

Kobbefjord Site Manual

Nuuk Ecological Research Operations
(NERO)



NERO 

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Introduction

Nuuk Ecological Research Operations (NERO) was founded in 2005 when the Danish Environmental Protection Agency decided to finance the establishment and operation of a low Arctic counterpart to Zackenberg Ecological Research Operations (ZERO) in Northeast Greenland. The monitoring component of NERO – Nuuk Basic – is very similar to ZERO's Zackenberg Basic which has been in operation since 1995. Their mutual aim is to study the effects of climate change in the Arctic. The two programmes are both part of the Greenland Ecosystem Monitoring (GEM) programme. In 2016 the GEM-programme has been expanded to include Arctic station at Disko Island as a GEM-site.

Nuuk Basic is located in Kobbefjord/ Kangerluarssunguaq (64°07' N, 51°21' W) close to Nuuk in low Arctic West Greenland. The first monitoring season was in 2005 (MarineBasis) while the other sub-programmes (see below) were initiated in 2006, 2007 and 2008.

Concept and aim of Nuuk Basic

The concept of Nuuk Basic is to collect long time series in order to quantify variations in biological and geophysical parameters in the terrestrial, limnic, and marine parts of the ecosystem. This is done by recording variations in different parameters during the seasons, years, and even longer periods caused by changes in climate on a local, regional, and global scale.

The overall aim of Nuuk Basic is to establish a data platform that facilitates (i) an in-depth description and analysis of climate effects on the structure, function, and feedback dynamics in a low Arctic ecosystem, (ii) a more complete spatial description of the general climate-ecosystem interactions across the Arctic (in collaboration with the high Arctic Zackenberg Basic), and (iii) an understanding of the interactions between climate effects and human utilisation of the natural resources.

Nuuk Basic is comprised of five sub-programmes:

- BioBasis: monitoring of the biological part of the ecosystem including freshwater
- ClimateBasis: monitoring of climate and river water discharge
- GeoBasis: monitoring of physical landscape processes, snow cover, and fluxes of greenhouse gases
- MarineBasis: monitoring of physical and biological processes in the marine part of the ecosystem.
- GlacioBasis: monitoring of the mass and energy balance of a mountain glacier

Further information on Nuuk Basic is available at www.nuuk-basic.dk.

