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WINGS OVER GREENLAND • II

The Icecap Circumnavigation Project

2013





In the past few years, polar skiing expeditions have seen a rapid evolution thanks to the use of snowkites. While opening new possibilities, power kites have made these endeavors more challenging in the field, but also in the preparation: the logic of the aerology is now at the heart of the most ambitious projects.

Since the 1990-ties, some of the most impressive realizations had their success based on the use of powerkites. At the beginning of the next decade, a spanish team marked the beginning of a new era with the first longitudinal crossing of Greenland, covering a distance of 2300 km by kite, relying on the logic of katabatic wind systems alone. A few years later, Norwegian kites once more confirmed this approach by shattering all previous expedition speed and distance records in Greenland and Antarctica.

During the antarctic summer 2011-2012, a belgian duo pushed the limits even further with their attempt

to circumnavigate the icecap of east Antarctica, utilizing the katabatic wind systems to a maximum. After 74 days on the ice, they set a new world record for the longest kite skiing trip: 5013 km. In parallel, and for the same aerological reasons, the idea of a first circumnavigation of the Greenland icecap floats around in the small community of polar kites since a few years now.

We too, we have been considering this project for quite some time already. The idea came up again in fall 2011, and has since then grown in our minds. The following spring, we made the decision...

Destination Greenland !

Greenland is the worlds biggest Island. The Greenland Ice Sheet (Inlandsis : interior ice) covers over 1.7 Million square kilometers, the equivalent surface of France, Germany, Italy, Spain and Switzerland combined. It's

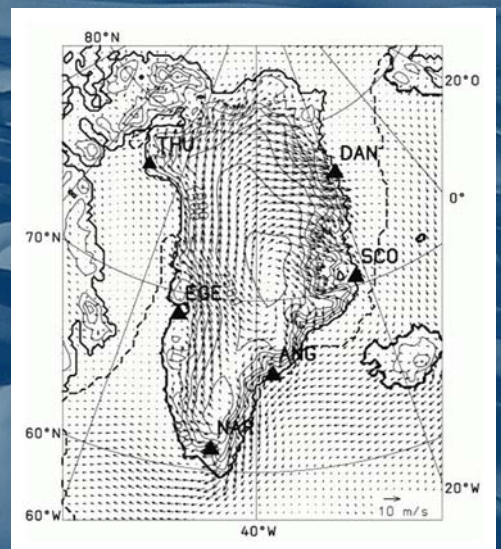
Climate & katabatic winds

The extreme climate of the ice sheet, in particular in its north central part is dominated by stable high pressure regimes, that are perturbed only from time to time by the passage of depressions. The existence of this anticyclonic sheet is at the origin of a large negative radiation balance and leads to a strong thermal surface inversion. The layers of dense cold air, formed through contact with the ice flow, downward the slope through gravity. Originating usually from the center and the crests of the icecap, these diverging fluxes first propagate along the strongest gradient and are then subsequently deviated clock-wise by the Coriolis force closer to the coasts.

The direction and strength of these katabatic winds is strongly linked to the global topography of the ice sheet and the local relief of the mountains and valleys in the coastal areas. In general, these winds are mainly characterized by their:

- constancy in direction,
- temporal periodicity,
- weak average strength.

Despite the last parameter, the constancy of the katabatic winds an their direct link to the topography create a favorable frame for the realization of kite supported long distance expeditions.



Model of the katabatic winds. Arrows: direction and strength at 10m for given date and time. Image: Heinemann and Klein.

the second largest ice surface on earth after the antarctic continent. It extends over 2600 km and 24 degrees of latitude from south to north, and 1000 kilometers from east to west. The average elevation is 2135 m and the the Icecap reaches a thickness of up to 3000 m at its center.

Wings over Greenland II – The Icecap Circumnavigation project

The two ice sheets covering Greenland and Antarctica constitute the most suitable areas for wind based very long distance trips.

A circumnavigation of the Greenland ice sheet is particularly interesting as the necessary logistics and global budget are comparatively small for a total distance exceeding 5000 km - a similar project in Antarctica would require incomparably more logistics and financial means.

