

ZACKENBERG

SITE MANUAL

VERSION

2023



www.zackenberg.dk

Welcome to Zackenberg

The Zackenberg Research Station appreciates that you have decided to conduct your high Arctic field research at our facilities at Zackenberg and/or its branch facility at Daneborg.

Hopefully this site manual will give you most of the background information needed for planning your stay, information about the application requirements, facilities in Zackenberg, what to expect regarding travel, weather, wildlife, safety, communication and what to bring etc. Remember, the nearest shop is approximately 500 km away! Also, as there is no internet or normal phone coverage, any software that does not function completely off-line will be useless during the entire stay at Zackenberg.

The study area at Zackenberg is located around 74°28'N / 20°34'W within the Northeast Greenland National Park. The Northeast Greenland National Park (Greenlandic: Kalaallit Nunaanni nuna eq-qissisimatitaq) is the world's largest national park, established in 1974 and expanded to its present size in 1988.

Zackenberg has 11 buildings, encompassing scientific equipment and laboratories, living accommodations and a communication room. The station can host up to 24.

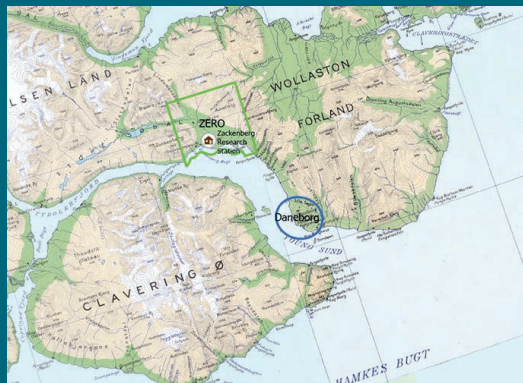
Daneborg station is located about 25 km southeast of Zackenberg. This marine branch facility with basic lab facilities can accommodate ten people.

Zackenberg Research Station is normally open for scientists from approximately May to October.

When the Zackenberg secretariat is planning your travel, we will do our best to meet your wishes for travel, but please be flexible around dates. The flights are scheduled for fixed dates (weekly or bi-weekly during the summer period), but can change due to weather etc, so be aware of this and plan for some buffer.

Google street view is available for Zackenberg to explore the area and the station.

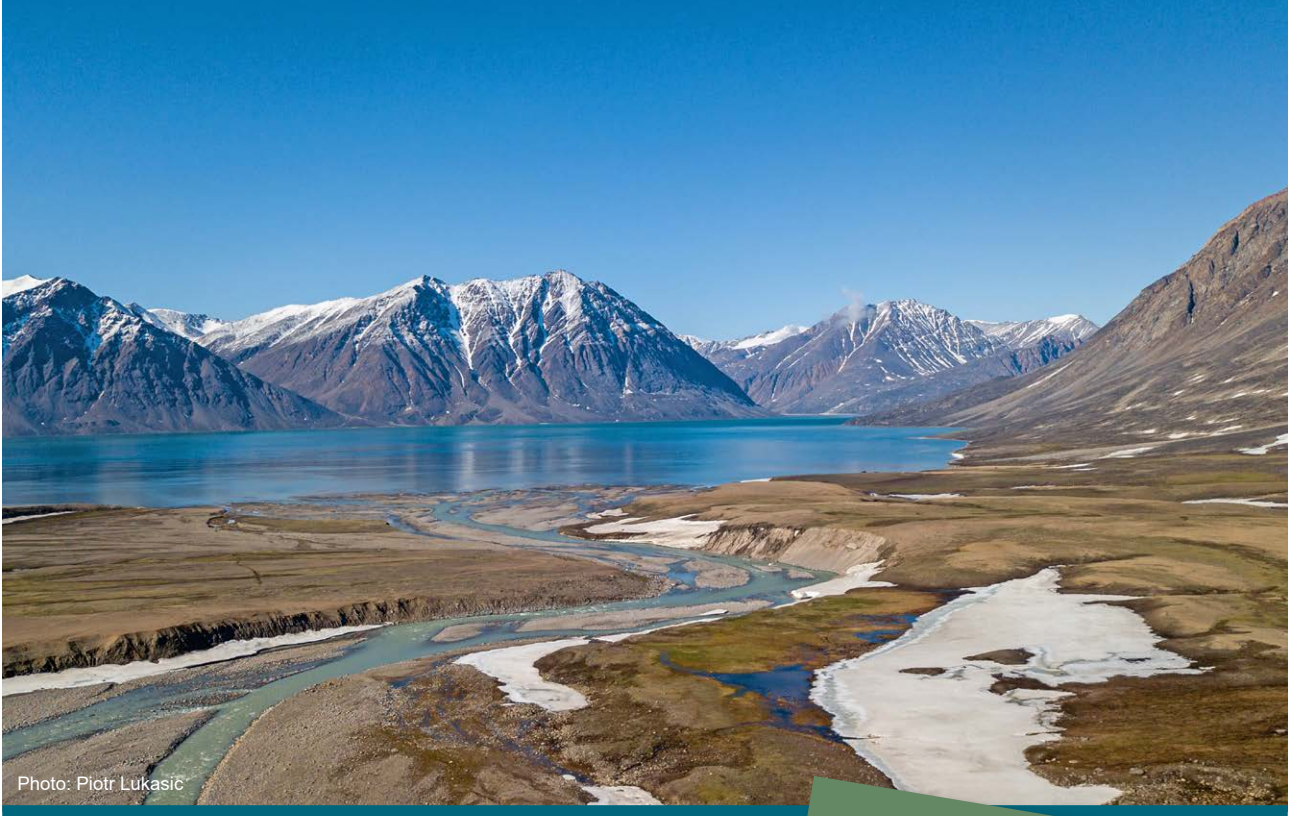
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1 Zackenberg secretariat



Zackenberg Research Station and its secretariat are operated by Aarhus University. The Zackenberg secretariat consists of a scientific leader, a logistics manager and a scientific coordinator.

Zackenberg Secretariat

Aarhus University, Department of Ecoscience
Frederiksborgvej 399
4000 Roskilde, Denmark
e-mail: zackenberg@au.dk
www.zackenberg.dk

The members of the secretariat/logistics may be out of their offices for extended periods due to their stay at Zackenberg Research Station. We therefore recommend that you use the e-mail address zackenberg@au.dk

During the field season, it is possible to contact the station via the e-mail at Zackenberg: logistics@zackenberg.com (only short text messages, no attachments or email signatures).

GOOD-TO-KNOW:
Be aware that Zackenberg Station follows the Icelandic time zone year-round, which means UTC±00:00, known as Greenwich Mean Time or Western European Time.

2 Introduction to Zackenberg

2.1 Zackenberg Research Station

After years of surveys and pilot studies, Zackenberg Research Station was established in 1995 by a group of scientists. The general objective of the station was to facilitate research on the dynamics of a high Arctic ecosystem under the framework of what was at the time called the ZERO (Zackenberg Ecological Research Operations) programme. This objective was met by providing facilities (logistic and scientific) for specific research projects and by running a long-term monitoring programme initially called 'Zackenberg Basic'. The objective of the Basic programme was to provide long-term data on natural high Arctic terrestrial, limnic and marine ecosystems. This was accomplished through monitoring of a suite of key biological and physical parameters in the terrestrial and marine environments. Today, this programme has expanded and operates in close coordination with fully comparable monitoring at Disko and in Nuuk - all as part of the joint Greenland Ecosystem Monitoring (GEM) programme (see below).

For more than 25 years, the station has provided logistics facilities and accommodation in Zackenberg and in our branch facility at Daneborg. The station offers logistics support for transport to and from as well as within the area and provides access to a wide range of both biotic and abiotic data from the long-term monitoring programme. The research station is very remote and still has no internet access. Thus, all visits to the station require careful planning, and reading the present document carefully is a good start.

Zackenberg Research Station is owned by The Government of Greenland and is operated by the Department of Ecoscience, Aarhus University.



Zackenberg research station is named after the mountain Zackenberg – a German name referring to its serrated top. Photo: Marie Frost Arndal.

2.2 Greenland Ecosystem Monitoring Programme

The GEM programme collects more than 2000 ecosystem parameters each year from water flow and sediment transport to plant flowering, phenology, wildlife population, fjord productivity, active layer depth, etc.