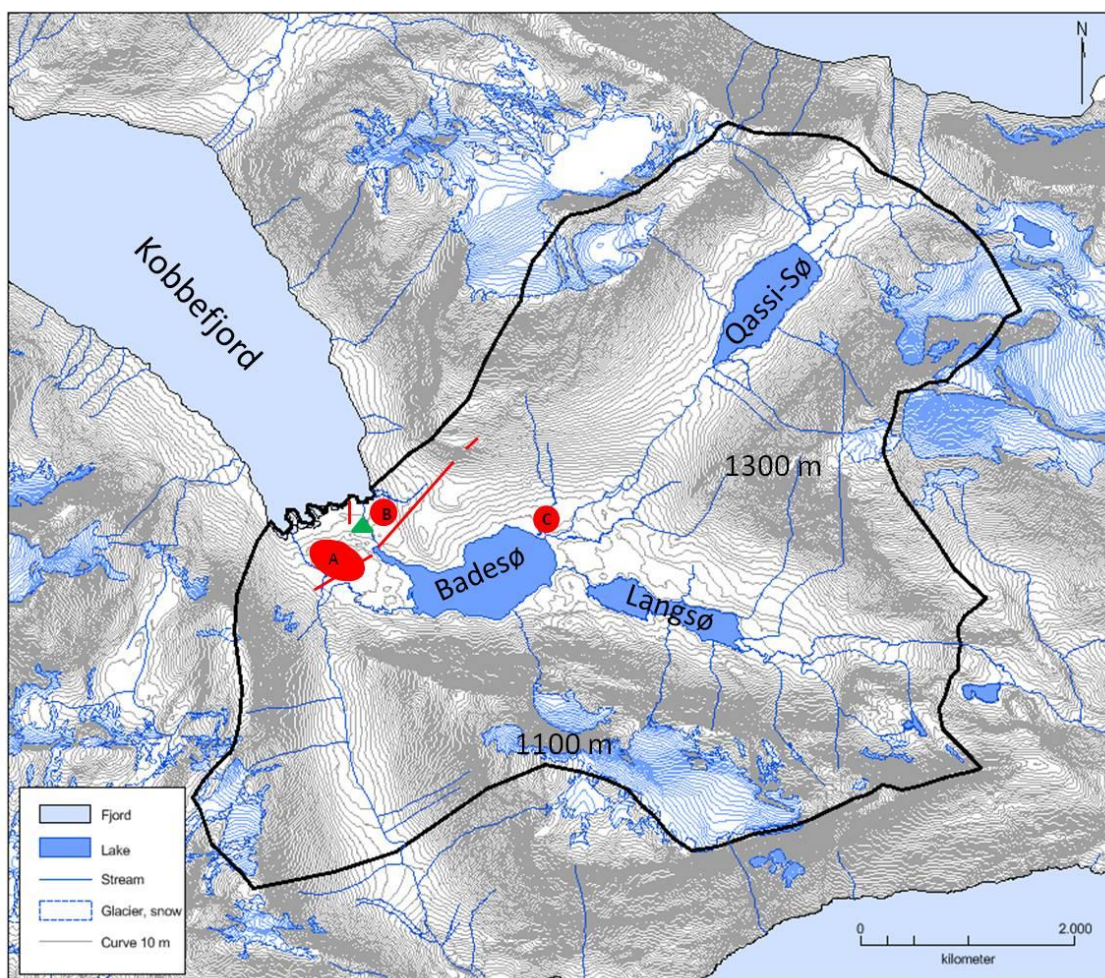
Financing and involved partners

Nuuk Basic is financed by the Danish Energy Agency and the Danish Environmental Protection Agency with partners from the Greenland Institute of Natural Resources (GINR), Asiaq – Greenland Survey, Aarhus University and University of Copenhagen. The Aage V. Jensen Foundation has funded most of the infrastructure including boats and the research station in Kobbefjord.

The monitoring area

The Nuuk Basic catchment area is approximately 32 km² located at the bottom of Kobbefjord / Kangerluarssunguaq (64°07' N, 51°21' W) approx. 20 km south-east of Nuuk. The area is characterised by three major valleys surrounded by steep hills reaching approx. 1300 m a.s.l.

The area is often used as a recreational site by locals during weekends and holidays. In order to minimise human impact and prevent disturbances to the study area, researchers visiting the area must give the utmost consideration to the natural environment and to the interests of others working in the area. Hence, disturbance of soil and plants must be kept to a minimum. Researchers are also strongly encouraged to use walking tracks whenever possible.



The red dots and lines on the map mark areas where access is limited and regulated. A: the fen site, B: the C-flux site, C: the heath site. The red lines: the NERO line (vegetation transect). The green triangle marks the location of the cabin and the generator hut.

Please note that placement of permanent equipment and location of your plots etc. must be approved by GINR and Asiaq.

It remains the responsibility of the individual leaders of research projects to remove scientific equipment from the field site(s) and from the monitoring area once the studies or experiments are terminated.

Use of the monitoring area

All researchers / research projects must fill in the **Kobbefjord Access Application Form** before entering the monitoring area. Visiting scientists are not allowed to bring private guests to the Kobbefjord Field site.

The monitoring area houses several plots where continuous monitoring takes place. These areas are **NOT** to be changed, manipulated, or damaged by visiting researchers. When walking in the area please make use of the tracks already there. The vegetation is very fragile and tracks are easily created.

Waste – including food waste – must always be brought back to the research station.

Restricted research sites

Access to the sites listed below is restricted! Any deviations to the rules stipulated below **must be agreed upon by GINR's or Asiaq's personnel**.

