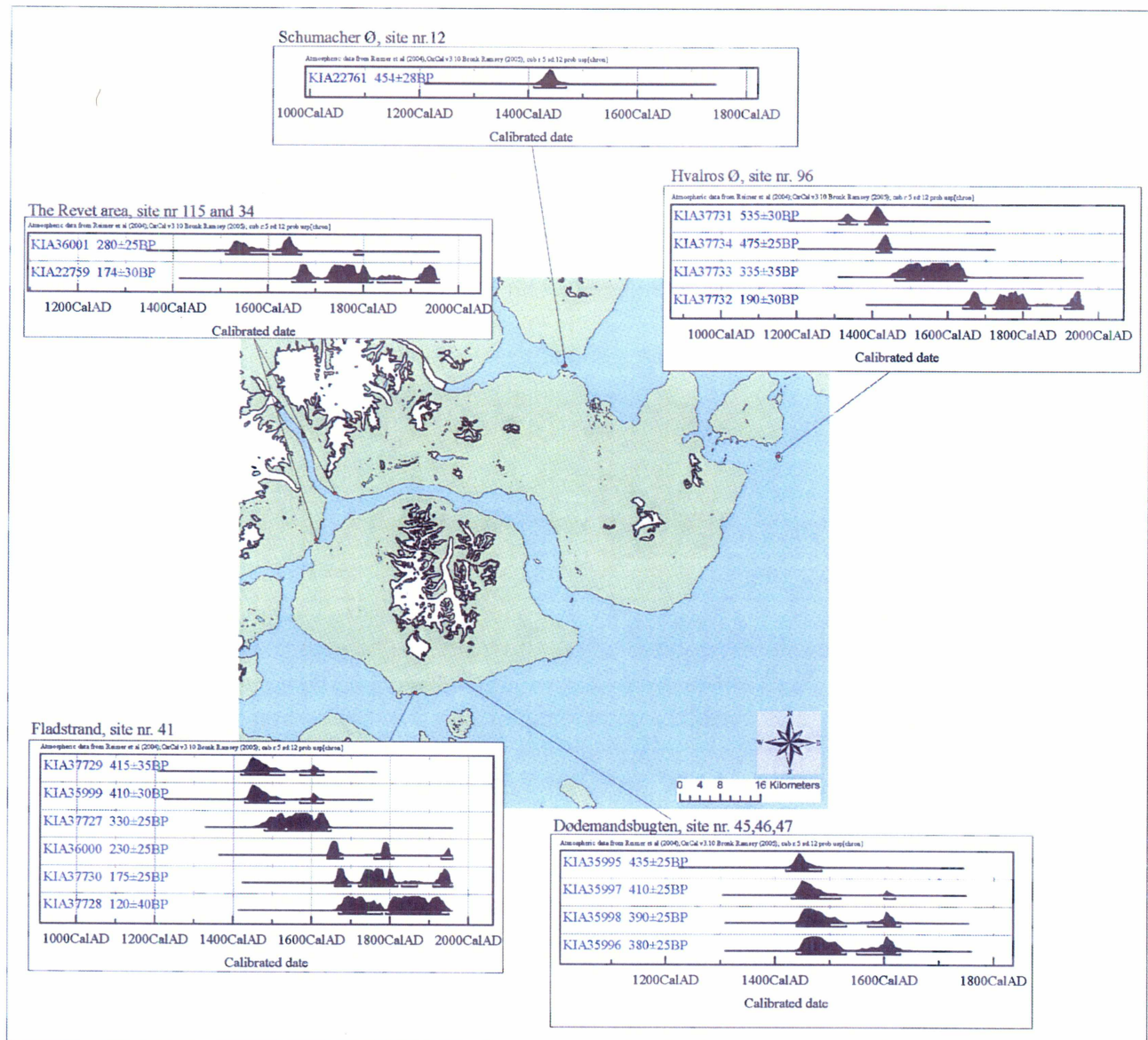
The first places that the sea ice opens up near the coast of northeast Greenland is outside Wollaston Forland and Lille Pendulum Ø, where Hvalros Ø is situated. Also in the Scoresby Sund area, near Cap Tobin is a polynya present.

Satellite photo of the Clavering Ø - Wollaston Forland region, July 1997 (Landsat)



The sea ice situation during mid summer in the region (but without Sabine and Hvalros Ø). It is seen that the sea ice disappears first from the estuary of Young Sund, from the southern Clavering Ø coast and in the Revet area, while the sea ice is lying solid in the middle of Young Sund and north of Wollaston Forland. However note the small polynyas at the east coast of Kuhn Ø, caused by black sediments blown out onto the ice by the predominant northern winds.

AMS dating of the Thule Culture in the region



AMS dating document that the region has been inhabited and exploited by the Thule Culture from around 1400 AD to 1800 AD. Furthermore the dates reveal that the different areas within the region have been in use during the entire period. Note that only the earliest house phases in Dødemandsbugten have been dated.