GEM is operated by research institutions in Denmark and Greenland and consists of five field-based sub-programmes and one Remote sensing and Modelling sub-programme:

- BioBasis – monitoring the flora and fauna in the terrestrial and freshwater ecosystems
- Climate Basis – monitoring climate and river water discharge
- GeoBasis – monitoring physical landscape processes, snow cover and solute fluxes and fluxes of greenhouse gases
- GlacioBasis – monitoring glacier mass balance
- MarineBasis – monitoring the physical and biological processes in the marine part of the ecosystem
- Remote sensing and Ecosystem Modeling.

More information about the GEM programme can be found at <https://g-e-m.dk/> and the manuals for the five field operational Basis programmes can be downloaded at <https://g-e-m.dk/gem-publications-and-reports/manuals/>.

All data from the GEM programme can be downloaded free of charge from the GEM database at <https://data.g-e-m.dk/>. The data base currently covers data from the monitoring programmes in Zackenberg (1995-), Nuuk (2007-) and Disko (2017-). If data from the Greenland Ecosystem Monitoring Programme is included in your work, please acknowledge GEM data as stated in the 'Terms of Use' document you receive when downloading data from the [GEM database](#).

At Zackenberg Research Station, the Scientific Leader or the Scientific Liaison deal with any issues concerning the location of research activities and equipment in the study area on an ad hoc basis. This is to ensure that new research activities are not in conflict with the aim of protecting the long-term monitoring activities under the auspices of the GEM programme.

2.3 Introduction to the area

The study area at Zackenberg is characterized by continuous permafrost with a maximum active layer thickness varying from 20 to 120 cm. The area was de-glaciated approximately 8,000 years ago and holds a great diversity of biotopes, such as ponds, fens, heaths, fell field plateaus and grasslands.

A major geological flexure and thrust zone dissects the Zackenberg valley, separating the core study area into two: Caledonian gneiss bedrock (to the west) from Cretaceous sandstones and Tertiary basalts (to the east). The margin of the Greenland Ice Sheet is located approximately 60 km to the west of the Zackenberg Research Station.

The study area comprises the entire water catchment area of the Zackenberg River (Zackenbergelven), totaling about 600 km², with the core study area situated in the Zackenberg Valley (Zackenbergdalen) at the lower reach of the river. Only a few small, local glaciers exist within the area; Freya Glacier, located on Clavering Island 10 km southeast of the Zackenberg Research Station, and the A.P. Olsen ice cap, the latter also being subject to the glacier monitoring within GEM.

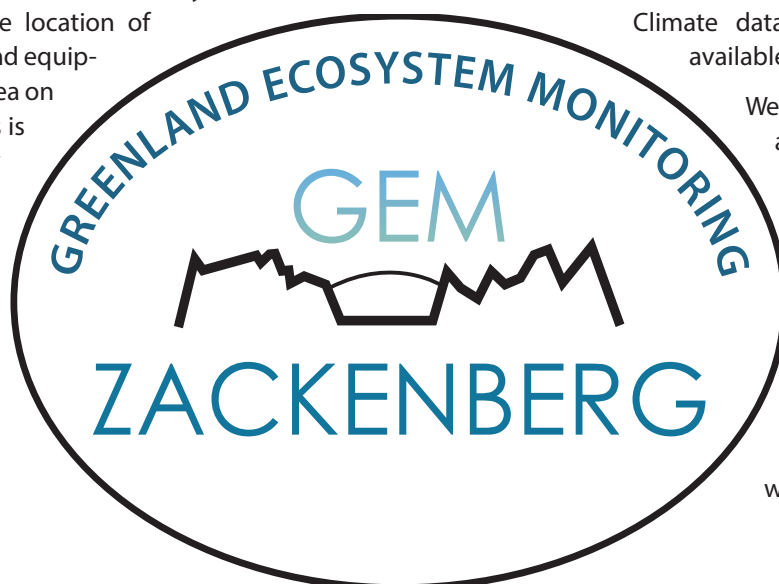
2.4 Climate

At Zackenberg, the mean annual air temperature for the period 1996-2020 was -8.9 °C. The warmest month is July (6.3 °C), while the coldest month is March (-20.1 °C). The mean annual precipitation is about 350 mm w.e. Mean annual snow depth is 0.8m (ranging from 0.12-1.44m) and accounts for about two thirds of the annual precipitation.

In Daneborg, situated on the outer coast approximately 20 km SE of Zackenberg, the mean annual air temperature is -10.3 °C (1960-1990). The warmest month is July (3.8 °C), while the coldest month is February (-17.6 °C). The mean annual precipitation at Daneborg is about 200 mm w.e., according to measurements carried out by the Danish Meteorological Institute.

Climate data from Zackenberg are available from the GEM database.

Weather services: Both [DMI](#) and [YR](#) have forecasts for Zackenberg. YR has two, and the one for "Zackenberg Bugt" tends to be best. Local forecasts are, however, never to be substituted for normal field precautions when it comes to possible sudden shifts in weather conditions.



2.5 National Park regulations

Zackenberg, and its study area, is located within the National Park of North and Northeast Greenland under the jurisdiction of the Government of Greenland. Please confer the unofficial English translation of the '[National Park Executive Order](#)' with all current rules and regulations to be observed while you are in Northeast Greenland. Please notice that objects and samples are only allowed to be taken home with special permission from the Government of Greenland

If your research includes activities that do not comply with the National Park regulations, you are required to apply to the Government of Greenland for additional exemption permit(s)/dispensation(s) well in advance (see https://govgen.gl/?sc_lang=da for permits on genetic resources, or mineral samples incl. sediment <https://govmin.gl/da/videnskabelige-undersogelser/ansoegninger/videnskabelig-tilladelse/>).

If there is a need for such exemption permit(s)/ dispensation(s) from the National Park Executive Order, you may be informed by the Zackenberg secretariat, but it is your responsibility to apply to the Government of Greenland. Upon receipt, make sure to send a copy of the exemption permit to the Zackenberg secretariat.

2.6 Nature and wildlife

The vegetation in northeast Greenland is exclusively comprised of low plants, but there are also large areas, where the snow blows away in winter, which are so dry that there is almost no vegetation at all. Vegetated areas are dominated by various heath types, often with a beautiful flora of mountain aven (*Dryas octopetala*), arctic bell

heather (*Cassiope tetragona*), arctic poppy (*Papaver rad-icatum*) and purple saxifrage (*Saxifraga oppositifolia*). In the valleys and on slopes, one finds fens and grasslands.

Thanks to the stable continental climate caused by the pack ice in front of the east coast, both lemmings and musk oxen are found in the High Arctic areas of Greenland. Whereas the musk oxen in West Greenland were introduced by man, the muskoxen in the High Arctic areas of Greenland migrated from Canada. Both lemmings and musk oxen are completely dependent on a stable winter climate devoid of prolonged periods of thawing. In addition to these two species, the local fauna mainly consists of foxes, arctic hares, waders (shorebirds), as well as geese, long-tailed skuas and snow buntings. The migratory birds depart in late summer/early autumn, leaving behind only the ptarmigans, ravens and snowy owls in the cold winter.

Polar bears occasionally visit Zackenberg, even in summer. In recent years, polar bears appear to become more frequent in the Zackenberg Valley. Staying vigilant and prepared for encounters with polar bears or muskox is therefore essential. Please read the [bear safety](#) manual.



Photo: Tom Versluijs.



Photo: Henning Thing.

3 Before you go

3.1 Applying for access as scientist

To facilitate planning and coordination of research and monitoring, all research projects must submit an application to the Zackenberg secretariat (zackenberg@au.dk). Your application will also be used for applying to the Government of Greenland concerning your admission to enter the National Park. You do not need to apply for admission to the National Park, as this is part of the general station application made by the secretariat.

Application deadline is by mid-February in the year of the planned summer field season, but for very early projects in Spring (from March to May), the deadline is in mid-January. Application forms are available [online](#).

A copy of all documents must be completed and sent to the secretariat. Appendix D must be used if your institution is self-insured, otherwise Appendix E is used.

If there is a need for exemption permits (dispensation) from the National Park Executive Order (see www.zackenberg.dk), you will be informed by the secretariat, but you will have to apply to the Government of Greenland for an exemption permit (dispensation). It is your own responsibility to have all the rights permits in place.