C-flux site

You are not allowed to walk to the installations. When crossing the area please keep your distance.

Fen site

You are not allowed to walk outside the board walks. If you need to cross the area you must walk outside and around the area. When walking left of the area, please, do not cross the line marked with poles (red topped) in the ground.

Heath site

You are not allowed to walk to the installation. Keep your distance when walking around the area and – if allowed – follow the small stream to the installations.

NERO line

If possible please **do not walk along the line marked by poles** in the ground. **No research is allowed along the line.**

Getting there

The field site in Kobbefjord is accessed by boat. GINR has two boats (Aage V. Jensen II and Avataq) that are used for regular transportation to and from the area. Information on how to book the boats can be found on <http://www.natur.gl/en/the-institute/booking-of-facilities/>.

Important phone numbers

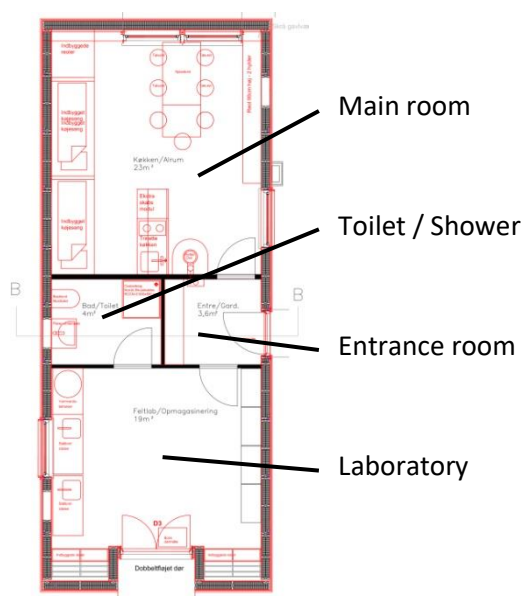
Police, Nuuk	(00299) 70 14 48
Ambulance, Nuuk	(00299) 34 41 12
Dronning Ingrid's Hospital (Sana)	(00299) 34 40 00
Fire Department, Nuuk	(00299) 32 10 56
Air Greenland	(00299) 34 34 34
Greenland Institute of Natural Resources (GINR)	(00299) 36 12 00
Logistics, GINR: Henrik Philipsen	(00299) 55 05 62
Boat driver, GINR: Flemming Heinrich	(00299) 55 18 64
Asiaq	(00299) 34 88 00

The research station

The research station has two buildings: a main cabin fitted to house 4 people and a generator hut. The cabin is relatively sparsely equipped with:

- 4 berths.
- Kitchen with two hotplates, pots and pans, refrigerator, warm/cold water, sink, and utensils for 4 people.
- Laboratory facilities (the storage facilities in the lab room is used by the researchers working on the Nuuk Basic monitoring programmes).
- Toilet (see below), shower, and sink with warm/cold water.
- Storage facilities under the cabin are mainly used by researchers working on the Nuuk Basic monitoring programmes.

Researchers may stay in the main cabin or in tents close by the cabin. Remember to bring your own tent, sleeping bag, and sleeping mat and make sure they are sufficient for use in the Arctic. You must bring sleeping bag and mat (or bed sheet) even if you are staying in the cabin.



Keys

If visiting scientists are staying for longer periods of time, keys for the cabin and generator hut can be provided by contacting the logistics coordinator at the Greenland Institute of Natural Resources, Henrik Philipsen (heph@natur.gl).

Generator

Remember to only use **petrol** for the generator! It is stored in the red or black cans in the generator hut. When a red can is empty bring it to the boat and inform the boat driver. Instructions for starting the generator can be found in the generator hut and in the cabin.

Electricity

The power outlet in the cabin is 220V, 50 Hz from a petrol generator. The outlets are standard Type C and K. Please notice that the generator only provides a certain amount of power. Therefore, you should always check what is plugged in before adding new equipment (e.g. computers) to the system.