But the relative simplicity of a circumnavigation of the Greenland ice sheet stops here. In all other aspects, we are dealing with a complex equation with a number of unknowns:

- Due to the smaller size of the Greenland icecap, the katabatic winds are less stable compared to Antarctica. This is particularly true for the south part of the icecap. The southern part being rather narrow, the katabatic winds are attenuated, especially in the south eastern quarter of the planned circumnavigation.
- Only few information is available on the aerologic conditions of the east slope (today no significant long distance kiting trip has ever been realized in this part); the difficulty to gather and analyze the limited available data.
- The proximity of the coastal mountains in several areas of the eastern part is expected to induce crevasses propagating far into the interior.
- The risk to encounter large areas of surface melt in the southern third, in the beginning of June.

Easily accessible documentation on climate and topography of the Greenland ice sheet remains sparse. A methodic approach using topographic data, digital elevation models and a systematic analysis of scientific data from the automatic weather stations at select locations on the icecap, complemented by satellite images, were necessary to obtain pertinent information on :

- The precise cartography of Greenland
- Temperature averages and probabilities for given locations and periods
- Aerology, average wind speeds, dominant directions, constancy and probabilities
- Surface melt, temporal evolution and spatial extent
- Glaciology, glaciers draining the icecap, ice flow towards the coast and resulting crevasse areas propagating to the interior.

The full technical document containing careful and extensive analysis of the conditions and on which our project 'Wings Over Greenland II' is founded is available on request.

From a sportive point of view, our experience shows the importance to be proficient in the use of kites in all types of conditions. While one needs to be able to handle strong conditions and stormy days, the capacity to exploit weak and even very weak winds efficiently is even more crucial.

The correct choice of the kiting equipment is obviously of primordial importance and does not allow for compromises. The same holds true for all of the expedition equipment, as the expedition will be fully autonomous for nearly 60 days, and the initial weight of the sledges and equipment at the start will approach 150 kg per person





Wings Over Greenland

Itinerary (see map below)

Starting point and finish: Narsaq (Southern Greenland).

Dates April 20 - June 20 2013

Projected planning :

- ⌚ D1 - D4 Deposit at end of Qaleraligd Fjord (latitude 61N). Ascent from sea level to the glacier plateau (elevation 1800 m, progression against the dominant winds).
- ⌚ D9 Passage the latitude of the capital Nuuk (latitude 64N).
- ⌚ D11 Abandoned american radar station DYE 2 (latitude 66.5 N).
- ⌚ D14 Latitude of Illulissat (69N). Progression between 2200 m - 2400 m.
- ⌚ D21 We are going to leave the route we followed in 2008, heading towards the extreme north of the icecap. (Latitude beyond 80N, elevation 1800 m).
- ⌚ D23 We will enter the Northeast Greenland National Park. (With a size comparable to Egypt, it's world largest national park.)
- ⌚ D25 heading south east.
- ⌚ D28 - D34 The itinerary climbs 1000 m over a distance of 650 km until 73N, while passing the nunataks of Dronning Louise Land (D30), and the mountains of Kong Christian X Land (D32 - D34).

- ⌚ D37 Passage at 165 km from Gunnbjorn Fjeld (3964 m), the culminating point of Greenland and the Arctic; crossing above the large 'funnel' formed by the Kangerlugssuaq Glacier draining the icecap towards the homonymous fjord.
- ⌚ D38 Traversing 'east col' (Latitude 68.3N).
- ⌚ D39 -D41 Losing 800 m over 300 km until reaching the latitude of the south col (66N).
- ⌚ D41 - D45 Progression at 2000 m elevation, close to the mountains of Kong Frederiks VI Kyst (latitude 63N).
- ⌚ D48 Traversing the south east col separating the mountain ranges above of Kap Farvel at the extreme south tip from the icecap. (latitude 61.8N).
- ⌚ D49 Final descent, passing an area scattered with large isolated nunataks.
- ⌚ D50 Reaching the point of departure at the end of Qaleraligd fjord. recovery by boat to Narsaq.

Total distance: 5100 km.

Team

Cornelius Strohm (age 39, German, scientist in experimental physics)

Michael Charavin (42 ans, French, Polar Guide, snowkite instructor, free lance journalist for mountain-, ski- and outdoor magazines)

As avid snowkiters we regularly train in the Alps and Norway.