Access to the station and the designated research zones for any research project is given by the secretariat after receiving input from the GEM programme managers. The proposed field work needs to be described with aims and practicalities of the field research. Your research activities at Zackenberg Research Station cannot be carried out unless, prior to your arrival at Zackenberg, you have received the approval of your research project from the Zackenberg secretariat. Experimental and manipulative studies will be allocated to specific sites and will only be allowed upon approval before the start of the field season. The final location of your sites/plots will be decided in a dialog with the Scientific Leader/Liaison on location at Zackenberg. Due to environmental concerns, all applications will be evaluated, and project leaders may be asked to provide additional information before their project can be approved. Taking samples for others (other researchers, institutions) is not allowed, unless it has been mentioned in the application and approved by the secretariat and GEM Principal Investigators at Zackenberg/Daneborg.

3.1.1 Access for non-scientists

Non-scientists may apply upon consultation with the Zackenberg Secretariat. Journalists and artists may be allowed access to the station, but only if the planned activities do not conflict with the research activities. Please note that prices for transport to/from Zackenberg /Daneborg and prices for staying at Zackenberg/Daneborg are differentiated, depending on whether you are a scientist or a non-scientist.

The use of UAVs is subject to local guidelines at Zackenberg. Please see our [UAV guidelines](#) available at the Zackenberg website. Also, the use of drones should follow current regulations.

3.2 Daily fee

The daily fees for staying at the Zackenberg Research Station and Daneborg (including full board and use of all facilities for scientists) are given in an updated price list in the beginning of a new year on the [website](#).

The fee includes food, accommodations and free use of all facilities, except e-mail and satellite phone calls. Any consumables to be used in labs or in the field must be brought. In case you have special logistical needs (boat transport, snowmobile etc), you will be charged for the extra service. Please contact the secretariat for advice concerning extra services.

Note that the invoice for your stay at the Zackenberg Research Station may not be expected before late November/early December.

Accommodation based on own tent and/or provisions is not allowed unless special arrangements have been made with the scientific leader of the station.

If you need to send equipment, minimise the weight and use of packaging and reduce the use of plastic and polystyrene wrapping. Cardboard and wood can often be reused or burned at the station.

3.3 Cargo

All shipment of cargo to Zackenberg/Daneborg must be coordinated with the logistics unit through the Zackenberg Secretariat.

The cargo needs either to be sent to the logistics headquarter in Roskilde, Denmark, or to Nordlandair at Akureyri Airport, Iceland (see Zackenberg homepage for addresses).

If you have enough time and it is possible, it is recommended to send cargo as surface freight instead of by aircraft to reduce fuel consumption and, thus, costs.

If your project has a total amount of cargo exceeding 500 kg, you must contact the logistics department in advance.

3.3.1 Cargo - Flights

It is essential for optimal planning and utilisation of the charter flights to and from Zackenberg that the amounts and types of cargo are known to the Zackenberg secretariat. You are therefore requested to specify the approximate weight of all the cargo you and your project colleagues want to have transported to and from Zackenberg in your application. Any changes in cargo amounts and types must be reported immediately to the Zackenberg secretariat.

On board the aircraft between Iceland and Zackenberg, the luggage weight limit is 20 kg per passenger (incl. hand luggage). If the secretariat is not notified beforehand, any luggage in excess of this is treated as cargo and is given lower priority than scheduled visitors and staff and is charged to the project at the current rate. This charge applies both to the northbound cargo transported by aircraft from Iceland to Zackenberg and to the southbound cargo transported by aircraft from Zackenberg to Iceland. Please note that luggage and cargo will be weighed and registered in the name of a person/project prior to every flight to/from Zackenberg.

Please note that further, you might be charged for any excess luggage on the commercial flight between Iceland and the airport from where you start and end your journey to/from Zackenberg.

Please inform the secretariat if you need extra luggage on the commercial flight to be booked on your ticket.

From Iceland to Zackenberg, the cargo will preferably be airlifted well in advance of your stay at Zackenberg to allow it to be there when you arrive. A rule of thumb to be sure that the cargo is in place at Zackenberg will be to have it to reach Akureyri two-three weeks in advance of your planned personal arrival.



Please note that southbound cargo airlifted out of Zackenberg will continue from Iceland to its final destination by surface transportation (i.e. ship, truck, train) unless you specifically have indicated something else to the logistics manager. Accordingly, it might take at least a month before you receive your southbound cargo.

3.3.2 Cargo - ship

Since the prices on excess luggage and cargo on flights between Copenhagen and Keflavik can be high, you should consider using the possibility of having your cargo transported by ship from Denmark to Iceland at a lower price (see the price list on www.zackenberg.dk). However, this requires that you deliver your cargo at the Department of Ecoscience, Aarhus University, in Roskilde at an agreed time with the logistics manager well before your field season. You must pack your goods in plywood or aluminium boxes together with a table of contents and a precise indication of recipient on the box (see [proforma invoice template](#) at the website).

If it fits your time schedule, you can also have cargo transported by ship from Denmark to Daneborg (and then airlifted the last 20 km to Zackenberg). This requires that you deliver your cargo at the Department of Ecoscience, Aarhus University, in Roskilde in mid-June. You must pack your goods in plywood or aluminium boxes together with a table of contents, proforma invoice and a precise indication of recipient on the box.



The annual cargo ship leaves Denmark in early July and arrives in Daneborg in early August.



Photo: Marie Frost Amdal

Likewise, you can send cargo back to Denmark on board the southbound cargo ship with departure from Zackenberg around 15 August (typically with cargo handed in earlier at the station) and arrival in Denmark up to 8-10 weeks later.

3.3.3 Cargo – dangerous goods

If you need to ship 'dangerous goods' to or from Zackenberg, you must inform the Zackenberg secretariat. It is your responsibility to ensure that cargo can be identified, labelled and packaged according to international rules applicable to both land, sea and air transport.

All chemicals need to be marked correctly according to the classification, labelling and packaging regulation (CLP, <https://echa.europa.eu/da/regulations/clp/legislation>). Include the safety data sheet. You can find more information about products to be classified at the Danish Emergency Management Agency website www.kemikalieberedskab.dk (only in Danish).

Remember that you are required to remove excess equipment etc. from Zackenberg!

BRUSH, HOOVER AND WASH



Prevent the spread of invasive species. Redrawn from: The Norwegian Institute for Nature Research.


3.4 Prevent the spread of invasive species

When travelling to the Arctic, you may accidentally carry small creatures, plants or plant seeds, bacteria and viruses with you. You should prevent bringing non-native species with you and your equipment when travelling to Zackenberg. Brush, vacuum and wash your bags, clothes, shoes and equipment before leaving home.

3.5 Exemption permits and license for research activities

If you plan to conduct manipulative studies or to collect field samples, you might need an exemption permit. Please go to <https://exp.gl/About> (the expedition office in Greenland) to find all relevant information regarding exemption permits from the Government of Greenland before going to Zackenberg.





Note that additional exemption permits may be required, for example regarding research on mammals, minerals or genetic resources etc. It is your own responsibility to ensure that all relevant exemption permits are obtained prior to fieldwork. Please send any exemption permits to the Zackenberg Research Station secretariat.

3.6 Insurances and liability, Search and Rescue (SAR)

Guests at Zackenberg Research Station (including Daneborg) are obliged to always follow the directions of the Station Manager and the Scientific Leader/Liaison regarding general usage of the terrain and movements on glaciers, land and the coastal environment. Furthermore, the Government of Greenland requires Search and Rescue (SAR) insurance from each project covering all persons involved. The SAR insurance must cover the amount of DKK 1,000,000, with the Danish State as the sole beneficiary if the project or expedition takes place inside the area covered by the Executive Order on remote travel. It is mandatory that you are properly insured before leaving for Zackenberg.

A research project carried out under the auspices of a public research institution (e.g. a university) normally does not need to obtain SAR and evacuation insurance, as project members are covered by the institution through the institution's self-insurance. The project leader (PI) must therefore forward to the Zackenberg secretariat an official statement with enclosed documentation from the involved institution(s) clarifying that the SAR and evacuation insurance conditions are valid for all participants in the project (Appendix D or E).

If you are operating outside the Zackenberg study area (i.e. outside research zones 1, 2 and

3), it still remains your own responsibility that you possess valid insurance covering all expenses deferred from any case of illness, injury etc. requiring non-scheduled transportation out of Northeast Greenland. The insurance obtained for this purpose must be approved and copied to the Zackenberg Secretariat before you depart. Please contact an insurance provider (e.g. Europæiske, International Health Insurance, IF or the HR-department of your institution) for more details.

The Secretariat cannot book flights for visitors to the station before Appendix D or E has been completed and received.

3.7 What to bring

A [packing](#) list is available at the Zackenberg website and some further information is provided below.