Heating oven

Remember only to use **diesel** for the heating oven! It is stored in the yellow can by the tank in the entrance room. When the yellow can is empty bring it to the boat and inform the boat driver. Instructions for using the oven are found in the cabin.

Indoor footwear

It is recommended to bring indoor footwear because outdoor footwear is not allowed in the main room of the cabin.

Laboratory

The laboratory in the cabin is not equipped; hence you will have to bring everything you need. Further, if you plan on using any types of chemicals it is your own responsibility that any leftovers are brought back to Nuuk and disposed of correctly.

Toilet

The toilet is a separation toilet that diverts the urine away and collects the solids in a bucket with a plastic bag. Toilet paper can be found in a box under one of the beds in the main room in the cabin.

When you leave the cabin you must empty the toilet:

1. Remove the toilet bag and close with steel wire.
 - a. Wires are in a grey box on the shelf to the right of the door.
 - b. The device used to close the wire is hanging on the rack next to the toilet.
2. Replace the used bag with a new bag.
 - a. Bags for the toilet are on the shelf to the left of the door in the bathroom.
3. Add disinfection fluid (green; on the shelf above the toilet):
 - a. Dilute the green fluid 1:50 with water:
 - i. Fill the green fluid into the empty container to the marking on the side.
 - ii. Fill the bottle with water and pour the entire content into the bag in the toilet.

Instructions for emptying the toilet is also found in the cabin.

It is not allowed to use the monitoring area as a toilet!

Water

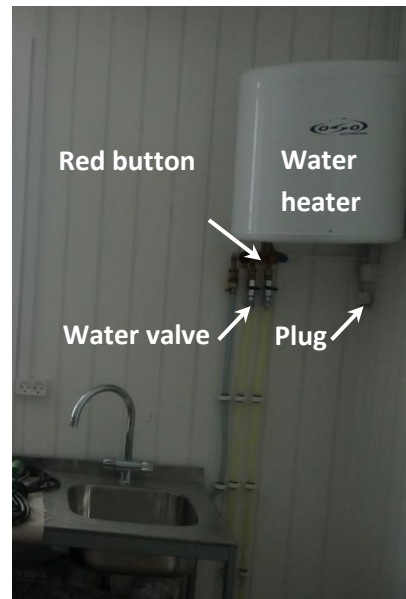
All freshwater streams, rivers, and lakes in the monitoring area are suitable for drinking. There is no need for bringing filters or water cleaning tablets.

Cabin water is drawn from the nearby river draining from Badesø. The water is pumped into a 1000 litre water tank on the south side of the cabin. Hence, the water supply is limited so please be aware when you use water for washing and cleaning – do not let the water run from the tap! The tank is filled when needed by GINR personnel.

The cabin has running water but the generator has to run in order for the pump to work. If you need warm water, the water heater (located in the laboratory room next to the door to the bathroom) has to be turned on as well (see figure):

1. Put the plug in the outlet.
2. Turn both the blue (water in) and the red (water out) button on by turning them far to the left.
3. Make sure the water valves (ballofix's) are open (turn from horizontal to vertical position).

4. Allow for at least 30 minutes for the water to warm up.



Tools and equipment

Equipment in the laboratory and tools in the generator hut are primarily for GINR and Asiaq use. Visiting scientists are not allowed to use the equipment or tools unless approved by GINR and/or Asiaq.