The faunal material – some preliminary conclusions

Due to the very heterogeneous sampling procedures and sample sizes of the faunal assemblages from the 2007 and 2008 field seasons it is difficult to conduct an inter site comparison. There are, however, some general trends to be seen from the figure beneath. Sample sizes less than $n=50$ were excluded from the diagrams and for simplicity only the four highest ranking taxa were used, however they still comprised at least 90 percent of the species identified portion of each site respectively. For the Fladstrand the five highest ranking taxa were included to reach the 90 percent portion of the species identified assemblage. The portion of unspecified seals (*Phoca* sp.) was distributed on ringed seal and harp seal proportionately which may to some degree inflate the harp seal frequencies giving harp seal an artificially high relative frequency, as the majority of the unspecified seal bones most probably derive from ringed seal.

The faunal samples deriving from summer habitations in the Revet area, 101, 103 and 105 (see text) are very small and therefore of limited value. However, the highest ranking species are caribou followed by seal mainly ringed seal and/or goose mostly pink-footed goose. The activity area dated to the Thule Culture A.D. 1519-1664 (2 sigma range) (KIA 36001) south of the hunter's cabin Moskusheimen (57) excavated during 2007 and 2008 shows a similar pattern with exploitation of caribou as the most frequent species but with presence of other terrestrial species as musk ox, polar fox and arctic hare and in addition seals. This site probably also reflects summer exploitation. The mid fjord summer habitations (36, 37 and 44) show a somewhat different pattern of exploitation with ringed seal and other seal species as the dominant game typically followed by narwhal and/or caribou. The Holmevig (44) showed a rather low frequency of caribou bones presumably to some extent due to the poor preservation conditions of the site.

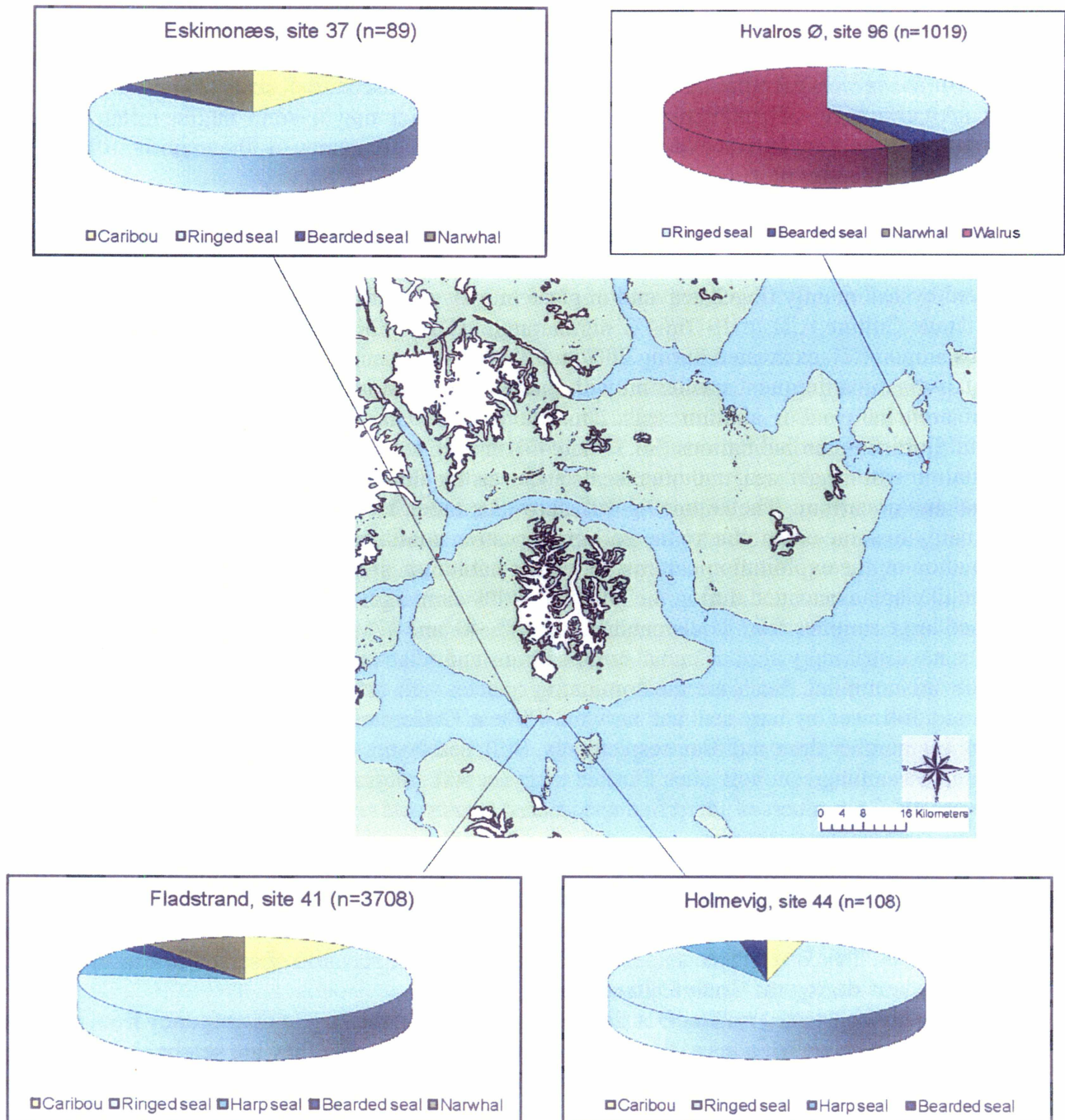
Information on the exploitation patterns on winter habitation sites derive from the Fladstrand (41) midden like area excavated during the 2007 and 2008 campaigns in front of turf house A and the re-analysed large samples from Dødemandsbugten (45, 46 and 47) (Gotfredsen in prep). The two large samples have strikingly similar faunal compositions and relative distributions when all contexts for each site are compiled. Seals are the dominating species with caribou ranking number two, at Fladstrand followed by harp seal and narwhal while at Dødemandsbugten narwhal and bearded seal are ranking number three and four respectively. Still, seal bones comprise more than two thirds of the faunal assemblage on both sites. Further analyses will integrate other quantification methods than mere NISP (numbers of identified specimens) counts and reveal if there are any temporal trends for the two large samples.