3.7.1 Indoor footwear

It is recommended to bring footwear dedicated to personal indoor use, since outdoor footwear is not allowed in any of the buildings except the workshop, garage and generator building. Furthermore, a pair of clogs is handy for use between buildings.

3.7.2 Personal equipment

The High Arctic summer season has a climate comparable to a southern Scandinavian autumn/early winter. There is a risk of sub-freezing temperatures and snow even during summer. Be prepared for windy conditions and occasional rain.

You should bring clothes that are versatile, durable and comfortable. One general rule should be obeyed: Keep dry from sweat and water. This can be accomplished by frequently adjusting the amount and combination of clothes to the weather at any given time. For optimal adjustment, it is advisable to dress in many thin layers, not one big bulky sweater. Be sure to bring wind- and waterproof garments and make sure that your footwear is comfortable, durable and waterproof. Do not forget gloves and hats – even during summer. A pair of sunglasses is essential.

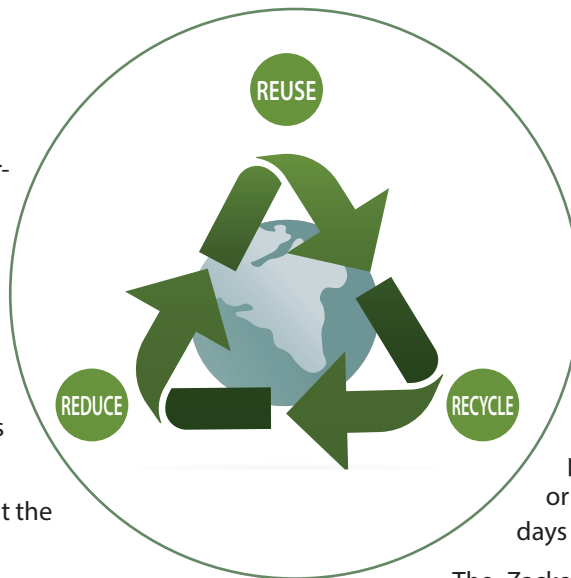
During the snowmelt period in June - early July, rubber boots as well as snowshoes and skis are recommended. Bring mosquito nets mounted on hats as well as repellents.

Please consider how much you bring to Zackenberg that will generate garbage when you have used it. Our waste management is responsible for taking care of garbage. This means flying and shipping out non-burnable waste. Please reduce the amount of plastic you bring to the station and follow the guidelines from staff about waste handling.

Remember all necessary personal toiletries, such as shampoo, tooth paste etc. Please only bring products with environmental-friendly ingredients, with minimal amounts of perfume and plastic in packaging.

Detergent for washing clothes is available at the station.

Linen and towels are available at the station.



Zackenberg secretariat and in your application form indicate the dates you would prefer to travel north and south.

Please be aware that due to the always unpredictable weather in Northeast Greenland, it is not advisable to plan participation in urgent meetings or appointments in the first few days after scheduled return.

3.8 Travelling to and from Zackenberg

The Zackenberg secretariat works closely with the Icelandic airline Norlandair in Akureyri, who helps with booking the flight tickets and accommodations during travel.

The Zackenberg secretariat plans and implements the charter flights to and from Zackenberg in order to meet the interests of the involved researchers as much as possible while considering the overall goal of optimal use of available aircraft payload. This balance may result in researchers having to adjust their proposed travelling schedule to fit into the overall logistics framework.

During the field season, charter flights with Twin Otters between Iceland and Zackenberg will be available approximately every week during July and August, approximately every fortnight in June, and for the rest of the season please check the preliminary flight schedule (www.zackenberg.dk). The final flight schedule cannot be established until all travel needs are known. Therefore, you must meet the deadline for applications to the

The Zackenberg secretariat organises the charter flights between Iceland and Zackenberg (as well as any associated overnight stays in Iceland) and provides travels as package solutions, including tickets to/from Zackenberg. This is done in collaboration with the Icelandic Airline Norlandair.

3.8.1 Travelling - northbound

Prior to the departure date, travellers will receive an email with information and an electronic ticket covering the flight from your point of departure to Akureyri via Keflavik, Iceland.

Upon arrival at Keflavik, you must collect your luggage and proceed to the domestic air terminal, located 52 km to the east in the capital city, Reykjavik. Citizens of Schengen countries do not need to show their passport, but it is always a good idea to bring your passport. All other nationals must be prepared to show their passport at the control booth at Keflavik.

Transport between Keflavik and Reykjavik is possible by taking the Icelandair shuttle bus that leaves just outside the Keflavik arrival hall. Tickets are sold at the airport or on board Icelandair flights to Keflavik. The bus stops at the bus terminal in Reykjavik (BSÍ), where normally a smaller bus goes to the domestic airport. Alternatively, there are also taxis leaving from Keflavik to Reykjavik.

Once at the Reykjavik airport, you must check in your luggage again – even though it should be labelled with Akureyri as your final destination. The flight Reykjavik – Akureyri is ‘ticketless’. The reservation number is your valid travel license to this route. Remember to bring ID with a picture (preferably passport). The flight to Akureyri takes approximately 50 minutes and – weather permitting – offers you low-level views of magnificent lava landscapes and local ice caps. Some turbulence is frequently encountered when descending into the Akureyri valley.



Bring GPS and binoculars for safety. Photo: Marie Frost Arndal

On arrival in Akureyri, go to the departure counter and ask for Norlandair or any message from them. Overnight stay is arranged by Norlandair, and they will be able to show you the location of your overnight accommodation in Akureyri. The Norlandair personnel will announce the expected time of departure for the Zackenberg flight (if not otherwise informed, this is usually at 9.00 with check-in at 8:00).

If staying in a hotel, notify the receptionist about your departure time in the morning, so that breakfast can be ready in due time. Any expenses derived from room service or private telephone calls charged to your room must be paid by you prior to departure. Except for breakfast, all meals in Akureyri are at your own expense. Credit cards like EuroCard, MasterCard, Visa and Diner's Club are widely accepted.

Notice that all local bus or taxi transportation between airports and between airports and overnight accommodation is at your own responsibility and cost.

It is essential for the charter flight Akureyri - Zackenberg that you comply with the following weight limit, i.e. one person is allowed 20 kg checked in luggage (incl. hand luggage). Any excess to that limit must be announced well in advance to the Zackenberg secretariat to secure optimal planning and transportation service, e.g. using alternative cargo options.

The flight from Akureyri to Zackenberg goes via Nerlerit Inaat (Constable Point) and takes 2–2.5 hours. At Nerlerit Inaat, only a brief ground stop allows for refuelling of the aircraft, 'defueling' of passengers and loading of any northbound additional Zackenberg cargo. The journey then continues north, sometimes via Daneborg, to Zackenberg – a distance covered in approximately 2 hours. For your own comfort, take your precautions to counteract the absence of any toilet facility on board the aircraft. It is advised that you bring some food and drink for the entire plane ride, which can normally be bought in Akureyri Airport before departure.

3.8.2 Travelling – southbound

You will most likely depart Zackenberg before lunch and arrive in Akureyri or Reykjavik during the afternoon. In case you have booked your own international flight leaving Keflavik after arrival from Zackenberg, you must leave time for weather-dependent delays as well as arriving in Akureyri with the time allowance for catching a domestic flight from Akureyri to Reykjavik and then transport from there to Keflavik.

Upon arrival at Reykjavik Airport, you and your fellow travellers must organise taxi or the transfer to the bus terminal from where the shuttle bus to Keflavik International Airport will depart.

Shuttle bus tickets are bought in the bus terminal building or from the bus driver.

If the planned date of departure from Zackenberg is changed due to weather conditions, technical problems etc., the Zackenberg secretariat will make the necessary arrangements with the Icelandic airline Norlandair in Akureyri to change your tickets and hotel reservations accordingly. A worst-case scenario will result in you staying a couple of additional days in Iceland on your way home - but Norlandair is indeed very efficient when it comes to re-booking and re-scheduling.

This flexibility around changes of tickets following weather-determined delays works best when all tickets from/to departure point have been organised by the secretariat (through the Icelandic airline Norlandair), as they can then re-book flights. It may be more difficult if tickets are based on individual/your own bookings.



3.8.3 Travelling - problems

If you should encounter any problems immediately before or during your travel relating to airline tickets or hotel reservations, you are recommended to contact Norlandair directly:

Norlandair

P.O. Box 400 IS-600 Akureyri Iceland

Contact persons:

Mrs Kristbjörg Björnsdóttir – also known as Kibba,
e-mail: kibba@norlandair.is, cell: +354 8601208.