REMEMBER TO CLEAN THE CABIN BEFORE LEAVING

This includes:

Sweeping floors

Cleaning and clearing surfaces

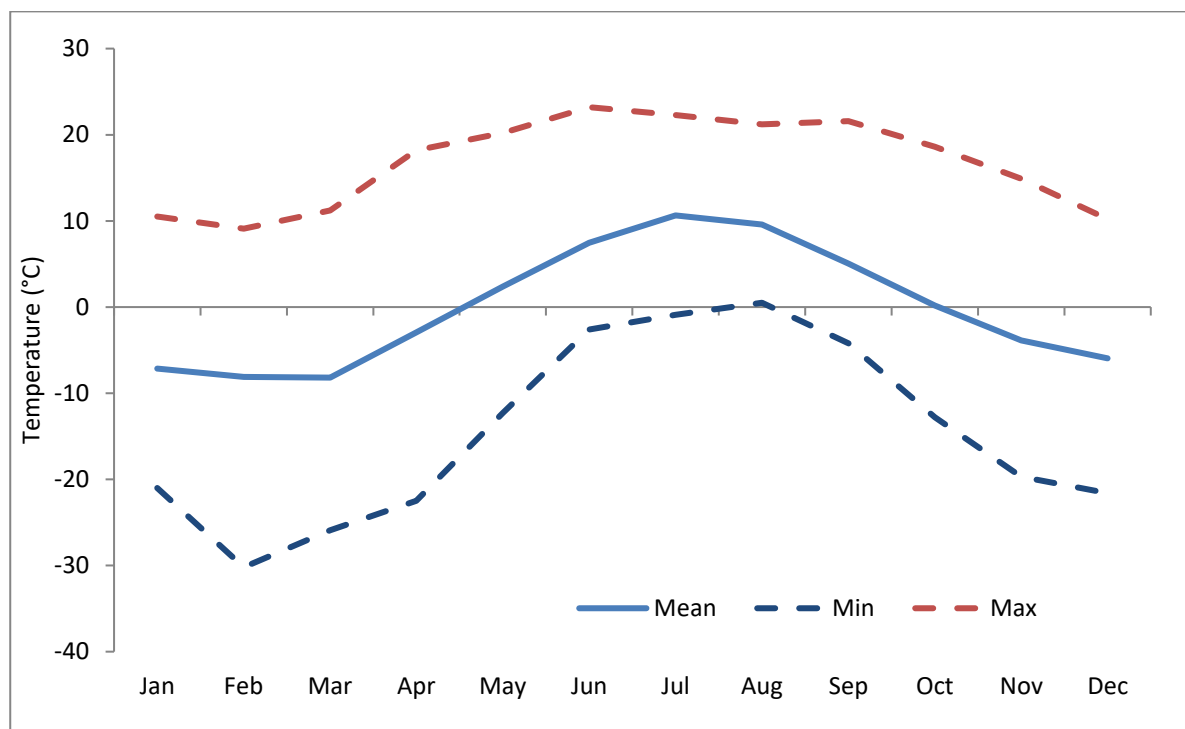
**Emptying toilet and bins (bring closed bags
back to Nuuk)**

Returning any borrowed equipment

A-Z information about the research station and the monitoring area

Climate

At the Kobbefjord Site the mean annual temperature is -0.1°C (2008-2017). The warmest month is July (10.6°C) while the average temperature in March is -8.2°C . The mean precipitation in Kobbefjord is around 800 mm and maximum snow depths vary strongly (between 0.3 and 1.3 m at the ClimateBasis station).



Average, maximum and minimum air temperature 2008-2017 in Kobbefjord at the ClimateBasis main climate station

Computer and internet

You must bring your own computer / laptop to meet your needs in the field and laboratory. There is **NO** internet connection at the site.

Dinghies

Nuuk Basic (the BioBasis programme) has two dinghies (one at Badesø and one at Qassi-sø). There is an outboard motor for each of the dinghies. Visiting scientists are allowed to use the dinghies only when approved by GINR and/or Asiaq. If you use the dinghies you must wear your own survival suit or a life jacket (there are two life jackets in the entrance room in the cabin). The dinghies can only carry 2 persons. Do not attempt to carry more and do not go alone!

First aid and medicine

There is a standard first aid kit in the cabin: a **green box** located on the upper shelf in the book case in the main room. There is an eye-wash station mounted on the wall to the left of the sink in the laboratory. You must bring your own personal medication, if needed.