We cumulate hundreds of days on polar expeditions (snowkite and ski). Among others:

- **The kite-ski south-north crossing of Greenland in 2008** : 2250 km in 31 days <http://kitegreenland.canalblog.com>
- A winter crossing of the Vatnajökull (Europes largest icecap) and of a part of Iceland in February 2010 <http://latitudes-nord.fr>
- The crossing from Ny Alesund to Longyearbyen, and the exploration of the southern part of Spitsbergen by ski
- The crossing of the Scandinavian Alps by ski (southern of Norway - north of Finland, 1700 km)



80°N

75°N

70°N

65°N

60°N

60°W

55°W

50°W

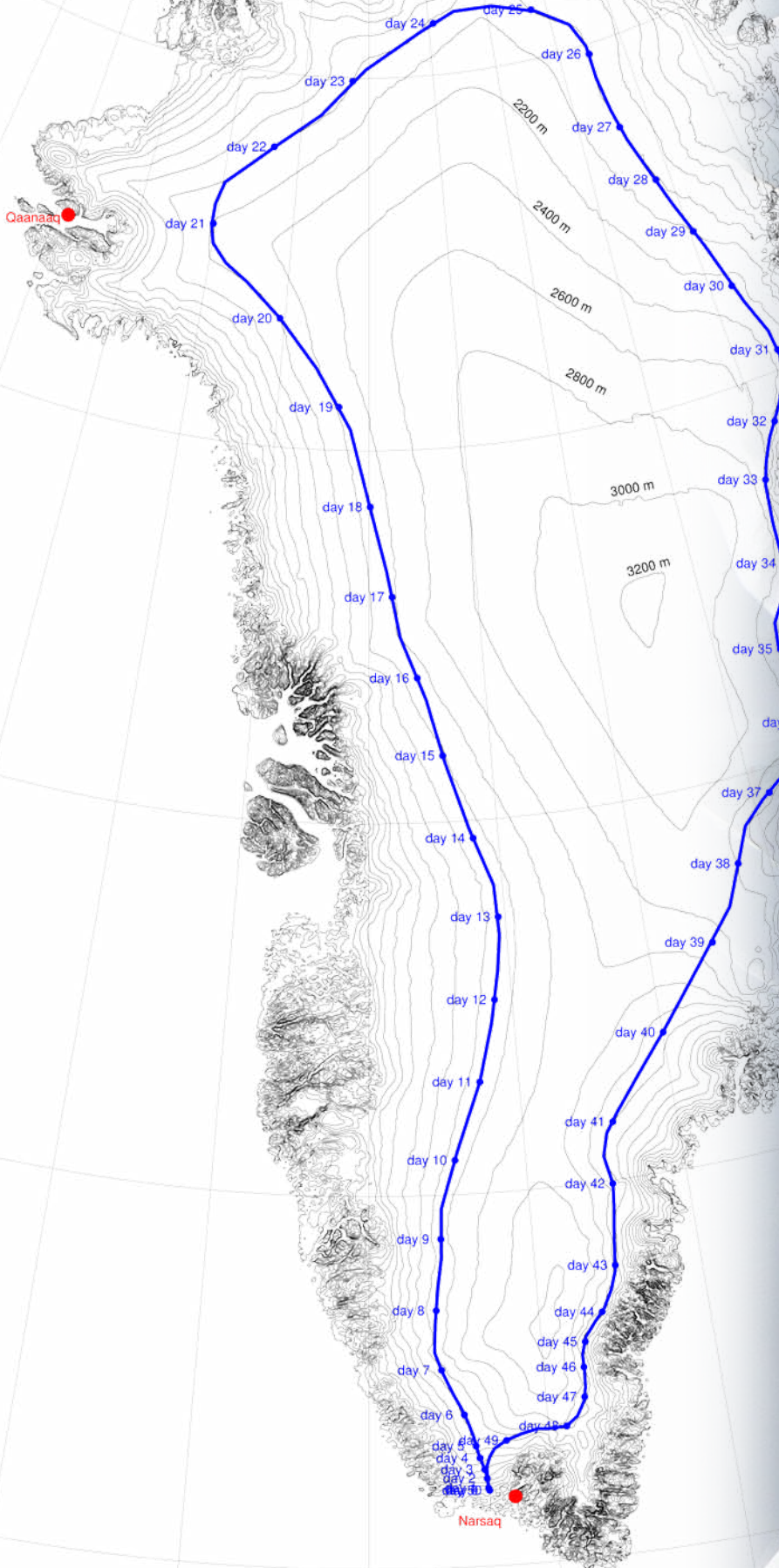
45°W

40°W

35°W

Qaanaaq

Narsaq





A total budget of 38000 Euro

- Logistics 13 000€
(Flights 3500 €, deposit and recovery by boat 2000€, Air freight 3400€, permits and insurances 3000€, weather routing 1000€)
- Sports equipment 19 000€
(kites 11 000€, skis 2000€, sleds 2300€, clothing 3000€, tents 1000€, etc.)
- Food and fuel 2500 €.
- Communication technology 3000 € (satellite phones and communication costs, distress beacon, solar panels)

This budget was established based on our experience from previous expeditions, and takes the evolution of services and equipment and associated costs into account. Naturally we will provide a detailed accountancy to our partners.

Become a Sponsor !

An endeavor of this dimension requires substantial financial and material investments. It would be impossible to attempt without the direct involvement of sponsors.

Our needs:

- We are interested in support in a number of different forms and on various scales. While all material help is welcome, direct financial support would allow to best answer our needs.
- The support we are looking for ranges from logistics such as flights and shipping of equipment, insurances, weather forecasting and routing services over kites, skis, sleds, camping equipment, and clothing to freeze dried meals and finally communication technology, satellite phones, emergency beacons, solar solutions and much more. A detailed list resuming our needs will be available soon.

If your company provides one of these services, if you are a manufacturer or reseller of equipment or if you would simply support the project to become a part of it, we would be excited to get in touch.

Our offer:

We expect to reach a broad audience in the mountaineering, skiing, kiting and polar communities and well beyond, given the chance.

- We have demonstrated during previous kite skiing expeditions, that we are familiar with the publication of articles and short reports, in French and English, in the specialized press and web (see appended list concerning 'Wings over Greenland' and 'The Elements Expedition').