Mrs. Erna Jónasdóttir, e-mail: erna@norlandair.is
Tel: +354 414 6960 Cell: +354 867 8152)

Mr Fridrik Adolfsson – also known as Frissi,
e-mail: frissi@norlandair.is, cell: +354 8945990).

3.9 Aircraft arrival and departure

To minimize the disruptive impact on wildlife of low-flying aircrafts in and adjacent to the Zackenberg valley, the following approach and departure procedures must be complied with for any aircrafts or helicopters approaching Zackenberg:

An approaching aircraft must remain above Young Sund and Tyrolerfjord at an altitude above 500 m above sea level as long as possible.

A departing helicopter must climb to above 500 m altitude and then take a southward turn heading for the fjord. The helicopter should avoid flying over the valley itself, if possible.

3.9.1 Airstrip at Zackenberg

Please note that the airstrip at Zackenberg is classified as an inadequate aerodrome. An inadequate aerodrome is an airfield where the following things are insufficient (the following list is non-exhaustive):

- Air traffic service,
- meteorological information services,
- area control service or
- emergency preparedness

As part of the access application procedure, passengers to Zackenberg must sign a "Disclaimer of Liability" to the airline company, Norlandair, providing air transport to Zackenberg claiming that he/she has been informed that on the air route to Zackenberg inadequate aerodromes can be used as a landing field. Inadequate aerodromes may increase the probability of damages and injuries. The airline company Norlandair bears no additional liability (whether in contract, tort or otherwise) for any loss, damage, or injury of any nature beyond the liability of Norlandair insurance policy (regulated by the Danish law, Luftfartsloven) based on the fact that an inadequate aerodrome is used as a landing field.

3.9.2 Force majeure

Please note that flights to and from Zackenberg may be changed due to weather conditions, technical problems etc. and sometimes route change. Furthermore, south-bound flights from Zackenberg to Iceland may be re-scheduled if the scientific leader, the station manager or the pilots consider it necessary due to weather forecasts.



Photo: Kirstine Skov.

4 During your stay at Zackenberg

Living in a small and isolated research station in the High Arctic is an amazing experience. But in a small community, good communication is essential, both in the field and at the station, to ensure that everyone is safe and maintain a good work environment (see Code of conduct, 5.2.1).

Staff

During the summer field season (June, July and August), the Zackenberg Research Station is staffed with the Station Manager, a logistician, a cook and the Scientific Leader or Liaison. The Scientific Liaison acts as a consultant to the Station Manager on issues that affect the scientific aspects of the work the guests will carry out.

The branch facility in Daneborg is only staffed if needed.

Please note that the logistics services provided by the staff at the station include only those related to running the facilities and to your board at the station. As a rule, you must therefore be able to take care of all work relating to your research projects.

4.1 Safety

Fieldwork in remote arctic areas with extreme climate and extreme physical settings requires close attention to the safety of each individual. Safety has top priority, and no unnecessary risks should be taken.

Immediately after your arrival to Zackenberg, the Station Manager and Scientific Leader/Liaison will give you a short introduction to the station and the surroundings, incl. area restrictions and sensible behaviour in the different research zones and an introduction concerning safety precautions in relation to the local wildlife. The station manager will introduce you to the use of different weapons, use of VHF-radios and general rules concerning rational behaviour in a mountainous area.

It is important to stress that guests and employees must always follow the Station Manager's instructions. The Station Manager is the person responsible at the station, and the instructions from the Station Manager must always be followed in terms of safety, movement and behaviour at the station and in the field.

Information about who is on duty as Station Manager will be shown on the information board.

LINKS TO RELEVANT INFORMATION ABOUT SAFETY IN THE ARCTIC:

AU Safety instructions for Fieldwork in the Arctic:

<https://ecos.medarbejdere.au.dk/fileadmin/ecosphere/Arbejdsmiljoe/Guides/FeltarbejdeArktisEng.pdf>

The INTERACT Practical Field Guide contains information on best practices and safety aspects in relation to fieldwork in the Arctic: [link](#).

<https://eu-interact.org/publication/interact-field-work-planning-handbook/>

Although Zackenberg does not require researchers and students from other institutions to comply with Aarhus University standards, it is recommended that participants in fieldwork have completed formal instructions corresponding to a basic course in first aid and the same courses as Aarhus University staff and students prior to participation in any fieldwork.

For safety, it is recommended to bring GPS and binoculars.

4.1.1 Firearms and flare guns

Rifles of caliber .30-06 and flare guns are available at the station and can be borrowed from the station manager in accordance with current regulations and after proper instruction. Pistols and revolvers are not allowed, neither is pepper spray.

Project participants are obliged to carry a firearm as well as polar bear deterrents (flare gun) in the National Park (Executive Order no. 138 of 10 February 2010 on Access to and Conditions for Travelling in Certain Parts of Greenland).

Except for an emergency, it is strictly forbidden to carry rifles with ammunition in the chamber anywhere in the area or at the station. Rifles should be carried half-loaded, and never let weapons point at anyone. Weapons should be picked up as the last thing before leaving for the field and are returned to house 5 directly upon return to the station. This will be clearly demonstrated to all guests upon arrival.



All guests will get an introduction to safety guidelines and weapons upon arrival. Photo of Logbook and weapons in house 5. Photo: Marc O. Hansen.

4.1.2 Logbook and Itinerary

Before going into the field, it is mandatory to deposit a written itinerary in house 5. Routes are drawn on the small maps along with approximate time of departure and arrival. We further recommend that leaving the research zones should not be carried out alone. It is important that you stick to the itinerary, unless a change has been mutually agreed upon with the station manager (by VHF radio or other means of telecommunication).

Itinerary when sailing

It is mandatory for any Zackenberg/Daneborg group sailing outside the immediate coastal areas off Zackenberg or Daneborg to keep regular contact with the station manager at Zackenberg. It is important that you stick to informed routes unless a change has been mutually agreed upon with the station manager (by VHF radio or other means of telecommunication).

4.2 Registration of manipulations, take of organisms etc.

Principal investigators must ensure that all manipulative sites, dug holes, sampling of organisms etc. relating to his/her project are registered with exact UTM coordinates. These GIS data must be delivered to the Scientific Leader/Liaison using a form available at the station. These data are collected to allow the station to provide an overview of the location of all research and monitoring sites during the years.



Photo: Marc O. Hansen.

4.3 Maps and GIS.

The Zackenberg secretariat can assist you in locating thematic field maps for the study area. A digital elevation model covering the Zackenberg valley and Store Sødal is available. You might also print your own maps with the Web-GIS tool on the Zackenberg website (www.zackenberg.dk).

The Zackenberg Research Station provides a number of different maps covering the study area. These maps can be downloaded from <https://g-e-m.dk/gem-localities/zackenberg/maps>

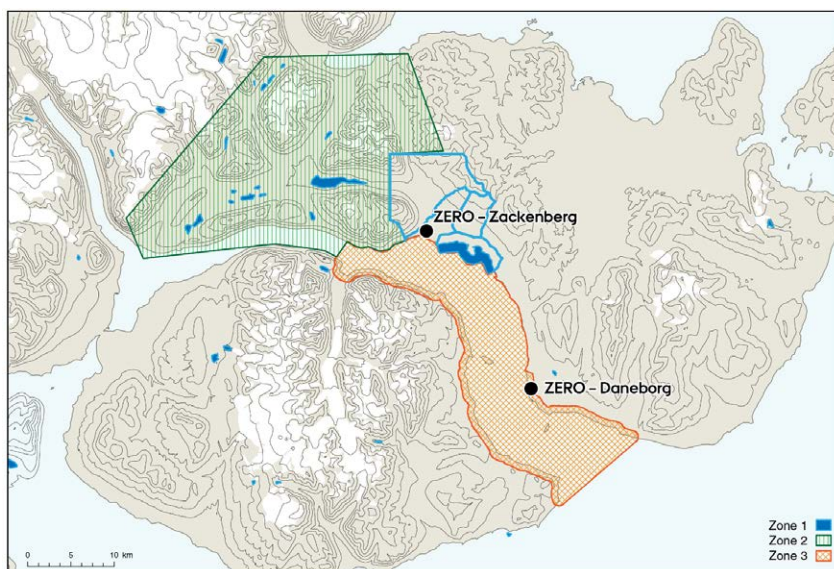
Twenty meters to the north of House 1, a boulder carries a copper plate for exact GPS and altimeter calibration. The position can be found on the bulletin board in House 1.