All fieldwork at the Kobbefjord Field Site is done at your own risk. We encourage you to tell your colleagues and fellow fieldworkers if you have any known diseases that require medication (e.g. diabetes and heart problems) and if you have any known allergies. GINR or Asiaq will take no responsibility or liability for any problems relating to your personal health.

The GINR and Asiaq researchers working on the monitoring programme have all had first aid training. It is recommended that visiting scientists and students have at least some training before coming to Nuuk. If needed, transportation to the local hospital can be arranged via boat transfer or helicopter. Please note that any evacuation will be carried out at your own cost. Therefore, make sure you are properly insured beforehand.

Food

You will have to bring your own food. During high season in summer it might be worthwhile to bring a camping stove because the cabin only has two hotplates. If freeze-dried food is a necessity you should bring your own. Freeze-dried food can normally be bought in Nuuk, but occasionally the stores run out during summer.

Mosquitoes and flies

During summer mosquitoes and biting flies are often a source of constant irritation. Remember to bring mosquito nets and repellents both of which may be bought in Nuuk. Please, do not apply repellent inside the cabin.

Personal equipment

Even though the weather in the Kobbefjord area tends to be relatively pleasant during summer you should always bring warm, wind- and waterproof clothes, gloves, and a hat. There is always a risk of below-zero temperatures. A pair of sunglasses is essential for all seasons.

Rubber boots may come in handy during snowmelt and after heavy rain. Snow shoes or skis are recommended during winter.

Remember to bring towels for personal use as well as all necessary personal toiletries.

Polar bears and foxes

Polar bears are extremely rare in the monitoring area. During the past years some bears have been seen and shot close to Nuuk. It is therefore recommended that you bring a flare gun with flares. Further, you should consider learning to use a rifle. There is a bolt rifle, calibre 30-06, behind the door from the laboratory room to the entrance room.

Several arctic foxes live in the monitoring area. They are generally not very keen on getting close to people. If a fox shows unusual behaviour (i.e. approaches or is aggressive towards people), it should be treated as being infected with rabies: Keep away from the fox and try to scare it away (e.g. using a signal pen with small flares). If the fox bites you it is essential that you go to the hospital and start a vaccination-treatment against rabies. It is important that you do not tempt the foxes by leaving food and waste in the monitoring area. If you leave instruments outside make sure that foxes are unable to bite in wires, plastic etc.

Telecommunication

The monitoring area is outside cell phone coverage. Thus, the only way of getting in contact with people outside the area is by using satellite phone or VHF-radios. The VHF-radios are mainly used for communication locally between researchers in the area (use **channel 72**). Due to the high mountains surrounding the valleys not all corners of the area are covered by the VHF. If needed you will have to climb to a higher level and preferably have visual contact to the person you try to reach.

- There is a satellite phone (number: 0088 16 41 48 23 75) permanently located in the cabin.
- Asiaq uses different phones so check up with the personnel if you need the number.

- Bring your own VHF-radios. If you stay for several days / weeks you must bring your own satellite phone.

Waste

Waste water from the cabin runs directly and unfiltered into the river close to where the river feeds into the fiord. Thus, use only detergents, shampoo, soap etc. that are biologically degradable.

Plastic bags for the smaller bins are on the shelf above the notice-board. Here you can also find larger, black waste bags for collecting several of the smaller plastic bin-bags if needed.

Kitchen waste, the toilet bag, and other types of waste must be brought back to Nuuk. The waste bags can be thrown into the containers at the harbour in Nuuk.

Batteries and other mechanical items are collected in special containers at the Greenland Institute of Natural Resources, Asiaq or the incinerator plant in Nuuk.

Weapons

There is a bolt rifle, calibre 30-06, behind the door from the laboratory room to the entrance room. There is no rifle or flare gun training provided at site. Therefore, it is recommended that you are well prepared and familiar with using and handling a rifle and/or a flare gun before arriving at site.

Own notes

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www.nuuk-basic.dk

www.g-e-m.dk