It is noteworthy that caribou hunting did not only take place in the inland although it was probably the most important game at inland summer sites in combination with goose hunting. Caribou was also a quite important game at the southern coast of Clavering Ø on summer and especially winter habitation sites. This is a pattern somewhat different from the scenario observed in coastal sites in West Greenland during the Thule Culture period.

The huge outer coast site Hvalros Ø is the locality exhibiting the largest discrepancy from the faunal distribution pattern on the sites at the southern Clavering Ø whether they are seasonal sites or winter habitations. The walrus was the key game species on Hvalros Ø. And even though walrus bones are documented at most sites along the southern and northern coasts of Clavering Ø they are found only in sparse numbers compared to other species. Thus, it is concluded that the most important place for walrus hunt and storage was Hvalros Ø.

The role of large baleen whale is difficult to assess and the effect on the Thule Culture bowhead whale exploitation inflicted by European whale hunters is thus difficult to evaluate. There is an indication that baleen and bones of large whale presumably bowhead whale are more frequent in

older culture layers than in layer from the younger part of the Thule period. Further analyses of the Dødemandsbugten and the Fladstrand faunal assemblages may give some answers.



Relative frequencies of the most important taxa on sites from the 2008 field campaign in the research area. Sample sizes less than n=50 were excluded from the diagrams.

SITE	36	37*	41*	44*	57*	60*	66*	67	68	101	103	105	Hvalros Ø
TAXON													
FISH (Pisces)													
Cod (<i>Gadus morhua</i>)			X						X				
Fish indet. (Pisces sp.)			X	X									
BIRD (Aves)													
Goose (<i>Anser/Branta</i> sp.)			X			X				X			X
Pink-footed goose (<i>Anser brachyrhynchos</i>)											X		X
Eider (<i>Somateria mollissima</i>)													X
Rock ptarmigan (<i>Lagopus mutus</i>)			X										
Gull (<i>Larus</i> sp.)									X				X
Black guillemot (<i>Cephus grylle</i>)													X
Bird indet. (Aves sp.)			X										
MAMMAL (Mammalia)													
Arctic hare (<i>Lepus arcticus</i>)		X	X		X	X							
Dog (<i>Canis familiaris</i>)			X		X		X						X
Polar fox (<i>Alopex lagopus</i>)		X	X		X								X
Polar bear (<i>Ursus maritimus</i>)			X									X	X
Walrus (<i>Odobenus rosmarus</i>)		X	X				X				X		X
Ringed seal (<i>Phoca hispida</i>)	X	X	X	X	X		X						X
Harp seal (<i>Phoca groenlandica</i>)			X	X									
Bearded seal (<i>Erignathus barbatus</i>)	X	X	X	X	X		X						X
Seal indet. (<i>Phoca</i> sp.)	X	X	X	X	X	X	X	X	X	X	X		X
Caribou (<i>Rangifer tarandus</i>)	X	X	X	X	X	X	X			X	X	X	X
Musk ox (<i>Ovibos moschatus</i>)			X	X	X	X			X				X
Narwhal (<i>Monodon monoceros</i>)	X	X	X	X			X						X
Bowhead whale (<i>Balaena mysticetus</i>)			X				X	X					X
Whale indet. (Cetacea)		X	X			X							X

The species distribution by site and taxon for sites examined during the 2008 field season. * designates the compiled result for registrations conducted during both the GeoArk 2007 and 2008 campaigns. The results of both surface *in situ* registered bones, surface samples and excavated material is shown. The sampling method of each particular site is mentioned in the text.

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