It is essential for any use of heavy digital map resources to prepare and upload everything needed in the field to your laptop, iPad/iPhones etc. before going to Zackenberg. Remember that software that does not function completely off-line will be useless during the entire stay at Zackenberg.

4.4 Research zones, areas and maps

To protect the research area, we kindly ask visitors to respect a limited number of guidelines and regulations concerning your transport and research activities in the nearest surroundings of the station and in the designated research zones.

Upon arrival in Zackenberg, a folder with map and info about [access restrictions](#) will be handed out.

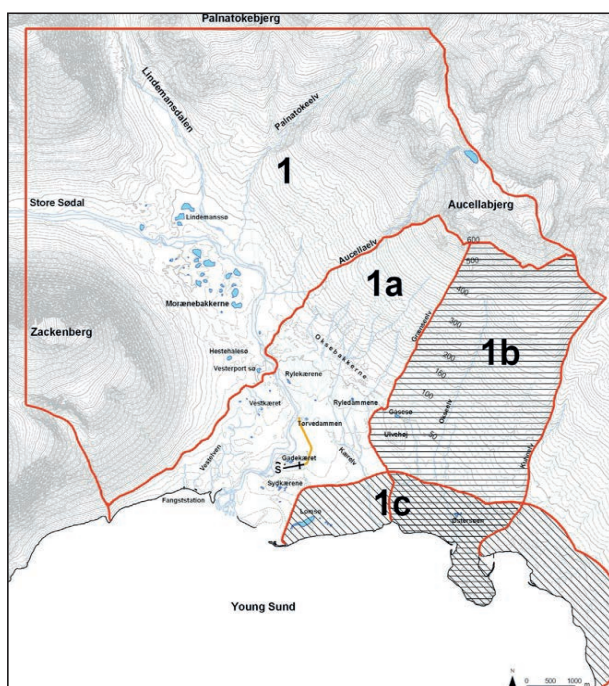


Map showing the different zones. Zone 1 is the Zackenberg valley, Zone 2 is Store Sødal area and the Zackenberg mountain and Zone 3 is the Fjord and Daneborg.

4.4.1 Research zone 1: The Zackenberg valley

Division 1a and 1b: This is the core area for monitoring and research projects. In these zones, a transportation corridor (from the east end of the runway towards the climate station and further to the north of the climate station) is staked out to concentrate general surface traffic to the least fragile habitats. Please use this corridor when you commute between the station and your field sites. Especially the area north of the runway markers, i.e. the gravel plateau and Gadekærret, should be avoided. Division 1b was earlier used to be reserved as a 'minimum impact' study area, but has from 2021 been opened for external project use in order to give better protection to 1a as the core monitoring zone. Therefore, external projects are encouraged to explore 1b to possibly accommodate their research interests.

Division 1c: Several hundreds of geese moult in the lowlands adjacent to the coastline. During the 50 days moulting season, geese are extremely sensitive to disturbance. In order not to scare off the geese permanently and thereby significantly alter the grazing regime of the coastal meadows, access is prohibited between 20 June and 10 August. The area is a 1000 m wide zone (landwards as well as seawards) adjacent to the coast east of the old delta of the river Zackenberg. Plans for research requiring access to this area during the critical period must be approved before the field season.



Map of the Zackenberg Valley with research zones.

4.5 In the field

To minimize human impact and to prevent research and other activities from disturbing the study area, a set of regulations must be observed. Primarily, every single person visiting Zackenberg/Daneborg must give the utmost consideration to the natural environment and to the interests of others working in the area. This is also because the Zackenberg Research Station and its branch facility at Daneborg are situated in a National Park, which has its own set of laws and regulations. See more about the "Executive Order no. 7 of 17 June 1992 from the Greenland Home Rule Authority concerning the National Park in North and East Greenland, as amended by Executive Order no. 16 of 5 October 1999" here: <https://g-e-m.dk/fileadmin/Resources/DMU/GEM/Zackenberg/pdf/executive-order.pdf>

Any manipulative study and sampling of organisms must be registered and approved. Please remember to fill in information about your project's manipulative sites, including UTM coordinates, and return the form (appendix F) to the Scientific Leader/Liaison before leaving Zackenberg Research Station.

Remember:

- Main transportation is on foot or on skis / snowshoes when the ground is snow covered
- Disturbance of soil, plants and animals should be kept at an absolute minimum.
- Objects and samples can only be collected and taken home by special exemption permission from Naalakkersuisut, the Government of Greenland and must be approved by Zackenberg secretariat.

- Please stay at least 20 meters away from study sites, experimental plots, scientific equipment, transects or markers etc., unless you have arranged otherwise with the Scientific Leader/Liaison.
- No waste must be left in the terrain (this includes contaminated water and other liquids).
- Outside the Station, the use of off-road motorized vehicles is prohibited. Motorized vehicles may, however, be used on ice or on a firm snow cover.

4.5.1 Boardwalks

In tundra habitats, human activity may lead to significant wear and tear of the vegetation and top soil layer. To counteract this undesirable influence on the local ecosystem, selected projects may be asked to install temporary boardwalks or walkways at their site. When the project is finished, these boardwalks should be completely removed unless other arrangements have been made with the scientific liaison.

Always use the already installed walkways in the field to protect the vegetation and soil below.

4.5.2 Camping

Camping and tent-based equipment storage etc. at a research site outside the station area must be specifically approved by the Scientific Leader/Liaison in consultation with the Station Manager. Camping in general is not allowed in Research zone 1.



Aerial view of Daneborg. The blue buildings are used for marine projects in Zackenberg. Photo: Maria Scheel.

4.5.3 Waste

All types of waste must be brought back to the research station from the field for proper disposal. Use of the station toilets should always have a clear priority over open-air defecation in the field (if necessary, cover your faeces with a stone big enough not to be removed by a fox). Peeing close to running water in the field is not allowed.

4.6 Wildlife precautions and guidelines

The Zackenberg station manager, logistics staff and the experienced researchers can, based on their local experiences of the conditions in Northeast Greenland, provide general guidance concerning many security issues.

Staying vigilant and prepared for encounters with polar bears or muskox is essential (see documents on the website such as [bear safety](#)).

4.6.1 Birds

Small populations of red-throated divers (*Gavia stellate*), king eiders (*Somateria spectabilis*) and long-tailed ducks (*Clangula hyemalis*) are found in the Zackenberg valley. These birds are confined to the relatively limited number of small lakes and ponds and are sensitive to disturbances. Please avoid scaring them off the ponds.

4.6.2 Geese

Family groups of barnacle geese and flocks of pink-footed and barnacle geese are highly sensitive to disturbances. Please do not scare them off their feeding and moulting sites (see Zone 1c in map at page 17).



4.6.3 Musk oxen

Keep a distance of at least 100 m from musk oxen, not only to avoid the danger from attacks, but also to avoid disturbing the animals.

4.6.4 Polar bear

The Station Manager and Scientific Leader/Liaison will introduce you to polar bear and musk ox precautions upon your arrival at the Zackenberg Research Station. Please read "Encounters with Wildlife in Greenland" and "The Handbook: Prevention and control of wildlife damage –

Photo: Lars Holst Hansen.



Polar bears". Both can be downloaded from our [website](#) before going to Zackenberg.

Polar bears were rare at Zackenberg, but encounters appear to have been rising since 2009 across all seasons. At Daneborg, polar bears have always been frequent visitors.

4.6.5 Walruses

Walruses can be dangerous to small vessels. Hence, when working in boats and zodiacs in Young Sund – Tyroler Fjord, a distance of at least 75 m should be kept to walruses.

4.7 Local transportation

First, anyone visiting Zackenberg must bear in mind that minimising human impact on the pristine ecosystem has highest priority. Local transportation must therefore take place with due consideration to landscape, flora and fauna. The main transportation is on foot or on skis / snowshoes when the ground is snow covered. The staked-out corridor through the most heavily used areas must be followed to the extent it is possible before fanning out to the various destinations in the landscape. The station manager will give you an introduction to traffic regulations in the Zackenberg region immediately after your arrival at the station.

4.7.1 Snowmobiles

The station has four snowmobiles, mainly to be used in early spring to the end of May and only to be used on snow-covered ground. Driving outside the station's im-

mediate area should always imply use of two snowmobiles. Station personnel will provide instruction in vehicle use and provide helmets and safety equipment. The rules for driving in terrain with motorized vehicles also apply to driving snowmobiles.