Beyond the frame of these expeditions, part of our professional experience is based on the publication in specialized media, through text and image, reports and pictures (see appended list of other press and web articles). We thus claim a real passion for this type of communication, and we combine this know-how with our familiarity of the publishing networks (among others the editorial offices of specialized journals).

We would be willing to extend the target audience to the general public, either through a direct collaboration with big media or the intermediate of a sponsor who would like to get visibility and media exposure via the support of our project.

The means and capacity of communication we offer varies depending on the commitment of our sponsors. We will be happy to provide regular dispatches, and possibly exclusive texts, images and video, from the ice and after the return. In English, French and German.

- Wings over Greenland II being a huge endeavor combined with appropriate means of communication, it will capture people through the many different aspects the team has to cover during the preparation and to deal with on the terrain.

The preparation covers the documentation polar history, the study of the topography, the analysis of the climate, wind and weather systems, and the development of a progression strategy. While this part is quite technical, it is at the same time critical for a successful execution, and of major interest to all those who would like to understand the complex logic and construction of such a project. The technical report resuming our detailed analysis of the meteorological, aerological and snow conditions is available to our partners.

Once on the ice, we will provide daily updates on our position and additional short reports available to everybody and that partners may use on their websites, as well as dedicated news for main sponsors. The daily progression of an expedition usually engages the audience to get involved, to share the struggles, fears and hesitations as well as the successes with the team on the ice.

After the expedition, we will provide detailed reports, articles and high quality pictures and video.

- In return for their support, and to carry their brand image and ideas forward, the sponsors will benefit from the enormous documentation work and the logistic put in place for the expedition, from the long term visibility of their brand, services and of their equipment in extreme use and, finally, media exposure during several months.

An experienced team of two
A journey never attempted before
An expedition “100% snowkite”

A logic itinerary imposed by a particular aerology
60 days and 5000 km in full autonomy
The largest icecap of the northern hemisphere

The desire to surpass ourselves,
the pleasure to achieve something unique !

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