4.7.2 Skis and Snowshoes

Until late June, traffic in the study area is hampered by extensive snow cover. During spring, deep and water-soaked snow may occur in many places. Skis and/or snowshoes will be an advantage during winter and spring and should always be used when appropriate, also to protect the snow and vegetation below. A limited number of skis and snowshoes are available for loan at the station (contact the station manager beforehand for this possibility).

4.7.3 Sandøen

The island Sandøen, southeast of Daneborg, is a strictly protected nature reserve with no access allowed without a special permit from the National Park authorities (i.e. The Government of Greenland). Permission to visit the island for research purposes can normally be achieved by applying the Government of Greenland well in advance. Make sure to keep your distance to walruses and avoid stepping on nests and young of the breeding birds.

4.7.4 Sirius – Daneborg

In the Daneborg station area outside the research station facilities, instructions from the Head of the Sirius Patrol must be obeyed.



5 At the station - Zackenberg

5.1 Sustainability

There are many things to keep in mind when staying at a small research station. Although the environmental impacts of our presence may seem small in a big landscape, it is still our obligation to reduce them to an absolute minimum.

The facilities at Zackenberg are currently undergoing a green transition towards increased use of solar panels for power production. Zackenberg Research Station has previously been powered solely by generators using diesel as fuel. From 2023, the supply will be powered by batteries only charged by solar panels and generators. The station will at the same time aim at reducing any excess use of electricity where possible.

Waste is separated into organic waste, clean wood, combustible items (paper, cardboard) and non-combustible items (plastic, glass, metal, electronics, batteries etc). Paper and cardboard are burned in the local incinerator. Toilet waste is fragmented and dumped into the river. All other types of waste are transported out from Zackenberg for treatment or deposition.

We kindly remind you to think about reducing your waste production and use of electricity (switch off light, computers, equipment etc. when not in use), take short showers to save water, fill laundry machines to full capacity, sort your waste – and ask the Station Manager of any guidelines when in doubt.

5.2 Station guidelines and general info

5.2.1 Zackenberg Code of conduct

In a small community like Zackenberg Research station and at Daneborg, good communication is essential, both in the field and at the station, to ensure that everyone is safe and a good work environment is maintained at all times. Respect and be considerate of others, be honest and accountable, and ask for help when you need it as well as respect those who ask for help. Unacceptable behaviour includes: Physical or verbal abuse, harassment, intimidation or bullying, manipulation and, gender, race-based, age-based, ability-based or sexual harassment.



Photo: Carsten Nørgaard.

REPORTING PROCEDURES

No matter your home institution or affiliation, you can disclose an incident that you experienced, observed, or were told about.

The best reporting option is often directly to Station Manager (See board and info screen in House 1 and House 9), unless you feel unsafe or uncomfortable with that option. In that case, you can report to the following:

For issues related to logistics and safety:

- Lars K. Brøndsel, Logistics Manager of Zackenberg, Department of Ecoscience, Aarhus University, lkb@ecos.au.dk, Mobile: +45 93522755

For scientific or monitoring issues contact:

- Torben R Christensen, Scientific Leader of Zackenberg, Department of Ecoscience, Aarhus University, torben.christensen@ecos.au.dk. Mobile: +45 93509049

If you feel unsafe or uncomfortable with these options, you can report incidents to the following:

- Mikkel Tamstorf, Deputy Head of Department, Department of Ecoscience, Aarhus University, mpt@ecos.au.dk, Mobile: +45 53575044
- Helene Nyegaard Hvid, Head of Secretariate, Department of Ecoscience, Aarhus University, helenehvid@ecos.au.dk, Mobile: +45 93522135



5.2.2 Electricity

The station supplies 230V, 50Hz AC power. Electricity outlets are of DIN standard.

5.2.3 Toilets, showers and washing machine

The station has three flushing toilets. To secure a continuous optimal function of the toilets, it is important that all users comply with the instructions that the Station Manager may give you regarding use of the toilets. Two separate gender washrooms with showers (both with hot and cold water) are in the accommodation building. Furthermore, two standard household washing machines are available in the same building as well as detergent.

5.2.4 House rules

Please observe the house rules for the individual buildings. A summary of the most important general house rules will be given by the Station Manager upon arrival and a list is posted in the individual buildings.

Please be aware of noise in the accommodation house. Sound travels far in house 9, so try to be quiet after 10 PM.

There is a vacuum cleaner and several brooms in house 9 to clean up your room.

5.2.5 Accommodations

The Zackenberg Research Station can accommodate a maximum of 24 scientists and staff. Scientists are accommodated in the accommodation building (house 9) or in other buildings. Accommodation is provided in double rooms with central heating, beds and essential furniture. Toilets, showers and living room are also located in house 9. Dining is in a separate building (House 1). Scientific samples and equipment should be kept out of House 1 and 9.

5.2.6 Kitchen/Meals

During the main season (June through August), the mess at the Zackenberg Research Station is staffed with a professional cook. Remember to state in the application if you have special dietary needs.

All meals are served buffet style. Snacks are available throughout the day (and night) on a self-service basis. Lunch packs can be prepared at breakfast.

If you know that you will be significantly late for a meal, please contact the kitchen staff well in advance, and then servings can be saved for you. In case you are on a special diet for health reasons or have other special dietary requirements (e.g. vegetarian), please state this in the application form.

Please give a hand in the kitchen with the dishes. The cook is only there in order to prepare and make the meals.

Consider bringing a re-usable container for your lunch pack to reduce the use of wrapping materials. A small range of thermos flasks are available.

It is your own responsibility to comply with customs regulations regarding the quantities of alcohol allowed on trips to Greenland.

If you need freeze-dried food for several days, please contact the Zackenberg secretariat prior to the field season. If you have special dietary needs, you should state this in the application.



5.2.7 First aid and medicine

A well-equipped first aid kit and defibrillator are available at the station. Any personal medication must be brought in by you. Projects are advised to bring their own first aid kits for field use.

Any disease that might affect your ability to stay and work in the field must be reported to the staff on the application form, but please note that the Department of Ecoscience, Aarhus University, will take no responsibility for any problems relating to the health information reported on the mandatory application form.

As there is no medical doctor at the Zackenberg Research Station, serious illness or accidents requiring urgent medical attention may result in an evacuation. The staff at the Zackenberg Research Station will help with the evacuation out of Zackenberg. However, please note that evacuations are carried out at your own expense.

Be aware of software that does not function completely off-line will be useless during the entire stay at Zackenberg.

5.3 Communication and hardware

You must bring your own portable hardware/laptop to meet your computer needs in the field and in the laboratory.

While there is no internet connection at the station, certain limited digital communication is possible via LAN/WiFi locally. Zackenberg/Daneborg intranet is under development and connecting to this network is optional.

5.3.1 Telecommunication

You may use three kinds of voice communication:

- For local communication purposes, i.e. within the core study area, a number of VHF radios are at your disposal and are compulsory to carry while in the field.
- The internal e-mail and digital chat facilities
- Regional/long-distance and international communication, e.g. to/from Denmark, will be handled with satellite telephones.



Zackenberg can be reached at the following iridium telephone number: 00 8816 7773 9103

Please note that you cannot count on somebody being within hearing distance of the phone - except around 8 a.m. (local time). It is strongly recommended to use the e-mail option as the cheapest and most reliable means of communication.

Please note that during the winter period, the telephones and the VHF radios are disconnected, as the station is unmanned, so please contact the secretariat via email zackenberg@au.dk.

5.3.2 E-mail

E-mail communication is available, but costs are high, and is invoiced per kb (see price list on the website). The Zackenberg e-mail system is only operated by the station manager, who will transfer your e-mail text from a memory stick to the mailing system and provide you with paper copies of the e-mails you receive. E-mail communication takes place via a dedicated PC located in House 5. The e-mail inbox is emptied daily just before breakfast and dinner, and recipients will be notified.

Due to technical constraints in the satellite, e-mail and data transmission can take place only at a very low bandwidth. E-mails should therefore only be used for sending text messages (no attachments of any kind, or email signatures etc). Please inform people emailing you to put your name in the subject line.

The e-mail address for Zackenberg is:
logistics@zackenberg.com

5.3.3 Mail

The postal connection between Zackenberg Research Station and the rest of the world goes through Akureyri, Iceland, thanks to the charter flight company Norlandair. The station office at Zackenberg Research Station has a small selection of postcards available for purchase, but no stamps (will be stamped in Iceland). Outgoing letters must be left in the out tray in the station manager's office in order to be sent off with the next aircraft.

To receive mail at Zackenberg the following mailing address applies:

'Person's name'

Zackenberg

c/o Norlandair

Akureyri Airport

IS-602 Akureyri,

Iceland

5.3.4 Smoking

Smoking, including the use of electronic cigarettes, is not allowed indoors at the Zackenberg Research Station. When smoking outdoors, cigarette butts, cigar stumps, pipe tobacco remains etc. must be taken to deposition

in the trash barrels or the designated cigarette butt disposal containers at house 1, 5 and 9.

5.3.5 Workshop

A selection of tools are at your disposal in the workshop in House 8. To keep the workshop well stocked and functional, it is required that everyone treat the facility appropriately. Therefore, please inform the station manager if you need anything from the workshop. They will then inform you about the proper use of the equipment and they will check that the equipment is still in good order when you deliver it back.

5.3.6 Tundra shop

At Zackenberg, a small Tundra shop is open upon request, which has selected items/souvenirs for sale (t-shirts, postcards, pens, etc.).

5.4 Laboratories

Zackenberg has a basic wet and a basic dry laboratory for sample preparation, sorting and examination. Basic laboratory equipment is available in both laboratories, but any particular consumables or specialised equipment must be brought by the individual projects.



Photo: Marie Frost Arndal



The basic laboratory equipment at Zackenberg includes pH-meters, conductivity meters, a high precision scale, normal range scales, a dissecting scope, a centrifuge, drying ovens, sieves and meshes, pipettes, various glass ware, plastic containers, refrigerators (+5 °C) and freezers (−18 °C) etc. In the wet laboratory, demineralised (<0,1 µS/cm) and filtered (<1 µm) water is available. Zackenberg Research Station does not provide laboratories with low temperature.

Some of the lab equipment is owned by the GEM programme, and use of pH- and conductivity meters should be coordinated with the GEM field work personnel. For specific information about the laboratory equipment at Zackenberg or Daneborg, please contact the secretariat (Zackenberg@au.dk).

5.4.1 Safe and responsible disposal of chemicals

It is your own responsibility to bring in the necessary chemicals relating to your project and to bring out of Zackenberg and Daneborg all waste chemicals that may follow their use. The Station Manager can assist you with the latter part. All paperwork relating to dangerous goods transportation in and out of Zackenberg must be obtained through the procedures linked to the application process for access to the station.

5.5 Recreation

A number of books, DVD's and games – indoor as well as outdoor – are available at the station.

5.5.1 Hiking and huts

The old Zackenberg trapping station at the coastline as well as the summits of Zackenberg and Aucellabjerg mountains are all favourite destinations for recreational hikes. Remember to use the route maps and check out safety equipment, also for recreational trips.

When visiting the old trapping stations and huts, please show respect for the historical values and lock up the house carefully when you leave. The wood stove in the Zackenberg Trapping Station is the property of the Sirius Sledge Patrol and should not be used by visitors from Zackenberg Research Station.

Use of the wood/coal stove is not allowed. Do not leave any waste behind. Please respect that the Sirius Patrol uses some of these huts for accommodation during winter. Therefore, please do not use the provisions or other things stored in the station and huts.

5.5.2 Hunting and fishing

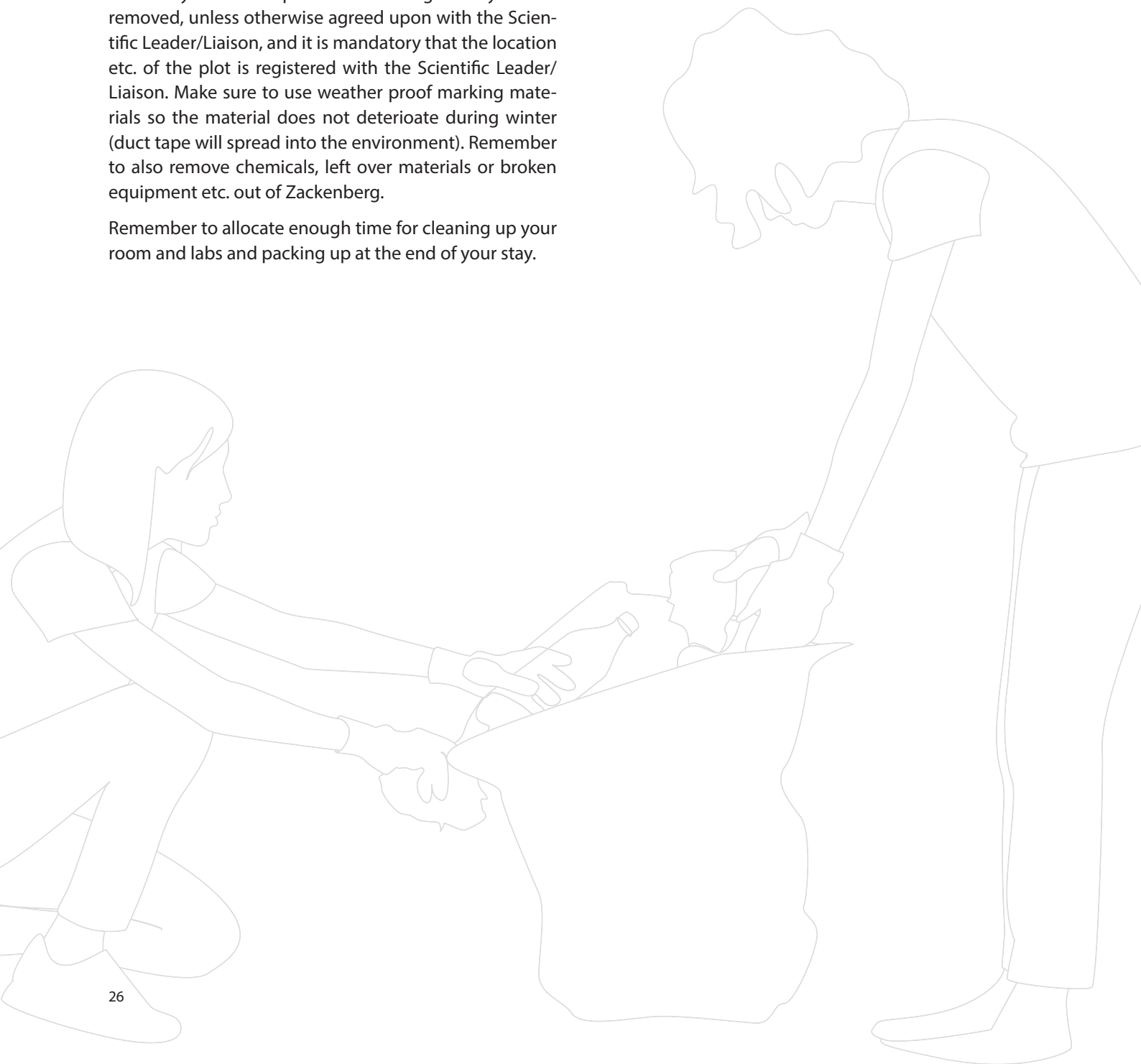
Hunting is prohibited in the National Park. Sport fishing in Greenland requires a [permit](#) (in Danish only).

6 Leaving Zackenberg and after your stay

6.1 Cleaning up in the field

It is the responsibility of the individual leaders of research projects (i.e. the principal investigators) to remove scientific equipment from the field site(s) and from the Zackenberg Research Station after termination of the study or experiment unless other specific arrangements have been agreed upon. Tags and markers indicating the position of your field experiment should generally not be removed, unless otherwise agreed upon with the Scientific Leader/Liaison, and it is mandatory that the location etc. of the plot is registered with the Scientific Leader/Liaison. Make sure to use weather proof marking materials so the material does not deteriorate during winter (duct tape will spread into the environment). Remember to also remove chemicals, left over materials or broken equipment etc. out of Zackenberg.

Remember to allocate enough time for cleaning up your room and labs and packing up at the end of your stay.



6.2 Payment/invoices

Following the field season, invoices covering the Zackenberg and travel related expenses of the individual person or project will be issued and e-mailed by the Zackenberg secretariat.

Invoices will be sent out as soon as possible and not later than late November/early December and must be paid to the Zackenberg secretariat before the end of December.

6.3 Acknowledgement in papers

Please acknowledge as follows: Department of Ecoscience, Aarhus University, is acknowledged for providing logistics at the Zackenberg Research Station Northeast Greenland.

